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Каталог продукции KSB

Pressure Booster System

Hya-Eco VP

Type Series Booklet



Building Services: Water Supply

Pressure Booster Systems

Hya-Eco VP



Main applications

- Pressure boosting

Fluids handled

Pump for handling clean liquids not chemically and mechanically aggressive to the pump materials.

- Drinking water
- Service water
- Cooling water

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 70 with a max. of 3 pumps ¹⁾
	Q [l/s]	≤ 19.5 with a max. of 3 pumps
Head	H [m]	≤ 110
Fluid temperature	T [°C]	≤ 70
		≤ 25 to DIN 1988 (DVGW)
Operating pressure	p [bar]	≤ 16
Inlet pressure	p _{vor} [bar]	≤ 6

Designation

Example: Hya-Eco VP 2 / 0406 / __ B

Designation key

Code	Description
Hya-Eco VP	Type series
2	Number of pumps
04	Movitec pump size
06	Number of stages
__	Inlet pressure [bar]
B	Design status

Design details

Design

- Fully automatic pressure booster package system
- Baseplate-mounted
- Either two or three vertical high-pressure centrifugal pumps, type Movitec, with oval flange
- One check valve and shut-off valves to DIN/DVGW for each pump
- Anti-vibration pads per pump
- Membrane-type accumulator (direct-flow) to DIN 4807-5 on the discharge side, approved for drinking water
- Pressure transmitter on the discharge side
- Pressure gauge for pressure indication
- Two standard volt-free changeover contacts for fault indication
- Design and function as per DIN 1988-500

Installation type

- Stationary installation

Drive

- Electric motor 60 Hz, 2-pole, IE2, special KSB model, for three-phase mains

Automation

- Control cabinet IP54
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the system
- Service interface for connection to a PC
- Frequency inverter
- Transformer for control voltage
- Motor protection switch per pump
- Lockable master switch (repair switch)
- Pressure transmitter on the discharge side
- Wiring plan to VDE and parts list for electric parts
- Terminal strip/terminals with identification for all connections
- Terminal connection for digital dry running protection
- Remote ON connection
- Remote OFF connection

¹⁾ With stand-by pump as peak load pump

Configuration and function



Hya-Eco VP

1	Control unit	2	Control cabinet
3	Pump	4	Collecting line
5	Baseplate		

Design

Fully automatic pressure booster package system, with 2 to 3 vertical high-pressure pumps and continuously variable speed adjustment of each pump for fully electronic control of the required supply pressure, with two standard volt-free changeover contacts for fault indication.

Function

Automatic mode

Either two or three pumps (3) are controlled and monitored by a micro-processor control unit (1). Each pump is connected to a frequency inverter and controlled by the control unit so as to ensure a constant discharge pressure of the pressure booster system. As the demand increases or decreases, peak load pumps are started and stopped automatically.

As soon as the demand increases again after one pump has been stopped, another pump which has not been in operation before is started up. When the last pump has been stopped and the demand increases again, the next pump in line is started up in variable-speed operation. The stand-by pump is also included in the alternating cycle. The standard setting is for the pressure booster system to start automatically as a function of pressure; the actual pressure is measured by an analog pressure measuring device (pressure transmitter). The function of this pressure transmitter is monitored (live-zero).

As long as the pressure booster system is in operation, the pumps are started and stopped as a function of demand (standard setting). In this way it is ensured that the individual pumps operate only in line with the actual demand. The use of variable-speed pumps reduces wear as well as the pumps' frequency of starts in parallel operation. If a duty pump fails, the next pump is started up immediately and a fault is output, which can be reported via volt-free contacts (e.g. to the control station). If the demand drops towards 0, the pressure booster system slowly runs down to the stop point. The operating status is displayed via LEDs.

Function

Manual mode

In exceptional cases, the system can also be operated in manual mode.

Minimum flow for pump in manual mode

Minimum flow per pump in manual mode

Pump	Minimum flow per pump in manual mode [l/h]
Movitec 2B	200
Movitec 4B	400
Movitec 6B	600
Movitec 10B	1100
Movitec 15B	1600

Materials

Overview of available materials

Component	Material
Inlet casing	Stainless steel
Discharge casing	Stainless steel
Hydraulic system	Stainless steel
Mechanical seal	Complies with EN 12756
Primary ring	Silicon carbide
Mating ring	Hard carbon
Elastomer	EPDM
Baseplate	Steel, powder-coated
Hydraulic design	
Distributor pipe	Stainless steel
Valves	Copper base alloy/brass DVGW-approved
Membrane-type accumulator	Connection made of stainless steel, flow through valve to DIN 4807-5
Membrane	Approved for drinking water

Product benefits

- Energy-efficient operation and constant pressure ensured by speed control of all pumps (all systems non-compliant with Drinking Water Directive, except for single-pump systems)
- Ease of use and fully automatic control by BoosterControl Advanced
- Corrosion-resistant by using high-quality stainless steel
- Ready-to-connect baseplate-mounted package system
- Pumps mounted on the baseplate on anti-vibration pads
- Suitable for drinking water installations, manufactured under stringent hygienic conditions

Selection information

Requirements:

Flow rate 4 m³/h

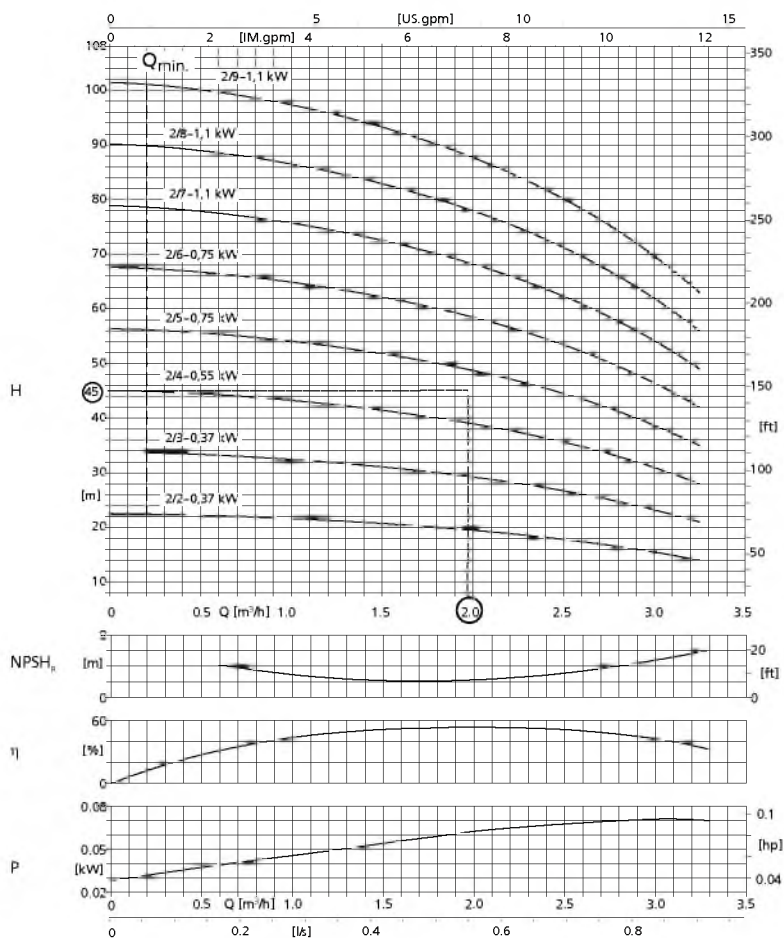
Start-up pressure 4.5 bar

Requested stand-by pump to DIN 1988

Solution:

Hya Eco-VP 2/0205 B

1. According to the table *Flow rate as a function of the number of pumps* the system may comprise 1 or 2 duty pumps (as stand-by pump is requested)
2. According to the table *Flow rate as a function of the number of pumps* the flow rate requirement can be either 4 m³/h (1 duty pump) or 2 m³/h (2 duty pumps)
3. The characteristic curves accordingly suggest Hya-Eco VP 2/205 (operating point close to Q_{opt})



The required flow rate is split according to the number of the duty pumps (not taking into account any stand-by pumps).

Flow rate as a function of the number of pumps

Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
2	0	Required flow rate / 2 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
2	1	Required flow rate / 2 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
3	0	Required flow rate / 3 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]

Technical data

Systems with 2 and 3 pumps

Hya-Eco VP	Per motor			Total rated power requirement	Mat. No.	[kg]
	Rated power	Rated current				
2/0202 B	0,37	0,89	1,3	29132656	120	
2/0203 B	0,37	0,89	1,3	29132657	121	
2/0204 B	0,55	1,32	1,9	29132658	122	
2/0205 B	0,75	1,65	2,4	29132659	123	
2/0206 B	0,75	1,65	2,4	29132660	127	
2/0207 B	1,10	2,36	3,4	29132661	128	
2/0208 B	1,10	2,36	3,4	29132662	129	
2/0209 B	1,10	2,36	3,4	29132663	133	
3/0202 B	0,37	0,89	1,9	29132664	147	
3/0203 B	0,37	0,89	1,9	29132665	152.6	
3/0204 B	0,55	1,32	2,9	29132666	150	
3/0205 B	0,75	1,65	3,6	29132667	151	
3/0206 B	0,75	1,65	3,6	29132668	158	
3/0207 B	1,10	2,36	5,2	29132669	159	
3/0208 B	1,10	2,36	5,2	29132670	160	
3/0209 B	1,10	2,36	5,2	29132671	167	
2/0402 B	0,55	1,32	1,9	29132672	120	
2/0403 B	0,75	1,65	2,4	29132673	125	
2/0404 B	1,10	2,36	3,4	29132674	126	
2/0405 B	1,50	2,88	4,2	29132675	130	
2/0406 B	1,50	2,88	4,2	29132676	136	
2/0407 B	2,20	4,09	6,0	29132677	137	
2/0408 B	2,20	4,09	6,0	29132678	144	
3/0402 B	0,55	1,32	2,9	29132679	148	
3/0403 B	0,75	1,65	3,6	29132680	154	
3/0404 B	1,10	2,36	5,2	29132681	156	
3/0405 B	1,50	2,88	6,3	29132682	162	
3/0406 B	1,50	2,88	6,3	29132683	171	
3/0407 B	2,20	4,09	8,9	29132684	172	
3/0408 B	2,20	4,09	8,9	29132685	183	
2/0602 B	0,75	1,65	2,4	29132686	122	
2/0603 B	1,10	2,36	3,4	29132687	131	
2/0604 B	1,50	2,88	4,2	29132688	136	
2/0605 B	2,20	4,09	6,0	29132689	137	
2/0606 B	2,20	4,09	6,0	29132690	146	
2/0607 B	3,00	5,51	8,0	29132691	147	
3/0602 B	0,75	1,65	3,6	29132692	150	
3/0603 B	1,10	2,36	5,2	29132693	162	
3/0604 B	1,50	2,88	6,3	29132694	171	
3/0605 B	2,20	4,09	8,9	29132695	172	
3/0606 B	2,20	4,09	8,9	29132696	184	
3/0607 B	3,00	5,51	12,0	29132697	186	
2/1002 B	1,50	2,88	4,2	29133769	167	
2/1003 B	2,20	4,09	6,0	29133770	175	
2/1004 B	3,00	5,51	8,0	29133771	193	
2/1005 B	4,00	7,34	10,7	29133772	195	
2/1006 B	4,00	7,34	10,7	29133773	207	

Hya-Eco VP	Per motor			Total rated power requirement	Mat. No.	[kg]
	Rated power	Rated current				
3/1002 B	1,50	2,88	6,3	29133775	218	
3/1003 B	2,20	4,09	8,9	29133776	230	
3/1004 B	3,00	5,51	12,0	29133777	256	
3/1005 B	4,00	7,34	16,0	29133778	259	
3/1006 B	4,00	7,34	16,0	29133779	277	
2/1502 B	3,00	5,51	8,0	29133781	213	
2/1503 B	5,50	9,86	14,3	29133782	310	
2/1504 B	7,50	13,20	19,2	29133783	320	
2/1505 B	7,50	13,20	19,2	29133784	322	
3/1502 B	3,00	5,51	12,0	29133786	281	
3/1503 B	5,50	9,86	21,5	29133787	422	
3/1504 B	7,50	13,20	28,8	29133788	437	
3/1505 B	7,50	13,20	28,8	29133789	440	

Type of connection

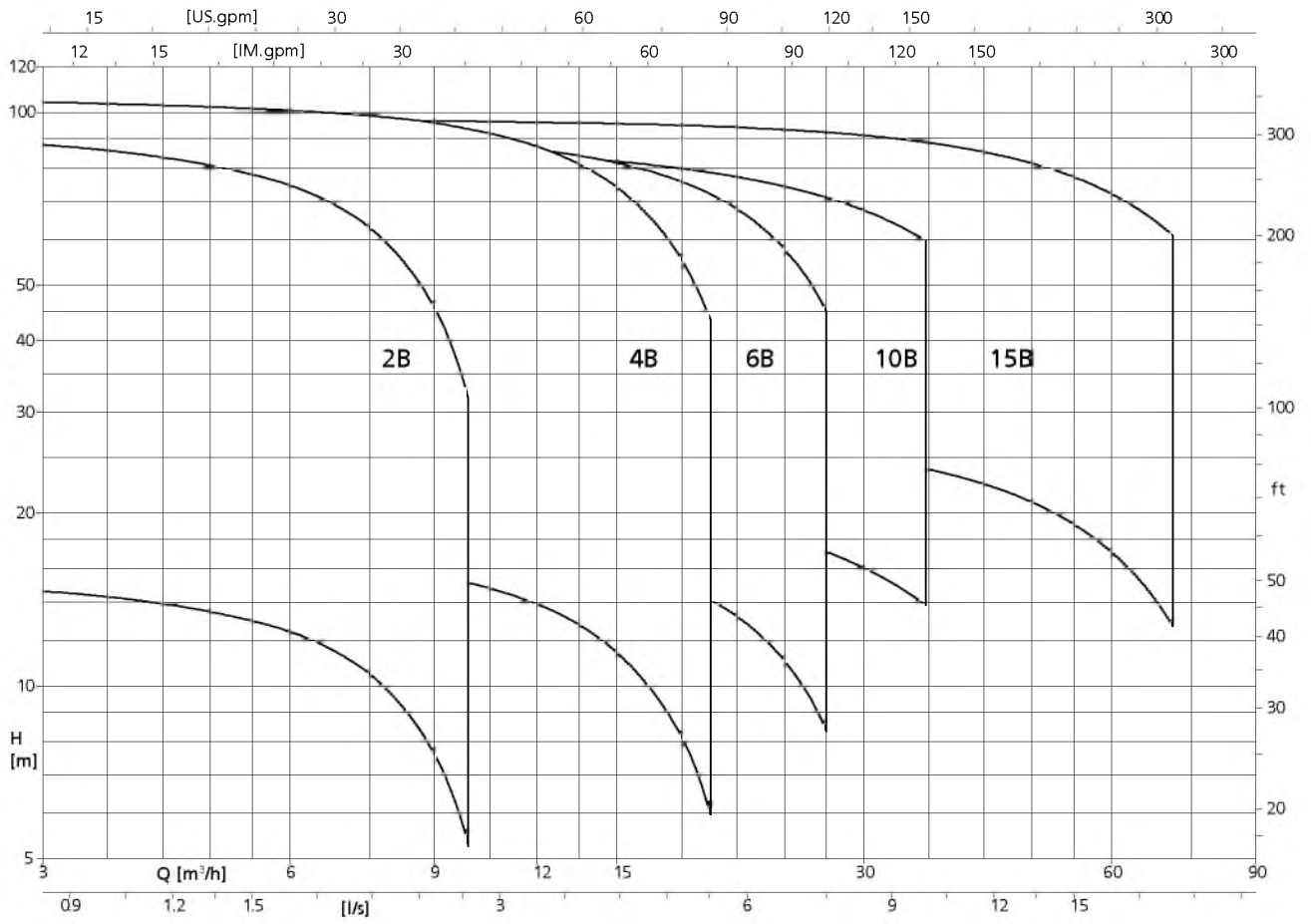
Types of connection (schematic)

Direct	Indirect	
<p style="text-align: right;">1952-106</p>	<p>Unpressurised inlet tank at the same or at a higher level</p> <p style="text-align: right;">1952-107</p>	<p>Unpressurised inlet tank at a lower level (suction-lift operation) ²⁾</p> <p style="text-align: right;">1952-108</p>
<p>Inlet pressure monitoring (see Supplementary equipment or Accessories)</p>		
<p>At $p_{in} > 0.5$ bar (min. 1 bar, DIN 1988)</p> <ul style="list-style-type: none"> - Pressure switch - Pressure sensor <p>At $p_{in} < 0.5$ bar</p> <ul style="list-style-type: none"> - Pressure sensor - Flow monitoring 	<ul style="list-style-type: none"> - Float switch - Set of electrodes and relay - Dry running protection for PE inlet tank - Pressure sensor - Flow monitoring³⁾ 	<ul style="list-style-type: none"> - Float switch - Set of electrodes and relay - Dry running protection for PE inlet tank - Flow monitoring³⁾

²⁾ Non-priming pumps, suitable for suction-lift operation (for selection, please consult KSB)

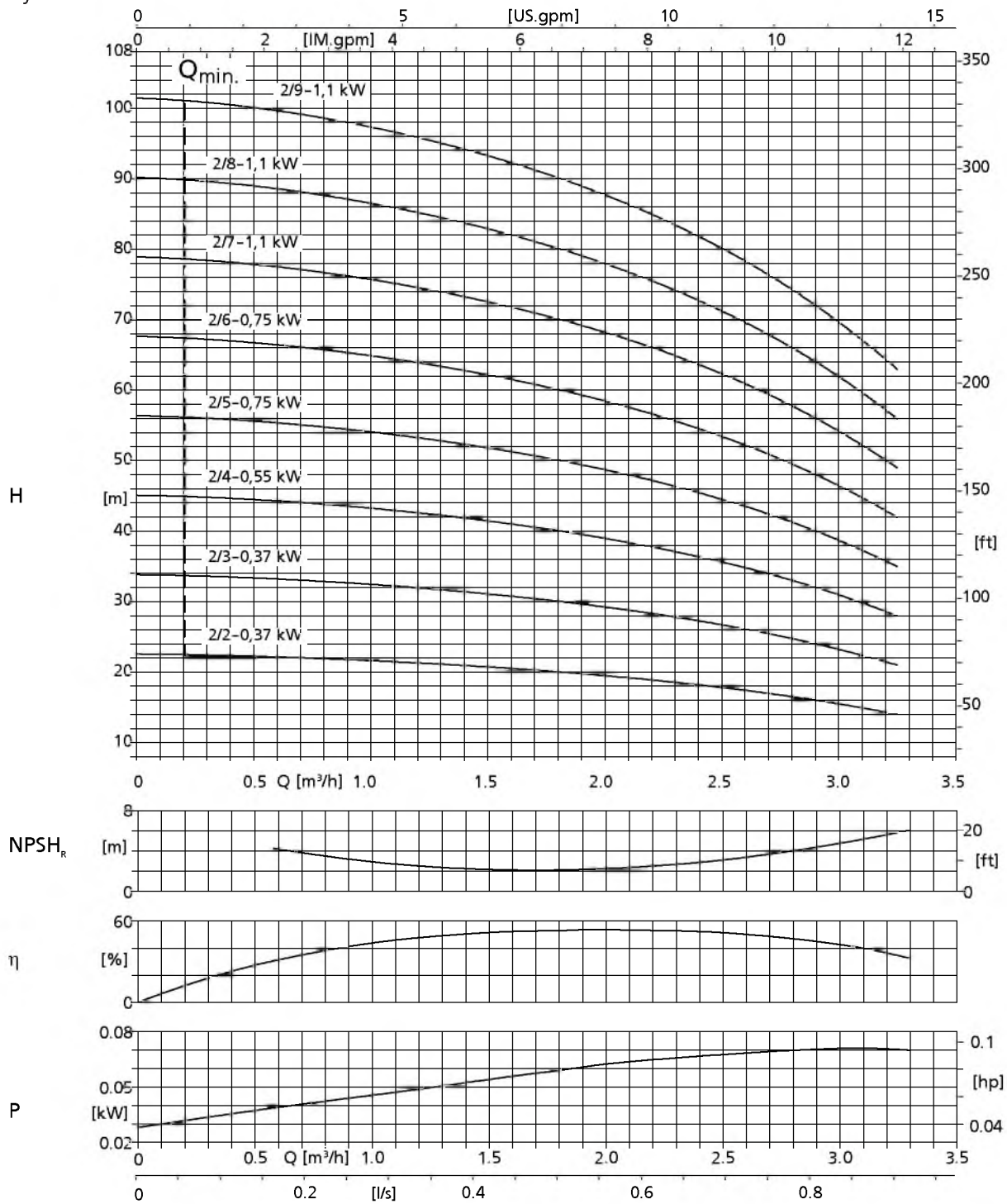
³⁾ Automatic reset is not possible for this type of dry running protection

Hya-Eco; n = 3500 rpm



Characteristic curves

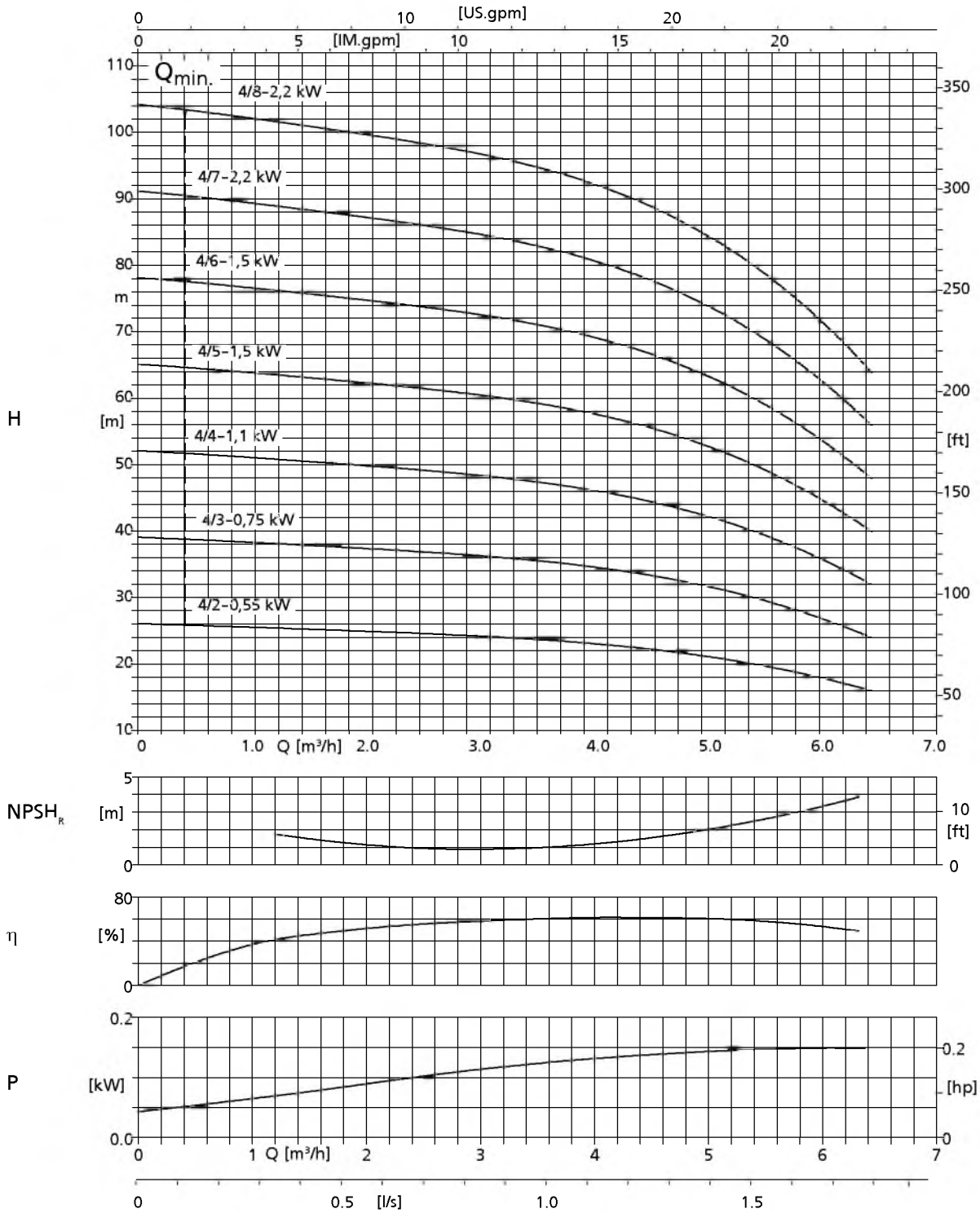
Hya-Eco VP with Movitec 2B



Flow rate as a function of the number of pumps

Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate \triangleq flow rate as per characteristic curve Q [m ³ /h]
2	0	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m ³ /h]
2	1	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m ³ /h]
3	0	Required flow rate: 3 \triangleq flow rate as per characteristic curve Q [m ³ /h]

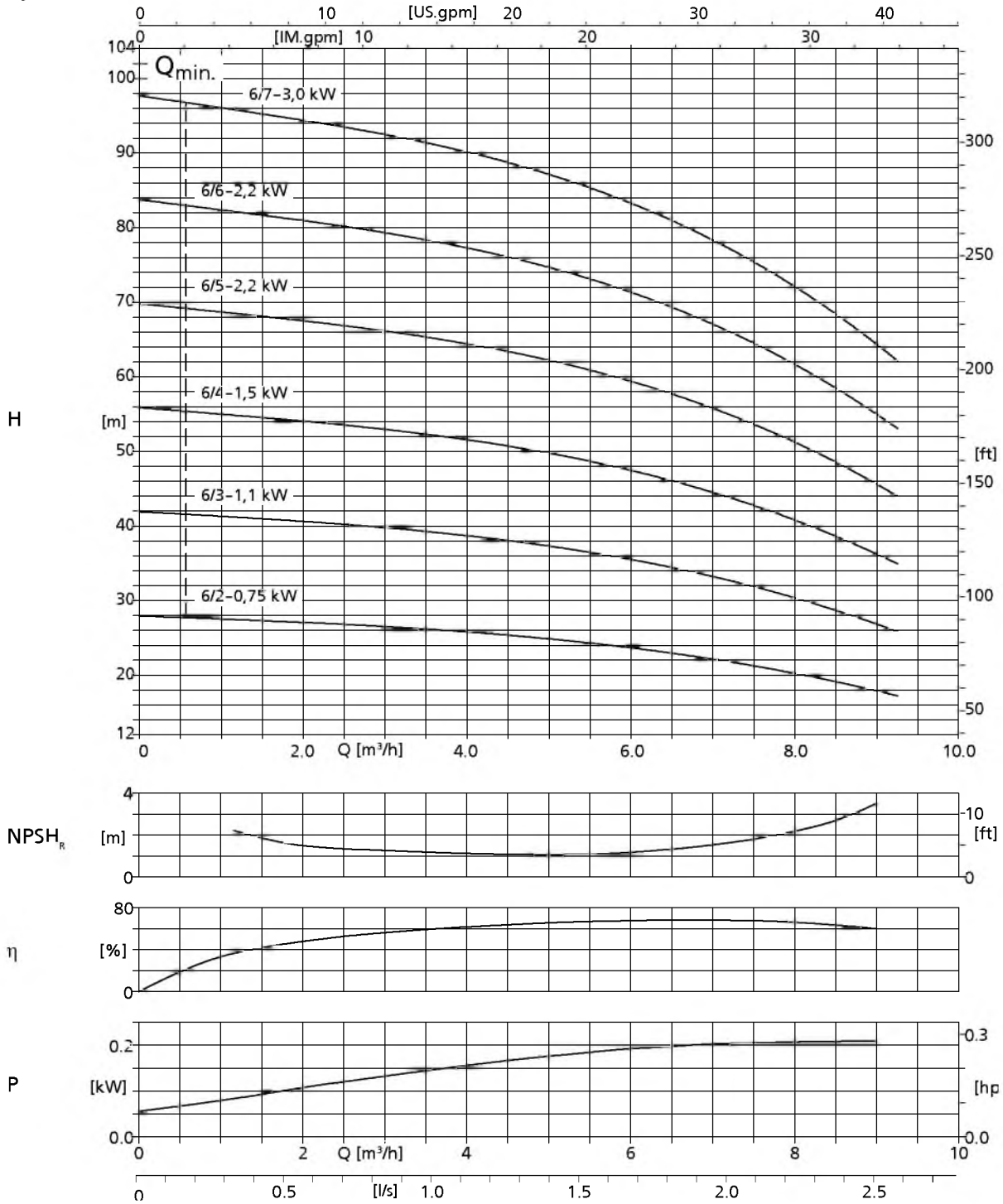
Hya-Eco VP with Movitec 4B



Flow rate as a function of the number of pumps

Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate \triangleq flow rate as per characteristic curve Q [m³/h]
2	0	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m³/h]
2	1	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m³/h]
3	0	Required flow rate: 3 \triangleq flow rate as per characteristic curve Q [m³/h]

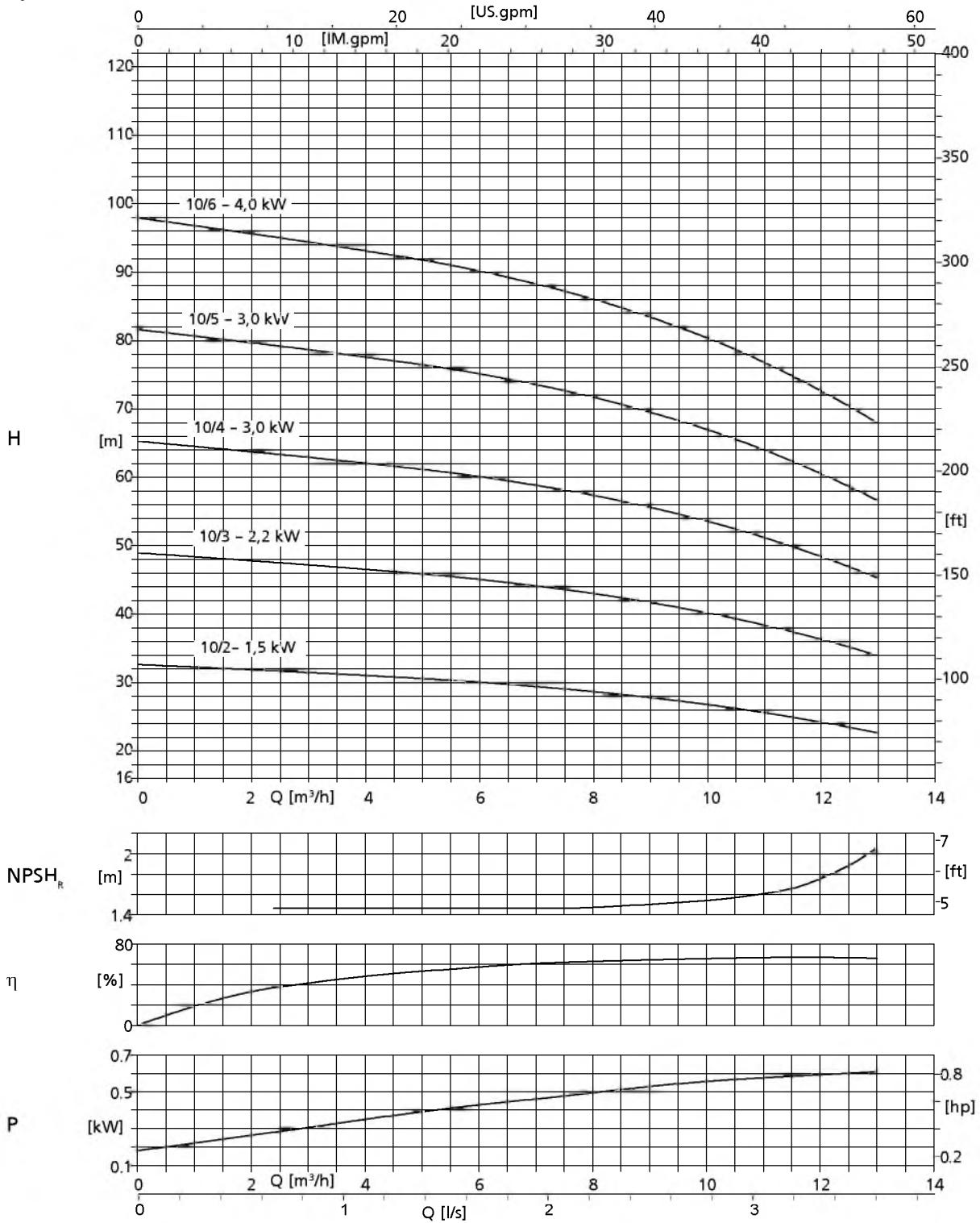
Hya-Eco VP with Movitec 6B



Flow rate as a function of the number of pumps

Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
2	0	Required flow rate: 2 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
2	1	Required flow rate: 2 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]
3	0	Required flow rate: 3 $\hat{=}$ flow rate as per characteristic curve Q [m ³ /h]

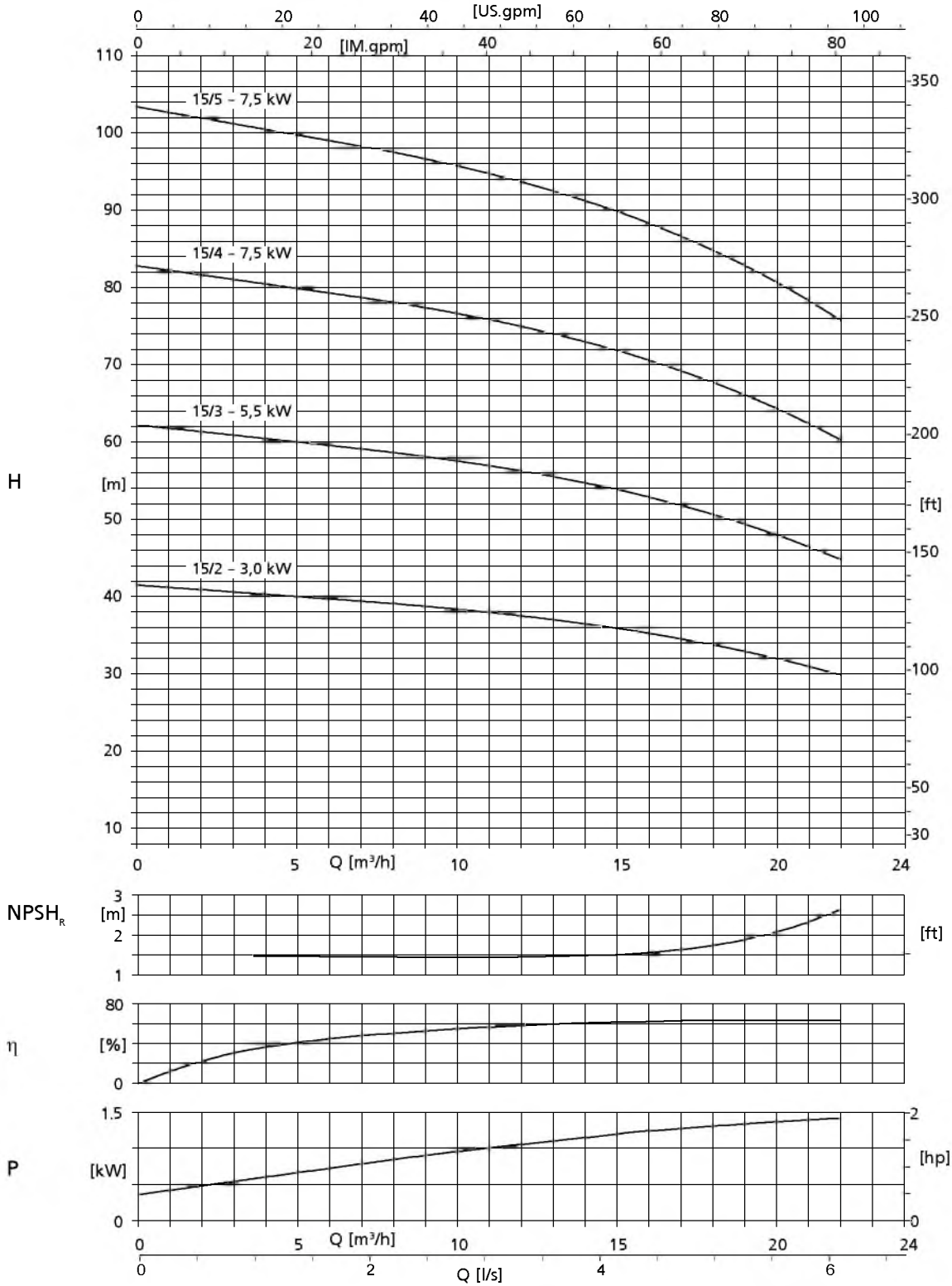
Hya-Eco VP with Movitec 10B



Flow rate as a function of the number of pumps

Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate \triangleq flow rate as per characteristic curve Q [m³/h]
2	0	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m³/h]
2	1	Required flow rate: 2 \triangleq flow rate as per characteristic curve Q [m³/h]
3	0	Required flow rate: 3 \triangleq flow rate as per characteristic curve Q [m³/h]

Hya-Eco VP with Movitec 15B

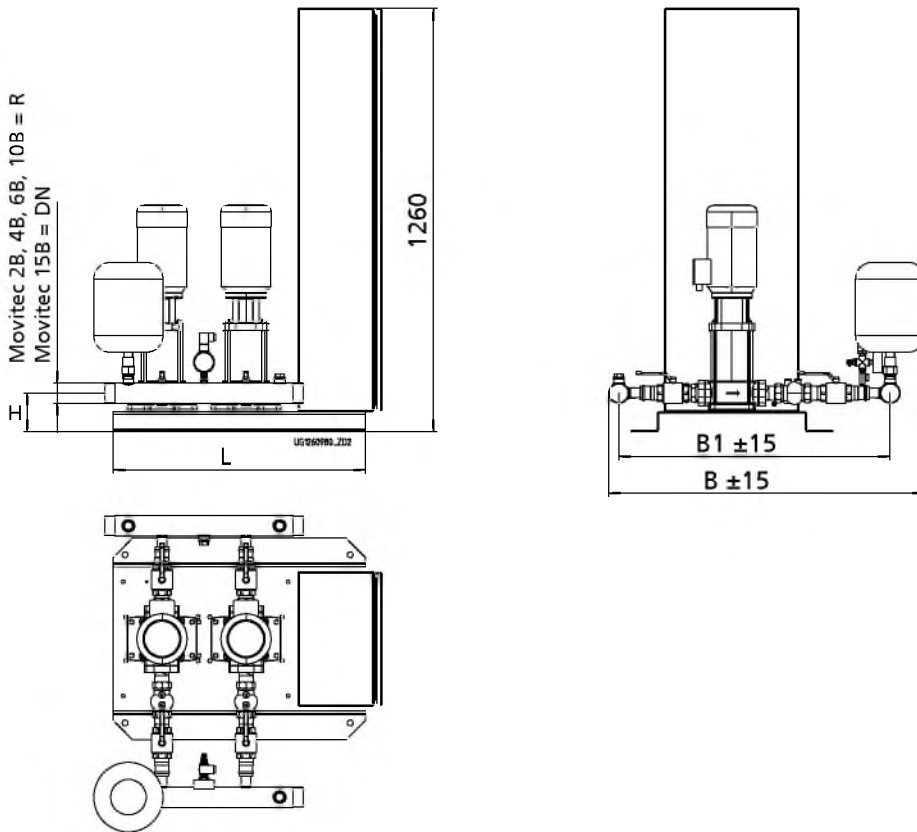


Flow rate as a function of the number of pumps

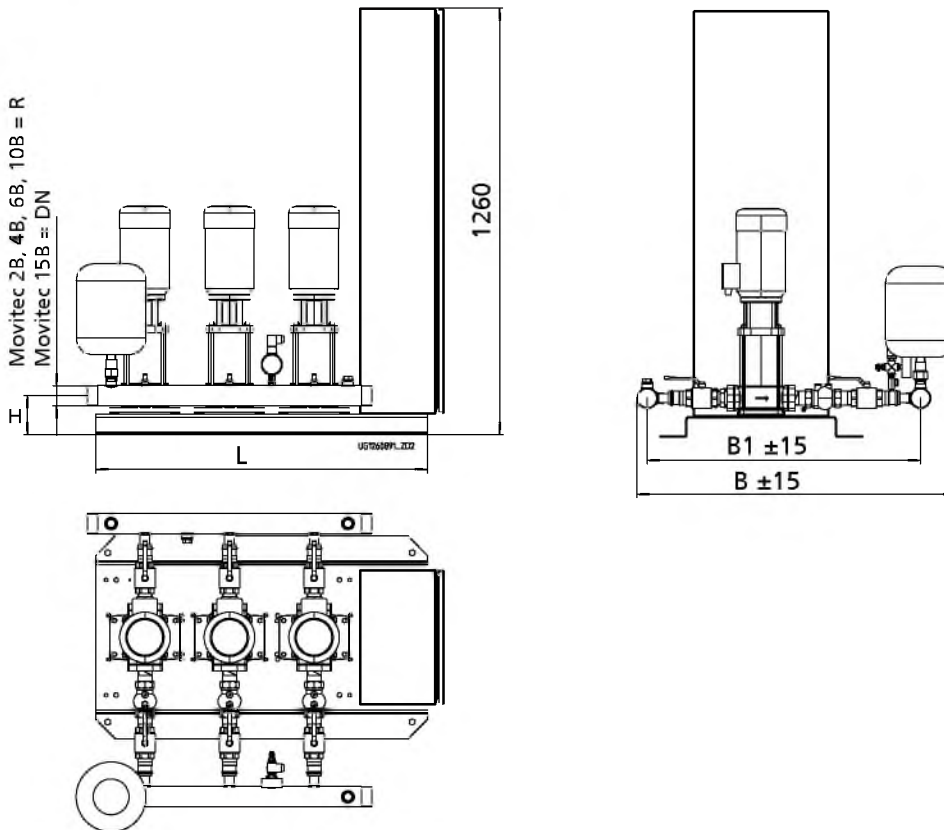
Duty pumps	Stand-by pumps	Flow rate as a function of the number of pumps
1	1	Required flow rate $\hat{=}$ flow rate as per characteristic curve Q [m³/h]
2	0	Required flow rate: 2 $\hat{=}$ flow rate as per characteristic curve Q [m³/h]
2	1	Required flow rate: 2 $\hat{=}$ flow rate as per characteristic curve Q [m³/h]
3	0	Required flow rate: 3 $\hat{=}$ flow rate as per characteristic curve Q [m³/h]

Dimensions

Hya-Eco VP with Movitec 2B, 4B, 6B, 10B and 15B with 2 pumps



Hya-Eco VP with Movitec 2B, 4B, 6B, 10B and 15B with 3 pumps




Thread R to DIN EN 10226
Flanges drilled to EN 1092-1 PN 16

Dimensions [mm]

Number of pumps	2	3	Movitec
B	874	874	2B/.. and 4B/..
	941	941	6B/..
	1018	1018	10B/..
	1087	1087	15B/..
B1	740	740	2B/.. and 4B/..
	808	808	6B/..
	885	885	10B/..
	884	884	15B/..
L	750	980	2B/.. and 4B/..
	750	980	6B/..
	750	980	10B/..
	980	1210	15B/..
R	R 2	R 2	2B/.. and 4B/..
	R 2	R 2	6B/..
	R 2	R 2	10B/..
DN	DN 80	DN 80	15B/..
H	115	115	2B/.. and 4B/..
	115	115	6B/..
	145	145	10B/..
	145	145	15B/..

- Connection for analog or digital dry running protection equipment
- External connection ON
- External connection OFF

Accessories

 See the separate type series booklet Accessories for Pressure Booster Systems 1954.5.

Scope of supply

Depending on the model, the following items are included in the scope of supply:

Pressure booster system

- Two to three vertical high-pressure centrifugal pumps (standard pumps)
- Membrane-type accumulator on the discharge side, approved for drinking water
- Pressure transmitter on the discharge side
- Pressure gauge
- Powder-coated steel baseplate
- Pumps mounted on the baseplate with anti-vibration mounts

Per pump:

- Check valve
- Shut-off valves

Control cabinet

- Control cabinet IP54
- Pump control and monitoring unit
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the pressure booster system
- Service interface for connection to a PC
- Transformer for control voltage
- Motor protection switch per pump
- Lockable master switch (repair switch)
- Terminal strip/terminals with identification for all connections
- Circuit diagram, settings for frequency inverters and list of electrical components

Pressure Booster System

Hyamat SVP

Type Series Booklet



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Building Services: Water Supply

Pressure Booster Systems

Hyamat SVP



Main applications

- Pressure boosting

Fluids handled

Pump for handling clean liquids not chemically and mechanically aggressive to the pump materials.

- Drinking water
- Service water
- Cooling water

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 660 with a max. of 6 pumps ¹⁾
	Q [l/s]	≤ 183 with a max. of 6 pumps ¹⁾
Head	H [m]	≤ 160
Fluid temperature	T [°C]	≤ 70
		≤ 25 to DIN 1988 (DVGW)
Operating pressure	p _d [bar]	≤ 16
Inlet pressure	p _{vor} [bar]	≤ 10

¹⁾ With stand-by pump as peak load pump

Designation

Example: Hyamat SVP 4/0408/1.2 - 3.5

Designation key

Code	Description
Hyamat	Pressure booster system
SVP	All pumps in variable-speed operation
4	Number of pumps
04	Pump size
08	Number of pump stages
1,2	Min. inlet pressure [bar]
3,5	Max. usable inlet pressure [bar]

Design details

Design

- Fully automatic pressure booster package system
- Baseplate-mounted
- Two to six vertical high-pressure centrifugal pumps with continuously variable speed adjustment
- Hydraulic components made of stainless steel / brass
- One check valve and shut-off valves to DIN/DVGW for each pump
- Anti-vibration mounts for each pump for systems with Movitec 2B, 4B, 6B, 10B, 15B
- Systems with level-adjustable feet with rubber pads (supplied but not fitted) for systems with Movitec 25B, 40B, 60B and 90B
- Membrane-type accumulator (direct-flow) to DIN 4807-5 on the discharge side, approved for drinking water
- Pressure gauge for pressure indication
- Pressure transmitter on the discharge side
- Design and function as per DIN EN 806-2, DIN 1988-500

Installation type

- Stationary installation

Drive

- High-efficiency magnet-less KSB-SuPremE-IE4 motor (as per IEC/CD 60034-30 Ed. 2)

Automation

- Control cabinet IP54
- Pump control and monitoring unit
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the system
- Service interface for connection to a PC
- Frequency inverter
- Transformer for control voltage
- Motor protection switch per pump
- Lockable master switch (repair switch)
- Pressure transmitter on the discharge side
- Wiring plan to VDE and parts list for electric parts
- Terminal strip/terminals with identification for all connections

- Connection for analog or digital dry running protection equipment
- External ON/OFF connection
- Field bus connection (optional)

Configuration and function



Hyamat SVP illustration

1	Control unit	2	Control cabinet
3	Motor with variable-speed system	4	Pump
5	Manifold	6	Baseplate

Design

The fully automatic pressure booster system is equipped with two to six vertical high-pressure pumps (4) (all of which are speed-controlled) for pumping the fluid handled to the consumer installations in the set pressure range.

Function

Automatic mode

Two to six pumps (4) are controlled and monitored by a micro-processor control unit (1). Each pump is connected to a frequency inverter and controlled by the control unit so as to ensure a constant discharge pressure of the pressure booster system. As the demand increases or decreases, peak load pumps are started and stopped automatically.

As soon as the demand increases again after one pump has been stopped, another pump which has not been in operation before is started up. When the last pump has been stopped and the demand increases again, the next pump in line is started up in variable-speed operation. The stand-by pump is also included in the alternating cycle. The standard setting is for the pressure booster system to start automatically as a function of pressure; the actual pressure is measured by an analog pressure measuring device (pressure transmitter). The function of this pressure transmitter is monitored (live-zero). As long as the pressure booster system is in operation, the pumps are started and stopped as a function of demand (standard setting). In this way it is ensured that the individual pumps operate only in line with the actual demand. The use of variable-speed pumps reduces wear as well as the pumps' frequency of starts in parallel operation. If a duty pump fails, the next pump is started up immediately and a fault is output, which can be reported via volt-free contacts (e.g. to the control station). If the demand drops towards 0, the pressure booster system slowly runs down to the stop point. The operating status is displayed via LEDs.

Function

Energy-saving mode

In conjunction with a very large discharge-side accumulator, the energy-saving mode prevents the pressure booster system from running at the least efficient operating point, supplying very small amounts of water.

If very small amounts of water are consumed the pressure booster system only fills the downstream accumulator and stops.

Any small water volumes required can then be supplied from the accumulator.

Function

Manual mode

Depending on the equipment the pressure booster system is supplied with, the pumps can be operated in manual mode in either one or two different ways.

Standard: By making the appropriate settings at the display, one of the pumps can be operated directly via the mains for 10 seconds, independently of the control unit. The pump will then automatically return to OFF mode.

Supplementary equipment: Manual-0-automatic selector switches can be supplied as supplementary equipment. They can be used to operate each pump directly on mains power.

In manual mode, a minimum flow (see table below) is essential to prevent the fluid handled and the pump from overheating when no water is consumed at the consumer installations.

Minimum flow for pump in manual mode

Minimum flow per pump in manual mode

Pump	Minimum flow per pump in manual mode [l/h]
Movitec 2B	200
Movitec 4B	400
Movitec 6B	600
Movitec 10B	1100
Movitec 15B	1600
Movitec 25B	2800
Movitec 40B	4600
Movitec 60B	6100
Movitec 90B	8500

Example

An open 1/2-inch tap equals a water consumption of approx. 800 to 1,200 l/h.

Dry running protection (supplementary equipment)

To protect the system from dry running, a range of protective equipment (see Supplementary equipment / Accessories) is available for various installation conditions.

Digital or analog lack-of-water monitoring equipment can be connected to the corresponding terminals.

Field bus connection (supplementary equipment)

For remote monitoring of all system-relevant parameters and connection to a control station the system can optionally be supplied fitted with a field bus module.

Materials

Overview of available materials

Component	Material
Pump casing	Stainless steel
Shroud	Stainless steel
Hydraulic system	Stainless steel

Component	Material
Mechanical seal	Complies with EN 12756
Primary ring	Silicon carbide
Mating ring	Hard carbon
Elastomer	EPDM
Baseplate	Steel, with powder or paint coating
Hydraulic design	
Manifold	Stainless steel
Valves	Copper-base alloy / brass or nodular cast iron / EPDM DVGW-approved Approved for drinking water
Accumulator	Connection made of stainless steel, flow through valve to DIN 4807-5
Membrane	Approved for drinking water

Product benefits

- Energy-efficiency optimised by high-efficiency magnet-less KSB-SuPremE-IE4 motor (to IEC/CD 60034-30 Ed. 2) and energy-saving function
- Ready-to-connect, supplied pre-set and tested for functionality
- User-friendly, straightforward menu navigation
- Reliable operation by corrosion-resistant internal parts
- Suitable for drinking water installations, manufactured under stringent hygienic conditions
- Hydraulic components made of stainless steel / brass

Selection information

Selecting the pressure booster system

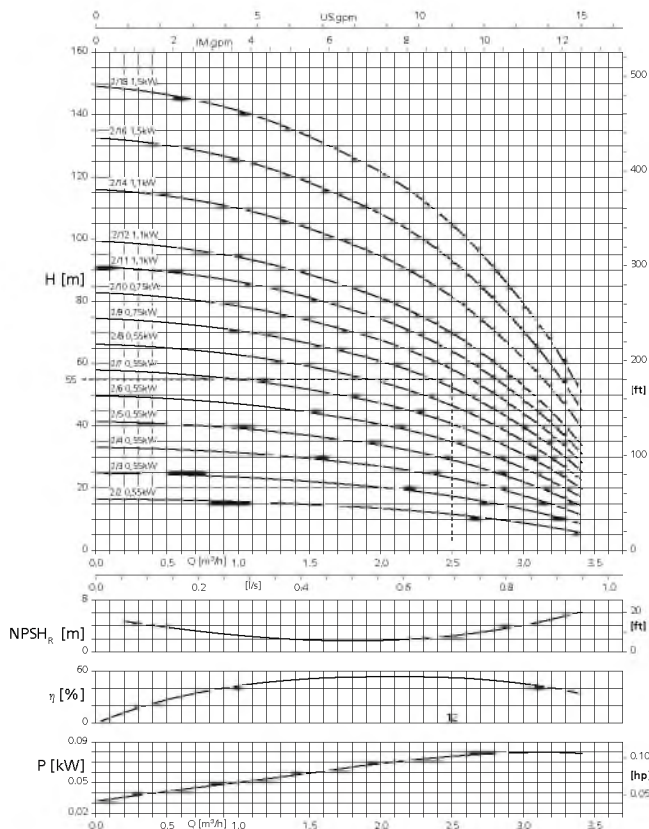
Requirements:

Flow rate 10 m³/h
Start-up pressure 5.5 bar
Stand-by pump to DIN 1988

Solution:

Hyamat SVP 5/0210 B

1. According to the table *Flow rate as a function of the number of pumps* the system may comprise either 2 or 3 duty pumps (as stand-by pump is requested)
2. According to the table *Flow rate as a function of the number of pumps* the flow rate requirement can be either 24.4 m³/h (2 duty pumps) or 12.2 m³/h (1 duty pump)
3. The characteristic curves accordingly suggest Hyamat SVP 5/0210 B (operating point close to Q_{opt})



The flow rate in the characteristic curve is based on one duty pump:
The flow rate of a stand-by pump, if any, is not taken into account when calculating the flow rate required.

Flow rate as a function of the number of pumps

Number of duty pumps	With stand-by pump	Flow rate indicated in the diagram
1	No	Flow rate [Q] as shown in characteristic curve
1	Yes	Flow rate [Q] as shown in characteristic curve
2	No	Flow rate required divided by 2 = flow rate in characteristic curve [Q]
2	Yes	Flow rate required divided by 2 = flow rate in characteristic curve [Q]
3	No	Flow rate required divided by 3 = flow rate in characteristic curve [Q]
3	Yes	Flow rate required divided by 3 = flow rate in characteristic curve [Q]
4	No	Flow rate required divided by 4 = flow rate in characteristic curve [Q]
4	Yes	Flow rate required divided by 4 = flow rate in characteristic curve [Q]
5	No	Flow rate required divided by 5 = flow rate in characteristic curve [Q]
5	Yes	Flow rate required divided by 5 = flow rate in characteristic curve [Q]
6	No	Flow rate required divided by 6 = flow rate in characteristic curve [Q]

Determining the power input

- The power input is indicated per stage (St = 1) and/or per stage with a smaller impeller (St = -1).
The pump input power can be calculated accordingly.
Calculation: value indicated in the diagram (St = 1) × number of stages + value indicated in the diagram (St = -1) × number of stages with a smaller impeller
Example 1, Movitec 90/4: P = (St = 1) × 4
Example 2, Movitec 90/4-1: P = (St = 1) × 3 + (St = -1)
Example 3, Movitec 90/4-2: P = (St = 1) × 2 + (St = -1) × 2

Technical data

Electrical performance data

Electrical performance data

Hyamat SVP with Movitec pumps	Rated power per motor	Rated current per motor at 400 V	Total rated power [kVA]				
			Number of pumps (motors)				
	[kW]	[A]	2	3	4	5	6
0202B	0,55	1,6	2,3	3,5	4,7	5,8	7
0203B	0,55	1,6	2,3	3,5	4,7	5,8	7
0204B	0,55	1,6	2,3	3,5	4,7	5,8	7
0205B	0,55	1,6	2,3	3,5	4,7	5,8	7
0206B	0,55	1,6	2,3	3,5	4,7	5,8	7
0207B	0,55	1,6	2,3	3,5	4,7	5,8	7
0208B	0,55	1,6	2,3	3,5	4,7	5,8	7
0209B	0,75	2,1	3,1	4,6	6,1	7,6	9,2
0210B	0,75	2,1	3,1	4,6	6,1	7,6	9,2
0211B	1,1	3	4,4	6,5	8,7	10,9	13,1
0212B	1,1	3	4,4	6,5	8,7	10,9	13,1
0214B	1,1	3	4,4	6,5	8,7	10,9	13,1
0216B	1,5	4,1	6	8,9	11,9	14,9	17,9
0218B	1,5	4,1	6	8,9	11,9	14,9	17,9
0402B	0,55	1,6	2,3	3,5	4,7	5,8	7
0403B	0,55	1,6	2,3	3,5	4,7	5,8	7
0404B	0,55	1,6	2,3	3,5	4,7	5,8	7
0405B	0,75	2,1	3,1	4,6	6,1	7,6	9,2
0406B	1,1	3	4,4	6,5	8,7	10,9	13,1
0407B	1,1	3	4,4	6,5	8,7	10,9	13,1
0408B	1,5	4,1	6	8,9	11,9	14,9	17,9
0409B	1,5	4,1	6	8,9	11,9	14,9	17,9
0410B	1,5	4,1	6	8,9	11,9	14,9	17,9
0411B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0412B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0414B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0416B	3	7,6	11,1	16,6	22,1	27,6	33,2
0602B	0,55	1,6	2,3	3,5	4,7	5,8	7
0603B	0,75	2,1	3,1	4,6	6,1	7,6	9,2
0604B	1,1	3	4,4	6,5	8,7	10,9	13,1
0605B	1,1	3	4,4	6,5	8,7	10,9	13,1
0606B	1,5	4,1	6	8,9	11,9	14,9	17,9
0607B	1,5	4,1	6	8,9	11,9	14,9	17,9
0608B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0609B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0610B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
0611B	3	7,6	11,1	16,6	22,1	27,6	33,2
0612B	3	7,6	11,1	16,6	22,1	27,6	33,2
0614B	3	7,6	11,1	16,6	22,1	27,6	33,2
1002B	0,75	2,1	3,1	4,6	6,1	7,6	9,2
1003B	1,1	3	4,4	6,5	8,7	10,9	13,1
1004B	1,5	4,1	6	8,9	11,9	14,9	17,9

Hyamat SVP with Movitec pumps	Rated power per motor	Rated current per motor at 400 V	Total rated power [kVA]				
			Number of pumps (motors)				
	[kW]	[A]	2	3	4	5	6
1005B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
1006B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
1007B	3	7,6	11,1	16,6	22,1	27,6	33,2
1008B	3	7,6	11,1	16,6	22,1	27,6	33,2
1009B	4	9,4	13,7	20,5	27,4	34,2	41
1010B	4	9,4	13,7	20,5	27,4	34,2	41
1011B	4	9,4	13,7	20,5	27,4	34,2	41
1013B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
1502B	2,2	5,6	8,1	12,2	16,3	20,4	24,4
1503B	3	7,6	11,1	16,6	22,1	27,6	33,2
1504B	4	9,4	13,7	20,5	27,4	34,2	41
1505B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
1506B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
1507B	7,5	16,7	24,3	36,4	48,6	60,7	72,9
1508B	7,5	16,7	24,3	36,4	48,6	60,7	72,9
2502B	4	9,4	13,7	20,5	27,4	34,2	41
2503B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
2504B	7,5	16,7	24,3	36,4	48,6	60,7	72,9
2505B	11	23,7	34,5	51,7	69	86,2	103,4
2506B	11	23,7	34,5	51,7	69	86,2	103,4
2507B	15	32	46,6	69,8	93,1	116,4	139,7
4002-2B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
4002B	7,5	16,7	24,3	36,4	48,6	60,7	72,9
4003-2B	11	23,7	34,5	51,7	69	86,2	103,4
4003B	11	23,7	34,5	51,7	69	86,2	103,4
4004-2B	15	32	46,6	69,8	93,1	116,4	139,7
4004B	15	32	46,6	69,8	93,1	116,4	139,7
4005-2B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
4005B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
4006-2B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
4006B	22	50,7	73,8	110,6	147,5	184,4	221,3
6001B	5,5	12,5	18,2	27,3	36,4	45,5	54,6
6002-2B	7,5	16,7	24,3	36,4	48,6	60,7	72,9
6002B	11	23,7	34,5	51,7	69	86,2	103,4
6003-2B	15	32	46,6	69,8	93,1	116,4	139,7
6003B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
6004-2B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
6004B	22	50,7	73,8	110,6	147,5	184,4	221,3
6005-2B	22	50,7	73,8	110,6	147,5	184,4	221,3
9002-2-2B	11	23,7	34,5	51,7	69	86,2	103,4
9002-2-1B	15	32	46,6	69,8	93,1	116,4	139,7
9002-2B	15	32	46,6	69,8	93,1	116,4	139,7
9002-3-2B	18,5	38,8	56,5	84,7	112,9	141,1	169,4
9002-3-1B	22	50,7	73,8	110,6	147,5	184,4	221,3
9002-3B	22	50,7	73,8	110,6	147,5	184,4	221,3

Type of connection

Types of connection (schematic)

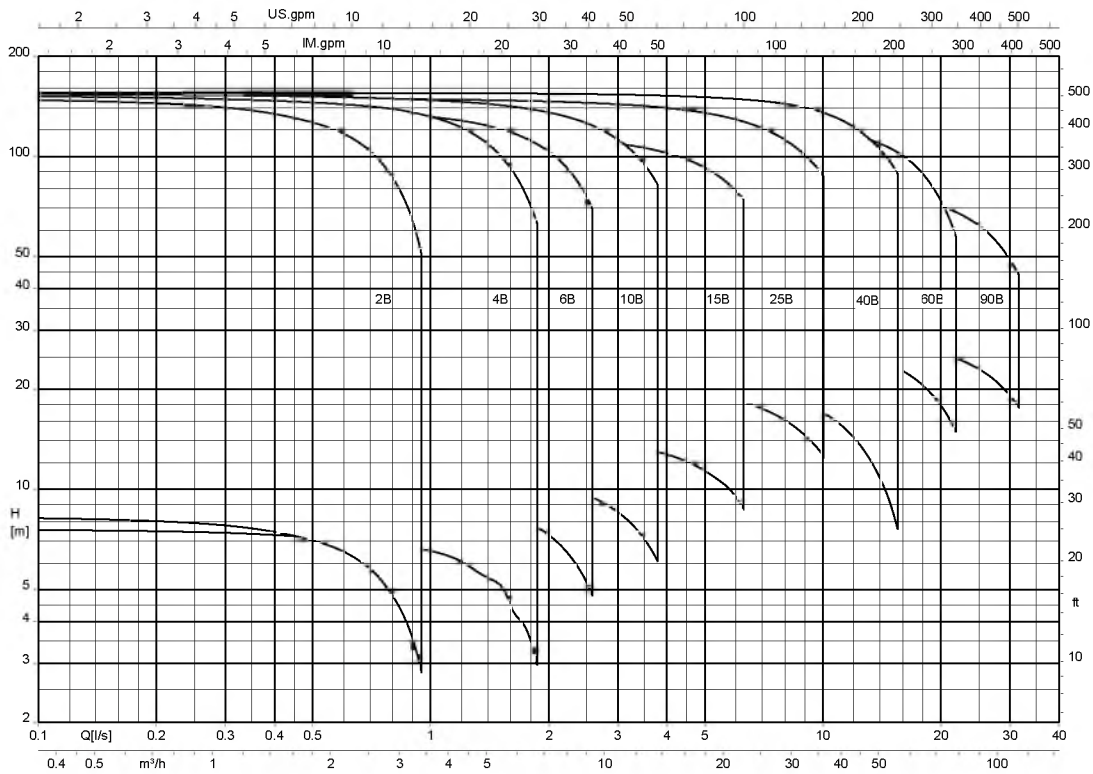
Direct	Indirect	
<p style="text-align: right;">1952-106</p>	<p>Unpressurised inlet tank at the same or at a higher level</p> <p style="text-align: right;">1952-107</p>	<p>Unpressurised inlet tank at a lower level (suction-lift operation) ²⁾</p> <p style="text-align: right;">1952-108</p>
<p>Inlet pressure monitoring (see Supplementary equipment or Accessories)</p>		
<p>At $p_{in} > 0.5$ bar (min. 1 bar, DIN 1988)</p> <ul style="list-style-type: none"> - Pressure switch - Pressure sensor <p>At $p_{in} < 0.5$ bar</p> <ul style="list-style-type: none"> - Pressure sensor - Flow monitoring 	<ul style="list-style-type: none"> - Float switch - Set of electrodes and relay - Dry running protection for PE inlet tank - Pressure sensor - Flow monitoring³⁾ 	<ul style="list-style-type: none"> - Float switch - Set of electrodes and relay - Dry running protection for PE inlet tank - Flow monitoring³⁾

²⁾ Non-priming pumps, suitable for suction-lift operation (for selection, please consult KSB)

³⁾ Automatic reset is not possible for this type of dry running protection

Selection chart

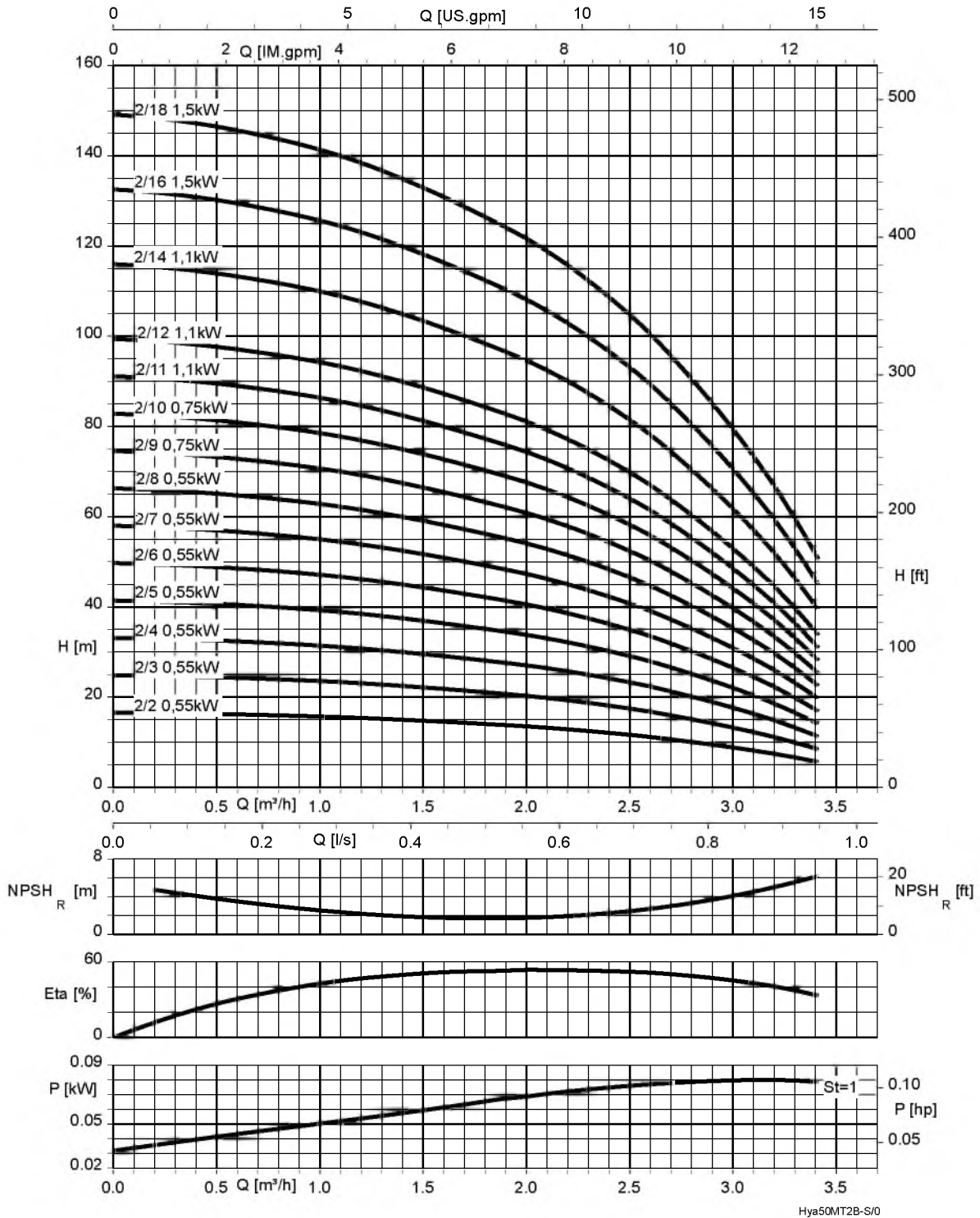
Hyamat SVP; n = 3000 rpm



The flow rate in the characteristic curves is based on one duty pump:
 The flow rate of a stand-by pump, if any, is not taken into account when calculating the flow rate required.
 Flow rates for multiple pump systems (→ Page 7)

Characteristic curves

Hyamat SVP with Movitec 2B; n = 3000 rpm

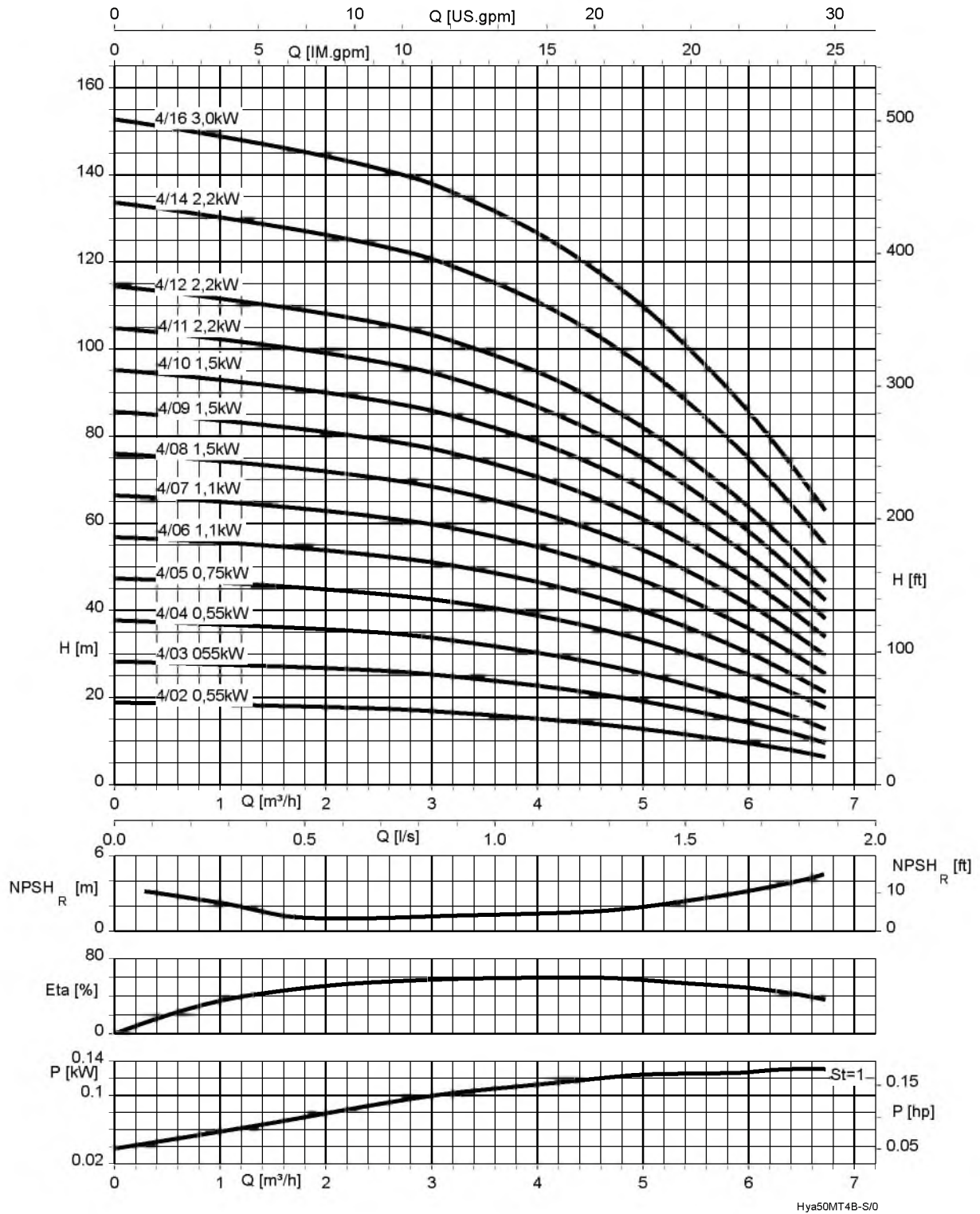


Systems with 4 and 8 stages

The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

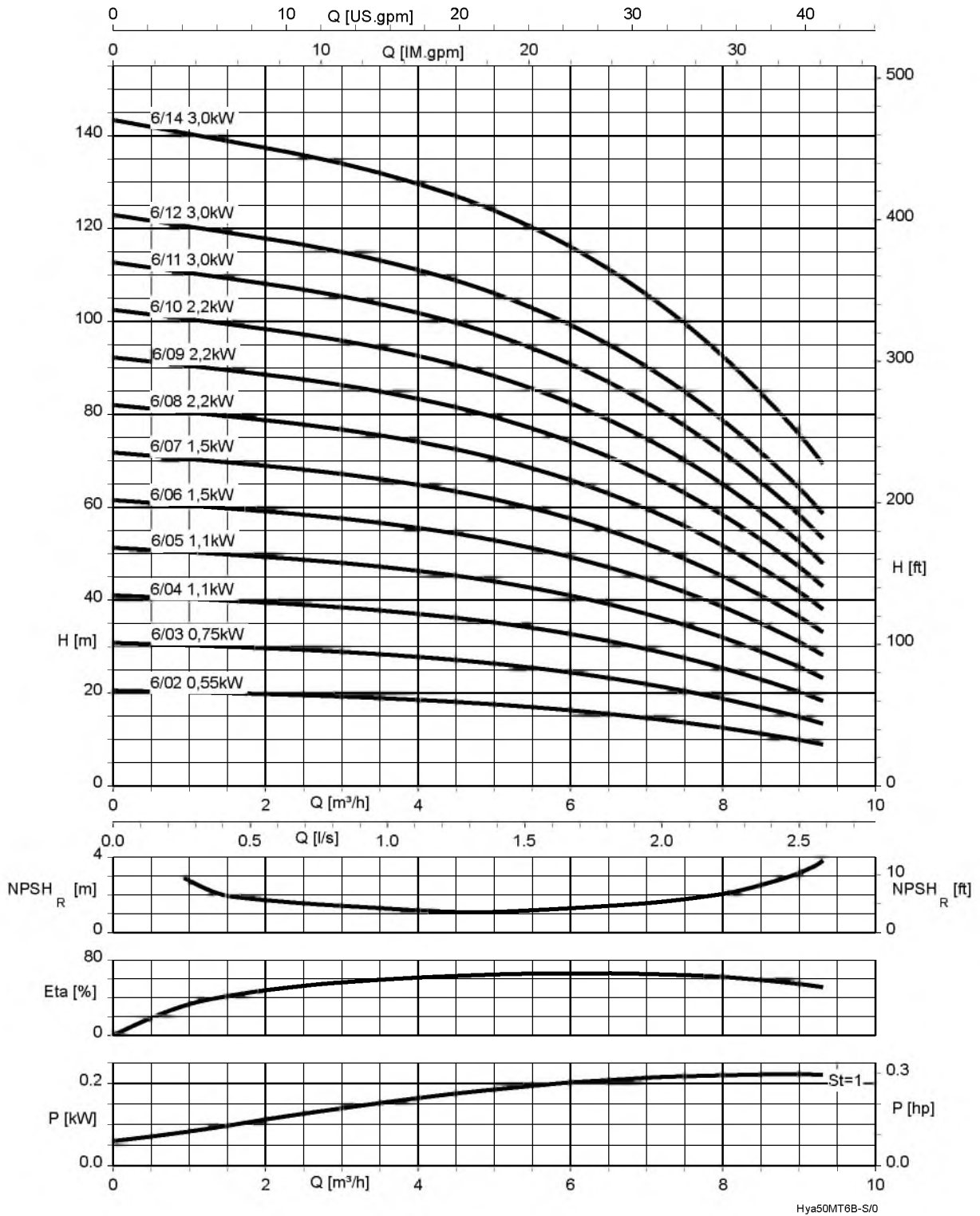
Hyamat SVP with Movitec 4B; n = 3000 rpm



i Systems with 4, 5 and 10 stages
 The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

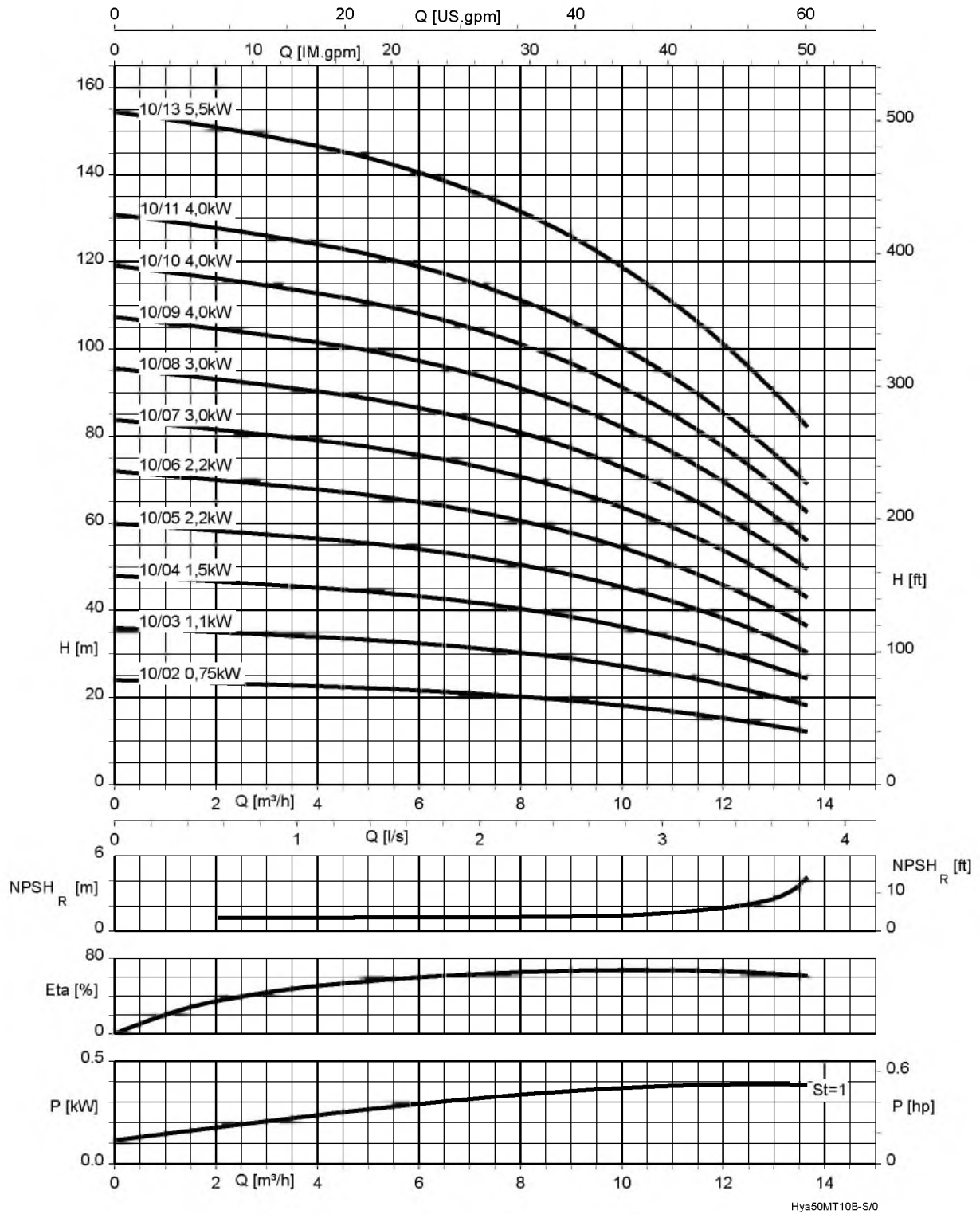
Hyamat SVP with Movitec 6B; n = 3000 rpm



i Systems with 2 and 14 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

Hyamat SVP with Movitec 10B; n = 3000 rpm

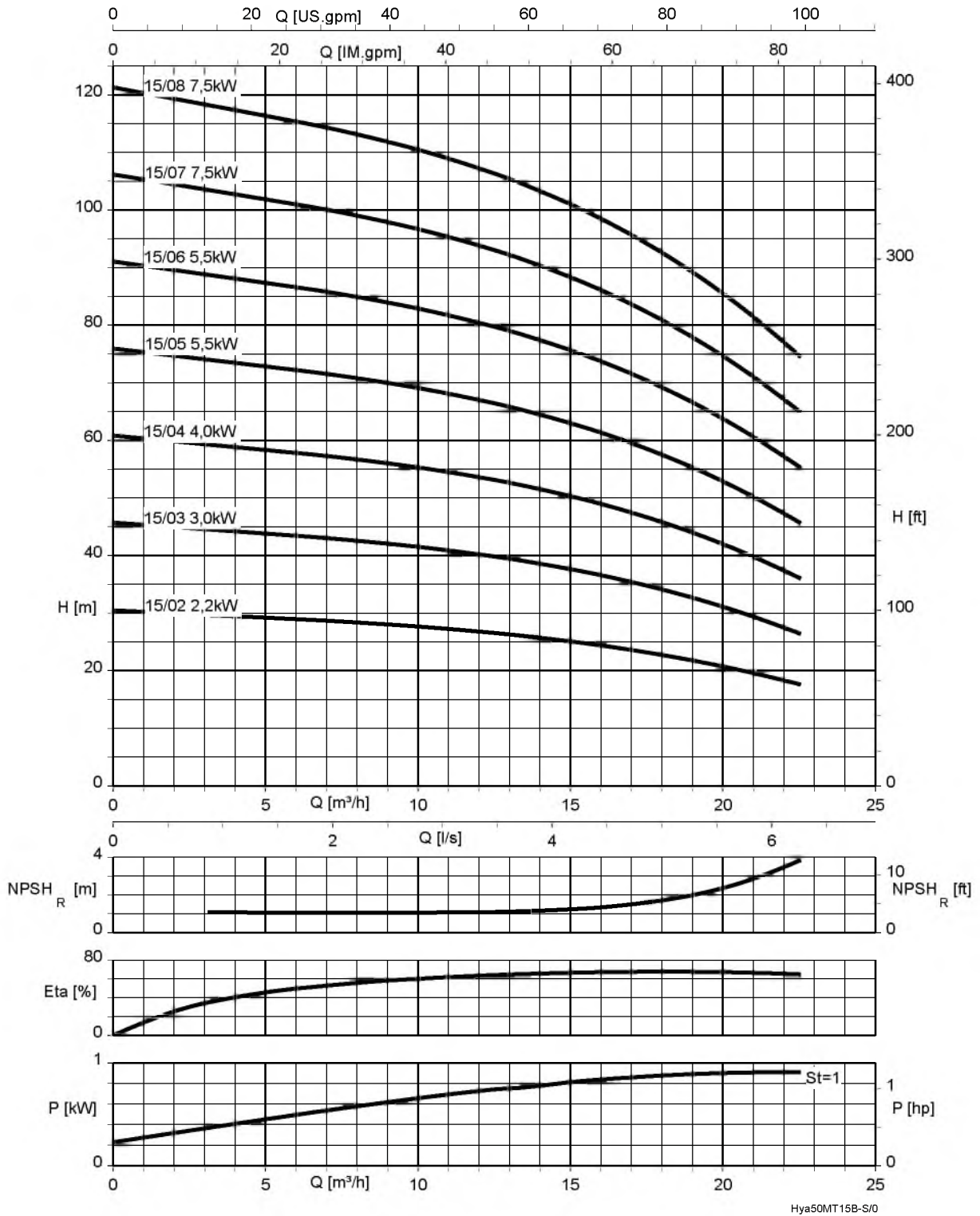


i Systems with 2, 3, 4, 8 and 11 stages

The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

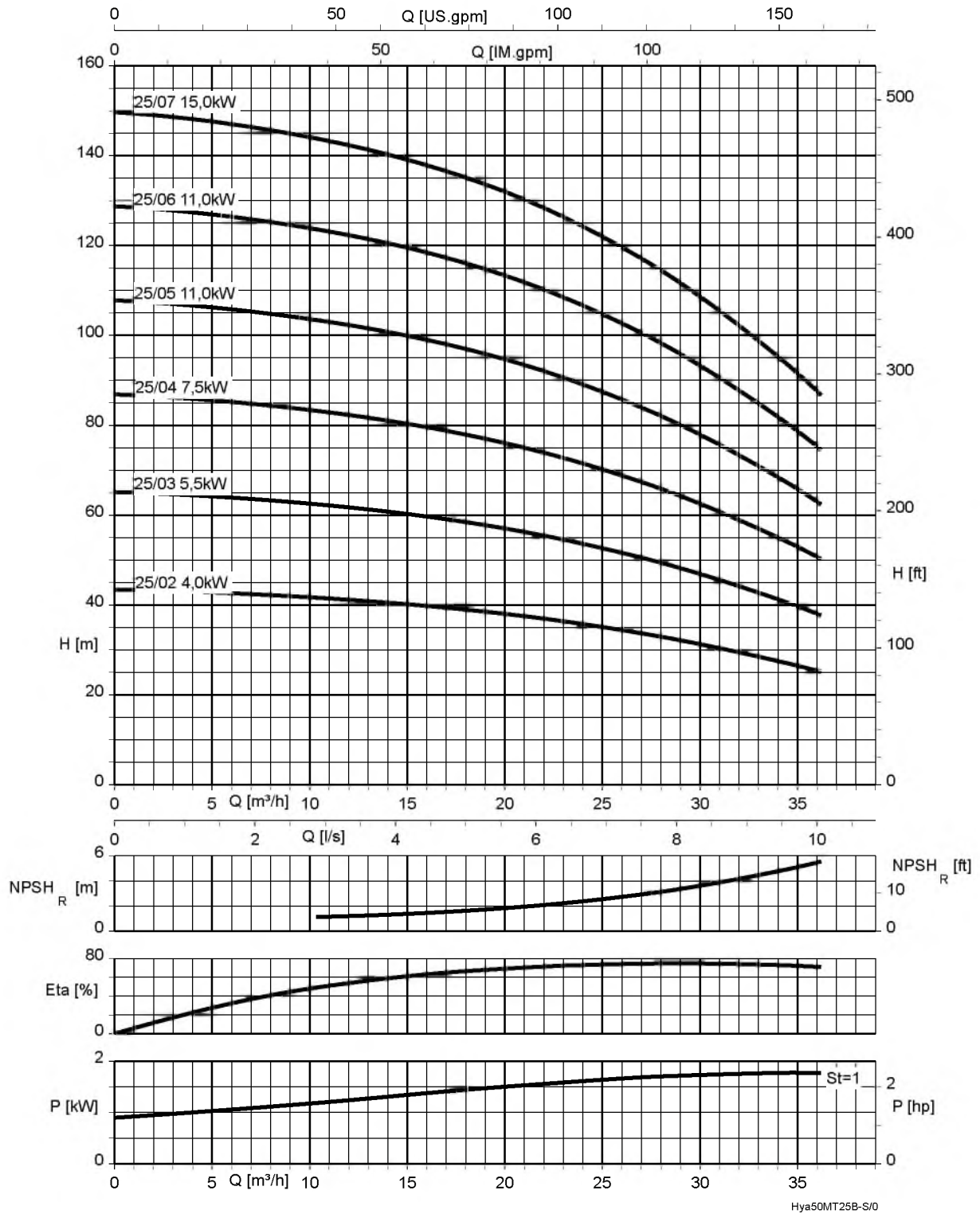
St = 1 | P per stage

Hyamat SVP with Movitec 15B; n = 3000 rpm



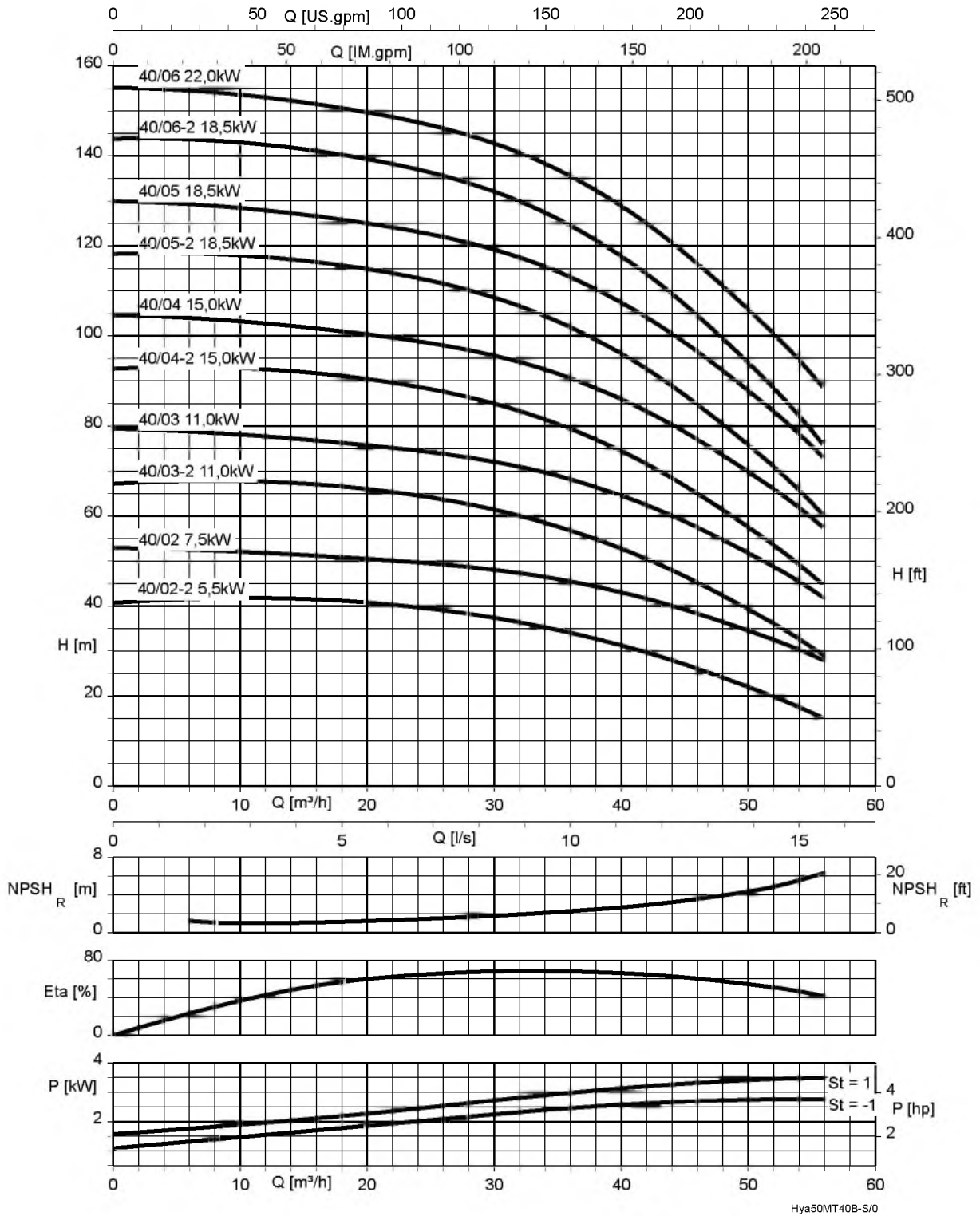
St = 1 | P per stage

Hyamat SVP with Movitec 25B; n = 3000 rpm



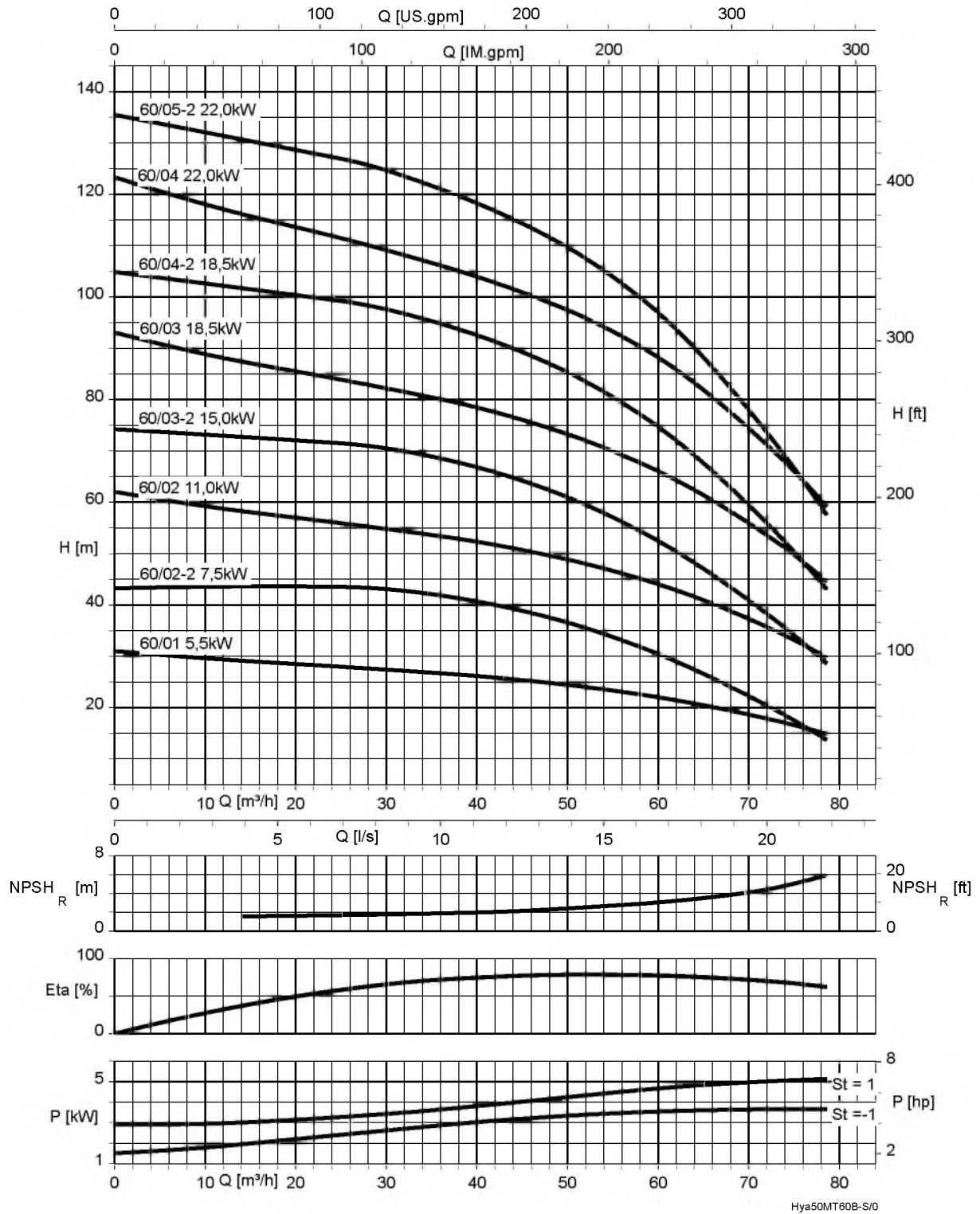
St = 1 | P per stage

Hyamat SVP with Movitec 40B; n = 3000 rpm



St = 1 P per stage	St = -1 P per stage with a smaller impeller
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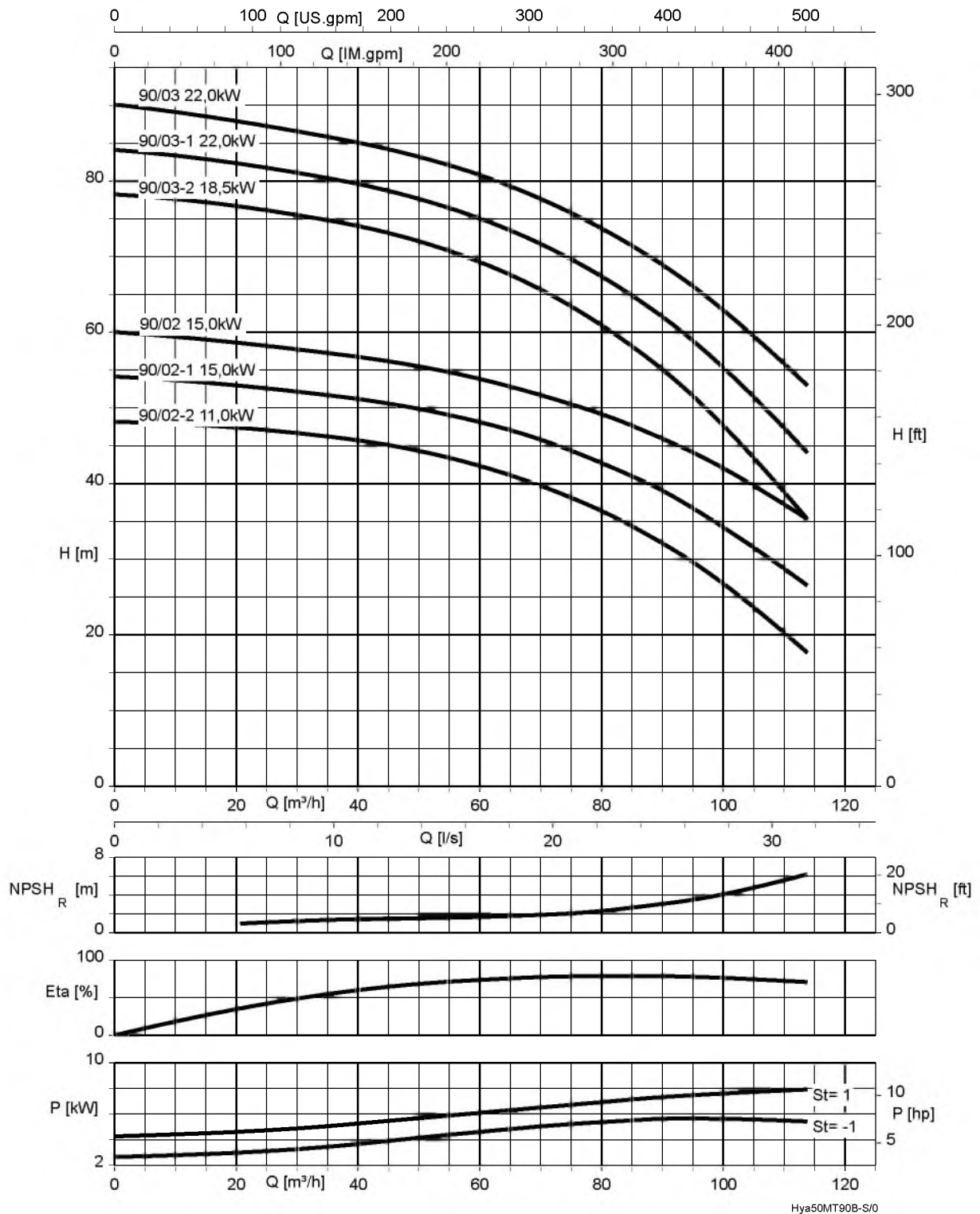
Hyamat SVP with Movitec 60B; n = 3000 rpm



St = 1 | P per stage

St = -1 | P per stage with a smaller impeller

Hyamat SVP with Movitec 90B; n = 3000 rpm

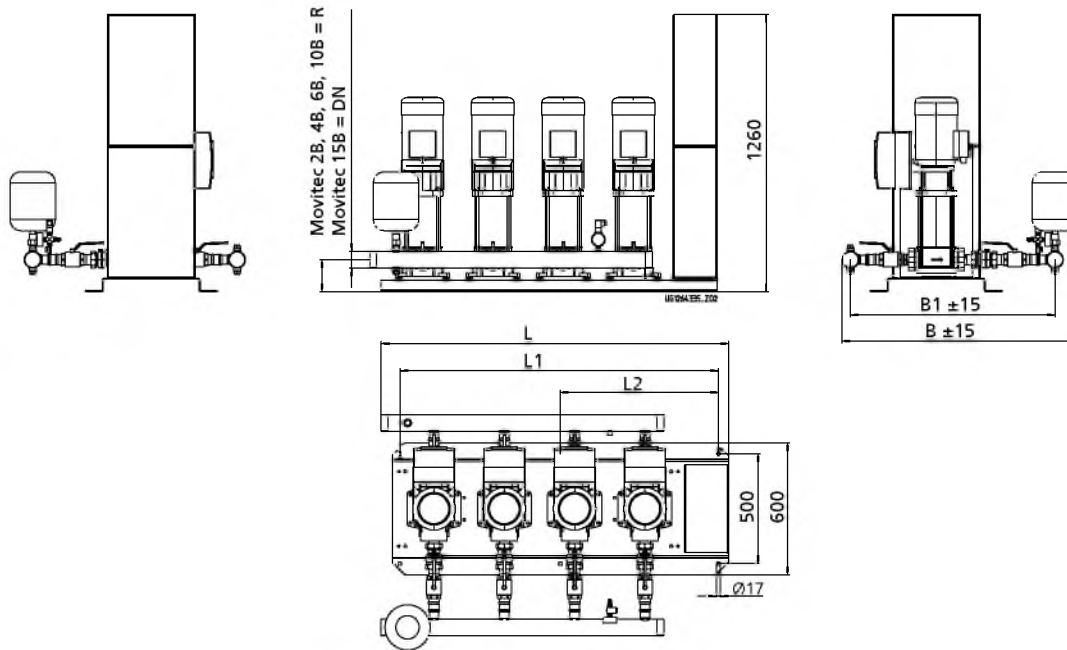


i Systems with 2, 3-2 and 3 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage	St = -1 | P per stage with a smaller impeller
----------------------	---

Dimensions and weights

Hyamat SVP with Movitec 2B / 4B / 6B / 10B / 15B

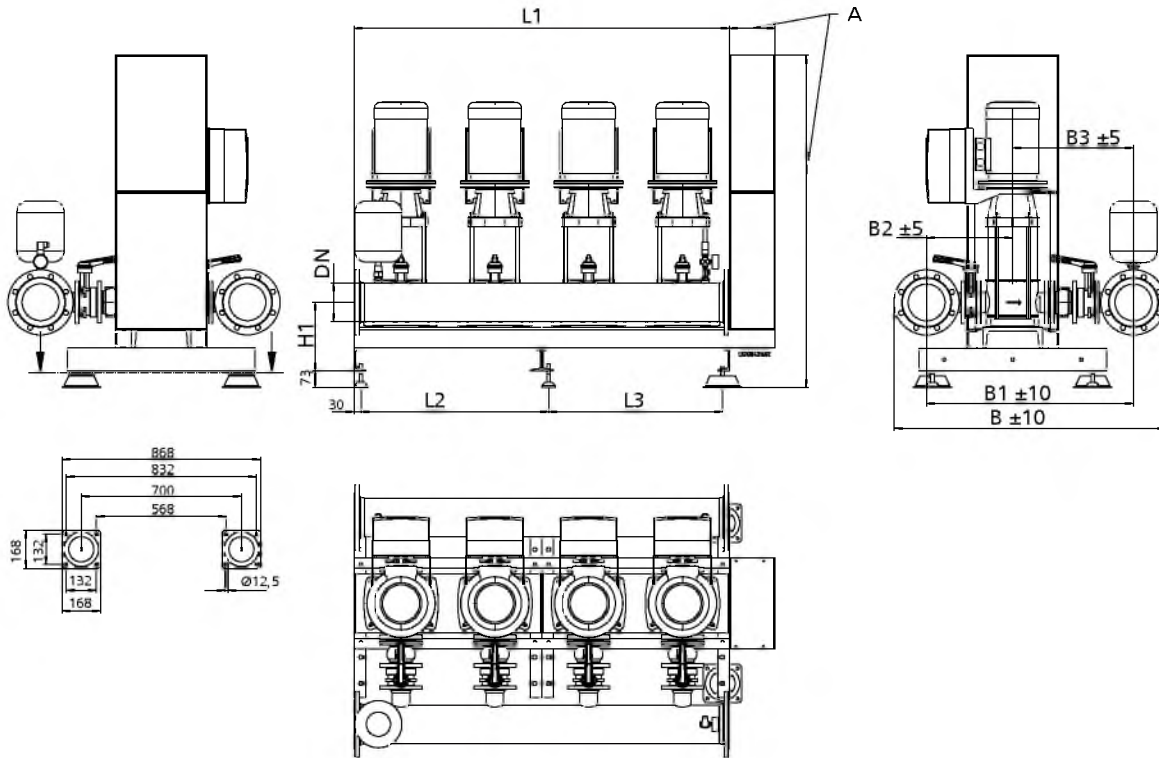


Dimensions of Hyamat SVP with Movitec 2B / 4B / 6B / 10B / 15B
Control cabinet dimensions, Hyamat SVP (→ Page 23)
Flanges drilled to EN 1092-1 PN 16
Baseplate RAL 5002, control unit RAL 7035

Dimensions [mm]

Size	Connection	B	B1	H1	L	L1	L2
2/02.. B	R 2	896	763	115	825	670	-
2/04.. B	R 2	896	763	115	825	670	-
2/06.. B	R 2	961	828	115	825	670	-
2/10.. B	R 2	1050	916	145	985	900	-
2/15.. B	DN 80	1097	894	145	980	900	-
3/02.. B	R 2	896	763	115	1055	900	-
3/04.. B	R 2	896	763	115	1055	900	-
3/06.. B	R 2	961	828	115	1055	900	-
3/10.. B	R 2 1/2	1073	932	145	1260	1130	560
3/15.. B	DN 80	1097	894	145	1210	1130	560
4/02.. B	R 2	896	763	115	1285	1130	560
4/04.. B	R 2	896	763	115	1285	1130	560
4/06.. B	R 2	961	828	115	1285	1130	560
4/10.. B	R 2 1/2	1073	932	145	1580	1450	720
4/15.. B	DN 100	1272	1052	145	1544	1450	720
5/02.. B	R 2 1/2	920	778	115	1605	1450	720
5/04.. B	R 2 1/2	920	778	115	1605	1450	720
5/06.. B	R 2 1/2	987	846	115	1605	1450	720
5/10.. B	R 2 1/2	1073	932	145	1900	1770	880
5/15.. B	DN 100	1221	1001	145	1850	1770	880
6/02.. B	R 2 1/2	920	778	115	1925	1770	880
6/04.. B	R 2 1/2	920	778	115	1925	1770	880
6/06.. B	R 2 1/2	987	846	115	1925	1770	880
6/10.. B	R 3	1090	943	145	2220	2090	1040
6/15.. B	DN 150	1352	1067	145	2170	2090	1040

Hyamat SVP with Movitec 25B / 40B / 60B / 90B



Dimensions of Hyamat SVP with Movitec 25B / 40B / 60B / 90B

A = control cabinet dimensions, Hyamat SVP (⇒ Page 23)

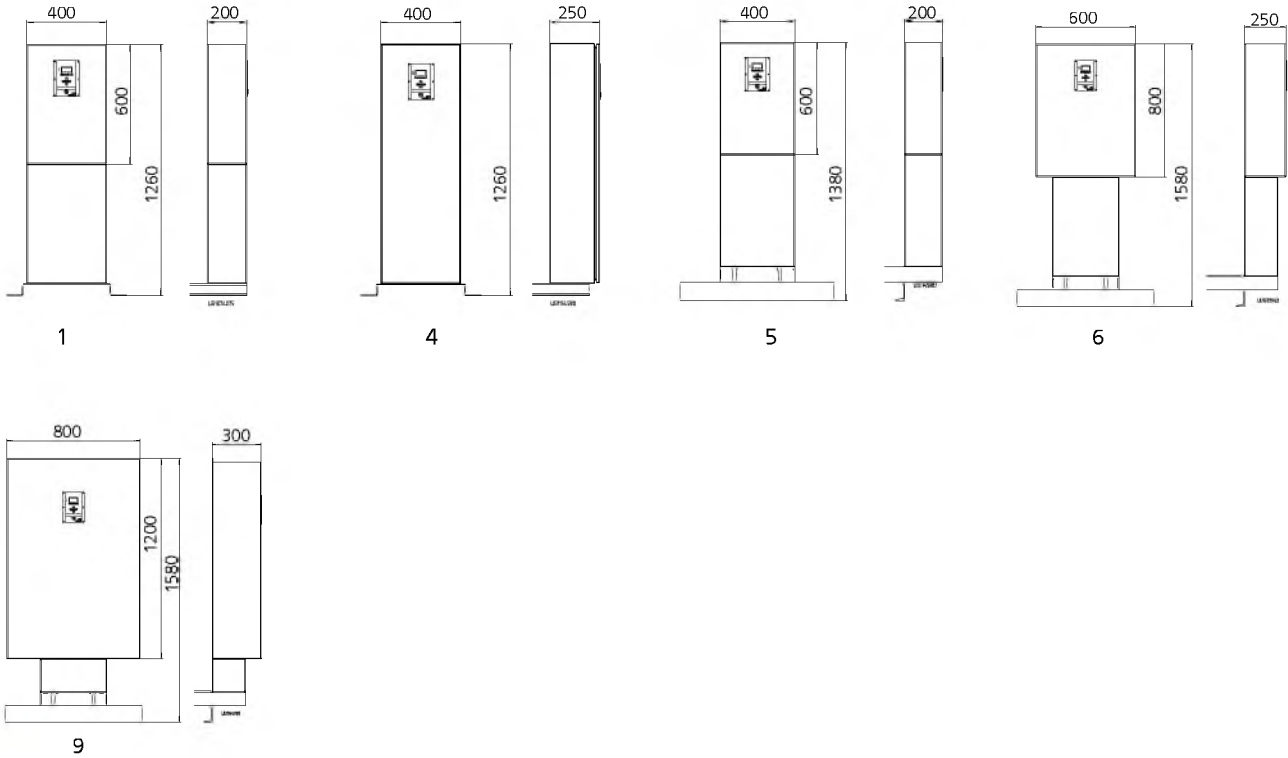
Flanges drilled to EN 1092-1 PN 16

Baseplate RAL 5002, control unit RAL 7035

Dimensions [mm]

Size	Connection	B	B1	B2	B3	H1	L1	L2	L3
2/25.. B	DN 100	1074	854	351	503	302	820	-	760
2/40.. B	DN 100	1139	919	374	545	337	820	-	760
2/60.. B	DN 150	1320	1035	431	604	337	820	-	760
2/90.. B	DN 150	1335	1050	439	611	337	820	-	760
3/25.. B	DN 100	1074	854	351	503	302	1230	-	1170
3/40.. B	DN 150	1248	963	396	567	337	1230	-	1170
3/60.. B	DN 150	1320	1035	431	604	337	1230	-	1170
3/90.. B	DN 200	1436	1096	462	634	337	1230	-	1170
4/25.. B	DN 150	1189	904	376	528	302	1640	820	760
4/40.. B	DN 150	1248	963	396	567	337	1640	820	760
4/60.. B	DN 200	1421	1081	454	627	337	1640	820	760
4/90.. B	DN 200	1436	1096	462	634	337	1640	820	760
5/25.. B	DN 150	1189	904	376	528	302	2050	1230	760
5/40.. B	DN 200	1349	1009	419	590	337	2050	1230	760
5/60.. B	DN 200	1421	1081	454	627	337	2050	1230	760
5/90.. B	DN 250	1561	1156	492	664	337	2050	1230	760
6/25.. B	DN 150	1189	904	376	528	302	2460	1230	1170
6/40.. B	DN 200	1349	1009	419	590	337	2460	1230	1170
6/60.. B	DN 200	1421	1081	454	627	337	2460	1230	1170
6/90.. B	DN 250	1561	1156	492	664	337	2460	1230	1170

Control cabinet – Hyamat SVP with Movitec 2B / 4B / 6B / 10B / 15B / 25B / 40B / 60B / 90B



Control cabinet dimensions for Hyamat SVP [mm]

The control cabinet dimensions refer to systems in the standard design. Larger control cabinets may be required for installing other optional equipment.

Combinations of Hyamat SVP systems and control cabinet dimensions

Hyamat SVP	P [kW] (per pump)						
	4,00	5,50	7,50	11,00	15,00	18,50	22,00
2/02.. B	1	1	1	-	-	-	-
2/04.. B	1	1	1	-	-	-	-
2/06.. B	1	1	1	-	-	-	-
2/10.. B	1	1	1	-	-	-	-
2/15.. B	1	1	1	-	-	-	-
2/25.. B	5	5	5	9	9	9	9
2/40.. B	5	5	5	9	9	9	9
2/60.. B	5	5	5	9	9	9	9
2/90.. B	5	5	5	9	9	9	9
3/02.. B	1	1	1	-	-	-	-
3/04.. B	1	1	1	-	-	-	-
3/06.. B	1	1	1	-	-	-	-
3/10.. B	1	1	1	-	-	-	-
3/15.. B	1	1	1	-	-	-	-
3/25.. B	5	5	5	9	9	9	9
3/40.. B	5	5	5	9	9	9	9
3/60.. B	5	5	5	9	9	9	9
3/90.. B	5	5	5	9	9	9	9
4/02.. B	1	1	1	-	-	-	-
4/04.. B	1	1	1	-	-	-	-
4/06.. B	1	1	1	-	-	-	-
4/10.. B	1	1	1	-	-	-	-
4/15.. B	1	1	1	-	-	-	-
4/25.. B	5	5	5	9	9	9	9
4/40.. B	5	5	5	9	9	9	9
4/60.. B	5	5	5	9	9	9	9

Hyamat SVP	P [kW] (per pump)						
	4,00	5,50	7,50	11,00	15,00	18,50	22,00
4/90.. B	5	5	5	9	9	9	9
5/02.. B	1	4	4	-	-	-	-
5/04.. B	1	4	4	-	-	-	-
5/06.. B	1	4	4	-	-	-	-
5/10.. B	1	4	4	-	-	-	-
5/15.. B	1	4	4	-	-	-	-
5/25.. B	5	6	6	9	9	9	9
5/40.. B	5	6	6	9	9	9	9
5/60.. B	5	6	6	9	9	9	9
5/90.. B	5	6	6	9	9	9	9
6/02.. B	1	4	4	-	-	-	-
6/04.. B	1	4	4	-	-	-	-
6/06.. B	1	4	4	-	-	-	-
6/10.. B	1	4	4	-	-	-	-
6/15.. B	1	4	4	-	-	-	-
6/25.. B	5	6	6	9	9	9	9
6/40.. B	5	6	6	9	9	9	9
6/60.. B	5	6	6	9	9	9	9
6/90.. B	5	6	6	9	9	9	9

Weights

Hyamat SVP weights [kg]

Hyamat SVP	1	2-2	2-1	2	3-2	3-1	3	4-2	4	5-2	5	6-2	6	7	8	9	10	11	12	13	14	16	18
2/B 02.../..	-	-	-	136	-	-	136	-	137	-	138	-	142	143	144	149	149	155	156	-	158	167	168
3/B 02.../..	-	-	-	172	-	-	173	-	174	-	176	-	182	183	184	191	193	202	203	-	205	218	221
4/B 02.../..	-	-	-	211	-	-	213	-	214	-	216	-	225	226	228	237	239	251	252	-	256	273	277
5/B 02.../..	-	-	-	256	-	-	258	-	260	-	262	-	274	276	278	289	291	306	308	-	312	334	338
6/B 02.../..	-	-	-	297	-	-	299	-	302	-	304	-	317	320	322	336	338	356	359	-	363	390	395
2/B 04.../..	-	-	-	136	-	-	140	-	141	-	145	-	151	152	160	161	162	168	170	-	171	200	-
3/B 04.../..	-	-	-	172	-	-	178	-	181	-	187	-	196	197	208	210	212	220	223	-	226	268	-
4/B 04.../..	-	-	-	212	-	-	220	-	223	-	231	-	243	244	259	262	264	276	279	-	283	340	-
5/B 04.../..	-	-	-	257	-	-	268	-	271	-	281	-	296	298	316	320	322	338	342	-	346	417	-
6/B 04.../..	-	-	-	297	-	-	310	-	314	-	326	-	344	347	369	374	376	394	399	-	404	489	-
2/B 06.../..	-	-	-	138	-	-	146	-	152	-	153	-	161	162	169	170	171	191	192	-	193	-	-
3/B 06.../..	-	-	-	174	-	-	186	-	195	-	197	-	209	210	221	222	224	254	255	-	256	-	-
4/B 06.../..	-	-	-	214	-	-	230	-	242	-	244	-	260	262	276	278	280	320	321	-	323	-	-
5/B 06.../..	-	-	-	258	-	-	278	-	293	-	296	-	316	318	336	338	341	390	392	-	395	-	-
6/B 06.../..	-	-	-	297	-	-	322	-	339	-	342	-	367	370	391	394	397	456	459	-	462	-	-
2/B 10.../..	-	-	-	171	-	-	177	-	187	-	194	-	196	214	216	229	231	233	-	315	-	-	-
3/B 10.../..	-	-	-	224	-	-	234	-	250	-	260	-	263	289	292	312	314	317	-	441	-	-	-
4/B 10.../..	-	-	-	281	-	-	294	-	315	-	329	-	333	368	372	397	401	405	-	570	-	-	-
5/B 10.../..	-	-	-	342	-	-	358	-	384	-	402	-	406	450	455	487	492	497	-	708	-	-	-
6/B 10.../..	-	-	-	398	-	-	417	-	448	-	469	-	475	528	533	572	578	584	-	836	-	-	-
2/B 15.../..	-	-	-	211	-	-	230	-	242	-	320	-	322	332	337	-	-	-	-	-	-	-	-
3/B 15.../..	-	-	-	282	-	-	309	-	327	-	444	-	447	462	469	-	-	-	-	-	-	-	-
4/B 15.../..	-	-	-	369	-	-	406	-	430	-	586	-	590	609	619	-	-	-	-	-	-	-	-
5/B 15.../..	-	-	-	580	-	-	626	-	656	-	856	-	860	885	898	-	-	-	-	-	-	-	-
6/B 15.../..	-	-	-	705	-	-	761	-	797	-	1036	-	1041	1071	1086	-	-	-	-	-	-	-	-
2/B 25.../..	-	-	-	396	-	-	455	-	469	-	699	-	705	729	-	-	-	-	-	-	-	-	-
3/B 25.../..	-	-	-	546	-	-	634	-	654	-	980	-	988	1024	-	-	-	-	-	-	-	-	-
4/B 25.../..	-	-	-	760	-	-	877	-	905	-	1325	-	1337	1385	-	-	-	-	-	-	-	-	-
5/B 25.../..	-	-	-	948	-	-	1100	-	1134	-	1644	-	1660	1720	-	-	-	-	-	-	-	-	-
6/B 25.../..	-	-	-	1104	-	-	1235	-	1277	-	1932	-	1950	2022	-	-	-	-	-	-	-	-	-
2/B 40.../..	-	411	-	419	627	-	628	632	660	682	712	717	789	-	-	-	-	-	-	-	-	-	-
3/B 40.../..	-	616	-	629	922	-	922	629	971	1004	1048	1056	1163	-	-	-	-	-	-	-	-	-	-
4/B 40.../..	-	793	-	810	1187	-	1187	1196	1252	1296	1356	1366	1509	-	-	-	-	-	-	-	-	-	-
5/B 40.../..	-	1094	-	1114	1571	-	1572	1583	1653	1708	1782	1794	1974	-	-	-	-	-	-	-	-	-	-
6/B 40.../..	-	1274	-	1298	1839	-	1840	1854	1938	2003	2093	2107	2323	-	-	-	-	-	-	-	-	-	-
2/B 60.../..	481	496	-	701	736	-	760	796	875	882	-	-	-	-	-	-	-	-	-	-	-	-	-
3/B 60.../..	638	660	-	948	1000	-	1036	1091	1209	1220	-	-	-	-	-	-	-	-	-	-	-	-	-
4/B 60.../..	926	956	-	1326	1396	-	1443	1517	1674	1688	-	-	-	-	-	-	-	-	-	-	-	-	-
5/B 60.../..	1175	1212	-	1660	1747	-	1806	1898	2096	2112	-	-	-	-	-	-	-	-	-	-	-	-	-
6/B 60.../..	1369	1413	-	1944	2048	-	2120	2230	2467	2487	-	-	-	-	-	-	-	-	-	-	-	-	-
2/B 90.../..	-	822	834	834	905	977	977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/B 90.../..	-	1178	1196	1196	1302	1388	1388	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/B 90.../..	-	1568	1592	1592	1734	1878	1878	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/B 90.../..	-	2098	2128	2128	2306	2486	2486	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/B 90.../..	-	2463	2499	2499	2712	2928	2928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Scope of supply

Depending on the model, the following items are included in the scope of supply:

Pressure booster system

- Two to six vertical high-pressure centrifugal pumps (standard pumps)

For Movitec 2B, 4B, 6B, 10B and 15B:

- With oval/round flange

For Movitec 25B, 40B, 60B and 90B:

- With round flange
- Membrane-type accumulator on the discharge side, approved for drinking water
- Pressure transmitter on the discharge side
- Pressure gauge
- Powder-coated / epoxy resin-coated steel baseplate

For Movitec 2B, 4B, 6B, 10B and 15B:

- Pumps mounted on the baseplate with anti-vibration mounts

For Movitec 25B, 40B, 60B and 90B:

- Pressure booster system with level-adjustable feet and rubber pads (supplied but not fitted)

Per pump:


- Check valve
- Shut-off valves

Control cabinet

- Control cabinet IP54
- Pump control and monitoring unit
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the pressure booster system
- Service interface for connection to a PC
- Transformer for control voltage
- Motor protection switch per pump

- Lockable master switch (repair switch)
- Terminal strip/terminals with identification for all connections
- Circuit diagram and list of electric components
- Connection for analog or digital dry running protection equipment
- External connection ON
- External connection OFF

Accessories

 See the separate type series booklet Accessories for Pressure Booster Systems 1954.5.

Pressure Booster System

Hya-Solo

Type Series Booklet



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Building Services: Water Supply

Pressure Booster Systems

Hya-Solo D / DSV



Hya-Solo D



Hya-Solo DSV

Main applications

- Spray irrigation systems
- General irrigation systems
- Service water supply systems
- Domestic water supply
- Rainwater harvesting
- Water supply systems

Fluids handled

- Drinking water
- Service water
- Cooling water
- Fluids not chemically or mechanically aggressive to the materials

Operating data

Operating properties

Characteristic	Value	
Flow rate	Q [m ³ /h]	≤ 110
	Q [l/s]	≤ 30.6
Head	H [m]	≤ 160
Fluid temperature	T [°C]	≤ 70
Operating pressure	p [bar]	≤ 16

Designation

Example: Hya-Solo D 1 / 0405 / 2 B

Designation key

Code	Description
Hya-Solo	Type series
D	Three-phase current
1	Number of pumps
04	Pump size
05	Number of pump stages
2	Inlet pressure [bar] (for DSV, from - to)
B	Design status

Design details

Design

Hya-Solo D

- Fully automatic pressure booster package system
- Membrane-type accumulator (direct-flow) to DIN 4807-5 on the discharge side, approved for drinking water
- Pressure gauge for pressure indication

Hya-Solo DSV

- Fully automatic pressure booster package system
- Membrane-type accumulator (direct-flow) to DIN 4807-5 on the discharge side, approved for drinking water
- Pressure gauge for pressure indication

Installation type

- Stationary installation

Drive

Hya-Solo D

- Three-phase asynchronous squirrel-cage motor
- Efficiency class IE3
- 220-240 V / 380-420 V ; 380-420 V / 660-720 V
- IP55 enclosure
- Thermal class F
- DOL starting up to and including 4 kW
- Star-delta starting for 5.5 kW and above

Hya-Solo DSV

- KSB SuPremE IE4 motor (as per IEC/CD 60034-30 Ed. 2)
- Three-phase motor
- 380 V AC -10% up to 480 V AC +10%, 50/60 Hz
- IP55 enclosure

Automation

Hya-Solo D

- Control unit for pressure-controlled starting and stopping
- Control cabinet IP54
- LEDs indicate faults and lack of water (red)
- Motor protection switch
- Manual-0-automatic selector switch
- Timer for daily operation check run
- Terminal strip with markings for all connections
- Volt-free contacts for operation, fault, lack of water
- Remote ON/OFF
- Lockable master switch (repair switch)

Hya-Solo DSV

- Self-cooling motor-mounted frequency inverter (PumpDrive) for pressure-controlled starting and demand-based stopping
- Plain-text display (for voltage, current, power, speed, frequency)
- Control panel with operating keys (manual-0-automatic), navigation and function keys
- LEDs signalling operational availability (green), warning (yellow), alert (red)
- Two freely parameterisable relay outputs (operation/fault, alert, etc.)
- Analog input for external setpoint adjustment

- Analog output for transmitting the actual value, motor speed, etc.
- Control cabinet IP54
- Lockable master switch (repair switch)

Materials

Overview of available materials

Component	Material
Pump	
Pump casing	Stainless steel
Pump shroud	Stainless steel
Hydraulic system	Stainless steel
Sealing element	EPDM
Plain bearing	Aluminium oxide
Mechanical seal	To EN 12756
Primary ring	Silicon carbide
Mating ring	Hard carbon
Elastomer	EPDM
Piping	
Hya-Solo D/DSV	Chrome steel
PumpDrive housing	
Heat sink	Die-cast aluminium
Casing cover	PBT, glass fibre reinforced
Accumulator	Connection made of stainless steel, flow through valve to DIN 4807-5
Membrane	Approved for drinking water

Product benefits

- Corrosion-resistant by using high-quality stainless steel
- Very compact, space-saving design

Hya-Solo DSV

- Saves energy through efficient operating mode

Selection information

Selecting the pressure booster system

Selection example

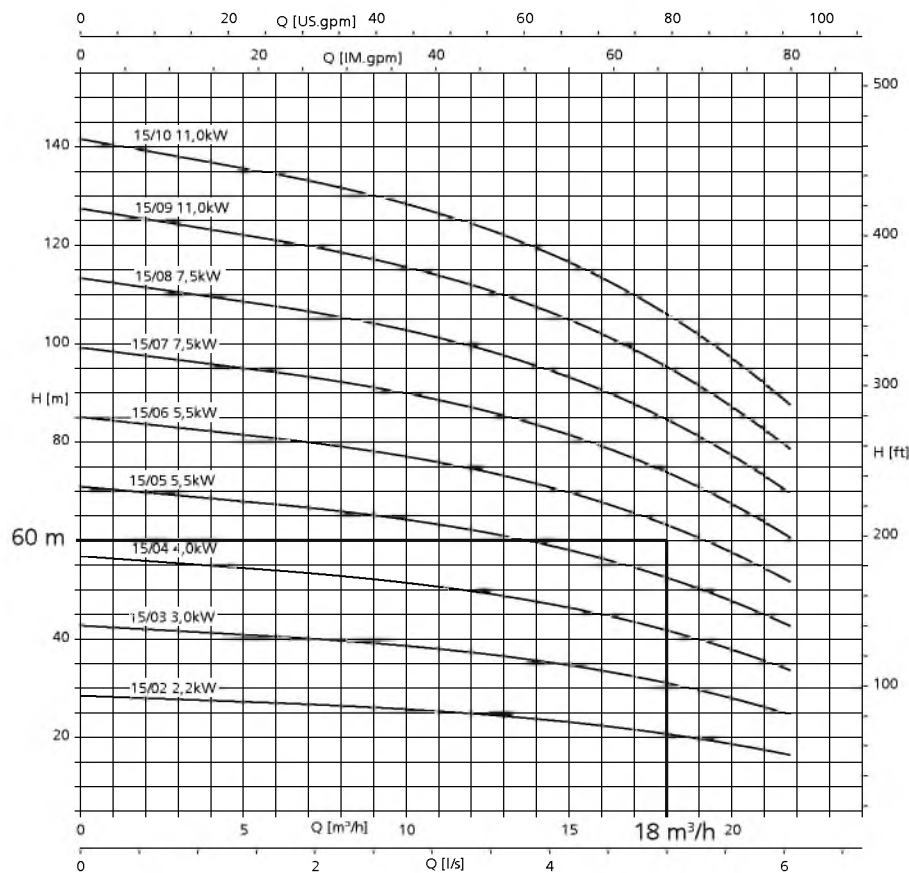
Requirements:

Specified duty point at:

- Flow rate: 18 m³/h
- Head: 60 m

Solution:

1. The values are transferred to the selection chart to select the most suitable pump.
- ⇒ At an inlet pressure $p_{in} = 0$ bar: Movitec 15/06 => Hya-Solo D / 1506/0



Determining the power input

- The power input is indicated per stage (St = 1) and/or per stage with a smaller impeller (St = -1).
The pump input power can be calculated accordingly.
Calculation: value indicated in the diagram (St = 1) × number of stages + value indicated in the diagram (St = -1) × number of stages with a smaller impeller
- Example 1, Movitec 90/4: $P = (St = 1) \times 4$
 Example 2, Movitec 90/4-1: $P = (St = 1) \times 3 + (St = -1)$
 Example 3, Movitec 90/4-2: $P = (St = 1) \times 2 + (St = -1) \times 2$

Technical data

Hya-Solo D

Selection table

Hya-Solo D	P _N [kW]	I _N 3~400 V [A]	[kg]	Connection Suction side - Discharge side
1/0202 B	0,37	0,94	64	G 1 - R 1
1/0203 B	0,37	0,94	64	G 1 - R 1
1/0204 B	0,37	0,94	65	G 1 - R 1
1/0205 B	0,37	0,94	65	G 1 - R 1
1/0206 B	0,55	1,33	68	G 1 - R 1
1/0207 B	0,55	1,33	68	G 1 - R 1
1/0208 B	0,55	1,33	68	G 1 - R 1
1/0209 B	0,75	1,68	71	G 1 - R 1
1/0210 B	0,75	1,68	71	G 1 - R 1
1/0211 B	1,10	2,40	74	G 1 - R 1
1/0212 B	1,10	2,40	74	G 1 - R 1
1/0214 B	1,10	2,40	75	G 1 - R 1
1/0216 B	1,50	2,92	80	G 1 - R 1
1/0218 B	1,50	2,92	80	G 1 - R 1
1/0402 B	0,37	0,94	64	G 1 - R 1
1/0403 B	0,55	1,33	66	G 1 - R 1
1/0404 B	0,55	1,33	67	G 1 - R 1
1/0405 B	0,75	1,68	69	G 1 - R 1
1/0406 B	1,10	2,40	72	G 1 - R 1
1/0407 B	1,10	2,40	72	G 1 - R 1
1/0408 B	1,50	2,92	76	G 1 - R 1
1/0409 B	1,50	2,92	77	G 1 - R 1
1/0410 B	1,50	2,92	77	G 1 - R 1
1/0411 B	2,20	4,15	80	G 1 - R 1
1/0412 B	2,20	4,15	81	G 1 - R 1
1/0414 B	2,20	4,15	82	G 1 - R 1
1/0416 B	3,00	5,59	96	G 1 - R 1
1/0602 B	0,37	0,94	65	G 1 1/4 - R 1 1/4
1/0603 B	0,75	1,68	69	G 1 1/4 - R 1 1/4
1/0604 B	1,10	2,40	72	G 1 1/4 - R 1 1/4
1/0605 B	1,10	2,40	73	G 1 1/4 - R 1 1/4
1/0606 B	1,50	2,92	77	G 1 1/4 - R 1 1/4
1/0607 B	1,50	2,92	77	G 1 1/4 - R 1 1/4
1/0608 B	2,20	4,15	81	G 1 1/4 - R 1 1/4
1/0609 B	2,20	4,15	81	G 1 1/4 - R 1 1/4
1/0610 B	2,20	4,15	82	G 1 1/4 - R 1 1/4
1/0611 B	3,00	5,59	92	G 1 1/4 - R 1 1/4
1/0612 B	3,00	5,59	92	G 1 1/4 - R 1 1/4
1/0614 B	3,00	5,59	93	G 1 1/4 - R 1 1/4
1/0616 B	4,00	7,45	103	G 1 1/4 - R 1 1/4
1/1002 B	0,75	1,68	82	G 1 1/2 - R 1 1/2
1/1003 B	1,10	2,40	85	G 1 1/2 - R 1 1/2
1/1004 B	1,50	2,92	90	G 1 1/2 - R 1 1/2
1/1005 B	2,20	4,15	94	G 1 1/2 - R 1 1/2
1/1006 B	2,20	4,15	94	G 1 1/2 - R 1 1/2
1/1007 B	3,00	5,59	103	G 1 1/2 - R 1 1/2
1/1008 B	3,00	5,59	104	G 1 1/2 - R 1 1/2
1/1009 B	4,00	7,45	111	G 1 1/2 - R 1 1/2
1/1010 B	4,00	7,45	112	G 1 1/2 - R 1 1/2
1/1011 B	4,00	7,45	113	G 1 1/2 - R 1 1/2
1/1013 B	5,50	10,00	156	G 1 1/2 - R 1 1/2
1/1502 B	2,20	4,15	91	G 2 - R 2

Hya-Solo D	P _N	I _N		[kg]	Connection Suction side - Discharge side
		3~400 V			
	[kW]	[A]			
1/1503 B	3,00	5,59	100		G 2 - R 2
1/1504 B	4,00	7,45	106		G 2 - R 2
1/1505 B	5,50	10,00	148		G 2 - R 2
1/1506 B	5,50	10,00	149		G 2 - R 2
1/1507 B	7,50	13,40	154		G 2 - R 2
1/1508 B	7,50	13,40	156		G 2 - R 2
1/1509 B	11,00	19,30	238		G 2 - R 2
1/1510 B	11,00	19,30	239		G 2 - R 2
1/2502 B	4,00	7,45	141		DN 65
1/2503 B	5,50	10,00	173		DN 65
1/2504 B	7,50	13,40	180		DN 65
1/2505 B	11,00	19,30	267		DN 65
1/2506 B	11,00	19,30	270		DN 65
1/2507 B	15,00	26,20	308		DN 65
1/4002-2 B	5,50	10,00	147		DN 80
1/4002 B	7,50	13,40	151		DN 80
1/4003-2 B	11,00	19,30	228		DN 80
1/4003 B	11,00	19,30	228		DN 80
1/4004-2 B	15,00	26,20	256		DN 80
1/4004 B	15,00	26,20	270		DN 80
1/4005-2 B	18,50	31,80	280		DN 80
1/4005 B	18,50	31,80	296		DN 80
1/4006-2 B	18,50	31,80	298		DN 80
1/4006 B	22,00	37,60	335		DN 80
1/6001 B	5,50	10,00	156		DN 100
1/6002-2 B	7,50	13,40	163		DN 100
1/6002 B	11,00	19,30	238		DN 100
1/6003-2 B	15,00	26,20	281		DN 100
1/6003 B	18,50	31,80	292		DN 100
1/6004-2 B	18,50	31,80	311		DN 100
1/6004 B	22,00	37,60	351		DN 100
1/6005-2 B	22,00	37,60	354		DN 100
1/9002-2 B	11,00	19,30	298		DN 100
1/9002-1 B	15,00	26,20	330		DN 100
1/9002 B	15,00	26,20	330		DN 100
1/9003-2 B	18,5	37,60	402		DN 100
1/9003-1 B	22,0	31,80	365		DN 100
1/9003 B	22,00	37,60	402		DN 100
1/9004-2 B	30,00	51,60	527		DN 100
1/9004-1 B	30,00	51,60	527		DN 100
1/9004 B	30,00	51,60	527		DN 100
1/9005-2 B	37,00	63,30	567		DN 100
1/9005-1 B	37,00	63,30	567		DN 100
1/9005 B	37,00	63,30	567		DN 100

Hya-Solo DSV

Selection table

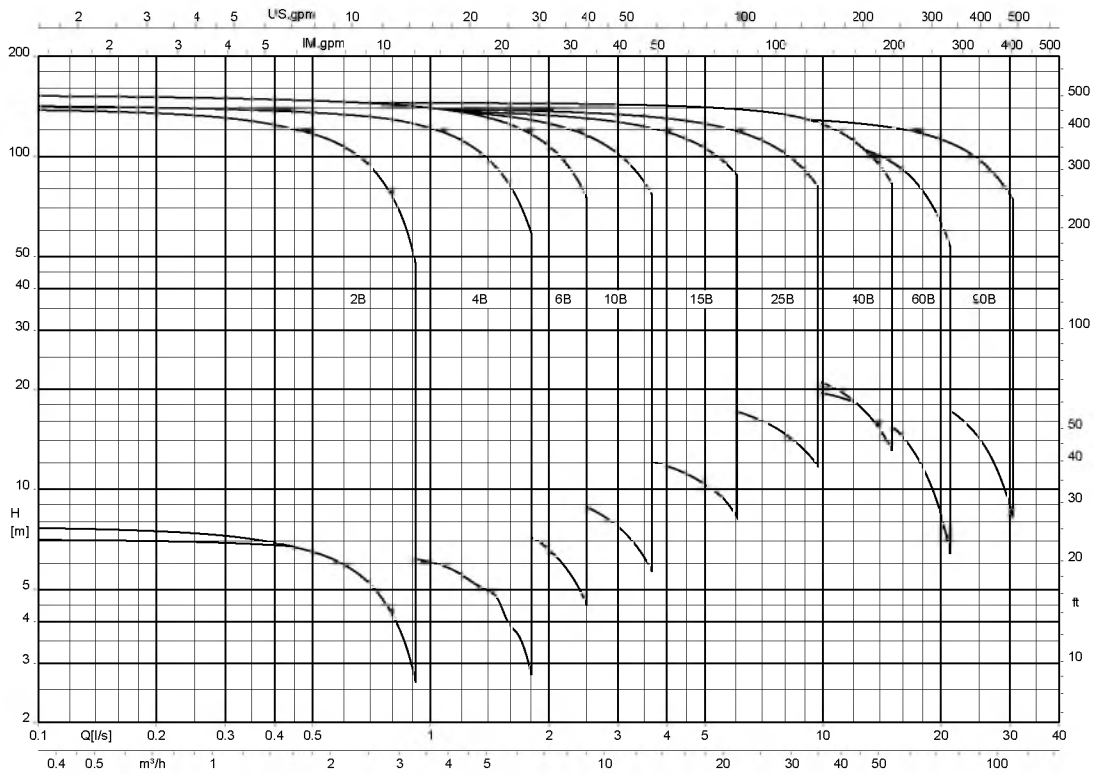
Hya-Solo DSV	P _N	I _N		[kg]	Connection Suction side - Discharge side
		3~400 V			
	[kW]	[A]			
1/0202 B	0,55	1,60	46		G 1 - R 1
1/0203 B	0,55	1,60	46		G 1 - R 1
1/0204 B	0,55	1,60	47		G 1 - R 1
1/0205 B	0,55	1,60	47		G 1 - R 1
1/0206 B	0,55	1,60	50		G 1 - R 1

Hya-Solo DSV	P _N [kW]	I _N 3~400 V		[kg]	Connection Suction side - Discharge side
		[A]			
1/0207 B	0,55	1,60		50	G 1 - R 1
1/0208 B	0,55	1,60		50	G 1 - R 1
1/0209 B	0,75	2,10		53	G 1 - R 1
1/0210 B	0,75	2,10		53	G 1 - R 1
1/0211 B	1,10	3,00		56	G 1 - R 1
1/0212 B	1,10	3,00		56	G 1 - R 1
1/0214 B	1,10	3,00		57	G 1 - R 1
1/0216 B	1,50	4,10		62	G 1 - R 1
1/0218 B	1,50	4,10		62	G 1 - R 1
1/0402 B	0,55	1,60		46	G 1 - R 1
1/0403 B	0,55	1,60		48	G 1 - R 1
1/0404 B	0,55	1,60		49	G 1 - R 1
1/0405 B	0,75	2,10		51	G 1 - R 1
1/0406 B	1,10	3,00		54	G 1 - R 1
1/0407 B	1,10	3,00		54	G 1 - R 1
1/0408 B	1,50	4,10		58	G 1 - R 1
1/0409 B	1,50	4,10		59	G 1 - R 1
1/0410 B	1,50	4,10		59	G 1 - R 1
1/0411 B	2,20	5,60		62	G 1 - R 1
1/0412 B	2,20	5,60		63	G 1 - R 1
1/0414 B	2,20	5,60		64	G 1 - R 1
1/0416 B	3,00	7,60		78	G 1 - R 1
1/0602 B	0,55	1,60		47	G 1 1/4 - R 1 1/4
1/0603 B	0,75	2,10		51	G 1 1/4 - R 1 1/4
1/0604 B	1,10	3,00		54	G 1 1/4 - R 1 1/4
1/0605 B	1,10	3,00		55	G 1 1/4 - R 1 1/4
1/0606 B	1,50	4,10		59	G 1 1/4 - R 1 1/4
1/0607 B	1,50	4,10		59	G 1 1/4 - R 1 1/4
1/0608 B	2,20	5,60		63	G 1 1/4 - R 1 1/4
1/0609 B	2,20	5,60		63	G 1 1/4 - R 1 1/4
1/0610 B	2,20	5,60		64	G 1 1/4 - R 1 1/4
1/0611 B	3,00	7,60		74	G 1 1/4 - R 1 1/4
1/0612 B	3,00	7,60		74	G 1 1/4 - R 1 1/4
1/0614 B	3,00	7,60		75	G 1 1/4 - R 1 1/4
1/0616 B	4,00	9,40		85	G 1 1/4 - R 1 1/4
1/1002 B	0,75	2,10		64	G 1 1/2 - R 1 1/2
1/1003 B	1,10	3,00		67	G 1 1/2 - R 1 1/2
1/1004 B	1,50	4,10		72	G 1 1/2 - R 1 1/2
1/1005 B	2,20	5,60		76	G 1 1/2 - R 1 1/2
1/1006 B	2,20	5,60		76	G 1 1/2 - R 1 1/2
1/1007 B	3,00	7,60		85	G 1 1/2 - R 1 1/2
1/1008 B	3,00	7,60		86	G 1 1/2 - R 1 1/2
1/1009 B	4,00	9,40		93	G 1 1/2 - R 1 1/2
1/1010 B	4,00	9,40		94	G 1 1/2 - R 1 1/2
1/1011 B	4,00	9,40		95	G 1 1/2 - R 1 1/2
1/1013 B	5,50	12,50		135	G 1 1/2 - R 1 1/2
1/1502 B	2,20	5,60		73	G 2 - R 2
1/1503 B	3,00	7,60		82	G 2 - R 2
1/1504 B	4,00	9,40		88	G 2 - R 2
1/1505 B	5,50	12,50		127	G 2 - R 2
1/1506 B	5,50	12,50		128	G 2 - R 2
1/1507 B	7,50	16,70		133	G 2 - R 2
1/1508 B	7,50	16,70		135	G 2 - R 2
1/1509 B	11,00	23,70		225	G 2 - R 2
1/1510 B	11,00	23,70		226	G 2 - R 2
1/2502 B	4,00	9,40		134	DN 65

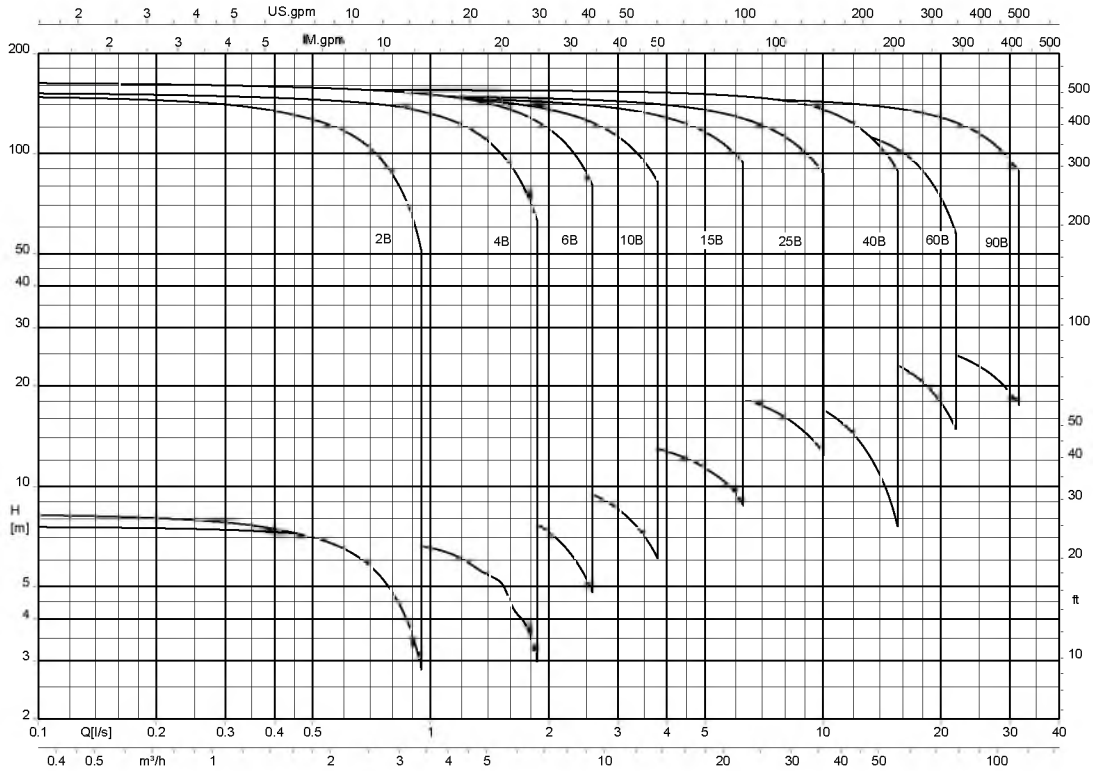
Hya-Solo DSV	P _N [kW]	I _N 3~400 V	[kg]	Connection Suction side - Discharge side
		[A]		
1/2503 B	5,50	12,50	163	DN 65
1/2504 B	7,50	16,70	170	DN 65
1/2505 B	11,00	23,70	265	DN 65
1/2506 B	11,00	23,70	268	DN 65
1/2507 B	15,00	32,00	280	DN 65
1/4002-2 B	5,50	12,50	137	DN 80
1/4002 B	7,50	16,70	141	DN 80
1/4003-2 B	11,00	23,70	226	DN 80
1/4003 B	11,00	23,70	226	DN 80
1/4004-2 B	15,00	32,00	228	DN 80
1/4004 B	15,00	32,00	242	DN 80
1/4005-2 B	18,50	38,80	252	DN 80
1/4005 B	18,50	38,80	266	DN 80
1/4006-2 B	18,50	38,80	269	DN 80
1/4006 B	22,00	50,70	305	DN 80
1/6001 B	5,50	12,50	146	DN 100
1/6002-2 B	7,50	16,70	153	DN 100
1/6002 B	11,00	23,70	236	DN 100
1/6003-2 B	15,00	32,00	253	DN 100
1/6003 B	18,50	38,80	263	DN 100
1/6004-2 B	18,50	38,80	282	DN 100
1/6004 B	22,00	50,70	321	DN 100
1/6005-2 B	22,00	50,70	324	DN 100
1/9002-2 B	11,00	23,70	296	DN 100
1/9002-1 B	15,00	32,00	302	DN 100
1/9002 B	15,00	32,00	302	DN 100
1/9003-2 B	18,50	38,80	336	DN 100
1/9003-1 B	22,00	50,70	372	DN 100
1/9003 B	22,00	50,70	372	DN 100
1/9004-2 B	30,00	63,50	496	DN 100
1/9004-1 B	30,00	63,50	496	DN 100
1/9004 B	30,00	63,50	496	DN 100
1/9005-2 B	37,00	77,80	534	DN 100
1/9005-1 B	37,00	77,80	534	DN 100
1/9005 B	37,00	77,80	534	DN 100

Selection charts

Hya-Solo D, n = 2900 rpm

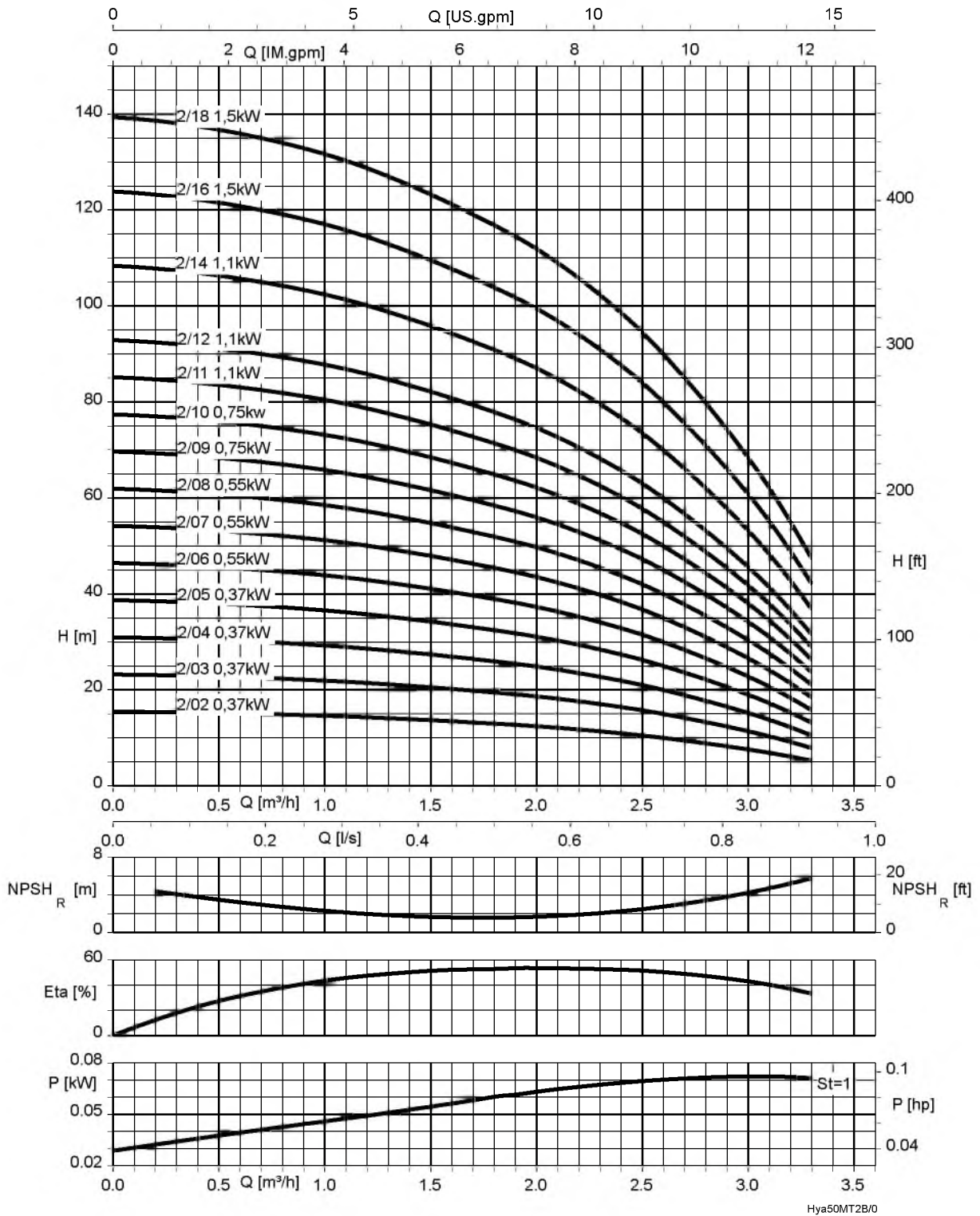


Hya-Solo DSV, n = 3000 rpm



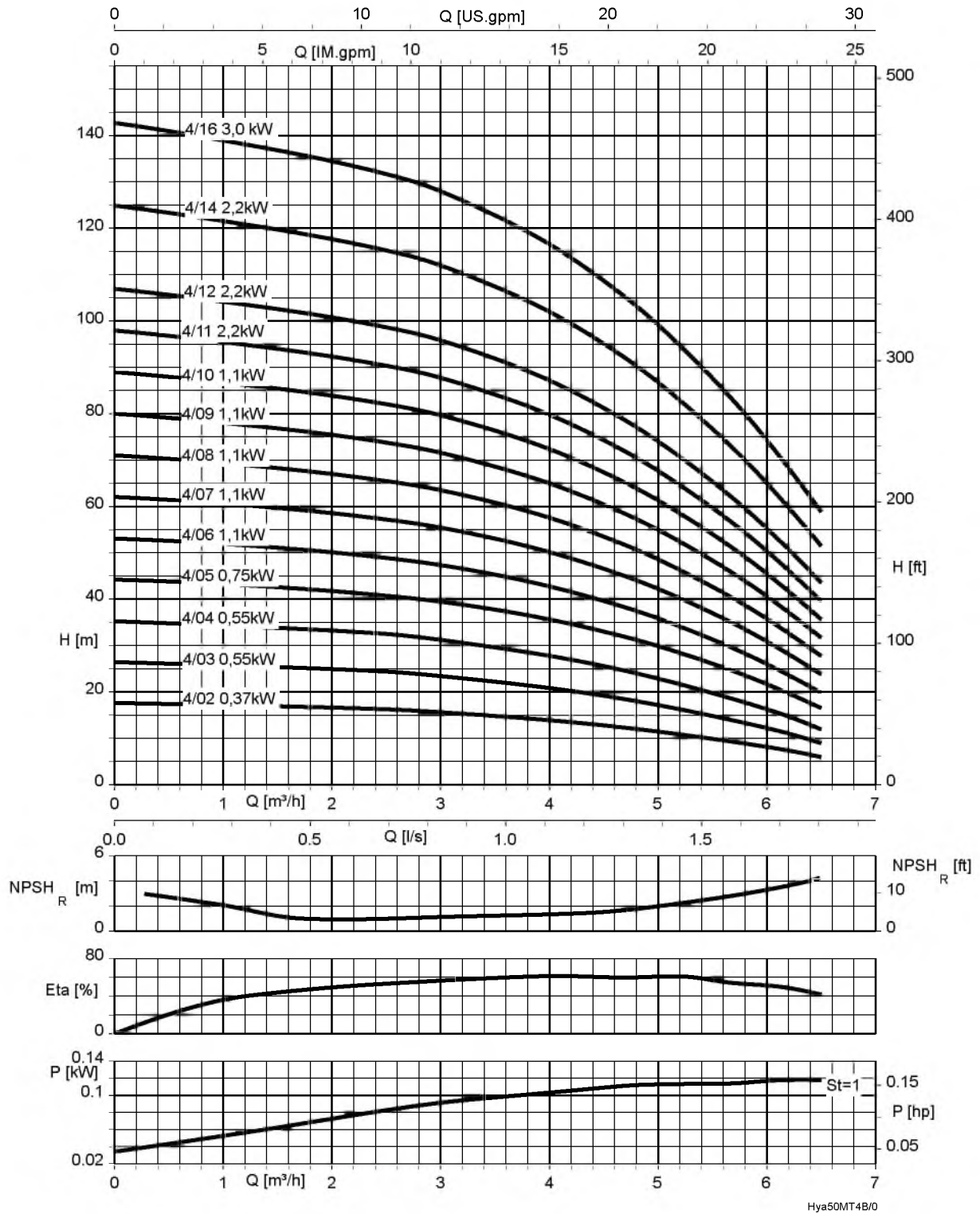
Characteristic curves

Hya-Solo D with Movitec 2B, n = 2900 rpm



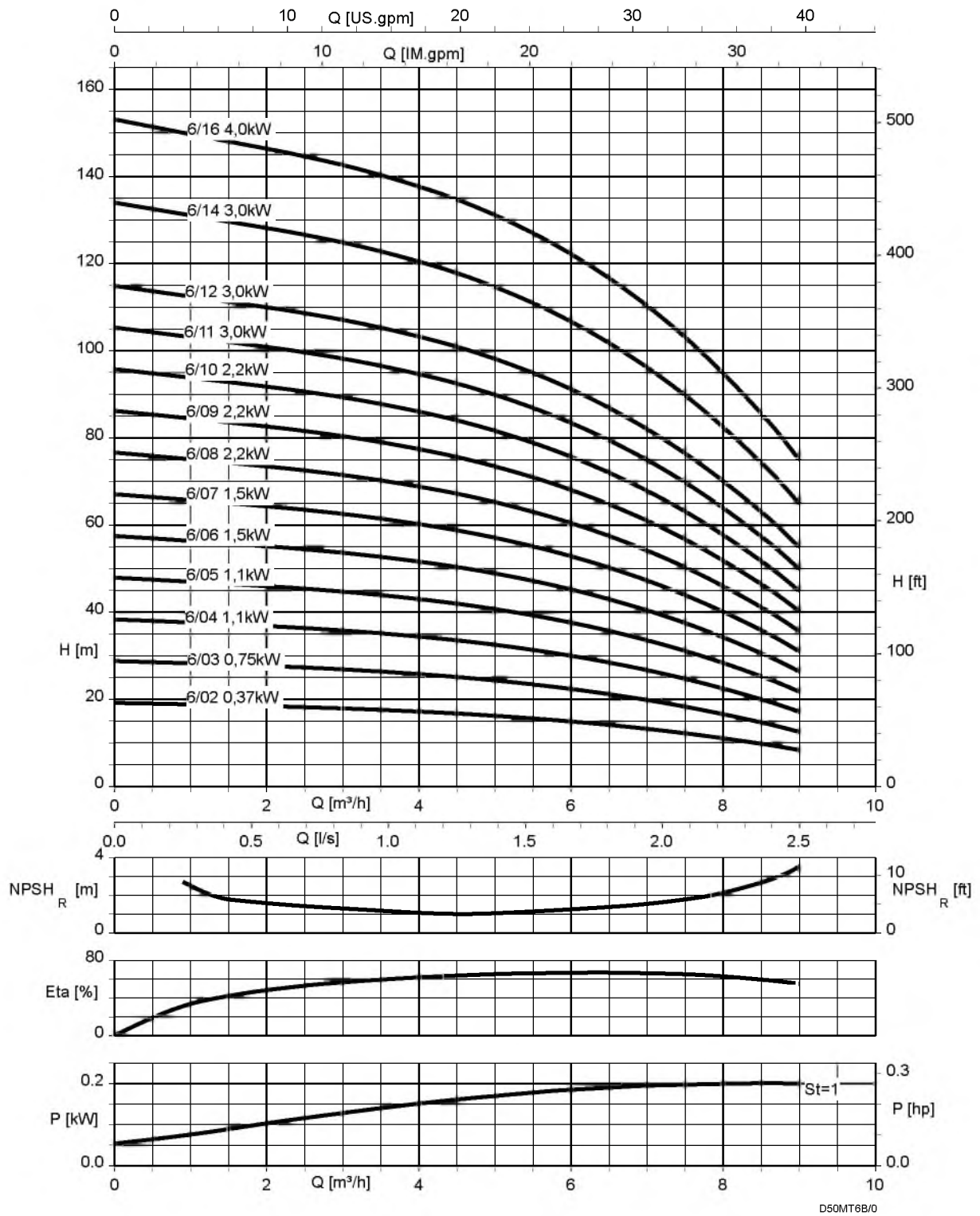
St = 1 | P per stage

Hya-Solo D with Movitec 4B, n = 2900 rpm



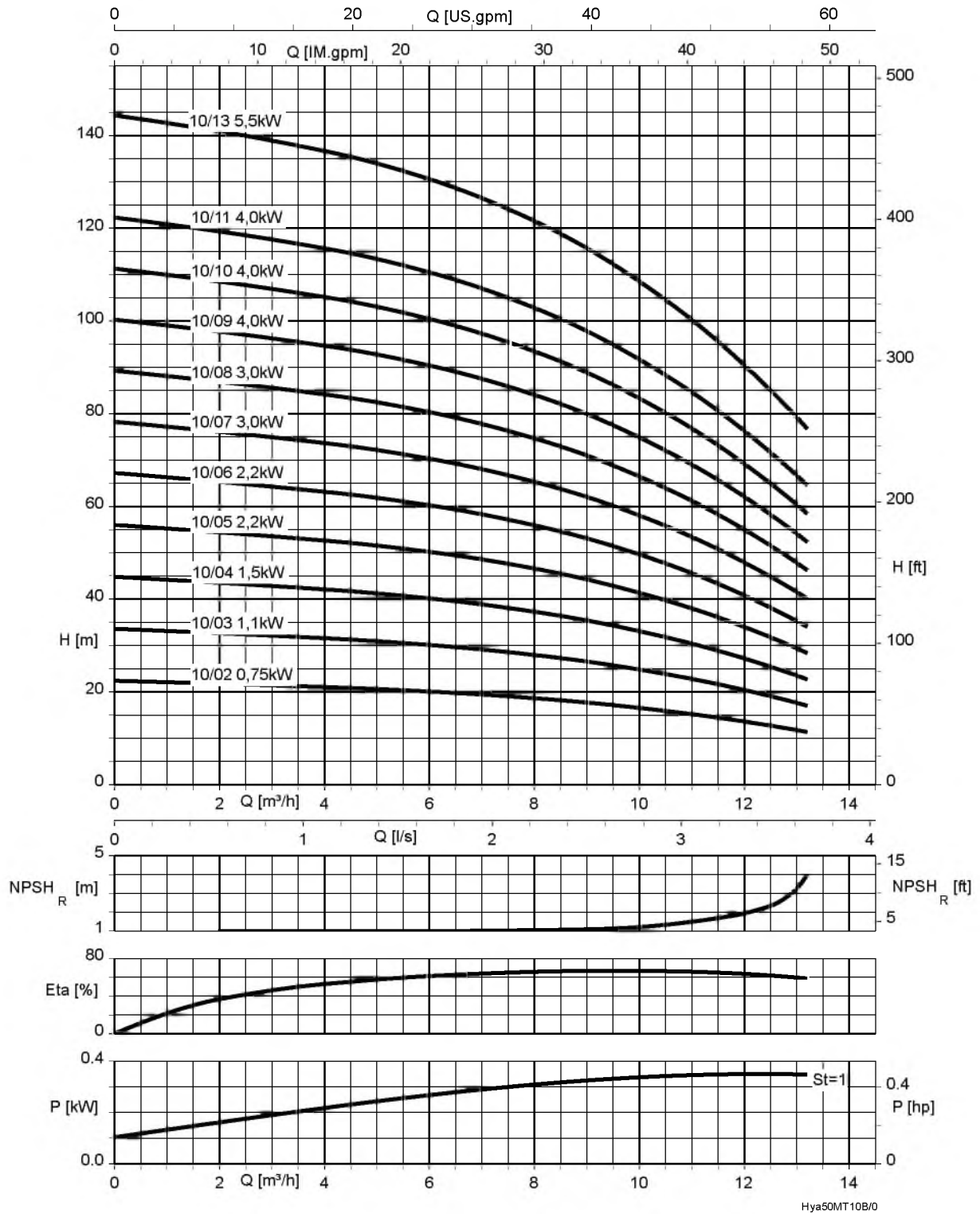
St = 1 | P per stage

Hya-Solo D with Movitec 6B, n = 2900 rpm



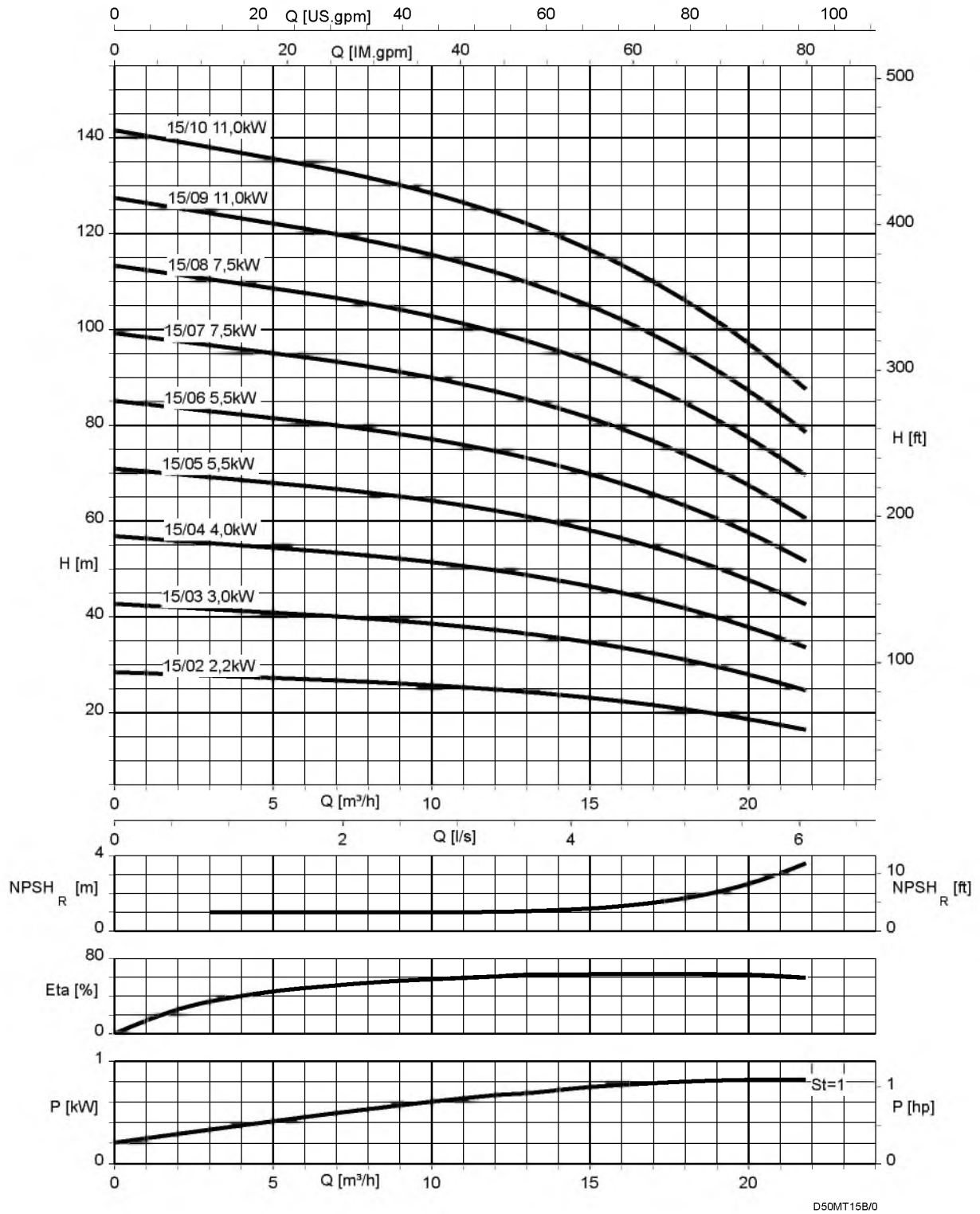
St = 1 | P per stage

Hya-Solo D with Movitec 10B, n = 2900 rpm



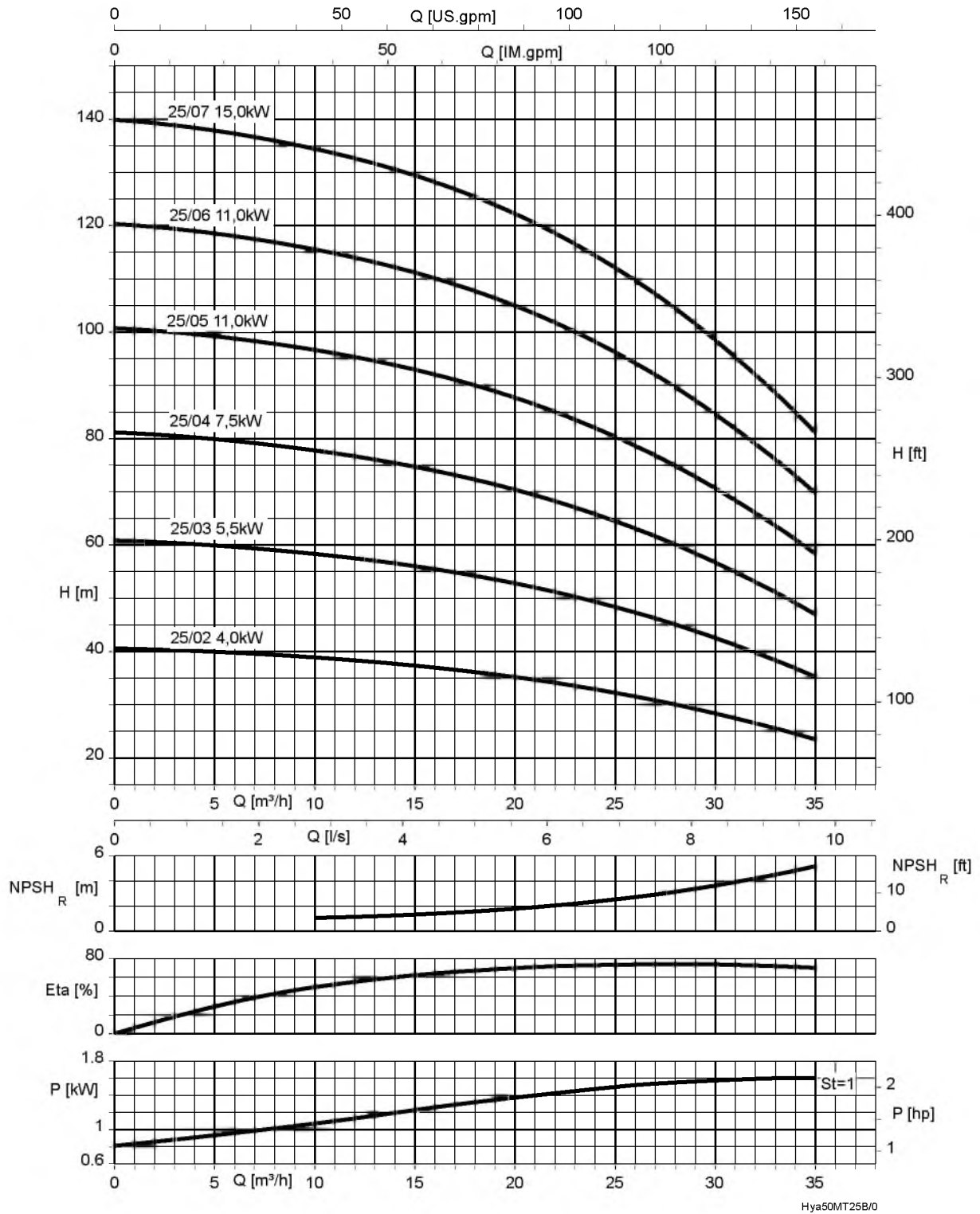
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Hya-Solo D with Movitec 15B, n = 2900 rpm



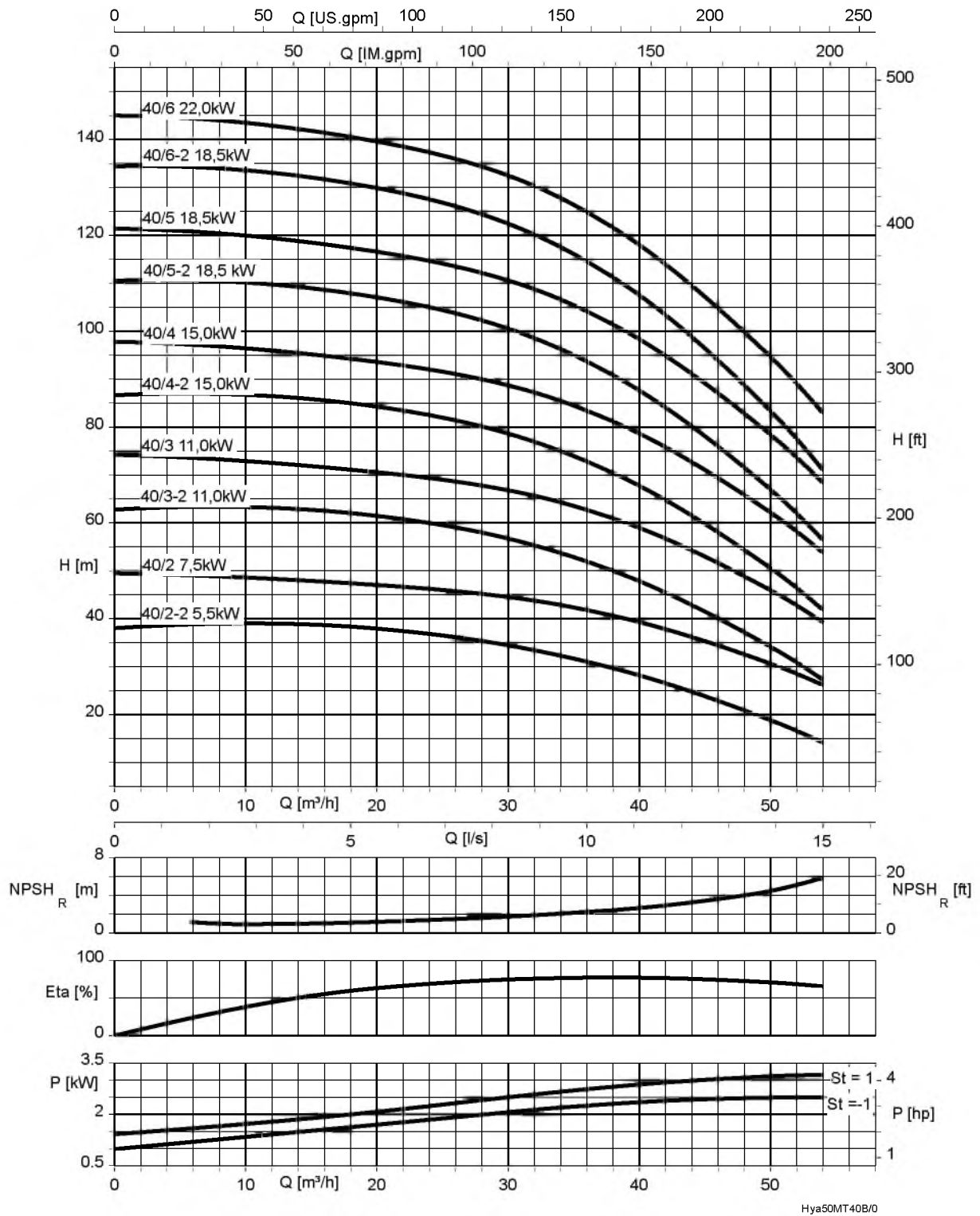
St = 1 | P per stage

Hya-Solo D with Movitec 25B, n = 2900 rpm



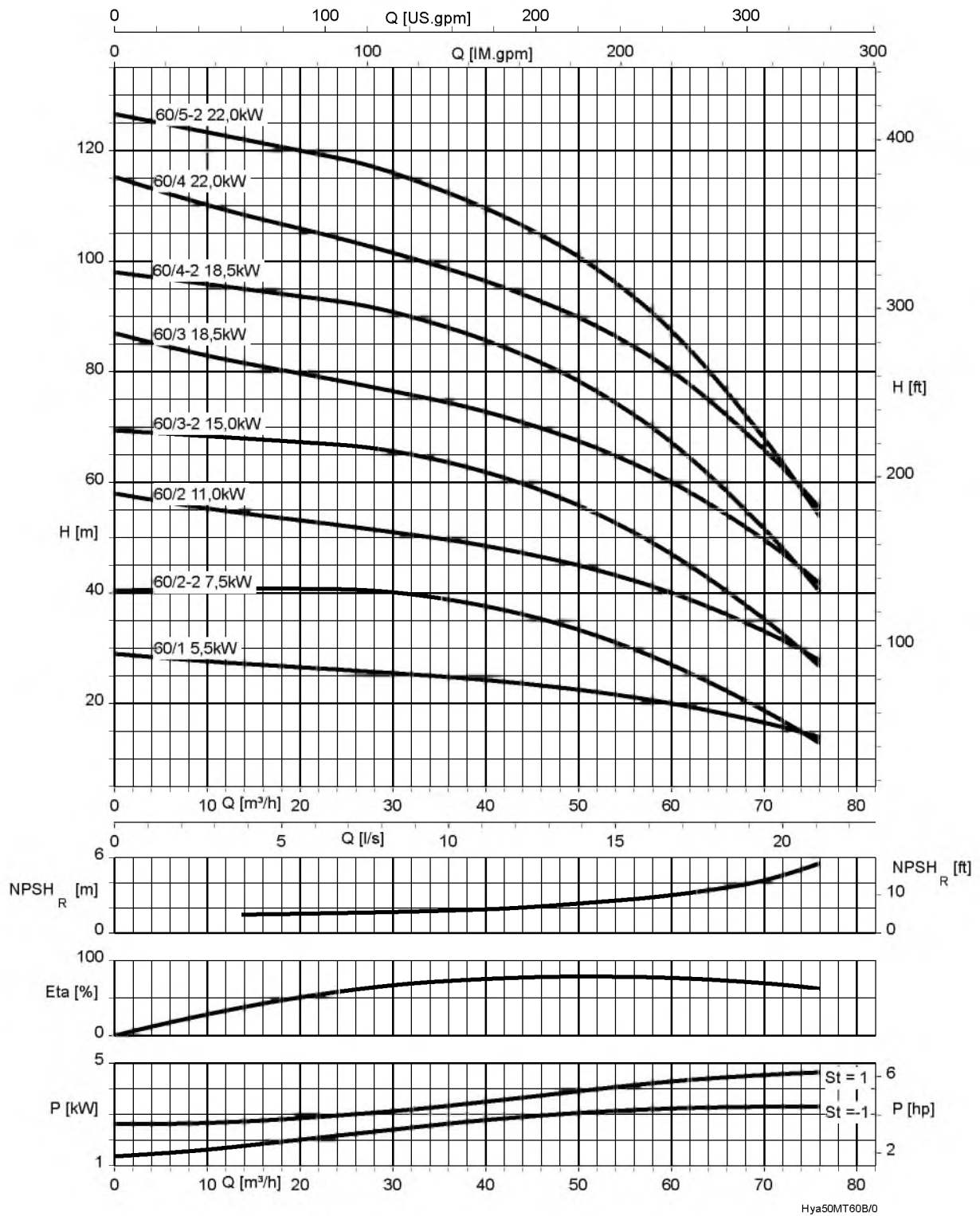
St = 1 | P per stage

Hya-Solo D with Movitec 40B, n = 2900 rpm



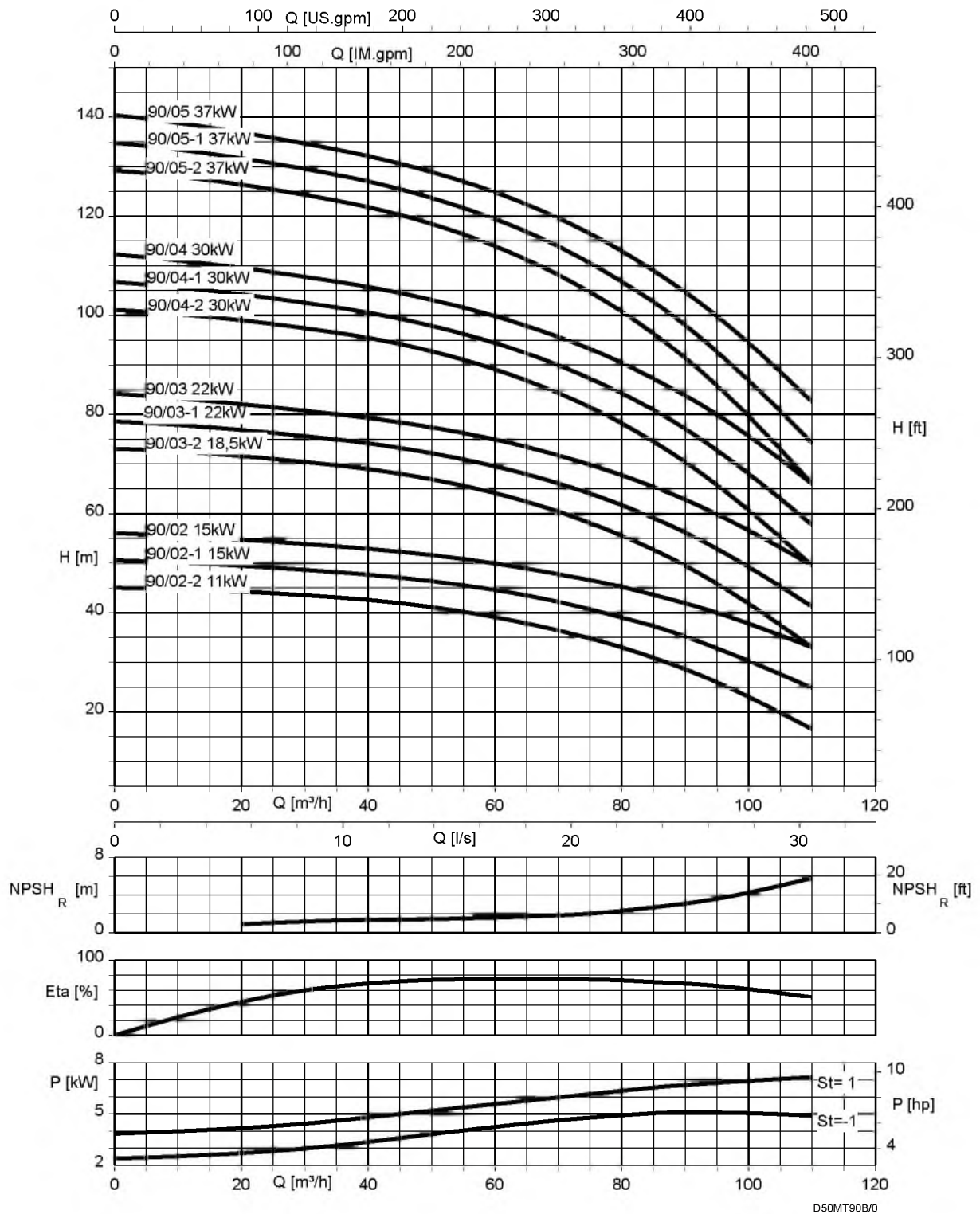
St = 1 P per stage	St = -1 P per stage with a smaller impeller
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Hya-Solo D with Movitec 60B, n = 2900 rpm



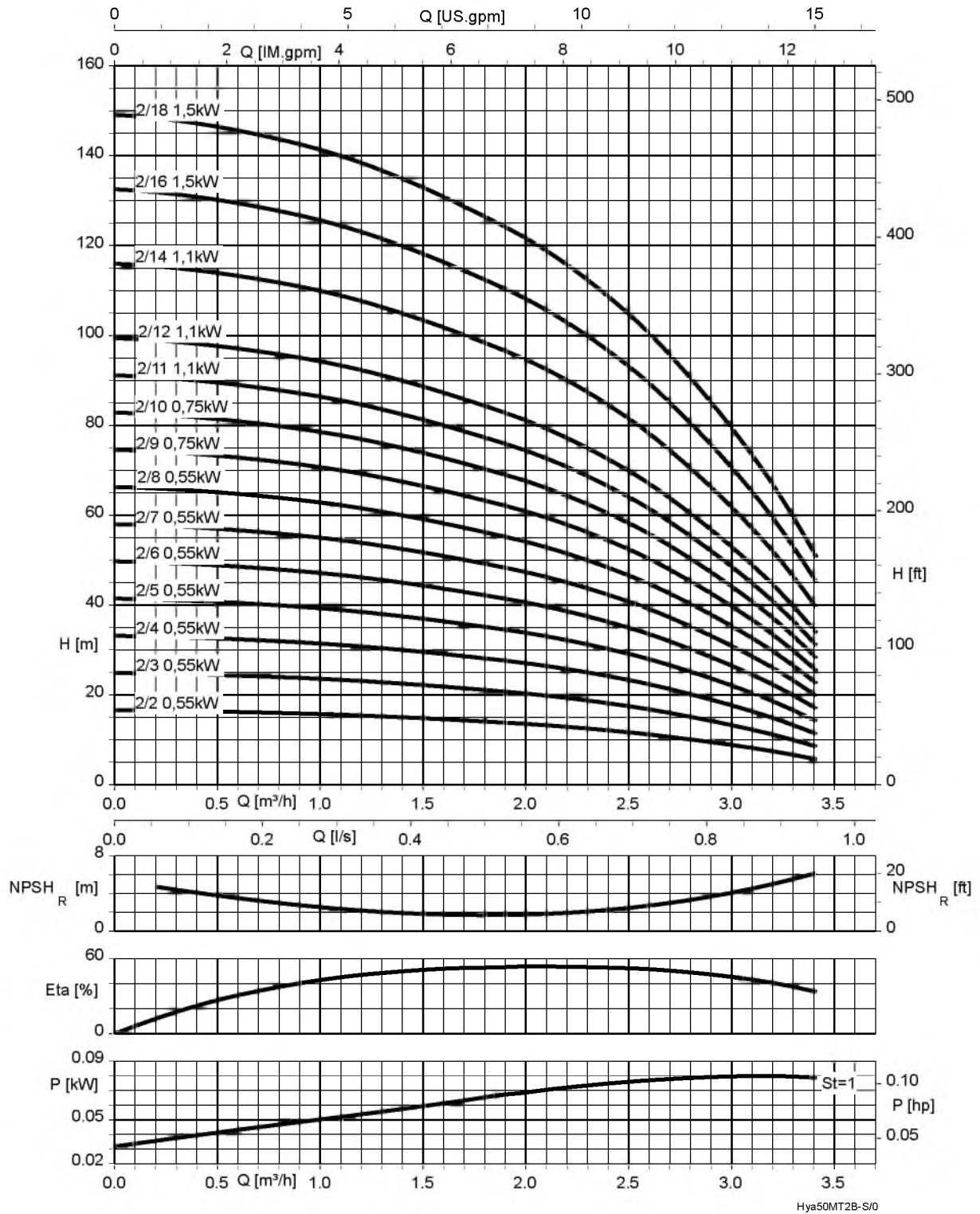
St = 1 P per stage	St = -1 P per stage with a smaller impeller
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Hya-Solo D with Movitec 90B, n = 2900 rpm



St = 1 P per stage	St = -1 P per stage with a smaller impeller
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Hya-Solo DSV with Movitec 2B, n = 3000 rpm

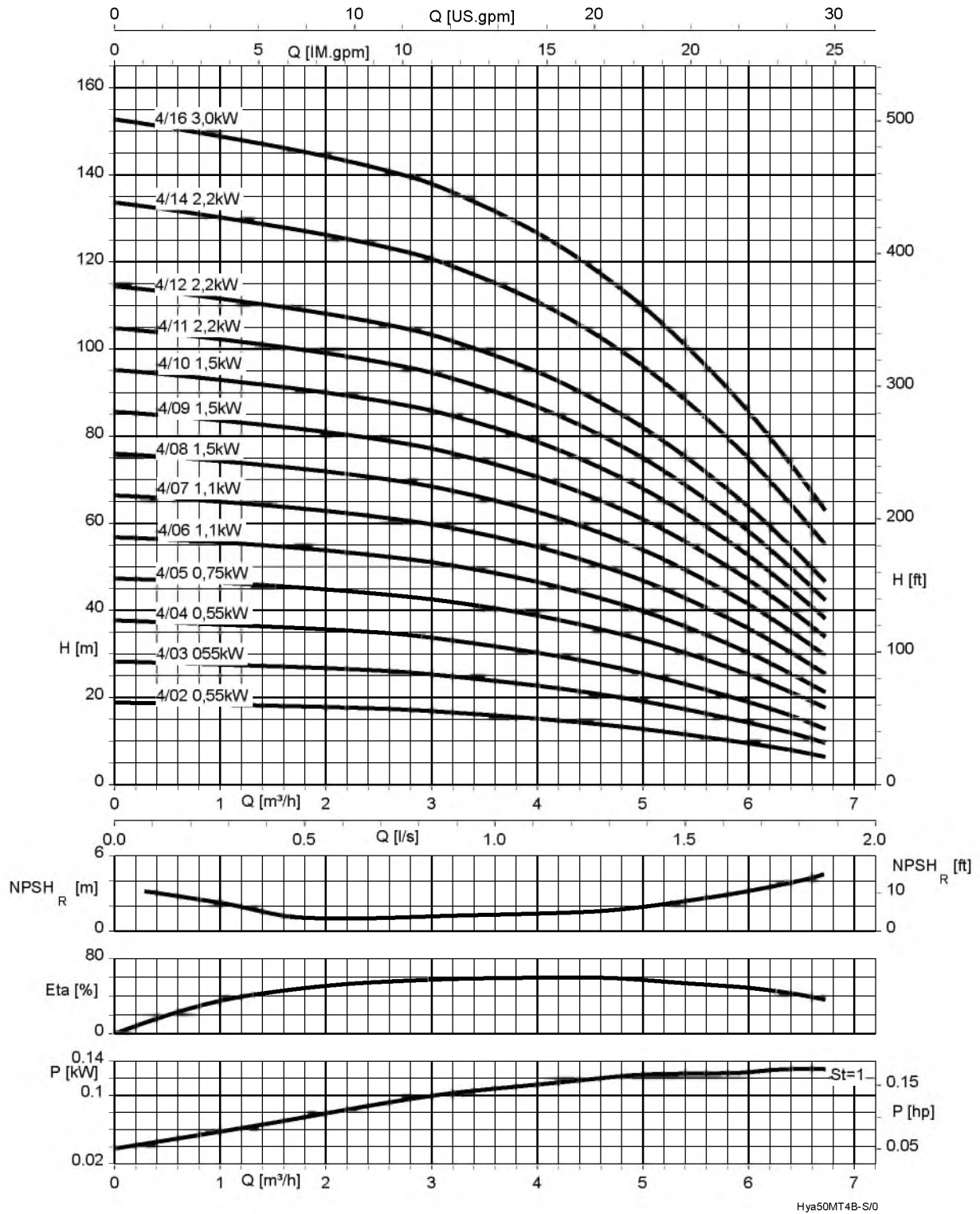


Systems with 8 and 10 stages

The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

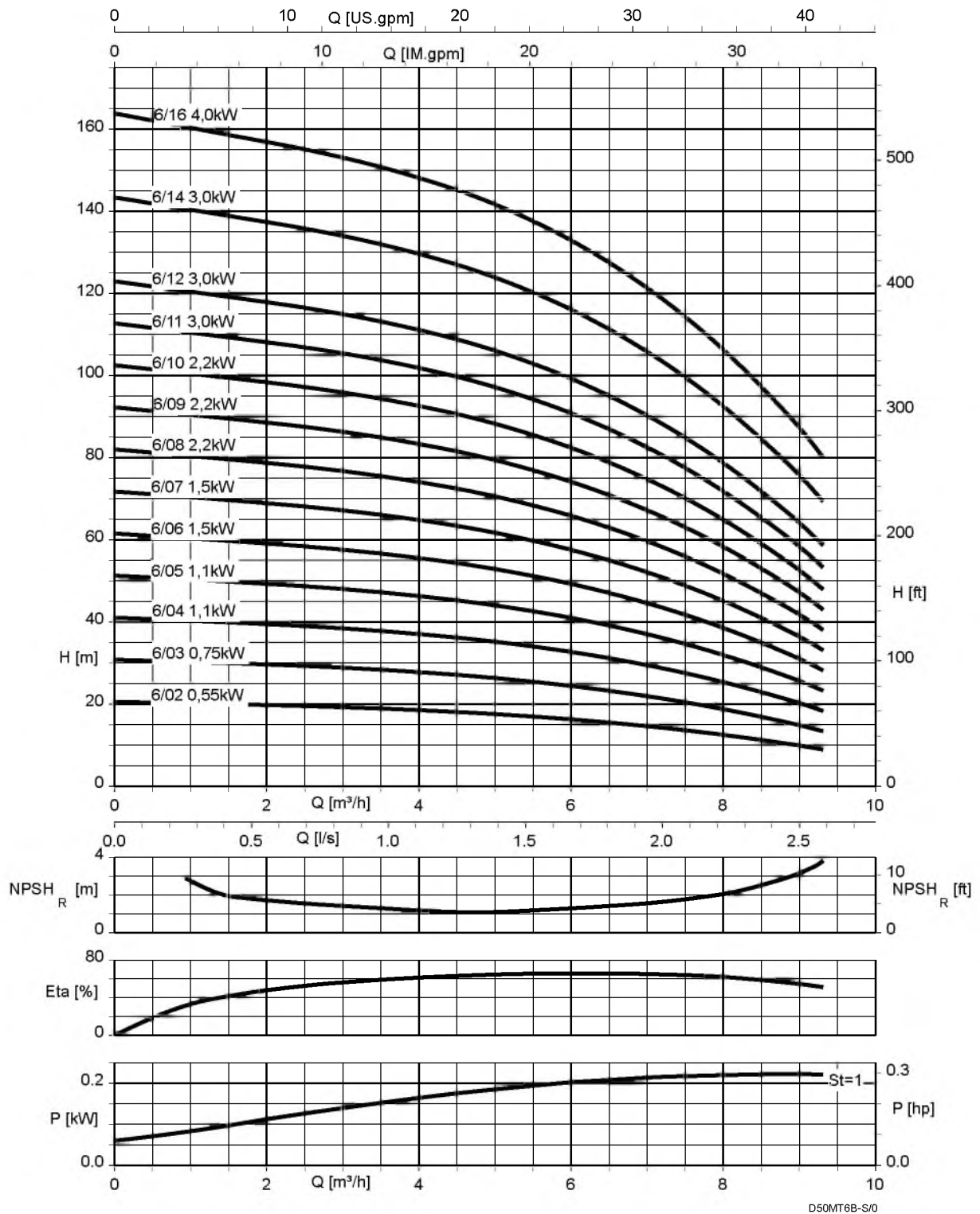
Hya-Solo DSV with Movitec 4B, n = 3000 rpm



i Systems with 4, 5 and 10 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

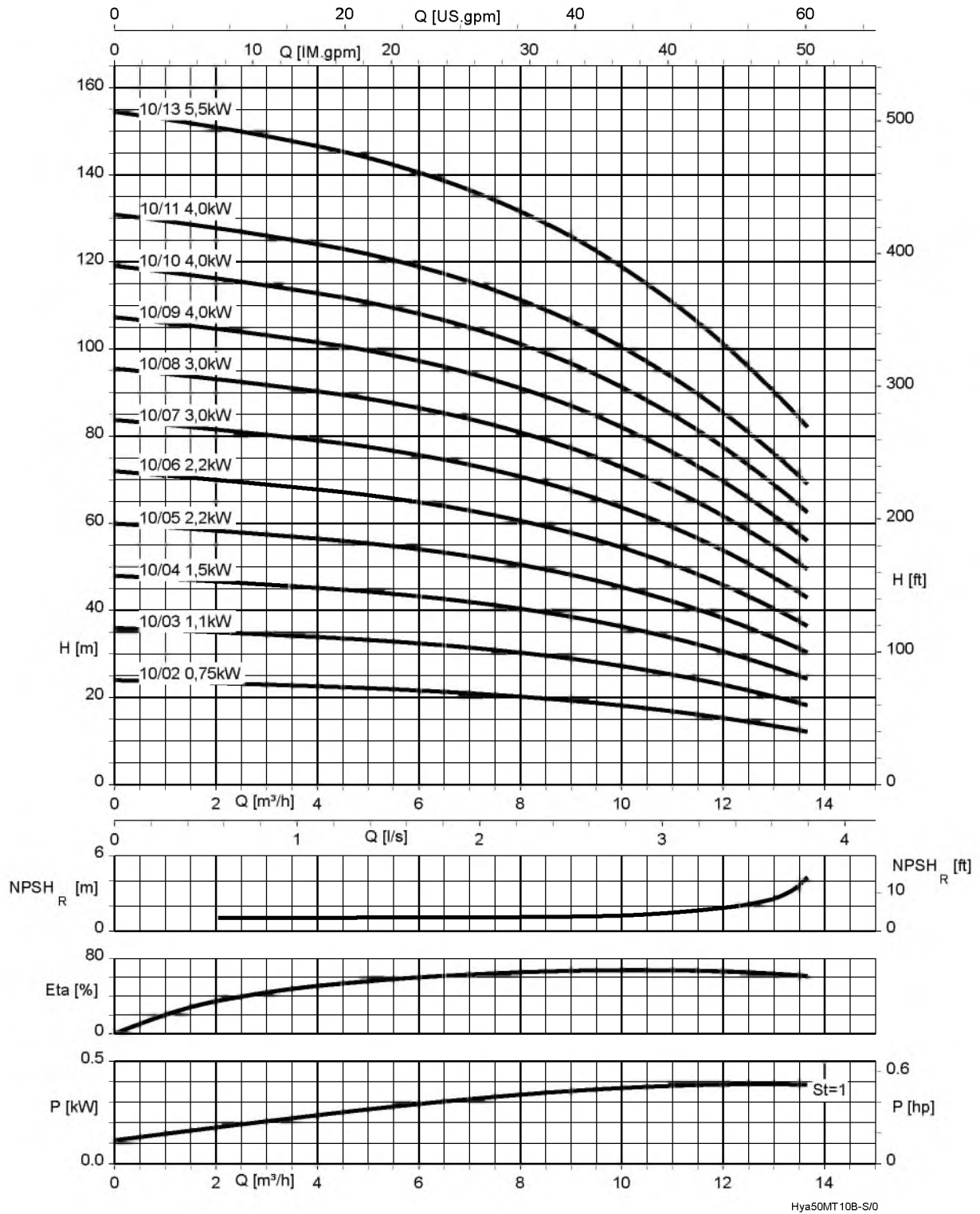
Hya-Solo DSV with Movitec 6B, n = 3000 rpm



i Systems with 2, 14 and 16 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

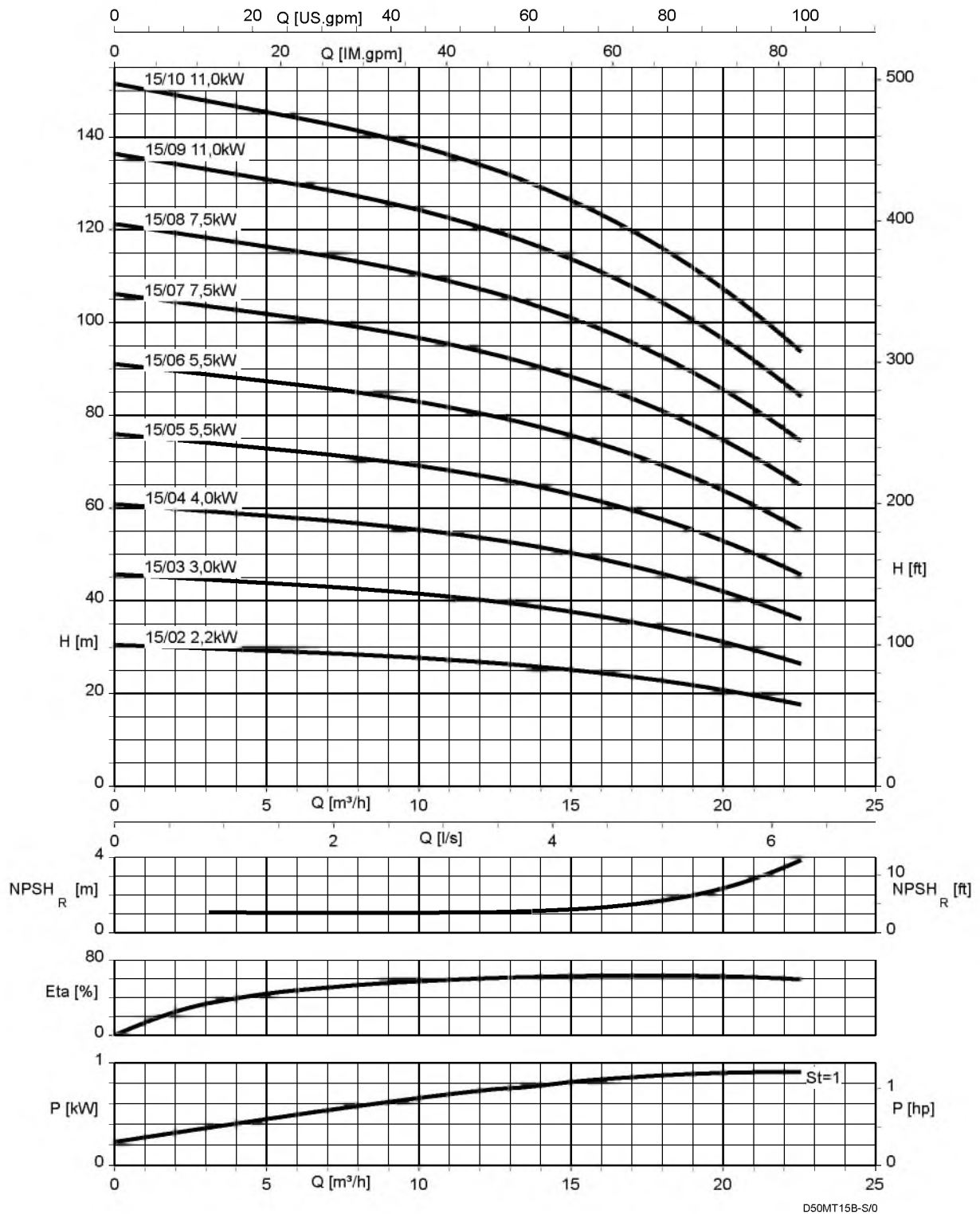
Hya-Solo DSV with Movitec 10B, n = 3000 rpm



i Systems with 2, 3, 4, 8 and 11 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

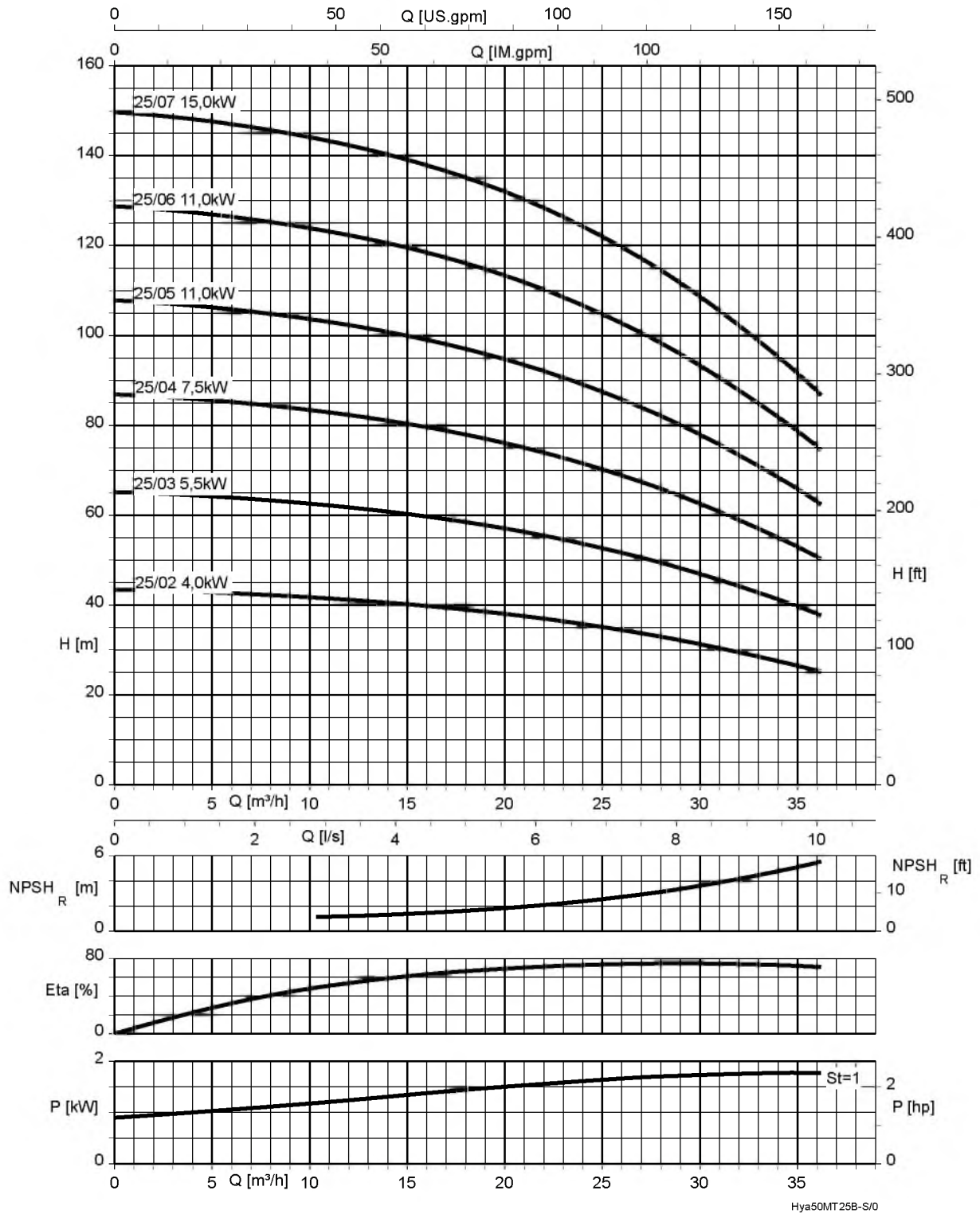
St = 1 | P per stage

Hya-Solo DSV with Movitec 15B, n = 3000 rpm



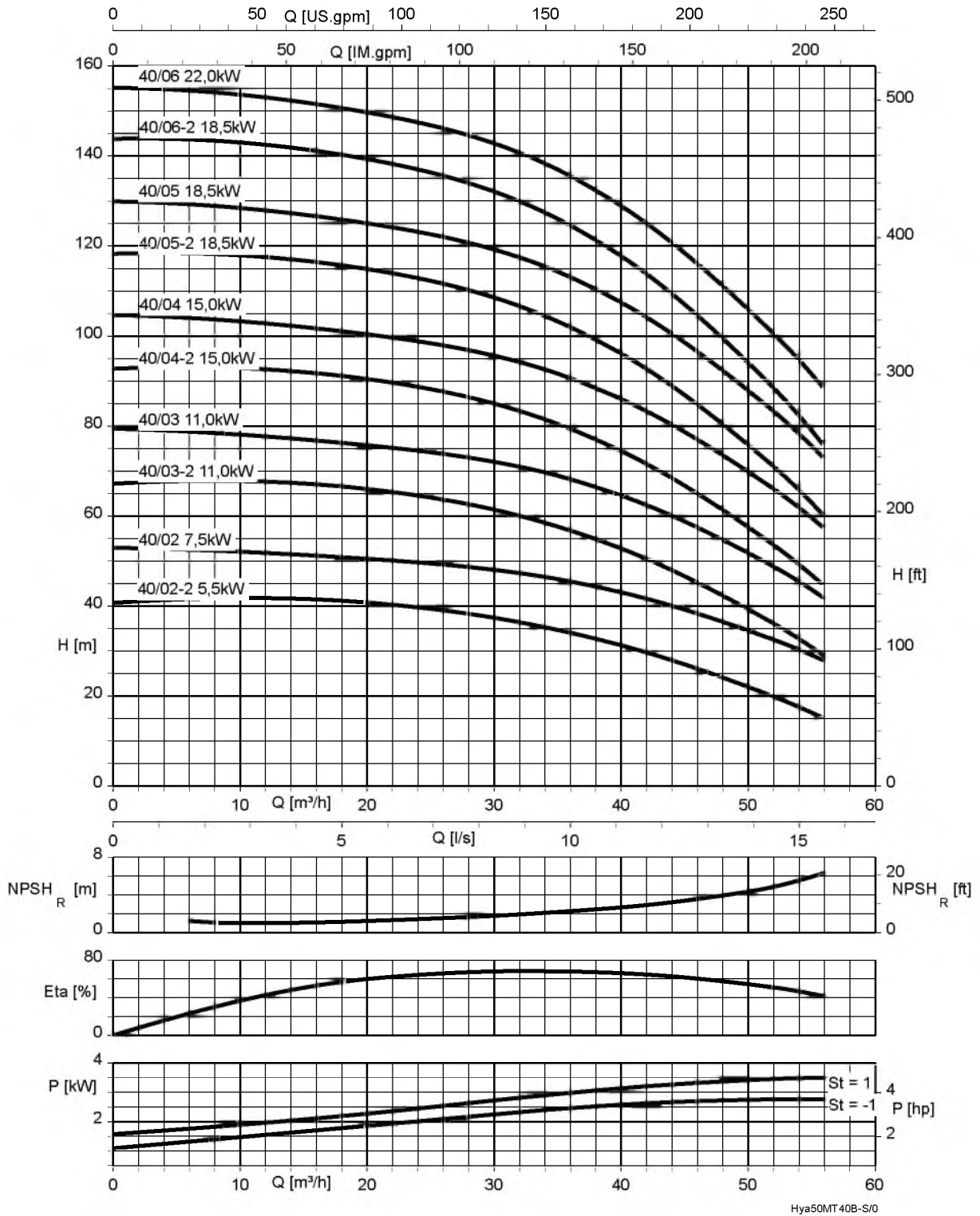
St = 1 | P per stage

Hya-Solo DSV with Movitec 25B, n = 3000 rpm



St = 1 | P per stage

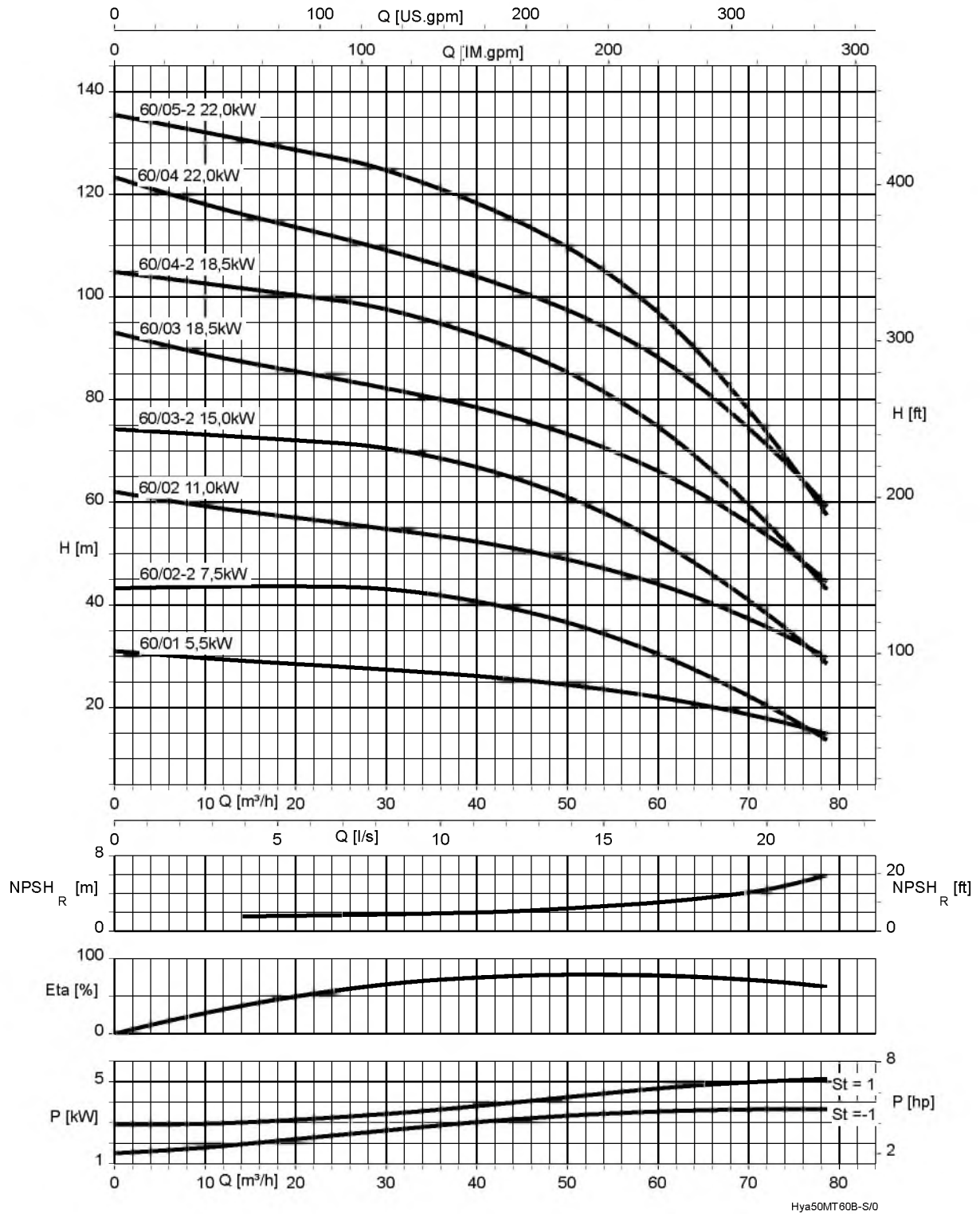
Hya-Solo DSV with Movitec 40B, n = 3000 rpm



St = 1 | P per stage

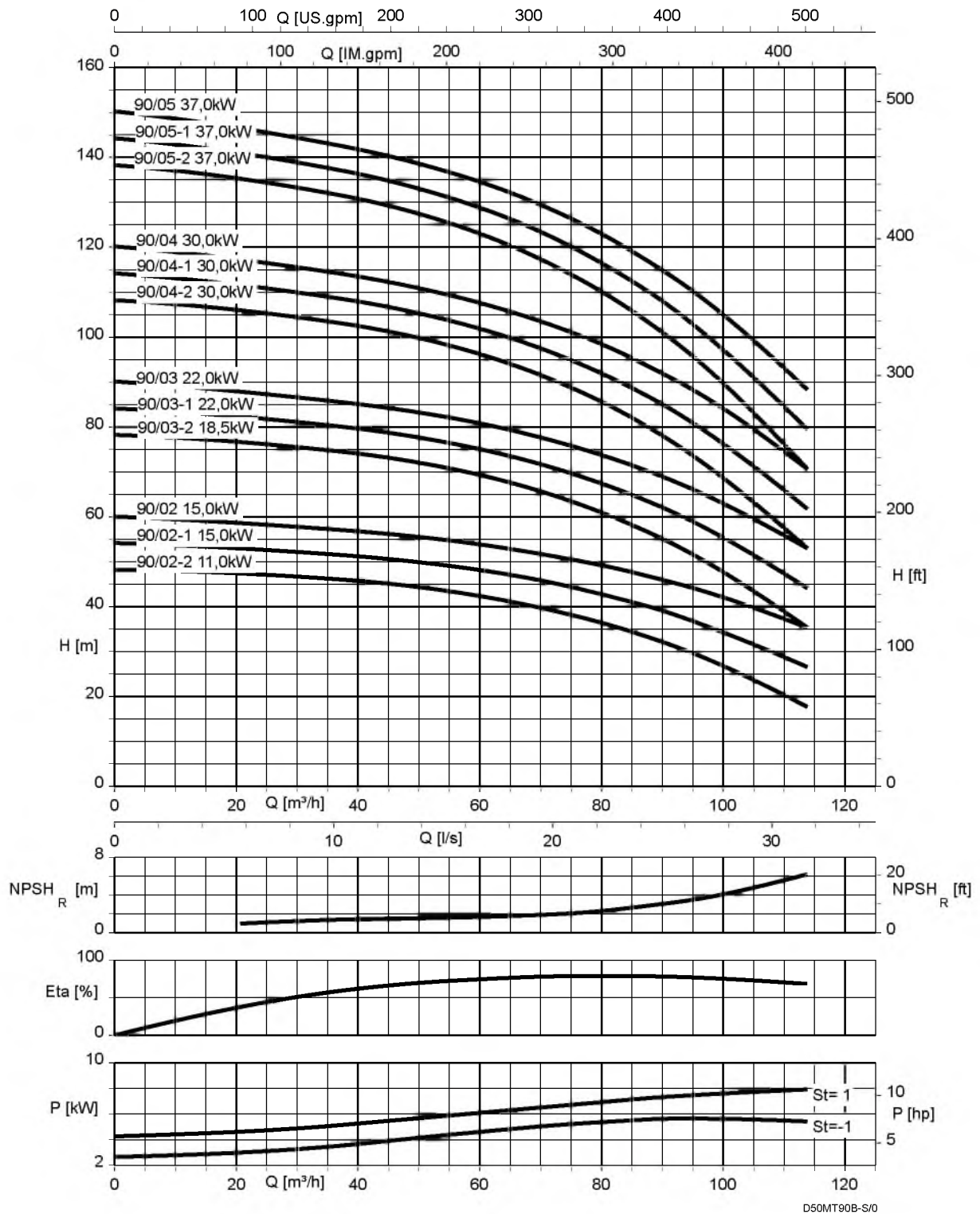
St = -1 | P per stage with a smaller impeller

Hya-Solo DSV with Movitec 60B, n = 3000 rpm



St = 1 | P per stage	St = -1 | P per stage with a smaller impeller
----------------------	---

Hya-Solo DSV with Movitec 90B, n = 3000 rpm



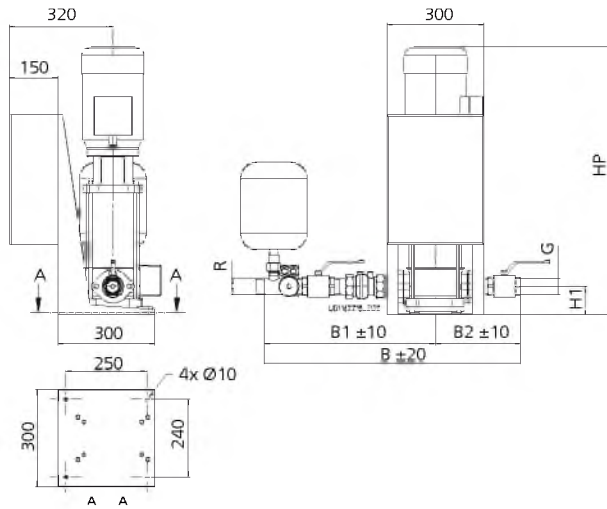
i Systems with 1, 1-1, 2, 2-2, 3 and 3-2 stages
 The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 P per stage	St = -1 P per stage with a smaller impeller
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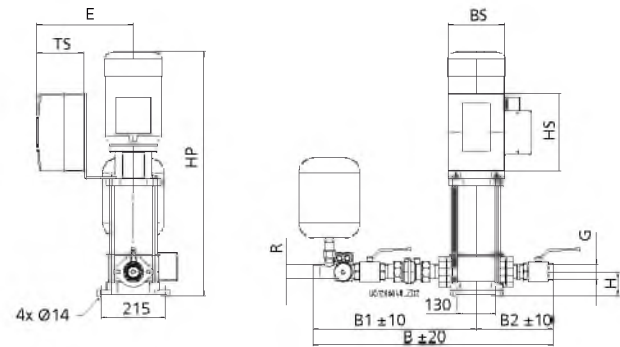
Dimensions

Hya-Solo D / DSV with Movitec 2B / 4B

Hya-Solo D with Movitec 2B / 4B



Hya-Solo DSV with Movitec 2B / 4B



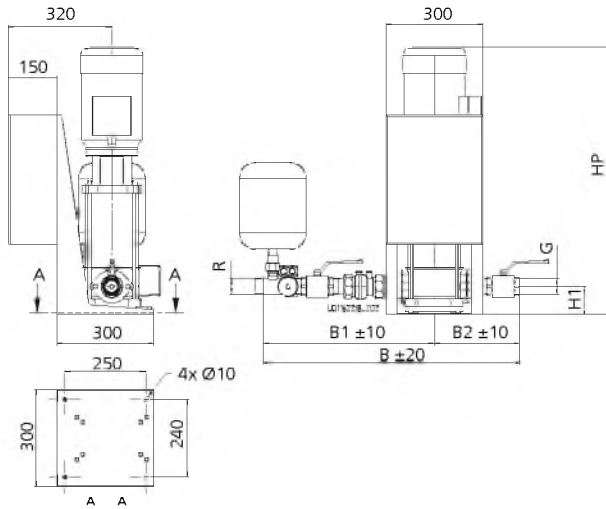
External thread R to DIN EN 10226
Internal thread G to DIN ISO 228-1

Dimensions [mm]

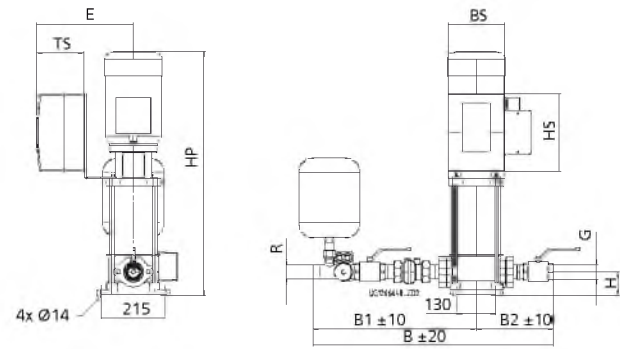
Hya-Solo D / DSV	Suction-side connection	Discharge-side connection	Pump					PumpDrive HS × BS × TS	Distance E
			HP	H1	B	B1	B2		
1/0202 B	G 1	R 1	472	50	684	476	208	260 × 190 × 58	251
1/0203 B	G 1	R 1	493	50	684	476	208	260 × 190 × 58	251
1/0204 B	G 1	R 1	515	50	684	476	208	260 × 190 × 58	251
1/0205 B	G 1	R 1	536	50	684	476	208	260 × 190 × 58	251
1/0206 B	G 1	R 1	558	50	684	476	208	260 × 190 × 58	251
1/0207 B	G 1	R 1	579	50	684	476	208	260 × 190 × 58	251
1/0208 B	G 1	R 1	601	50	684	476	208	260 × 190 × 58	251
1/0209 B	G 1	R 1	676	50	684	476	208	260 × 190 × 58	251
1/0210 B	G 1	R 1	698	50	684	476	208	260 × 190 × 58	251
1/0211 B	G 1	R 1	719	50	684	476	208	260 × 190 × 58	251
1/0212 B	G 1	R 1	741	50	684	476	208	260 × 190 × 58	251
1/0214 B	G 1	R 1	784	50	684	476	208	260 × 190 × 58	286
1/0216 B	G 1	R 1	833	50	684	476	208	260 × 190 × 58	286
1/0218 B	G 1	R 1	833	50	684	476	208	260 × 190 × 58	286
1/0402 B	G 1	R 1	472	50	728	502	226	260 × 190 × 58	251
1/0403 B	G 1	R 1	493	50	728	502	226	260 × 190 × 58	251
1/0404 B	G 1	R 1	515	50	728	502	226	260 × 190 × 58	251
1/0405 B	G 1	R 1	590	50	728	502	226	260 × 190 × 58	251
1/0406 B	G 1	R 1	612	50	728	502	226	260 × 190 × 58	251
1/0407 B	G 1	R 1	633	50	728	502	226	260 × 190 × 58	251
1/0408 B	G 1	R 1	661	50	728	502	226	260 × 190 × 58	286
1/0409 B	G 1	R 1	682	50	728	502	226	260 × 190 × 58	286
1/0410 B	G 1	R 1	704	50	728	502	226	260 × 190 × 58	286
1/0411 B	G 1	R 1	754	50	728	502	226	260 × 190 × 58	286
1/0412 B	G 1	R 1	776	50	728	502	226	260 × 190 × 58	286
1/0414 B	G 1	R 1	819	50	728	502	226	260 × 190 × 58	286
1/0416 B	G 1	R 1	904	50	728	502	226	260 × 190 × 58	286

Hya-Solo D / DSV with Movitec 6B / 10B

Hya-Solo D with Movitec 6B / 10B



Hya-Solo DSV with Movitec 6B / 10B



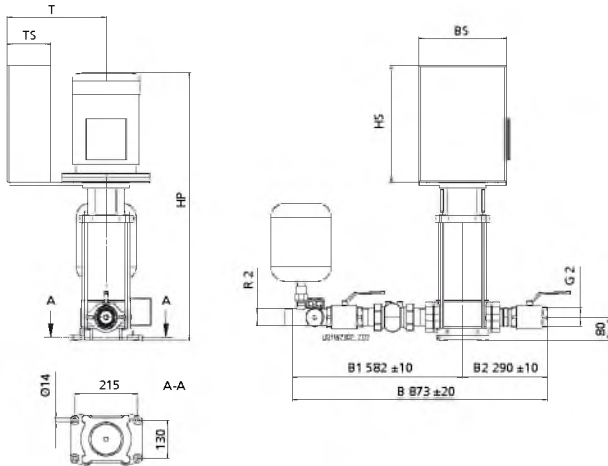
External thread R to DIN EN 10226
Internal thread G to DIN ISO 228-1

Dimensions [mm]

Hya-Solo D / DSV	Suction-side connection	Discharge-side connection	Pump					PumpDrive HS × BS × TS	Distance E
			HP	H1	B	B1	B2		
1/0602 B	G 1 1/4	R 1 1/4	479	50	728	502	226	260 × 190 × 58	251
1/0603 B	G 1 1/4	R 1 1/4	558	50	728	502	226	260 × 190 × 58	251
1/0604 B	G 1 1/4	R 1 1/4	583	50	728	502	226	260 × 190 × 58	251
1/0605 B	G 1 1/4	R 1 1/4	608	50	728	502	226	260 × 190 × 58	286
1/0606 B	G 1 1/4	R 1 1/4	639	50	728	502	226	260 × 190 × 58	286
1/0607 B	G 1 1/4	R 1 1/4	664	50	728	502	226	260 × 190 × 58	286
1/0608 B	G 1 1/4	R 1 1/4	718	50	728	502	226	260 × 190 × 58	286
1/0609 B	G 1 1/4	R 1 1/4	743	50	728	502	226	260 × 190 × 58	286
1/0610 B	G 1 1/4	R 1 1/4	768	50	728	502	226	260 × 190 × 58	286
1/0611 B	G 1 1/4	R 1 1/4	835	50	728	502	226	260 × 190 × 58	286
1/0612 B	G 1 1/4	R 1 1/4	835	50	728	502	226	400 × 300 × 50	286
1/0614 B	G 1 1/4	R 1 1/4	860	50	728	502	226	260 × 190 × 58	286
1/0616 B	G 1 1/4	R 1 1/4	910	50	728	502	226	260 × 190 × 58	286
1/1002 B	G 1 1/2	R 1 1/2	608	80	818	554	264	260 × 190 × 58	251
1/1003 B	G 1 1/2	R 1 1/2	634	80	818	554	264	260 × 190 × 58	251
1/1004 B	G 1 1/2	R 1 1/2	666	80	818	554	264	260 × 190 × 58	286
1/1005 B	G 1 1/2	R 1 1/2	707	80	818	554	264	260 × 190 × 58	286
1/1006 B	G 1 1/2	R 1 1/2	734	80	818	554	264	260 × 190 × 58	286
1/1007 B	G 1 1/2	R 1 1/2	815	80	818	554	264	260 × 190 × 58	286
1/1008 B	G 1 1/2	R 1 1/2	842	80	818	554	264	260 × 190 × 58	286
1/1009 B	G 1 1/2	R 1 1/2	878	80	818	554	264	260 × 190 × 58	305
1/1010 B	G 1 1/2	R 1 1/2	905	80	818	554	264	260 × 190 × 58	305
1/1011 B	G 1 1/2	R 1 1/2	931	80	818	554	264	260 × 190 × 58	328
1/1013 B	G 1 1/2	R 1 1/2	1089	80	818	554	264	325 × 250 × 70	328

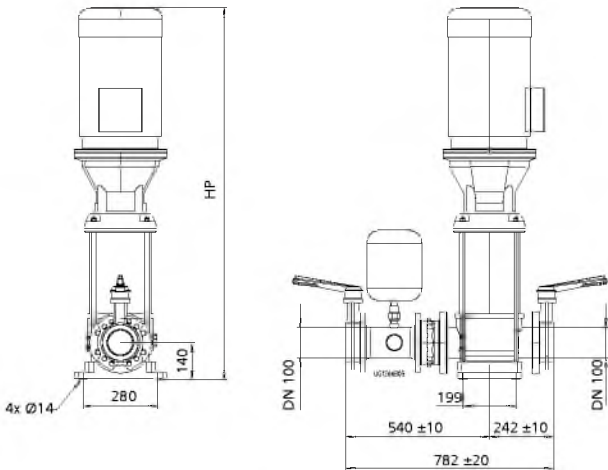
Hya-Solo D with Movitec 15B / 25B / 40B / 60B / 90B

Hya-Solo D with Movitec 15B



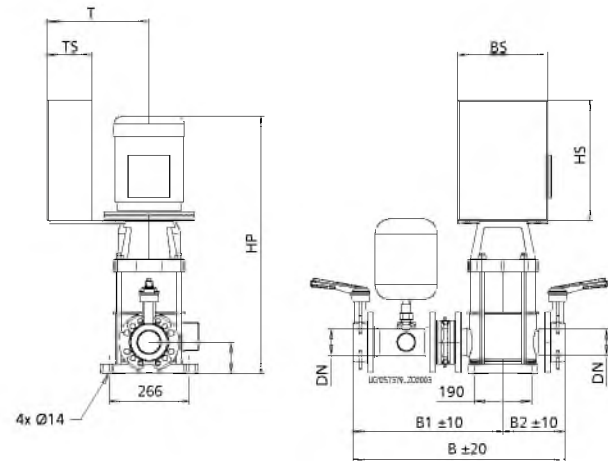
External thread R to DIN EN 10226
Internal thread G to DIN ISO 228-1

Hya-Solo D with Movitec 90B



Flanges drilled to EN 1092-1 PN 16
Butterfly valves and dry running protection equipment are supplied but not fitted.
Control cabinet for wall mounting

Hya-Solo D with Movitec 25B / 40B / 60B



Flanges drilled to EN 1092-1 PN 16
Butterfly valves and dry running protection equipment are supplied but not fitted.

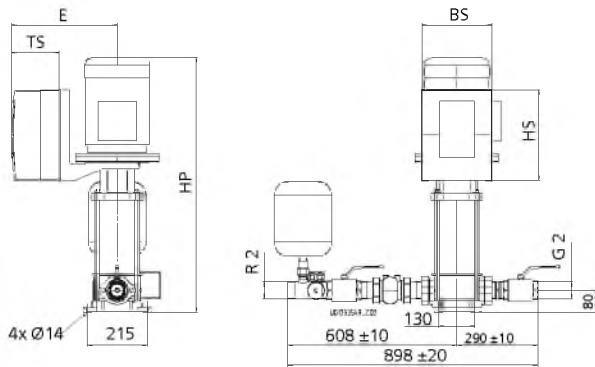
Dimensions [mm]

Hya-Solo D	Suction-side connection	Discharge-side connection	Pump					Control unit HS x WS x DS	Distance T
			HP	H1	B	B1	B2		
1/1502 B	G 2	R 2	628	80	873	582	290	400 x 300 x 150	286
1/1503 B	G 2	R 2	709	80	873	582	290	400 x 300 x 150	286
1/1504 B	G 2	R 2	746	80	873	582	290	400 x 300 x 150	305
1/1505 B	G 2	R 2	877	80	873	582	290	600 x 400 x 200	328
1/1506 B	G 2	R 2	903	80	873	582	290	600 x 400 x 200	328
1/1507 B	G 2	R 2	930	80	873	582	290	600 x 400 x 200	328
1/1508 B	G 2	R 2	956	80	873	582	290	600 x 400 x 200	328
1/1509 B	G 2	R 2	1146	80	873	582	290	600 x 400 x 200	431
1/1510 B	G 2	R 2	1172	80	873	582	290	600 x 400 x 200	431
1/2502 B	DN 65	DN 65	818	105	700	494	206	400 x 300 x 150	305
1/2503 B	DN 65	DN 65	998	105	700	494	206	600 x 400 x 200	328
1/2504 B	DN 65	DN 65	1064	105	700	494	206	600 x 400 x 200	328
1/2505 B	DN 65	DN 65	1292	105	700	494	206	600 x 400 x 200	431
1/2506 B	DN 65	DN 65	1357	105	700	494	206	600 x 400 x 200	431

Hya-Solo D	Suction-side connection	Discharge-side connection	Pump					Control unit	Distance
			HP	H1	B	B1	B2	HS x WS x DS	T
1/2507 B	DN 65	DN 65	1422	105	700	494	206	600 x 400 x 200	431
1/4002-2 B	DN 80	DN 80	1002	140	748	520	228	600 x 400 x 200	328
1/4002 B	DN 80	DN 80	1002	140	748	520	228	600 x 400 x 200	328
1/4003-2 B	DN 80	DN 80	1261	140	748	520	228	600 x 400 x 200	431
1/4003 B	DN 80	DN 80	1261	140	748	520	228	600 x 400 x 200	431
1/4004-2 B	DN 80	DN 80	1339	140	748	520	228	600 x 400 x 200	431
1/4004 B	DN 80	DN 80	1339	140	748	520	228	600 x 400 x 200	431
1/4005-2 B	DN 80	DN 80	1499	140	748	520	228	600 x 400 x 200	431
1/4005 B	DN 80	DN 80	1499	140	748	520	228	600 x 400 x 200	431
1/4006-2 B	DN 80	DN 80	1577	140	748	520	228	600 x 400 x 200	431
1/4006 B	DN 80	DN 80	1577	140	748	520	228	600 x 400 x 200	431
1/6001 B	DN 100	DN 100	942	140	767	533	234	600 x 400 x 200	328
1/6002-2 B	DN 100	DN 100	1020	140	767	533	234	600 x 400 x 200	328
1/6002 B	DN 100	DN 100	1183	140	767	533	234	600 x 400 x 200	431
1/6003-2 B	DN 100	DN 100	1261	140	767	533	234	600 x 400 x 200	431
1/6003 B	DN 100	DN 100	1341	140	767	533	234	600 x 400 x 200	431
1/6004-2 B	DN 100	DN 100	1421	140	767	533	234	600 x 400 x 200	431
1/6004 B	DN 100	DN 100	1421	140	767	533	234	600 x 400 x 200	431
1/6005-2 B	DN 100	DN 100	1499	140	767	533	234	600 x 400 x 200	431
1/9002-2 B	DN 100	DN 100	1282	140	782	533	242	600 x 400 x 200	-
1/9002-1 B	DN 100	DN 100	1282	140	782	533	242	600 x 400 x 200	-
1/9002 B	DN 100	DN 100	1282	140	782	533	242	600 x 400 x 200	-
1/9003-1 B	DN 100	DN 100	1484	140	782	533	242	600 x 400 x 200	-
1/9003-2 B	DN 100	DN 100	1484	140	782	533	242	600 x 400 x 200	-
1/9003 B	DN 100	DN 100	1484	140	782	533	242	600 x 400 x 200	-
1/9004-1 B	DN 100	DN 100	1713	140	782	533	242	600 x 400 x 200	-
1/9004-2 B	DN 100	DN 100	1713	140	782	533	242	600 x 400 x 200	-
1/9004 B	DN 100	DN 100	1713	140	782	533	242	600 x 400 x 200	-
1/9005-2 B	DN 100	DN 100	1822	140	782	533	242	600 x 400 x 200	-
1/9005-1 B	DN 100	DN 100	1822	140	782	533	242	600 x 400 x 200	-
1/9005 B	DN 100	DN 100	1822	140	782	533	242	600 x 400 x 200	-

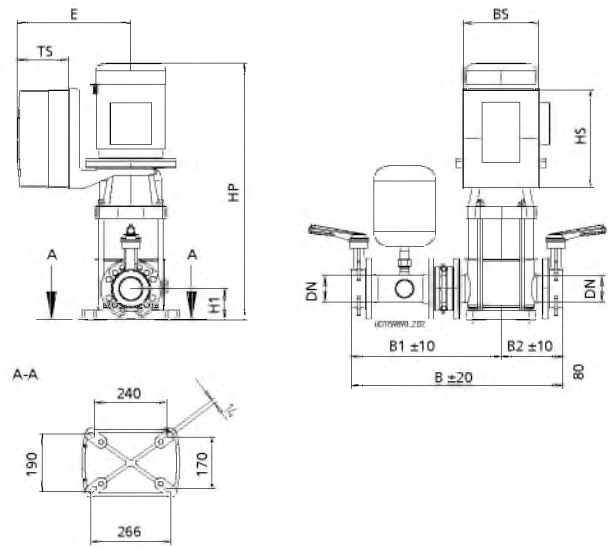
Hya-Solo DSV with Movitec 15B / 25B / 40B / 60B / 90B

Hya-Solo DSV with Movitec 15B



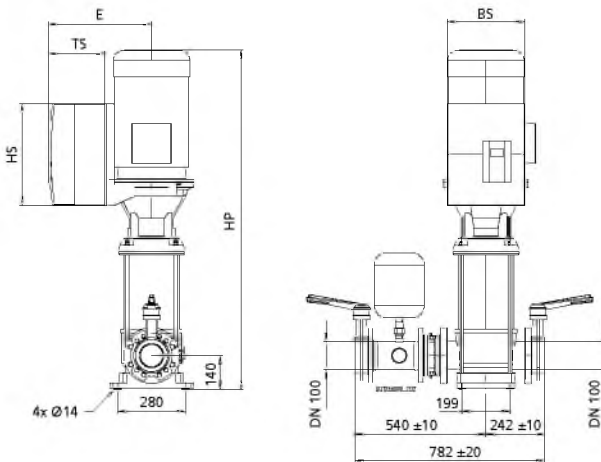
External thread R to DIN EN 10226
Internal thread G to DIN ISO 228-1

Hya-Solo DSV with Movitec 25B / 40B / 60B



Flanges drilled to EN 1092-1 PN 16
Butterfly valves and dry running protection equipment are supplied but not fitted.

Hya-Solo DSV with Movitec 90B




Flanges drilled to EN 1092-1 PN 16
Butterfly valves and dry running protection equipment are supplied but not fitted.

Dimensions [mm]

Hya-Solo DSV	Suction-side connection	Discharge-side connection	Pump					PumpDrive	Distance
			HP	H1	B	B1	B2		
1/1502 B	G 2	R 2	628	80	898	608	290	260 × ≈190 × ≈158	286
1/1503 B	G 2	R 2	709	80	898	608	290	260 × ≈190 × ≈158	286
1/1504 B	G 2	R 2	746	80	898	608	290	260 × ≈190 × ≈158	305
1/1505 B	G 2	R 2	877	80	898	608	290	325 × ≈250 × ≈170	328
1/1506 B	G 2	R 2	903	80	898	608	290	325 × ≈250 × ≈170	328
1/1507 B	G 2	R 2	930	80	898	608	290	325 × ≈250 × ≈170	328
1/1508 B	G 2	R 2	956	80	898	608	290	325 × ≈250 × ≈170	328
1/1509 B	G 2	R 2	1146	80	898	608	290	420 × ≈320 × ≈235	431
1/1510 B	G 2	R 2	1172	80	898	608	290	420 × ≈320 × ≈235	431
1/2502 B	DN 65	DN 65	818	105	700	494	206	260 × ≈190 × ≈158	305
1/2503 B	DN 65	DN 65	999	105	700	494	206	325 × ≈250 × ≈170	328
1/2504 B	DN 65	DN 65	1064	105	700	494	206	325 × ≈250 × ≈170	328

Hya-Solo DSV	Suction-side connection	Discharge-side connection	Pump					PumpDrive	Distance
			HP	H1	B	B1	B2	HS x WS x DS	E
1/2505 B	DN 65	DN 65	1292	105	700	494	206	420 x 320 x 235	431
1/2506 B	DN 65	DN 65	1357	105	700	494	206	420 x 320 x 235	431
1/2507 B	DN 65	DN 65	1422	105	700	494	206	420 x 320 x 235	431
1/4002-2 B	DN 80	DN 80	1002	140	703	497	206	325 x 250 x 170	328
1/4002 B	DN 80	DN 80	1002	140	703	497	206	325 x 250 x 170	328
1/4003-2 B	DN 80	DN 80	1261	140	703	497	206	420 x 320 x 235	431
1/4003 B	DN 80	DN 80	1261	140	703	497	206	420 x 320 x 235	431
1/4004-2 B	DN 80	DN 80	1339	140	703	497	206	420 x 320 x 235	431
1/4004 B	DN 80	DN 80	1339	140	703	497	206	420 x 320 x 235	431
1/4005-2 B	DN 80	DN 80	1499	140	703	497	206	420 x 320 x 235	431
1/4005 B	DN 80	DN 80	1499	140	703	497	206	420 x 320 x 235	431
1/4006-2 B	DN 80	DN 80	1577	140	703	497	206	420 x 320 x 235	431
1/4006 B	DN 80	DN 80	1577	140	703	497	206	420 x 320 x 235	431
1/6001 B	DN 100	DN 100	942	140	767	533	234	325 x 250 x 170	328
1/6002-2 B	DN 100	DN 100	1020	140	767	533	234	325 x 250 x 170	328
1/6002 B	DN 100	DN 100	1183	140	767	533	234	420 x 320 x 235	431
1/6003-2 B	DN 100	DN 100	1261	140	767	533	234	420 x 320 x 235	431
1/6003 B	DN 100	DN 100	1341	140	767	533	234	420 x 320 x 235	431
1/6004-2 B	DN 100	DN 100	1421	140	767	533	234	420 x 320 x 235	431
1/6004 B	DN 100	DN 100	1421	140	767	533	234	420 x 320 x 235	431
1/6005-2 B	DN 100	DN 100	1499	140	767	533	234	420 x 320 x 235	431
1/9002-2 B	DN 100	DN 100	1282	140	782	540	242	420 x 320 x 235	431
1/9002-1 B	DN 100	DN 100	1282	140	782	540	242	420 x 320 x 235	431
1/9002 B	DN 100	DN 100	1282	140	782	540	242	420 x 320 x 235	431
1/9003-1 B	DN 100	DN 100	1484	140	782	540	242	420 x 320 x 235	431
1/9003-2 B	DN 100	DN 100	1484	140	782	540	242	420 x 320 x 235	431
1/9003 B	DN 100	DN 100	1484	140	782	540	242	420 x 320 x 235	431
1/9004-1 B	DN 100	DN 100	1713	140	782	540	242	600 x 450 x 290	520
1/9004-2 B	DN 100	DN 100	1713	140	782	540	242	600 x 450 x 290	520
1/9004 B	DN 100	DN 100	1713	140	782	540	242	600 x 450 x 290	520
1/9005-2 B	DN 100	DN 100	1822	140	782	540	242	600 x 450 x 290	520
1/9005-1 B	DN 100	DN 100	1822	140	782	540	242	600 x 450 x 290	520
1/9005 B	DN 100	DN 100	1822	140	782	540	242	600 x 450 x 290	520

Accessories

 See the separate type series booklet Accessories for Pressure Booster Systems 1954.5.

Pressure Booster System

Surpresschrom SIC.2 SVP

Type Series Booklet



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Building Services: Water Supply

Pressure Booster Systems

Surpresschrom SIC.2 SVP



Main applications

- Pressure boosting

Fluids handled

Pump for handling clean liquids not chemically and mechanically aggressive to the pump materials.

- Drinking water
- Service water
- Cooling water

Operating data

Operating properties

Characteristic	Value
Flow rate	Q [m ³ /h] ≤ 660 with a max. of 6 pumps ¹⁾
	Q [l/s] ≤ 183 with a max. of 6 pumps ¹⁾
Head	H [m] ≤ 160
Fluid temperature	T [°C] ≤ 70
	≤ 25 to DIN 1988 (DVGW)
Operating pressure	p _d [bar] ≤ 16
Inlet pressure	p _{vor} [bar] ≤ 10

Designation

Example: Surpresschrom SIC.2B SVP 4.2.8 C

Designation key

Code	Description
Surpresschrom SIC	Pressure booster system
2B	Design status

¹⁾ With stand-by pump as peak load pump

Code	Description
SVP	All pumps in variable-speed operation
4	Pump size
2	Number of pumps
8	Number of stages
C	Types of connection V, C or A

Design details

Design

- Fully automatic pressure booster package system
- Baseplate-mounted
- Two to six vertical high-pressure centrifugal pumps with continuously variable speed adjustment
- Hydraulic components made of stainless steel / brass
- One check valve (depending on the installation type) and shut-off valves for each pump
- Anti-vibration mounts for each pump for systems with Movitec 2B, 4B, 6B, 10B, 15B
- Systems with level-adjustable feet with rubber pads (supplied but not fitted) for systems with Movitec 25B, 40B, 60B and 90B
- Membrane-type accumulator (direct-flow) to DIN 4807-5 on the discharge side, approved for drinking water
- Pressure gauge for pressure indication
- Pressure transmitter on the discharge side

Compliance with standards

- EN 809
- EN 806-2
- EN 60204-1
- ISO 12100-1 and 2
- NFC 15-100

ACS-approved (Attestation de Conformité Sanitaire)

Installation type

- Stationary installation

Drive

- High-efficiency magnet-less KSB-SuPremE-IE4 motor (as per IEC/CD 60034-30 Ed. 2)

Automation

- Control cabinet IP54
- Pump control and monitoring unit
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the system
- Service interface for connection to a PC
- Frequency inverter
- Transformer for control voltage
- Motor protection switch per pump
- Lockable master switch (repair switch)
- Pressure transmitter on the discharge side
- Circuit diagram and list of electric components
- Terminal strip/terminals with identification for all connections

- Connection for analog or digital dry running protection equipment
- External ON/OFF connection
- Field bus connection (optional)

Volt-free signals

- Volt-free signals for dry running protection, warning and alert as standard
- Volt-free signals for operation and fault per pump, voltage monitoring and phase monitoring (optional)

Configuration and function



Illustration of pressure booster system

1	Control unit	2	Control cabinet
3	Motor with variable speed system	4	Pump
5	Manifold	6	Baseplate

Design

The fully automatic pressure booster system is equipped with two to six vertical high-pressure pumps (4) (all of which are speed-controlled) for pumping the fluid handled to the consumer installations in the set pressure range.

Function

Automatic mode

Two to six pumps (4) are controlled and monitored by a micro-processor control unit (1). Each pump is operated on a frequency inverter and controlled by the control unit so as to ensure a constant discharge pressure of the pressure booster system. As the demand increases or decreases, peak load pumps are started and stopped automatically.

As soon as the demand increases again after one pump has been stopped, another pump which has not been in operation before is started up. When the last pump has been stopped and the demand increases again, the next pump in line is started up in variable speed operation. The stand-by pump is also included in the alternating cycle. The standard setting is for the pressure booster system to start automatically as a function of pressure; the actual pressure is measured by an analog pressure measuring device (pressure transmitter). The function of this pressure transmitter is monitored (live-zero). As long as the pressure booster system is in operation, the pumps are started and stopped as a function of demand (standard setting). In this way it is ensured that the individual pumps operate only in line with actual demand. The use of variable speed pumps reduces wear as well as the pumps' frequency of starts in parallel operation. If a duty pump fails,

the next pump is started up immediately and a fault is output, which can be reported via volt-free contacts (e.g. to the control station). If the demand drops towards 0, the pressure booster system slowly runs down to the stop point. The operating status is displayed via LEDs.

Function

Energy-saving mode

In conjunction with a very large discharge-side accumulator, the energy-saving mode prevents the pressure booster system from running at the least efficient operating point, supplying very small amounts of water.

If very small amounts of water are consumed the pressure booster system only fills the downstream accumulator and stops.

Any small water volumes required can then be supplied from the accumulator.

Function

Manual mode

Depending on the equipment the pressure booster system is supplied with, the pumps can be operated in manual mode in either one or two different ways.

Standard: By making the appropriate settings at the display, one of the pumps can be operated directly on mains power for 10 seconds, independently of the control unit. The pump will then automatically return to OFF mode.

Supplementary equipment: Manual-0-automatic selector switches can be supplied as supplementary equipment. They can be used to operate each pump directly on mains power, independently of the control unit.

In manual mode, a minimum flow (see table below) is essential to prevent the fluid handled and/or the pump from overheating when no water is consumed at the consumer installations.

Minimum flow for pump in manual mode

Minimum flow per pump in manual mode

Pump	Minimum flow per pump in manual mode [l/h]
Movitec 2B	200
Movitec 4B	400
Movitec 6B	600
Movitec 10B	1100
Movitec 15B	1600
Movitec 25B	2800
Movitec 40B	4600
Movitec 60B	6100
Movitec 90B	8500

Example

An open 1/2-inch tap equals a water consumption of approx. 800 to 1,200 l/h.

Materials

Overview of available materials

Component	Material
Pump casing	Stainless steel
Shroud	Stainless steel
Hydraulic system	Stainless steel
Mechanical seal	Complies with EN 12756
Primary ring	Silicon carbide
Mating ring	Hard carbon
Elastomer	EPDM
Baseplate	Steel, with powder or paint coating
Hydraulic design	

Component	Material
Manifold	Stainless steel
Valves	Copper-base alloy / brass or nodular cast iron / EPDM DVGW-approved Approved for drinking water
Accumulator	Connection made of stainless steel, flow through valve to DIN 4807-5
Membrane	Approved for drinking water

Product benefits

- Energy-efficiency optimised by high-efficiency magnet-less KSB-SuPremE-IE4 motor (to IEC/CD 60034-30 Ed. 2) and energy-saving function
- Ready-to-connect, supplied pre-set and tested for functionality
- User-friendly, straightforward menu navigation
- Reliable operation by corrosion-resistant internal parts
- Suitable for drinking water installations, manufactured under stringent hygienic conditions
- Hydraulic components made of stainless steel / brass

Selection information

A pressure booster system in an overall system behaves similar to a single pump. Its behaviour depends on several factors, some of which are system-specific. All conditions that can influence the operation of the pressure booster system should be considered during selection. Rather than focussing entirely on the demand to be satisfied on the discharge side, make sure that the suction-side conditions of the pressure booster system are also met.

The following parameters define the operating data of the system:

- Flow rate Q: maximum demand
- Head H in metres of water: system head at the least favourable consumer installation
- Conditions for supplying the pressure booster system with water and power. See the section on "Operating limit"
- Always inform KSB if the distribution network comprises control equipment, such as pressure reducers or control valves, installed downstream of the pressure booster system.

Operating conditions

- Consumption profile
This reflects the consumption and its minimum/maximum peaks. This parameter is required to determine the optimum number of pumps and the most suitable control mode. Typical profiles are known especially from drinking water supply or pressure boosting tasks for drinking water applications. For industrial applications an exact analysis of the profile is essential.
- Special requirements mentioned in the functional requirements specification (if any)

Application limits

Place of installation:
The maximum ambient temperature depends on the relative atmospheric humidity.

Atmospheric humidity

Temperature [°C]	Atmospheric humidity [%]
40	50
30	65
20	80

Maximum installation altitude: 1000 m above MSL (for higher altitudes, derate the motor power by 1 % per 100 m).

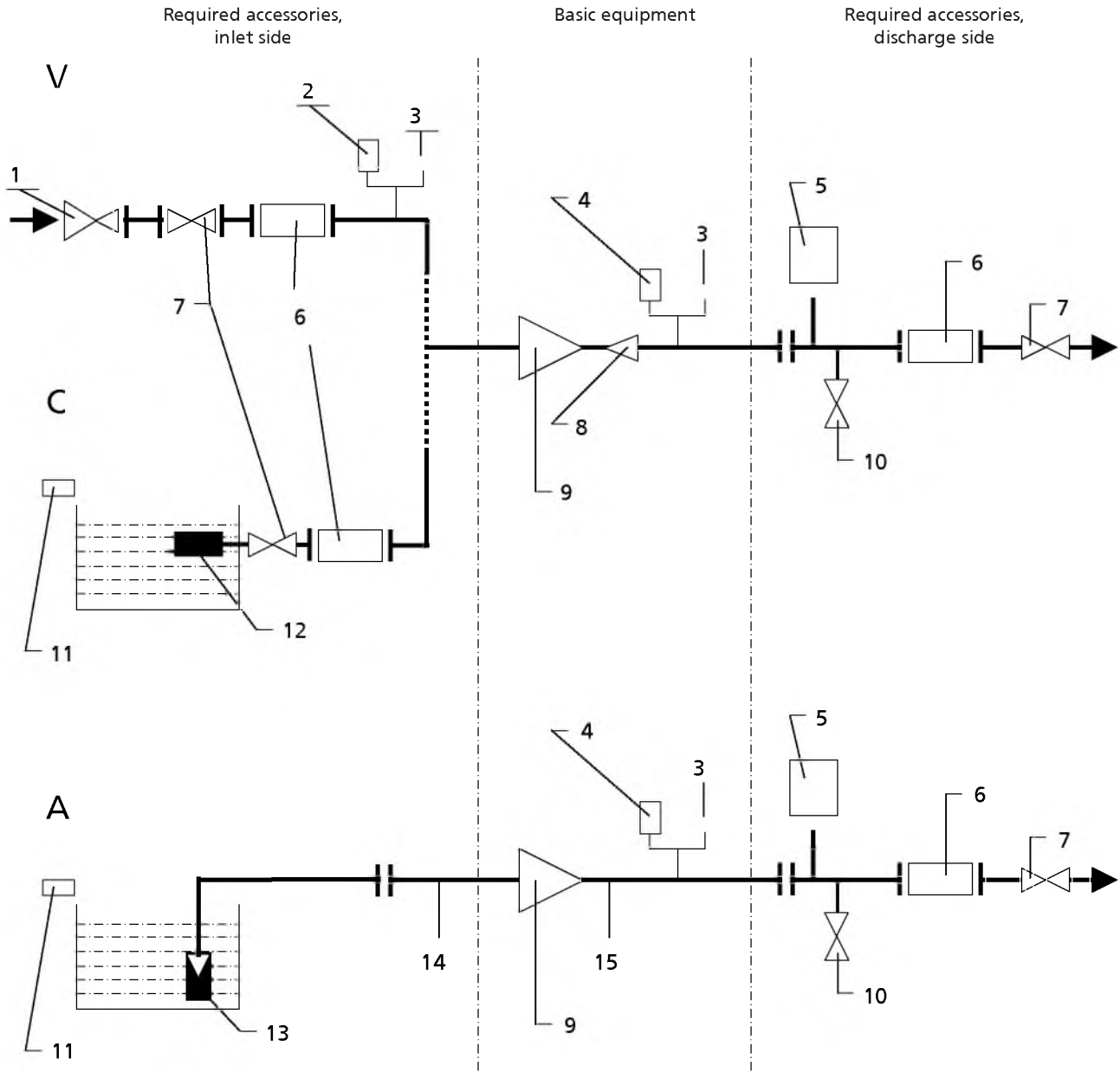
Accumulator in combination with a variable speed system

Unless otherwise specified in special regulations, installing an accumulator is recommended, especially for maintaining the pressure in the piping network during standstill of the pressure booster system. The accumulator volume is not stipulated in any regulations. The selection is based on the system-specific conditions (as a basic solution KSB offers an 8-litre accumulator). The standstill times of the pressure booster system depend on the volume the accumulator can feed back into the piping system. The accumulator size should be a compromise and take into account possible leakages in the piping system.

Determining the power input

- The power input is indicated per stage (St = 1) and/or per stage with a smaller impeller (St = -1).
The pump input power can be calculated accordingly.
Calculation: value indicated in the diagram (St = 1) × number of stages + value indicated in the diagram (St = -1) × number of stages with a smaller impeller
Example 1, Movitec 90/4: P = (St = 1) × 4
Example 2, Movitec 90/4-1: P = (St = 1) × 3 + (St = -1)
Example 3, Movitec 90/4-2: P = (St = 1) × 2 + (St = -1) × 2

Flow diagram



1	Pressure reducer	2	Pressure switch
3	Pressure gauge	4	Pressure sensor
5	Membrane-type accumulator	6	Expansion joint
7	Shut-off valve, system	8	Check valve (integrated in pump)
9	Pressure booster system	10	Drain valve
11	Float switch	12	Suction-side filter
13	Foot valve (1 per pump)	14	Inlet pipe per pump
15	Removed check valve		
V	Connection type V (direct connection)	C	Connection type C (indirect connection)
A	Connection type A (suction lift operation)		

V = connection type V (direct connection)	C = connection type C (indirect connection)	A = connection type A (suction lift operation)
<p>For strong inlet pressure fluctuations using a pressure reducer is recommended (see accessories).</p> <p>Accessories to be added to the scope of supply:</p> <ul style="list-style-type: none"> ▪ Dry running protection via pressure switch ▪ Membrane-type accumulator 	<p>For connection type C the pressure booster system is factory-set to a supply head of 1 m.</p> <p>In order to prevent water vortices in the inlet tank the minimum water level for the inlet tank must be observed.</p> <p>The inlet line diameter must be chosen for the flow velocity not to exceed 1.5 m/s.</p> <p>Accessories to be added to the scope of supply:</p> <ul style="list-style-type: none"> ▪ Dry running protection via float switch ▪ Membrane-type accumulator <p>For supply heads of 8 m and higher, direct connection (connection type V) has to be selected.</p>	<p>The pressure booster system is supplied without a suction-side manifold and check valve.</p> <p>In this design the pumps are connected to the water supply with individual inlet pipes. A foot valve (check valve) for each pump is required to prevent backflow.</p> <p>The inlet line diameter must be chosen for the flow velocity not to exceed 1.5 m/s.</p> <p>For selecting the foot valve observe the manufacturer's information (consultation by KSB on request).</p> <p>Verify that the NPSH values of pump and system are suitable.</p> <p>Accessories to be added to the scope of supply:</p> <ul style="list-style-type: none"> ▪ Dry running protection via float switch ▪ Membrane-type accumulator

Technical data
Electrical performance data

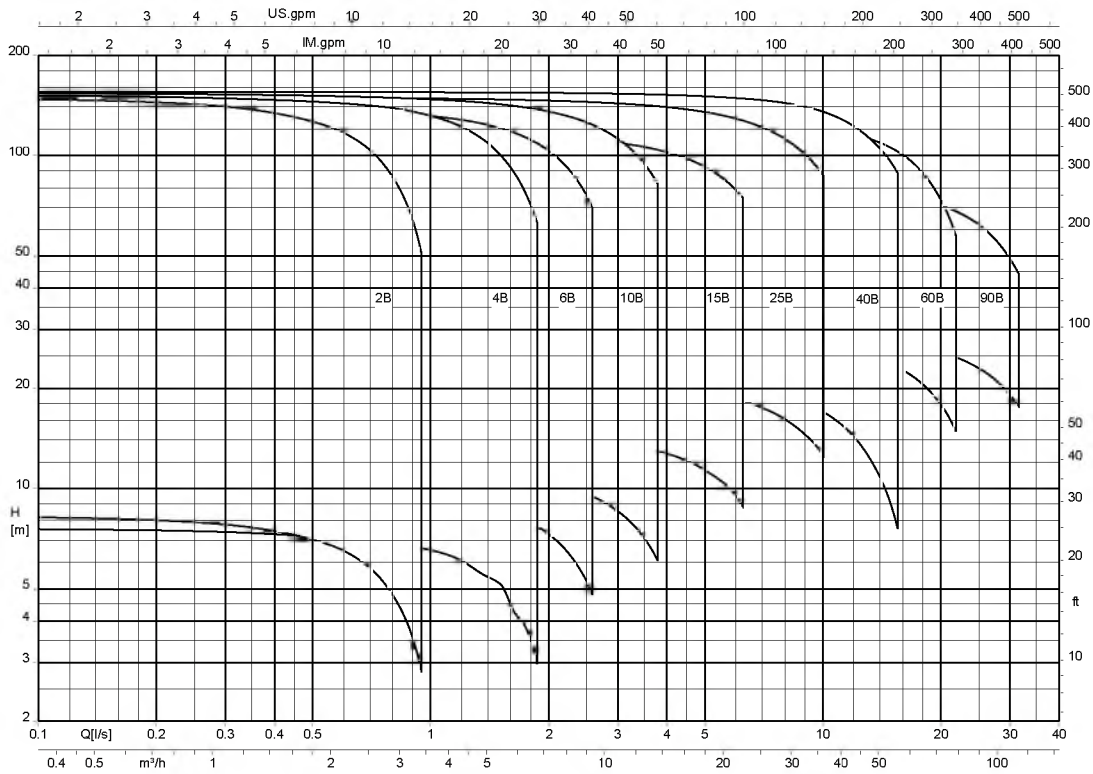
Electrical performance data

Surpresschrom SIC.2 SVP with Movitec pumps	Rated power per motor	Rated current per motor at 400 V	Total rated power [kVA]						Noise characteristics					
			Number of pumps (motors)						Number of pumps (motors)					
	[kW]	[A]	2	3	4	5	6	2	3	4	5	6		
0202 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0203 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0204 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0205 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0206 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0207 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0208 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0209 B	0,75	2,1	3,1	4,6	6,1	7,6	9,2	73	74,8	76	77	77,8		
0210 B	0,75	2,1	3,1	4,6	6,1	7,6	9,2	73	74,8	76	77	77,8		
0211 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0212 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0214 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0216 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0218 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0402 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0403 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0404 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0405 B	0,75	2,1	3,1	4,6	6,1	7,6	9,2	73	74,8	76	77	77,8		
0406 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0407 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0408 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0409 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0410 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0411 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0412 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0414 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0416 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
0602 B	0,55	1,6	2,3	3,5	4,7	5,8	7	73	74,8	76	77	77,8		
0603 B	0,75	2,1	3,1	4,6	6,1	7,6	9,2	73	74,8	76	77	77,8		
0604 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0605 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
0606 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0607 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
0608 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0609 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0610 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
0611 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
0612 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
0614 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
1002 B	0,75	2,1	3,1	4,6	6,1	7,6	9,2	73	74,8	76	77	77,8		
1003 B	1,1	3	4,4	6,5	8,7	10,9	13,1	73	74,8	76	77	77,8		
1004 B	1,5	4,1	6	8,9	11,9	14,9	17,9	73	74,8	76	77	77,8		
1005 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
1006 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
1007 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
1008 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
1009 B	4	9,4	13,7	20,5	27,4	34,2	41	74	75,8	77	78	78,8		
1010 B	4	9,4	13,7	20,5	27,4	34,2	41	74	75,8	77	78	78,8		
1011 B	4	9,4	13,7	20,5	27,4	34,2	41	74	75,8	77	78	78,8		
1013 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8		
1502 B	2,2	5,6	8,1	12,2	16,3	20,4	24,4	73	74,8	76	77	77,8		
1503 B	3	7,6	11,1	16,6	22,1	27,6	33,2	74	75,8	77	78	78,8		
1504 B	4	9,4	13,7	20,5	27,4	34,2	41	74	75,8	77	78	78,8		
1505 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8		
1506 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8		
1507 B	7,5	16,7	24,3	36,4	48,6	60,7	72,9	74	75,8	77	78	78,8		
1508 B	7,5	16,7	24,3	36,4	48,6	60,7	72,9	74	75,8	77	78	78,8		

Surpresschrom SIC.2 SVP with Movitec pumps	Rated power per motor	Rated current per motor at 400 V	Total rated power [kVA]					Noise characteristics				
			Number of pumps (motors)					Number of pumps (motors)				
	[kW]	[A]	2	3	4	5	6	2	3	4	5	6
2502 B	4	9,4	13,7	20,5	27,4	34,2	41	74	75,8	77	78	78,8
2503 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8
2504 B	7,5	16,7	24,3	36,4	48,6	60,7	72,9	74	75,8	77	78	78,8
2505 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
2506 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
2507 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
4002-2 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8
4002 B	7,5	16,7	24,3	36,4	48,6	60,7	72,9	74	75,8	77	78	78,8
4003-2 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
4003 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
4004-2 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
4004 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
4005-2 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
4005 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
4006-2 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
4006 B	22	50,7	73,8	110,6	147,5	184,4	221,3	75	76,8	78	79	79,8
6001 B	5,5	12,5	18,2	27,3	36,4	45,5	54,6	74	75,8	77	78	78,8
6002-2 B	7,5	16,7	24,3	36,4	48,6	60,7	72,9	74	75,8	77	78	78,8
6002 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
6003-2 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
6003 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
6004-2 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
6004 B	22	50,7	73,8	110,6	147,5	184,4	221,3	75	76,8	78	79	79,8
6005-2 B	22	50,7	73,8	110,6	147,5	184,4	221,3	75	76,8	78	79	79,8
9002-2 B	11	23,7	34,5	51,7	69	86,2	103,4	74	75,8	77	78	78,8
9002-1 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
9002 B	15	32	46,6	69,8	93,1	116,4	139,7	74	75,8	77	78	78,8
9003-2 B	18,5	38,8	56,5	84,7	112,9	141,1	169,4	75	76,8	78	79	79,8
9003-1 B	22	50,7	73,8	110,6	147,5	184,4	221,3	75	76,8	78	79	79,8
9003 B	22	50,7	73,8	110,6	147,5	184,4	221,3	75	76,8	78	79	79,8

Selection chart

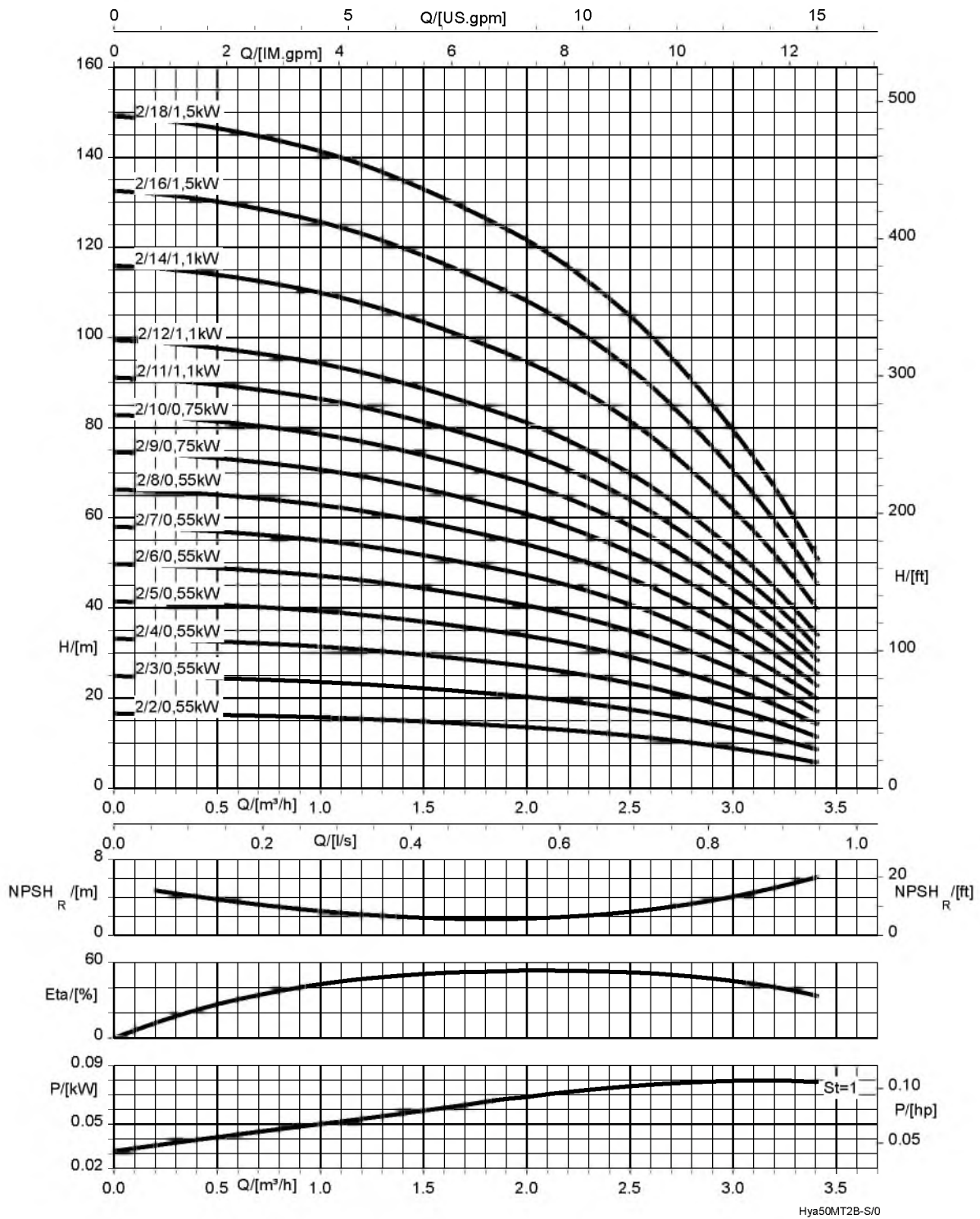
Surpresschrom SIC.2 SVP, n = 3000 rpm



The flow rate in the characteristic curves is based on one duty pump:
 The flow rate of a stand-by pump, if any, is not taken into account when calculating the flow rate required.
 Flow rates for multiple pump systems

Characteristic curves

Surpresschrom SIC.2 SVP with Movitec 2B, n = 3000 rpm

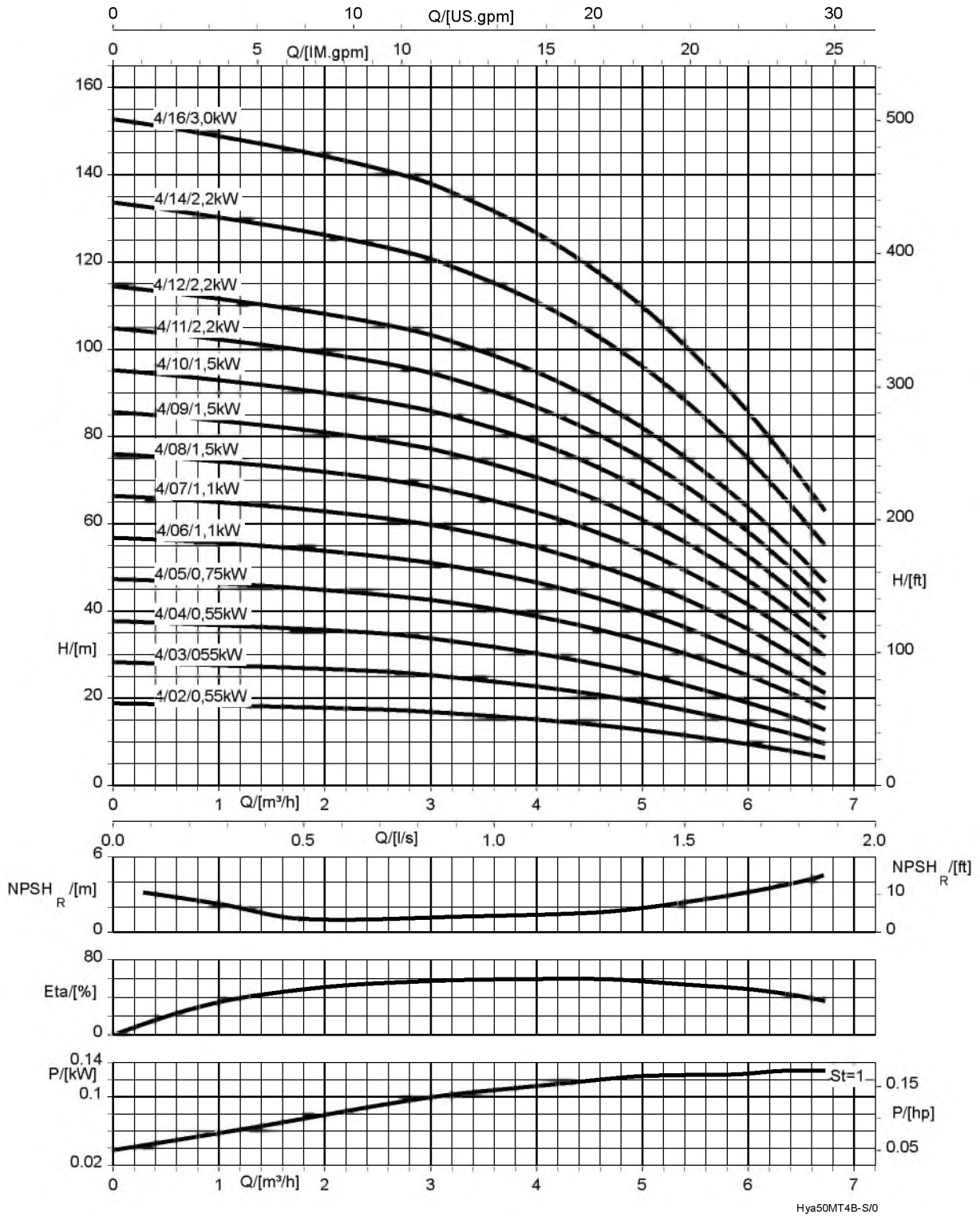


Systems with 4 and 8 stages

The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

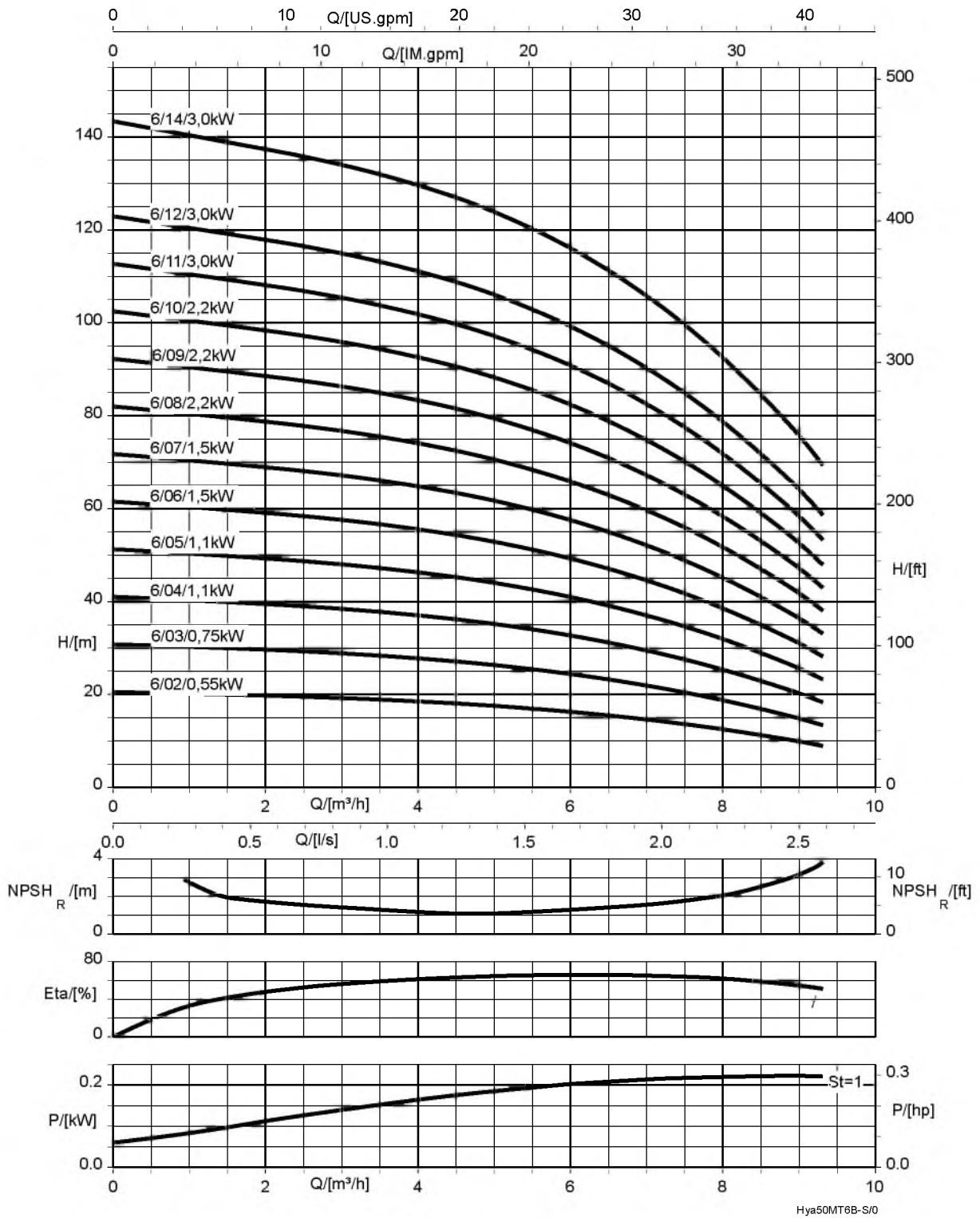
Surpresschrom SIC.2 SVP with Movitec 4B, n = 3000 rpm



i Systems with 4, 5 and 10 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

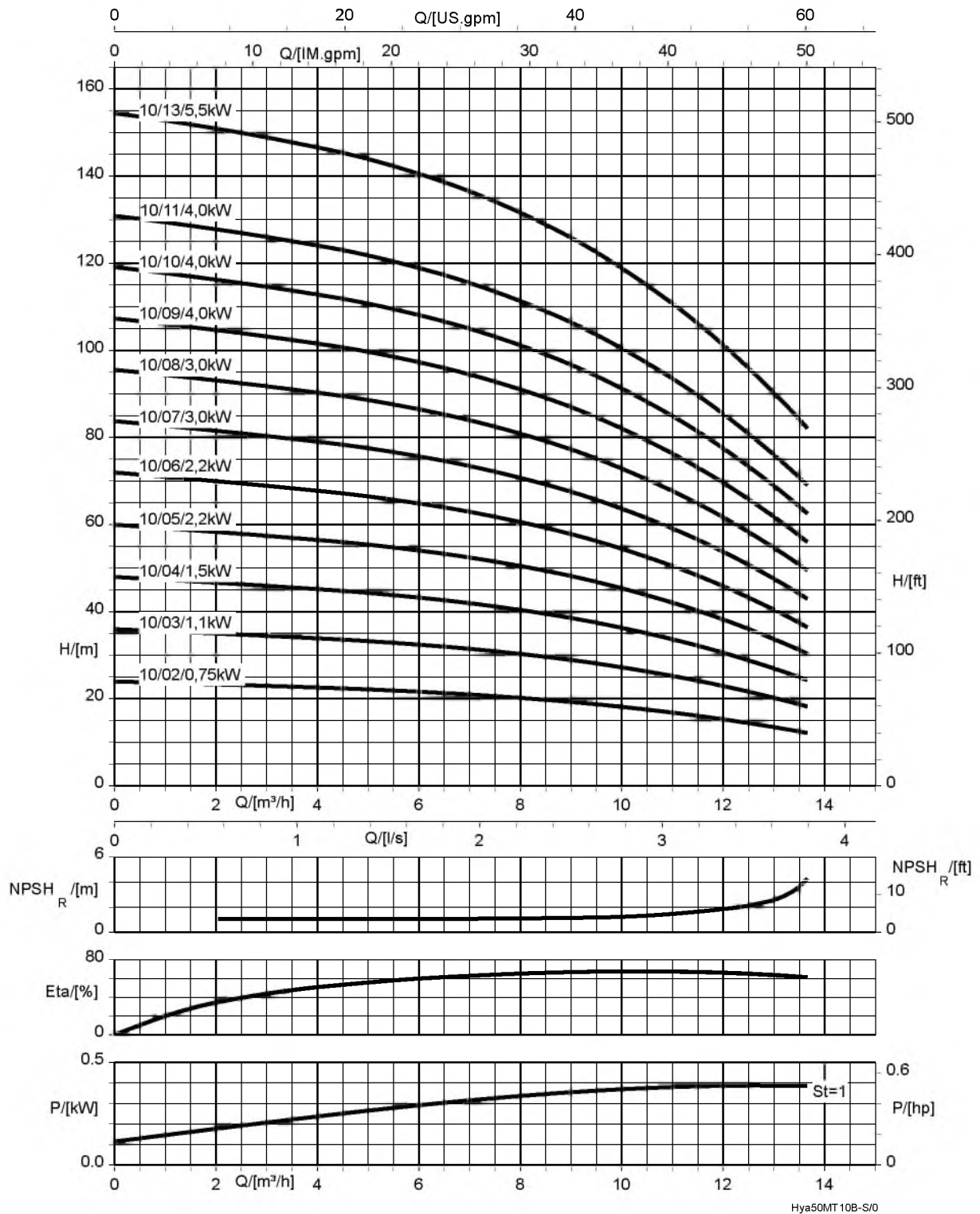
Surpresschrom SIC.2 SVP with Movitec 6B, n = 3000 rpm



i Systems with 2 and 14 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 | P per stage

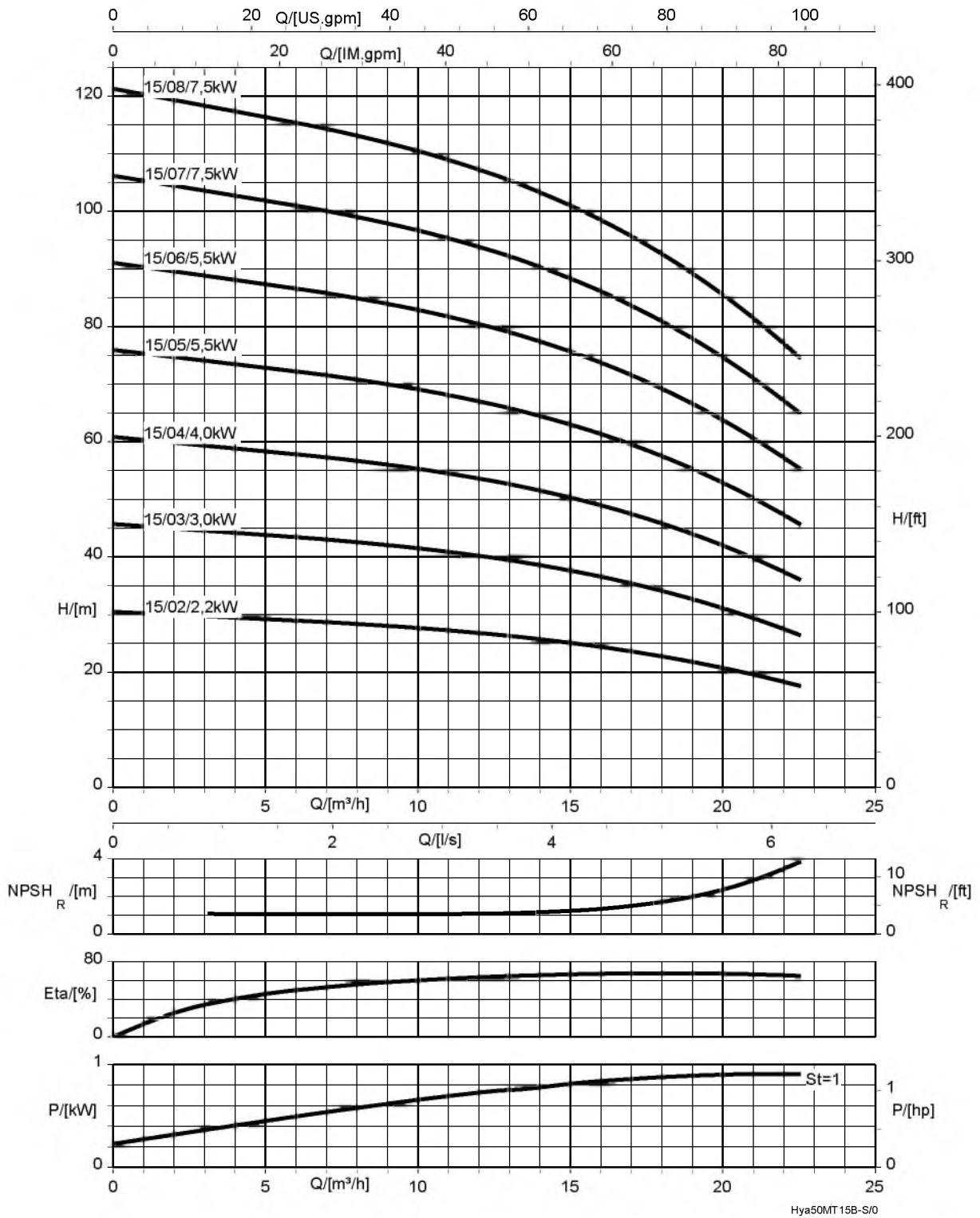
Surpresschrom SIC.2 SVP with Movitec 10B, n = 3000 rpm



i Systems with 2, 3, 4, 8 and 11 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

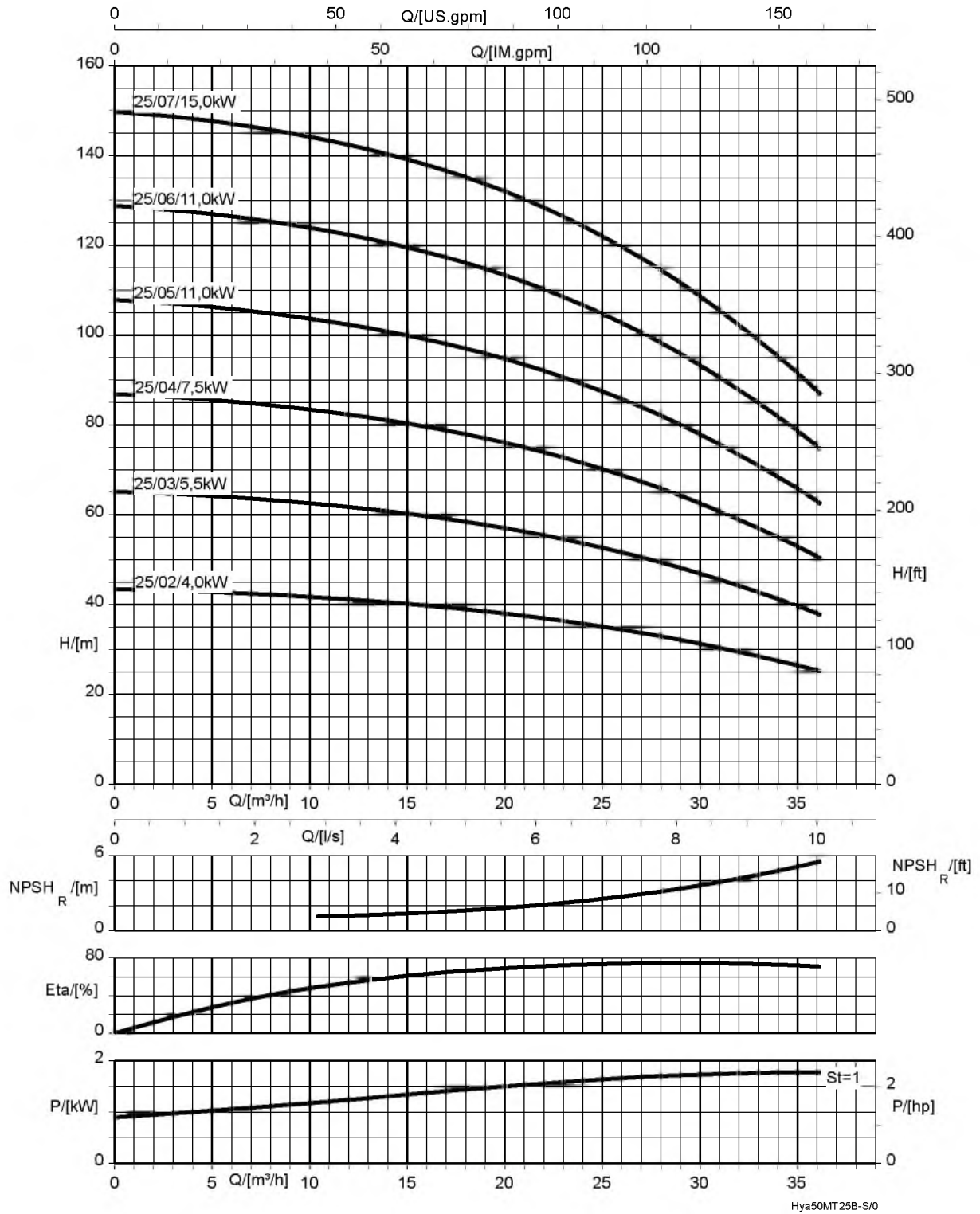
St = 1 | P per stage

Surpresschrom SIC.2 SVP with Movitec 15B, n = 3000 rpm



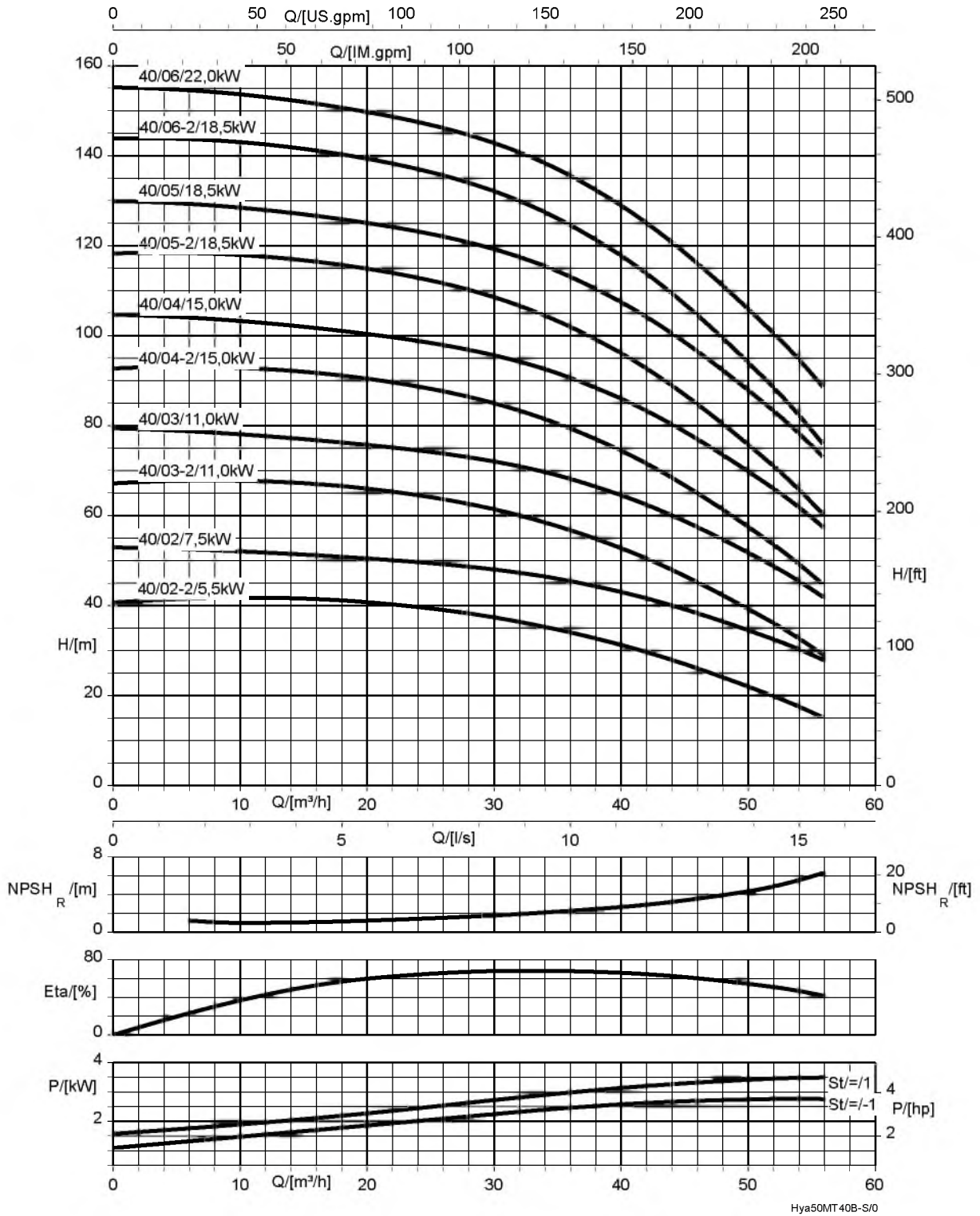
St = 1 | P per stage

Surpresschrom SIC.2 SVP with Movitec 25B, n = 3000 rpm



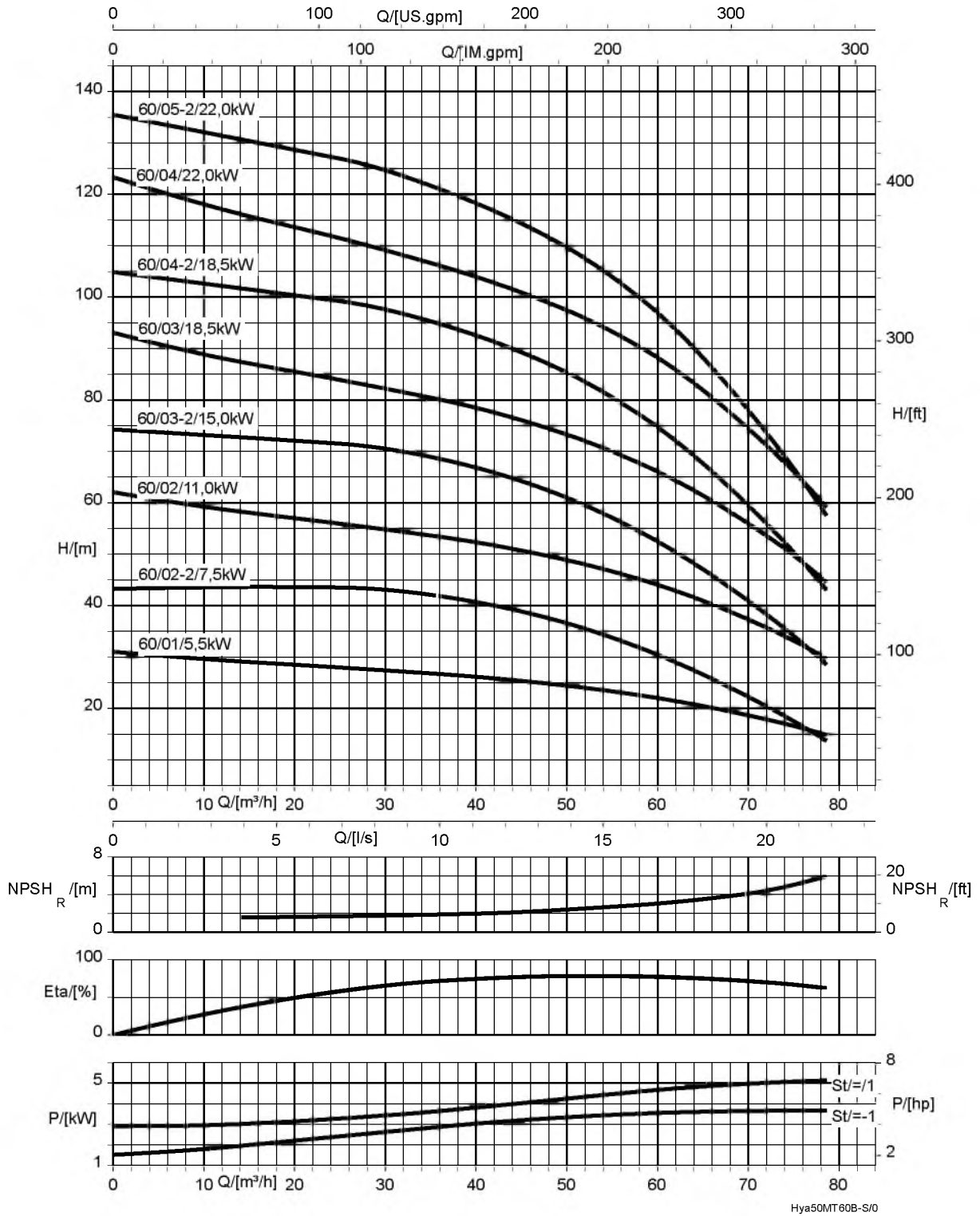
St = 1 | P per stage

Surpresschrom SIC.2 SVP with Movitec 40B, n = 3000 rpm



St = 1 | P per stage | St = -1 | P per stage with a smaller impeller

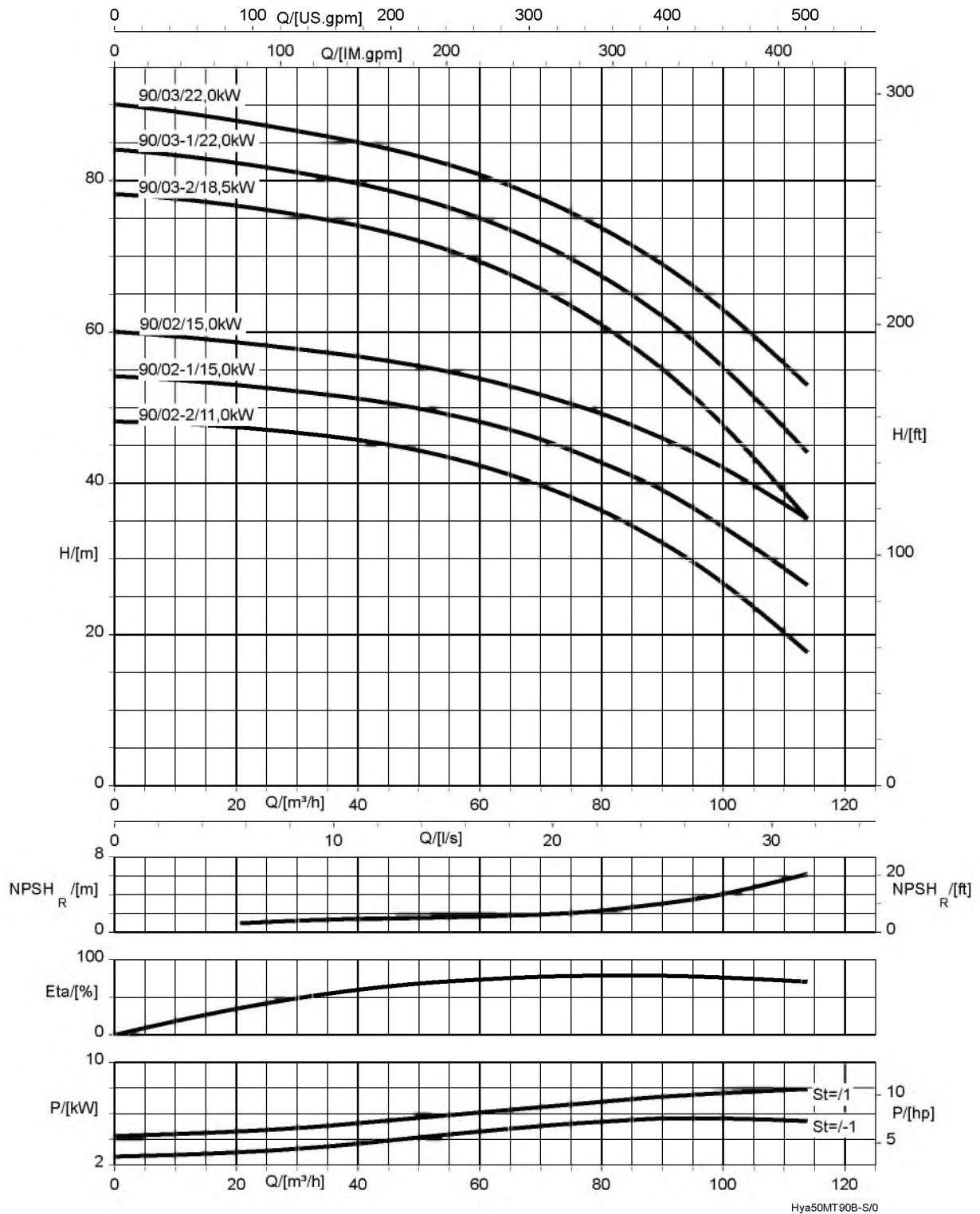
Surpresschrom SIC.2 SVP with Movitec 60B, n = 3000 rpm



St = 1 | P per stage

St = -1 | P per stage with a smaller impeller

Surpresschrom SIC.2 SVP with Movitec 90B, n = 3000 rpm

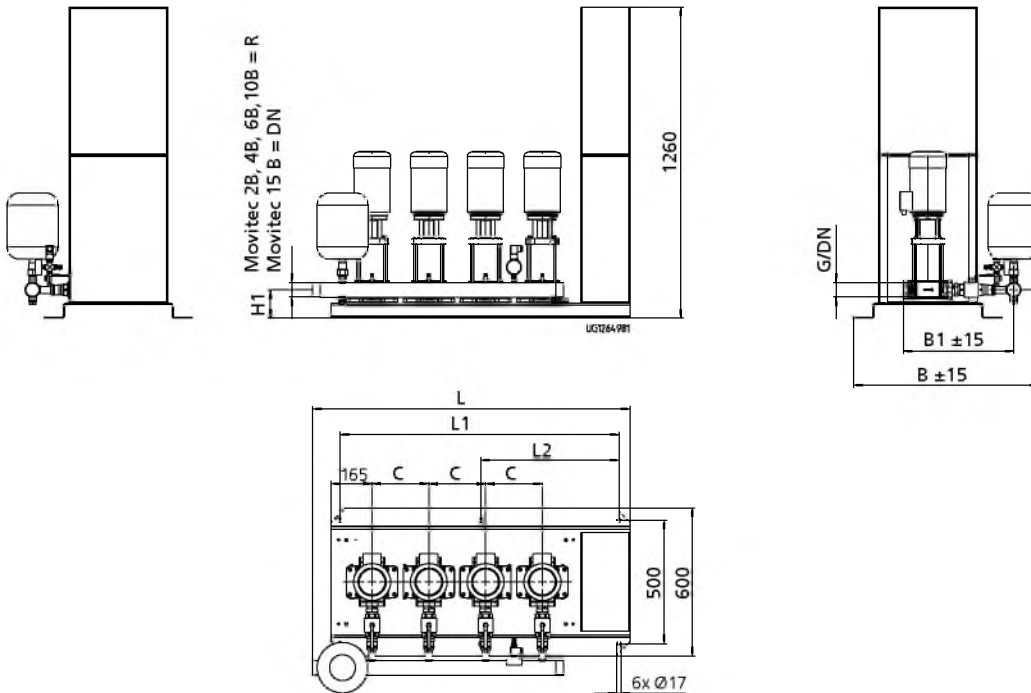


i Systems with 2, 3-2 and 3 stages
The actual curve will deviate from the documented curve due to the reduced speed. An accurate selection can only be made with KSB's selection program KSB EasySelect.

St = 1 P per stage	St = -1 P per stage with a smaller impeller
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Dimensions and weights

Surpresschrom SIC.2 SVP – Connection type A – Movitec 2B, 4B, 6B, 10B and 15B



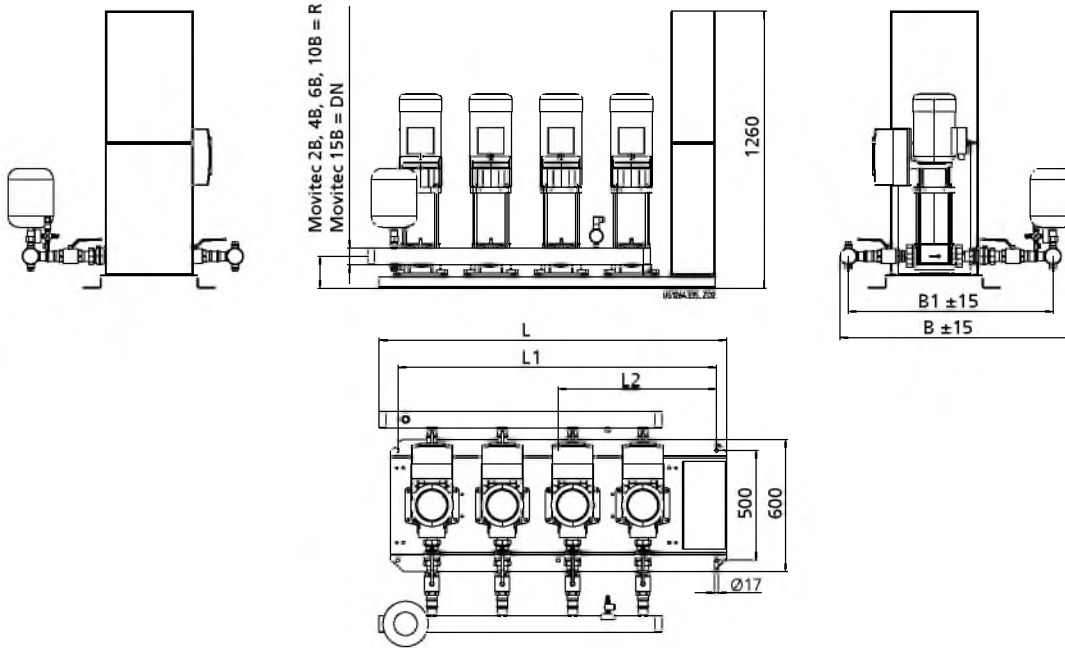
Dimensions of Surpresschrom SIC.2 SVP – Connection type A – with Movitec 2B / 4B / 6B / 10B / 15B
Control cabinet dimensions Surpresschrom SIC.2 SVP
Baseplate RAL 5002, control cabinet RAL 7035

Dimensions [mm]

Size	Connection		B	B1	C	H1	L	L1	L2
	R / DN	G / DN							
2/02.. B	R 2	1	723	420	230	115	825	670	-
2/04.. B	R 2	1	723	420	230	115	825	670	-
2/06.. B	R 2	1 1/4	751	447	230	115	825	670	-
2/10.. B	R 2	1 1/2	787	510	320	145	985	900	-
2/15.. B	DN 80	2	762	486	320	145	980	900	-
3/02.. B	R 2	1	723	420	230	115	1055	900	-
3/04.. B	R 2	1	723	420	230	115	1055	900	-
3/06.. B	R 2	1 1/4	794	447	230	115	1055	900	-
3/10.. B	R 2	1 1/2	794	517	320	145	1260	1130	560
3/15.. B	DN 80	2	762	486	320	145	1210	1130	560
4/02.. B	R 2	1	723	420	230	115	1285	1130	560
4/04.. B	R 2	1	723	420	230	115	1285	1130	560
4/06.. B	R 2	1 1/4	751	447	230	115	1285	1130	560
4/10.. B	R 2	1 1/2	794	517	320	145	1580	1450	720
4/15.. B	DN 100	2	848	565	320	145	1544	1450	720
5/02.. B	R 2	1	731	428	252,5	115	1605	1450	720
5/04.. B	R 2	1	731	428	252,5	115	1605	1450	720
5/06.. B	R 2	1 1/4	758	455	252,5	115	1605	1450	720
5/10.. B	R 2	1 1/2	794	517	320	145	1900	1770	880
5/15.. B	DN 100	DN 50	810	550	320	155	1850	1770	880
6/02.. B	R 2	1	731	428	266	115	1925	1770	880
6/04.. B	R 2	1	731	428	266	115	1925	1770	880
6/06.. B	R 2	1 1/4	758	455	266	115	1925	1770	880

Size	Connection		B	B1	C	H1	L	L1	L2
	R / DN	G / DN							
6/10.. B	R 2	1 1/2	800	523	320	145	2220	2090	1040
6/15.. B	DN 150	DN 50	876	584	320	155	2170	2090	1040

Surpresschrom SIC.2 SVP – Connection types C & V – Movitec 2B, 4B, 6B, 10B and 15B

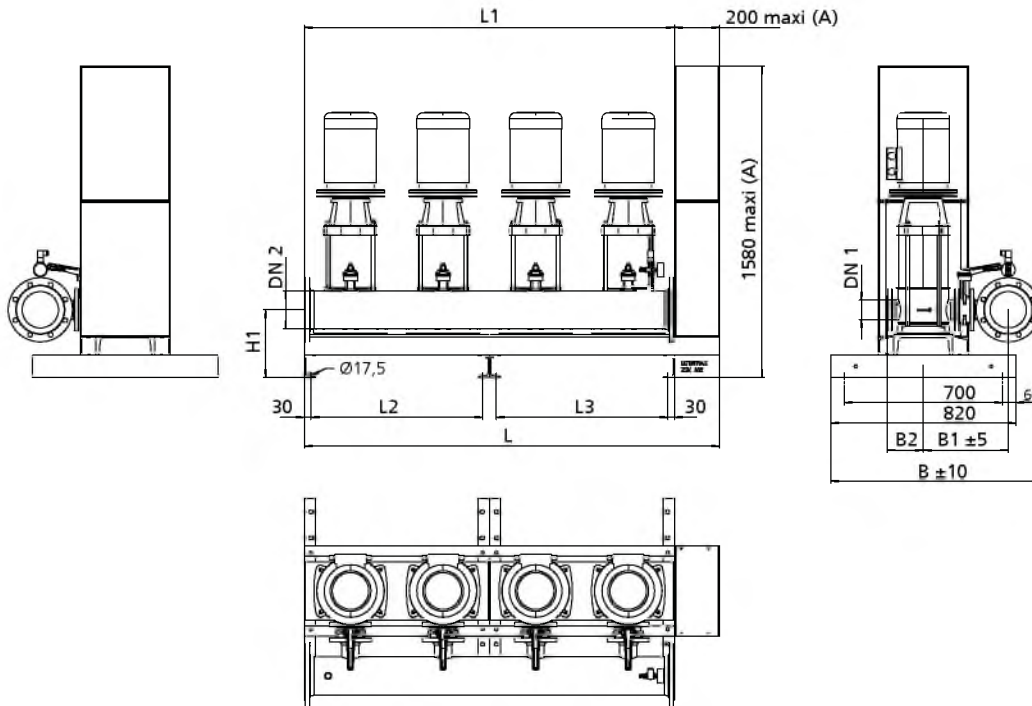


Dimensions of Surpresschrom SIC.2 SVP – Connection types C & V – with Movitec 2B / 4B / 6B / 10B / 15B
Control cabinet dimensions Surpresschrom SIC.2 SVP
Baseplate RAL 5002, control cabinet RAL 7035

Dimensions [mm]

Size	Connection	B	B1	H1	L	L1	L2
	R / DN						
2/02.. B	R 2	896	763	115	825	670	-
2/04.. B	R 2	896	763	115	825	670	-
2/06.. B	R 2	961	828	115	825	670	-
2/10.. B	R 2	1050	916	145	985	900	-
2/15.. B	DN 80	1097	894	145	980	900	-
3/02.. B	R 2	896	763	115	1055	900	-
3/04.. B	R 2	896	763	115	1055	900	-
3/06.. B	R 2	961	828	115	1055	900	-
3/10.. B	R 2	1073	932	145	1260	1130	560
3/15.. B	DN 80	1097	894	145	1210	1130	560
4/02.. B	R 2	896	763	115	1285	1130	560
4/04.. B	R 2	896	763	115	1285	1130	560
4/06.. B	R 2	961	828	115	1285	1130	560
4/10.. B	R 2	1073	932	145	1580	1450	720
4/15.. B	DN 100	1272	1052	145	1544	1450	720
5/02.. B	R 2	920	778	115	1605	1450	720
5/04.. B	R 2	920	778	115	1605	1450	720
5/06.. B	R 2	987	846	115	1605	1450	720
5/10.. B	R 2	1073	932	145	1900	1770	880
5/15.. B	DN 100	1221	1001	155	1850	1770	880
6/02.. B	R 2	920	778	115	1925	1770	880
6/04.. B	R 2	920	778	115	1925	1770	880
6/06.. B	R 2	981	846	115	1925	1770	880
6/10.. B	R 2	1090	943	145	2220	2090	1040
6/15.. B	DN 150	1352	1067	155	2170	2090	1040

Surpresschrom SIC.2 SVP – Connection type A – Movitec 25B, 40B, 60B and 90B



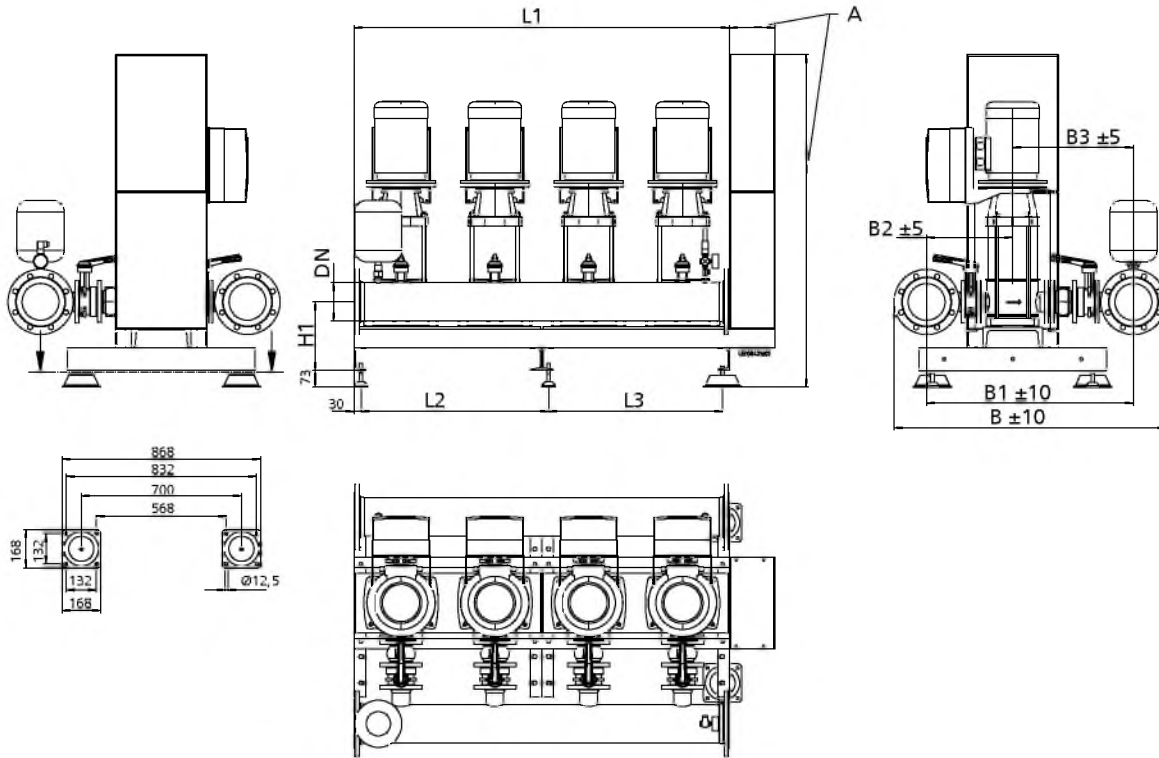
Dimensions of Surpresschrom SIC.2 SVP - Connection type A - with Movitec 25B / 40B / 60B / 90B
Control cabinet dimensions Surpresschrom SIC.2 SVP (⇒Page 26)
Baseplate RAL 5002, control cabinet RAL 7035

A See control cabinets (⇒Page 26)

Dimensions [mm]

Size	Connection		B	B1	B2	B3	H1	L	L1	L2	L3
	DN 1	DN 2									
2/25.. B	DN 65	DN 100	871	351	351	503	302	1020	820	-	760
2/40.. B	DN 80	DN 100	894	373	373	373	337	1020	820	-	760
2/60.. B	DN 100	DN 150	984	431	431	431	337	1020	820	-	760
2/90.. B	DN 100	DN 150	992	439	439	439	337	1020	820	-	760
3/25.. B	DN 65	DN 100	871	351	351	503	302	1430	1230	-	1170
3/40.. B	DN 80	DN 150	951	395	395	395	337	1430	1230	-	1170
3/60.. B	DN 100	DN 150	984	431	431	431	337	1430	1230	-	1170
3/90.. B	DN 100	DN 200	1042	462	462	462	337	1430	1230	-	1170
4/25.. B	DN 65	DN 150	928	376	376	376	302	1840	1640	820	760
4/40.. B	DN 80	DN 150	951	395	395	395	337	1840	1640	820	760
4/60.. B	DN 100	DN 200	1034	454	454	454	337	1840	1640	820	760
4/90.. B	DN 100	DN 200	1042	462	462	462	337	1840	1640	820	760
5/25.. B	DN 65	DN 150	928	376	376	376	302	2250	2050	1230	760
5/40.. B	DN 80	DN 200	999	418	418	418	337	2250	2050	1230	760
5/60.. B	DN 100	DN 200	1034	454	454	454	337	2250	2050	1230	760
5/90.. B	DN 100	DN 250	1105	492	492	492	337	2250	2050	1230	760
6/25.. B	DN 65	DN 150	928	376	376	376	302	2660	2460	1230	1170
6/40.. B	DN 80	DN 200	999	418	418	418	337	2660	2460	1230	1170
6/60.. B	DN 100	DN 200	1034	454	454	454	337	2660	2460	1230	1170
6/90.. B	DN 100	DN 250	1105	492	492	492	337	2660	2460	1230	1170

Surpresschrom SIC.2 SVP – Connection types C & V – Movitec 25B, 40B, 60B and 90B



Dimensions of Surpresschrom SIC.2 SVP - Connection types C & V - with Movitec 25B / 40B / 60B / 90B
Control cabinet dimensions Surpresschrom SIC.2 SVP (⇒Page 26)
Baseplate RAL 5002, control cabinet RAL 7035

A See control cabinets (⇒Page 26)

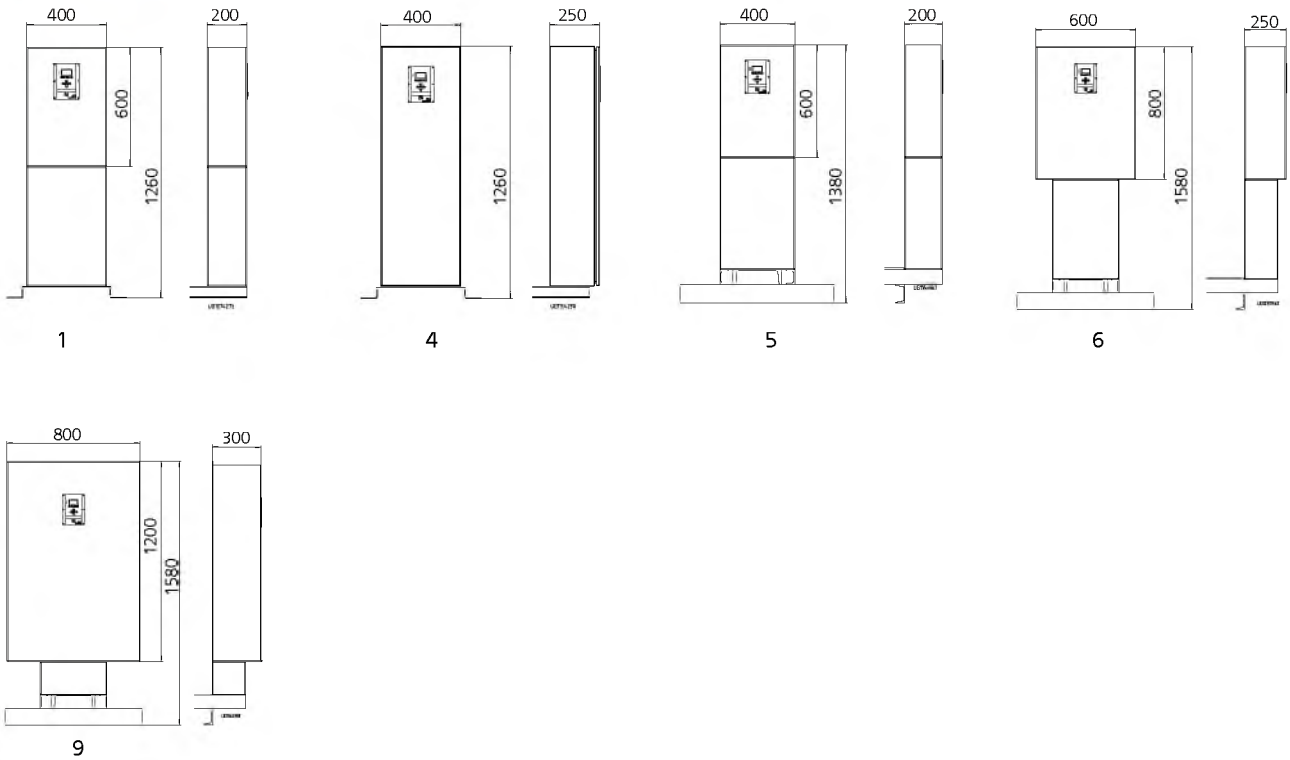
Dimensions [mm]

Size	Connection	B	B1	B2	H1	L	L1	L2	L3
	DN 2								
2/25.. B	DN 100	1074	854	351	302	1020	820	-	760
2/40.. B	DN 100	1139	919	374	337	1020	820	-	760
2/60.. B	DN 150	1320	1035	431	337	1020	820	-	760
2/90.. B	DN 150	1335	1050	439	337	1020	820	-	760
3/25.. B	DN 100	1074	854	351	302	1430	1230	-	1170
3/40.. B	DN 150	1248	963	396	337	1430	1230	-	1170
3/60.. B	DN 150	1320	1035	431	337	1430	1230	-	1170
3/90.. B	DN 200	1436	1096	462	337	1430	1230	-	1170
4/25.. B	DN 150	1189	904	376	302	1840	1640	820	760
4/40.. B	DN 150	1248	963	396	337	1840	1640	820	760
4/60.. B	DN 200	1421	1081	454	337	1840	1640	820	760
4/90.. B	DN 200	1436	1096	462	337	1840	1640	820	760
5/25.. B	DN 150	1189	904	376	302	2250	2050	1230	760
5/40.. B	DN 200	1349	1009	419	337	2250	2050	1230	760
5/60.. B	DN 200	1421	1081	454	337	2250	2050	1230	760
5/90.. B	DN 250	1561	1156	492	337	2250	2050	1230	760
6/25.. B	DN 150	1189	904	376	302	2660	2460	1230	1170
6/40.. B	DN 200	1349	1009	419	337	2660	2460	1230	1170
6/60.. B	DN 200	1421	1081	454	337	2660	2460	1230	1170
6/90.. B	DN 250	1561	1156	492	337	2660	2460	1230	1170

Control cabinet dimensions

Combinations of Surpresschrom SIC.2 SVP systems and control cabinet dimensions

Size	P [kW] (per pump)						
	4,00	5,50	7,50	11,00	15,00	18,50	22,00
2/02.. B	1	-	-	-	-	-	-
2/04.. B	1	-	-	-	-	-	-
2/06.. B	1	-	-	-	-	-	-
2/10.. B	1	1	-	-	-	-	-
2/15.. B	1	1	1	-	-	-	-
2/25.. B	5	5	5	9	6	-	-
2/40.. B	-	5	5	9	6	9	6
2/60.. B	-	5	5	9	6	9	6
2/90.. B	-	-	-	9	6	9	6
3/02.. B	1	-	-	-	-	-	-
3/04.. B	1	-	-	-	-	-	-
3/06.. B	1	-	-	-	-	-	-
3/10.. B	1	1	-	-	-	-	-
3/15.. B	1	1	1	-	-	-	-
3/25.. B	5	5	5	9	9	-	-
3/40.. B	-	5	5	9	9	9	6
3/60.. B	-	5	5	9	9	9	6
3/90.. B	-	-	-	9	9	9	6
4/02.. B	1	-	-	-	-	-	-
4/04.. B	1	-	-	-	-	-	-
4/06.. B	1	-	-	-	-	-	-
4/10.. B	1	1	-	-	-	-	-
4/15.. B	1	1	1	-	-	-	-
4/25.. B	5	5	5	9	9	-	-
4/40.. B	-	5	5	9	9	9	9
4/60.. B	-	5	5	9	9	9	9
4/90.. B	-	-	-	9	9	9	9
5/02.. B	1	-	-	-	-	-	-
5/04.. B	1	-	-	-	-	-	-
5/06.. B	1	-	-	-	-	-	-
5/10.. B	1	4	-	-	-	-	-
5/15.. B	1	4	4	-	-	-	-
5/25.. B	5	6	4	9	9	-	-
5/40.. B	-	6	6	9	9	9	9
5/60.. B	-	6	6	9	9	9	9
5/90.. B	-	-	-	9	9	9	9
6/02.. B	1	-	-	-	-	-	-
6/04.. B	1	-	-	-	-	-	-
6/06.. B	1	-	-	-	-	-	-
6/10.. B	1	4	-	-	-	-	-
6/15.. B	1	4	4	-	-	-	-
6/25.. B	5	6	6	9	9	-	-
6/40.. B	-	6	6	9	9	9	9
6/60.. B	-	6	6	9	9	9	9
6/90.. B	-	-	-	9	9	9	9



Control cabinet dimensions Surpresschrom SIC.2 SVP

i The control cabinet dimensions refer to systems in the standard design. Larger control cabinets may be required for installing other optional equipment.

SIC.2 SVP	1	2-2	2-1	2	3-2	3-1	3	4-2	4	5-2	5	6-2	6	7	8	9	10	11	12	13	14	16	18
5/B 10./.	-	-	-	339	-	-	355	-	381	-	399	-	403	447	452	484	489	494	-	705	-	-	-
6/B 10./.	-	-	-	403	-	-	422	-	453	-	474	-	480	533	538	577	583	589	-	841	-	-	-
2/B 15./.	-	-	-	211	-	-	230	-	242	-	320	-	322	332	337	-	-	-	-	-	-	-	-
3/B 15./.	-	-	-	282	-	-	309	-	327	-	444	-	447	462	469	-	-	-	-	-	-	-	-
4/B 15./.	-	-	-	369	-	-	406	-	430	-	586	-	590	609	619	-	-	-	-	-	-	-	-
5/B 15./.	-	-	-	445	-	-	626	-	656	-	856	-	860	885	898	-	-	-	-	-	-	-	-
6/B 15./.	-	-	-	584	-	-	761	-	797	-	1036	-	1041	1071	1086	-	-	-	-	-	-	-	-
2/B 25./.	-	-	-	426	-	-	485	-	499	-	729	-	735	724	-	-	-	-	-	-	-	-	-
3/B 25./.	-	-	-	537	-	-	624	-	646	-	970	-	980	1016	-	-	-	-	-	-	-	-	-
4/B 25./.	-	-	-	760	-	-	877	-	905	-	1325	-	1337	1385	-	-	-	-	-	-	-	-	-
5/B 25./.	-	-	-	948	-	-	1100	-	1134	-	1644	-	1660	1720	-	-	-	-	-	-	-	-	-
6/B 25./.	-	-	-	1092	-	-	1273	-	1315	-	1920	-	1938	2010	-	-	-	-	-	-	-	-	-
2/B 40./.	-	411	-	419	627	-	628	597	625	682	712	717	754	-	-	-	-	-	-	-	-	-	-
3/B 40./.	-	606	-	619	912	-	912	919	961	994	1038	1046	1118	-	-	-	-	-	-	-	-	-	-
4/B 40./.	-	793	-	810	1187	-	1187	1196	1252	1296	1356	1366	1509	-	-	-	-	-	-	-	-	-	-
5/B 40./.	-	1094	-	1114	1571	-	1572	1583	1653	1708	1782	1794	1974	-	-	-	-	-	-	-	-	-	-
6/B 40./.	-	1274	-	1298	1839	-	1840	1854	1938	2003	2093	2107	2323	-	-	-	-	-	-	-	-	-	-
2/B 60./.	481	496	-	701	701	-	760	796	840	847	-	-	-	-	-	-	-	-	-	-	-	-	-
3/B 60./.	638	660	-	948	1000	-	1036	1091	1174	1184	-	-	-	-	-	-	-	-	-	-	-	-	-
4/B 60./.	927	957	-	1327	1397	-	1444	1518	1675	1689	-	-	-	-	-	-	-	-	-	-	-	-	-
5/B 60./.	1159	1196	-	1644	1731	-	1790	1882	2080	2096	-	-	-	-	-	-	-	-	-	-	-	-	-
6/B 60./.	1349	1393	-	1924	2028	-	2100	2210	2447	2467	-	-	-	-	-	-	-	-	-	-	-	-	-
2/B 90./.	-	822	799	799	905	942	942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/B 90./.	-	1178	1196	1196	1302	1375	1375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/B 90./.	-	1569	1593	1593	1735	1879	1879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/B 90./.	-	2098	2128	2128	2306	2486	2486	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/B 90./.	-	2463	2499	2499	2712	2928	2928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Scope of supply

Depending on the model, the following items are included in the scope of supply:

Pressure booster system

- Two to six vertical high-pressure centrifugal pumps (standard pumps)

For Movitec 2B, 4B, 6B, 10B and 15B:

- With oval/round flange

For Movitec 25B, 40B, 60B and 90B:

- With round flange
- Membrane-type accumulator on the discharge side, approved for drinking water
- Pressure transmitter on the discharge side
- Pressure gauge
- Powder-coated / epoxy resin-coated steel baseplate

For Movitec 2B, 4B, 6B, 10B and 15B:

- Pumps mounted on the baseplate with anti-vibration mounts

For Movitec 25B, 40B, 60B and 90B:

- Pressure booster system with level-adjustable feet and rubber pads (supplied but not fitted)

Per pump:


- Check valve
- Shut-off valves

Control cabinet

- Control cabinet IP54
- Pump control and monitoring unit
- Graphical display with operating panel
- LEDs indicating operational availability and fault of the pressure booster system
- Service interface for connection to a PC
- Transformer for control voltage
- Motor protection switch per pump

- Lockable master switch (repair switch)
- Terminal strip/terminals with identification for all connections
- Circuit diagram and list of electric components
- Connection for analog or digital dry running protection equipment
- External connection ON
- External connection OFF

Accessories

 See the separate type series booklet Accessories for Pressure Booster Systems 1954.51.

Globe Valve

ECOLINE GLB 800

Class 150-600, Class 800
NPS ½"-2"
Forged Steel/Stainless Steel
Bellows
Flanged/Socket Weld Ends
or Threaded Ends

Type Series Booklet



Globe Valves

Bellows-type Globe Valves to ANSI/ASME

ECOLINE GLB 800



Main applications

- Petrochemical industry
- Process engineering
- General industry
- Food and beverage industry
- Sugar industry

Fluids handled

- Steam
- Explosive fluids
- Combustible fluids
- Liquids containing gas or vapour
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Feed water
- Thermal oil
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 800
Nominal size	NPS ½" - 2"
Max. permissible pressure	136 bar
Max. permissible temperature	425 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 105	Up to 425 °C
ASTM A 182 F304	Up to 425 °C
ASTM A 182 F316	Up to 425 °C

Other materials on request.

Design details

Design

- Valve design to ASME B16.34, API 602 and MSS SP-117
- Bolted bonnet
- Outside screw
- Outside yoke
- Reduced/full bore
- Tapered valve disc
- Integrated seat ring
- Metal-seated
- Rising stem
- Graphite gland packing
- Stainless steel/graphite gaskets
- Travel stop
- Guided valve disc
- Stem sealed by double-walled bellows and back-up gland packing
- Positive anti-rotation feature between stem and bellows
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Variants

- Throttling plug
- Needle valve disc
- Full bore
- PTFE gasket (up to 200 °C)
- PTFE gland packing (up to 200 °C)
- Locking device
- Position switch(es)
- Position indicator
- Seal-welded body/bonnet joint

- Stellited seat/disc interface
- Version with free stem end and top flange to ISO 5210
- Y-pattern
- Body extension with nipple
- NACE standard
- TA-Luft-compliant model (with or without spring loading) for applications to VDI 2440 at temperatures up to 250 °C and above 250 °C (400 °C max.)
- Electric actuators
- Other flanged end designs or butt weld ends to ASME B16.25
- Ease of service without additional costs
 - No costs for daily or frequent maintenance work during valve duty thanks to reliable bellows seal between the stem and the body.
 - If required, a leakage monitoring hole can be provided in the gland packing area.
 - The bolted bonnet and the design of the stem and bellows assembly enable straightforward dismantling in the event that defective internal components need to be replaced.
 - Damage on valve disc and seat rings can easily be remedied due to the "T"-shaped connection between valve disc and stem.

Product benefits

- Leak-free stem seal
 - Primary sealing to atmosphere is provided by a multi-walled metal bellows welded to the stem and a graphite gasket between body and bonnet.
 - Secondary sealing of the stem passage to atmosphere is provided by a minimum of five graphite packing rings plus lower gland section for added safety.
 - In the event of a ruptured bellows, fluid leakage along the stem passage is temporarily contained by the integral back seat.
- Longer service lives of valve and bellows
 - Specially designed multi-ply stainless steel bellows offers excellent corrosion resistance and flexibility; designed to withstand 1.5 times the nominal valve pressure.
 - Thanks to its position well outside the flow path, the bellows is not exposed to abrupt changes in fluid pressure which could result in lateral deformation and subsequent failure.
 - The valve disc is accurately guided along the inner body wall, resulting in a straight movement of the stem and bellows without seizing or jamming.
 - The guide pin on the stem moves in a groove in the bonnet, ensuring straight, non-rotating movement of the stem and bellows and preventing circumferential deformation at the bellows.
 - Stellite hard-facing applied to the seating surfaces of the seat rings and the valve disc prevents the valve disc from seizing on the seat rings and reduces wear. A minimum hard-faced layer of 1.6 mm is retained after machining.
- Reliable leakage protection of body
 - Integrally forged extension; no further potential leakage points (compared to welded design).
 - Valve body with integrally forged flanged ends withstands higher pressures than body with welded flanges.
 - Gaskets are fitted above and below the end fitting of the bellows assembly and firmly compressed by a set of bolts. The lower gasket is confined by the body shoulder and the end fitting of the bellows to prevent excessive compression.
- Operating reliability
 - Standard travel stop prevents excessive valve travel which could destroy the bellows or reduce the expected service life of the bellows.
 - Anti-blow out stem design prevents stem from being blown out of the valve body under high internal valve pressure.
- Suitable for various installation positions
 - Design with valve disc accurately guided in the body enables special installation positions (in vertical pipes or with inclined but upward stem position). No chattering or jamming of valve disc during valve travel.
- Available for all kinds of fluids
 - Several material variants available for body and bellows to suit a variety of fluids and applications.

Related documents

- Gate valve, type ECOLINE GTB 800, see type series booklet 7372.1
- Operating manual 7368.8

On all enquiries/orders please specify

1. Type
2. Class
3. Nominal size
4. Design pressure/temperature
5. Operating pressure
6. Operating temperature
7. Differential pressure
8. Material
9. Fluid handled
10. Flow rate
11. Pipe connection
12. Pipe schedule
13. Variants
14. Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to API 602 and ASME B16.34)

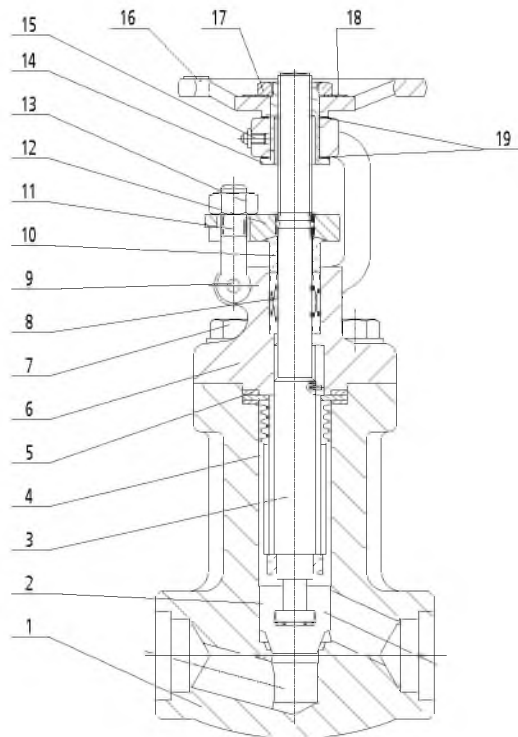
Class	Material	0 to 38	93	149	204	260	316	343	371	399	427
150	A 105	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9
800		136,0	124,8	120,5	116,4	110,9	104,5	101,1	97,4	93,2	75,7
150	A 182 F304	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8
800		132,4	110,3	98,9	91,4	85,5	81,2	79,4	77,6	76,0	74,5
150	A 182 F316	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3
800		132,4	114,0	102,9	94,3	87,9	82,9	81,2	80,0	78,5	77,6

Test pressures

Test	Test medium	Class 150		Class 300		Class 600		Class 800	
		bar	psi	bar	psi	bar	psi	bar	psi
Shell	Water	31,0	450	77,6	1125	153,4	2225	205,1	2975
Leak test (seat)		22,4	325	56,9	825	113,8	1650	149,8	2173
Leak test (seat)	Air	5,5	80	5,5	80	5,5	80	5,5	80

Materials



Overview of available materials

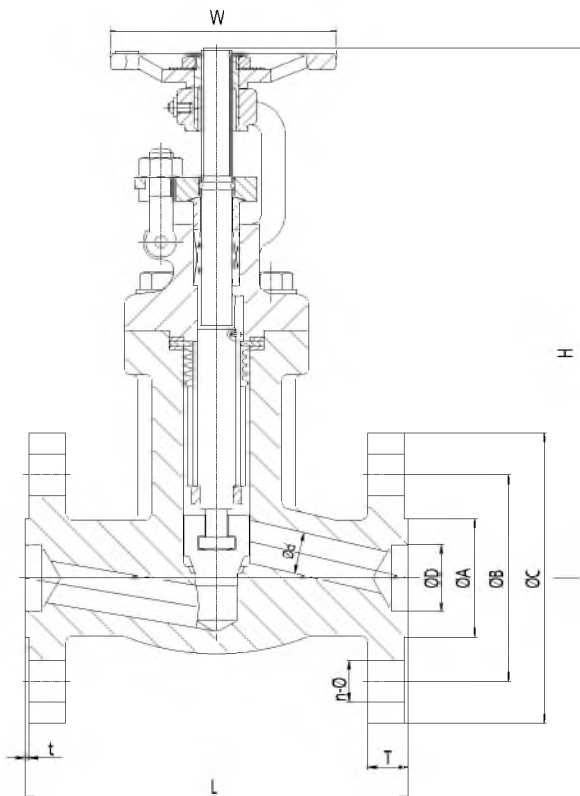
Part No.	Description	Material		
		Trim 8	Trim 2	Trim 10
1	Body	A 105	A 182 F304	A 182 F316
2	Valve disc	A 276 410 + STL6	A 276 304	A 276 316
3	Stem	A 182 F6a	A 182 F304	A 182 F316
4 ¹⁾	Bellows	SS304	SS316L	SS316L
5	Bonnet gasket	SS316 + graphite	SS316 + graphite	316 + graphite
6	Bonnet	A 105	A 182 F304	A 182 F316
7	Bolt	A 193 B7	A 193 B8	A 193 B8M
8	Gland packing	Graphite	Graphite	Graphite

¹⁾ Other bellows materials on request.

Part No.	Description	Material		
		Trim 8	Trim 2	Trim 10
9	Pin	A 276 410	A 276 304	A 276 316
10	Lower gland section	A 276 420	A 276 304	A 276 316
11	Eyebolt	A 193 B7	A 193 B8	A 193 B8
12	Gland follower	A 105	A 182 F304	A 182 F316
13	Nut	A 194 2H	A 194 8	A 194 8
14	Stem nut	A 276 410	A 276 410	A 276 410
15	Lubricating nipple	Brass	Brass	Brass
16	Handwheel	A 197	A 197	A 197
17	Nut	A 194 2H	A 194 8	A 194 8
18	Name plate	SS304	SS304	SS304
19	Washer	A 276 410	A 276 410	A 276 410

Dimensions

Dimensions Class 150 to 600



Dimensions in mm

Class	NPS	L	T	t	n-Ø	Ød	ØD	ØA	ØB	ØC	H ²⁾	W	[kg]
150	½"	108	9,6	1,6	4-16	10	15	34,9	60,3	90	212	100	4,5
	¾"	117	10,5	1,6	4-16	13	20	42,9	69,9	100	212	100	6,9
	1"	127	11,2	1,6	4-16	17,5	25	50,8	79,4	110	238	125	9,8
	1 ¼"	140	12,8	1,6	4-16	23	32	63,5	89,9	115	306	160	13,5
	1 ½"	165	14,3	1,6	4-16	28,5	40	73,0	98,4	125	306	160	19,5
	2"	203	15,9	1,6	4-19	35	50	92,1	120,7	150	336	180	29,0
300	½"	152	14,3	1,6	4-16	10	15	34,9	66,7	95	212	100	4,8
	¾"	178	15,9	1,6	4-19	13	20	42,9	82,6	115	212	100	7,7
	1"	203	17,5	1,6	4-19	17,5	25	50,8	88,9	125	238	125	11,0
	1 ¼"	216	19,1	1,6	4-19	23	32	63,5	98,4	135	306	160	16,8
	1 ½"	229	20,7	1,6	4-22	28,5	40	73,0	114,3	155	306	160	21,2
	2"	267	22,3	1,6	8-19	35	50	92,1	127,0	165	336	180	32,6
600	½"	165	20,7	6,4	4-16	10	15	34,9	66,7	95	212	100	5,6
	¾"	190	22,3	6,4	4-19	13	20	42,9	82,6	115	212	100	7,6
	1"	216	23,9	6,4	4-19	17,5	25	50,8	88,9	125	238	125	12,5
	1 ¼"	229	27,1	6,4	4-19	23	32	63,5	98,4	135	306	160	17,0
	1 ½"	241	28,7	6,4	4-22	28,5	40	73,0	114,3	155	306	160	23,5
	2"	292	31,8	6,4	8-19	35	50	92,1	127,0	165	336	180	38,8

Mating dimensions - Standards

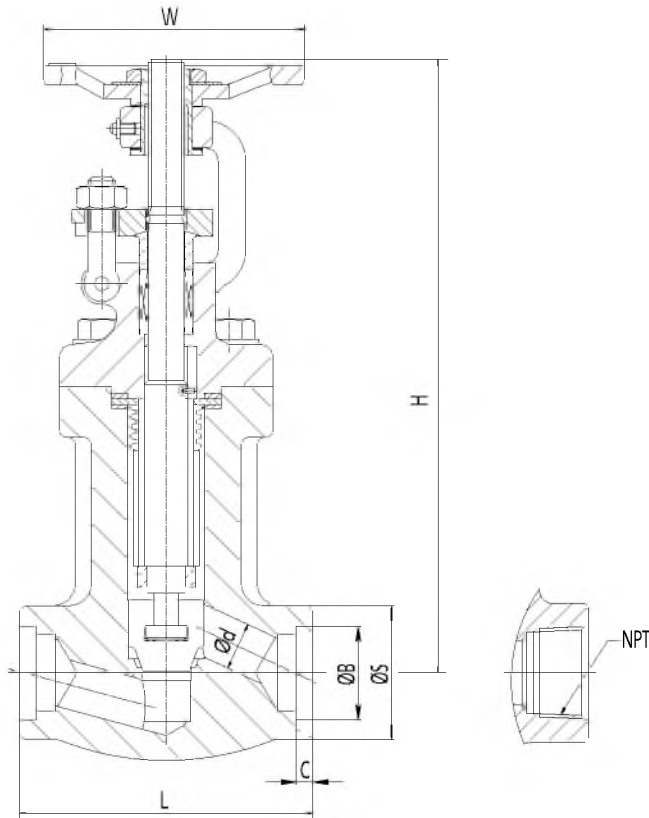
Face-to-face ASME B16.5

lengths:

Flanges: ASME B16.5

²⁾ Open

Dimensions Class 800



Dimensions in mm

Class	NPS	L	Ød	ØB	C	S	NPT	H ³⁾	W	[kg]
800	½"	79	10	21,8	10	34	½"	212	100	3,0
	¾"	92	13	27,2	13	40	¾"	212	100	4,8
	1"	111	18	33,9	13	49	1"	238	125	7,9
	1 ¼"	152	23	42,7	13	58	1 ¼"	306	160	11,0
	1 ½"	152	29	48,8	13	64	1 ½"	306	160	16,8
	2"	172	36	61,2	16	78	2"	336	180	25,2

Mating dimensions - Standards

Face-to-face lengths: see table
 Threaded ends: ASME B1.20.1
 Socket weld ends: ASME B16.11

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

³⁾ Open

Globe Valve

ECOLINE GLV 150-300

Class 150-300
NPS ½"-12"

Type Series Booklet



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Globe Valves

Globe Valves with Gland Packing to ANSI/ASME

ECOLINE GLV 150-300



Main applications

- Chemical industry
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Gas
- Fluids containing gas
- Hot water
- Fluids containing mineral oils
- Oil
- Feed water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 300
Nominal size	NPS ½" - 12"
Max. permissible pressure	50 bar / 720 PSI
Min. permissible temperature	-29 °C / °F
Max. permissible temperature	+816 °C / +1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (⇒ Page 6)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 351 CF8	Up to 816 °C / 1500 °F
ASTM A 351 CF8M	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Globe valve to ASME B16.34
- Tested to API 598
- Compact design to API 603
- Valve made of corrosion-resistant materials
- Body made of stainless steel
- Bolted bonnet
- Outside screw
- Rotating stem
- Stem with burnished shank
- Stem nut made of nickel steel
- Rising handwheel
- Outside yoke
- Yoke head suitable for mounting electric and pneumatic actuators (DIN ISO 5210)
- Fully confined bonnet gasket
- Stem sealed by gland packing
- Two-piece self-aligning gland follower
- Die-moulded graphite gland packing, packing end rings made of braided graphite
- Stainless steel/graphite gaskets
- Back seat
- Integrated seat ring
- Minimum wall thickness as per ASME B16.34
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Hard-faced back seat
- Hard-faced sealing surface (single or double)
- PTFE packing
- PTFE gasket
- Drain plug
- Locking device
- Position indicator
- Limit switches
- Grease-free version
- Version with free stem end and top flange to ISO 5210
- Gearboxes
- Electric actuators

- Non-destructive testing, e.g. radiographic testing
- NACE standard
- Other flange designs
- Larger nominal sizes and other variants on request

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.2 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Male/female joint between body and bonnet prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.
- Potential internal and external leakage points eliminated by integral back seat and body seat.

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Integral seat is highly resistant to wear and easy to repair after long-term operation.

Related documents

- Operating manual 7255.81

Purchase order specifications

- Type
- Class
- Nominal size
- Design pressure
- Design temperature
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Variants
- Reference number

Pressure/temperature ratings

Permissible operating pressures [bar] (to ASME B16.34)

Class	Material	[°C]																								
		-29 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
150	A 351 CF8 ¹⁾	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,0 ²⁾
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9	27,2	26,9	26,2	24,5	22,4	17,6	14,1	11,4	9,3	7,9	6,6	5,2	4,1	2,8	
150	A 351 CF8M ¹⁾	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,4 ²⁾	1,0 ²⁾
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0	29,0	28,6	26,5	25,2	24,8	21,0	16,2	12,8	10,0	7,9	6,6	5,2	4,1	2,8	

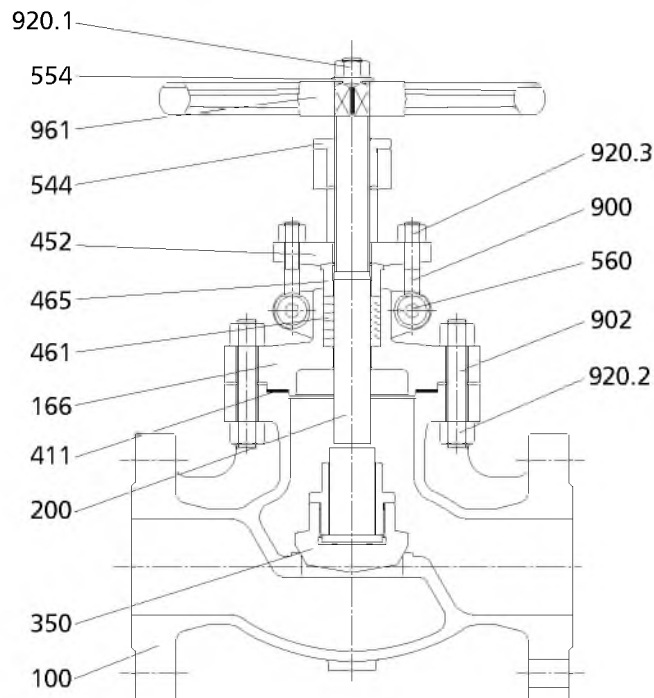
Permissible operating pressures [psi] (to ASME B16.34)

Class	Material	[°F]																								
		-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
150	A 351	275	230	205	190	170	140	125	110	95	80	65	50	35	20	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	15 ²⁾
300	CF8 ¹⁾	720	600	540	495	465	440	430	420	415	405	395	390	380	355	325	255	205	165	135	115	95	75	60	40	
150	A 351	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	20 ²⁾	15 ²⁾
300	CF8M ¹⁾	720	620	560	515	480	450	440	435	425	420	420	415	385	365	360	305	235	185	145	115	95	75	60	40	

Test pressures

Test	Test medium	Class 150		Class 300	
		[bar]	[psi]	[bar]	[psi]
Shell	Water	32	450	78	1125
Leak test (seat)		23	315	56	815
Leak test (back seat)		23	315	56	815
Leak test (seat)	Air	4 to 7	60 to 100	4 to 7	60 to 100

Materials



ECOLINE GLV 150-300

1) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.
 2) For butt weld end valves only. Flanged end ratings terminate at 538 °C (1000 °F).

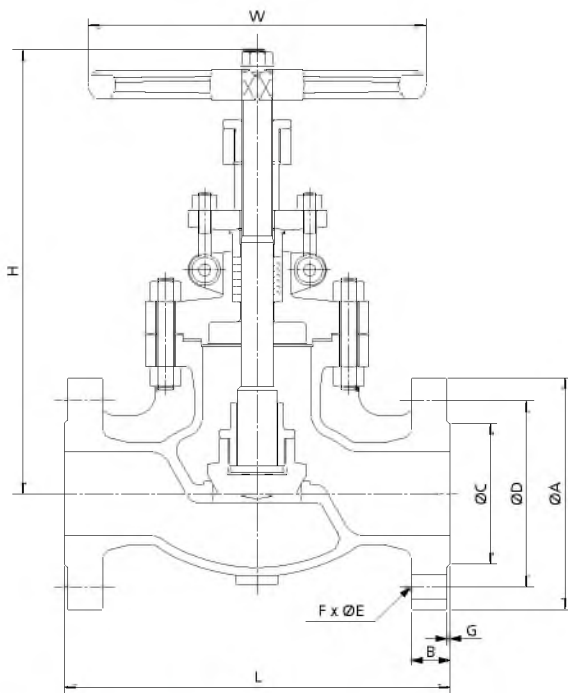
Parts list

Part No.	Description	Material	
		A 351 CF8	A 351 CF8M
100	Body	A 351 CF8	A 351 CF8M
350	Valve disc	A 276 304	A 276 304
200	Stem	A 276 304	A 276 316
411	Joint ring	Stainless steel/graphite	Stainless steel/graphite
166	Yoke	A 351 CF8	A 351 CF8M
461	Gland packing	Graphite	Graphite
465	Lower gland section	A 276 304	A 276 316
452	Gland follower	A 351 CF8	A 351 CF8
544	Threaded bush	A 439 D2	A 439 D2
961	Handwheel	A 395 65 45 15	A 395 65 45 15
554	Washer	A 276 420	A 276 420
920.1	Handwheel nut	A 194 8	A 194 8
920.2	Nut	A 194 8	A 194 8
902	Stud	A 193 B8	A 193 B8
560	Pin	A 276 304	A 276 304
900	Eyebolt	A 193 B8	A 193 B8
920.3	Nut	A 194 8	A 194 8

Trim materials

Part No.	Description	Trim 2	Trim 10
		304 / 304	316 / 316
100	Body	304 stainless steel	316 stainless steel
350	Valve disc	304 stainless steel	316 stainless steel
200	Stem	304 stainless steel	316 stainless steel

Dimensions and weights



ECOLINE GLV 150-300

Dimensions [mm]

Class	NPS	L	H ³⁾	W	B	G	ØC	ØD	ØA	F x ØE	[kg]
150	1/2"	108	185	100	11	1,6	35	60,5	89	4 x 16	3,4
	3/4"	117	195	100	11,5	1,6	43	70	98	4 x 16	3,8
	1"	127	212	100	12	1,6	51	79,5	108	4 x 16	5
	1 1/2"	165	255	138	15	1,6	73	98,5	127	4 x 16	7,4
	2"	203	274,0	160	15,7	1,6	91,9	120,7	152	4 x 19,1	11
	2 1/2"	216	379,5	200	17,5	1,6	104,6	139,7	178	4 x 19,1	25
	3"	241	400,0	224	19,1	1,6	127,0	152,4	191	4 x 19,1	34
	4"	292	469,0	280	23,9	1,6	157,2	190,5	229	8 x 19,1	56
	6"	406	649,0	350	25,4	1,6	215,9	241,3	279	8 x 22,4	97
	8"	495	794,0	450	28,4	1,6	269,7	298,5	343	8 x 22,4	165
	10"	622	924,0	600	30,2	1,6	323,9	362,0	406	12 x 25,4	285
	12"	698	1060,5	700	31,8	1,6	381,0	431,8	483	12 x 25,4	450
300	1/2"	152	188	100	15	1,6	35	66,5	95	4 x 16	4
	3/4"	178	191	100	16	1,6	43	82,5	117	4 x 19	5
	1"	203	225	138	18	1,6	51	89	124	4 x 19	7,5
	1 1/2"	229	270	200	21	1,6	73	114,5	156	4 x 22	12,5
	2"	267	276,0	200	22,4	1,6	91,9	127,0	165	8 x 19,1	16
	2 1/2"	292	381,0	224	25,4	1,6	104,6	149,4	191	8 x 22,4	31
	3"	318	405,0	280	28,4	1,6	127,0	168,1	210	8 x 22,4	39
	4"	356	469,0	350	31,8	1,6	157,2	200,2	254	8 x 22,4	64
	6"	445	690,0	400	36,6	1,6	215,9	269,7	318	12 x 22,4	138
	8"	559	799,0	500	41,1	1,6	269,7	330,2	381	12 x 25,4	273
	10"	622	924,0	600	47,8	1,6	323,9	387,4	445	16 x 28,4	468
	12"	711	1060,5	700	50,8	1,6	381,0	450,9	521	16 x 31,8	692

3) Open

Mating dimensions as per standard

Face-to-face lengths: ASME B16.10
Flanges: ASME B16.5

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe valves must always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

Globe Valve

ECOLINE GLF 800-2500

Class 800-2500
NPS ½"-2"
Forged Steel
Bolted Bonnet or
Welded Bonnet

Type Series Booklet



Globe Valves

Globe Valves with Gland Packing to ANSI/ASME

ECOLINE GLF 800-2500



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Gas
- Hot water
- Fluids containing mineral oils
- Oil
- Feed water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 800 - 2500
Nominal size	NPS 1/2" - 2"
Max. permissible pressure	431 bar / 6250 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	+538 °C / +1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 105	Up to 425 °C / 800 °F
ASTM A 182 F11	Up to 593 °C / 1100 °F
ASTM A 182 F22	Up to 593 °C / 1100 °F
ASTM A 182 F91	Up to 650 °C / 1200 °F
ASTM A 182 F304	Up to 816 °C / 1500 °F
ASTM A 182 F316	Up to 816 °C / 1500 °F
ASTM A 182 F304L	Up to 425 °C / 800 °F
ASTM A 182 F316L	Up to 450 °C / 850 °F

Other materials on request.

Design details

Design

- Globe valve to API 602
- Tested to API 598
- Body made of forged steel
- Bolted bonnet (Class 800)
- Welded bonnet
- Outside screw
- Outside yoke
- Rotating stem
- Rising handwheel
- Stem sealed by gland packing
- Reduced bore
- Two-piece self-aligning gland follower
- Graphite gland packing
- Stem with burnished shank
- Fully confined bonnet gasket (Class 800)
- Back seat
- Solid valve disc
- Integral seat - ST6 (HF)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Full bore
- Hard-faced back seat
- Extended bonnet
- Locking device
- Position indicator
- Electric actuators
- Version in compliance with TA-Luft (German Clean Air Act) to VDI 2440 for temperatures up to 400 °C
- Butt weld ends
- NACE standard
- Other threaded ends or butt weld ends to ASME B16.25
- Other trims
- Other material variants

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.3 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Hard-faced body seat and solid disc seat made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.
- Male/female joint between body and bonnet of Class 800 model prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.
- Zero leakage due to seal-welded threaded joint between body and bonnet of Class 1500 and Class 2500 models

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of chrome nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Hard-facing applied to valve disc and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term shut-off even with frequent opening/closing cycles.
- Integral seating surface is highly resistant to wear and easy to repair after long-term operation.

Related documents

- Globe valve, type ECOLINE GLF 150-600, see type series booklet 7361.13
- Gate valve, type ECOLINE GTF 150-600, see type series booklet 7361.11
- Gate valve, type ECOLINE GTF 800-2500, see type series booklet 7361.12
- Lift check valve, type ECOLINE PTF 800-2500, see type series booklet 7361.18
- Swing check valve, type ECOLINE SCF 800-2500, see type series booklet 7361.16
- Operating manual 7361.81

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Reduced or full bore
- Variants
- Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
800	A 105	136,0	124,8	120,5	116,4	110,9	104,5	101,1	97,4	93,2	75,7															
1500		255,3	233,0	225,4	219,0	209,7	193,6	187,8	181,8	173,6	143,8															
2500		425,5	388,3	375,6	365,0	349,5	322,6	313,0	303,1	289,3	239,7															
800	A 182 F11 ¹⁾	137,9	137,9	132,7	127,4	122,2	111,2	108,1	104,5	97,8	93,4	89,5	82,7	58,6	39,8	26,4	17,7									
1500		258,6	257,4	248,7	239,8	231,8	206,6	201,1	194,1	183,1	175,1	169,0	158,2	128,6	74,5	44,0	30,5									
2500		430,9	429,0	414,5	399,6	386,2	344,3	335,3	323,2	304,9	291,6	281,8	263,9	214,4	124,1	73,4	50,9									
800	A 182 F22	137,9	137,9	133,9	129,6	122,2	111,2	108,1	104,5	97,8	93,4	89,5	82,7	70,7	49,1	32,2	20,2									
1500		258,6	257,6	250,8	243,4	231,8	206,6	201,1	194,1	183,1	175,1	169,0	158,2	140,9	92,2	52,6	34,4									
2500		430,9	429,4	418,2	405,4	386,2	344,3	335,3	323,2	304,9	291,6	281,8	263,9	235,0	153,7	87,7	57,4									
800	A 182 F304 ²⁾	132,4	110,3	98,9	91,4	85,5	81,2	79,4	77,6	76,0	74,5	72,9	71,5	70,2	65,3	59,8	47,2	37,7	30,3	24,5	20,8	17,1	13,8	10,7	7,7	
1500		248,2	204,3	185,0	172,4	162,4	151,1	148,1	145,2	142,2	140,0	137,0	134,7	132,4	122,1	104,2	84,4	68,9	56,3	46,7	40,1	33,8	28,9	17,4	14,1	
2500		413,7	340,4	308,4	287,3	270,7	251,9	246,9	241,9	237,0	233,3	228,4	224,5	220,7	203,6	173,7	140,7	114,9	93,8	77,9	66,9	56,3	48,1	29,2	23,8	
800	A 182 F316 ²⁾	132,4	114,0	102,9	94,3	87,9	82,9	81,2	80,0	78,5	77,6	76,9	76,3	71,2	66,7	66,2	56,1	43,6	34,0	27,0	21,5	17,7	13,8	10,7	7,7	
1500		248,2	211,0	192,5	178,3	166,9	154,4	151,6	149,4	147,2	145,7	144,2	143,4	140,9	125,5	119,7	99,5	79,1	63,3	51,6	41,9	34,9	29,3	17,4	14,1	
2500		413,7	351,6	320,8	297,2	278,1	257,4	252,7	249,0	245,3	242,9	240,4	238,9	235,0	208,9	199,5	165,9	131,8	105,5	86,0	69,8	58,2	48,9	29,2	23,8	
800	A 182 F304L	110,3	94,0	83,9	77,2	72,3	68,4	67,1	66,2	64,9	63,4															
1500		206,8	173,9	157,0	145,8	137,3	127,4	125,4	123,8	121,5	119,3															

1) Use normalised and tempered materials only.
2) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816
2500		344,7	289,9	261,6	243,0	228,9	212,3	208,9	206,3	202,5	198,8														
800	A 182 F316L	110,3	94,0	83,9	77,2	72,3	68,4	67,1	66,2	64,9	63,4	62,2													
1500		206,8	173,9	157,0	145,8	137,3	127,4	125,4	123,8	121,5	119,3	117,1													
2500		344,7	289,9	261,6	243,0	228,9	212,3	208,9	206,3	202,5	198,8	195,1													
1500	A 182 F91	258,6	257,6	250,8	243,4	231,8	206,6	201,1	194,1	183,1	175,1	169,0	158,2	140,9	125,5	119,7	97,5	73,0	49,6						
2500		430,9	429,4	418,2	405,4	386,2	344,3	335,3	323,2	304,9	291,6	281,8	263,9	235,0	208,9	199,5	162,5	121,7	82,7						

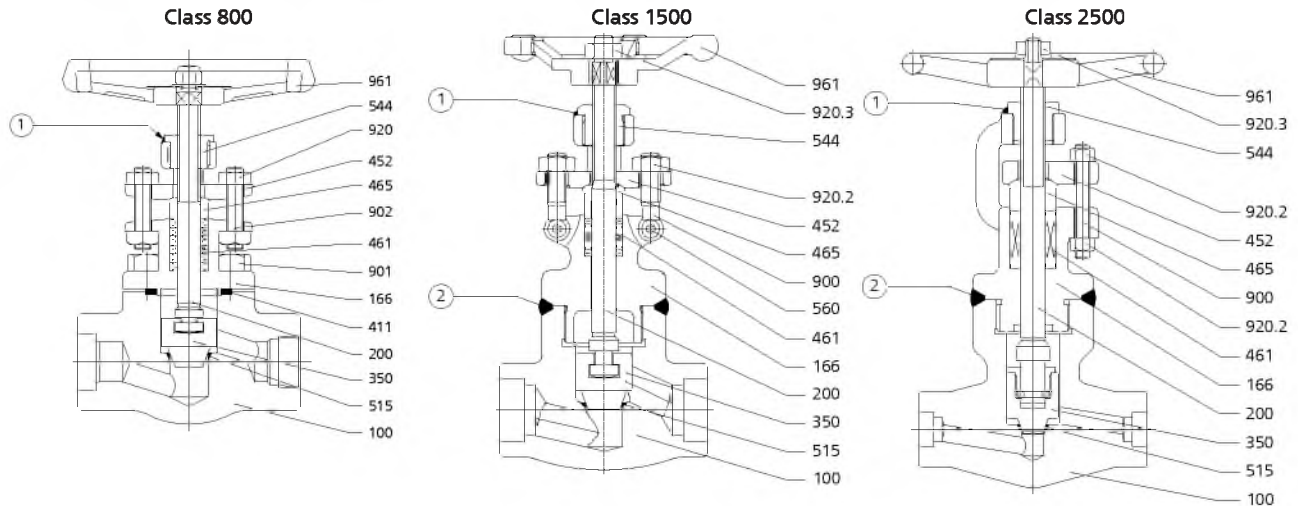
Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

Class	Material	32 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
800	A 105	1973	1810	1747	1688	1608	1515	1467	1413	1352	1098															
1500		3705	3395	3270	3170	3015	2840	2745	2665	2535	2055															
2500		6170	5655	5450	5280	5025	4730	4575	4425	4230	3430															
800	A 182 F11 ¹⁾	2000	2000	1925	1848	1773	1613	1568	1515	1418	1355	1298	1200	850	577	383	257									
1500		3750	3750	3610	3465	3325	3025	2940	2840	2660	2540	2435	2245	1595	1080	720	480									
2500		6250	6250	6015	5775	5540	5040	4905	4730	4430	4230	4060	3745	2655	1800	1200	800									
800	A 182 F22	2000	2000	1942	1880	1773	1613	1568	1515	1418	1355	1298	1200	1025	712	467	293									
1500		3750	3750	3640	3530	3325	3025	2940	2840	2660	2540	2435	2245	1930	1335	875	550									
2500		6250	6250	6070	5880	5540	5040	4905	4730	4430	4230	4060	3745	3220	2230	1455	915									
800	A 182 F304 ²⁾	1920	1600	1435	1325	1240	1178	1152	1125	1102	1080	1057	1037	1018	947	867	685	547	440	355	302	248	200	155	112	
1500		3600	3000	2690	2485	2330	2210	2160	2110	2065	2030	1980	1945	1910	1770	1630	1285	1030	825	670	565	465	380	290	205	
2500		6000	5000	4480	4140	3880	3680	3600	3520	3440	3380	3300	3240	3180	2950	2715	2145	1715	1370	1115	945	770	630	485	345	
800	A 182 F316 ³⁾	1920	1653	1493	1368	1275	1203	1178	1160	1138	1125	1115	1107	1032	968	960	813	632	493	392	312	257	200	155	112	
1500		3600	3095	2795	2570	2390	2255	2210	2170	2135	2110	2090	2075	1930	1820	1800	1525	1185	925	735	585	480	380	290	205	
2500		6000	5160	4660	4280	3980	3760	3680	3620	3560	3520	3480	3460	3220	3030	3000	2545	1970	1545	1230	970	800	630	485	345	
800	A 182 F304L	1600	1363	1217	1120	1048	992	973	960	942	920															
1500		3000	2555	2280	2100	1970	1860	1825	1800	1765	1730															
2500		5000	4260	3800	3500	3280	3100	3040	3000	2940	2880															
800	A 182 F316L	1600	1363	1217	1120	1048	992	973	960	942	920	902														
1500		3000	2555	2280	2100	1970	1860	1825	1800	1765	1730	1690														
2500		5000	4260	3800	3500	3280	3100	3040	3000	2940	2880	2820														
1500	A 182 F91	3750	3750	3640	3530	3325	3025	2940	2840	2660	2540	2435	2245	1930	1820	1800	1510	1115	720							
2500		6250	6250	6070	5880	5540	5040	4905	4730	4430	4230	4060	3745	3220	3030	3000	2515	1855	1200							

Test pressures

Test	Test medium	Class 800		Class 1500		Class 2500	
		[bar]	[psi]	[bar]	[psi]	[bar]	[psi]
Shell	Water	205,1	2975	396	5625	660	9375
Leak test (back seat)		149,8	2173	291	4125	484	6875
Leak test (seat)		149,8	2173	291	4125	484	6875
Optional leak test (seat)	Air	5,5	80	4 to 7	58 to 100	4 to 7	58 to 100

Materials



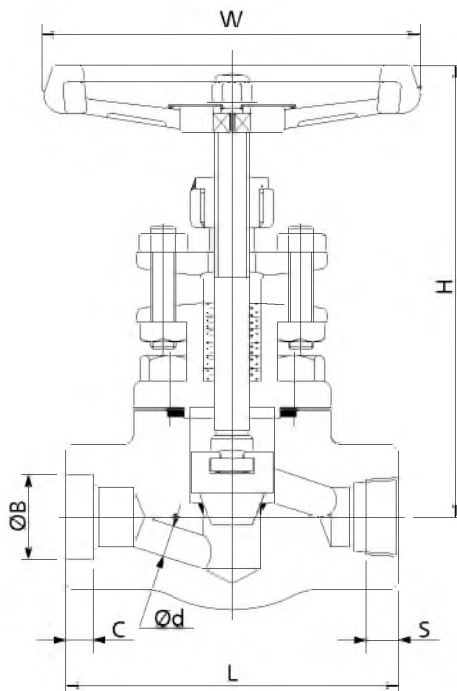
- ① Back-welded
- ② Seal-welded

Parts list

Part No.	Description	Class	Material					
			A 105 Trim 8	A 182 F11 Trim 5	A 182 F22 Trim 5	A 182 F304 Trim 2	A 182 F316 Trim 10	A 182 F91 Trim 5
100	Body		A 105	A 182 F11	A 182 F22	A 182 F304	A 182 F316	A 182 F91
166	Yoke		A 105	A 182 F11	A 182 F22	A 182 F304	A 182 F316	A 182 F91
200	Stem	800	A 182 F6a	A 182 F6a	A 182 F6a	A 182 F304	A 182 F316	
		1500/2500	A 479-410-2	A 479-410-2	A 479-410-2	A 182 F304	A 182 F316	A 479-XM19
350	Valve disc	800	A 182 F6a	A 182 F6a + STL6	A 182 F6a + STL6	A 182 F304	A 182 F316	
		1500/2500	A 276-410/ A 276-410+ST6	A 276-410/ A 276-410+ST6	A 276-410/ A 276-410+ST6	A 276-304/ A 276-304+ST6	A 276-304/ A 276-304+ST6	A 276-410/ A 276-410+ST6
411	Joint ring		304 + graphite	304 + graphite	304 + graphite	304 + graphite	316 + graphite	
452	Gland follower	800	A 105	A 105	A 105	A 182 F304	A 182 F316	
		1500/2500	A 105	A 105	A 105	A 182 F304	A 182 F304	A 182 F22
465	Lower gland section	800	A 276-410	A 276-410	A 276-410	A 276-304	A 276-316	
		1500/2500	A 276-420	A 276-420	A 276-420	A 276-304	A 276-316	A 276-420
461	Gland packing		Flexible graphite	Flexible graphite	Flexible graphite	Flexible graphite	Flexible graphite	Flexible graphite
515	Seat ring	800	A 276-410 + ST6	A 276-410 + ST6	A 276-410 + ST6	A 276-304	A 276-316	
		1500/2500	A 276-410/ A 276-410+ST6	A 276-410/ A 276-410+ST6	A 276-410/ A 276-410+ST6	A 276-304/ A 276-304+ST6	A 276-304/ A 276-304+ST6	A 276-410/ A 276-410+ST6
544	Threaded bush		A 276-410	A 276-410	A 276-410	A 276-410	A 276-410	A 276-410
560	Pin	1500/2500	A 276-410	A 276-410	A 276-410	A 276-410	A 276-410	A 276-410
900	Eyebolt	1500/2500	A 193 B8	A 193 B8	A 193 B8	A 193 B8	A 193 B8	A 193 B8
901	Bolt	800	A 193 B7	A 193 B16	A 193 B16	A 193 B8	A 193 B8M	
902	Stud	800	A 193 B8	A 193 B16	A 193 B16	A 193 B8	A 193 B8	
920	Nut	800	A 194 2H	A 194 8	A 194 8	A 194 8	A 194 8M	
920.2	Nut	1500/2500	A 194 2H	A 194 2H	A 194 2H	A 194 8	A 194 8	A 194 4/7
920.3	Handwheel nut	1500/2500	A 194 2H	A 194 2H	A 194 2H	A 194 8	A 194 8	A 194 2H
961	Handwheel		A 197	A 197	A 197	A 197	A 197	A 197

Dimensions

Dimensions of ECOLINE GLF 800



Dimensions in mm

Class	NPS	L	S	C	Ød	ØB	H ³⁾	W	[kg]
800	½"	79	13,6	10	10,0	21,8	168	100	2,25
	¾"	92	13,9	13	13,0	27,2	170	100	2,40
	1"	111	17,4	13	17,5	33,9	205	120	4,20
	1 ¼"	118	18,0	13	22,5	42,7	233	150	6,00
	1 ½"	140	18,4	13	28,6	48,8	235	150	8,13
	2"	172	19,2	16	36,5	61,2	282	180	12,14

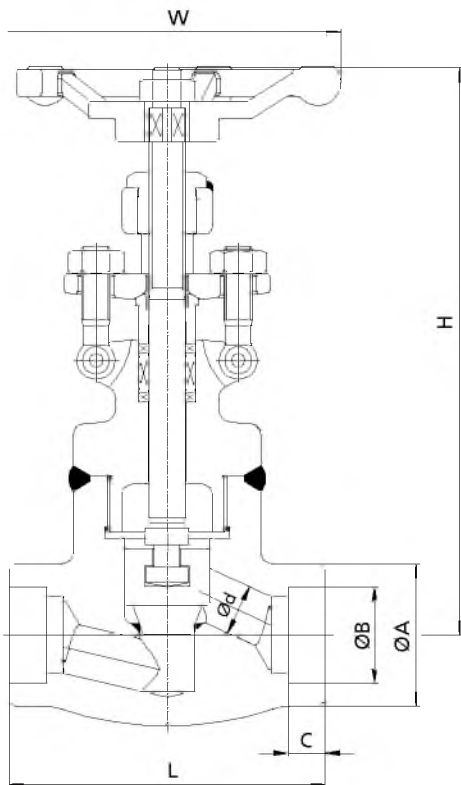
Mating dimensions - Standards

Face-to-face lengths: see table
 Threaded ends: ASME B1.20.1
 Socket weld ends: ASME B16.11

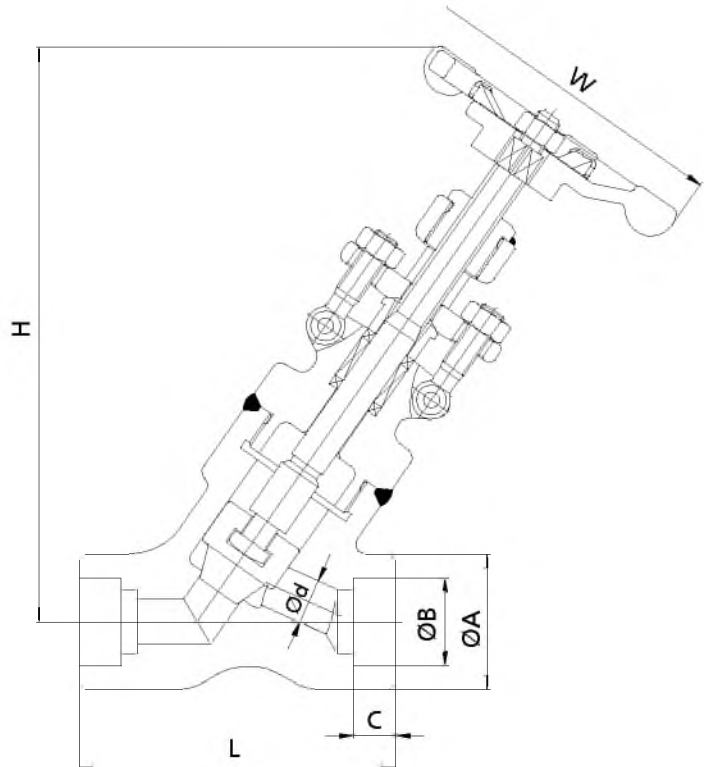
³⁾ Open

Dimensions of ECOLINE GLF 1500-2500

Straight-pattern body



Y-pattern body



Straight-pattern body

Dimensions in mm

Class	NPS	L	Ød	C	ØB	ØA	H ⁴⁾	H ⁵⁾	W	[kg]
1500	½"	92	10	10	21,8	42	187	177	125	3,3
	¾"	111	13	13	27,2	49	187	177	125	3,8
	1"	120	17,5	13	33,9	58	227	211	160	6,1
	1 ¼"	152	23	13	42,7	64	242	224	160	7,8
	1 ½"	172	28,5	13	48,8	78	278	258	180	12,3
	2"	220	35	16	61,2	88	325	301	200	19,3
2500	½"	150	11	10	21,8	52	262	249	200	8,5
	¾"	150	14	13	27,2	52	262	249	200	8,7
	1"	170	19	13	33,9	64	298	282	200	12,5
	1 ¼"	200	25	13	42,7	80	347	327	300	20,7
	1 ½"	200	28	13	48,8	80	347	327	300	21,0
	2"	230	35	16	61,2	95	406	381	300	36,0

Y-pattern body

Dimensions in mm

Class	NPS	L	Ød	C	ØB	ØA	H ⁶⁾	H ⁷⁾	W	[kg]
1500	½"	120	10	10	21,8	50	192	182	125	4,0
	¾"	120	13	13	27,2	50	192	182	125	3,8
	1"	152	17,5	13	33,9	64	240	226	160	7,1
	1 ¼"	152	23	13	42,7	64	240	226	160	12,3
	1 ½"	180	28,5	13	48,8	80	273	256	180	12,1
	2"	200	35	16	61,2	90	316	297	200	16,7
2500	½"	152	11	10	21,8	64	243	234	200	9,6

- 4) Open
- 5) Closed
- 6) Open
- 7) Closed

Class	NPS	L	Ød	C	ØB	ØA	H ⁶⁾	H ⁷⁾	W	[kg]
	¾"	152	14	13	27,2	64	243	234	200	9,6
	1"	180	19	13	33,9	80	290	278	200	15,4
	1 ¼"	200	25	13	42,7	90	335	321	300	23,0
	1 ½"	200	28	13	48,8	90	335	321	300	22,8
	2"	200	35	16	61,2	98	390	373	300	30,8

Butt weld ends

NPS	SCH5	SCH10	SCH30	SCH40/STD	SCH80/XS	SCH160	SCHXXS
½"	Available						Not available
¾"							
1"							
1 ¼"							
1 ½"							
2"							

Mating dimensions - Standards

Face-to-face lengths: see table
 Socket weld ends: ASME B16.11
 Butt weld ends: ASME B16.25, ASME B36.10

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

6) Open
 7) Closed

Strainer

ECOLINE FYF 800

Class 800
NPS ½"-2"
Forged Steel
Threaded Ends or
Socket Weld Ends

Type Series Booklet



Check Valves and Strainers

Strainers to ANSI/ASME

ECOLINE FYF 800



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Gas
- Hot water
- Fluids containing mineral oils
- Oil
- Feed water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 800
Nominal size	NPS ½" - 2"
Max. permissible pressure	141 bar / 2000 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	816 °C / 1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 105	Up to 427 °C / 800 °F
ASTM A 182 F304	Up to 816 °C / 1500 °F
ASTM A 182 F316	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Strainer to ASME B16.34
- Tested to API 598
- Y-pattern strainer
- Body made of forged steel
- Bolted cover
- Reduced bore
- Fully confined cover gasket
- Cylindrical screen made of stainless steel
- Cover equipped with screw plug
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- PTFE gasket
- Other mesh widths on request
- Other screen materials
- NACE standard

Product benefits

Reliable sealing and longer service life

- Male/female joint between body and cover prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.

Cost-efficient

- Y-pattern body with hydraulically favourable flow path: higher flow rates and lower pressure losses result in energy cost savings.

Extended maintenance-free service life

- Screen fine-machined to a smooth finish, causing foreign particles to slide smoothly down to the bottom of the screen. As a result, cleaning intervals and maintenance costs are reduced.

Versatile application

- Wide range of mesh widths and materials for handling various fluid types and properties, e.g. water, oil, gas and other process fluids.

Related documents

- Operating manual 7361.81

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Variants
- Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
800	A 105	136,0	124,8	120,5	116,4	110,9	104,5	101,1	97,4	93,2	75,7															
800	A 182 F304 ¹⁾	132,4	110,3	98,9	91,4	85,5	81,2	79,4	77,6	76,0	74,5	72,9	71,5	70,2	65,3	59,8	47,2	37,7	30,3	24,5	20,8	17,1	13,8	10,7	7,7	
800	A 182 F316 ¹⁾	132,4	114,0	102,9	94,3	87,9	82,9	81,2	80,0	78,5	77,6	76,9	76,3	71,2	66,7	66,2	56,1	43,6	34,0	27,0	21,5	17,7	13,8	10,7	7,7	

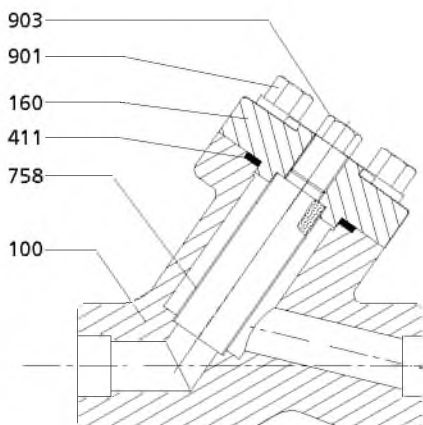
Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

Class	Material	32 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
800	A 105	1973	1810	1747	1688	1608	1515	1467	1413	1352	1098															
800	A 182 F304 ¹⁾	1920	1600	1435	1325	1240	1178	1152	1125	1102	1080	1057	1037	1018	947	867	685	547	440	355	302	248	200	155	112	
800	A 182 F316 ¹⁾	1920	1653	1493	1368	1275	1203	1178	1160	1138	1125	1115	1107	1032	968	960	813	632	493	392	312	257	200	155	112	

Test pressures

Test	Test medium	Class 800	
		bar	psi
Shell	Water	205,1	2975

Materials



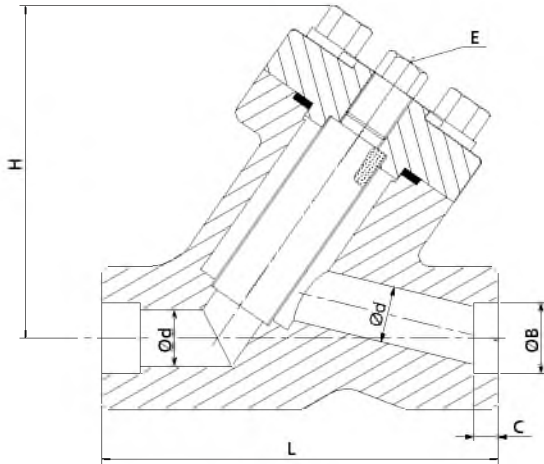
Parts list

Part No.	Description	Material		
		A 105 Trim 2	A 182 F304 Trim 2	A 182 F316 Trim 10
903	Drain plug	A 105N	A 182 F304	A 182 F316
160	Cover	A 105N	A 182 F304	A 182 F316

¹⁾ At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Part No.	Description	Material		
		A 105 Trim 2	A 182 F304 Trim 2	A 182 F316 Trim 10
411	Joint ring	SS 316 + graphite	SS 316 + graphite	SS 316 + graphite
758	Screen	AISI 304	AISI 304	AISI 316
100	Body	A 105N	A 182 F304	A 182 F316
901	Bolt	A 193-B7	A 193-B8	A 193-B8

Dimensions



Dimensions in mm

Class	NPS	L	C	ØB	H	E	Ød	Mesh width	[kg]
800	½"	94	10	21,8	92	¼"-18NPT	10,0	0,42	1,2
	¾"	98	13	27,2	92	¼"-18NPT	13,0	0,42	1,4
	1"	120	13	33,9	114	¼"-18NPT	17,5	0,42	2,5
	1 ¼"	140	13	42,7	137	¼"-18NPT	23,0	0,42	3,7
	1 ½"	140	13	48,8	137	¼"-18NPT	28,5	0,42	3,9
	2"	170	16	61,2	143	1"-11,5NPT	36,5	0,42	6,6

Mating dimensions - Standards

Face-to-face lengths: see table
Threaded ends: ASME B1.20.1
Socket weld ends: ASME B16.11

Y-type strainers can be installed in horizontal or vertical pipes. The fluid must always enter through the screen inlet. Flow through Y-type strainers installed in vertical pipes must always be downwards.

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Gate Valve

ECOLINE GTC 150-600

Class 150-600
NPS 2"-36"
Cast Steel / Stainless Steel
Bolted Bonnet
Flanged Ends

Type Series Booklet



Gate Valves

Gate Valves with Bolted Bonnet to ANSI/ASME

ECOLINE GTC 150-600



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Gas
- Hot water
- Feed water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS 2" - 36"
Max. permissible pressure	106 bar / 1500 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	816 °C / 1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (⇒Page 5)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 427 °C / 800 °F
ASTM A 217 WC6	Up to 593 °C / 1100 °F
ASTM A 217 WC9	Up to 593 °C / 1100 °F
ASTM A 217 C5	Up to 649 °C / 1200 °F
ASTM A 217 C12	Up to 649 °C / 1200 °F
ASTM A 352 LCB	Up to 343 °C / 650 °F
ASTM A 352 LCC	Up to 343 °C / 650 °F
ASTM A 351 CF8	Up to 816 °C / 1500 °F
ASTM A 351 CF8M	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Gate valve to API 600-2009
- Tested to API 598
- Body made of cast steel or stainless steel
- Flexible wedge
- Bolted bonnet
- Non-rotating stem
- Non-rising handwheel
- Stem sealed by gland packing
- Two-piece self-aligning gland follower
- Die-moulded graphite gland packing, packing end rings made of braided graphite
- Stainless steel/graphite gaskets
- Stem with burnished shank
- Stem nut made of nickel steel
- Outside screw
- Sealing surfaces made of wear and corrosion resistant materials
- Back seat
- Hardened back seat bush
- Outside yoke
- Yoke head suitable for mounting electric and pneumatic actuators (DIN ISO 5210)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Position switch(es)
- Locking device
- Stem protecting tube
- Stem protecting tube with position indicator
- Drain plug
- Hard-faced back seat
- Pressure relief arrangement
- Bypass

- Version with free stem end and top flange to ISO 5210
 - Gearboxes
 - Electric actuators
 - Version in compliance with TA-Luft (German Clean Air Act) to VDI 2440 for temperatures up to 400 °C
 - Non-destructive testing, e.g. radiographic testing
 - Inspections to technical codes such as AD2000 or IBR
 - Gate valve to API 600-2015
 - NACE standard
 - Other flanged end designs or butt weld ends to ASME B16.25
 - Larger nominal sizes and other variants on request
- Temperature rating
 - Differential pressure
 - Fluid handled
 - Material
 - Trim material (API trim number)
 - Line connection
 - Pipe schedule (for butt weld ends)
 - Variants
 - Number of type series booklet

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.2 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Hard-faced body seat and solid sealing surface of flexible wedge made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.
- Male/female joint between body and bonnet prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance. (Exception: Class 150; flat body/bonnet interface due to square or oval flange design to comply with limited face-to-face length specified by design standard).

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Wear allowance higher than specified in relevant standard, for substantially increased service life.
- Hard-facing applied to wedge and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term sealing even with frequent opening/closing cycles.

Related documents

- Operating manual 7362.81

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	-29 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
150	A 216 WCB ¹⁾	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4											
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3	22,1	15,9	9,3	5,9											
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9	44,1	31,7	19,0	11,7											
150	A 217 WC6 ²⁾	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	49,6	47,9	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	22,1	14,8	10,0	6,6									
600		103,4	103,4	99,6	95,5	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	44,1	29,6	20,0	13,1									
150	A 217 WC9	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	26,5	18,3	12,1	7,6									
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	36,9	24,1	15,2									
150	A 217 C5	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	25,9	19,0	13,8	10,0	6,9	4,1	2,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	51,4	37,9	27,6	20,0	13,8	8,6	4,8							
150	A 217 C12	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	25,9	17,6	11,7	7,9	5,2	3,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	34,8	23,8	15,5	10,3	7,2							
150	A 352 LCB ⁴⁾	18,3	17,6	15,9	13,8	11,7	9,7	8,6																		
300		47,9	45,5	44,1	42,4	40,3	37,9	36,9																		
600		96,2	91,0	87,9	84,8	81,0	76,2	73,4																		
150	A 352 LCC	20,0	17,9	15,9	13,8	11,7	9,7	8,6																		
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7																		
600		103,4	103,4	100,3	96,6	91,7	83,4	81,0																		
150	A 351 CF8 ⁵⁾	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾	
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9	27,2	26,9	26,2	24,5	22,4	17,6	14,1	11,4	9,3	7,9	6,6	5,2	4,1	2,8	
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8	54,5	53,8	52,7	49,0	44,8	35,5	28,3	22,8	18,3	15,5	12,8	10,3	7,9	5,9	
150	A 351 CF8M ⁵⁾	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾	
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0	29,0	28,6	26,5	25,2	24,8	21,0	16,2	12,8	10,0	7,9	6,6	5,2	4,1	2,8	
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3	57,6	57,2	53,4	50,0	49,6	42,1	32,8	25,5	20,3	16,2	13,1	10,3	7,9	5,9	

Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
150	A 216 WCB ¹⁾	285	260	230	200	170	140	125	110	95	80	65	50	35	20											
300		740	680	655	635	605	570	550	530	505	410	320	230	135	85											
600		1480	1360	1310	1265	1205	1135	1100	1060	1015	825	640	460	275	170											
150	A 217 WC6 ²⁾	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾									
300		750	750	720	695	665	605	590	570	530	510	485	450	320	215	145	95									
600		1500	1500	1445	1385	1330	1210	1175	1135	1065	1015	975	900	640	430	290	190									
150	A 217 WC9	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾									
300		750	750	730	705	665	605	590	570	530	510	485	450	385	265	175	110									
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	535	350	220									
150	A 217 C5	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾							
300		750	750	730	705	665	605	590	570	530	510	485	375	275	200	145	100	60	35							
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	745	550	400	290	200	125	70							
150	A 217 C12	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾							
300		750	750	730	705	665	605	590	570	530	510	485	450	375	255	170	115	75	50							
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	505	345	225	150	105							
150	A 352 LCB ⁴⁾	265	255	230	200	170	140	125																		
300		695	660	640	615	585	550	535																		

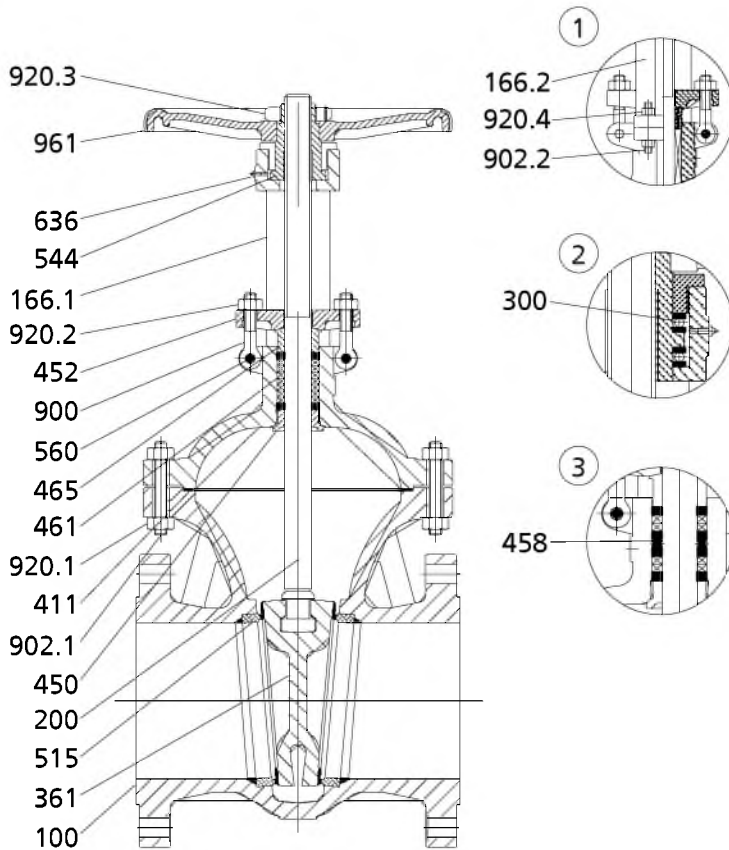
- 1) Permissible but not recommended for prolonged use above 427 °C (800 °F).
- 2) Cannot be used for temperatures above 593 °C (1100 °F).
- 3) For butt weld end valves only. Flanged end ratings terminate at 538 °C (1000 °F).
- 4) Cannot be used for temperatures above 343 °C (650 °F).
- 5) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
600		1395	1320	1275	1230	1175	1105	1065																		
150	A 352 LCC	290	260	230	200	170	140	125																		
300		750	750	730	705	665	605	590																		
600		1500	1500	1455	1405	1330	1210	1175																		
150	A 351 CF8 ⁵⁾	275	230	205	190	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾
300		720	600	540	495	465	440	430	420	415	405	395	390	380	355	325	255	205	165	135	115	95	75	60	40	
600		1440	1200	1075	995	930	885	865	845	825	810	790	780	765	710	650	515	410	330	265	225	185	150	115	85	
150	A 351 CF8M ⁵⁾	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾
300		720	620	560	515	480	450	440	435	425	420	420	415	385	365	360	305	235	185	145	115	95	75	60	40	
600		1440	1240	1120	1025	955	900	885	870	855	845	835	830	775	725	720	610	475	370	295	235	190	150	115	85	

Test pressures

Test	Test medium	Class 150		Class 300		Class 600	
		bar	psi	bar	psi	bar	psi
Shell	Water	32	450	78	1125	153	2225
Leak test (back seat)		23	315	56	815	112	1630
Leak test (seat)	Air	4-7	60-100	4-7	60-100	4-7	60-100

Materials



- ① Yoke (14"-36" Class 150, 14"-36" Class 300)
- ② Bearing (6"-36" Class 600)
- ③ Lantern ring (optional)

Parts list

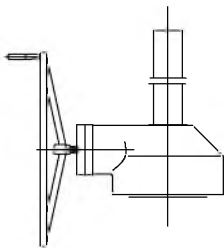
Part No.	Description	Material									
		A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A 352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M	
100	Body	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M	
166.1	Yoke	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M	
166.2	Yoke	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M	
361	Flexible wedge	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M	
515	Seat ring	A 105	A 182 F11	A 182 F22	A 182 F5	A 182 F9	A 182 LF2	A 350 LF2	A 182 F304	A 182 F316	
200	Stem	See "Trim materials" table									
450	Back seat bush	See "Trim materials" table									
465	Lower gland section	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	304	
452	Gland follower	A 216 WCB	A 216 WCB	A 216 WCB	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	
544	Threaded bush	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	A 439 D-2	
902.1	Stud	A 193 B7	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8	
920.1	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8	
461	Gland packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	
411	Joint ring	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	
900	Eyebolt	A 307 B	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8	
920.2	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8	
560	Pin	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel	
961	Handwheel	Nodular cast iron or malleable cast iron									
920.3	Handwheel nut	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel	
300	Bearing	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	
458	Lantern ring	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	316	

Part No.	Description	Material								
		A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A 352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
636	Lubricating nipple	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Stainless steel	Stainless steel
902.2	Stud	A 193 B7	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8
920.4	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8

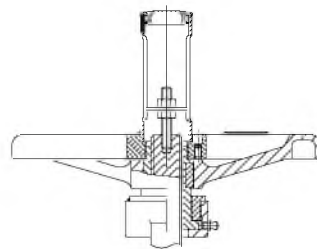
Trim materials

Part No.	Description	Trim 1	Trim 2	Trim 5	Trim 8	Trim 10
		13% chrome steel (Cr) / 13% chrome steel (Cr)	304 / 304	Stellite / Stellite	Stellite / 13% chrome steel (Cr)	316 / 316
361	Flexible wedge	13% chrome steel (Cr)	304 stainless steel	Stellite	13% chrome steel (Cr)	316 stainless steel
515	Seat ring	13% chrome steel (Cr)	304 stainless steel	Stellite	Stellite	316 stainless steel
200	Stem	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel
450	Back seat bush	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel

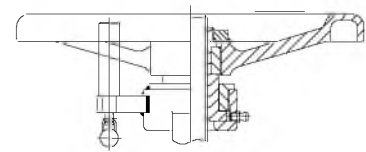
Variants



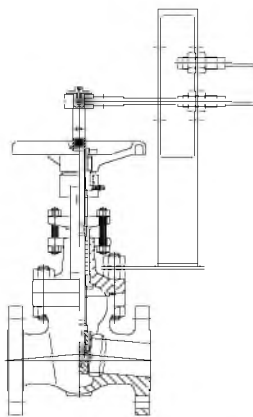
Gearbox



Position indicator

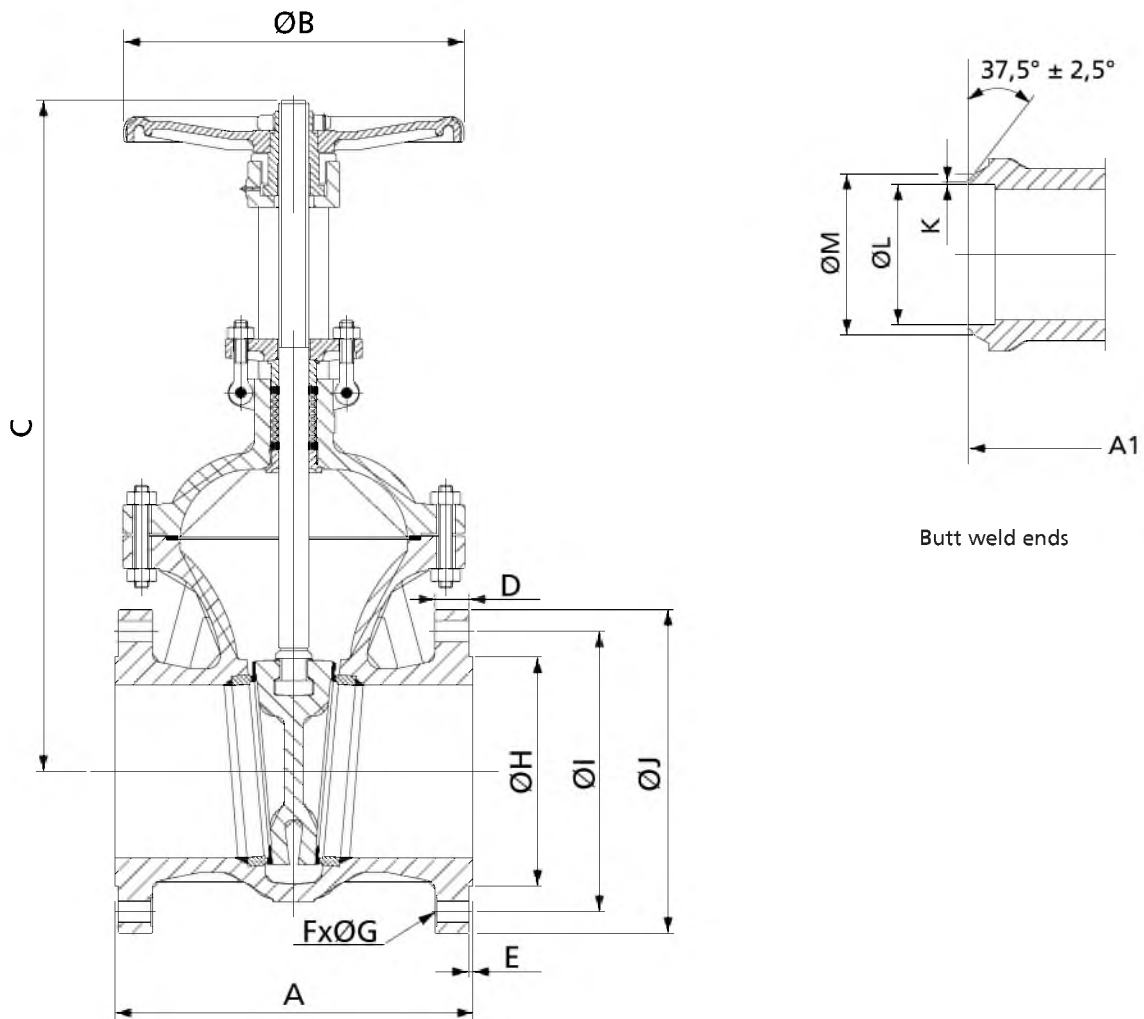


Locking device



Position switches

Dimensions



Butt weld ends

Dimensions in mm

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
150	2"	178	372	200	14,3	2	92,1	120,7	150	4	19,1	216	15
	2 ½"	190	439	200	15,9	2	104,8	139,7	180	4	19,1	241	23
	3"	203	433	250	17,5	2	127,0	152,4	190	4	19,1	282	25
	4"	229	510	250	22,3	2	157,2	190,5	230	8	19,1	305	40
	6"	267	730	350	23,9	2	215,9	241,3	280	8	22,4	403	70
	8"	292	933	350	27,0	2	269,9	298,5	345	8	22,4	419	125
	10"	330	1158	450	28,6	2	323,8	362,0	405	12	25,4	457	200
	12"	356	1395	500	30,2	2	381,0	431,8	485	12	25,4	502	280
	14"	381	1657	500	33,4	2	412,8	476,3	535	12	28,4	572	430
	16"	406	1908	610	35,0	2	469,9	539,8	595	16	28,4	610	585
	18"	432	2051	700	38,1	2	533,4	577,9	635	16	31,8	660	710
	20"	457	2260	800	41,3	2	584,2	635,0	700	20	31,8	711	860
	24"	508	2669	800	46,1	2	692,2	749,3	815	20	35,1	813	1260
30"	610	3606	610	74,7	2	857,3	914,4	984	28	35,1	914	2380	
36"	711	3924	610	90,4	2	1022,0	1086,0	1168	32	41,1	1016	3600	
300	2"	216	394	200	20,7	2	92,1	127,0	165	8	19,1	216	28
	2 ½"	241	505	250	23,9	2	104,8	149,2	190	8	22,4	241	45

⁶⁾ Open

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
	3"	282	496	250	27,0	2	127,0	168,3	210	8	22,4	282	45
	4"	305	618	250	30,2	2	157,2	200,0	255	8	22,4	305	65
	6"	403	831	350	35,0	2	215,9	269,9	320	12	22,4	403	135
	8"	419	1022	450	39,7	2	269,9	330,2	380	12	25,4	419	220
	10"	457	1237	500	46,1	2	323,8	387,4	445	16	28,4	457	375
	12"	502	1427	500	49,3	2	381,0	450,8	520	16	31,8	502	470
	14"	762	1738	610	52,4	2	412,8	514,4	585	20	31,8	762	855
	16"	838	1920	700	55,6	2	469,9	571,5	650	20	35,1	838	1110
	18"	914	2053	800	58,8	2	533,4	628,6	710	24	35,1	914	1235
	20"	991	2194	610	62,0	2	584,2	685,8	775	24	35,1	991	1655
600	24"	1143	2598	610	68,3	2	692,2	812,8	915	24	41,1	1143	2320
	30"	1397	3320	610	91,9	2	857,3	997,0	1092	28	41,1	1397	4930
	2"	292	428	200	25,4	7	92,1	127,0	165	8	19,1	292	32
	2 ½"	330	588	250	28,6	7	104,8	149,4	190	8	22,4	330	55
	3"	356	526	250	31,8	7	127,0	168,3	210	8	22,4	356	60
	4"	432	641	350	38,1	7	157,2	215,9	275	8	25,4	432	105
	6"	559	884	500	47,7	7	215,9	292,1	355	12	28,4	559	210
	8"	660	1060	500	55,6	7	269,9	349,2	420	12	31,8	660	365
	10"	787	1246	500	63,5	7	323,8	431,8	510	16	35,1	787	600
	12"	838	1546	610	66,7	7	381,0	489,0	560	20	35,1	838	820
	14"	889	1623	610	69,9	7	412,8	527,1	605	20	38,1	889	1316
	16"	991	1816	610	76,2	7	469,9	603,3	685	20	41,1	991	1672
	18"	1092	2260	610	82,6	7	533,4	654,1	745	20	44,5	1092	2070
	20"	1194	2705	610	88,9	7	584,2	723,9	815	24	44,5	1194	2405
	24"	1397	2810	610	101,6	7	692,2	838,2	940	24	50,8	1397	4550

Butt weld end dimensions in mm

NPS	Pipe OD	K	ØM	ØL for various pipe schedules													
				10	20	30	40	60	80	100	120	140	160	STD	XS	XXS	
2"	60,30	1,6 ±0,8	60,30	54,79			52,51		49,25					42,85	Sch 40	Sch 80	38,19
2 ½"	73,03	1,6 ±0,8	75,2	66,93			62,71		59,00					53,98	Sch 40	Sch 80	44,98
3"	88,90	1,6 ±0,8	91,2	82,80			77,93		73,66					66,65	Sch 40	Sch 80	58,42
4"	114,30	1,6 ±0,8	117,3	108,20			102,26		97,18		92,05			87,07	Sch 40	Sch 80	80,06
6"	168,28	1,6 ±0,8	172,2	161,47			154,05		146,33		139,73			131,75			
8"	219,08	1,6 ±0,8	223,0	211,56	206,38		202,72	198,45	193,68	188,90	182,55	177,83	173,05	Sch 40	Sch 80	174,63	
10"	273,05	1,6 ±0,8	277,9	264,67	260,35		254,51	247,65	242,87	236,52	230,17	222,25	215,90	Sch 40	Sch 60	Sch 140	
12"	323,85	1,6 ±0,8	329,4	314,71	311,15		303,23	295,30	288,90	280,97	273,05	266,70	257,20	304,80	298,45	Sch 120	
14"	355,60	1,6 ±0,8	362,0	342,90	339,75	336,55	333,35	325,42	317,50	307,95	300,02	292,10	284,18	Sch 30	330,20		
16"	406,40	1,6 ±0,8	412,8	393,70	390,55	387,35	381,00	373,08	363,52	354,03	344,47	333,35	325,42	Sch 30	Sch 40		
18"	457,20	1,6 ±0,8	464,3	444,50	441,35		428,65	419,10	409,55	398,48	387,35	377,85	366,73	438,15	431,80		
20"	508,00	1,6 ±0,8	515,9	495,30	488,95	482,60	477,82	466,75	455,63	442,93	431,80	419,10	407,97	Sch 20	Sch 30		
24"	609,60	1,6 ±0,8	619,3	596,90	590,55	581,05	574,65	560,37	547,67	531,83	517,55	504,85	490,52	Sch 20	584,20		
30"	762,00	1,6 ±0,8	771,7	746,15	736,60	730,25								742,95	Sch 20		
36"	914,40	1,6 ±0,8	927,1	898,55	889,00	882,65	876,30							895,35	Sch 20		

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
 Flanges (2"-24"): ASME B16.5
 Flanges (30"-36"): ASME B16.47
 Butt weld ends: ASME B16.25

Notes on installation

Flow may pass a gate valve in either direction. High-pressure valves with pressure relief arrangement are unidirectional, however.

⁶⁾ Open

Strainer

ECOLINE FYC 150-600

Class 150-600
NPS 2"-12"
Cast Steel / Stainless Steel
Bolted Cover
Flanged Ends

Type Series Booklet



Check Valves and Strainers

Strainers to ANSI/ASME

ECOLINE FYC 150-600



Main applications

- Fossil-fuelled power stations
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Fluids containing mineral oils
- Gas
- Oil

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS 2" - 12"
Max. permissible pressure	106 bar / 1500 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	816 °C / 1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (⇒Page 4)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 427 °C / 800 °F
ASTM A 351 CF8	Up to 816 °C / 1500 °F
ASTM A 351 CF8M	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Strainer to ASME B16.34
- Tested to API 598
- Y-pattern strainer
- Body made of cast steel or stainless steel
- Bolted cover
- Fully confined cover gasket
- Cover made of wear and corrosion-resistant materials
- Stainless steel/graphite gaskets
- Cylindrical screen made of stainless steel
- Drain plug
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Other mesh widths on request
- Other screen materials
- Other drain plug sizes
- Butt weld ends
- Non-destructive testing, e.g. radiographic testing
- NACE standard
- Other flanged end designs or butt weld ends to ASME B16.25
- Other material variants
- Larger nominal sizes and other variants on request

Product benefits

Long service life and high functional reliability

- All-stainless steel screen and holder suitable for the majority of application conditions; no risk of corrosion in the piping.

Reliable sealing and longer service life

- Male/female joint between body and cover prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.

Cost-efficient

- Y-pattern body with hydraulically favourable flow path: higher flow rates and lower pressure losses result in energy cost savings.

Extended maintenance-free service life

- Screen fine-machined to a smooth finish, causing foreign particles to slide smoothly down to the bottom of the screen. As a result, cleaning intervals and maintenance costs are reduced.

Versatile application

- Wide range of mesh widths and materials for handling various fluid types and properties, e.g. water, oil, gas and other process fluids.

Related documents

- Operating manual 7362.81

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating

- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Pipe schedule (for butt weld ends)
- Variants
- Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	-29 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
150	A 216 WCB ¹⁾	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4											
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3	22,1	15,9	9,3	5,9											
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9	44,1	31,7	19,0	11,7											
150	A 351 CF8 ²⁾	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9	27,2	26,9	26,2	24,5	22,4	17,6	14,1	11,4	9,3	7,9	6,6	5,2	4,1	2,8	
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8	54,5	53,8	52,7	49,0	44,8	35,5	28,3	22,8	18,3	15,5	12,8	10,3	7,9	5,9	
150	A 351 CF8M ²⁾	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0	29,0	28,6	26,5	25,2	24,8	21,0	16,2	12,8	10,0	7,9	6,6	5,2	4,1	2,8	
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3	57,6	57,2	53,4	50,0	49,6	42,1	32,8	25,5	20,3	16,2	13,1	10,3	7,9	5,9	

Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

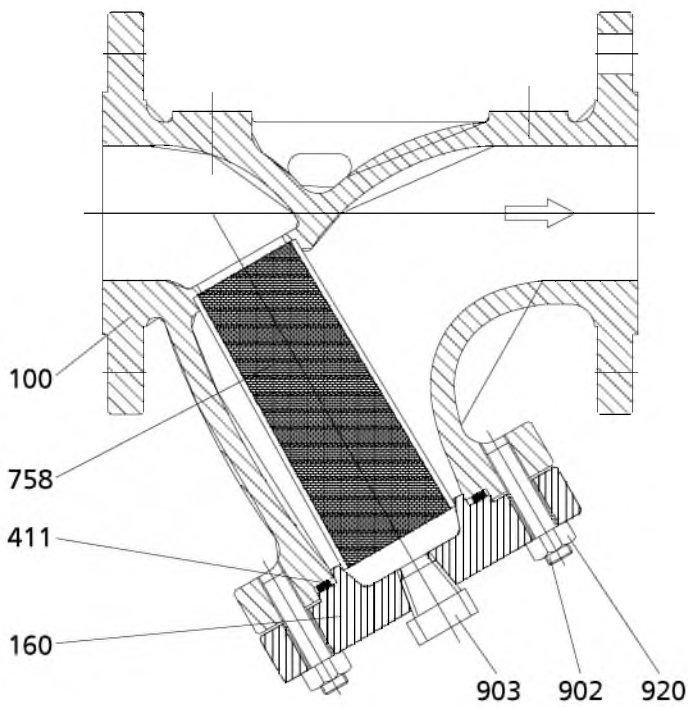
Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
150	A 216 WCB ¹⁾	285	260	230	200	170	140	125	110	95	80	65	50	35	20											
300		740	680	655	635	605	570	550	530	505	410	320	230	135	85											
600		1480	1360	1310	1265	1205	1135	1100	1060	1015	825	640	460	275	170											
150	A 351 CF8 ²⁾	275	230	205	190	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾
300		720	600	540	495	465	440	430	420	415	405	395	390	380	355	325	255	205	165	135	115	95	75	60	40	
600		1440	1200	1075	995	930	885	865	845	825	810	790	780	765	710	650	515	410	330	265	225	185	150	115	85	
150	A 351 CF8M ²⁾	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾
300		720	620	560	515	480	450	440	435	425	420	420	415	385	365	360	305	235	185	145	115	95	75	60	40	
600		1440	1240	1120	1025	955	900	885	870	855	845	835	830	775	725	720	610	475	370	295	235	190	150	115	85	

Test pressures

Test	Test medium	Class 150		Class 300		Class 600	
		bar	psi	bar	psi	bar	psi
Shell	Water	32	450	78	1125	153	2225

1) Permissible but not recommended for prolonged use above 427 °C (800 °F).
 2) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.
 3) For butt weld end valves only. Flanged end ratings terminate at 538 °C (1000 °F).

Materials



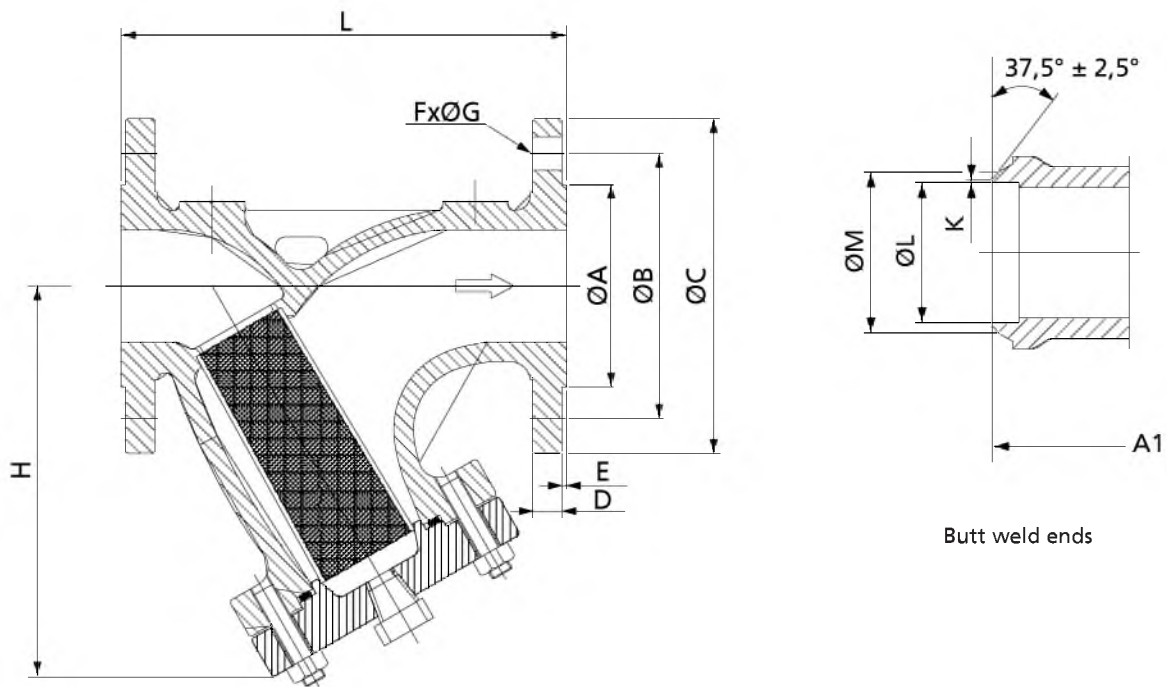
Parts list

Part No.	Description	Material		
		A 216 WCB	A 351 CF8	A 351 CF8M
100	Body	A 216 WCB	A 351 CF8	A 351 CF8M
758	Screen	See "Trim materials" table		
411	Joint ring	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel
160	Cover	A 216 WCB	A 351 CF8	A 351 CF8M
903	Drain plug	A 105	A 182 F304	A 182 F316
902	Stud	A 193 B7	A 193 B8	A 193 B8
920	Nut	A 194 2H	A 194 Gr. 8	A 194 Gr. 8

Trim materials

Part No.	Description	Trim 2	Trim 10
		304 / 304	316 / 316
758	Screen	304 stainless steel	316 stainless steel

Dimensions



Dimensions in mm

Class	NPS	L	H	D	E	ØA	ØB	ØC	F	ØG	A1	[kg]
150	2"	203	145	15,7	1,6	91,9	120,7	152	4	19,1	203	12
	2 ½"	216	183	17,5	1,6	104,6	139,7	178	4	19,1	216	18
	3"	241	206	19,1	1,6	127,0	152,4	191	4	19,1	241	21
	4"	292	228	23,9	1,6	157,2	190,5	229	8	19,1	292	32
	6"	356	329	25,4	1,6	215,9	241,3	279	8	22,4	356	48
	8"	495	440	28,4	1,6	269,7	298,5	343	8	22,4	495	105
	10"	622	507	30,2	1,6	323,9	362,0	406	12	25,4	622	169
300	12"	699	594	31,8	1,6	381,0	431,8	483	12	25,4	699	215
	2"	267	170	22,4	1,6	91,9	127,0	165	8	19,1	267	15
	2 ½"	292	185	25,4	1,6	104,6	149,4	191	8	22,4	292	18
	3"	318	235	28,4	1,6	127,0	168,1	210	8	22,4	318	35
	4"	356	290	31,8	1,6	157,2	200,2	254	8	22,4	356	51
	6"	445	375	36,6	1,6	215,9	269,7	318	12	22,4	445	92
	8"	533	450	41,1	1,6	269,7	330,2	381	12	25,4	533	182
600	10"	622	575	47,8	1,6	323,9	387,4	445	16	28,4	622	285
	12"	711	665	50,8	1,6	381,0	450,9	521	16	31,8	711	307
	2"	292	185	22,4	6,4	91,9	127,0	165	8	19,1	292	35
	2 ½"	330	200	25,4	6,4	104,6	149,4	191	8	22,4	330	40
	3"	356	250	28,4	6,4	127,0	168,1	210	8	22,4	356	48
	4"	432	300	31,8	6,4	157,2	200,2	254	8	22,4	432	90
	6"	559	415	36,6	6,4	215,9	269,7	318	12	22,4	559	220
	8"	660	490	41,1	6,4	269,7	330,2	381	12	25,4	660	360
	10"	787	595	47,8	6,4	323,9	387,4	445	16	28,4	787	781
	12"	838	680	50,8	6,4	381,0	450,9	521	16	31,8	838	1210

Butt weld end dimensions in mm

NPS	Pipe OD	K	ØM	ØL for various pipe schedules												
				10	20	30	40	60	80	100	120	140	160	STD	XS	XXS
2"	60,30	1,6 ±0,8	60,30	54,79			52,51		49,25				42,85	Sch 40	Sch 80	38,19
2 ½"	73,03	1,6 ±0,8	75,2	66,93			62,71		59,00				53,98	Sch 40	Sch 80	44,98

NPS	Pipe OD	K	ØM	ØL for various pipe schedules													
				10	20	30	40	60	80	100	120	140	160	STD	XS	XXS	
3"	88,90	1,6 ±0,8	91,2	82,80			77,93		73,66					66,65	Sch 40	Sch 80	58,42
4"	114,30	1,6 ±0,8	117,3	108,20			102,26		97,18		92,05			87,07	Sch 40	Sch 80	80,06
6"	168,28	1,6 ±0,8	172,2	161,47			154,05		146,33		139,73			131,75			
8"	219,08	1,6 ±0,8	223,0	211,56	206,38		202,72	198,45	193,68	188,90	182,55	177,83	173,05	Sch 40	Sch 80	174,63	
10"	273,05	1,6 ±0,8	277,9	264,67	260,35		254,51	247,65	242,87	236,52	230,17	222,25	215,90	Sch 40	Sch 60	Sch 140	
12"	323,85	1,6 ±0,8	329,4	314,71	311,15		303,23	295,30	288,90	280,97	273,05	266,70	257,20	304,80	298,45	Sch 120	

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
 Flanges: ASME B16.5
 Butt weld ends: ASME B16.25

Y-type strainers can be installed in horizontal or vertical pipes. The fluid must always enter through the screen inlet. Flow through Y-type strainers installed in vertical pipes must always be downwards.

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe Valve

ECOLINE GLF 150-600

Class 150-600
NPS ½"-2"
Forged Steel
Bolted Bonnet
Flanged Ends

Type Series Booklet



Globe Valves

Globe Valves with Gland Packing to ANSI/ASME

ECOLINE GLF 150-600



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Gas
- Hot water
- Fluids containing mineral oils
- Oil
- Feed water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS ½" - 2"
Max. permissible pressure	104 bar / 1480 PSI
Max. permissible temperature	816 °C / 1500 °F

Selection as per pressure/temperature ratings (→ Page 5)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 105	Up to 427 °C / 800 °F
ASTM A 182 F11	Up to 593 °C / 1100 °F
ASTM A 182 F22	Up to 593 °C / 1100 °F
ASTM A 182 F304	Up to 816 °C / 1500 °F
ASTM A 182 F316	Up to 816 °C / 1500 °F
ASTM A 182 F304L	Up to 427 °C / 800 °F
ASTM A 182 F316L	Up to 450 °C / 850 °F

Other materials on request.

Design details

Design

- Globe valve to API 602
- Tested to API 598
- Body made of forged steel
- Bolted bonnet
- Outside screw
- Outside yoke
- Rotating stem
- Rising handwheel
- Stem sealed by gland packing
- Reduced bore
- Two-piece self-aligning gland follower
- Graphite gland packing
- Stem with burnished shank
- Fully confined bonnet gasket
- Back seat
- Solid valve disc
- Integral seat - ST6 (HF)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Variants

- Seal-welded body/bonnet joint
- Full bore
- Hard-faced back seat
- Extended bonnet
- Locking device
- Position indicator
- Electric actuators
- Butt weld ends
- NACE standard
- Other flanged end designs or butt weld ends to ASME B16.25
- Other trims

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.2 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Hard-faced body seat and solid disc seat made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.
- Male/female joint between body and bonnet prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of chrome nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Hard-facing applied to valve disc and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term shut-off even with frequent opening/closing cycles.

- Integral seating surface is highly resistant to wear and easy to repair after long-term operation.

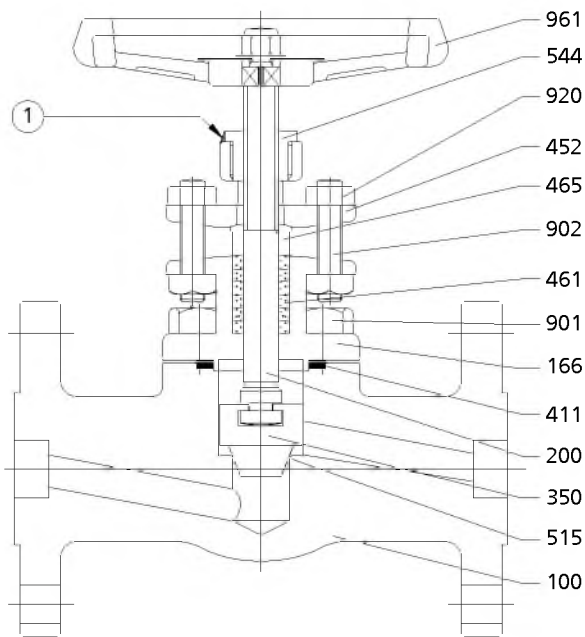
Related documents

- Globe valve, type ECOLINE GLF 800, see type series booklet 7361.14
- Operating manual 7361.81

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Reduced or full bore
- Variants
- Number of type series booklet

Materials

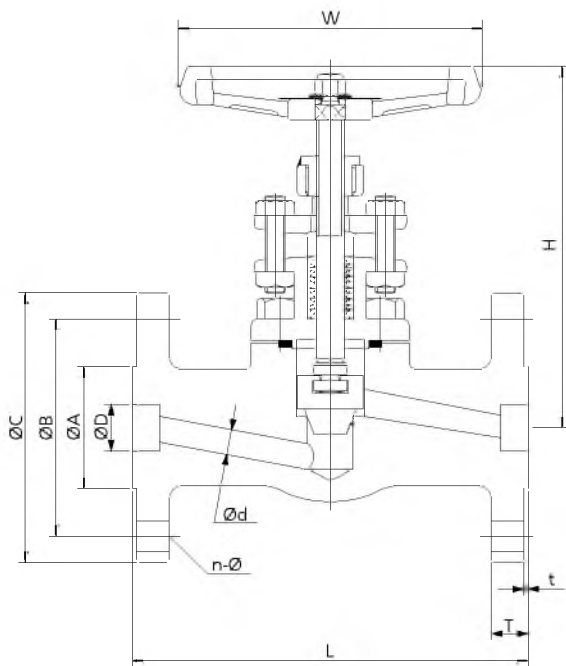


① Tack weld

Overview of available materials

Part No.	Description	Material				
		A 105 Trim 8	A 182 F11 Trim 5	A 182 F22 Trim 5	A 182 F304 Trim 2	A 182 F316 Trim 10
100	Body	A 105	A 182 F11	A 182 F22	A 182 F304	A 182 F316
166	Yoke	A 105	A 182 F11	A 182 F22	A 182 F304	A 182 F316
200	Stem	A 182 F6a	A 182 F6a	A 182 F6a	A 182 F304	A 182 F316
350	Valve disc	A 182 F6a	A 182 F6a + STL6	A 182 F6a + STL6	A 182 F304	A 182 F316
411	Joint ring	304 + graphite	304 + graphite	304 + graphite	304 + graphite	316 + graphite
452	Gland follower	A 105	A 105	A 105	A 182 F304	A 182 F316
465	Lower gland section	A 276 410	A 276 410	A 276 410	A 276 304	A 276 316
461	Gland packing	Flexible graphite	Flexible graphite	Flexible graphite	Flexible graphite	Flexible graphite
515	Seat ring	STL6 (integral)	STL6 (integral)	STL6 (integral)	304 (integral)	316 (integral)
544	Threaded bush	A 276 410	A 276 410	A 276 410	A 276 410	A 276 410
901	Bolt	A 193 B7	A 193 B16	A 193 B16	A 193 B8	A 193 B8M
902	Stud	A 193 B8	A 193 B16	A 193 B16	A 193 B8	A 193 B8
920	Nut	A 194 2H	A 194 8	A 194 8	A 194 8	A 194 8M
961	Handwheel	A 197	A 197	A 197	A 197	A 197

Dimensions



Dimensions in mm

Class	NPS	L	T	t	n-Ø	Ød	ØD	ØA	ØB	ØC	H ⁴⁾	W	[kg]
150	½"	108	11,5	1,6	4-16	9,5	15	35	60,5	89	155	100	2,70
	¾"	117	13,0	1,6	4-16	12,7	20	43	70,0	98	160	100	3,20
	1"	127	14,5	1,6	4-16	17,5	25	51	79,5	108	185	120	4,84
	1 ½"	165	17,5	1,6	4-16	28,6	40	73	98,5	127	235	150	8,00
	2"	178	19,5	1,6	4-19	36,5	50	92	120,5	152	282	180	12,50
300	½"	152	14,5	1,6	4-16	9,5	15	35	66,5	95	155	100	3,75
	¾"	178	16,0	1,6	4-19	12,7	20	43	82,5	117	160	100	5,40
	1"	203	17,5	1,6	4-19	17,5	25	51	89,0	124	185	120	8,36
	1 ½"	229	21,0	1,6	4-22	28,6	40	73	114,5	156	235	150	11,70
	2"	267	22,5	1,6	8-19	36,5	50	92	127,0	165	282	180	24,50
600	½"	165	20,7	6,4	4-16	9,5	15	35	66,5	95	155	100	5,00
	¾"	190	22,3	6,4	4-19	12,7	20	43	82,5	117	160	100	5,75
	1"	216	23,9	6,4	4-19	17,5	25	51	89,0	124	185	120	6,53
	1 ½"	241	28,7	6,4	4-22	28,6	40	73	114,5	156	235	150	12,50
	2"	292	31,8	6,4	8-19	36,5	50	92	127,0	165	282	180	17,90

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
Flanges: ASME B16.5

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

4) Open

Globe Valve

ECOLINE GLB 150-600

Class 150-600
NPS 2"-12"
Cast Steel / Stainless Steel
Bellows
Flanged Ends

Type Series Booklet



Globe Valves

Bellows-type Globe Valves to ANSI/ASME

ECOLINE GLB 150-600



Main applications

- Petrochemical industry
- Process engineering
- General industry
- Food and beverage industry
- Energy

Fluids handled

- Steam
- Thermal oil
- Explosive fluids
- Combustible fluids
- Fluids containing gas
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Feed water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS 2" - 12"
Max. permissible pressure	106 bar
Max. permissible temperature	427 °C

Selection as per pressure/temperature ratings (⇒ Page 5)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 427 °C
ASTM A 351 CF8	Up to 427 °C
ASTM A 351 CF8M	Up to 427 °C

Other materials on request.

Design details

Design

- Valve design to BS 1873 and MSS SP-117
- On/off disc
- Bolted bonnet
- Outside screw
- Outside yoke
- Integrated seat ring
- Metal-seated
- Rising stem
- Non-rising handwheel
- Graphite gland packing
- Stainless steel/graphite gaskets
- Travel stop
- Stem sealed by double-walled bellows and back-up gland packing
- Positive anti-rotation feature between stem and bellows
- Position indicator
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Variants

- Locking device
- Position switch(es)
- Version with free stem end and top flange to ISO 5210
- NACE standard
- Electric actuators
- Seal-welded body/bonnet joint
- Leakage monitoring hole in the gland packing area
- Replaceable seat ring

- TA-Luft-compliant model (with or without spring loading) for applications to VDI 2440 at temperatures up to 250 °C and above 250 °C (400 °C max.)
- Other flanged end designs or butt weld ends to ASME B16.25

Product benefits

- Leak-free stem seal
 - Primary sealing to atmosphere is provided by a multi-walled metal bellows welded to the stem and a graphite gasket between bonnet and yoke.
 - Secondary sealing of the stem passage to atmosphere is provided by a minimum of five graphite packing rings plus lower gland section for added safety.
- Longer service lives of valve and bellows
 - Specially designed multi-ply stainless steel bellows offers excellent corrosion resistance and flexibility; designed to withstand 1.5 times the nominal valve pressure.
 - Thanks to its position well outside the flow path, the bellows is not exposed to abrupt changes in fluid pressure which could result in lateral deformation and subsequent failure.
 - A stop attached to the stem by means of a pin ensures straight, non-rotating movement of the stem and bellows and prevents circumferential deformation at the bellows.
 - On some of the larger sizes, an additional valve disc guide accurately seats the valve disc on the body seat and prevents deformation of the long stem/bellows assembly.
 - Stellite-6 hard-facing applied to the seating surfaces of the body and the valve disc prevents the valve disc from seizing in the body seat and reduces wear.
- Reliable leakage protection of body
 - Yoke gaskets are fitted above and below the end plate of the bellows assembly and firmly compressed by a set of studs and nuts. The lower gasket is confined by the body shoulder and the end fitting of the bellows to prevent excessive compression.
 - Identical design of bonnet gasket and yoke gasket prevents excessive compression.
- Ease of service without additional costs
 - No costs for daily or frequent maintenance work during valve duty thanks to reliable bellows seal between the stem and the body.
 - If required, a leakage monitoring hole can be provided in the gland packing area.
 - The bolted bonnet and the design of the stem and bellows assembly enable straightforward dismantling in the event that defective internal components need to be replaced.

- The valve disc dismantles from the stem to allow straightforward repair in the event of damage to the valve disc and body seating surfaces.
- Operating reliability
 - When the valve is in the fully open position, the stop acts as a travel stop preventing excessive valve travel which could destroy the bellows or reduce the expected service life of the bellows.
 - The stop also provides anti-blow out protection, preventing the stem from being blown out of the valve body under high internal valve pressure when the valve is fully open.
- Suitable for various installation positions
 - Design with valve disc accurately guided onto the seat by means of a guiding plate enables special installation positions (in vertical pipes or with inclined but upward stem position). No chattering or jamming of valve disc during valve travel.
- Available for all kinds of fluids
 - Several material variants available for body and bellows to suit a variety of fluids and applications.

Related documents

- Gate valve, type ECOLINE GTB 800, see type series booklet 7372.1
- Globe valves, type ECOLINE GLB 800, see type series booklet 7368.1
- Operating manual 7366.8

On all enquiries/orders please specify

- Type
- Class
- Nominal size
- Pressure rating
- Temperature rating
- Differential pressure
- Fluid handled
- Material
- Trim material (API trim number)
- Line connection
- Pipe schedule (for butt weld ends)
- Variants
- Number of type series booklet

Pressure/temperature ratings

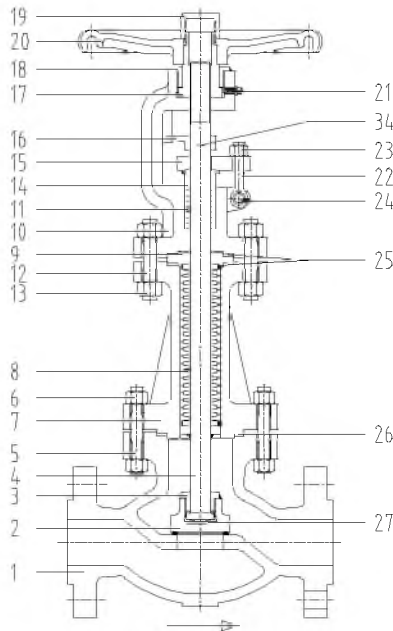
Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427
150	A 216 WCB	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9
150	A 351 CF8	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8
150	A 351 CF8M	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3

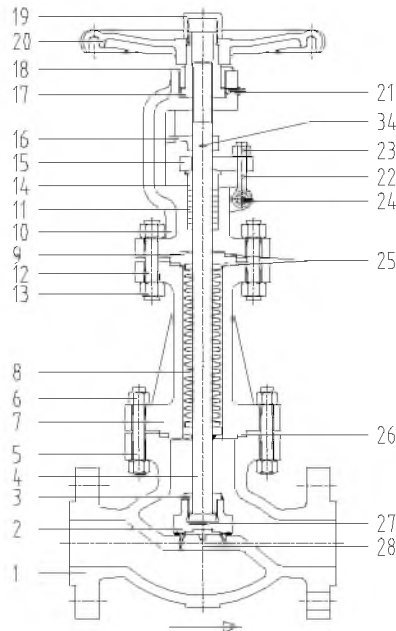
Test pressures

Test	Test medium	Class 150		Class 300		Class 600	
		bar	psi	bar	psi	bar	psi
Shell	Water	32	450	78	1125	153	2225
Leak test (seat)		23	315	56	815	112	1630
Leak test (seat)	Air	5,5	80	5,5	80	5,5	80

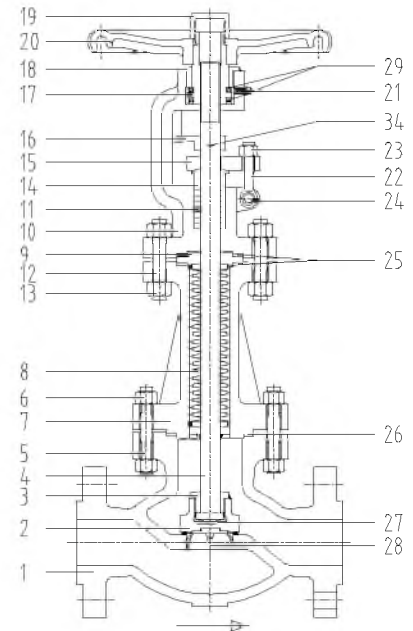
Materials



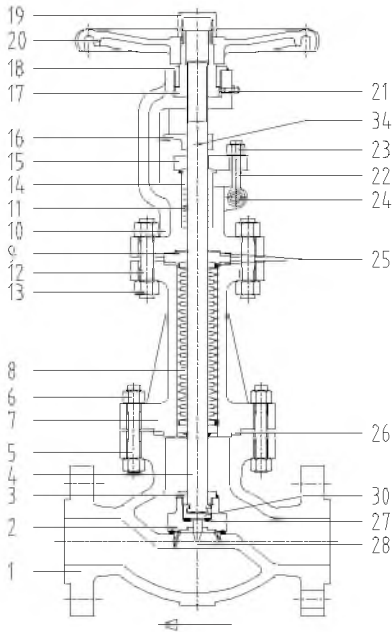
Class 150: 2" - 4"
Class 300: 2" - 4"
Class 600: 2" - 3"



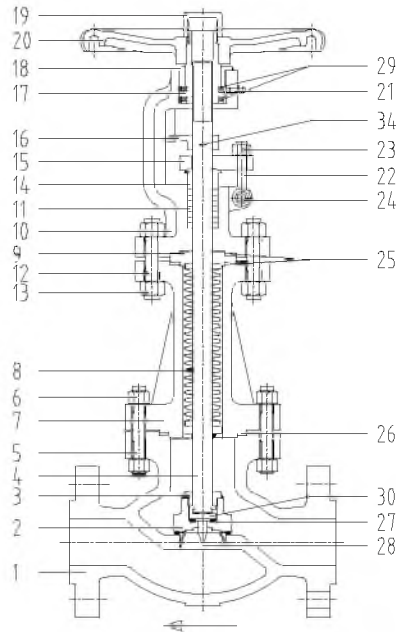
Class 150: 6"



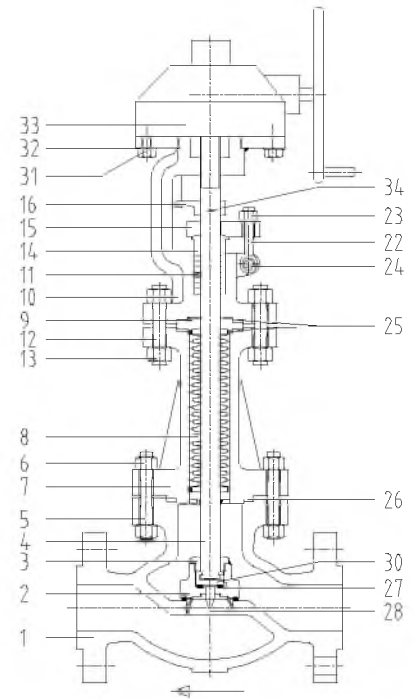
Class 150: 8"



Class 300: 6"
Class 600: 4"



Class 300: 8"
Class 600: 6"



Class 150: 10" - 12"
Class 300: 10" - 12"
Class 600: 8"

Overview of available materials

Part No.	Description	Material			
		Bellows: A 182 F316L ¹⁾			
		A 216 WCB/Trim 8	A 216 WCB/Trim 5	A 351 CF8/Trim 2	A 351 CF8M/Trim 10
1	Body	A 216 WCB	A 216 WCB + ST6	A 351 CF8	A 351 CF8M
2	Valve disc	A 105 + 13 % chrome (Cr)	A 105 + ST6	A 182 F304	A 182 F316
3	Nut	A 105	A 105	A 182 F304	A 182 F316
4 ²⁾	Stem	2 Cr 13	2 Cr 13	A 182 F304	A 182 F316
5	Stud	A 193 B7	A 193 B7	A 193 B8	A 193 B8
6	Nut	A 194 2H	A 194 2H	A 194 Gr. 8	A 194 Gr. 8
7	Bonnet	A 216 WCB	A 216 WCB	A 351 CF8	A 351 CF8M
8 ²⁾	Bellows	SS 316L	SS 316L	SS 316L	SS 316L
9 ²⁾	End plate ³⁾	SS 316L	SS 316L	SS 316L	SS 316L
10	Yoke	A 216 WCB	A 216 WCB	A 351 CF8	A 351 CF8M
11 ²⁾	Gland packing	Graphite	Graphite	Graphite	Graphite
12	Stud	A 193 B7	A 193 B7	A 193 B8	A 193 B8
13	Nut	A 194 2H	A 194 2H	A 194 Gr. 8	A 194 Gr. 8
14	Lower gland section	1 Cr 13	1 Cr 13	SS 304	SS 316
15	Gland follower	Carbon steel	Carbon steel	Stainless steel	Stainless steel
16 ²⁾	Stop	Carbon steel	Carbon steel	Stainless steel	Stainless steel
17	Stem nut	D-2	D-2	D-2	D-2
18	Threaded ring	Carbon steel	Carbon steel	Stainless steel	Stainless steel
19	Cap	Carbon steel	Carbon steel	Stainless steel	Stainless steel
20	Handwheel	Nodular cast iron	Nodular cast iron	Nodular cast iron	Nodular cast iron
21	Lubricating nipple	Stainless steel	Stainless steel	Stainless steel	Stainless steel
22	Eyebolt	A 193 B7	A 193 B7	A 193 B8	A 193 B8
23	Nut	A 194 2H	A 194 2H	A 194 Gr. 8	A 194 Gr. 8
24	Pin	Carbon steel	Carbon steel	Stainless steel	Stainless steel

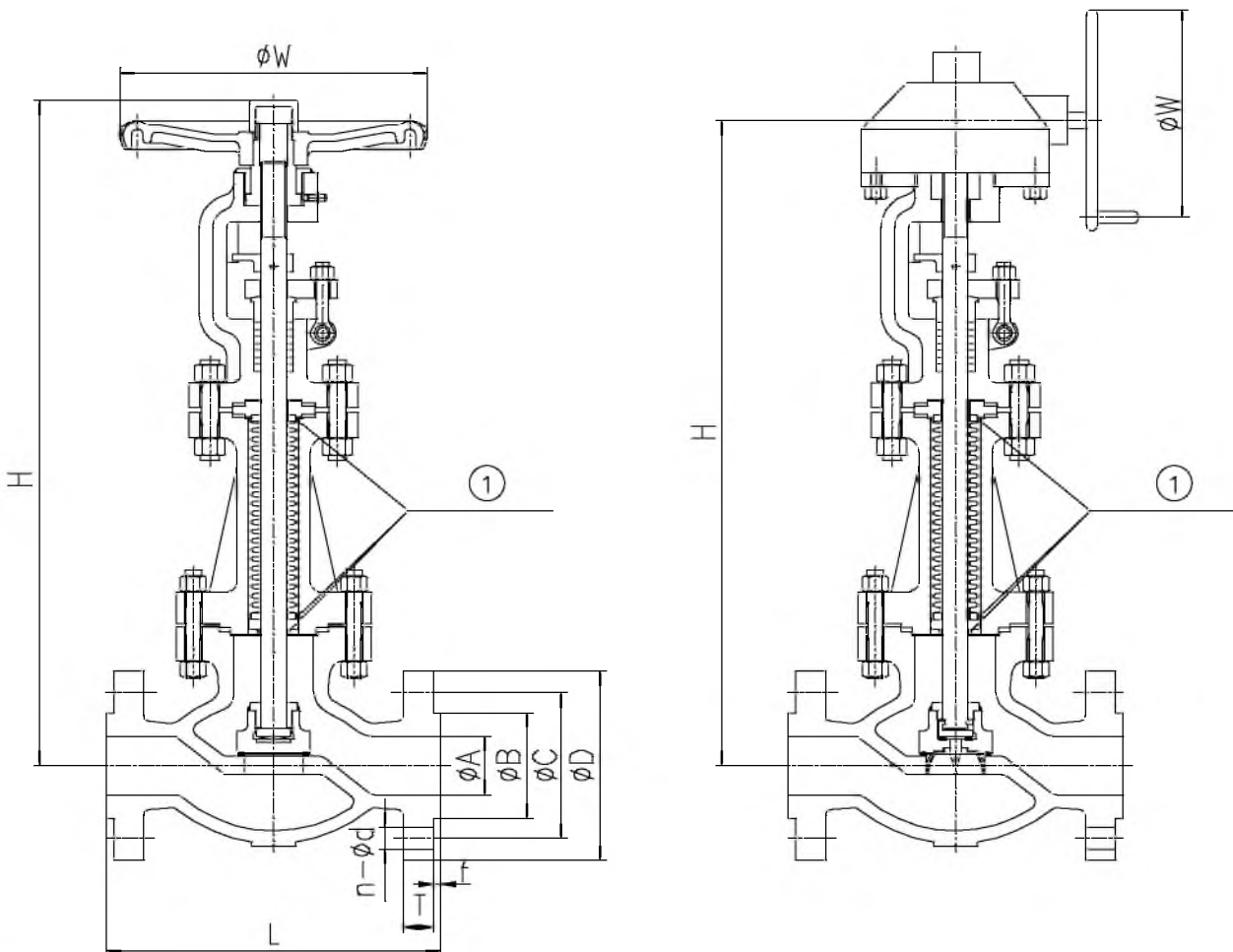
1) Other bellows materials on request, e.g. SS316Ti.

2) Recommended spare parts

3) Welded to bellows

Part No.	Description	Material			
		Bellows: A 182 F316L ¹⁾			
		A 216 WCB/Trim 8	A 216 WCB/Trim 5	A 351 CF8/Trim 2	A 351 CF8M/Trim 10
25 ²⁾	Gasket	SS 316 + graphite	SS 316 + graphite	SS 316 + graphite	SS 316 + graphite
26 ²⁾	Gasket	SS 316 + graphite	SS 316 + graphite	SS 316 + graphite	SS 316 + graphite
27	Disc thrust plate	1 Cr 13	1 Cr 13	SS 304	SS 316
28	Valve disc guide	Carbon steel	Carbon steel	Stainless steel	Stainless steel
29	Bearing	-	-	-	-
30	Pilot plug	A 105 + 13 % chrome (Cr)	A 105 + ST6	A 182 F304	A 182 F316
31	Bolt	Carbon steel	Carbon steel	Stainless steel	Stainless steel
32	Washer	Carbon steel	Carbon steel	Stainless steel	Stainless steel
33	Gearbox	-	-	-	-
34 ²⁾	Pin	Carbon steel	Carbon steel	Stainless steel	Stainless steel

Dimensions



①	Seal-welded
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Dimensions in mm

Class	NPS	L	Ø A	Ø B	Ø C	Ø D	T	f	n - Ø d	H ⁴⁾	Ø W	Travel	[kg]
150	2"	203	50,8	92,1	120,7	150	14,3	2	4 - 19	391	200	15	23
	2 ½"	216	63,5	104,8	139,7	180	15,9	2	4 - 19	459	200	20	31

1) Other bellows materials on request, e.g. SS316Ti.

4) Open

Class	NPS	L	Ø A	Ø B	Ø C	Ø D	T	f	n - Ø d	H ⁴⁾	Ø W	Travel	[kg]
300	3"	241	76,2	127,0	152,4	190	17,5	2	4 - 19	500	250	25	45
	4"	292	101,6	157,2	190,5	230	22,3	2	8 - 19	593	300	30	63
	6"	406	152,4	215,9	241,3	280	23,9	2	8 - 22	682	400	40	115
	8"	495	203,2	269,9	298,5	345	27,0	2	8 - 22	779	450	55	204
	10"	622	254,0	323,8	362,0	405	28,6	2	8 - 19	956	460 ⁵⁾	65	351
	12"	698	304,5	381,0	431,8	458	30,2	2	8 - 19	1159	540 ⁵⁾	80	534
	2"	267	50,8	92,1	127,0	165	20,7	2	8 - 19	409	250	15	31
	2 ½"	292	63,5	104,8	149,2	190	23,9	2	8 - 22	481	250	20	44
	3"	318	76,2	127,0	168,3	210	27,0	2	8 - 22	529	250	25	62
	4"	356	101,6	157,2	200,0	255	30,2	2	8 - 22	621	300	30	84
	6"	444	152,4	215,9	269,9	320	35,0	2	12 - 22	808	400	40	182
	8"	559	203,2	269,9	330,2	380	39,7	2	12 - 25	976	450	55	300
600	10"	622	254,0	323,8	387,4	445	46,1	2	16 - 28	1118	610 ⁵⁾	65	541
	12"	711	304,8	381,0	450,8	520	49,3	2	16 - 32	1287	610 ⁵⁾	80	725
	2"	292	50,8	92,1	127,0	165	25,4	7	8 - 19	474	250	15	49
	2 ½"	330	63,5	104,8	149,4	190	28,6	7	8 - 22	549	250	20	65
	3"	356	76,2	127,0	168,3	210	31,8	7	8 - 22	608	350	25	80
	4"	432	101,6	157,2	215,9	275	38,1	7	8 - 25	724	400	30	134
	6"	559	152,4	215,9	292,1	355	47,7	7	12 - 28	1016	500	40	333
	8"	660	199,9	269,9	349,2	420	55,6	7	12 - 32	1271	610 ⁵⁾	55	620

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
Flanges: ASME B16.5

Overview of available materials

Overview of variants

Class	NPS	Single valve disc	Double valve disc (with pilot plug)	Guided valve disc	Handwheel-operated	Gearbox-operated
150	2	✓	✗	○	✓	○
	2 ½"	✓	✗	○	✓	○
	3	✓	✗	○	✓	○
	4	✓	✗	○	✓	○
	6	✓	✗	✓	✓	○
	8	✓	✗	✓	✓	○
	10	✗	✓	✓	✗	✓
	12	✗	✓	✓	✗	✓
300	2	✓	✗	○	✓	○
	2 ½"	✓	✗	○	✓	○
	3	✓	✗	○	✓	○
	4	✓	✗	○	✓	○
	6	✗	✓	✓	✓	○
	8	✗	✓	✓	✓	○
	10	✗	✓	✓	✗	✓
	12	✗	✓	✓	✗	✓
600	2	✓	✗	○	✓	○
	2 ½"	✓	✗	○	✓	○
	3	✓	✗	○	✓	○
	4	✗	✓	✓	✓	○
	6	✗	✓	✓	✓	○
	8	✗	✓	✓	✗	✓

Key to the symbols

Symbol	Description
✓	Standard design
○	Optional, available on request
✗	Not available

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

- 4) Open
5) Diameter of gearbox handwheel

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

Gate Valve

ECOLINE GTB 800

Class 150-600, Class 800
NPS ½"-2"
Forged Steel/Stainless Steel
Bellows
Flanged/Socket Weld Ends
or Threaded Ends

Type Series Booklet



Gate Valves

Gate Valves with Bolted Bonnet to ANSI/ASME

ECOLINE GTB 800



Main applications

- Petrochemical industry
- Process engineering
- General industry
- Food and beverage industry
- Sugar industry

Fluids handled

- Steam
- Explosive fluids
- Combustible fluids
- Liquids containing gas or vapour
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Feed water
- Thermal oil
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 800
Nominal size	NPS ½" - 2"
Max. permissible pressure	136 bar
Max. permissible temperature	425 °C

Selection as per pressure/temperature ratings (⇒ Page 5)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 105	Up to 425 °C
ASTM A 182 F304	Up to 425 °C
ASTM A 182 F316	Up to 425 °C

Other materials on request.

Design details

Design

- Valve design to ASME B16.34, API 602 and MSS SP-117
- Bolted bonnet
- Outside screw
- Outside yoke
- Reduced/full bore
- Single-piece wedge
- Integrated seat ring
- Metal-seated
- Rising stem
- Non-rotating stem
- Non-rising handwheel
- Graphite gland packing
- Stainless steel/graphite gaskets
- Travel stop
- Wedge guided in the body
- Stem sealed by double-walled bellows and back-up gland packing
- Positive anti-rotation feature between stem and bellows
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Variants

- Full bore
- PTFE gasket (up to 200 °C)
- PTFE gland packing (up to 200 °C)
- Locking device
- Position switch(es)
- Position indicator
- Seal-welded body/bonnet joint

- Stellite seat/disc interface
- Version with free stem end and top flange to ISO 5210
- Pressure relief hole in wedge inlet side
- Y-pattern
- Body extension with nipple
- NACE standard
- TA-Luft-compliant model (with or without spring loading) for applications to VDI 2440 at temperatures up to 250 °C and above 250 °C (400 °C max.)
- Electric actuators
- Other flanged end designs or butt weld ends to ASME B16.25

Product benefits

- Leak-free stem seal
 - Primary sealing to atmosphere is provided by a multi-walled metal bellows welded to the stem and a graphite gasket between body and bonnet.
 - Secondary sealing of the stem passage to atmosphere is provided by a minimum of five graphite packing rings plus lower gland section for added safety.
 - In the event of a ruptured bellows, fluid leakage along the stem passage is temporarily contained by the integral back seat.
- Longer service lives of valve and bellows
 - Specially designed multi-ply stainless steel bellows offers excellent corrosion resistance and flexibility; designed to withstand 1.5 times the nominal valve pressure.
 - Thanks to its position well outside the flow path, the bellows is not exposed to abrupt changes in fluid pressure which could result in lateral deformation and subsequent failure.
 - The wedge is accurately guided in a square groove in the body, ensuring straight, non-rotating movement of the stem and bellows and preventing circumferential deformation at the bellows.
 - Stellite hard-facing applied to the seating surfaces of the seat rings and the wedge prevents the wedge from seizing on the seat rings and reduces wear. A minimum hard-faced layer of 1.6 mm is retained after machining.
- Reliable leakage protection of body
 - Integrally forged extension; no further potential leakage points (compared to welded design).
 - Valve body with integrally forged flanged ends withstands higher pressures than body with welded flanges.
 - Gaskets are fitted above and below the end fitting of the bellows assembly and firmly compressed by a set of bolts. The lower gasket is confined by the body shoulder and the end fitting of the bellows to prevent excessive compression.

- Ease of service without additional costs
 - No costs for daily or frequent maintenance work during valve duty thanks to reliable bellows seal between the stem and the body.
 - If required, a leakage monitoring hole can be provided in the gland packing area.
 - The bolted bonnet and the design of the stem and bellows assembly enable straightforward dismantling in the event that defective internal components need to be replaced.
 - Damage on wedge and seat rings can easily be remedied due to the "T"-shaped connection between wedge and stem.
- Operating reliability
 - Standard travel stop prevents excessive valve travel which could destroy the bellows or reduce the expected service life of the bellows.
 - Anti-blow out stem design prevents stem from being blown out of the valve body under high internal valve pressure.
- Suitable for various installation positions
 - Design with wedge accurately guided in the body enables special installation positions (in vertical pipes or with inclined but upward stem position). No chattering or jamming of wedge during valve travel.
- Available for all kinds of fluids
 - Several material variants available for body and bellows to suit a variety of fluids and applications.

Related documents

- Globe valves, type ECOLINE GLB 800, see type series booklet 7368.1
- Operating manual 7368.8

On all enquiries/orders please specify

1. Type
2. Class
3. Nominal size
4. Design pressure/temperature
5. Operating pressure
6. Operating temperature
7. Differential pressure
8. Material
9. Fluid handled
10. Flow rate
11. Pipe connection
12. Pipe schedule
13. Variants
14. Number of type series booklet

Pressure/temperature ratings

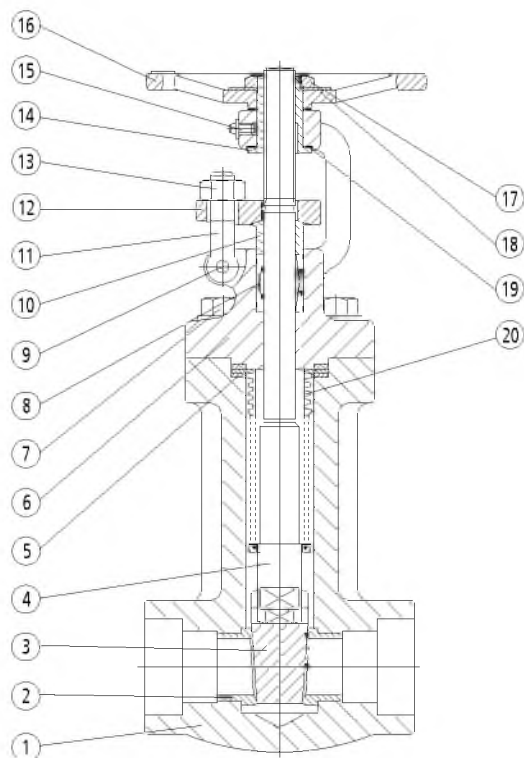
Permissible operating pressures in bar at temperatures in °C (to API 602 and ASME B16.34)

Class	Material	0 to 38	93	149	204	260	316	343	371	399	427
150	A 105	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9
800		136,0	124,8	120,5	116,4	110,9	104,5	101,1	97,4	93,2	75,7
150	A 182 F304	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8
800		132,4	110,3	98,9	91,4	85,5	81,2	79,4	77,6	76,0	74,5
150	A 182 F316	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3
800		132,4	114,0	102,9	94,3	87,9	82,9	81,2	80,0	78,5	77,6

Test pressures

Test	Test medium	Class 150		Class 300		Class 600		Class 800	
		bar	psi	bar	psi	bar	psi	bar	psi
Shell	Water	31,0	450	77,6	1125	153,4	2225	205,1	2975
Leak test (seat)		22,4	325	56,9	825	113,8	1650	149,8	2173
Leak test (seat)	Air	5,5	80	5,5	80	5,5	80	5,5	80

Materials



Overview of available materials

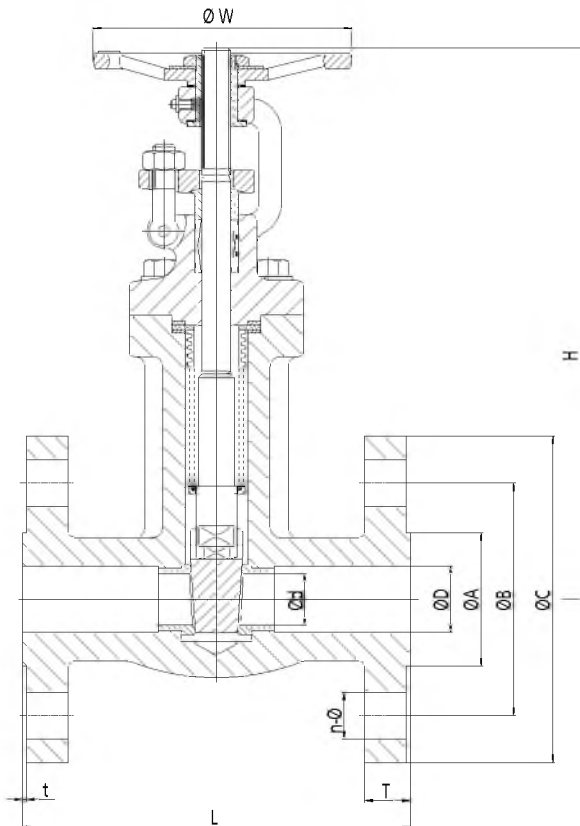
Part No.	Description	Material		
		Trim 8	Trim 2	Trim 10
1	Body	A 105	A 182 F304	A 182 F316
2	Seat ring	A 276 410 + STL6	A 276 304	A 276 316
3	Wedge	A 182 F6a	A 182 F304	A 182 F316
4	Stem	A 182 F6a	A 182 F304	A 182 F316
5	Bonnet gasket	SS316 + graphite	SS316 + graphite	316 + graphite
6	Bonnet	A 105	A 182 F304	A 182 F316

Part No.	Description	Material		
		Trim 8	Trim 2	Trim 10
7	Bolt	A 193 B7	A 193 B8	A 193 B8M
8	Gland packing	Graphite	Graphite	Graphite
9	Pin	A 276 410	A 276 304	A 276 316
10	Lower gland section	A 276 420	A 276 304	A 276 316
11	Eyebolt	A 193 B7	A 193 B8	A 193 B8
12	Gland follower	A 105	A 182 F304	A 182 F316
13	Nut	A 194 2H	A 194 8	A 194 8
14	Stem nut	A 276 410	A 276 410	A 276 410
15	Lubricating nipple	Brass	Brass	Brass
16	Handwheel	A 197	A 197	A 197
17	Nut	A 194 2H	A 194 8	A 194 8
18	Name plate	SS304	SS304	SS304
19	Washer	A 276 410	A 276 410	A 276 410
20 ¹⁾	Bellows	SS304	SS316L	SS316L

1) Other bellows materials on request.

Dimensions

Dimensions Class 150 to 600



Dimensions in mm

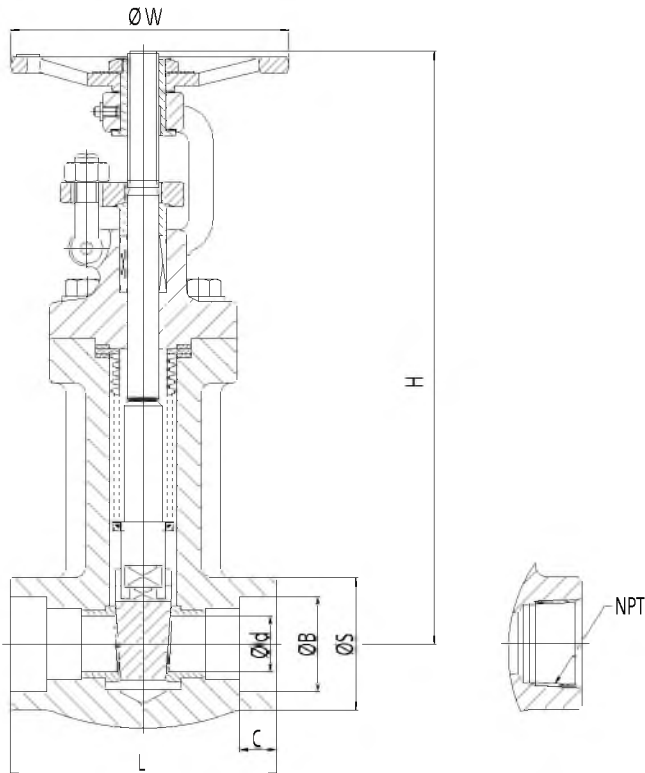
Class	NPS	L	T	t	n-Ø	Ød	ØD	ØA	ØB	ØC	H ²⁾	W	[kg]
150	½"	108	9,6	1,6	4-16	13	15	34,9	60,3	90	242	100	3,0
	¾"	117	10,5	1,6	4-16	13	20	42,9	69,9	100	242	100	3,5
	1"	127	11,2	1,6	4-16	18	25	50,8	79,4	110	287	125	5,5
	1 ¼"	140	12,8	1,6	4-16	24	32	63,5	89,9	115	384	160	6,8
	1 ½"	165	14,3	1,6	4-16	29	40	73,0	98,4	125	384	160	10,4
	2"	178	15,9	1,6	4-19	36,8	50	92,1	120,7	150	454	180	14,4
300	½"	140	14,3	1,6	4-16	13	15	34,9	66,7	95	242	100	3,6
	¾"	152	15,9	1,6	4-19	13	20	42,9	82,6	115	242	100	4,9
	1"	165	17,5	1,6	4-19	18	25	50,8	88,9	125	287	125	7,0
	1 ¼"	178	19,1	1,6	4-19	24	32	63,5	98,4	135	384	160	9,4
	1 ½"	190	20,7	1,6	4-22	29	40	73,0	114,3	155	384	160	13,3
	2"	216	22,3	1,6	8-19	36,8	50	92,1	127,0	165	454	180	18,0
600	½"	165	20,7	6,4	4-16	13	15	34,9	66,7	95	242	100	4,2
	¾"	190	22,3	6,4	4-19	13	20	42,9	82,6	115	242	100	5,8
	1"	216	23,9	6,4	4-19	18	25	50,8	88,9	125	284	125	8,8
	1 ¼"	229	27,1	6,4	4-19	24	32	63,5	98,4	135	384	160	12,1
	1 ½"	241	28,7	6,4	4-22	29	40	73,0	114,3	155	384	160	15,6
	2"	292	31,8	6,4	8-19	36,8	50	92,1	127,0	165	454	180	19,5

Mating dimensions - Standards

Face-to-face ASME B16.5
lengths:
Flanges: ASME B16.5

2) Open

Dimensions Class 800



Dimensions in mm

Class	NPS	L	Ød	ØB	C	S	NPT	H ³⁾	W	[kg]
800	½"	79	10	21,8	10	34	½"	242	100	2,9
	¾"	92	13	27,2	13	40	¾"	242	100	3,2
	1"	111	18	33,9	13	49	1"	287	125	5,9
	1 ¼"	120	24	42,7	13	58	1 ¼"	384	160	8,7
	1 ½"	120	29	48,8	13	64	1 ½"	384	160	10,2
	2"	140	36	61,2	16	78	2"	454	180	16,0

Mating dimensions - Standards

Face-to-face lengths: see table
 Threaded ends: ASME B1.20.1
 Socket weld ends: ASME B16.11

Notes on installation

Flow may pass a gate valve in either direction. High-pressure valves with pressure relief arrangement are unidirectional, however.

³⁾ Open

ANSI/ASME Two-Piece Ball Valves



Floating Ball
Full Bore
Flanged End

Class 150 – 300
½" – 12"

Applications

- Process and general industry
- For water, steam, gas, oil, and other media
- Other applications on request

Operating Data

- Maximum allowable pressure 740 psi (51 bar)
- Maximum allowable temperature 392°F (200°C)
- Pressure/Temperature ratings per ASME B16.34
- Temperature below 0°C on request

Body Materials

- ASTM A216 WCB Carbon Steel
- ASTM A351 CF8 Type 304 Stainless Steel
- ASTM A351 CF8M Type 316 Stainless Steel

Ball Materials

- ASTM A351 CF8 Type 304 Stainless Steel
- ASTM A351 CF8M Type 316 Stainless Steel

Seat Material

- PTFE up to 320°F (160°C)

Design

- Design per ASME B16.34
- Pressure/temperature rating per ASME B16.34
- End-end dimension per ASME B16.10
- Flange dimensions per ASME B16.5
- Testing per API 598
- Full bore
- Two-piece body
- Blowout proof stem
- ISO 5211 mounting pad
- Locking device
- Solid ball
- Antistatic device

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of Annex I for Fluid Groups 1 and 2.

Variants on request

- Gear operators
- Fire safe configuration
- RPTFE seats up to 392°F (200°C)
- PTFE + graphite seats up to 392°F (200°C)
- Pneumatic actuator
- Electric actuator

Remarks

- Operating Instructions No. 8222.81
- ECOLINE-BLC 1000 type series booklet no. 8222.53
- ECOLINE-GT type series booklet no. 7247.11
- ECOLINE-GL type series booklet no. 7247.12
- ECOLINE-SC type series booklet no. 7247.13

On all enquiries/orders please specify

1. Valve type
2. ANSI pressure class
3. Size
4. Design pressure
5. Design temperature
6. Differential pressure-shut off
7. Flow medium
8. Material of construction
9. Variants
10. Type series booklet number
11. Valve data sheet if applicable

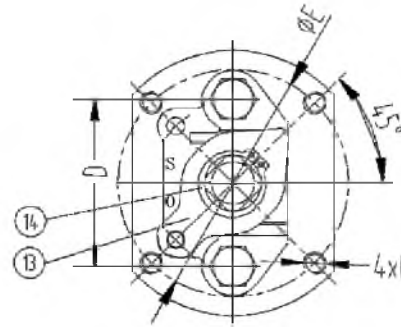
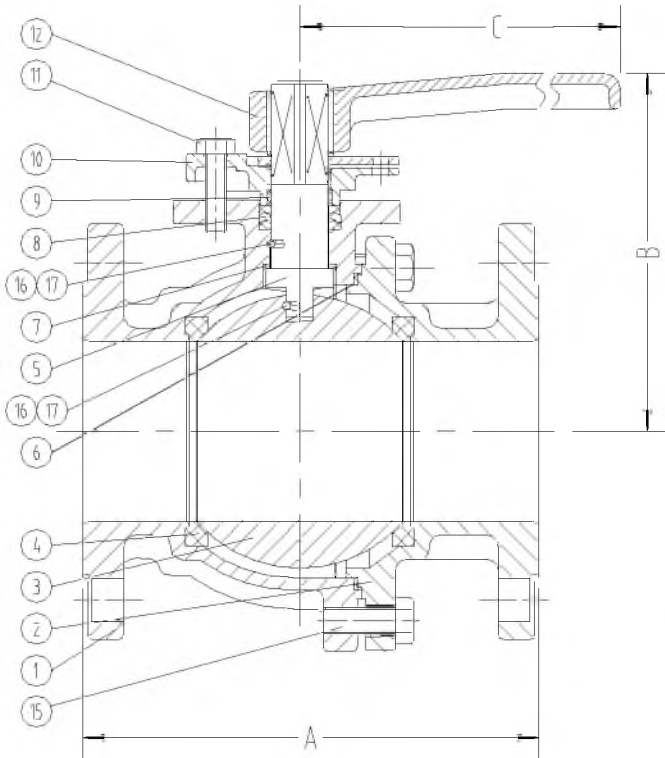
When ordering spare parts, indicate valve product code. (shown on nameplate) and serial number.



Two-Piece Ball Valves – Type BLT 150 – 300

Design Specifications

General Valve Design	: ASME B16.34
Pressure/Temperature Rating	: ASME B16.34
Flange Dimensions	: ASME B16.5
End-to-End	: ASME B16.10
Testing	: API 598



Dimensions and Data

CLASS	NPS	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6	8	10	12
150	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300
A	inch	4.25	4.63	5.00	5.50	6.50	7.00	7.50	8.00	9.00	14.00	15.50	18.00	21.00	24.00
	mm	108	117	127	140	165	178	190	203	229	356	394	457	533	610
B	inch	2.83	2.99	3.62	3.74	4.09	4.49	5.59	6.02	6.54	8.82	9.72	12.01	12.87	Gear
	mm	72	76	92	95	104	114	142	153	166	224	247	305	327	
C	inch	4.84	4.84	7.20	6.02	7.32	7.32	12.76	12.76	12.76	29.53	29.53	39.37	39.37	Gear
	mm	123	123	183	153	186	186	324	324	324	750	750	1000	1000	
D	inch	-	-	-	-	2.44	2.44	2.44	2.95	2.95	3.50	3.50	3.94	3.94	3.94
	mm	-	-	-	-	62	62	75	75	75	89	89	100	100	100
E	inch	1.42	1.42	11.97	1.65	2.76	2.76	2.76	4.02	4.02	4.92	4.92	4.92	5.51	5.51
	mm	36	36	50	42	70	70	70	102	102	125	125	125	140	140
F	--	M5	M5	M6	M5	M8	M8	M8	M10	M10	M12	M12	M12	M16	M16
	lbs	3.3	4.0	6.1	7.9	12	18	29	40	62	101	146	268	513	671
Weight	kg	1.5	1.8	2.8	3.6	5.6	8.3	13.3	18	28	46	66.5	122	233	305
	--	26	50	94	143	260	480	750	1300	2300	3200	5400	10000	15000	21000
Cv	ft.lb.	9	10	13	16	18	22	26	44	59	89	133	184	280	332
	Nm	12	14	18	21	25	30	35	60	80	120	180	250	380	450
Torque															
Mounting Pad		F03	F03	F05	F04	F07	F07	F07	F10	F10	F12	F12	F12	F14	F14

CLASS	NPS	1/2	3/4	1	1-1/2	2	2-1/2	3	4	6	8
300	DN	15	20	25	40	50	65	80	100	150	200
A	inch	5.50	6.00	6.50	7.50	8.50	9.50	11.14	12.00	15.87	19.75
	mm	140	152	165	190	216	241	283	305	403	502
B	inch	2.83	2.91	3.23	4.09	4.49	5.59	6.10	6.65	9.72	12.01
	mm	72	74	82	104	114	142	155	169	247	305
C	inch	6.3	6.3	6.3	7.32	7.32	12.8	12.8	12.76	29.53	39.37
	mm	160	160	160	186	186	324	324	324	750	1000
D	inch	1.97	1.97	1.97	2.44	2.44	2.95	2.95	2.95	3.50	3.94
	mm	50	50	50	62	62	75	75	75	89	100
E	inch	1.65	1.65	1.97	2.76	2.76	2.76	4.02	4.02	4.92	4.92
	mm	42	42	50	70	70	70	102	102	125	125
F	--	M5	M5	M6	M8	M8	M8	M10	M10	M12	M12
	lbs	5.9	7.3	14.0	20.0	25	40	56	85	191	343
Weight	kg	2.7	3.3	6.5	8.9	11.5	18.1	25.3	38.5	87	156
	--	26	50	94	260	480	750	1300	2300	5400	10000
Cv	ft.lb.	12	13	15	22	26	33	52	74	148	207
	Nm	16	18	20	30	35	45	70	100	200	280
Torque											
Mounting Pad		F04	F04	F05	F07	F07	F07	F10	F10	F12	F12

Standard Ball Valve Materials

Part No.	Part Name	WCB/304	WCB/316	CF8/CF8	CF8M/CF8M
1	Body	A216 WCB	A216 WCB	A351 CF8	A351 CF8M
2	Cap	A216 WCB	A216 WCB	A351 CF8	A351 CF8M
3	Ball	A351 CF8	A351 CF8M	A351 CF8	A351 CF8M
4	Seat	PTFE			
5	Stem	304 SS	316 SS	304 SS	316 SS
6	Gasket	PTFE			
7	Thrust Washer	PTFE			
8	Packing	PTFE			
9	Stem Packing	PTFE			
10	Gland	304 SS			
11	Gland Bolt	A194 B8			
12	Handle	Steel			
13	Stopper	304 SS			
14	Snap Ring	304 SS			
15	Body Bolt	A194 B8			
16	Antistatic Spring	SS			
17	Antistatic Ball	SS			

Test Requirements

Test	Medium	Class 150		Class 300	
		psi	bar	psi	bar
Shell	Water	450	32	1125	80
Seat	Air	85	6	85	6
Seat	Water	315	22	815	58

Note: A216 WCB test pressures

Pressure/Temperature Ratings: PTFE Seats (Standard)
CLASS 150 ASTM A216 WCB

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	285	19.7	285	19.7	285	19.7	285	19.7	285	19.7
150	66	273	18.8	273	18.8	273	18.8	273	18.8	273	18.8
200	93	260	17.9	260	17.9	260	17.9	260	17.9	260	17.9
250	121	245	16.9	245	16.9	236	16.3	212	14.6	189	13.0
300	149	130	9.0	92	6.3	67	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A216 WCB

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	740	51.0	740	51.0	725	50	653	45	580	40
150	66	708	48.8	708	48.8	568	39.2	511	35.3	454	31.3
200	93	675	46.5	559	38.5	405	27.9	365	25.1	324	22.3
250	121	462	31.9	325	22.4	236	16.3	212	14.6	189	13.0
300	149	130	9.0	92	6.3	66	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

CLASS 150 ASTM A351 CF8

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	275	19.0	275	19.0	275	19.0	275	19.0	275	19.0
150	66	253	17.5	253	17.5	253	17.5	253	17.5	253	17.5
200	93	230	15.9	230	15.9	230	15.9	230	15.9	230	15.9
250	121	218	15.0	218	15.0	218	15.0	212	14.6	189	13.0
300	149	130	9.0	92	6.3	67	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A351 CF8

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	720	49.6	720	49.6	720	49.6	653	45	580	40
150	66	660	45.5	660	45.5	568	39.2	511	35.3	454	31.3
200	93	600	41.4	559	38.5	405	27.9	365	25.1	324	22.3
250	121	462	31.9	325	22.4	236	16.3	212	14.6	189	13.0
300	149	130	9.0	92	6.3	66	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

CLASS 150 ASTM A351 CF8M

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	275	19.0	275	19.0	275	19.0	275	19.0	275	19.0
150	66	255	17.6	255	17.6	255	17.6	255	17.6	255	17.6
200	93	235	16.2	235	16.2	235	16.2	235	16.2	235	16.2
250	121	225	15.5	225	15.5	225	15.5	212	14.6	189	13.0
300	149	130	9.0	92	6.3	67	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A351 CF8M

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	720	49.6	720	49.6	720	49.6	653	45	580	40
150	66	670	46.2	670	46.2	568	39.2	511	35.3	454	31.3
200	93	620	42.7	559	38.5	405	27.9	365	25.1	324	22.3
250	121	462	31.9	325	22.4	236	16.3	212	14.6	189	13.0
300	149	130	9.0	92	6.3	66	4.6	60	4.1	53	3.7
320	160	0	0	0	0	0	0	0	0	0	0

Note 1. PTFE seats are limited to 320°F (160°C).

Pressure/Temperature Ratings: RPTFE or PTFE + Graphite Seats (Variant)
CLASS 150 ASTM A216 WCB

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	285	19.7	285	19.7	285	19.7	285	19.7	285	19.7
150	66	273	18.8	273	18.8	273	18.8	273	18.8	273	18.8
200	93	260	17.9	260	17.9	260	17.9	260	17.9	260	17.9
250	121	245	16.9	245	16.9	245	16.9	245	16.9	245	16.9
300	149	230	15.9	230	15.9	230	15.9	208	14.3	185	12.8
350	177	205	14.1	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A216 WCB

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	740	51.0	740	51.0	725	50	653	45.0	580	40.0
150	66	708	48.8	708	48.8	607	41.9	547	37.7	486	33.5
200	93	675	46.5	670	46.2	485	33.4	436	30.0	388	26.8
250	121	665	45.9	494	34.1	358	24.7	322	22.2	286	19.8
300	149	453	31.2	319	22.0	231	15.9	208	14.3	185	12.8
350	177	205	14.1	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

CLASS 150 ASTM A351 CF8

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	275	19.0	275	19.0	275	19.0	275	19.0	275	19.0
150	66	253	17.5	253	17.5	253	17.5	253	17.5	253	17.5
200	93	230	15.9	230	15.9	230	15.9	230	15.9	230	15.9
250	121	218	15.0	218	15.0	218	15.0	218	15.0	218	15.0
300	149	205	14.1	205	14.1	205	14.1	205	14.1	185	12.8
350	177	197	13.6	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A351 CF8

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	720	49.6	720	49.6	720	49.6	653	45.0	580	40.0
150	66	660	45.5	660	45.5	607	41.9	547	37.7	486	33.5
200	93	600	41.4	600	41.4	485	33.4	436	30.0	388	26.8
250	121	570	39.3	494	34.1	358	24.7	322	22.2	286	19.8
300	149	453	31.2	319	22.0	231	15.9	208	14.3	185	12.8
350	177	205	14.1	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

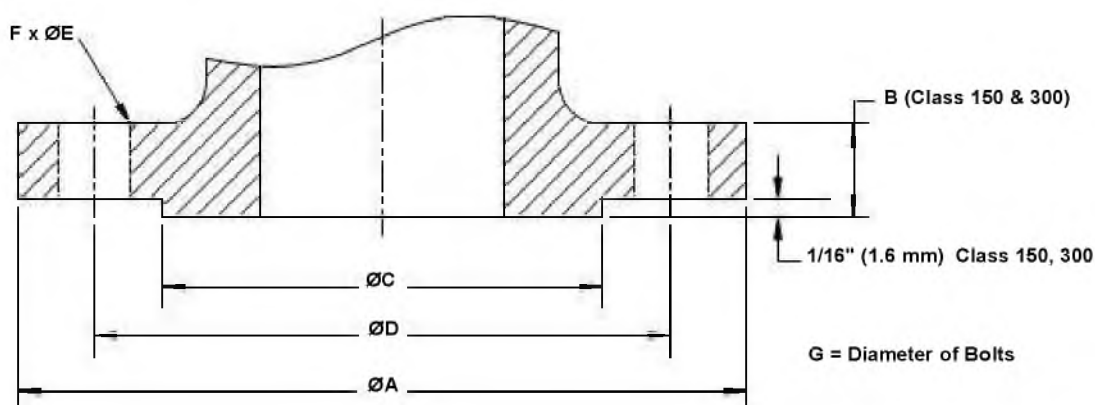
CLASS 150 ASTM A351 CF8M

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	275	19.0	275	19.0	275	19.0	275	19.0	275	19.0
150	66	255	17.6	255	17.6	255	17.6	255	17.6	255	17.6
200	93	235	16.2	235	16.2	235	16.2	235	16.2	235	16.2
250	121	225	15.5	225	15.5	225	15.5	225	15.5	225	15.5
300	149	215	14.8	215	14.8	215	14.8	208	14.3	185	12.8
350	177	205	14.1	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

CLASS 300 ASTM A351 CF8M

Temperature		1/2"-3/4"		1"-2"		2.5"-4"		5"-8"		10"-12"	
°F	°C	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	720	49.6	720	49.6	720	49.6	653	45.0	580	40.0
150	66	670	46.2	670	46.2	607	41.9	547	37.7	486	33.5
200	93	620	42.7	620	42.7	485	33.4	436	30.0	388	26.8
250	121	590	40.7	494	34.1	358	24.7	322	22.2	286	19.8
300	149	453	31.2	319	22.0	231	15.9	208	14.3	185	12.8
350	177	205	14.1	144	9.9	104	7.2	94	6.5	84	5.8
392	200	0	0	0	0	0	0	0	0	0	0

Note 1. RPTFE and PTFE + graphite seats are limited to 392°F (200°C).

Flange Dimensions per ASME B16.5

Class 150

Inches							
Size	A	B	C	D	E	F	G
0.5	3.50	0.38	1.38	2.38	0.62	4	½
0.75	3.88	0.41	1.69	2.75	0.62	4	½
1	4.25	0.44	2.00	3.12	0.62	4	½
1.25	4.62	0.50	2.50	3.50	0.62	4	½
1.5	5.00	0.56	2.88	3.88	0.62	4	½
2	6.00	0.62	3.62	4.75	0.75	4	5/8
2.5	7.00	0.69	4.12	5.50	0.75	4	5/8
3	7.50	0.75	5.00	6.00	0.75	4	5/8
4	9.00	0.94	6.19	7.50	0.75	8	5/8
5	10.00	0.94	7.31	8.50	0.88	8	¾
6	11.00	1.00	8.50	9.50	0.88	8	¾
8	13.50	1.12	10.62	11.75	0.88	8	¾
10	16.00	1.19	12.75	14.25	1.00	12	7/8
12	19.00	1.25	15.00	17.00	1.00	12	7/8

Millimeters							
DN	A	B	C	D	E	F	G
15	89	9.7	35	60.5	16	4	12.7
20	98	10.4	43	70.0	16	4	12.7
25	108	11.1	51	79.5	16	4	12.7
32	117	12.7	64	89.0	16	4	12.7
40	127	14.3	73	98.5	16	4	12.7
50	152	15.9	92	120.5	19.1	4	15.9
65	178	17.5	105	139.5	19.1	4	15.9
80	190	19.1	127	152.5	19.1	4	15.9
100	229	23.9	157	190.5	19.1	8	15.9
125	254	23.9	186	216.0	22.4	8	19.1
150	279	25.4	216	241.5	22.4	8	19.1
200	343	28.6	270	298.5	22.4	8	19.1
250	406	30.2	324	362.0	25.4	12	22.2
300	483	31.8	381	432.0	25.4	12	22.2

Class 300

Inches							
Size	A	B	C	D	E	F	G
0.5	3.75	0.56	1.38	2.62	0.62	4	½
0.75	4.62	0.62	1.69	3.25	0.75	4	5/8
1	4.88	0.69	2.00	3.50	0.75	4	5/8
1.5	6.12	0.81	2.88	4.50	0.88	4	¾
2	6.50	0.88	3.62	5.00	0.75	8	5/8
2.5	7.50	1.00	4.12	5.88	0.88	8	¾
3	8.25	1.12	5.00	6.62	0.88	8	¾
4	10.00	1.25	6.19	7.88	0.88	8	¾
6	12.50	1.44	8.50	10.62	0.88	12	¾
8	15.00	1.62	10.62	13.00	1.00	12	7/8

Millimeters							
DN	A	B	C	D	E	F	G
15	95	14.3	35	66.5	16	4	12.7
20	117	15.9	43	82.5	19	4	15.9
25	124	17.5	51	89.0	19	4	15.9
40	156	20.7	73	114.5	22	4	19.1
50	165	22.4	91.9	127.0	19.1	8	15.9
65	191	25.4	104.6	149.4	22.4	8	19.1
80	210	28.4	127.0	168.1	22.4	8	19.1
100	254	31.8	157.2	200.2	22.4	8	19.1
150	318	36.6	215.9	269.7	22.4	12	19.1
200	381	41.1	269.7	330.2	25.4	12	22.2

Tolerances

B	+0.12/-0 inch	+3/-0 mm	
C	+/- 0.06 inch	+/- 1.6 mm	(Class 150 and 300)
D	+/- 0.08 inch	+/- 2 mm	

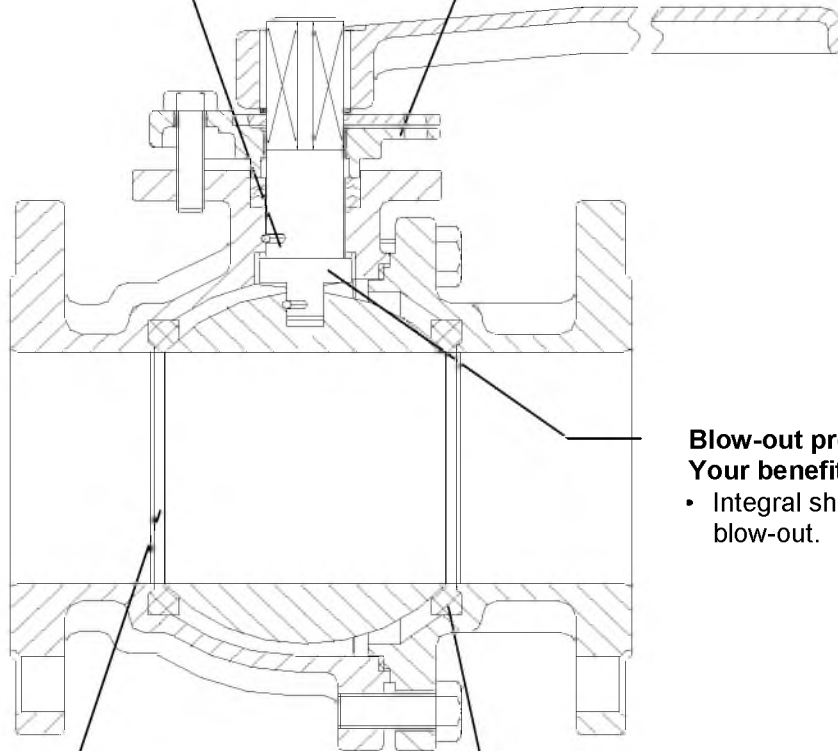
Product features – to our customers' benefit

**Anti-Static Connection
Your benefit**

- Prevents buildup of static charge during operation.

**ISO 5211 Mounting Pad
Your benefit**

- For gear or actuator mounting.



**Blow-out proof stem
Your benefit**

- Integral shoulder prevents blow-out.

**Full Port
Your benefit**

- For maximum flow with minimum pressure drop.

**PTFE Seats
Your benefit**

- Resilient seats provide tight shut-off.

Subject to technical modification without prior notice

16.3.2010

8222.51-10

ANSI/ASME Three-Piece Ball Valves



Floating Ball
Full Bore
Socket Weld or Threaded End

1000 WOG: 1/4" – 4"

Applications

- Process and general industry
- For water, steam, gas, oil, and other media
- Other applications on request

Operating Data

- Maximum allowable pressure 1220 psi (84.1 bar)
- Maximum allowable temperature 392°F (200°C)
- Pressure/Temperature ratings per ASME B16.34
- Temperature below 0°C on request

Body Materials

- ASTM A216 WCB Carbon Steel
- ASTM A351 CF8M Type 316 Stainless Steel

Ball Material

- ASTM A351 CF8M Type 316 Stainless Steel

Seat Material

- PTFE up to 320°F (160°C)

Design

- Design and test per ASME B16.34
- Socket weld ends per ASME B16.11
- NPT pipe thread ends per ASME B1.20.1
- Full bore
- Three-piece body
- Blowout proof stem
- Locking device
- Solid ball
- Antistatic device

Variants on request

- RPTFE or PTFE + Graphite seats up to 392°F (200°C)
- Pneumatic actuator
- Electric actuator

Remarks

- Operating Instructions No. 8222.81
- ECOLINE-BLT 150-300 type series booklet no. 8222.51
- ECOLINE-GT type series booklet no. 7247.11
- ECOLINE-GL type series booklet no. 7247.12
- ECOLINE-SC type series booklet no. 7247.13

On all enquiries/orders please specify

1. Valve type
2. ANSI pressure class
3. Size
4. Design pressure
5. Design temperature
6. Differential pressure-shut off
7. Flow medium
8. Material of construction
9. Variants
10. Type series booklet number
11. Valve data sheet if applicable

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of Annex I for Fluid Groups 1 and 2.

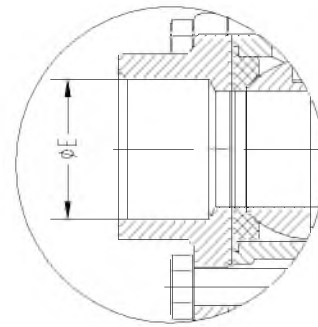
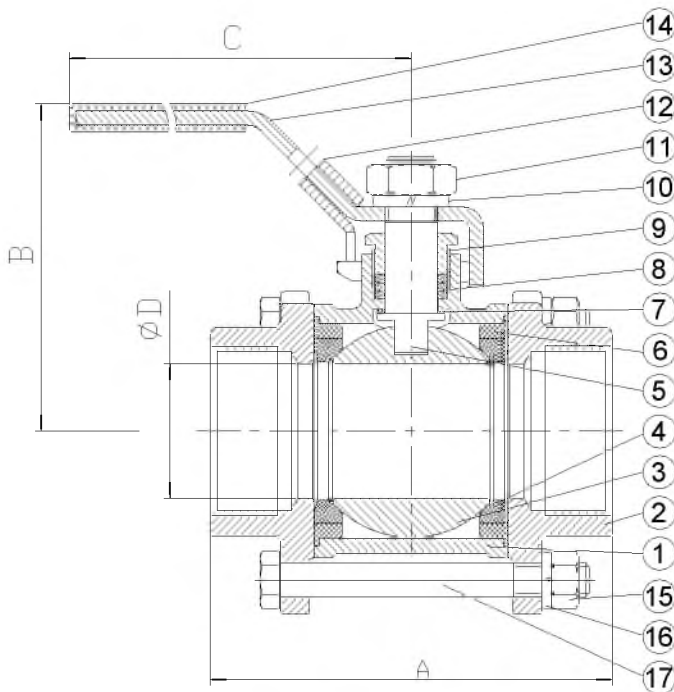
When ordering spare parts, indicate valve product code. (shown on nameplate) and serial number.



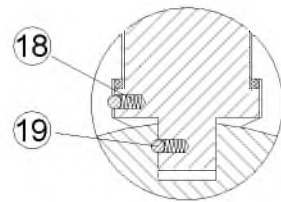
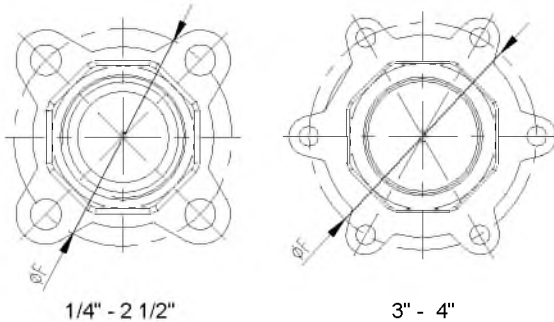
Three-Piece Ball Valves – Type BLC 1000

Design Specifications

General Valve Design	: ASME B16.34
Pressure/Temperature Rating	: KSB standard
Socket Weld Dimensions	: ASME B16.11
Pipe Thread Dimensions	: ASME B1.20.1
End-to-End Dimensions	: KSB standard
Testing	: API 598



SOCKET WELD TYPE



ANTISTATIC DEVICE

Dimensions and Data

	NPS	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
	DN	8	10	15	20	25	32	40	50	65	80	100
A	inch	2.28	2.28	2.48	2.87	3.35	3.78	4.49	5.28	7.09	7.87	8.98
	mm	58	58	63	73	85	96	114	134	180	200	228
B	inch	2.20	2.20	2.56	2.64	3.11	3.31	3.62	3.90	5.35	5.75	6.61
	mm	56	56	65	67	79	84	92	99	136	146	168
C	inch	4.02	4.02	4.84	4.84	6.02	6.02	7.20	7.20	9.69	9.69	19.8
	mm	102	102	123	123	153	153	183	183	246	246	503
D	inch	0.46	0.50	0.59	0.79	0.98	1.26	1.50	1.97	2.56	3.15	3.94
	mm	11.6	12.7	15	20	25	32	38	50	65	80	100
E	inch	0.56	0.69	0.85	1.07	1.33	1.68	1.92	2.41	3.03	3.54	4.55
	mm	14.1	17.6	21.7	27.1	33.8	42.6	48.7	61.1	76.9	89.8	115.5
F	inch	1.59	1.59	1.85	2.11	2.35	2.92	3.31	3.98	5.20	6.36	7.52
	mm	40.5	40.5	47	53.5	59.6	74.2	84	101	132	161.5	191
Weight	lbs	0.81	0.75	1.1	1.5	2.1	3.3	4.8	7.3	15.9	27.7	43.1
	kg	0.37	0.34	0.51	0.66	0.96	1.5	2.2	3.3	7.21	12.6	19.6
Cv	--	6	7	10	25	35	46	80	110	310	360	820
Torque	ft.lb.	3	3	6	7	10	13	26	31	37	59	74
	Nm	4	4	8	9	14	17	35	42	50	80	100

Standard Ball Valve Materials

Part No.	Part Name	WCB	CF8M
1	Body	A216 WCB	A351 CF8M
2	Cap	A216 WCB	A351 CF8M
3	Ball	A351 CF8M	A351 CF8M
4	Seat	PTFE	
5	Stem	316 SS	
6	Gasket	PTFE	
7	Thrust Washer	PTFE	
8	Packing	PTFE	
9	Gland	304 SS	
10	Spring Washer	304 SS	
11	Stem Nut	304 SS	
12	Locking Device	304 SS	
13	Handle	304 SS	
14	Plastic Cover	Plastic	
15	Nut	304 SS	
16	Bolt Washer	304 SS	
17	Bolt	304 SS	
18	Antistatic Spring	Stainless Steel	
19	Antistatic Ball	Stainless Steel	

Test Requirements

Test	Medium	1/4" - 4"	
		psi	bar
Shell	Water	1500	105
Seat	Air	85	6
Seat	Water	1100	77

Note: A216 WCB test pressures

Pressure/Temperature Ratings
ASTM A216 WCB and A351 CF8M (PTFE)

Temperature		1/4" - 1"		1 1/4" - 1 1/2"		2" - 4"	
°F	°C	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	1220	84.1	1000	69.0	725	50.0
150	66	956	65.9	784	54.1	568	39.2
200	93	681	47.0	559	38.5	406	28.0
250	121	396	27.3	325	22.4	236	16.3
300	149	112	7.7	92	6.3	67	4.6
320	160	0	0	0	0	0	0

**ASTM A216 WCB and A351 CF8M
(RPTFE and PTFE + Graphite)**

Temperature		1/4" - 1"		1 1/4" - 1 1/2"		2" - 4"	
°F	°C	psi	bar	psi	bar	psi	bar
32 to 100	0 to 38	1220	84.1	1000	69.0	725	50.0
150	66	1022	70.4	838	57.8	608	41.9
200	93	816	56.2	669	46.1	485	33.4
250	121	602	41.5	494	34.1	363	25.0
300	149	389	26.8	319	22.0	231	15.9
350	177	173	11.9	144	9.9	105	7.2
392	200	0	0	0	0	0	0

Note 1. PTFE seats are limited to 320°F (160°C).
RPTFE and PTFE + Graphite seats are limited to 392°F (200°C).

Product features – to our customers' benefit

**Anti-Static Connection
Your benefit**

- Prevents buildup of static charge during operation.

**Locking Device
Your benefit**

- Valve can be locked open or shut

**Blow-out proof stem
Your benefit**

- Integral shoulder prevents blow-out.

**Solid Ball
Your benefit**

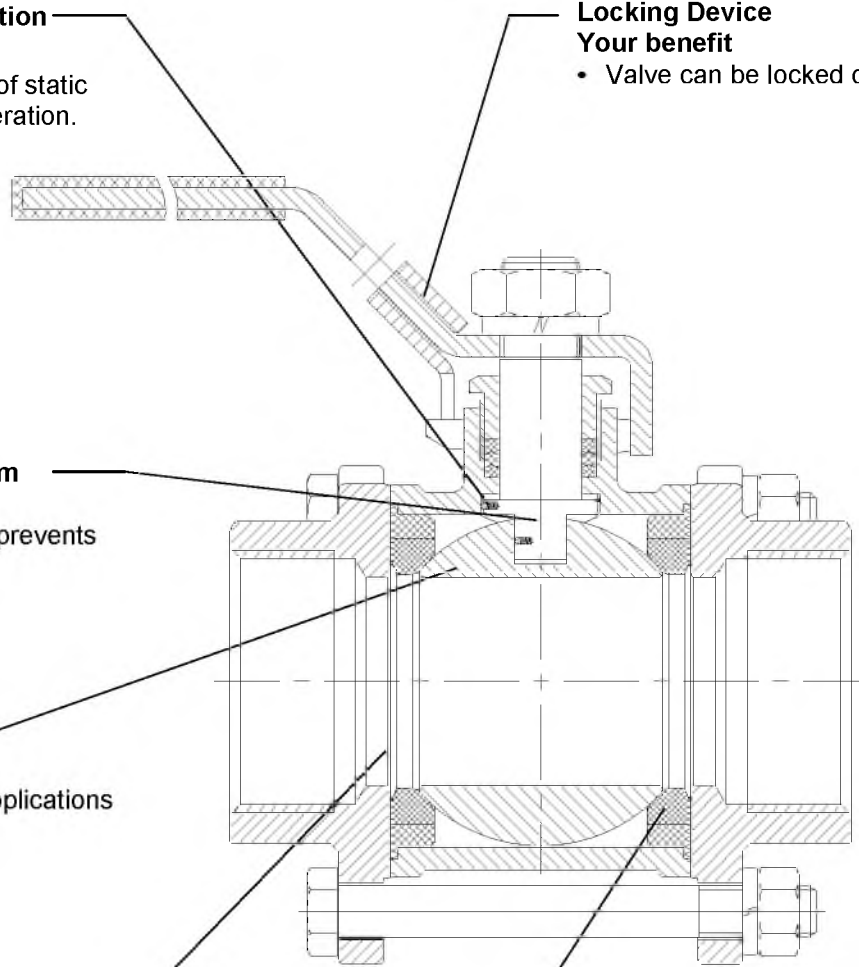
- For heavy duty applications

**Full Port
Your benefit**

- For maximum flow with minimum pressure drop

**PTFE Seats
Your benefit**

- Resilient seats provide tight shut-off.



LUS

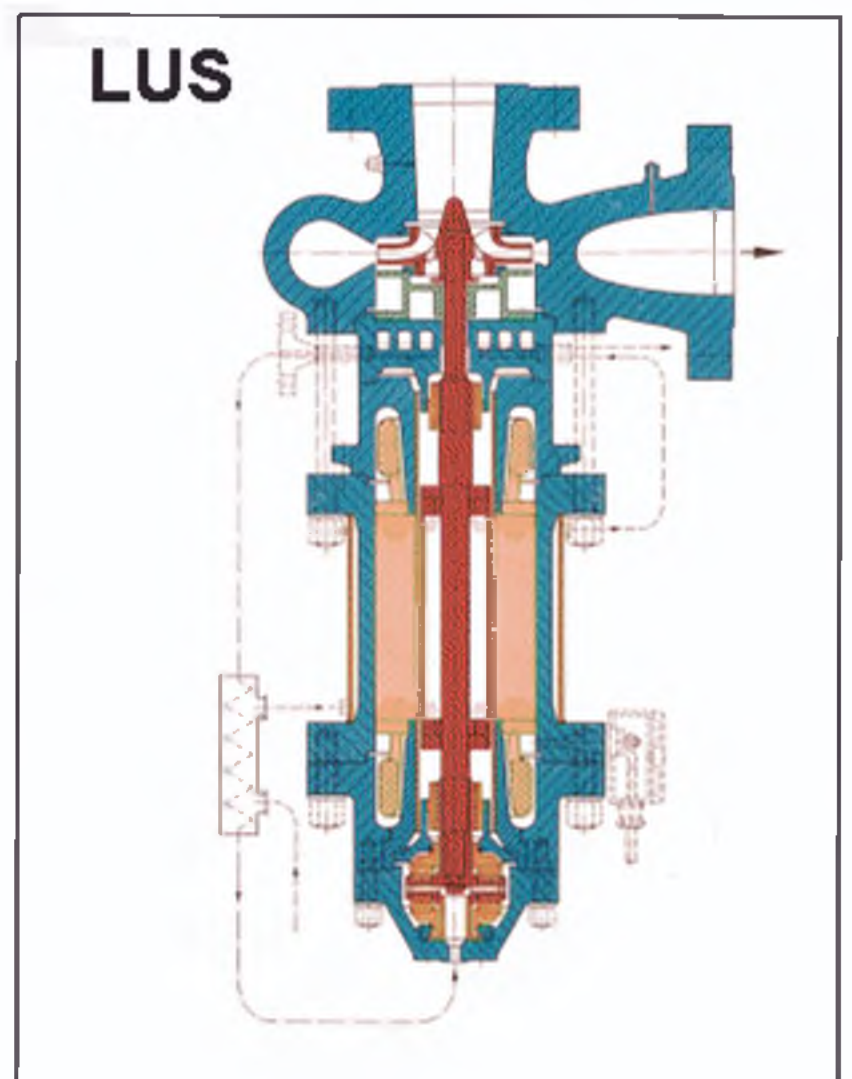
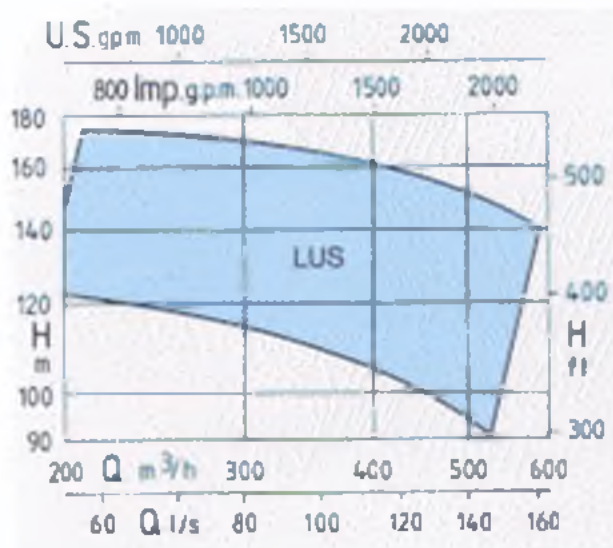


Application =
Glandless canned motor pump for boron injection and miscellaneous reactor systems.

Application =
Groupe étanche chemise vertical pour injection de bore et alimentation auxiliaire.

Einsatzgebiet =
Stopfbuchslose Spaltrohrmotorpumpe zur Borsäureinjektion und weitere Anwendungen.

DN	mm	≈	350
Q	l/s	≈	160
H	m	≈	175
p	bar		120
t	°C	≈	300
n	1/min	≤	1 500



Canned-motor circulating pumps with absolutely leaktight casings

Design features

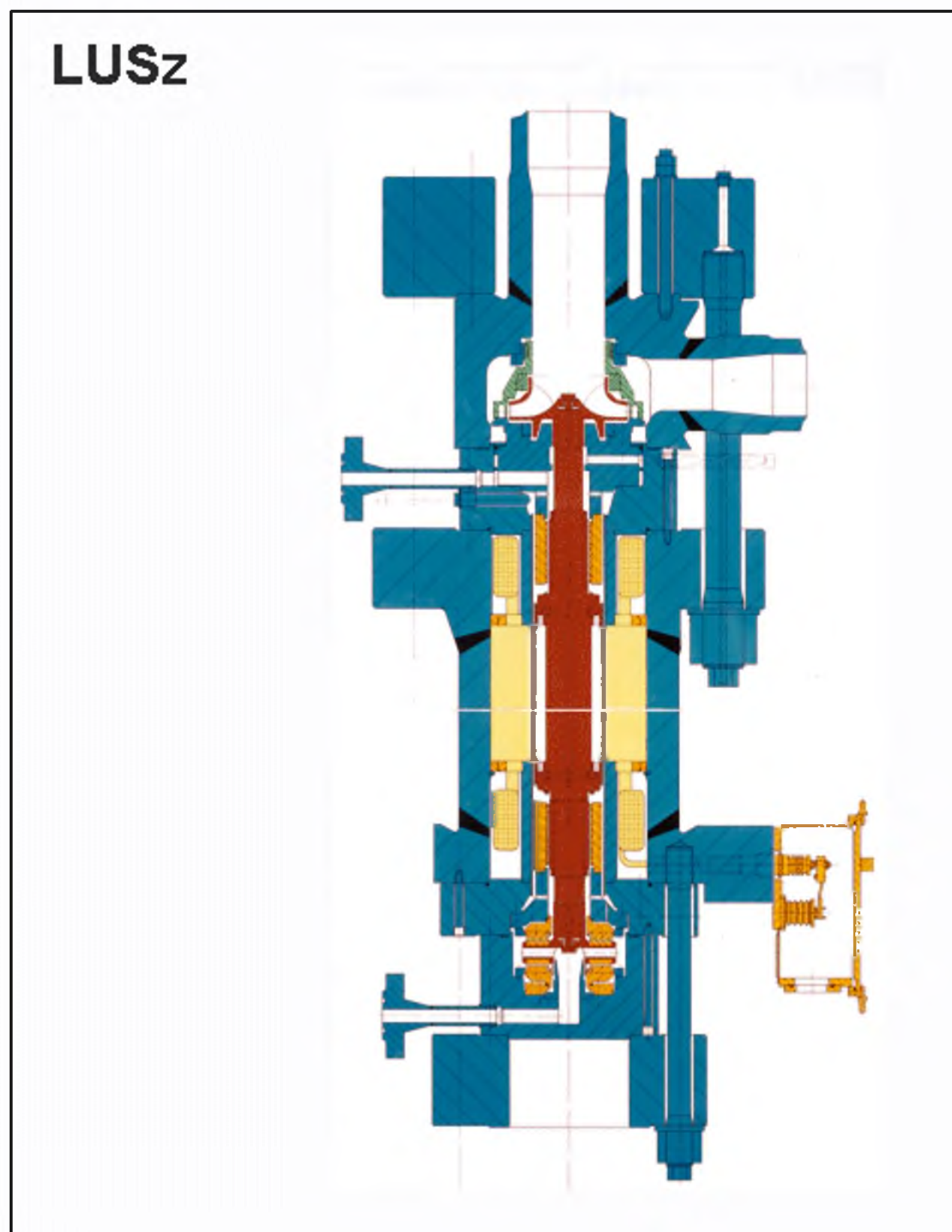
- Glandless canned motor pump, vertical or horizontal arrangement.
- Internal bearings made of graphite or silicon carbide, lubricated by the pumped liquid.
- Class-H motor with insulation material specially selected to withstand radiation; terminals qualified for high-pressure integrity.
- Thermal barrier and heat exchanger for high-temperature service.
- Rotor axial-displacement monitor.

Particularités techniques

- Groupe étanche chemise en position verticale ou horizontale.
- Paliers internes en graphite ou en carbure de silicium, lubrifiés par le liquide pompé.
- Moteur classe H avec des matériaux spécialement choisis pour leur résistance à l'irradiation; passages étanches qualifiés pour les hautes pressions.
- Barrière thermique et échangeur pour les hautes températures de service.
- Système de détection du déplacement axial du rotor.

Konstruktionsmerkmale

- Spaltrohrmotorpumpe, vertikal oder horizontal.
- Interne mediumgeschmierte Graphit-oder Siliziumkarbidlager.
- Motor der Klasse H mit einem speziell ausgewählten strahlungsbeständigen Isolationsmaterial; Polklemmen hochdruckbeständig.
- Wärmesperre und Wärmetauscher für Hochtemperaturbetrieb.
- Überwachung der axialen Läuferstellung.



► Our technology. Your success.

Pumps • Valves • Service



RUV – Generation 3+ customized Reactor Coolant Pump



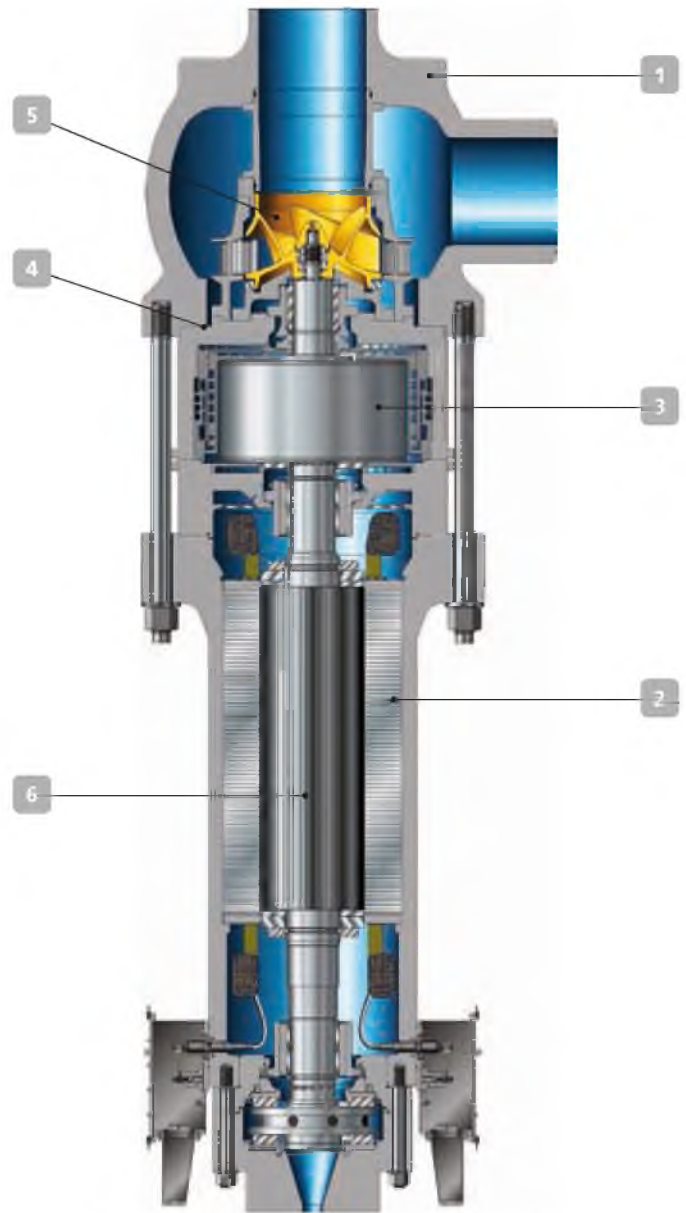
Applications:

- Reactor coolant pump for generation 3+ nuclear power stations

More information:

RUV – Generation 3+ customized Reactor Coolant Pump

- 1 Operational Safety**
 - Maximum safety due to completely forged pressure boundary
 - Hermetically sealed (leakage free, no mechanical seals)
 - Perfect rotor dynamic behaviour
- 2 Integrity under upset conditions**
 - Motor cooling through thermosyphon effect
- 3 Flywheel**
 - High inertia flywheel to address coast down requirements
- 4 Optimized thermal barrier**
 - Advanced cooling concept for homogeneous temperature distribution
- 5 Optimized hydraulics**
 - Well proven design with very high hydraulic efficiency
- 6 Maximum overall efficiency**
 - Due to proven wet winding motor technology
- 7 Maintenance free design**



Technical data*

Size	up to DN 650
Pressure	up to 175 bar (17.5 MPa (a))
Temperature	up to 350 °C (662 °F)
Capacity	up to 22,000 m ³ /h (96,866 gpm)
Head	up to 120 m (394 ft)
Speed	up to 1,800 min ⁻¹
Frequency	50 Hz or 60 Hz

*Higher ratings on request

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Pumps • Valves • Service



LUV – Reactor coolant / Reactor water clean-up pump



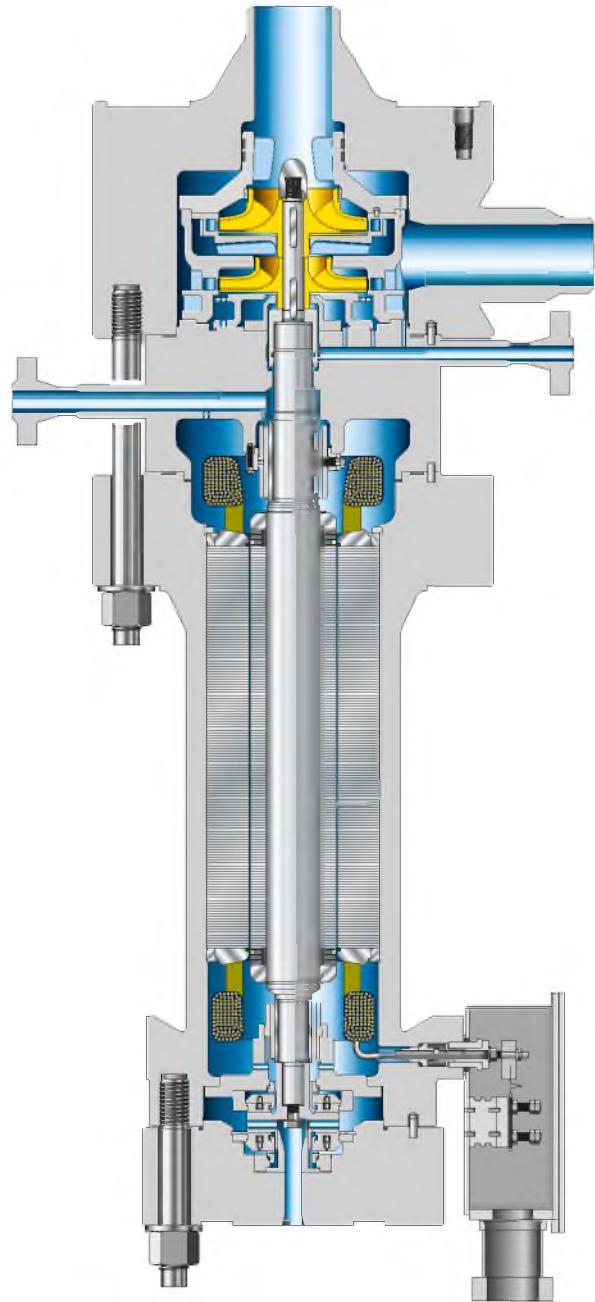
Applications:

- Reactor water clean-up systems

More information:

LUV – Reactor coolant / Reactor water clean-up pump

- **High safety and increased plant availability**
 - Self-contained cooling and lubrication through integrated impeller
 - Hermetically sealed pump casing
 - No shaft seals
 - Symmetrically forged and thermoelastic casing, optimized to handle temperature and pressure transients
 - Hot standby at full pressure and temperature loads
- **Low life cycle costs (LCC)**
 - Long maintenance intervals – major inspection every 10 years
 - Stainless steel for all pump parts eliminates corrosion
- **Reduced radiation exposure (ALARA) and enhanced environmental protection**
 - Zero leakage
 - Long inspection intervals
 - Asbestos-free
- **Quick replacement and maintenance**
 - Pull-out design – the entire pump/motor unit can be pulled out without having to remove the pump casing, which also reduces the maintenance personnel's radiation exposure.
 - Easy access to wear parts



Technical data*

Size	DN 40-600
Capacity	up to 7,000 m ³ /h
Head	up to 300 m
Operating pressure	up to 320 bar
Temperature	up to +430 °C
Frequency	50 Hz / 60 Hz

*Higher ratings on request



Applications

- All sectors of Navy construction, Water and Industry markets.
- AMTROBOX R is designed for harsh applications.

General information

- AMTROBOX R can be mounted directly on actuators compatible with VDI/VDE 3845 interface:
 - ACTO / DYNACTO hydraulic actuators,
 - ACTAIR / DYNACTAIR pneumatic actuators,
 - MR manual actuators.
- No bracket is necessary, overall dimensions are reduced.
- This robust box integrates the open/close detection box:
 - by switches
 - by proximity sensors.
- Its adjustable cams device for position detection makes it very reliable and easy to adjust.
- The electrical connections are made by packing-gland.

Protection

- IP 68

Temperature range

- From -20°C up to $+70^{\circ}\text{C}$

Materials

- Its cataphoresis coating and the paint ensure a good resistance in corrosive environments.
- Housing: cast iron

Standard variants

- Position detection by standard microswitches or inductive proximity detectors on printed circuit: R 1187
- Position detection by special microswitches or inductive proximity detectors on metallic plate: RA 1187

Options

- Valve position feed-back by potentiometer or 4-20 mA transmitter.
- Visual indication of valve position by flag.
- Submersible version
- Fieldbus
- Heating resistance
- For applications in explosive areas, KSB has developed an intrinsically safe version: AMTROBOX R EEx-ia (R 1188). Refer to Type series booklet no. 8524.11/-10.

This leaflet is also to be used as a start-up guide
ref. 42 057 233.

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General technical data

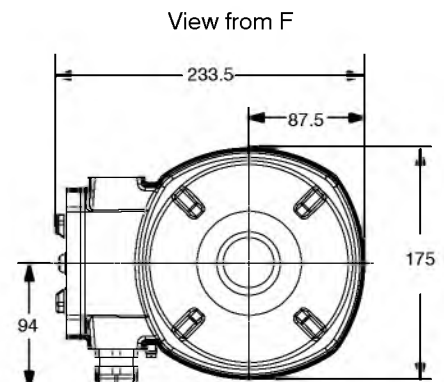
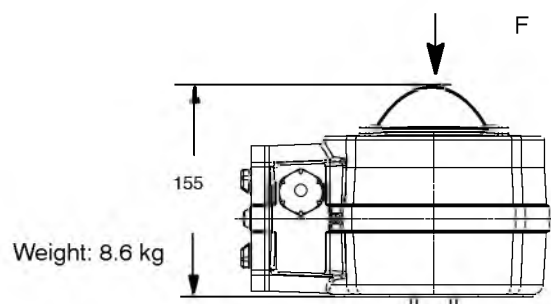
Environment

- Protection level:	Standard: IP 68 (30 m, 72 hours); Option: IP 68, 30 m permanent according to ABS SC180
- Resistance to vibrations:	According to "Test programm Lloyd's Register - vibration test 1" and IEC 60068-2-6 Test Fc standard. Fréquency: 5 to 100 Hz. Displacement ± 1 mm. Acceleration: ± 0.7 g.
- Température de fonctionnement :	From - 20° C up to + 65° C or + 70° C (from - 4° F up to + 149° F or + 158° F)
- Electromagnetic compatibility:	
- generic standards	EN 61000-6-2; EN 61000-6-4
- fundamental standards	EN 55011; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5 EN 61000-4-6

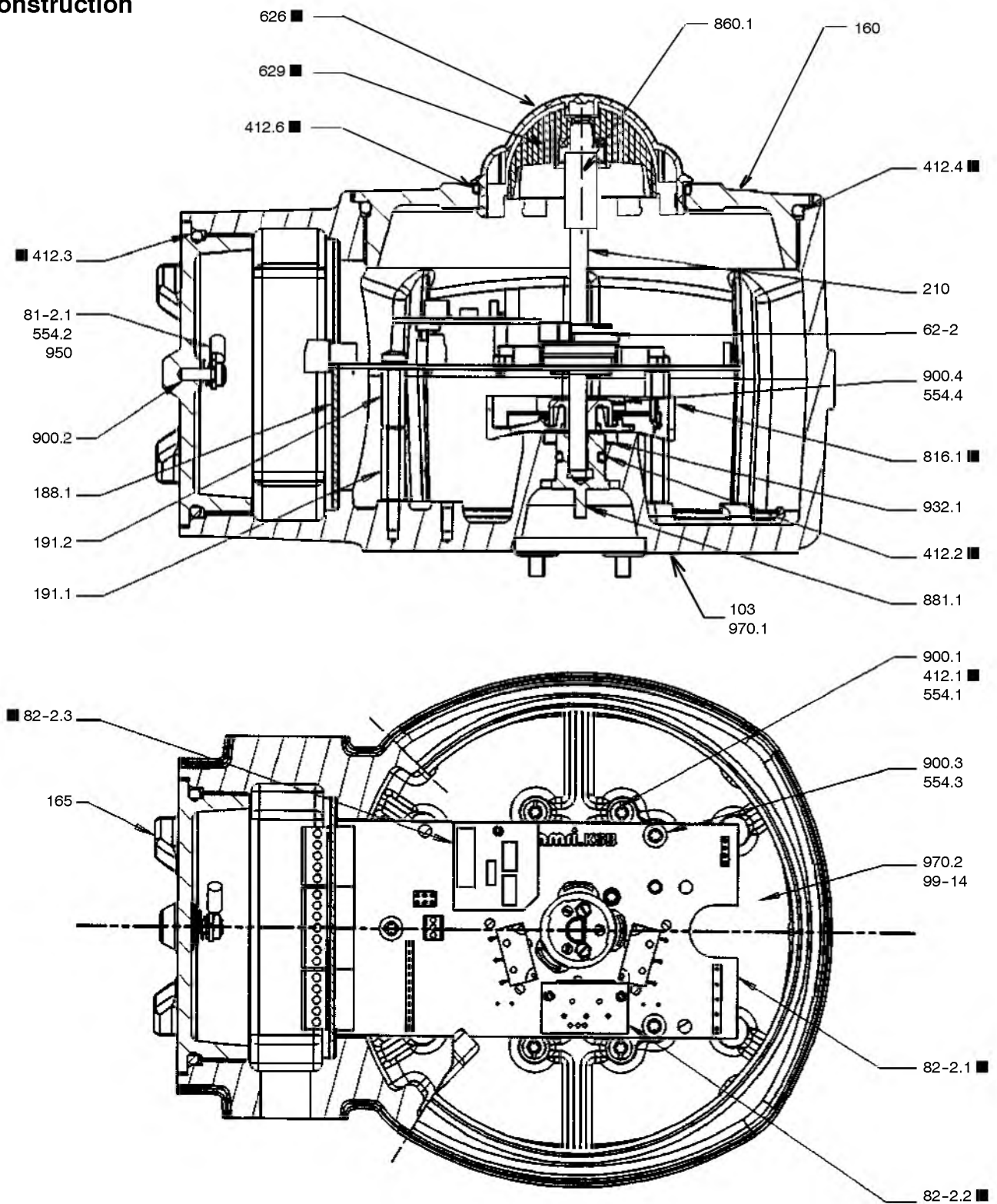
Housing

- Material:	JL 1040 cast iron
- Coating:	Cataphoresis (25 μ m)+ black paint (125 μ m)
- Position signalisation:	by pointer under sight glass or by flag
- Electrical connection :	By packing-gland (metallic or plastic) M20x1.5 or M25x1.5 for cable dia. 6 to 18 mm

Overall dimensions (mm) and weight (kg)



Construction



■ Parts included in the spare parts kit

Item	Designation	Materials
103	Housing	JL 1040 cast iron
160	Cover	JL 1040 cast iron
165	Electric compartment cover	JL 1040 cast iron
188.1	Fixing plate	Steel
191.1	Support of printed circuit board	Nickeled brass
191.2	Support of printed circuit board	Nickeled brass
210	Operating shaft	316 L stainless steel
412.1 ■	O-Ring	Nitrile
412.2 ■	O-Ring	Nitrile
412.3 ■	O-Ring	Nitrile
412.4 ■	O-Ring	Nitrile
412.7 ■	O-Ring	Nitrile
554.1	Plain washer	Stainless steel
554.2	Plain washer	Stainless steel
554.3	Plain washer	Stainless steel
554.4	Tooth lock washer	Steel
62-2	Cam sub-assembly	Acetal
626 ■	Sight glass	Transparent polycarbonate
629 ■	Pointer	Polyamide 6.6
81-2.1	Ground wire sub-assembly	Copper + PVC
816.1 ■	Angle sensor	Acetal
82-2.1 ■	Printed circuit board with 2 microswitches or 2 detectors	-----
82-2.2 ■	Printed circuit board with intermediate microswitch (option)	-----
82-2.3 ■	Printed circuit board for position feed-back (option)	-----
860.1	Adjustment adaptation sleeve	Stainless steel
881.1	Hub	Brass
900.1	Cheese-head screw	Stainless steel
900.2	Self-tapping screw	Stainless steel
900.3	Cheese-head screw	Stainless steel
900.4	Cheese-head screw	Steel
932.1	Self locking	Steel
950	Conic spring	Stainless steel
970.1	Identity plate	Polyester
970.2	Instruction guide	Paper
99-14	Dessicant bag	-----

■ Spare parts available in kit

Position detection by standard microswitches on printed circuit board - Box R 1187-1.....

- Detection by 2 microswitches: 1 on opening and 1 on closing, changeover function, trigger action adjustable by cam on each microswitch.
- Connection: refer page 12.

Microswitches characteristics

Manufacturer	CROUZET	
Material:	Housing	Polyester UL94V0
	Button	Polyester
	Contact	Ag/Ni gold plated
	Membrane	Silicone
Rating:	Cut-off capacity 6 A under 24 VDC and 250 VAC	
Life:	Electrical	under I = 5 A 7 x 10 ⁴ operating cycles under I = 1 A 3 x 10 ⁵ operating cycles under I = 0.2 A 10 ⁶ operating cycles
	Mechanical	2 x 10 ⁶ operating cycles
Resistance to vibrations:	Standard: CEI 60068-2-6 / 3 axis / 50g from 10 to 500 Hz	
Electromagnetic compatibility:	EN 50081-2; EN 50082-2	
Electric connection:	Welded on circuit	
Protection level	IP 67	

Breaking capacity according to the standard CEI 60947-5-1: 6000 cycles

I (A)	Alternating current (AC)				
	24 V	48 V	110 to 127 V	220 to 240 V	380 to 440 V
AC-12	6	6	6	6	5
AC-13	2	1,5	1	1	0,5
AC-14	≤ 72 VA				
AC-15	2	1,5	1	1	0,5

I (A)	Direct current (DC)			
	24 V	48 V	110 to 127 V	220 to 240 V
DC-12	6	2	0,4	0,2
DC-13	3	1	0,2	0,1
DC-14	0,6	0,15	0,02	0,01

I (A) : Allowable maximum intensity (A)

AC-12: Control of resistive loads and solid state loads with isolation by optocouplers

AC-13: Control of solid state loads with transformer isolation

AC-14: Control of small electromagnetic loads (≤ 72 VA)

AC-15: Control of electromagnetic loads (≥ 72 VA)

DC-12: Control of resistive loads and solid state loads with isolation by optocouplers

DC-13: Control of electromagnets

DC-14: Control of electromagnetic loads having economy resistors in circuit

This microswitch is designed to operate indifferently on circuits of bi-level type: low intensity (1 mA, 4 V minimum) or medium intensity (6 A maximum). However, a microswitch must change over only one and same type of PCB during its all use.

Position detection by standard inductive proximity detectors on printed circuit board Box R 1187-2.....

- Detection by 2 inductive proximity detectors: 1 on opening and 1 on closing, changeover function, trigger action by cam on each detector.
- Connection: refer page 11.

Detectors characteristics

Manufacturer	IFM
Material:	Housing in polybutylenetherephthalate
Operating voltage:	5 to 36 V DC
Current rating/continuous and peak:	200 mA
Minimum load current:	4 mA
Maximum voltage drop:	< 4.6V
Residual current:	< 0.8 mA
Maximum switching frequency:	2 kHz
Output status indication:	by yellow LED
Resistance to impacts:	5 g in accordance with CEI 68-2-27
Resistance to vibrations:	According to "Test programm Lloyd's Register - vibration test 1" and IEC 60068-2-6 Test Fc standard. Fréquency: 5 to 100 Hz. Displacement ± 1 mm. Acceleration: ± 0.7 g
Electromagnetic compatibility:	EN 50081-2; EN 50082-2
Electric connection:	Welded on circuit

Position detection by special microswitches or inductive proximity detectors fitted on metallic plate - Box RA 1187

Various types of microswitches or inductive proximity detectors can be fitted on a metallic plate in the AMTROBOX R for extreme positions indication (opening and closing).

In these versions, the box can be equipped:

- either with one microswitch or proximity detector on closing,
- or with one microswitch or proximity detector on opening,
- or with one microswitch or proximity detector on closing and one microswitch or proximity detector on opening.

Microswitches

Manufacturer	Type	Reference	Size	Codification
CROUZET	electric	83-186-069-FD0 + lever 170A R24	V4	RA 1187-A111....

Inductive proximity detectors

Manufacturer	Type	Reference	Size	Codification
BAUMER	PNP-NO	IFFK 10P11A11 - 3 lugs 4.8	V3	RA 1187-H311....
IFM EFFECTOR	PNP-NO	IS-3003-BPOG/IS 5031 - cable 3 wires	V3	RA 1187-H211....
	PNP-NC	IS-3003-APOG/IS 5032 - cable 3 wires	V3	RA 1187-H212....
	CC Quadronorm	IS-2002-FROG/IS 5026 - cable 2 wires	V3	RA 1187-HA31....
	CC/CA	IN-2004-ABOA/IN0081 - cable 2 wires	40 x 26 x 12	RA 1187-JA31....
PEPPERL & FUCHS	CC-NO	NBN4-12GM40-Z0 - cable 2 wires	M12	RA 1187-MA32....
	PNP-NC	NBB2-V3-E2-V5	V3	RA 1187-H312....
TELEMECANIQUE	CC-NO	XS512B1DAL2 - cable 2 wires	M12	RA 1187-MA31....
	CC-NO	XS518B1DAL12 - cable 2 wires	M18	RA 1187-PA31....

For technical characteristics of these components, please consult us.

Options

Microswitch on intermediate position - Box R 1187-1.....

A third microswitch identical to the two previous ones can be fitted on the printed circuit board and allows either to couple one of open or closed microswitch or to be adjusted on any point of the travel (adjustable on 90°).

Heating resistance

This option allows to warm continuously the inside of the box in order to avoid the condensation phenomenons encountered in the hazardous areas (tropical environment, humidity, ...).

This option is available in two kits:

Voltage	Regulated temperature	Consumption	Kit reference
12 VDC -24 VDC	40° C	10 W	42095198
110 VAC - 230 VAC	50° C	10 W	42095199

The wiring is achieved by connecting the two supply wires to the no-polarized resistance through the packing-gland.

Feed-back position 0° to 90° by resistive angle sensor - Any box

AMTROBOX R can be equipped with feed-back position sensor.

So, the valve position is transmitted during its whole travelling angle by means of a variable resistance between 0 Ω and 4.7kΩ.

In instrumentation technology, the use of a potentiometer to transmit a signal under voltage exposes the user to electromagnetic pollution, mainly for high distance transmissions or in very polluted environment.

The use of a 4-20 mA current loop is always preferable due to its better electromagnetic strength (see page 8).

Technical characteristics of angle sensor

	Min.	Nominal	Max.	Units
Mechanical travel	80	90	105	Degrees
Electrical span	3.58	4.03	4.7	kΩ
Maximal current			1	mA
Mechanical and lectrical life			> 5.10 ⁶	Travel O/C

Other values are available: 1 kΩ, 2.2 kΩ and 4.7 kΩ. Please consult us for the characteristics.

Feed-back position 0° to 90° by 4-20 mA transmitter

A transmitter can be associated to the the angle sensor in order to convert the measure in a 4-20 mA signal insuring a good immunity to the electrical disturbances. This transmitter can be:

- active : it generates the 4-20 mA signal and must be supplied in 24 VDC (3 wires) – Box R 1187,
- passive:it changes the intensity in the current loop in accordance with the position measured by the angle sensor (2 wires) – Boxes R 1187 and RA 1187..

4-20 mA active feed-back position module (3 wires) - Boxes R 1187 and RA 1187

Parameter	Minimal	Nominal	Maximal	Unit
Supply voltage	18	24	30	V
Output signal	0.6	/	21	mA
Loop resistance	0	/	550	Ω
Zero adjustment (4 mA)	0.6	4	5	mA
Span adjustment (20 mA)	12	20	21	mA
Temperature range	-20	/	+70	°C
Temperature influence (from -20 to +70 °C)		± 0.12	± 0.28	% FS
Hysteresis and dead band		± 0.05	± 0.2	% FS
Non linearity		± 0.05	± 0.2	% FS

4-20 mA passive feed-back position (2 wires) - Box R 1187

Parameter	Minimal	Nominal	Maximal	Unit
Supply voltage	7.5	21.5	36	V
Output signal	3.6	/	28	mA
Loop resistance [(U _{supply} - 7.5V)/0.02A]	0	700	1425	Ω
Zero adjustment (4 mA)	2	4	11	mA
Span adjustment (20 mA)	16	20	26	mA
Temperature range	-20	/	+70	°C
Temperature influence (from -20 to +70 °C)		± 0.12	± 0.28	% FS
Hysteresis and dead band		± 0.05	± 0.2	% FS
Non linearity		± 0.05	± 0.2	% FS

4-20 mA passive feed-back position (2 wires) - Box RA 1187

Parameter	Minimal	Nominal	Maximal	Unit
Supply voltage	10	24	30	V
Output signal	3.8	/	22	mA
Loop resistance [(U _{supply} - 7.5V)/0.02A]	0	700	1050	Ω
Zero adjustment (4 mA)	3.8	4	4.2	mA
Span adjustment (20 mA)	18	20	22	mA
Temperature range	-20	/	+65	°C
Temperature influence (from -20 to +70 °C)		± 0.15		% FS
Hysteresis and dead band		± 0.15		% FS
Non linearity		± 1		% FS

Detection of faulty box or angle sensor connection

Active feed-back position (3 wires)		Passive feed-back position (3 wires)			
Box R 1187		Box R 1187		Box RA 1187	
Connection defect		Angle sensor defect		Transmitter response	
Wire + of sensor open	2.8 mA	Wire 1 open (-)	I output = 26 mA	Wire 1 open	I output ≈ 20 mA
Wire - of sensor open	23 mA	Wire 2 open (M)	I output = 1.7 mA	Wire 2 open	I output ≈ 25 mA
Wire M of sensor open	3.15 mA	Wire 3 open (+)	I output = 1.2 mA	Wire 3 open	I output ≤ 4 mA
No sensor	2.8 mA			No sensor	I output ≈ 25 mA

On/off fieldbus - Box R 1187

AMTROBOX R can be connected to fieldbus.

The reduction of cable lengths, cable ways quantity and connecting points constitute more significant savings in the case of harsh environments.

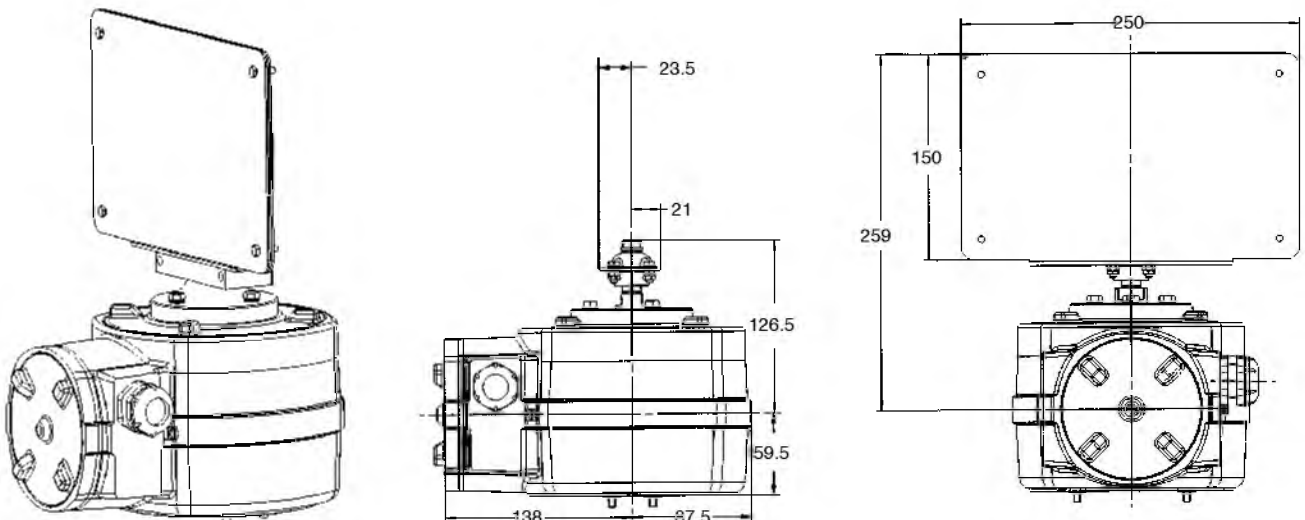
Various communication protocols are available (AS-i, Profibus DP) and allow to digitalize the information of travel limit switches.

Bus characteristics

Protocol	AS-i v3.0	Profibus DP		
Topology	Bus, tree and ring	Bus, tree with repeaters		
Cable type	2-wire cable AS-i power	4-wire shielded cable: twisted pair and 24 VDC power supply		
Speed and length of network	Cycle time 10 msec. Length from 100 metres to 300 metres with repeaters	Speed (kbit/s)	length (without repeater)	Length (with repeater)
		9,6	1200 m	10 km
		19,2	1200 m	10 km
		45,45	1200 m	10 km
		93,75	1200 m	10 km
Profil / version	S-BAE / version 3.0 S-30F / version 3.0	187,5	1000 m	6 km
		500	400 m	1 km
		1500	200 m	600 m
Max. quantity stations	62 profile S-BAE 31 profile S-30F	32 per segments - 126 max.		
Bus access	Polling	Polling master/slave Token rings between masters		
Adressing	E ² PROM	by encoders		
Electric consumption	3 w (max.)	3 w (max.)		
Supply	26,5 to 31,5 VCC	24 VCC ± 15%		

Visual indication by flag - Any box

As an option, AMTROBOX R EEx-ia can be equipped with a flag allowing to visualize the valve position at great distance, thanks to a melaminated sheet.



In this version, the top cover is without position visual indication.

Submersible version (IP 68 (30m, 72 permanent hours in accordance with ABS SC180) - All boxes

This version is equipped with a top cover without position visual indication and a specific packing gland.

Cable diameter (outer sheath): 6 to 13.4 mm,

Cable diameter (inner sheath): 3.1 to 8.6 mm,

Armour wires crawling for electrical continuity and mechanical crawling.

Commissioning

WARNING



CAUTION !

Electric wiring:

- The electric components are "CE" marked in accordance with 89/336/CEE and 76/117/CEE european directives.
- The electric supply voltage and the electric values of the signals must be checked before connecting the components.

Never exceed the values stipulated in this leaflet

This box is an electric device. As such, it may be a source of danger for property or even personnel. Any excess of these values may cause damage.

Never open, uncouple or disassemble the AMTROBOX R when energized.

During workshop or on-site checking, the valve associated with the actuator and its AMTROBOX R box can be operated from full open to full closed position. This operation may be of a high significant risk of personal injury if the safety steps required are not taken to prevent access between the disc and the seat.

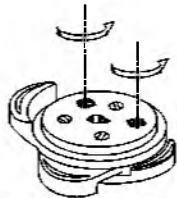
Mounting on actuator

AMTROBOX R is fitted on the actuator according to VDI/VDE 3845 interface.
The four screws can be reached easily by opening the top cover.
The driving of the shaft is done by coupling on the actuator pinion.

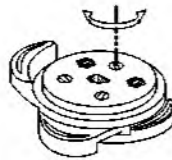
Adjustment of open/close detection

The limit switches or detectors are factory adjusted.
It is not necessary to re-adjust before valve mounting on site.
Nevertheless, if you wish to re-adjust after a maintenance operation, proceed as follows:

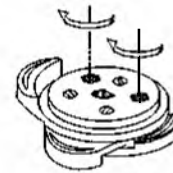
- Remove the top cover of AMTROBOX R by unscrewing it with a wrench.
- Put the disc in extreme position (opening or closing).
- Unscrew the two metal screws one turn.
- Adjust triggering of the required detector by turning the coloured screw corresponding to the colour of the cam to adjust.
- Proceed in the same manner with the opposite switch.
- Each cam is adjusted independently and the adjustment does not affect in any way the adjustment of the other cam.
- When adjustments are completed, slightly tighten the two metal screws to prevent adjustments being changed.
- Replace the top cover of the box by screwing it with a wrench.



1 - Loosen the metallic screws



2 - Adjust the cams

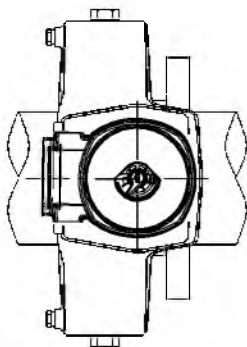


3 - Tighten the screws

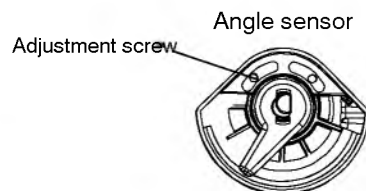
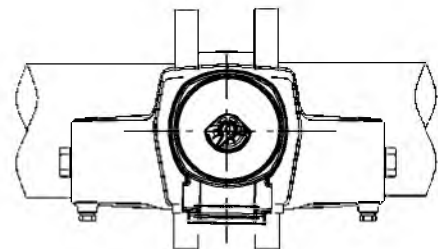
Angle sensor adjustment

Following actuator position on the pipe ("N" or "M" mounting), angle sensor position must be adjusted.
Use a screwdriver to adjust the angle sensor position. See diagram below.

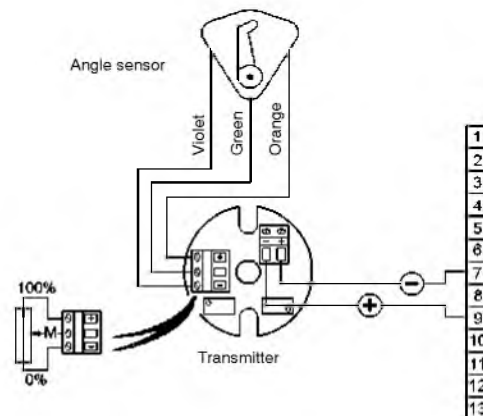
"N" mounting



"M" mounting



4-20 mA transmitter internal wiring diagram Box RA 1187



4-20 mA transmitter adjustment

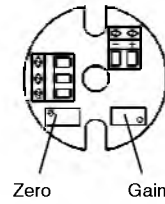
When AMTROBOX R is delivered with its actuator, the transmitter is preadjusted in workshop.

It is not necessary to re-adjust it before valve mounting on site.

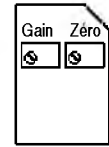
Nevertheless, if you wish to re-adjust it after a maintenance operation, proceed as follows:

- Remove the top cover of AMTROBOX R by unscrewing it with a wrench.
- Two adjustments are available for the zero adjustment (4 mA) and the gain (20 mA) thanks to two potentiometers.
- Replace the top cover of the box by screwing it with a wrench.

Box RA 1187



Box R 1187
All options



Electric connection

The box can be delivered with a plug or a packing-gland

In standard version, it is equipped with one packing-gland M20 x 1.5 or M 25 x 1.5, metallic or plastic.

Gland capacity: cable external dia. 6 to 18 mm. Other gland capacities are possible.

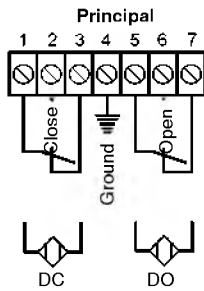
The wiring is done by connector, capacity 0.08 to 1.5 mm².

Open the side cover to access to the terminal block by unscrewing with a wrench.

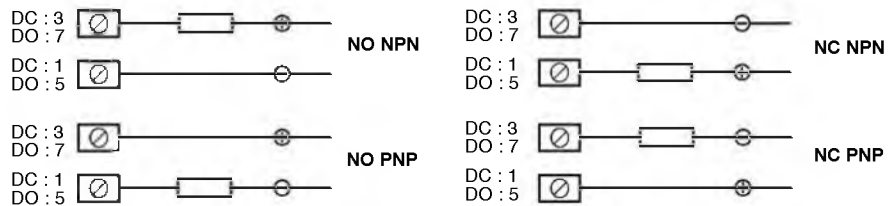
The good tightness of the box depends on cable selection and tightening of packing-gland. See wiring diagrams (pages 7, 8 and 9).
Screw the side cover with a wrench.

Wiring diagrams

Boxes R 1187 - Microswitches or detectors

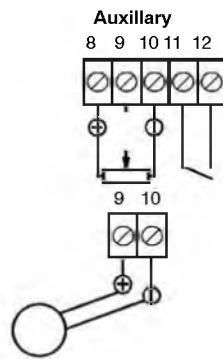
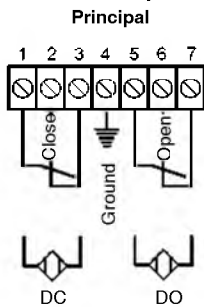


Customer connection for the detectors

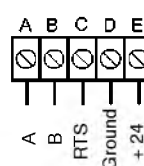


Bus

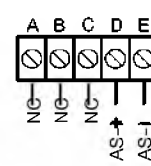
Boxes R 1187 - All options



Profibus DP



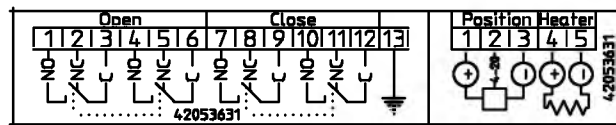
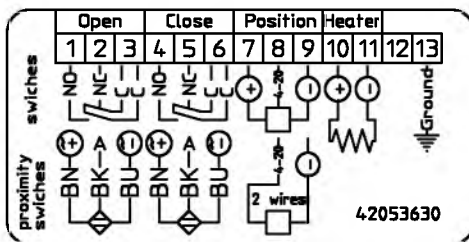
AS-i



Boxes RA 1187

1/O and 1/F

2/O and 2/F



Assembly fitting instructions for installation of cable gland type T3CDS

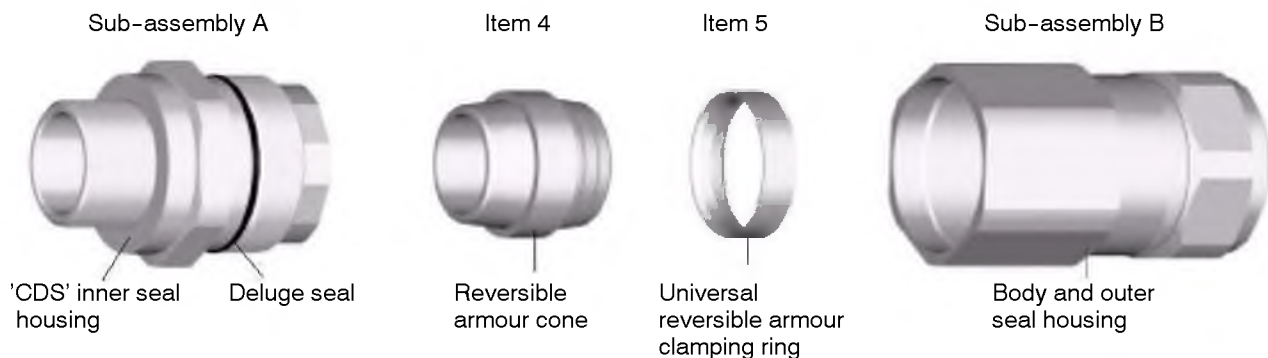
Always adopt safe working practices as your prime consideration, and use good engineering principles when carrying out your duties. Everyone is responsible for following corporate health and safety requirements.

These Cable Glands are certified EEx d IIC & EEx e II as Category 2 IIGD equipment for use in Zone 1, Zone 21, Zone 2 and Zone 22 Hazardous Areas with Braided, SWA (Single Wire Armour), Strip Armour, and Tape Armour cables, providing a flameproof seal on the cable inner sheath, and an environmental seal to the cable outer sheath with the added benefit of deluge protection to the armour lock chamber.

Please read these instructions carefully before beginning the installation.

This cable gland design has four key elements to its general construction, as shown by the diagram below. When opening the cable gland there are two loose components, the armour cone and clamping ring, which facilitate a disconnectable arrangement.

It is not necessary to dismantle the cable gland any further than illustrated below.

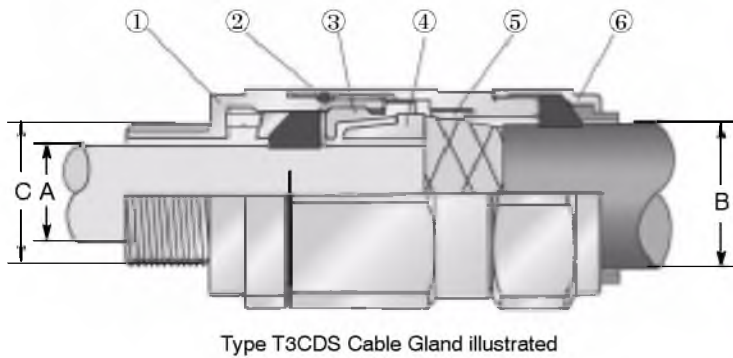
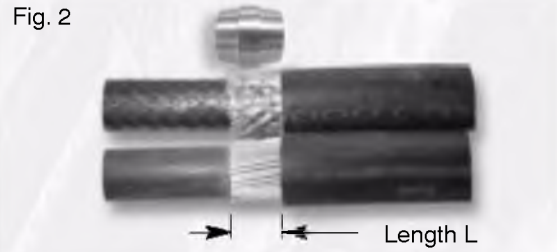


Installation instructions

1. Select the correct cable gland size using physical dimensions of the cable cross-referenced against the selection table opposite.
2. Separate the cable gland into two sub-assemblies A and B.
Note : Items 4 and 5 are loose components (See diagram above).
3. Determine conductor length required and strip back cable outer sheath and cable braid or armour to suit the equipment geometry. (Note, when cutting armour wires, care should be taken to avoid cutting into the inner cable sheath beneath the armour wires). Expose the cable braid or armour further by stripping the outer sheath enough to allow contact with the tapered cone. This length may vary slightly depending upon diameter of the cable. See fig 2 and table opposite for guidance.
Note :The reversible armour cone is suitable for terminating several cable armour types including Braid, SWA (Single Wire Armour), Strip Armour and Tape Armour. Identification of the cable armour types is marked on the cone.
For reference :
Smooth / Plain Side of Cone is for terminating SWA Cable (W)
Grooved Side of Cone is for terminating Braid, Strip Armour or Tape Armour (X,Y, Z)
4. Secure entry component (sub-assembly A) into equipment using a spanner, and in cases where a locknut is to be fitted inside the equipment, two spanners will be required to tighten correctly.
5. Pass sub-assembly B and clamping ring ⑤ over the cable, outer seal nut first.
6. Insert reversible armour cone ④, in the orientation to suit the cable braid or armour type, into compensating sleeve ③ and pass the cable through sub-assembly A equally spacing the braid or armour around the cone. See fig 3.
7. Whilst continuing to push the cable forward to maintain the cable braid or armour in contact with the cone, tighten compensating sleeve ③ into entry component ① until the components are metal to metal, and cannot be tightened any further.
8. Terminate the cable braid or armour by first securing entry component with a spanner (to prevent additional stress being transferred to entry threads) then tighten body ② onto entry component ① using a second spanner until the components are metal to metal, and cannot be tightened any further.
9. Close outer seal by tightening outer seal nut ⑥ onto body ②. Figure 5 shows a completed assembly.

Remote installation

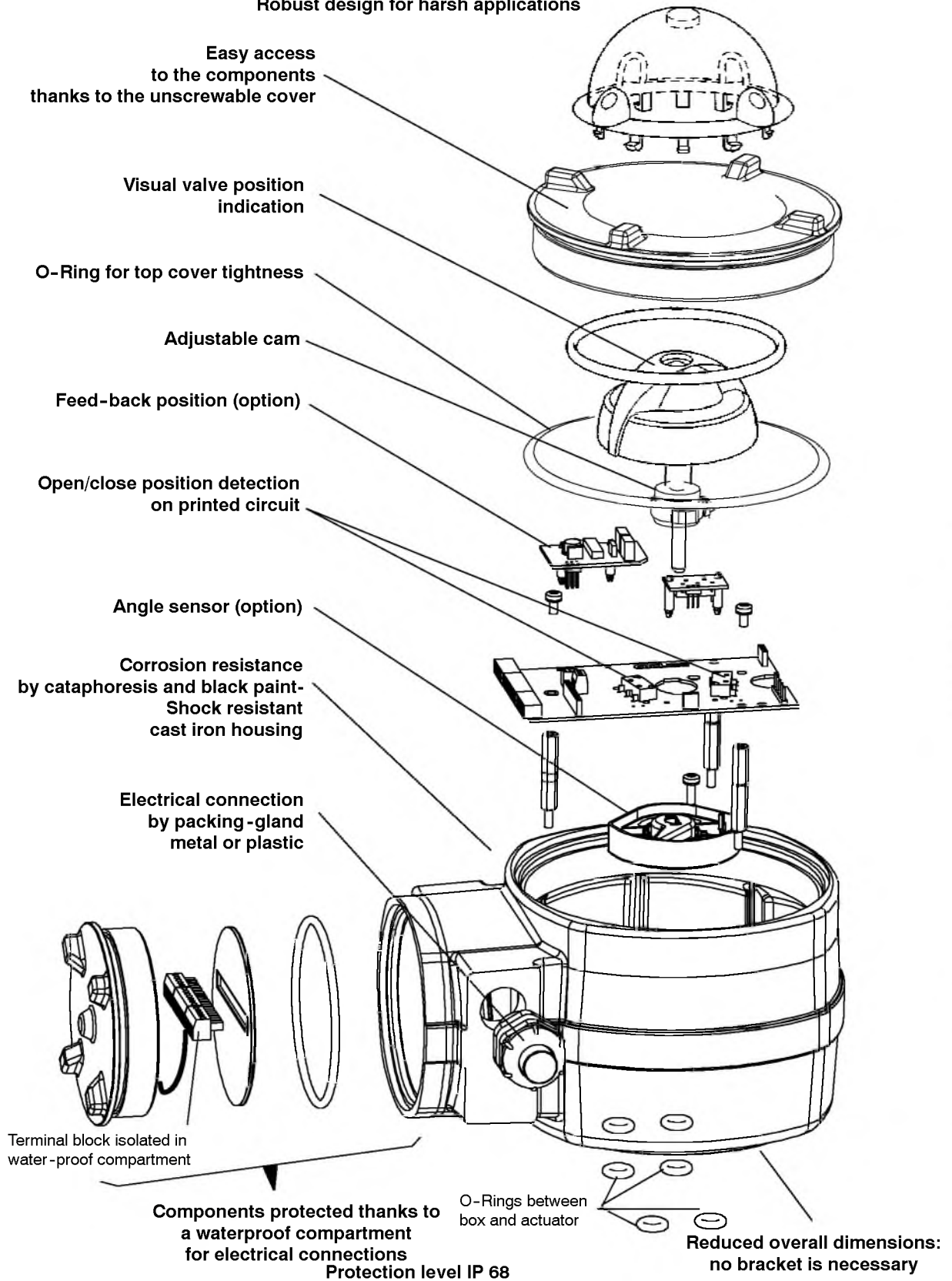
1. For remote installation follow steps 1 to 9 opposite, ignoring step 4.
2. Disconnect body ② from entry component ①. Unscrew compensating sleeve ③ until cable can be withdrawn from entry component.
3. Remote the actually cable by a new cable (See step 3, previous page).
4. Follow the steps 4 to 9 (See previous page).



Gland Size	Entry Threads C	Min. Thread	Cable Dia A		Cable Dia B		Cable gland size
	Standard Metric	Length D	Min.	Maxi.	Min.	Max.	Length L
20/16	M20	15	3.1	8.6	6	13.4	12

Product features - to our Customers' Benefit

AMTROBOX R
Robust design for harsh applications



This leaflet is not contractual and may be amended without notice.

22.07.09

8525.11/8-10

Automation

SMARTRONIC MA

Digital Positioner
SMARTRONIC MA R1310
Electro-pneumatic 4-20mA

Type Series Booklet



Automation

Digital Positioner

SMARTRONIC MA



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Operating data overview

Characteristic	Value
Enclosure	IP 67 to EN 60529
Electromagnetic compatibility	In conformity with the European EMC Directive 2004/108/EC and NF EN 61000-6-2/NF EN 61000-6-4
Operating temperature	-20 °C to +80 °C
Vibrations	To IEC 68-2-6 Test Fc
Compressed air purity class	ISO 8573-1 Class 4

Design details

- SMARTRONIC MA is a digital electro-pneumatic positioner. Power is supplied via the 4-20 mA signal.
- Used for the control of:
 - Quarter-turn actuators from the ACTAIR and DYNACTAIR type series
 - Quarter-turn actuators with standardised VDI/VDE 3845 interface
 - Linear actuators to NAMUR

- SMARTRONIC MA features a LEXAN housing (polycarbonate with 20% glass fibre) accommodating the following 3 components:
 - Electrical connection
 - Printed circuit board
 - Poppet valve with piezoelectric pilot valve (compressed air supply)
- The compressed air supply is connected via the base:
 - Direct connection to ACTAIR and DYNACTAIR
 - Connection via external piping for quarter-turn actuators with standardised VDI/VDE 3845 interface and for linear actuators to NAMUR
- Position signalling via limit switches or proximity sensors along the entire valve travel.
- The actuating times for open/close operations are set via the easily accessible air flow reducer.
- Communication using the HART protocol

Variants

- Actual-position feedback via 4-20 mA signal
- Position signalling via proximity sensors
- SMARTRONIC AS-i, type series booklet No. 8520.806

Product benefits

- Quick, straightforward installation and commissioning thanks to auto-calibration which allows optimal positioner adjustment. Can be quickly adapted to all types of actuators.
- Intuitive, user-friendly interface for local control and configuration via display and buttons
- Negligible consumption irrespective of position
- Position indicator under sight glass for remote indication
- Fully enclosed design avoids protruding, moving components
- The adjustable cams are reliable and facilitate the setting of the open/closed positions.
- Direct mounting to ACTAIR and DYNACTAIR
 - No installation components required (bracket and socket)
 - The compressed air is directly supplied via the VDI/VDE interface.
- KSB supplies a complete unit consisting of valve, actuator and positioner, fully tested for the relevant application.
- SMARTRONIC MA is HART compatible.
- The Device Type Manager (DTM) of SMARTRONIC MA and the DTMs employed for KSB pump automation have the same interface ("look and feel").
- The angle sensor adjusts itself automatically to the actuator stroke.

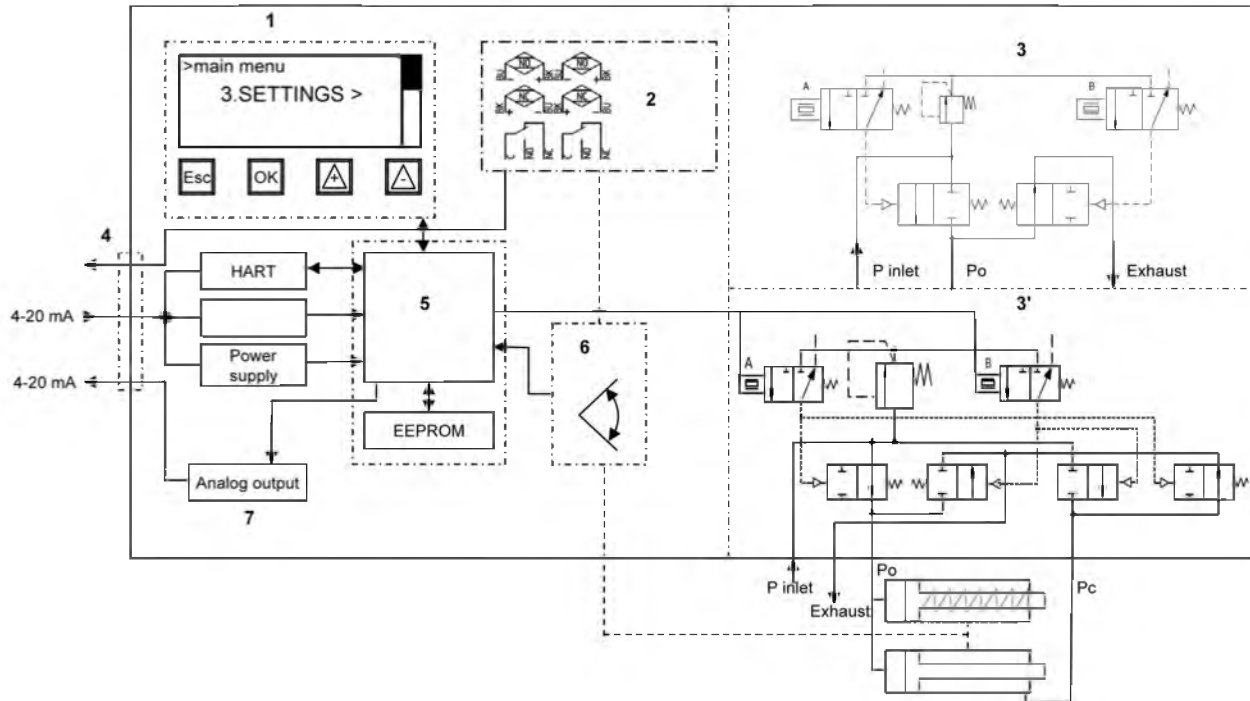
Related documents

Other applicable documents

Document	Reference No.
Operating manual	8520.8041

Technical data

Functional schematic



- 1 - User interface
- 2 - Limit switches or proximity sensors
- 3 - Electro-pneumatic functional schematic for single-acting actuators
- 3' - Electro-pneumatic functional schematic for double-acting actuators
- 4 - Terminal strip
- 5 - Micro-controller and printed circuit board
- 6 - Angle sensor
- 7 - Actual-position feedback via 4-20 mA signal

SMARTRONIC MA moves the valve into the required position in accordance with an analog 4-20 mA setpoint signal.

Control board

- The positioner is of the sequential digital type.
- The actuator is controlled by means of an ON/OFF poppet valve with 3 positions.
- SMARTRONIC MA is supplied with power via the 4-20 mA control signal only (2-wire system).
- In the event of a power supply failure, the valve moves into the fail-safe position which is configured when ordering the SMARTRONIC MA positioner.

Pneumatic poppet valve with piezoelectric pilot valve

- The piezoelectric pilot valves are controlled via the printed circuit board which responds as soon as a difference between the actual position and the setpoint is detected (signal from angle sensor).
- The piezoelectric pilot valves convert this command into a pneumatic signal and ensure the position is adopted quickly and reliably.
- This technology ensures an extremely long service life.

- The linear or rotational movement of the actuator is detected by the angle sensor.

User interface

The user interface features a graphical display with a user-friendly, intuitive drop-down menu and 4 buttons.

It allows the following functions:

- Switching to automatic or manual mode
- Adjusting the valve position along the entire valve travel (manual mode)
- Launching auto-calibration
- Manually adjusting the dead band and gain
- Configuring the split range mode
- Configuring the closing direction of the valve
- Reading diagnostic information
- Continuously reading the valve position
- Displaying the HART data

Technical specification

Housing	
Material	LEXAN (polycarbonate with 20% glass fibre)
Position indicator	Visual position indicator on the cover
Electrical connection	2 M20 ports for cable gland Connection to screw-type terminal strip (max. 1.5 mm ² cable)
Angle of rotation	-5° to 95°
Weight	1.5 kg

Compressed air supply	
Compressed air supply	1/4" gas port, marked "P" with filter fitted in the base
Exhaust connection	1/4" gas port, marked "E", fitted with silencer or exhaust system connection
Operating pressure	2 to 7 bar
Filtration	ISO 8573-1 Class 4 (< 15 µm)
Dew point	ISO 8573-1 Class 4 (pressure dew point temperature < 3 °C, and in all cases a temperature which is 5 °C below the ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 30 mg/m ³)
Max. flow rate	260 NI/min at 25 °C
Consumption in "at rest" position	< 0.4 NI/min at 25 °C

Electronic system	
Power supply	Via 4-20 mA control signal
Power consumption	From 40 mW at 4 mA to 200 mW at 20 mA
Control signal	4-20 mA
Minimum operating current	3.8 mA
Required load voltage	10 V DC
Polarity inversion protection	Yes (up to 20 V DC)
Overvoltage protection	Yes
Load resistance	500 to 515 Ohm at 20 mA
Limit of static destruction	40 mA

Positioner	
Hysteresis and dead band	< ± 1% < ± 1%
Linearity	Yes
Repeatability	< ± 0.5%
Law of variation	Linear
Offset adjustment (zero) and full scale adjustment	Manually adjustable via user interface (display + buttons)
Direct (standard) or indirect direction of action – dead band and gains are automatically adjusted – auto-calibration via buttons	

Actual-position feedback (optional)	
Output	4-20 mA, 2-wire system with galvanic/electronic isolation
Retrieval period	0.4 seconds
Resolution	CAN 16 bits
Linearity	< ± 0.01%
Temperature effect, from Tmin to Tmax	< ± 0.05% -10 °C

Open/closed position signalling (optional)	
Adjustment via cams along the entire travel	
Inductive proximity sensors, mechanical limit switches or inductive proximity sensors to ATEX	

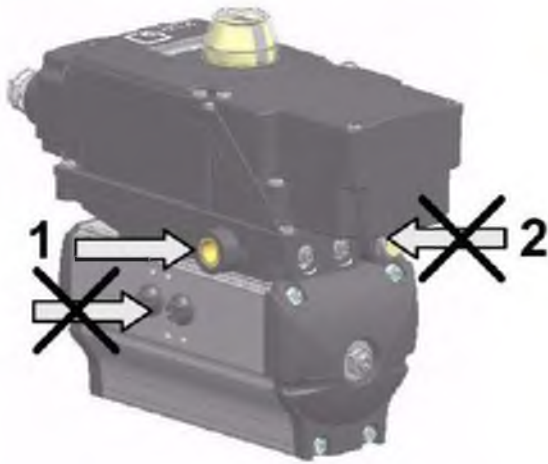
Compressed air supply

The compressed air is connected to the SMARTRONIC MA.

The pneumatic directional control valve requires filtered air to ISO 8573-1, Class 4.

A sintered bronze filter is fitted in the housing's inlet port for safety reasons to prevent clogging and damage to the pneumatic directional control valve.

The operating pressure ranges from 2 to 7 bar.



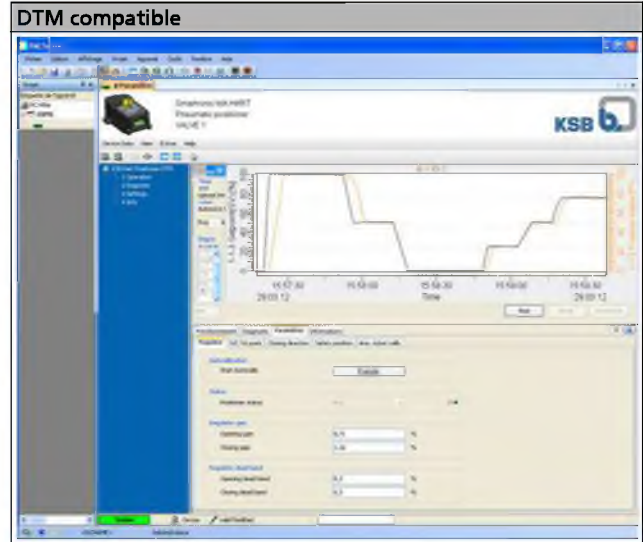
1 - Compressed air supply

2 - Exhaust

Compressed air supply: 1/4" gas port, marked "P"

Exhaust: 1/4" gas port, marked "E", with silencer or exhaust system connection

To prevent any premature mechanical component wear, especially of actuator components, the use of lubricated air (max. 10 mg/m3) is recommended.



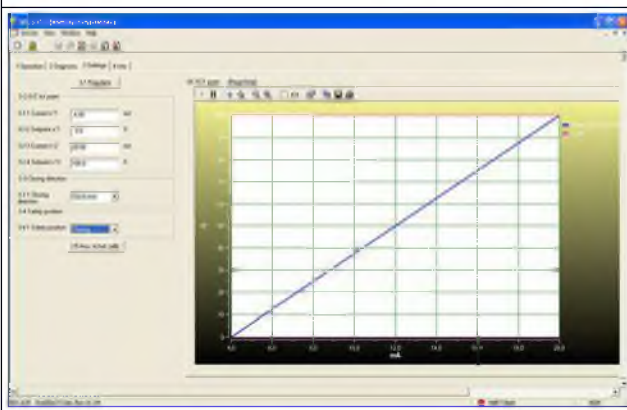
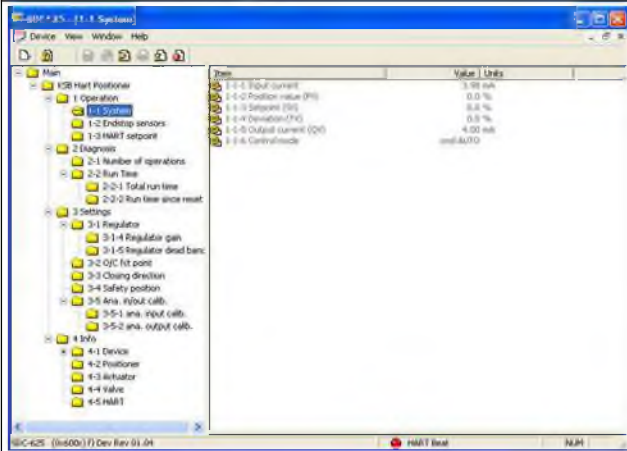
Adjusting the stroke depending on the setpoint signal

The operating staff can define two values for the setpoint current: I min (mA) and I max (mA); the values are assigned position setpoints P1 and P2 respectively.

The positioner describes a linear movement between these two points.

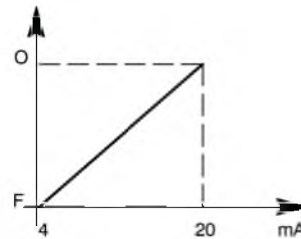
HART protocol

DD/EDD compatible
(.fm6, .fm8, .imf, .imp, .sym)



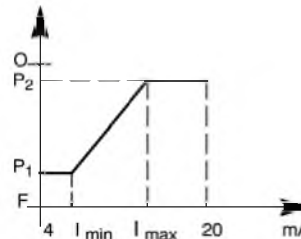
Standard configuration

Position



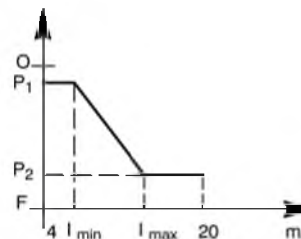
Manual configuration - Direct direction of action

Position



Manual configuration - Indirect direction of action

Position



O: Open

F: Closed

This allows the definition of the positioner's direct and indirect direction of action and operation in the split range mode.

Fail-safe position

The SMARTRONIC MA is configured to allow the valve to move into a fail-safe position in the event of a 4-20 mA signal failure or if the electric current falls below 3.6 mA. Possible fail-safe positions: Fail Open or Fail Close

Option: proximity sensors

The printed circuit board of the SMARTRONIC MA positioner is fitted with:

- 2 limit switches (standard)
- 2 inductive proximity sensors (optional)

The limit positions can be adjusted via the cams for the entire stroke.

Mechanical limit switches: technical data

Mechanical limit switches, Crouzet			
Supplier:	Crouzet		
Material:	Housing	Glass-fibre reinforced thermoplastic polyester	
	Button	Glass-fibre reinforced polyamide UL 94 VO	
	Switching contact	Silver nickel	
Switching capacity:	Current (Ohmic resistance): 6 A Breaking capacity to IEC 947.5.1		
Life expectancy:	Electrical	At I = 5 A	10 ⁵ operating cycles
		At I = 1 A	10 ⁶ operating cycles
		At I = 0.2 A	10 ⁷ operating cycles
	Mechanical	3 x 10 ⁷ operating cycles	

Max. permissible current in A	Alternating current			
	220 V	127 V	48 V	24 V
Control of resistive loads and solid state loads with isolation by optocouplers	5	5	5	5
Control of static loads with transformer isolation	2.5	3	4	4
Control of electromagnetic loads	2.5	3	4	4

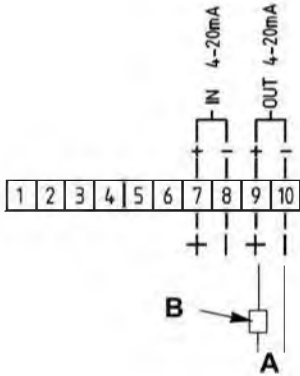
Max. permissible current in A	Direct current		
	115 V	48 V	24 V
Control of resistive loads and solid state loads with isolation by optocouplers	0.6	2	5
Control of static loads with transformer isolation	0.3	1	3
Control of electromagnetic loads	0.04	0.15	0.6

Proximity sensors: technical data

Proximity sensors, IFM XC035	
Supplier:	IFM
Housing material:	Polybutylene therephtalate
Power supply:	5 to 36 V DC
Max. current rating:	
- Peak:	200 mA
- Continuous:	200 mA
Min. current rating:	4 mA
Max. voltage drop:	<= 4.6 V
Leakage current:	<= 0.8 mA
Max. switching frequency:	2 kHz
Operating status indication:	LED

Option: actual-position feedback

SMARTRONIC MA can optionally be equipped with an additional printed circuit board for actual-position feedback via a 4-20 mA signal.

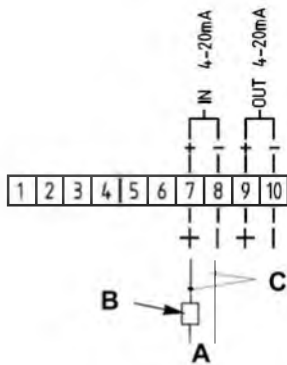


- A - Power supply 15 to 24 V DC
- B - Max. load resistance 1000 Ohm

Power supply	15 to 24 V DC
Output	4-20 mA, 2-wire system with galvanic/electronic isolation
Load resistance	0 - 1000 Ohm
Hysteresis and dead band	< ± 0.1 % of full scale
Linearity	< ± 0.1 % of full scale
Temperature effect, from T °C min. to T °C max.	< ± 0.05 % of full scale

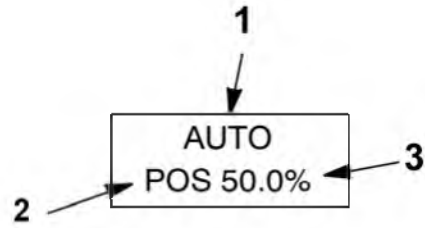
Connection to HART communicator

The positioner's printed circuit board can communicate with a HART communicator. For this purpose, it is sufficient to connect the HART modem or the input of the field communicator 375 or 475 in parallel to the 4-20 mA input of the positioner.



- A - Power supply 4 - 20 mA
- B - Max. load resistance 250 Ohm
- C - HART communicator (modem, field communicator 375 ...)

Display



- 1 Operating mode:
- 2 Parameter:
- 3 Parameter value

AUTO: Automatic positioning (4-20 mA setpoint)
POS: Valve position (%)
MANU: Manual positioning (local control)
SSR: Absolute angle sensor value (if NO CALIB)

HART: Positioning via HART protocol (HART setpoint)

NO CALIB: Instrument is not calibrated

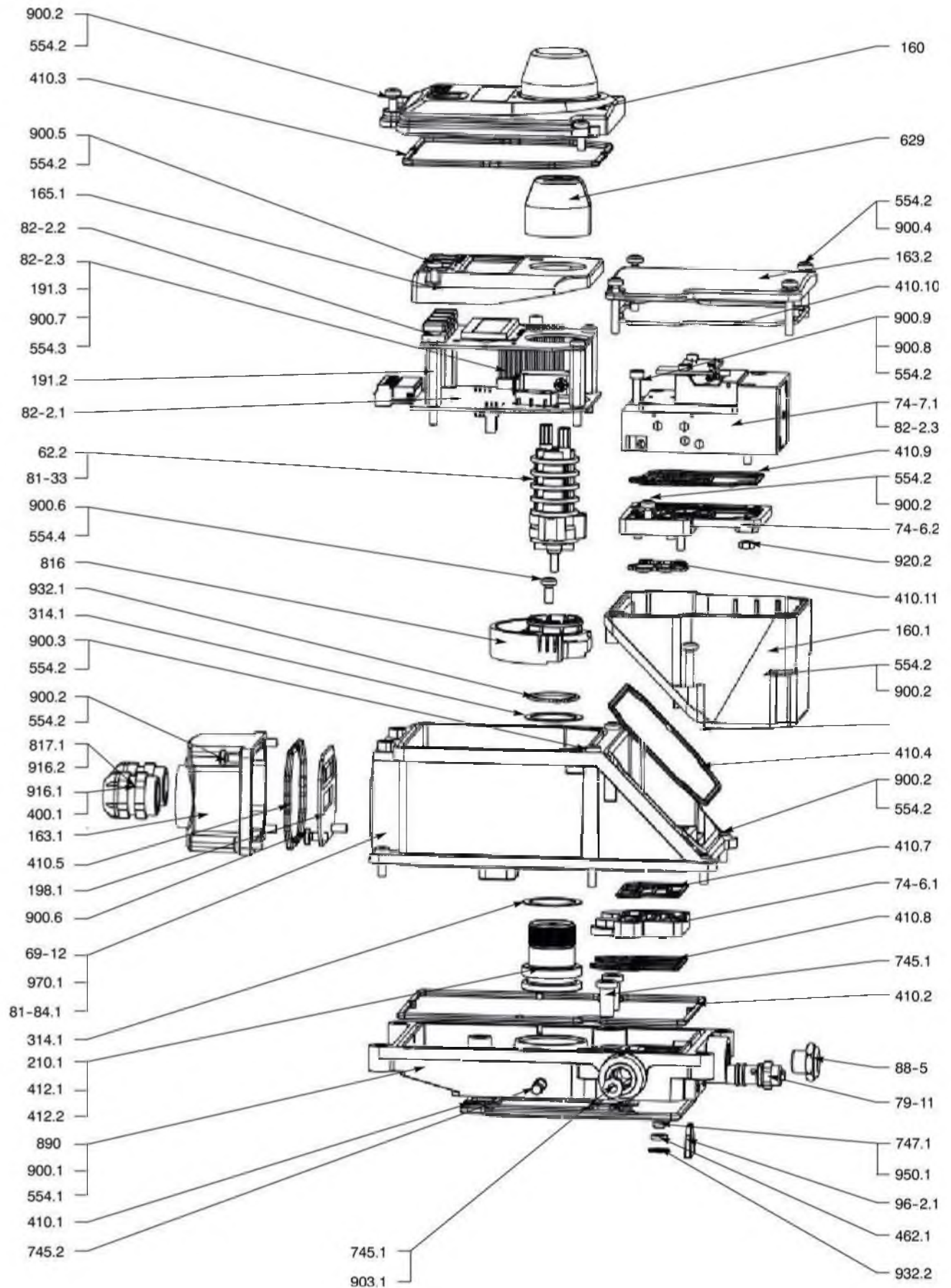
The display provides information about the operating mode and the valve position.

If the instrument has never been calibrated, the angle sensor value is displayed (SSR).

Text display may be adjusted according to the positioner's installation position.

Materials

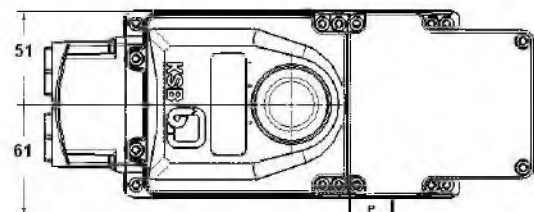
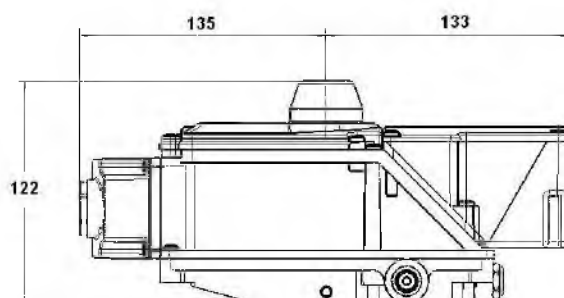
Exploded view



List of components

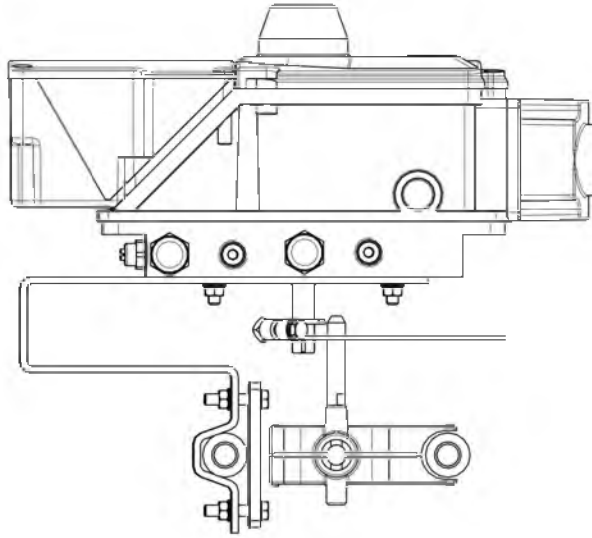
Part No.	Description	Materials
69-12	Housing	LEXAN (polycarbonate with 20% glass fibre)
160	Cover	LEXAN (polycarbonate with 20% glass fibre)
160.1	Cover (directional control valve)	LEXAN (polycarbonate with 20% glass fibre)
163.1	Housing (directional control valve)	LEXAN (polycarbonate with 20% glass fibre)
163.2	Cover	Polycarbonate
165.1	Cover	
191.2	Support	Nickel-plated brass
191.3	Crossbar	
198.1	Connection plate	
210.1	Actuating stem	Polycarbonate SM60/0
314.1	Stop disc	Stainless steel 304L
400.1	Gasket	Neoprene
410.1	Profile joint	NBR70
410.2	Profile joint	NBR70
410.3	Profile joint	NBR70
410.4	Profile joint	NBR70
410.5	Profile joint	NBR70
410.7	Profile joint	NBR70
410.8	Profile joint	NBR70
410.9	Profile joint	NBR70
410.10	Profile joint	NBR70
410.11	Profile joint	NBR70
412.1	O-ring	NBR70
412.2	O-ring	NBR70
462.1	Spring washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.3	Washer, flat	Steel
554.4	Serrated washer	Steel
629	Visual indicator assembly	
62-2	Adjustable cams assembly	

Part No.	Description	Materials
745.1	Filter	
745.2	Filter	Bronze
74-6.1	Distribution plate	
74-6.2	Distribution plate	
74-7.1	Directional control valve	
747.1	Profile joint (valve)	
79-11	Flow reducer	
816	Angle sensor assembly	
817.1	Cable gland	
81-33	Detection plate	Steel
81-84.1	Circuit diagram	
82-2.1	Printed circuit board	
82-2.2	Printed circuit board	
82-2.3	Actual-position feedback	
88-5	Silencer	Bronze
890	Base	LEXAN (polycarbonate with 20% glass fibre)
900.1	Screw	A2-70
900.2	Socket head cap screw	A2-70
900.3	Socket head cap screw	A2-70
900.4	Socket head cap screw	A2-70
900.5	Socket head cap screw	A2-70
900.6	Sheet metal screw	A2-80
900.7	Hexagon socket head cap screw	A2-80
900.8	Socket head cap screw	A2-70
900.9	Socket head cap screw	A2-70
903.1	Plug	
916.1	Screw plug	
916.2	Protective cap	Rubber
920.2	Hexagon nut	A2-70
932.1	Circlip	Steel
932.2	Reinforced circlip	Steel
950.1	Closing spring	
96-2.1	Locking plate	Polycarbonate SM60/0
970.1	Plate	Adhesive polyester

Dimensions


Variants

Mounting to linear actuator NAMUR



Base for actuators with VDI/VDE 3845 interface, not applicable to ACTAIR and DYNACTAIR



Purchase order data

SMARTRONIC MA coding

SMARTRONIC MA	R001310	.	0	0	0	1	.	.	.	B	.	.	2	.	0	6	0	0
Sensors																		
Limit switch on printed circuit board		1	0	0	0													
Proximity sensor on printed circuit board		2	0	0	0													
Position signalling																		
1/Open and 1/Closed						1												
Actual-position feedback																		
None							0											
Actual-position feedback via passive 4-20 mA signal (2 wires)							4											
Electrical output																		
None								0										
2 cable glands, plastic, M20 IP67 (diameter: 6 to 12)								1										
2 cable glands, metal, M20 IP67 (diameter: 6 to 12)								2										
Directional control valve																		
4/3 double, centre closed - Position (POS)										S								
3/3 single, centre closed - Position (POS)										T								
Power supply, directional control valve																		
24 V DC (Piezo)											B							

SMARTRONIC MA	R001310	.	0	0	0	1	.	.	.	B	.	.	2	.	0	6	0	0
Actuator																		
ACTAIR 3 to 200, stop position: Closed									S				2					
ACTAIR 3 to 200, stop position: Open									S				3					
ACTAIR 400 to 1600									S				4					
DYNACTAIR 1.5 to 25, Fail Close in the event of air supply failure									T				6					
DYNACTAIR 1.5 to 25, Fail Open in the event of air supply failure									T				7					
DYNACTAIR 50 to 100, Fail Close in the event of air supply failure									T				8					
DYNACTAIR 50 to 100, Fail Open in the event of air supply failure									T				9					
DYNACTAIR 200 to 800, Fail Close in the event of air supply failure									T				J					
DYNACTAIR 200 to 800, Fail Open in the event of air supply failure									T				K					
Pneumatic quarter-turn actuator, double-acting									S				W					
Pneumatic quarter-turn actuator, single-acting									T				X					
Pneumatic linear actuator, double-acting									S				Y					
Pneumatic linear actuator, single-acting									T				Z					
Fail-safe position																		
Fail Close in the event of power supply failure													A					
Fail Open in the event of power supply failure													B					
SMARTRONIC function																		
Intelligent positioner													2					
Field bus																		
Hart														D				
Heating resistor																		
None															0			
Indicator																		
3D sight glass																6		
Configuration																		
None																	0	
Diagnosis																		
None																		0

Balancing and Shut-off Valve

BOA-Control/ BOA-Control IMS

PN 16
DN 15-350

Type Series Booklet



Contents

Control Valves / Measurement Valves 4

- Balancing and Shut-off Valves to DIN/EN 4
- BOA-Control/BOA-Control IMS 4
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 - Fluids handled 4
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 - Accessories 10
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Control Valves / Measurement Valves

Balancing and Shut-off Valves to DIN/EN

BOA-Control/BOA-Control IMS



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Cooling circuits

Fluids handled

- Hot water for heating systems, with or without glycol ($\leq 60\%$)
- Cold water for air-conditioning systems, with or without glycol ($\leq 60\%$)
- The fluid handled should meet the requirements as specified in VdTÜV/AGFW TCh 1466 or VDI 2035.
- Only limited measurements of fluids containing gas or air can be made with ultrasound equipment. Proper venting of the systems is therefore essential.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 15 - 350 ¹⁾
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+120

Body materials

Overview of available materials

Material	Material number	Nominal size
EN-GJL-250	5.1301	\leq DN 300
EN-GJS-400-18-LT	5.3103	DN 350

Design details

Design

Valve:

- BOA-Control IMS complete with sensors for measuring flow rate and temperature
- BOA-Control prepared for attaching sensors for measuring flow rate and temperature
- Straight-way globe valve with slanted seat
- Non-rotating stem with protected, external thread
- Non-rising handwheel
- Locking device, travel stop, position indicator, throttling plug and insulating cap with anti-condensation feature as standard
- Compact EPDM-encapsulated throttling plug as soft main seat and back seat
- Maintenance-free stem seal with EPDM profile ring
- Face-to-face length to DIN EN 558/1
- Exterior coating: blue, RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

Measuring computer:

- Measuring flow rate and temperature requires the use of a measuring computer.
- Mobile short-term measurement with battery-powered BOATRONIC MS
- Permanent measurement set-up with BOATRONIC MS-420 (24 V DC power supply)

Variants

- Lead-sealable cap (prevents unauthorised actuation) as assembly set
- Control valve with electric actuator (DN 15 to 200)

Product benefits

- Innovative ultrasound technology for electronic flow rate measurement independent of minimum differential pressures
- Equipped with additional temperature sensor
- One model for shut-off and control duties due to throttling plug with linear characteristic
- Direct and straightforward measurement
- Minimised pressure loss and high flow rates due to hydraulically favourable flow passage
- Ultrasonic measurement: no contact with fluid handled
- High functional reliability as measurement is little affected by sedimentation and contamination
- Simple body design and anti-condensation feature allow easy insulation, also for air-conditioning systems. Optional insulation shells available.
- Automatic identification of flow direction for optimised fault analysis
- Type series and nominal size can be identified reliably due to colour coding even on insulated valves; travel indicator scale provided

1) DN 250-350: type BOA-H

Related documents

Information/documents

Document	Reference number
Flow characteristics	7112.41
Operating manual	0570.88
BOATRONIC MS, BOATRONIC MS-420 operating manual	7134.8
BOATRONIC MS, BOATRONIC MS-420 quick-reference operating manual	7134.81
Installation instructions "Accessories set for capped valves"	0570.811

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Variants
5. Reference number

Measuring computer:

- BOATRONIC MS: material No. 01624491
- BOATRONIC MS-420: material No. 01624492

Pressure/temperature ratings

Test pressure and operating pressure

PN	DN	Materials	Shell test	Leak test (seat)	Permissible operating pressure ²⁾
			With water		
			Tests P10 and P11 to DIN EN 12266-1	Test procedure 1 to DIN EN 60534-4	-10 to +120 °C
			[bar]	[bar]	[bar]
16	15-300	EN-GJL-250	24	17,6	16
	350	EN-GJS-400-18-LT			16

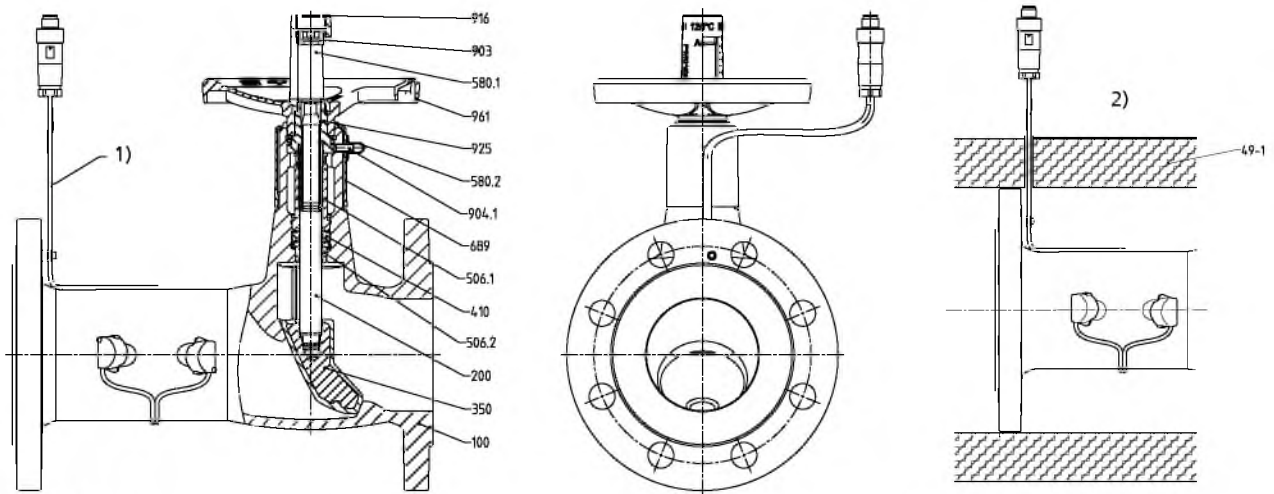
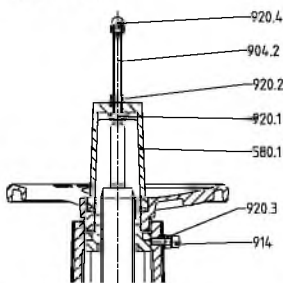
Valves from DN 250 can only be used for shut-off duties up to the differential pressures indicated below, even when handwheel levers are used!

Permissible differential pressures [bar]

PN	DN	Δp [bar]
16	250	9

PN	DN	Δp [bar]
16	300/350	6

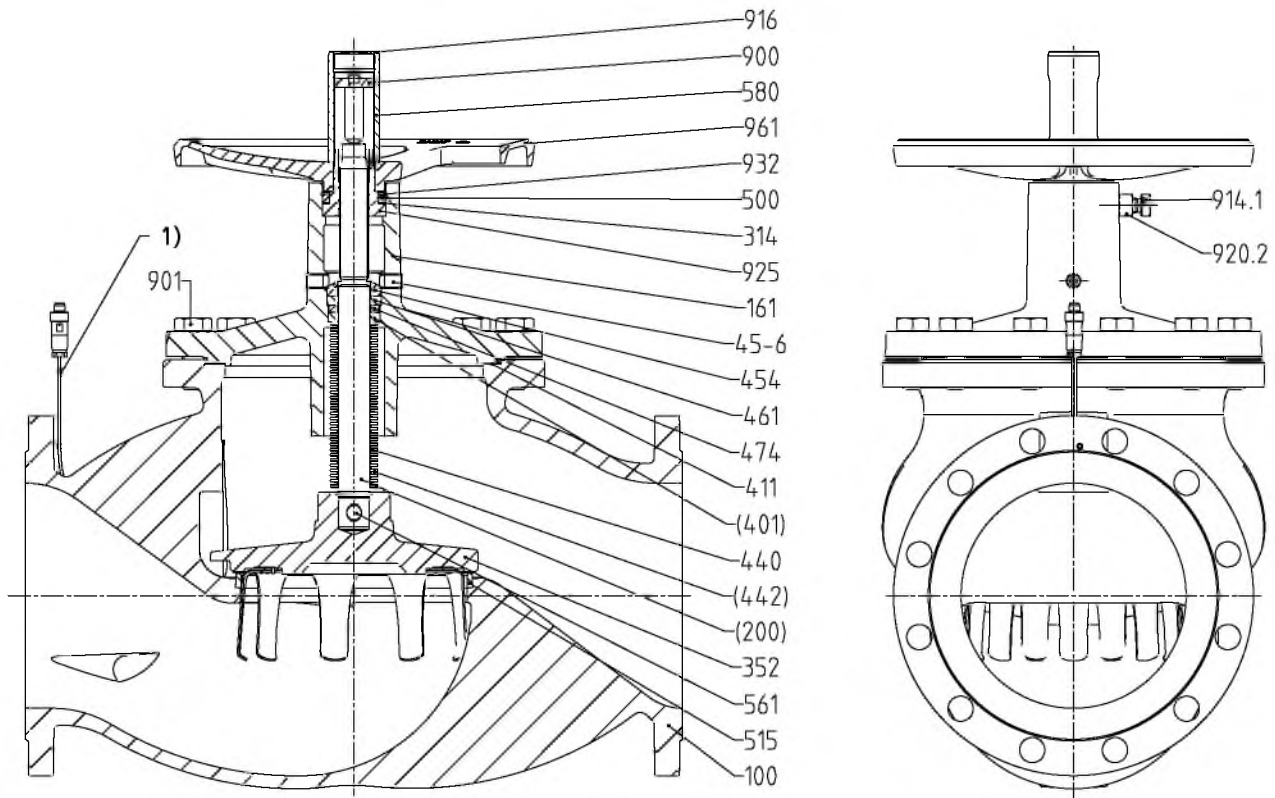
2) Static load

Materials
BOA-Control/BOA-Control IMS, type BOA-CL, DN 15-200

DN 15-150

DN 200

1)	Sensor set	2)	Insulation
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Parts list

Part No.	Description	Material	Note
49-1	Insulation shell	-	Accessory
100	Body	EN-GJL-250 (5.1301)	-
200	Stem	Stainless steel, min. 13 % chrome (Cr)	-
350	Valve disc	Cast iron/EPDM	-
410	Profile seal	Elastomer EPDM	-
506.1	Retaining ring, long	Plastic	-
		Galvanised steel	DN 200
506.2	Retaining ring, short	Plastic	-
		Galvanised steel	DN 200
580.1	Cap with travel scale	Plastic, glass-fibre reinforced, impact-resistant	-
580.2	Protective cap	Plastic	-
689	Insulation cap	Plastic	-
903	Travel stop	Galvanised steel	-
904.1	Locking device	Galvanised steel	-
904.2	Travel stop	Galvanised steel	-
914	Hexagon socket head cap screw	Galvanised steel	-
916	Plug	Plastic	-
920.1	Hexagon nut	Galvanised steel	-
920.2	Hexagon nut	Galvanised steel	-
920.3	Hexagon nut	Galvanised steel	-
920.4	Hexagon nut	Galvanised steel	-
925	Stem nut	Galvanised steel	-
961	Handwheel	Plastic, glass-fibre reinforced, impact-resistant	DN 15-50
		Aluminium, die-cast	DN 65-150
		Grey cast iron	DN 200
-	Sensor set	Plastic with ceramics	BOA-Control IMS only

BOA-Control IMS, type BOA-H, DN 250-350

Fig. 1: BOA-Control IMS, type BOA-H

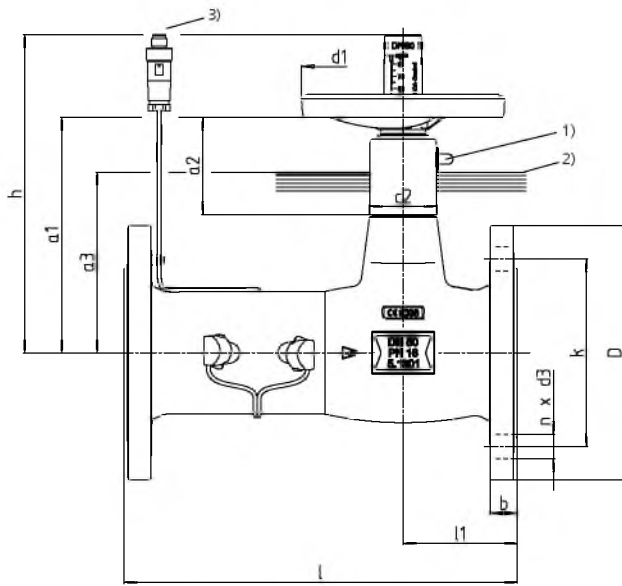
1)	Sensor set
----	------------

Parts list

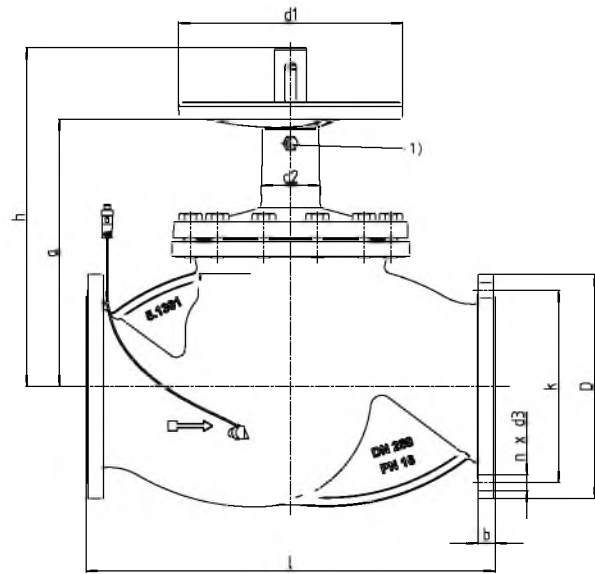
Part No.	Description	DN	Material	Material number
49-1	Insulation shell		-	Accessory
100	Body	250-300	EN-GJL-250	5.1301
		350	EN-GJS-400-18-LT	5.3106
161	Body bonnet	250-300	EN-GJL-250	5.1301
		350	EN-GJS-400-18-LT	5.3106
314	Thrust bearing		Stainless steel/PTFE	
352	Throttling plug		C22+N--NP	
411	Joint ring		CrNiSt/graphite	
440	Bellows set consisting of:			
	200	Stem	Stainless steel (min. 13 % Cr)	
	401	Weld ring	Stainless steel	
	442	Bellows	X 6 CrNiTi 18 10	1.4541
454	Stuffing box ring		Stainless steel	
45-6	Stuffing box screw		Galvanised steel	
461	Gland packing		Pure graphite	
474	Thrust ring		Stainless steel	
500	Ring		Galvanised steel	
515	Seat ring		Stainless steel	
561	Grooved pin		Steel	
580	Cap		Galvanised steel	
900	Screw		Galvanised steel	
901	Hexagon head bolt		8.8 on EN-GJL-250 variant	
902	Stud		CK 35 V on EN-GJS-400-18-LT variant	
914	Hexagon socket head cap screw		Galvanised steel	
914.1	Hexagon socket head cap screw		Galvanised steel	
916	Plug		Plastic	
920.1	Hexagon nut		C 35 on EN-GJS-400-18-LT variant	
920.2	Hexagon nut		Galvanised steel	
925	Stem nut		Coated steel	

Part No.	Description	DN	Material	Material number
932	Circlip		Spring steel	
961	Handwheel		Grey cast iron	5.1300
-	Sensor set		Plastic with ceramics	

Dimensions and weights



DN 15-200



DN 250-350

1)	Shown offset by 90°	2)	Insulation boundary
3)	Sensor		

Dimensions [mm] and weights [kg]

PN	DN	l	l ₁	h	d ₁	d ₂ ≈	a ₁	a ₂	a ₃	D	k	n × d ₃	b	[kg]	Capped valve		
															h ₃	d ₄	a ₄
16	15	130	42,5	130	50	33	93	29	57,5	95	65	4 × 14	14	2,0	181,5	130	166
	20	150	48	130	50	33	93	29	62,5	105	75	4 × 14	16	2,4	181,5	130	166
	25	160	54,5	156	80	35	105	46	72,5	115	85	4 × 14	16	3,1	191,5	130	166
	32	180	65	178	100	43	122	46	85	140	100	4 × 19	18	5,0	205,0	130	166
	40	200	70	178	100	43	122	46	95	150	110	4 × 19	18	5,8	207,5	130	166
	50	230	75	189	100	43	133	46	107,5	165	125	4 × 19	20	7,6	218,5	130	166
	65	290	85	247	125	47	175	66	125	185	145	4 × 19	20	11,5	258,5	130	166
	80	310	90	251	160	52	186	76	140	200	160	8 × 19	22	14,5	330,5	170	210
	100	350	95	305	160	63	224	73	160	220	180	8 × 19	24	20,7	346,5	170	210
	125	400	125	371	200	85	271	115	175	250	210	8 × 19	26	31,7	431,0	220	270
	150	480	150	385	250	85	283	113	192,5	285	240	8 × 23	26	41,6	453,0	340	390
	200	600	180,5	697	315	136	434	175	220	340	295	12 × 23	30	90,7	597,0	340	390

Dimensions [mm]

PN	DN	l	h	d ₁	d ₂ ≈	a	D	k	n × d ₃	b	[kg]
16	250	730	606	400	93	476	405	355	12 × 28	32	239
	300	850	660	400	93	530	460	410	12 × 28	32	343
	350	980	660	400	93	530	520	470	16 × 28	36	390

Mating dimensions as per standard

Face-to-face lengths: DIN EN 558/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21
 Flange facing: DIN EN 1092-2, type B

Installation instructions

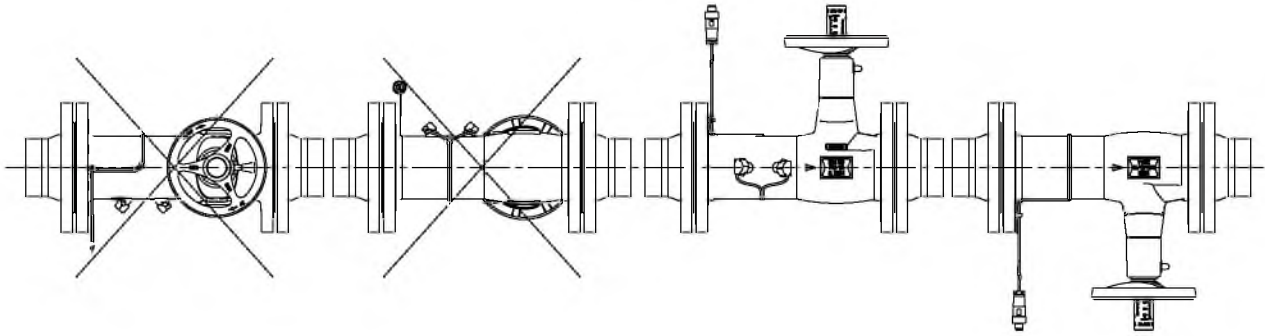
i Non-compliance with the following installation instructions may result in failure of the measuring functions!

For measuring purposes, the flow direction through BOAControl/ BOA-Control IMS balancing and shut-off valves of the BOA-CL series (DN 15-200) must correspond to the direction indicated by the arrow cast on the valve body. An alternating direction of flow is permissible for shut-off duty.

Flow through valve type BOA-H (DN 250-350) must be in the direction indicated by the arrow cast on the valve body.

Vertical installation: For installation in vertical piping, no restrictions apply with regard to the installation position of the valves.

Horizontal installation: Installation with the valve stem in a horizontal position is not allowed, to prevent air bubbles or deposits in the measuring plane.



1) Sensor below, handwheel in front. Arrangement is not allowed.	2) Sensor on top, handwheel in back. Arrangement is not allowed.	3) Sensor in front, handwheel on top.	4) Sensor in back, handwheel below.
--	--	---------------------------------------	-------------------------------------

i For optimum measuring accuracy, the following straight, minimum upstream stabilisation distances free from any sources of potential interference must be provided, irrespective of the installation position:

- At least 5 x DN between BOA-Control/BOA-Control IMS and single sources of interference such as single 90° bends or open shut-off valves
- At least 10 x DN between BOA-Control/BOA-Control IMS and turbulence-producing elements such as pumps or control valves

Installation in the return line is recommended. Installation at the highest points of a system must be avoided.

Any sources of potential interference in the upstream stabilisation area (such as, for example, immersion sensors or non-standardised sealing elements) must be avoided.

Any sources of interference must be assessed in accordance with EN ISO 5167-1, section 7.3 (previously DIN 1952, section 6).

A downstream stabilisation distance is not required!

i To avoid thermal damage to the valve disc and sensors, welding work in the area of the pipe flanges may only be carried out after the valve has been removed.

i If possible, avoid installing valves of DN 250-350 with the stem pointing downwards to prevent dirt deposits between the folds of the bellows which might cause valve failure.

i The length of the cables connecting the sensors to BOATRONIC must **not** be changed.

Accessories

- Insulation shells³⁾ for thermal insulation up to 130 °C with a thermal conductivity at 40 °C of 0.029 W/mk
Material: polyurethane
- Lead-sealable cap (prevents unauthorised actuation) as assembly set
- Mobile measuring computer BOATRONIC MS
- Stationary measuring computer BOATRONIC MS-420

³⁾ Insulation in accordance with German energy-saving regulations EnEV 2002 Annex 5

Technical data of BOATRONIC MS, BOATRONIC MS-420

Technical data of BOATRONIC MS, BOATRONIC MS-420

Characteristic	Measuring computer	
	BOATRONIC MS	BOATRONIC MS-420
Power supply	1.5 volt batteries, 4 pcs, AA Mignon	24 V DC \pm 25 %
Output Q [m ³ /h]	Display Q in m ³ /h, alternatively in [l/s] or [l/min] OR V in [m/s]	Current output 4 - 20 mA (0 m ³ /h = 4 mA) (max. m ³ /h "depending on DN" = 20 mA)
Output T (-10 to +120 °C)	Display T in [°C], alternatively in [°F]	Current output 4 - 20 mA (-10 °C = 4 mA) (+120 °C = 20 mA)
Current requirement [mA]	150	190
Low voltage detection	Battery status icon flashes when battery is very low (7.2 V) 1. Under 10 % voltage, error F16: Measuring still possible 2. Under 5 % voltage, message "Please change batteries": No measurement possible 3. Under 1 % voltage, message "Low battery": Device switches off.	-
Terminals: Output/power supply	-/2 battery holder	Spring-type
Enclosure to EN 60529	IP54	IP54
Safety class	III	III
Shock test, drop from 1 m	Passed	Passed
In-service ambient temperature	-20 to +50 °C	
In-storage ambient temperature	-20 to +50 °C	
Measuring range	Temperature	-10 to +120 °C
	Flow velocity	0.1 to 4 m/s
Measurement accuracy ⁴⁾	Flow rate	\pm 5 % of actual value
Measurement cable	Sensor connection	1 m in length (cannot be changed)

Design

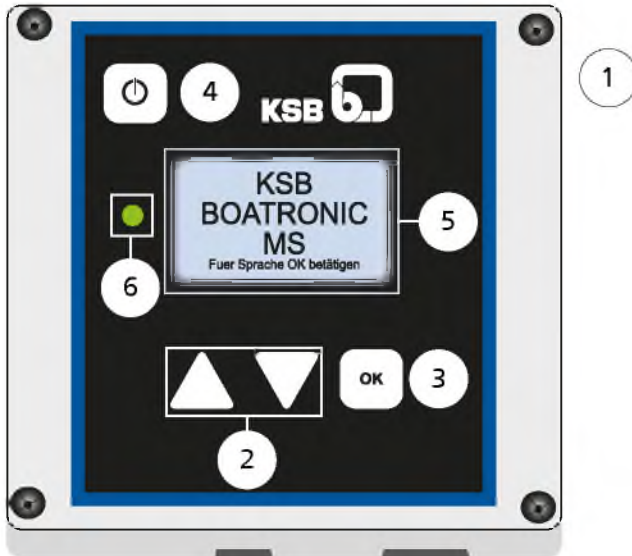
Overview of BOATRONIC models

Type	Function
BOATRONIC MS	<ul style="list-style-type: none"> ▪ For short-term measurement ▪ Mobile device (battery-powered) ▪ With USB interface for uploading and downloading data
BOATRONIC MS-420	<ul style="list-style-type: none"> ▪ For permanent measurement set-up ▪ Power supply: 24 V DC ▪ Current output 4-20 mA/2-10 V for Q and T

 4) Applies to BOA-Control IMS with H2O at 20 °C, $v \geq 0.5$ m/s with manual zero point calibration

Configuration and function

For flow rate and temperature measurement BOATRONIC must be connected to a BOA-Control or BOA-Control IMS balancing and shut-off valve. BOATRONIC is operated via a 3-key membrane keypad. A multi-line LCD display and multicolour LED provide the user with the requisite information.

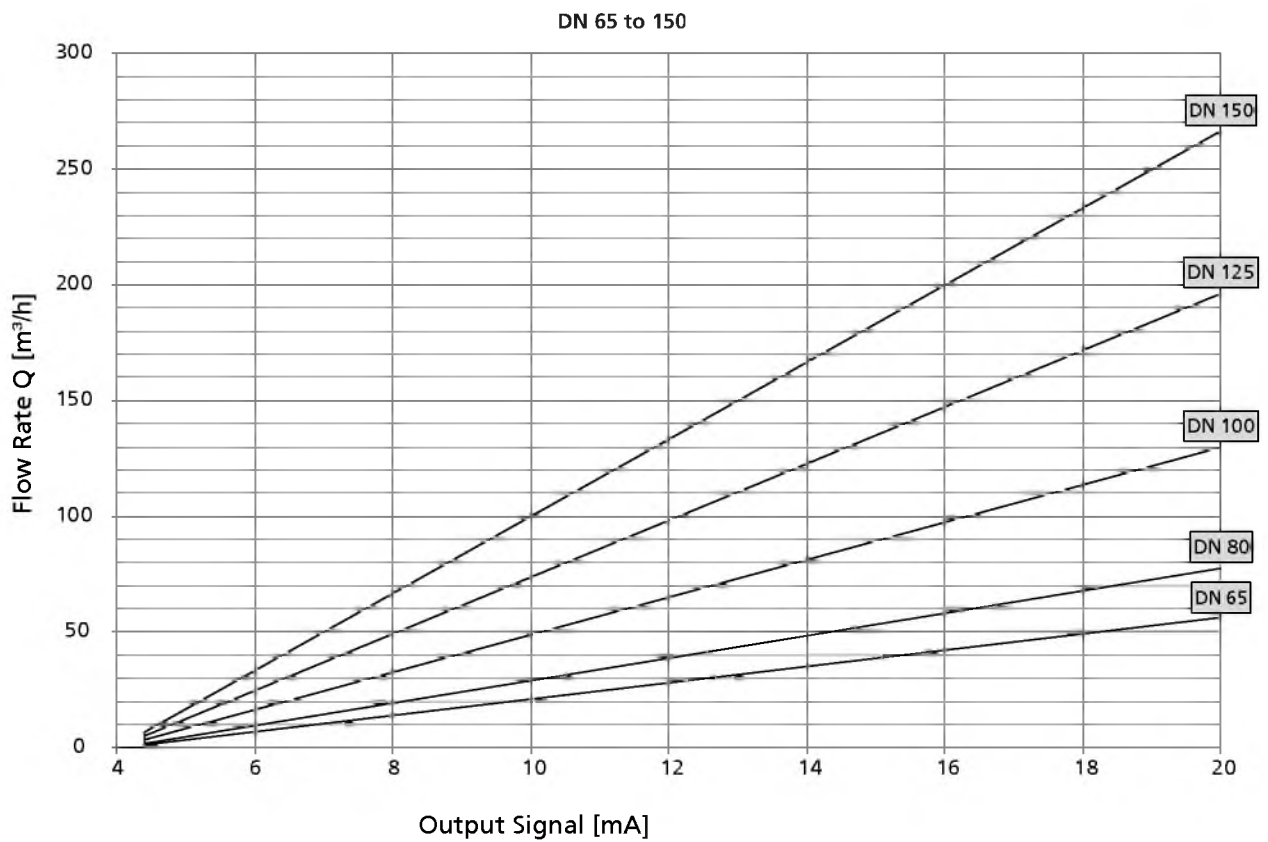
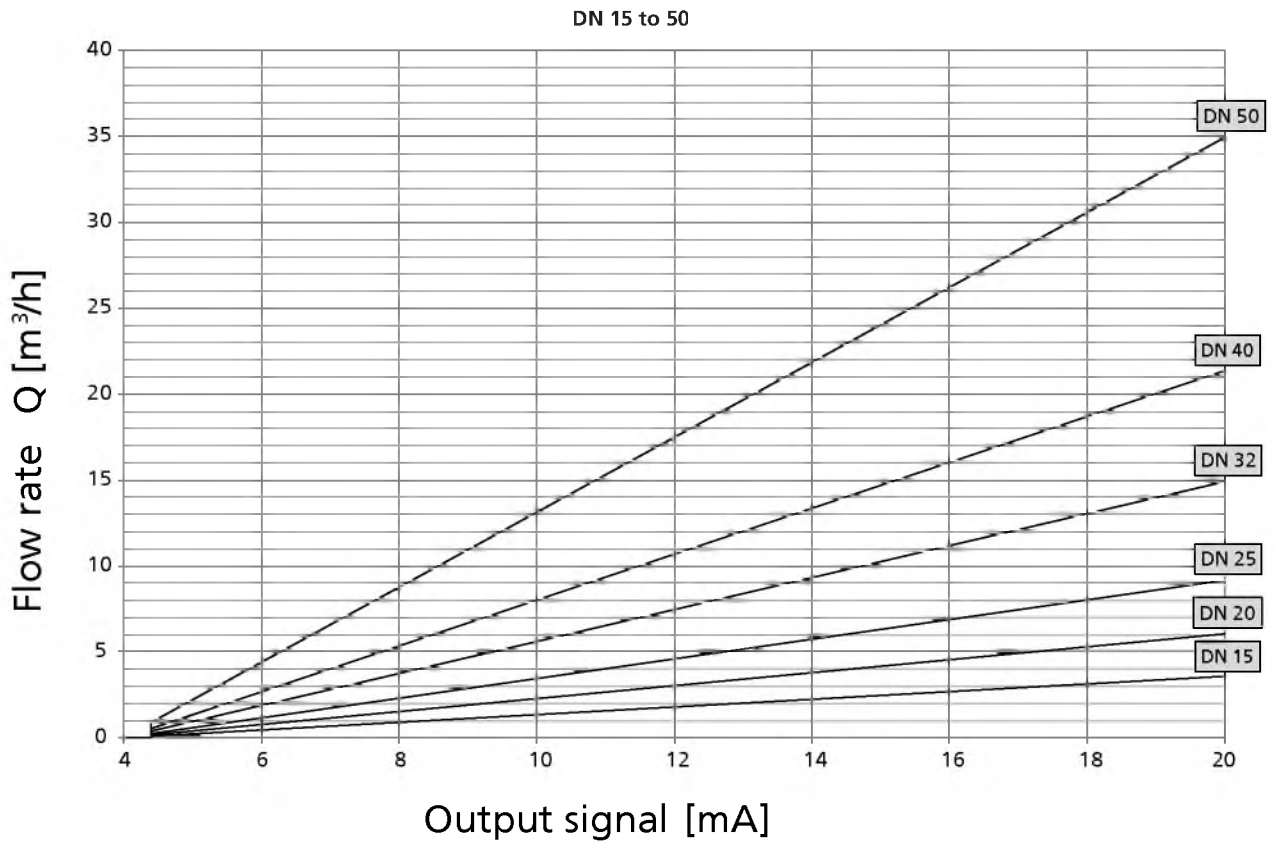


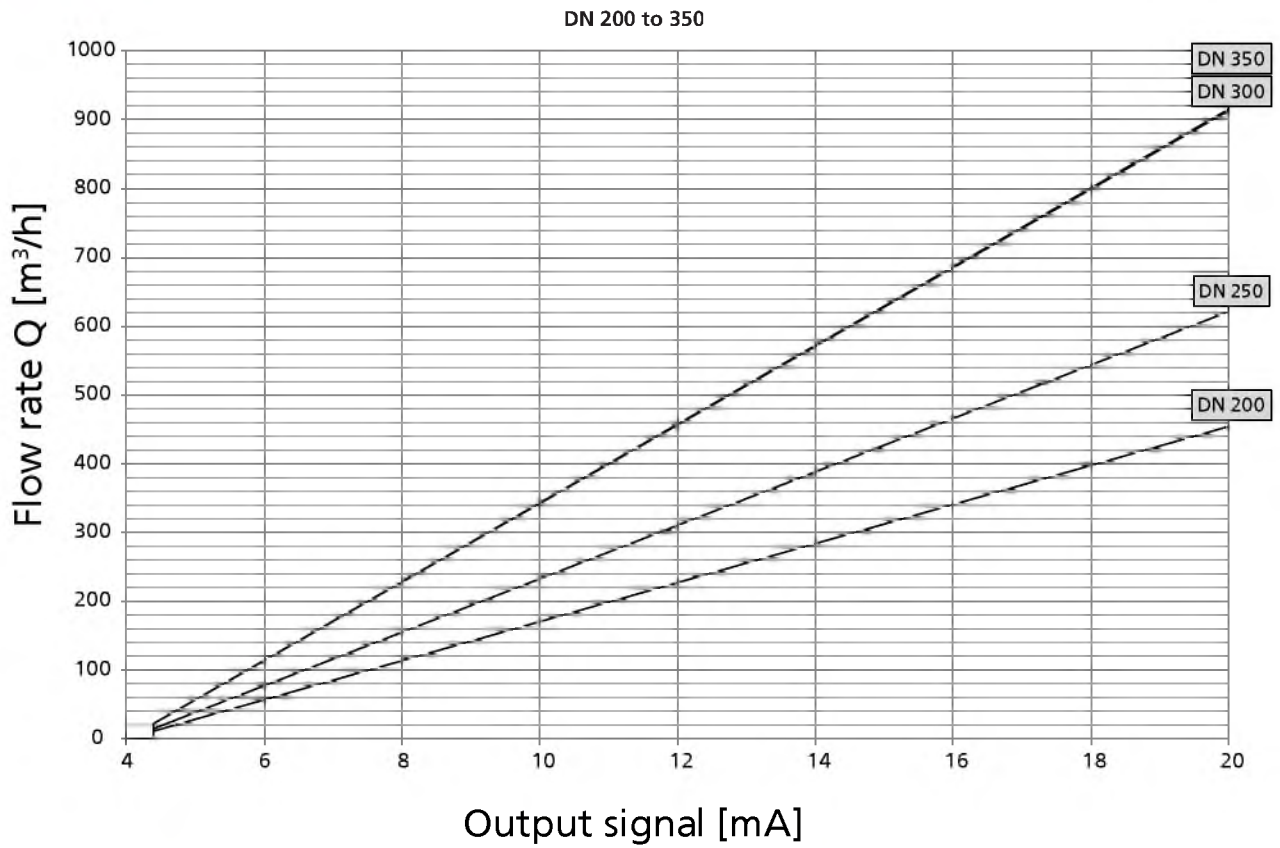
Display/indicator elements and operating elements

Elements	Key	Function/design
BOATRONIC front membrane	①	Membrane keypad with display/indicator elements
Direction keys	②	Selection of menu items
"OK" key	③	Confirmation of input/selection
"ON/OFF" key	④	Switching analysing unit ON/OFF Display backlighting ON/OFF
Display/indicator elements	⑤	Graphical LCD display
	⑥	Fault indication by red LED Measurement in progress by green LED

Characteristic curves of BOATRONIC MS-420

Correlation between volume flow rate and output signal for BOATRONIC MS-420





Data table

DN	[mA]	[m ³ /h]	[mA]	[m ³ /h]	[mA]	[m ³ /h]
15	4,4	0,09	12	1,80	20	3,61
20	4,4	0,15	12	3,01	20	6,02
25	4,4	0,23	12	4,59	20	9,17
32	4,4	0,37	12	7,46	20	14,93
40	4,4	0,53	12	10,67	20	21,33
50	4,4	0,87	12	17,46	20	34,93
65	4,4	1,41	12	28,24	20	56,48
80	4,4	1,93	12	38,69	20	77,37
100	4,4	3,24	12	64,85	20	129,70
125	4,4	4,90	12	98,08	20	196,17
150	4,4	6,65	12	133,08	20	266,16
200	4,4	11,37	12	227,33	20	454,65
250	4,4	15,51	12	310,17	20	620,33
300	4,4	22,84	12	456,74	20	913,48
350	4,4	22,87	12	457,38	20	914,77

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ⁵⁾ is observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
X	The fluid handled is not suitable for sensor measurement.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) ⁶⁾	○
Distilled water ⁶⁾	○
Heating water ⁶⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water ⁷⁾	○
Partly desalinated water ⁶⁾	○
Thermal water	✘
Drinking water	✘
Fully desalinated water ⁶⁾	○

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	X
Glycol (ethylene glycol)	X
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	○

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	X
Lye for metal cleaning	✘

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	X
Oil-containing compressed air	✘
Aqueous glycerine	X
Carbon dioxide (gas)	X
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

Evaluation shown includes measurement capability of valve.

- 5) General criteria for water to be handled by valves made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 6) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 7) Without larger solids or stringy material

Actual-position Feedback Unit

SISTO-SK-i

For Valves with Linear Actuators
Stroke: 5-46 mm

Type Series Booklet



SISTO

Actual-position Feedback Unit

Actual-position Feedback Unit for Linear Valves

SISTO-SK-i



Product description of SISTO-SK-i

SISTO-SK-i is a smart actual-position feedback unit for valves with linear actuators. Valve position is indicated visually and clearly by means of coloured LEDs. User-friendly setting of limit positions by automatic initialisation on site or via the process control system.

SISTO-SK-i continuously records valve travel and comprises a microcontroller-based analysing unit. Valve position is signalled optically by the device LEDs and electrically via digital outputs.

SISTO-SK-i is connected via an M12 plug connector and is ready for operation as soon as initialisation is complete.

Product benefits

- Pushbuttons for easy on-site operation
- Remote initialising possible
- Optional AS-i field bus connection
- Smooth surfaces are easy to clean

Main applications

- Process industry
- Food and beverages industry
- Pharmaceutical industry
- Biotechnology
- Chemical industry/Fine chemicals

Operating data

Operating properties

Characteristic	Value
Stroke	5 - 46 mm
Max. permissible temperature	-30 °C to +60 °C

Design details

- Compact actual-position feedback unit for mounting onto linear valve actuators
- Continuous valve travel recording via microcontroller
- Open/closed-position feedback
- 4 LEDs for status and position indication
- Electrical connection using M12 plug(s)
- Digital fault output

Directives

Electromagnetic Compatibility 2004/108/EC Directive

EC Low Voltage Directive 2006/95/EC

Standards

Enclosure to EN60529 IP64

Safety class to EN61140 Safety class III

Materials

Overview of available materials

Description	Material	Material number
Housing	Black plastic	PA66-GF30
Electrical connection M12	Stainless steel	1.4404

Variants

- Integrated 3/2-way solenoid valve
- Stainless steel housing (1.4404)
- Connection via AS interface

Ordering information

Design	
S0	Actual-position feedback unit 24V
S5	Actual-position feedback unit 24V with solenoid valve
A0	Actual-position feedback unit AS-i
A5	Actual-position feedback unit AS-i with solenoid valve

Material	
K0	Plastic PA66-GF30
00	Stainless steel 1.4404

For mounting on	
00	SISTO-B / SISTO-C
02	Valve with linear actuator - rod diameter 4 x 55

Ordering example: SK-i S0 K0 02

1. Design: Actual-position feedback unit 24V
2. Material: PA66-GF30
3. For mounting on valve with linear actuator - rod diameter 4 x 55

Related documents

- Operating manual 8676.81

Technical data

Technical data of SISTO-SK-i 24V

Electrical data	
Connection	8-pin M12 round plug connector
Supply voltage	24V +/- 10 %
Current consumption	ca. 80mA
Duty ratio	100 %
Digital outputs	24V, max. 100 mA, short-circuit-proof
	Open
	Closed
	Fault
Digital inputs	24V, Low: 0-3V, High: 18-24V
	Remote initialisation

Indicator and operating elements



Function

Power
Open
Closed
Fault

LED colour

Green
Orange
Yellow
Red

Pin assignment of SISTO-SK-i 24V



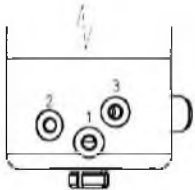
PIN

1
2
3
4
5
6
7
8

Assignment

+24V
DO Open ¹⁾
0V
DO Closed ¹⁾
DI Teach-in ²⁾
DI Solenoid valve ²⁾³⁾
DO Fault ¹⁾
Not used

Pneumatic connection

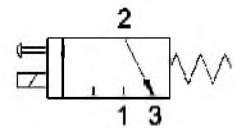


Connection

1
2
3

Assignment

Air supply
Actuator
Air outlet



Supplementary technical data for SISTO-SK-i solenoid valve

Electrical data	
Current requirement	Approx. 35mA
Pneumatic data	
Connection	Internal thread M5
Flow rate	15l _v /min.
P max	10 bar
Compressed air quality	ISO 8573-1 3/3/3
Materials	
Pneumatic connection	1.4404

¹⁾ Digital output

²⁾ Digital input

³⁾ With integrated solenoid valve only

Technical data

Technical data of SISTO-SK-i AS-i

Electrical data	
Connection	5-pin M12 round plug connector
Supply voltage	26,5 - 31,6V
Current consumption	ca. 110mA
Duty ratio	100 %
AS-i specification	V3.0
AS interface profile	
I/O configuration	7
ID-Code	A
ID1-Code	*
ID2-Code	E

Indicator and operating elements



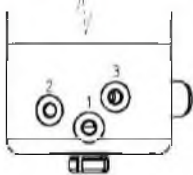
Function	LED colour
Power	Green
Open	Orange
Closed	Yellow
Fault	Red
AS-i-Power	Green
AS-i-Fault	Red

Pin assignment of SISTO-SK-i AS-i

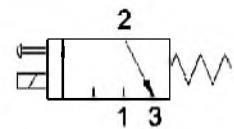


PIN	Assignment
1	AS-i +
2	Not used
3	AS-i -
4	Not used
5	Not used

Pneumatic connection



Connection	Assignment
1	Air supply
2	Actuator
3	Air outlet



Supplementary technical data for SISTO-SK-i AS-i solenoid valve

Electrical data	
Current requirement	150mA max.
Pneumatic data	
Connection	Internal thread M5
Flow rate	15l _N /min.
P max	10 bar
Compressed air quality	ISO 8573-1 3/3/3
Materials	
Pneumatic connection	1.4404

Inputs and outputs of SISTO-Sk-i AS-i

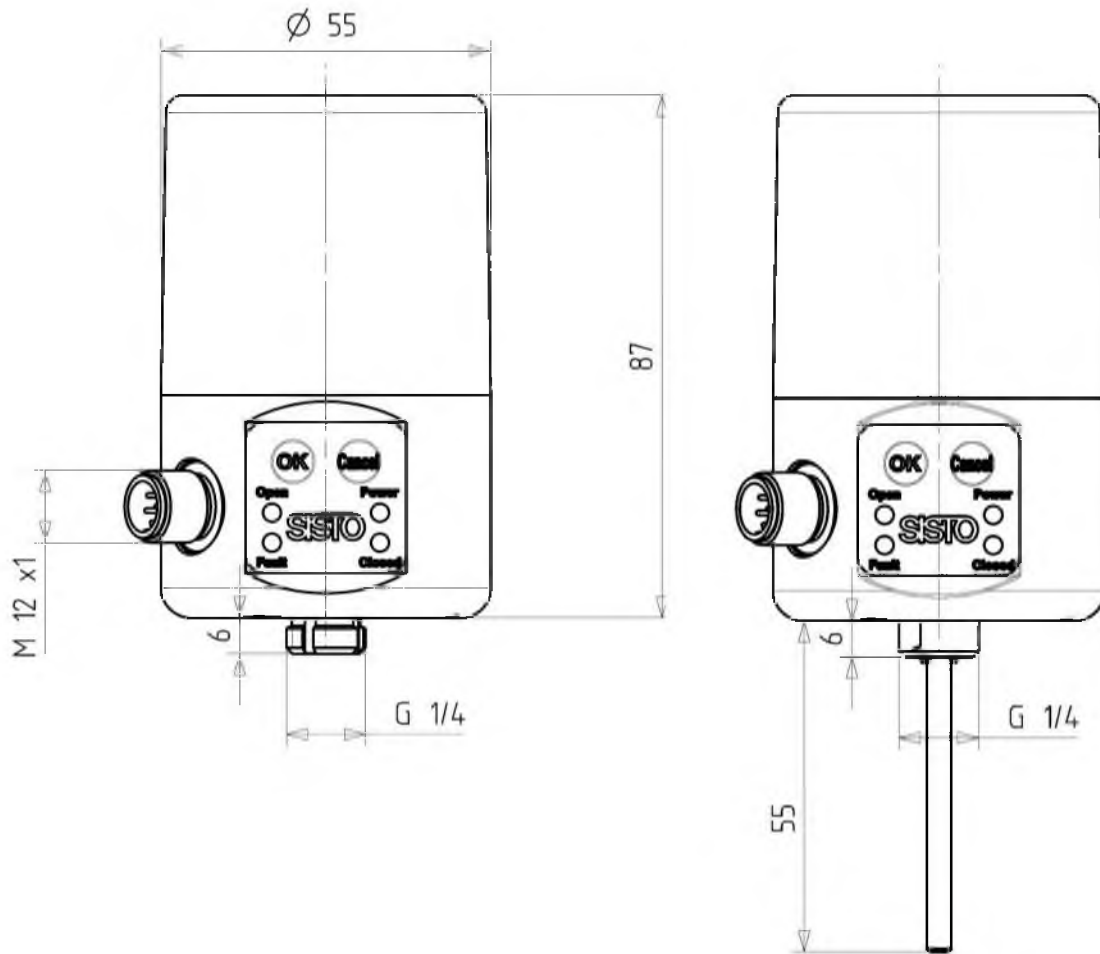
Inputs (AS-i master perspective)		
DIO	OPEN position	0 = "Not open" position 1 = "Open" position
DI1	CLOSED position	0 = "Not closed" position 1 = "Closed" position
DI2	Ready	0 = Normal operation 1 = Initialisation mode
DI3	Fault	0 = Normal operation 1 = Fault Alternating at 1 Hz = Valve not initialised
Outputs (AS-i master perspective)		
DO0	Operate valve	0 = Pilot valve not operated (if applicable) 1 = Pilot valve operated
DO1	Not connected	
DO2	Activate teach-in	0 = Normal operation 1 = Initialisation mode
DO3	Not connected	

Dimensions

Dimensions in mm

SISTO-B / SISTO-C

Mounting on valves with linear actuators



Mechanical data

Mechanical data of SISTO-SK-i / SK-i AS-i

Dimensions	[mm]
Diameter	55
Height	87
Stroke	5 - 46

Valve (actuator) connection	[inch]
Thread	G $\frac{1}{4}$

Weight	[g]
PA66-GF30	170
1.4404	470

Automation

SMARTRONIC PC

Intelligent Positioner
SMARTRONIC PC R1312

Type Series Booklet



Automation

Intelligent Positioner

SMARTRONIC PC



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Operating data overview

Characteristic	Value
Enclosure	IP 67 to EN 60529
Electromagnetic compatibility	In conformity with the European EMC Directive 2004/108/EC and NF EN 61000-6-2/NF EN 61000-6-4
Wi-Fi version	In conformity with the European 1999/56/EC Directive (R and TTE)
Operating temperature	-20 °C to +80 °C
Vibrations	To IEC 68-2-6 Test Fc
Compressed air purity class	ISO 8573-1 Class 5

Design details

- SMARTRONIC PC is an intelligent positioner.
- Used for the control of:
 - Quarter-turn actuators from the ACTAIR and DYNACTAIR type series
 - Quarter-turn actuators with standardised VDI/VDE 3845 interface
 - Linear actuators to NAMUR

- All SMARTRONIC PC versions feature the following functions:
 - Compressed air supply
 - Position signalling
 - Intelligent valve control
 - Monitoring the valve/actuator unit via an integrated printed circuit board with programmable microprocessor
- The compressed air supply is connected via the base:
 - Direct connection to ACTAIR and DYNACTAIR
 - Connection via external piping for quarter-turn actuators with standardised VDI/VDE 3845 interface and for linear actuators to NAMUR
- Position signalling via limit switches or proximity sensors along the entire valve travel.
- The actuating times for open/close operations are set via the easily accessible air flow reducer.
- Its design is based on a programmable microcontroller whose control and monitoring algorithms have been developed by KSB-AMRI.
- It is connected to the actuator in two ways: mechanically to the actuator itself and pneumatically to the inside of the actuator.

Variants

- Programmable curves for valve opening and closing
- Intelligent positioning
- Monitoring via external signal source
- Control function
- Filter tank level control
- Communication via RS232
- Communication via Ethernet
- Communication via Wi-Fi
- Field bus Profibus DP
- Actual-position feedback

Product benefits

- **Simplified and optimised automatic procedures**
SMARTRONIC PC allows the valve/actuator unit to perform comprehensive control functions:
 - Intelligent positioning
 - Control of process variables
 - Pressure surge control

This simplifies central automatic processes, both in terms of software (no valve-specific control algorithms) and hardware (fewer digital inputs and outputs).
- **Process safety and monitoring**
 - SMARTRONIC PC can process and display process-related alarms. To prevent any hazards, it is able to give the command that the valve should move into the fail-safe position.
- Position indicator under sight glass for remote indication
- **User-friendly**
KSB AMRI has developed a user-friendly interface which helps to save time during commissioning and maintenance work. The user is able to perform the following operations at any time, either locally or remotely; from a PC:
 - Visualise valve operation in real time

- Launch automatic auto-calibration
- Set the proportional, integral and derivative parameters (PID) to optimise system response
- Display SMARTRONIC PC's load cycles from commissioning
- Program the characteristic curves for opening and closing.
- **Reduced investment costs**
 - SMARTRONIC PC can optionally be connected to a Profibus DP field bus which ensures that the costs for planning and installing (cabling) the valve/actuator unit can be reduced.
- **Reduced operating costs**
 - If the actuator is inactive, the pneumatic directional control valve does not require any compressed air.
 - Compared with other positioners on the market, the SMARTRONIC PC allows substantial energy savings to be achieved.

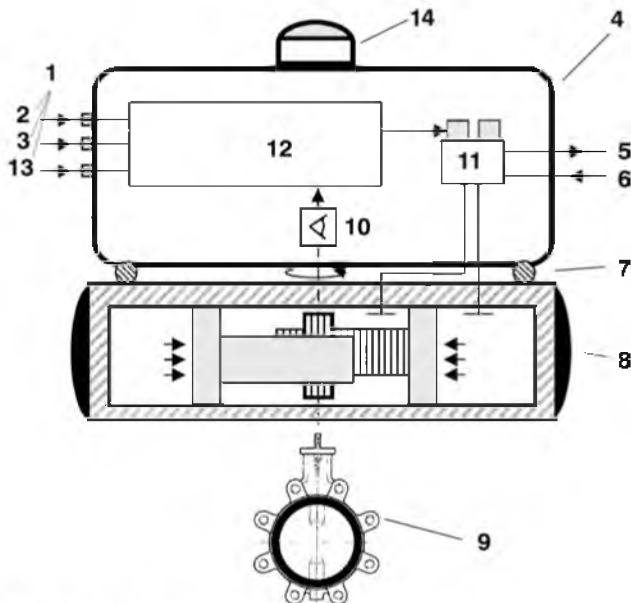
Related documents

Other applicable documents

Document	Reference No.
Operating manual	8520.8051
	42 812 734

Technical data

Functional schematic



13. External signal source

An analog external signal source can be connected to the SMARTRONIC PC which processes the measured values directly. The measured values are used for control or process monitoring.

14. Visual position indicator

1. Connections

2. User interface

Both the configuration of SMARTRONIC PC and real-time display of process data are performed via a serial interface, Ethernet or Wi-Fi using a PC.

3. Process control system

The open- and closed-loop control information from SMARTRONIC PC can be transmitted to the PLC and the monitoring PC via cable or field bus (Profibus DP).

4. SMARTRONIC PC

5. Exhaust

6. Compressed air supply

7. VDI/VDE interface

8. Pneumatic actuator

9. Valve

10. Position monitoring

The valve position is recorded by the angle sensor which is mounted on the actuator's stem. This information is transmitted to the microprocessor and the PLC for processing. The angle sensor is fitted with a stop mechanism which also ensures that the angle sensor is automatically adjusted to the actuator's stroke.

A 4-20 mA signal allows actual-position feedback to the process control system.

11. Integrated pneumatic control

The pneumatic directional control valve is fitted into the SMARTRONIC PC. The compressed air is supplied via the VDI/VDE interface, external connections are not required (up to ACTAIR 200 and DYNACTAIR 100). The pneumatic directional control valve is a 4/3 directional control valve. It is controlled via two pilot valves. The "fail-safe (Fail Open or Fail Close) position in the event of a power supply failure is specified for each unit in the purchase order.

12. Integrated microprocessor

The integrated microprocessor processes all data and runs the specific open- and closed-loop control algorithms for each SMARTRONIC PC version. It handles communication between the user interface (MMI), the process control system or the field bus (Profibus DP).

Technical specification

Housing	
Material	PBT, 30% glass fibre reinforced
Position indicator	Visual position indicator on the cover
Compressed air connection	2 x 1/4" gas ports
Electrical connection	<ul style="list-style-type: none"> - To the user interface (RS232 and Ethernet): 5-pin M12 female connector - To the user interface (Wi-Fi): Wi-Fi aerial - To the PLC and the external signal source: 2 cable glands for cable diameter 6 to 12 mm
Internal connectors	<ul style="list-style-type: none"> - Spring-type connection - Cable length to be stripped: 8 mm - For rigid or flexible conductors, with a cross-section of 0.14 mm² (26 AWG) to 0.5 mm² (20 AWG) - For flexible conductors with wire end sleeve and without insulating input sleeve, with a cross-section of 0.25 mm² (23 AWG) to 0.5 mm² (20 AWG)
Weight	1.7 kg

Compressed air supply	
Compressed air supply	Port "P" with filter fitted in the base
Exhaust	1/4" gas port, marked "E", with silencer or exhaust system connection
Operating pressure	2 to 8 bar (30 to 115 psi)
Filtration	ISO 8573-1 Class 5 (< 40 µm)
Dew point	ISO 8573-1 Class 5 (< 7 °C and in all cases < 5 °C below the ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 25 mg/m ³)
Max. flow rate	400 Nl/min
Consumption in "at rest" position	Zero

Power supply	
Max. voltage	30 V DC
Min. voltage	20 V DC
Power consumption	6.3 W max.

Compressed air supply

The compressed air is connected to the SMARTRONIC PC.



A sintered bronze filter is fitted in the housing's inlet port for safety reasons to prevent clogging and damage to the pneumatic directional control valve.

The operating pressure ranges from 2 to 8 bar.

To prevent any premature mechanical component wear, especially of actuator components, the use of lubricated air (between 5 and max. 25 mg/m³) is recommended.

1 - Compressed air supply

2 - Exhaust

Compressed air supply: port "P"

Exhaust: port "E", with silencer or exhaust system connection

Programmable curves for opening/closing

- Actuation is triggered by a volt-free On/Off contact (PLC).
- The user can program the valve's actuation time, i.e. time-dependent actuation curves for opening and closing can be stored.
- These two curves can be parameterised on the basis of 20 points. The microcontroller continuously compares the valve position with the programmed curve.
- This avoids pressures surges.

Intelligent positioning

- The valve position is controlled via an external 4-20 mA setpoint signal.
- The user defines the setpoint signal which triggers the complete closing or opening of the valve: this option is used for valves operated in split-range mode.
- The user can also configure the actuation curve of a butterfly valve disc according to the external signal.

This means valve actuation can be linear or in accordance with a user-defined curve which only applies to a specific application (butterfly valve employed as a linear control element).

Process monitoring

- Valve opening and closing is programmed.
- An external signal source directly connected to the SMARTRONIC PC allows the implementation of monitoring and safety functions.
- The user can define two limits for this external signal source (4-20 mA signal) and determine a fail-safe position.

Control

- A PID control algorithm allows the control of a physical quantity transmitted by an external signal source which is connected directly to the SMARTRONIC PC.
- This external signal source (4-20 mA) can be supplied with 24 V voltage by the control unit.
- An Open/Close control allows the selection of SMARTRONIC PC's operating mode: automatic or manual.

If the controller is in

- automatic mode**, it will control a physical quantity transmitted by the signal source.

The external setpoint input corresponds to a control setpoint.

- Example: 400 m³/h, if the flow rate is measured via the external signal source input

- manual mode**, it is used as a positioner.

The external setpoint input (4-20 mA signal or Profibus) corresponds to a position setpoint.

- Example: Valve opening angle is 45°

- The emergency shutdown command ensures the valve is closed automatically.

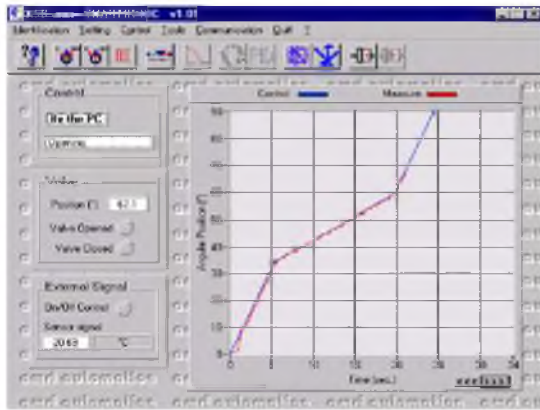
Filter tank level control

- The control task is to keep the water level in a filter tank constant; the water in the tank is filtered through anti-bacterial sand or charcoal filters.
- SMARTRONIC PC is installed at the tank's outlet ensuring that gradual filter clogging and fluctuations in the water volume entering the filter tank are compensated.
- Alongside classic control functions, SMARTRONIC PC features specific control algorithms which allow the water level in filter tanks to be controlled.

User interface

- The user interface is available via a PC or a PDA.
- It ensures straightforward commissioning, parameterisation and display of SMARTRONIC PC operating data, both locally and remotely.
- A programming set is available which helps install the software on the PC and connect the PC to the instrument's programming port.

The following example shows a time-dependent actuation curve (programmable opening/closing curves function).



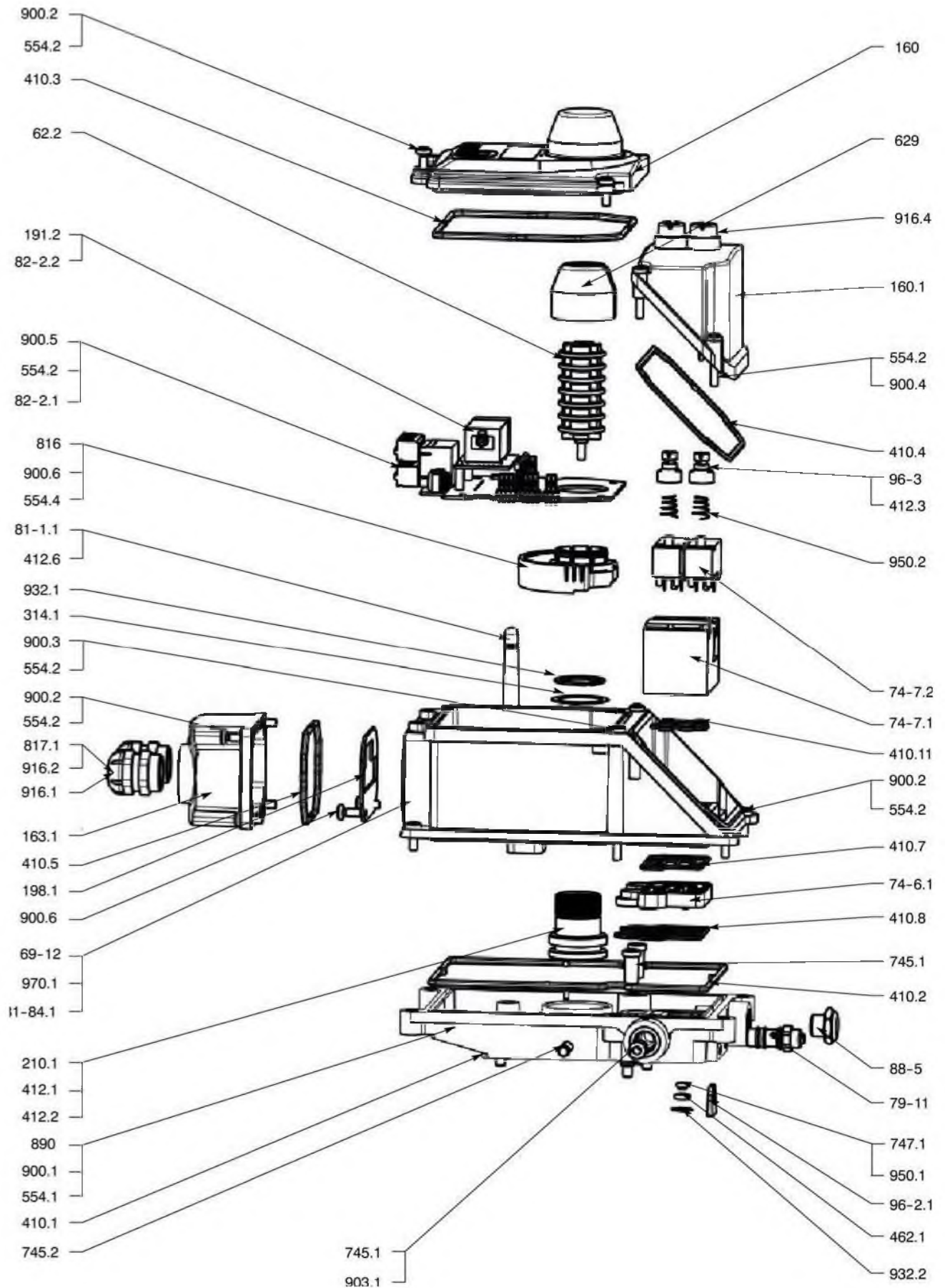
Profibus DP

Overview of operating data

SMARTRONIC PC Profibus DP meets the requirements of the EN 50170 and DIN 19245 Profibus standards.			
Actuator selection	SMARTRONIC PC Profibus DP is suitable for use with all pneumatic actuators from the ACTAIR and DYNACTAIR type series.		
Topology	Bus, tree with repeaters		
Medium	Twisted-pair cables, RS 485 interface		
Network speed and length	Speed Baud (kbits/s)	Length (without repeater)	Length (with repeater)
Profile/Version	9.6	1200 m	10 km
	19.2	1200 m	10 km
	45.45	1200 m	10 km
	93.75	1200 m	10 km
	187.5	1000 m	6 km
	500	400 m	1 km
	1500	200 m	600 m
Max. number of stations	32, up to 126 with repeaters		
Bus access	Polling of the master to the slave components (design with one or more masters)		
Addressing	Via 2 decimal encoders on the SMARTRONIC PC's printed circuit board		
Control bus variables	6 input bytes 6 output bytes		
Bus terminal resistor	A terminal resistor is integrated in each slave component of SMARTRONIC PC Profibus DP which can be activated via a switch on the printed circuit board.		
Supported operations	Cyclic data exchange, Sync mode, Freeze mode		

Materials

Exploded view

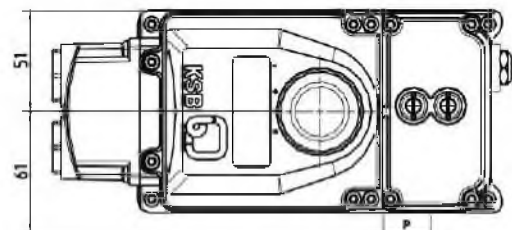
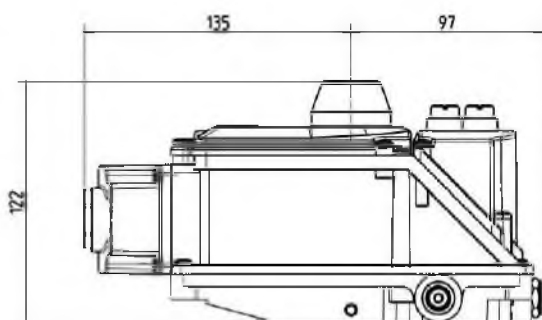


List of components

Part No.	Description	Material
160	Cover	Polycarbonate SM60/0
160.1	Cover (directional control valve)	Polycarbonate SM60/0
163.1	Housing (directional control valve)	Polycarbonate SM60/0
191.2	Support	PA 6.6
198.1	Connection plate	
210.1	Actuating stem	Polycarbonate SM60/0
314.1	Stop disc	Stainless steel 304L
410.1	Profile joint	NBR70
410.2	Profile joint	NBR70
410.3	Profile joint	NBR70
410.4	Profile joint	NBR70
410.5	Profile joint	NBR70
410.7	Profile joint	NBR70
410.8	Profile joint	NBR70
410.11	Profile joint	NBR70
412.1	O-ring	NBR70
412.2	O-ring	NBR70
412.3	O-ring	NBR70
412.6	O-ring	NBR70
462.1	Spring washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.4	Serrated washer	Steel
629	Visual indicator assembly	
62-2	Adjustable cams assembly	
69-12	Housing	Polycarbonate SM60/0
745.1	Filter	
745.2	Filter	Bronze
74-6.1	Distribution plate	

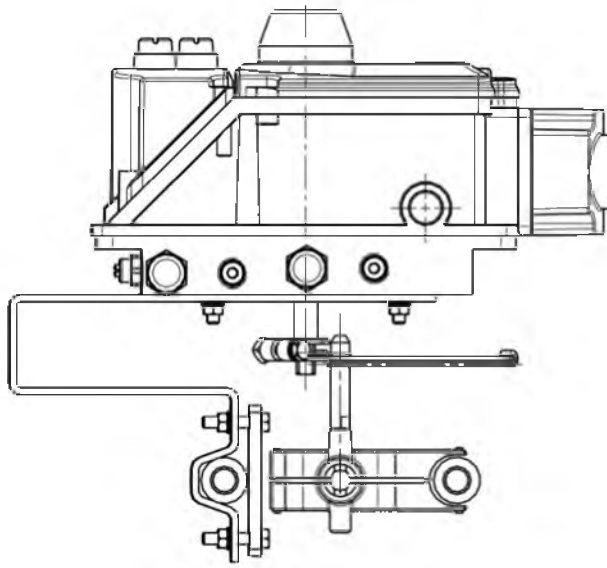
Part No.	Description	Material
74-7.1	Directional control valve	
74-7.2	Pilot valve	
747.1	Profile joint (valve)	
79-11	Flow reducer RP 1/8"	
81-1.1	Plug connector/aerial assembly	
81-84.1	Circuit diagram	
816	Angle sensor assembly	
817.1	Plug	
82-2.1	Printed circuit board	
82-2.2	COM printed circuit board assembly	
88-5	1/4" BSP silencer	Bronze
890	Base	Polycarbonate SM60/0
96-2.1	Locking plate	Polycarbonate SM60/0
96-3	Manual override	Polycarbonate SM60/0
900.1	Screw	A2-70
900.2	Socket head cap screw	A2-70
900.3	Socket head cap screw	A2-70
900.4	Socket head cap screw	A2-70
900.5	Socket head cap screw	A2-70
900.6	Sheet metal screw	A2-80
903.1	Plug	
916.1	Screw plug	
916.2	Protective cap	Rubber
916.4	Elastomer string	NBR HT 70
932.1	Circlip	Steel
932.2	Reinforced circlip	Steel
950.1	Closing spring	
950.2	Manual override spring, lockable	Stainless steel
970.1	Plate	Adhesive polyester

Dimensions

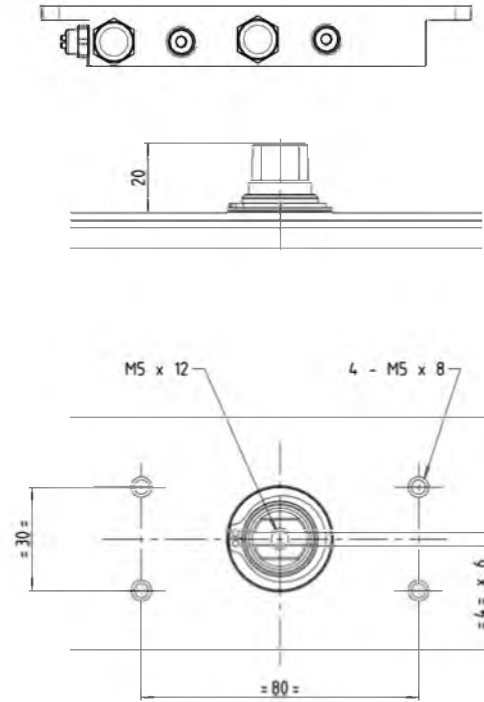


Variants

Mounting to linear actuator NAMUR



Base for actuators with VDI/VDE 3845 interface, not applicable to ACTAIR and DYNACTAIR



Purchase order data

SMARTRONIC PC	R001312	0	0	0	0	0	4	.	R	7	.	.	.	.	0	6	.	.
Sensors																		
Auto-calibrating		0	0	0	0	0												
Actual-position feedback																		
Actual-position feedback via passive 4-20 mA signal (2 wires)							4											
Electrical output																		
2 cable glands, metal, M20 IP67 (diameter: 6 to 12)								2										
Directional control valve																		
4/3 closed in centre position - Position (POS)									R									
Power supply, directional control valve																		
24 V DC										7								
Actuator																		
ACTAIR 3 to 200, stop position: Closed												2						
ACTAIR 3 to 200, stop position: Open												3						
ACTAIR 400 to 1600												4						
DYNACTAIR 1.5 to 25, Fail Close in the event of air supply failure												6						
DYNACTAIR 1.5 to 25, Fail Open in the event of air supply failure												7						
DYNACTAIR 50 to 100, Fail Close in the event of air supply failure												8						
DYNACTAIR 50 to 100, Fail Open in the event of air supply failure												9						
DYNACTAIR 200 to 800, Fail Close in the event of air supply failure												J						
DYNACTAIR 200 to 800, Fail Open in the event of air supply failure												K						
Pneumatic quarter-turn actuator, double-acting												W						
Pneumatic quarter-turn actuator, single-acting												X						
Pneumatic linear actuator, double-acting												Y						
Pneumatic linear actuator, single-acting												Z						
Fail-safe position																		
Fail Close in the event of power supply failure													A					
Fail Open in the event of power supply failure													B					
Fail-in-last in the event of power supply failure													C					
SMARTRONIC																		
Programmable curves for opening/closing													1					
Intelligent positioning													2					
Monitoring via external signal													3					
Control													4					
Filter tank level control													5					
Field bus																		
None															0			
Profibus DP															2			
Heating resistor																		
None																0		

SMARTRONIC PC	R001312	0	0	0	0	0	4	.	R	7	0	6	.	.
Position indicator																		
3D sight glass																6		
Configuration																		
RS232 (plug connector M12x1.5)																	1	
Ethernet (plug connector M12x1.5)																	2	
Wi-Fi 802.11																	3	
Diagnosis																		
Without																		0
With																		1

Valve controller

AMTRONIC

AMTRONIC R1300
Compressed Air Supply and Position Sign

Type Series Booklet



Automation

Valve Controller

AMTRONIC



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Operating data overview

Characteristic	Value
Standard enclosure	IP 67 to EN 60529
Electromagnetic compatibility	In conformity with the European EMC Directive 2004/108/EC and NF EN 61000-6-2/NF EN 61000-6-4
Operating temperature	-20 °C to +80 °C
Vibrations	To IEC 68-2-6 Test Fc
Compressed air purity class	ISO 8573-1 Class 5

Design details

- AMTRONIC is an open/close control unit for valves.
- Used for the control of:
 - Quarter-turn actuators from the ACTAIR and DYNACTAIR type series
 - Quarter-turn actuators with standardised VDI/VDE 3845 interface
 - Linear actuators to NAMUR
- AMTRONIC features a LEXAN housing (PC with 20% glass fibre) accommodating the following 3 components:

- Electrical connection
- Control and signalling board
- Compressed air supply
- The compressed air supply is connected via the base:
 - Direct connection to ACTAIR and DYNACTAIR
 - Connection via external piping for quarter-turn actuators with standardised VDI/VDE 3845 interface and for linear actuators to NAMUR
- All AMTRONIC versions incorporate the following electrical and pneumatic functions:
 - Open/closed position signalling via limit switches or proximity sensors, actual-position feedback via a 4-20 mA signal (optional)
 - Compressed air supply via integrated directional control valve (4/2 monostable, 4/2 bistable or 4/3 closed in centre position)
- To ensure a long service life of the pneumatic directional control valves, the compressed air is filtered.
- The actuating times for open/close operations are set via the easily accessible air flow reducer.

Variants

- AMTRONIC can be equipped with a wide range of limit switches and proximity sensors.
- Profibus DP version
- AS-i version
- Actual-position feedback via 4-20 mA signal
- Different supply voltages for the directional control valves

Product benefits

- For commissioning and maintenance, it is possible to manually operate the actuator via the pilot valve's manual override without having to open the cover.
- Fully enclosed design avoids protruding, moving components
- The adjustable cams are reliable and facilitate the setting of the open/closed positions.
- Position indicator under sight glass for remote indication
- Direct mounting to ACTAIR and DYNACTAIR
 - No installation components required (bracket and socket)
 - The compressed air is supplied directly supplied via the VDI/VDE interface.
- The AMTRONIC can be equipped with a variety of different limit switches and proximity sensors from leading suppliers in this field (Pepperl&Fuchs, IFM, Télémécanique, etc.), allowing the control unit to be individually equipped in compliance with customers' requirements.
- The integrated directional control valve is protected against shock, corrosion and dust.

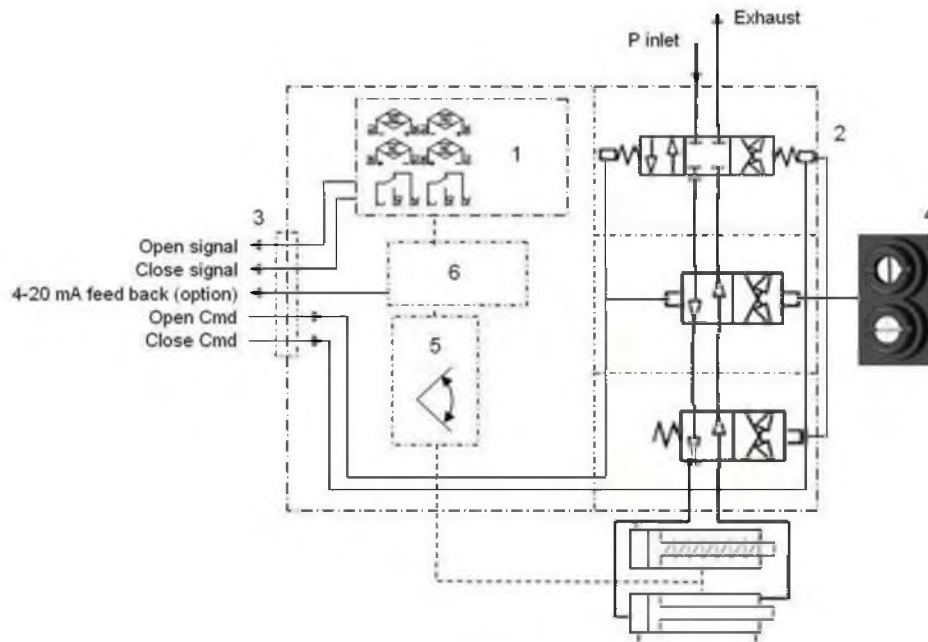
Related documents

Other applicable documents

Document	Reference No.
Operating manual	8514.8371
	42 812 299

Technical data

Functional schematic



1 - Limit switches or proximity sensors

2 - Compressed air supply via a 4/2 bistable, 4/2 monostable or a 4/3 directional control valve which is closed in centre position

3 - Terminal strip

4 - Manual override

5 - Angle sensor (optional)

6 - Actual-position feedback via 4-20 mA signal (optional)

Technical specification

Housing	
Material	LEXAN (PC with 20% glass fibre)
Position indicator	Visual position indicator on the cover
Compressed air connection	2 x 1/4" gas ports
Electrical connection	2 M20 ports for cable gland Connection to screw-type terminal strip (max. 1.5 mm ² cable)
Weight	1.5 kg

Compressed air supply	
Compressed air supply	1/4" gas port, marked "P" with filter fitted in the base
Exhaust	1/4" gas port, marked "E", with silencer or exhaust system connection
Operating pressure	3 to 8 bar (44 to 115 psi)
Filtration	ISO 8573-1 Class 5 (< 40 µm)
Dew point	ISO 8573-1 Class 5 (< 7 °C (pressure) and in all cases < 5 °C below the ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 25 mg/m ³)
Max. flow rate	400 Nl/min (at 25 °C)
Consumption in "at rest" position	Zero

Compressed air supply function

The directional control valve fitted in the AMTRONIC control unit uses a ceramic-slide technology design.
The compressed air can be dry or lubricated.
They are operated by one or two pilot valves.

Possible configurations:

Double-acting actuators

- 4/2 directional control valve, monostable
- 4/2 directional control valve, bistable
- 4/3 directional control valve, closed when under pressure

With:

Fail-safe position: 'Fail Close' in the event of a power failure
Fail-safe position: 'Fail Open' in the event of a power failure
'Fail-in-last' position when de-energised (4/3 directional control valve)

Single-acting actuators

- 4/2 directional control valve, monostable
- 4/3 directional control valve, closed when under pressure

With:

Fail-safe position: 'Fail Close' in the event of a power failure
Fail-safe position: 'Fail Open' in the event of a power failure
'Fail-in-last' position (4/3 directional control valve), fail-safe position being Fail Open or Fail Close in the event of compressed air supply failure (single-acting actuator)

Table for compressed air supply function

For ACTAIR double-acting actuators

Configuration	Case 1a	Case 1b	Case 2
Fail-safe position, power supply failure	Fail Open	Fail Close	Fail Close or Fail Open
Directional control valve	4/2, monostable	4/2, monostable	4/2, bistable
Pilot valve	1 PV 3/2 NC	1 PV 3/2 NC	2 PV 3/2 NC

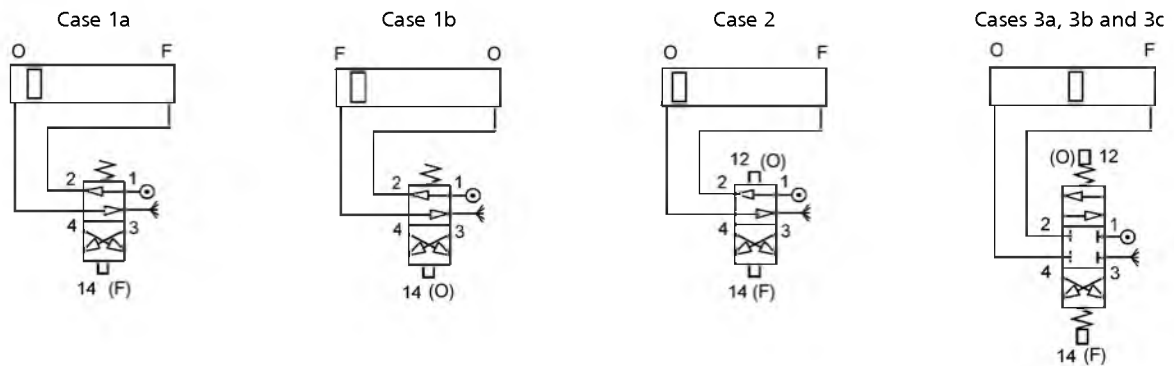
Configuration	Case 3a	Case 3b	Case 3c
Fail-safe position, power supply failure	Fail-in-last	Fail Open	Fail Close
Directional control valve	4/3, closed in centre position when under pressure	4/3, closed in centre position when under pressure	4/3, closed in centre position when under pressure
Pilot valve	2 PV 3/2 NC	1 PV 3/2 NO	1 PV 3/2 NO
		1 PV 3/2 NC	1 PV 3/2 NC

For DYNACTAIR single-acting actuators

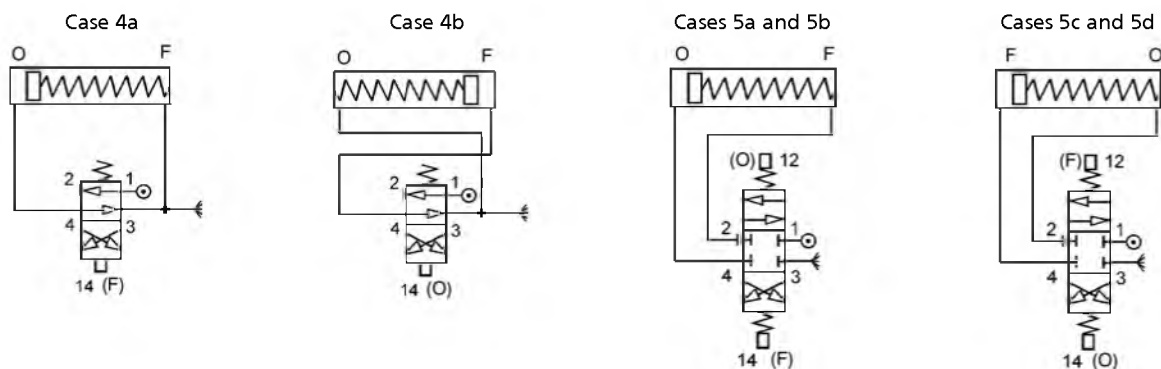
Configuration	Case 4a	Case 4b	Case 5a	Case 5b	Case 5c	Case 5d
Fail-safe position, power supply failure	Fail Open	Fail Close	Fail-in-last	Fail Close	Fail-in-last	Fail Open
Directional control valve	4/2, monostable	4/2, monostable	4/3, closed in centre position when under pressure	4/3, closed in centre position when under pressure	4/3, closed in centre position when under pressure	4/3, closed in centre position when under pressure
Pilot valve	1 PV 3/2 NC	1 PV 3/2 NC	2 PV 3/2 NC	1 PV 3/2 NO	2 PV 3/2 NC	1 PV 3/2 NO
				1 PV 3/2 NC		1 PV 3/2 NC

Schematic for compressed air supply function

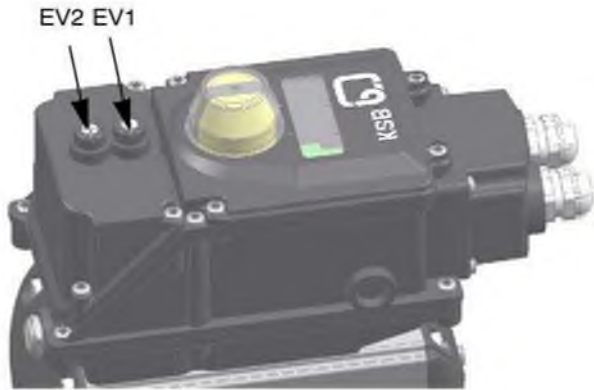
For ACTAIR double-acting actuators



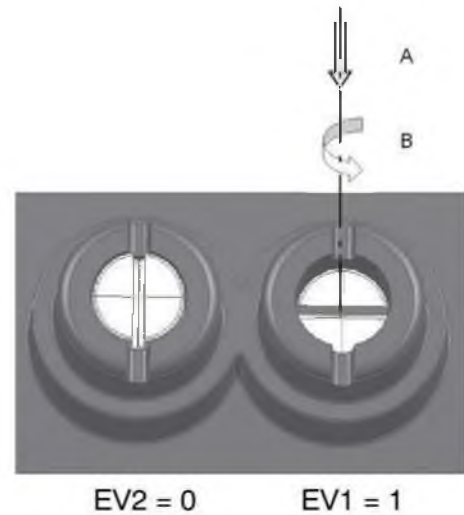
For DYNACTAIR single-acting actuators



Manual override of directional control valve



The pilot valves can be manually controlled via the buttons accessible from outside.



The manual override buttons can be locked.

How to use the manual override

A - Press the manual override button

B - Lock it in this position by turning it 90°

To avoid any interference with the pilot valves' electrical commands, it is recommended that the manual override only be used when the control unit is not energised.

Position signalling function

Two position signalling options are available for AMTRONIC:

- Via mechanical limit switches, Crouzet
- Via proximity sensors, IFM

A special feature of the AMTRONIC is that it can be fitted with limit switches or proximity sensors from other manufacturers according to the customer's specification.

Thanks to 20 years of experience in valve automation, a wide range of partner products is available from IFM, P&F, Télémécanique, etc.

Should customer processes require other limit switches or proximity sensors, please consult us.

Mechanical limit switches: technical data

Mechanical limit switches, Crouzet			
Supplier:	Crouzet		
Material:	Housing	Polyester UL94V0	
	Button	Polyester	
	Switching contact	Ag/Ni gold plated	
	Membrane	Silicone	
Switching capacity:	Breaking capacity 6 A at 24 V DC and 250 V AC		
Life expectancy:	Electrical	at I = 5 A	7 x 10 ⁴ operating cycles
		at I = 1 A	3 x 10 ⁵ operating cycles
at I = 0,2 A		10 ⁶ operating cycles	
	Mechanical	2 x 10 ⁶ operating cycles	
Vibration fatigue limit:	IEC 60068-2-6 / 3 axes / 50 g from 10 to 500 Hz		
EMC:	EN 50081-2, EN 50082-2		
Electrical connection:	Soldered on printed circuit board		
Enclosure:	IP 67		

Proximity sensors: technical data

Proximity sensors, IFM XC035	
Supplier:	IFM
Housing material:	IEC 60068-2-6 / 3 axes / 50 g from 10 to 500 Hz
Max. current rating:	
- Peak:	200 mA
- Maximum:	200 mA

Proximity sensors, IFM XC035	
Min. current rating:	4 mA
Max. voltage drop:	$\leq 4,6$ V
Leakage current:	≤ 0.8 mA
Max. switching frequency:	2 kHz
Operating status indication:	Yellow LED

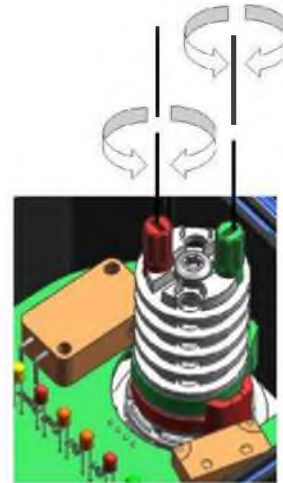
It is possible to add a third limit switch or proximity sensor for intermediate position signalling.

Setting the cams for position signalling

The cams are pre-set in the factory.

This setting can however be changed if the actuator's mechanical end stops are changed.

The limit switches or proximity sensors can be set independently of one another on the cams along the entire valve travel. (See Operating manual, ref. No. 8514.8371).



Option: actual-position feedback

Technical data of the passive actual-position feedback (4-20 mA signal/2-wire system)

Parameter	Minimum	Nominal	Maximum	Unit
Power supply	7.5	21.5	36	V DC
Output signal	3.6	/	28	mA
Resistance $[(U_{\text{Supply}} - 7.5 \text{ V}) / 0.02 \text{ A}]$	0	700	1425	Ohm
Zero adjustment (4 mA)	2	4	11	mA
Span adjustment (20 mA)	16	20	26	mA
Temperature range	-20	/	+70	°C
Temperature influence (from -20 to +70 °C)		± 0.12	± 0.28	% FS
Hysteresis and dead band		± 0.05	± 0.2	% FS
Linearity		± 0.05	± 0.2	% FS

Field bus communication version

Field bus communication is ensured by simply integrating an electronic printed circuit board.

A field bus system makes the wiring of control units for open/close applications straightforward and helps to reduce installation costs.

The AMTRONIC is compatible with the Profibus DP and AS-i field bus systems.

AMTRONIC AS-i

The AS-i (Actuator Sensor Interface) field bus is primarily used for sensors and actuators in open/close applications. The field bus is a master/slave bus system: The PLC as the master receives the open- and closed-loop control information from the AMTRONIC's slave components. This field bus is of a simple and robust design and can be easily installed. A two-wire cable is all that is required for power supply and transmission of digitalised information. 62 AS-i slave components can be connected to an AS-i field bus over a distance of 100 metres. Extensions are possible using repeaters. AMTRONIC has an AS-i interface with 2 inputs and 2 outputs. S-B.A.E and S-3.O profiles are available. The commands from the electro-pneumatic pilot valves are transmitted via the two outputs while the information from the limit switches (1 for Open and 1 for Closed) is provided via the two inputs. KSB recommends the use of the SMARTRONIC AS-i digital positioner for positioning applications using AS-i field bus.

AMTRONIC Profibus DP

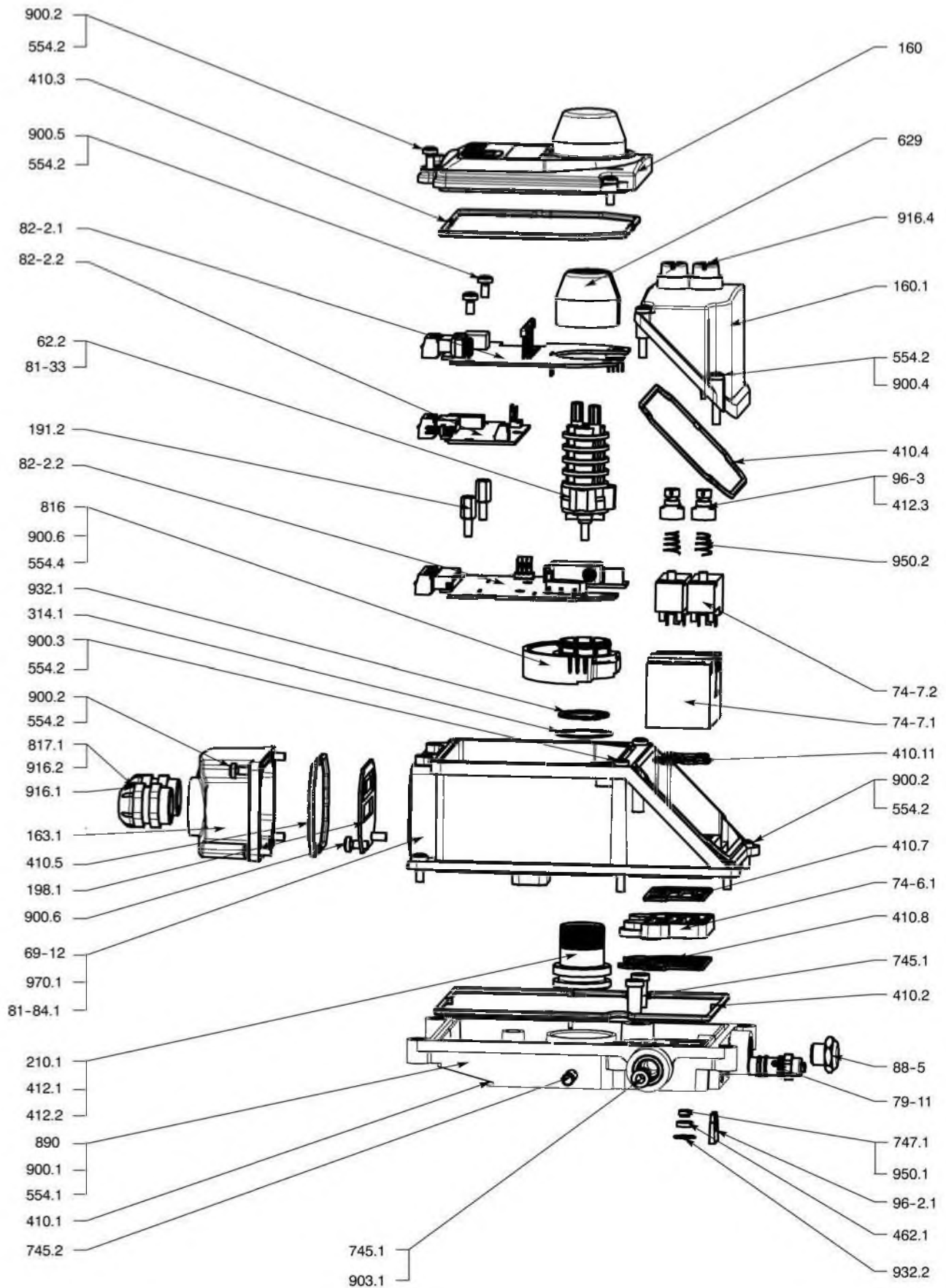
A slave interface is integrated in the AMTRONIC for Profibus DP (Decentralized Periphery) which allows the transmission of information to the PLC (master) via a twisted-pair, shielded cable. This interface ensures that up to 126 slave components can be connected over a distance of 1200 metres (up to 10 km when using repeaters with a speed of 1.5 Mbit/s). AMTRONIC Profibus DP processes information for two outputs for pilot valve control and two inputs for the limit switches' signals. The slave components are connected by a shielded cable (twisted pair) which transmits both the Profibus DP field bus information and the electrical voltage (24 V DC). KSB recommends the use of the SMARTRONIC PC Profibus DP intelligent positioner for positioning applications via Profibus DP.

Field buses: technical data

	AS-i	Profibus DP		
Topology	Bus, tree or ring	Bus, tree with repeaters		
Medium	2-wire cable/AS-i voltage supply	4-wire, shielded cable: twisted pair and 24 V DC power supply		
Network speed and length	Cycle time of 10 msec. Length from 100 to 300 m with repeaters	Speed (kbits/s)	Length (without repeater)	Length (with repeater)
Profile/Version	- S-B.A.E (for AS-i V2.11 and higher) - S-3.0 (for all AS-i types)	9.6	1200 m	10 km
		19.2	1200 m	10 km
		45.45	1200 m	10 km
		93.75	1200 m	10 km
		187.5	1000 m	6 km
		500	400 m	1 km
		1500	200 m	600 m
Max. number of stations	- S-B.A.E: 62 slaves - S-3.0: 31 slaves	32 per segment - max. 126		
Bus access	Polling	Polling master/slave: token ring between masters		
Addressing	EEPROM	Encoders		
Power consumption	3 W (max)	3 W (max)		
Power supply	26.5 to 31.5 V DC	24 V DC + 15%		

Materials

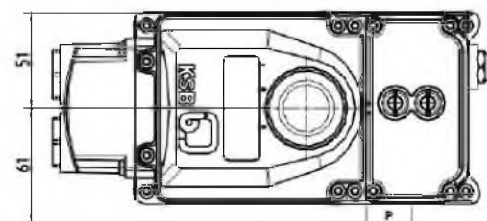
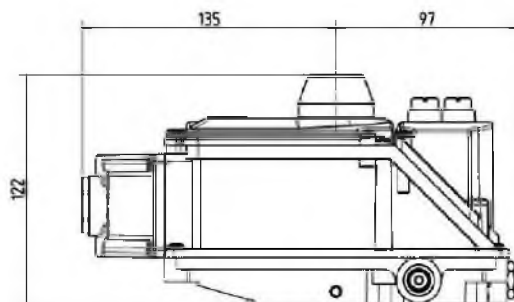
Exploded view



List of components

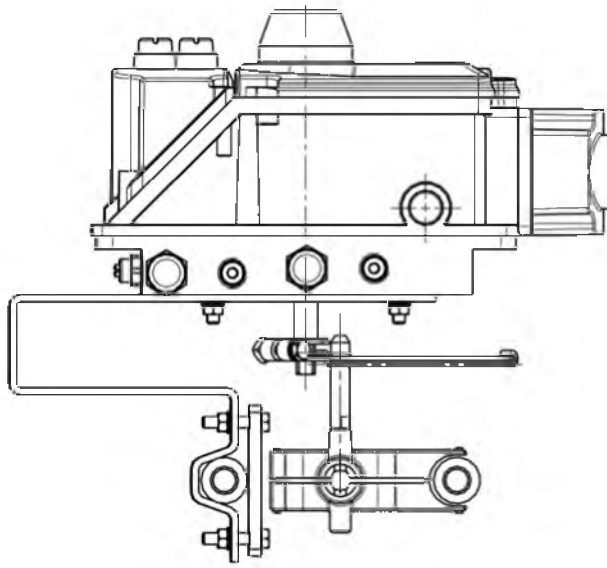
Part No.	Description	Materials
69-12	Housing	Polycarbonate SM60/0
160	Cover	Polycarbonate SM60/0
160.1	Cover (directional control valve)	Polycarbonate SM60/0
163.1	Cover	Polycarbonate SM60/0
191.2	Support	Nickel-plated brass
198.1	Connection plate	
210.1	Actuating stem	Polycarbonate SM60/0
314.1	Stop disc	Stainless steel 304L
410.1	Profile joint	NBR70
410.2	Profile joint	NBR70
410.3	Profile joint	NBR70
410.4	Profile joint	NBR70
410.5	Profile joint	NBR70
410.7	Profile joint	NBR70
410.8	Profile joint	NBR70
410.11	Profile joint	NBR70
412.1	O-ring	NBR70
412.2	O-ring	NBR70
412.3	O-ring	NBR70
462.1	Spring washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.4	Serrated washer	Steel
629	Visual indicator assembly	
62-2	Adjustable cams assembly	
629	Visual indicator assembly	
745.1	Filter	
745.2	Filter	Bronze

Part No.	Description	Materials
74-6.1	Distribution plate	
74-7.1	Directional control valve	
74-7.2	Pilot valve	
747.1	Profile joint (valve)	
79-11	Flow reducer	
816	Angle sensor assembly	
817.1	Cable gland	
81-33	Detection plate	Steel
81-84.1	Wiring diagram	
82-2.1	Printed circuit board	
82-2.2	Printed circuit board	
82-2.3	Actual-position feedback	
88-5	Silencer	Bronze
890	Base	Polycarbonate SM60/0
900.1	Screw	A2-70
900.2	Socket head cap screw	A2-70
900.3	Socket head cap screw	A2-70
900.4	Socket head cap screw	A2-70
900.5	Socket head cap screw	A2-70
900.6	Sheet metal screw	A2-80
903.1	Plug	
916.1	Screw plug	
916.2	Protective cap	Rubber
916.4	Elastomer string	NBR HT 70
932.1	Circlip	Steel
932.2	Reinforced circlip	Steel
950.1	Spring	
96-2.1	Locking plate	Polycarbonate SM60/0
96-3	Manual override	Polycarbonate SM60/0
970.1	Plate	Adhesive polyester

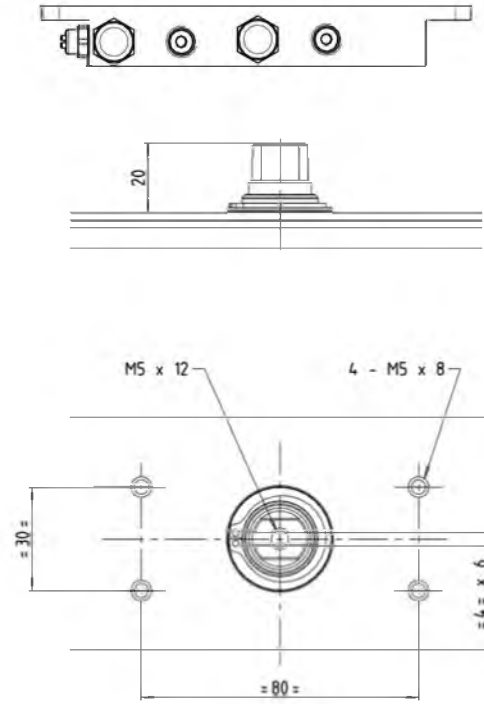
Dimensions


Variants

Mounting to linear actuator NAMUR



Base for actuators with VDI/VDE 3845 interface, not applicable to ACTAIR and DYNACTAIR



Purchase order data
Code AMTRONIC R1300

AMTRONIC	R001300	.	.	.	.	.	.	.	.	.	.	.	.	.	0	.	.	6	0	0
Sensors																				
Limit switch on printed circuit board		1	0	0	0															
Proximity sensor on printed circuit board		2	0	0	0															
Limit switch V3 for wires		B	1	1												0				
Limit switch V3 for cables		B	2	1												0				
Limit switch V3 for cable socket 4.8		B	3	1												0				
Limit switch V3 for cable socket 6.3		B	4	1												0				
Limit switch V3 welding clamp		B	6	1												0				
Proximity sensor V3 PNP for 3-wire cable		H	2	1												0				
Proximity sensor V3 PNP for 3-wire cable		H	2	2												0				
Proximity sensor V3 AC/DC for 2-wire cable		H	A	3												0				
Proximity sensor V3 NAMUR for 2-wire cable		H	A	4												0				
Proximity sensor V3 PNP for 3 cable sockets 4.8		H	3	1												0				
Proximity sensor V3 AC/DC for 2 cable sockets 4.8		H	B	3												0				
Proximity sensor V3 NAMUR for 2 cable sockets 4.8		H	B	4												0				
Proximity sensor V3 PNP for 3 cable sockets 6.3		H	4	1												0				
Proximity sensor 40x26x12 PNP for 3-wire cable		J	2	1					0							0				
Proximity sensor 40x26x12 AC/DC for 2-wire cable		J	A	3					0							0				
Proximity sensor dia. 6.5 PNP for 3-wire cable		K	2	1					0							0				
Proximity sensor M8 PNP for 3-wire cable		L	2	1					0							0				
Proximity sensor M12 PNP for 3-wire cable		M	2	1					0							0				
Proximity sensor M12 AC/DC for 2-wire cable		M	A	3					0							0				
Proximity sensor M12 NAMUR for 2-wire cable		M	A	4					0							0				
Proximity sensor M14 NAMUR for 2-wire cable		N	A	4					0							0				
Proximity sensor M18 PNP for 3-wire cable		P	2	1					0							0				
Proximity sensor M18 NPN for 3-wire cable		P	2	2					0							0				
Proximity sensor M18 AC/DC for 2-wire cable		P	A	3					0							0				
Proximity sensor M18 NAMUR for 2-wire cable		P	A	4					0							0				
Position signalling																				
1/Open and 1/Closed									1											
1/Open									3											
1/Closed									4											
1/Open and 1/Closed and 1/Intermediate			0	0	0				6	0						0	0			
Actual-position feedback																				
None										0										
With angle sensor 5 kOhm																				
Actual-position feedback via passive 4-20 mA signal (2 wires)										1						0	0			
Actual-position feedback via passive 20-4 mA signal (2 wires)										4						0	0			
Actual-position feedback via passive 20-4 mA signal (2 wires)										5						0	0			
Electrical connection																				
2 plugs, plastic, M20 IP67																0				
2 cable glands, plastic, M20 IP67 (diameter: 6 to 12)																1				
2 cable glands, metal, M20 IP67 (diameter: 6 to 12)																2				

AMTRONIC	R001300	0	.	.	6	0	0
Directional control valve																		
4/2 monostable - Open/Closed										P								
4/2 bistable - Open/Closed										Q								
4/3 closed in centre position - Position (POS)										R								
Voltage, directional control valve																		
230 V AC 50/60 Hz											2							
115 V AC 50/60 Hz											3							
48 V AC 50/60 Hz											4							
24 V AC 50/60 Hz											5							
24 V DC											7							
Actuator																		
ACTAIR 3 to 200, stop position: Closed												2						
ACTAIR 3 to 200, stop position: Open												3						
ACTAIR 400 to 1600												4						
DYNACTAIR 1.5 to 25, Fail Close in the event of air supply failure												6						
DYNACTAIR 1.5 to 25, Fail Open in the event of air supply failure												7						
DYNACTAIR 50 to 100, Fail Close in the event of air supply failure												8						
DYNACTAIR 50 to 100, Fail Open in the event of air supply failure												9						
DYNACTAIR 200 to 800, Fail Close in the event of air supply failure												J						
DYNACTAIR 200 to 800, Fail Open in the event of air supply failure												K						
Pneumatic quarter-turn actuator, double-acting												W						
Pneumatic quarter-turn actuator, single-acting												X						
Pneumatic linear actuator, double-acting												Y						
Pneumatic linear actuator, single-acting												Z						
Fail-safe position																		
Fail Close in the event of power supply failure													A					
Fail Open in the event of power supply failure													B					
Fail-in-last in the event of power supply failure													C					
Undefined position in the event of power supply failure										R			D					
										Q								
Field bus																		
None														0				
Profibus DP						1	0				7			2	0			
AS-i profile S-B.A.E (62 slaves)						1	0				7			7	0			
AS-i S-3.0 (31 slaves)						1	0				7			8	0			
Heating resistor																		
None															0			
With heating resistor 12 to 24 V DC			0	0	0	1	0								1			
With heating resistor 100 to 240 V AC			0	0	0	1	0								2			
Position indicator																		
3D sight glass																6		
Configuration																		
None																	0	
Diagnosis																		
None																		0

Automation

SMARTRONIC AS-i

Positioner
SMARTRONIC AS-i R1313

Type Series Booklet



Automation

Positioner

SMARTRONIC AS-i



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Operating data overview

Characteristic	Value
Enclosure	IP 67 to EN 60529
Electromagnetic compatibility	In conformity with the European EMC Directive 2004/108/EC and NF EN 61000-6-2/NF EN 61000-6-4
Wi-Fi version	In conformity with the European 2004/108/EC Directive (R and TTE)
Operating temperature	-20 °C to +80 °C
Vibrations	To IEC 68-2-6 Test Fc
Compressed air purity class	ISO 8573-1 Class 5

Design details

- SMARTRONIC AS-i is a digital, electro-pneumatic positioner for connection to an AS-i field bus.
- Used for the control of:
 - Quarter-turn actuators from the ACTAIR and DYNACTAIR type series

- Quarter-turn actuators with standardised VDI/VDE 3845 interface
- Linear actuators to NAMUR
- SMARTRONIC AS-i features a LEXAN housing (polycarbonate with 20% glass fibre) accommodating the following 3 components:
 - Electrical connection
 - Printed circuit board
 - Poppet valve with piezoelectric pilot valve (compressed air supply)
- The compressed air supply is connected via the base:
 - Direct connection to ACTAIR and DYNACTAIR
 - Connection via external piping for quarter-turn actuators with standardised VDI/VDE 3845 interface and for linear actuators to NAMUR
- The actuating times for open/close operations are set via the easily accessible air flow reducer.
- It is connected to the actuator in two ways: mechanically to the actuator itself and pneumatically to the inside of the actuator.

Product benefits

- Quick, straightforward installation and commissioning thanks to auto-calibration which allows optimal positioner adjustment. Can be quickly adapted to all types of actuators.
- Intuitive, user-friendly interface for local control and configuration via display and buttons
- Negligible consumption irrespective of position
- Position indicator under sight glass for remote indication
- Fully enclosed design avoids protruding, moving components
- The adjustable cams are reliable and facilitate the setting of the open/closed positions.
- Direct mounting to ACTAIR and DYNACTAIR
 - No installation components required (bracket and socket)
 - The compressed air is directly supplied via the VDI/VDE interface.
- The autoadaptive angle sensor adjusts itself to the actuator stroke.

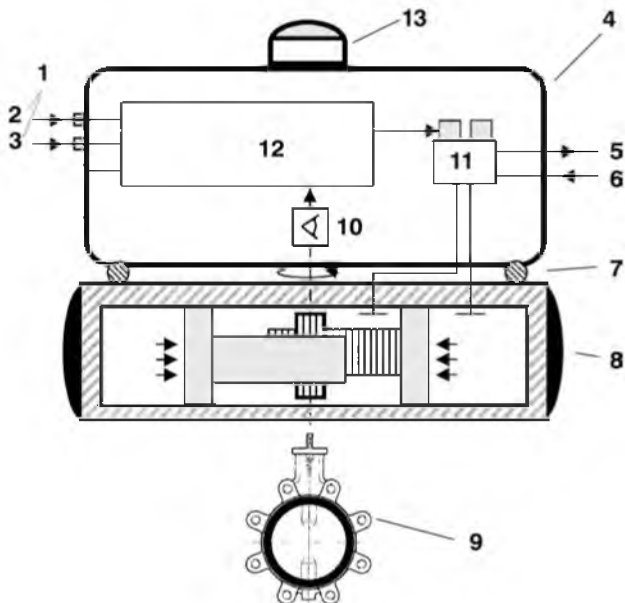
Related documents

Other applicable documents

Document	Reference No.
Operating manual	8520.8061

Technical data

Functional schematic



1. Connections
2. User interface (MMI)
Both the configuration of SMARTRONIC AS-i and real-time display of process data are performed via a serial interface, Ethernet or Wi-Fi using a PC.
3. Process control system
The closed- and open-loop control information from SMARTRONIC AS-i can be transmitted to the PLC and the monitoring PC via a cable or field bus (Profibus DP).
4. SMARTRONIC AS-i
5. Exhaust
6. Compressed air supply
7. VDI/VDE interface
8. Pneumatic actuator
9. Valve
10. Position monitoring
The valve position is recorded by the angle sensor which is mounted on the actuator's stem. This information is transmitted to the microprocessor and the PLC for processing. The angle sensor is fitted with a stop mechanism which also ensures that the angle sensor is automatically adjusted to the actuator's stroke.
A 4-20 mA signal allows actual-position feedback to the process control system.
11. Integrated pneumatic control
The pneumatic directional control valve is fitted into the SMARTRONIC AS-i. The compressed air is supplied via the VDI/VDE interface, external connections are not required (up to ACTAIR 200 and DYNACTAIR 100). The pneumatic directional control valve is a 4/3 directional control valve. It is controlled via two pilot valves. The fail-safe (Fail Open or Fail Close) position in the event of a power supply failure is specified for each unit in the purchase order.
12. Integrated microprocessor
13. Visual position indicator

Technical specification

Housing	
Material	LEXAN (polycarbonate with 20% glass fibre)
Position indicator	Visual position indicator on the cover
Compressed air connection	2 x 1/4" gas ports
Electrical connection	2 cable glands for 6 to 12 mm cable diameters
Internal connectors	For flexible conductors, with a cross-section of 0.14 mm ² (26 AWG) to 0.5 mm ² (20 AWG) For flexible conductors with wire end sleeve and without insulating input sleeve, with a cross-section of 0.25 mm ² (23 AWG) to 0.5 mm ² (20 AWG)
Weight	1.7 kg

Compressed air supply	
Compressed air supply	Port "P" with filter fitted in the base
Exhaust	1/4" gas port, marked "E", with silencer or exhaust system connection
Operating pressure	2 to 8 bar (30 to 115 psi)
Filtration	ISO 8573-1 Class 5 (< 40 µm)
Dew point	ISO 8573-1 Class 5 (pressure dew point temperature < 7 °C, and in all cases a dew point temperature which is 5 °C below the ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 25 mg/m ³)
Max. flow rate	400 Nl/min
Consumption in "at rest" position	Zero

AS-i field bus	
Power consumption	4 W max.
Power supply	Via AS-i field bus (26.5 V DC to 31.5 V DC)
Profile	S-7.A.x.5
Max. number of slave components	62
Specification	V3.0 (compatible with AS-i M4 master and higher)

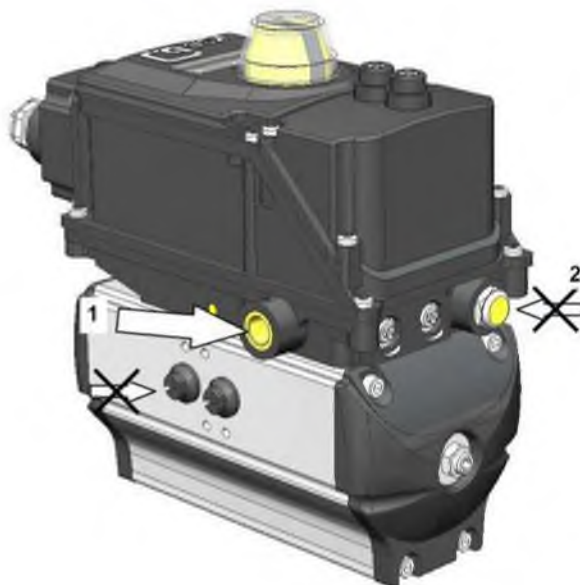
Compressed air supply

The compressed air is connected to the SMARTRONIC AS-i.

A sintered bronze filter is fitted in the housing's inlet port for safety reasons to prevent clogging and damage to the pneumatic directional control valve.

The operating pressure ranges from 2 to 7 bar.

To prevent any premature mechanical component wear, especially of actuator components, the use of lubricated air (between 5 and 25 mg/m³) is recommended.



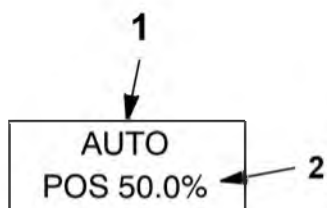
1 - Compressed air supply

2 - Exhaust

Compressed air supply: port "P"

Exhaust: port "E", with silencer or exhaust system connection

Display



1
Operating mode:

2
No communication with AS-i:
<< ASi com fault >>

AUTO: Automatic positioning (4-20 mA setpoint) Communication with AS-i:
Valve position (%)

MANU: Manual positioning
(local control)

NO CALIB: SMARTRONIC AS-i
is not calibrated

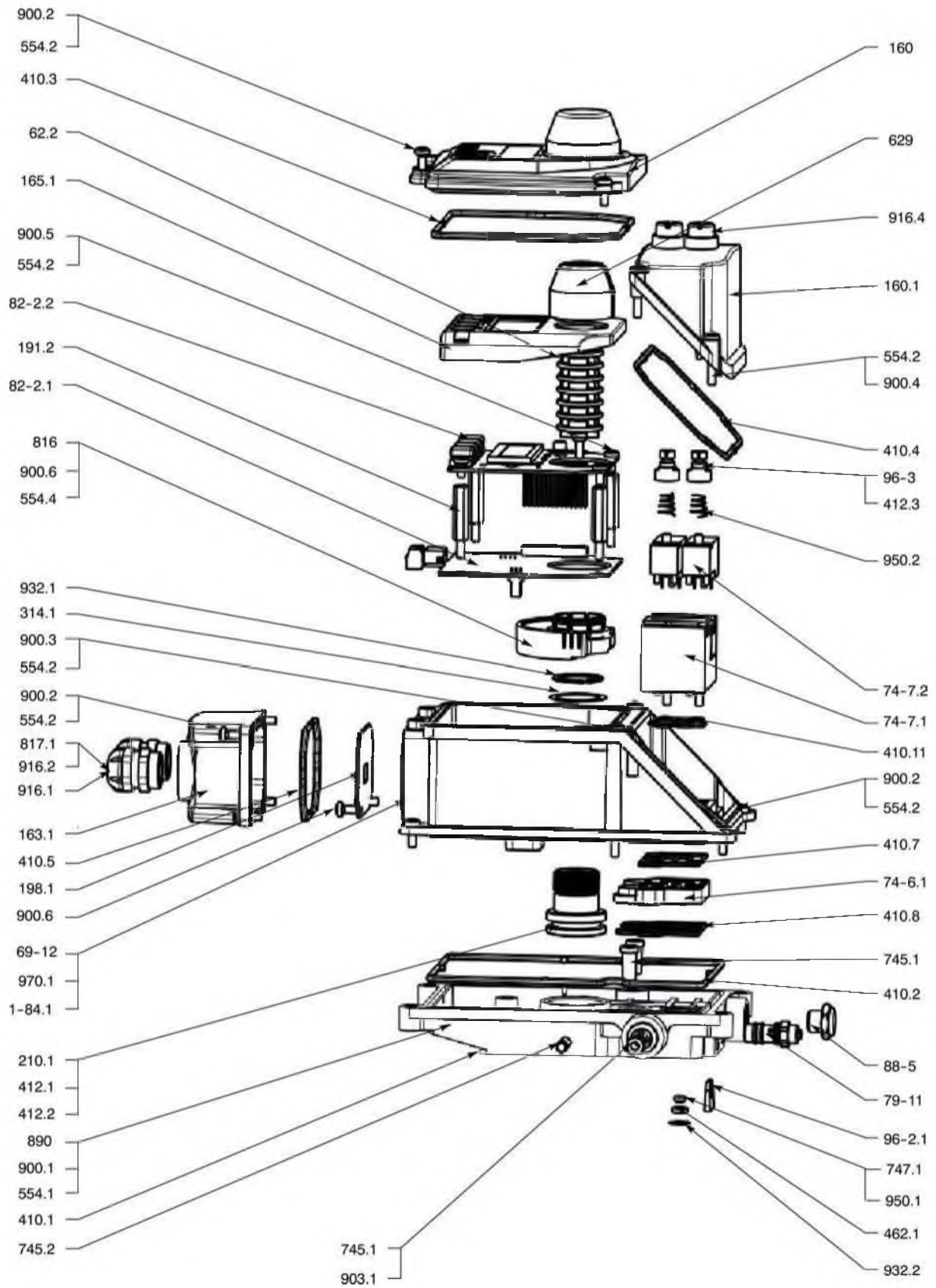
The display provides information about the operating mode and the valve position.

If the instrument has never been calibrated, the angle sensor value is displayed (SSR).

Text display may be adjusted according to the positioner's installation position.

Materials

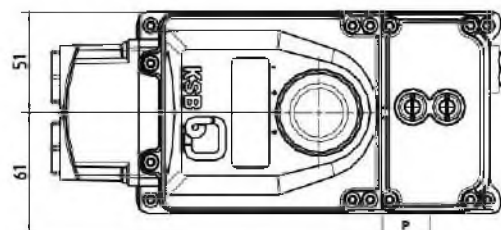
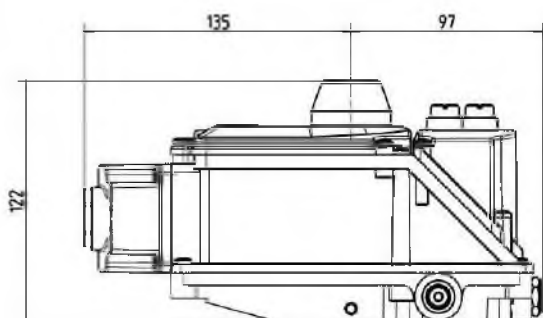
Exploded view



List of components

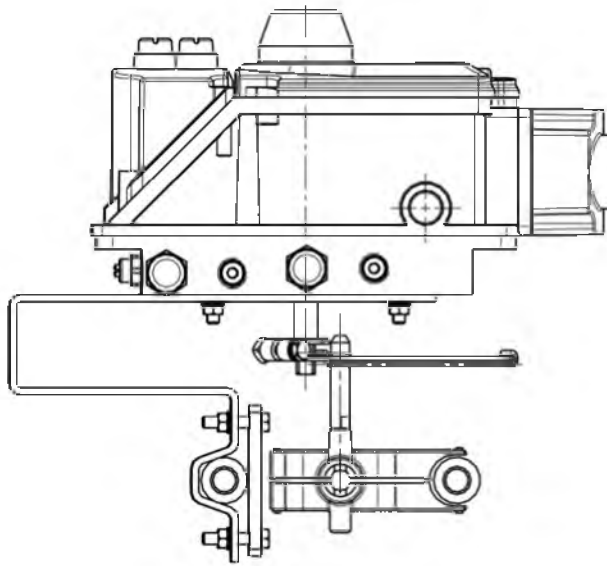
Part No.	Description	Material
160	Cover	LEXAN (PC with 20 % glass fibre)
160.1	Cover (directional control valve)	LEXAN (PC with 20 % glass fibre)
163.1	Housing (directional control valve)	LEXAN (PC with 20 % glass fibre)
165.1	Cover	
191.2	Support	Nickel-plated brass
198.1	Connection plate	
210.1	Actuating stem	Polycarbonate SM60/0
314.1	Stop disc	Stainless steel 304L
410.1	Profile joint	NBR70
410.2	Profile joint	NBR70
410.3	Profile joint	NBR70
410.4	Profile joint	NBR70
410.5	Profile joint	NBR70
410.7	Profile joint	NBR70
410.8	Profile joint	NBR70
410.11	Profile joint	NBR70
412.1	O-ring	NBR70
412.2	O-ring	NBR70
412.3	O-ring	NBR70
462.1	Spring washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.4	Serrated washer	Steel
629	Visual indicator assembly	
62-2	Adjustable cams assembly	
69-12	Housing	LEXAN (polycarbonate with 20% glass fibre)
745.1	Filter	

Part No.	Description	Material
745.2	Filter	Bronze
74-6.1	Distribution plate	
74-7.1	Directional control valve	
74-7.2	Pilot valve	
747.1	Profile joint (valve)	
79-11	Flow reducer RP 1/8"	
81-84.1	Circuit diagram	
816	Angle sensor assembly	
817.1	Plug	
82-2.1	Printed circuit board	
82-2.2	COM printed circuit board assembly	
88-5	1/4" BSP silencer	Bronze
890	Base	Polycarbonate SM60/0
96-2.1	Locking plate	Polycarbonate SM60/0
96-3	Manual override	Polycarbonate SM60/0
900.1	Screw	A2-70
900.2	Socket head cap screw	A2-70
900.3	Socket head cap screw	A2-70
900.4	Socket head cap screw	A2-70
900.5	Socket head cap screw	A2-70
900.6	Sheet metal screw	A2-80
903.1	Plug	
916.1	Screw plug	
916.2	Protective cap	Rubber
916.4	Elastomer string	NBR HT 70
932.1	Circlip	Steel
932.2	Reinforced circlip	Steel
950.1	Closing spring	
950.2	Manual override spring, lockable	Stainless steel
970.1	Plate	Adhesive polyester

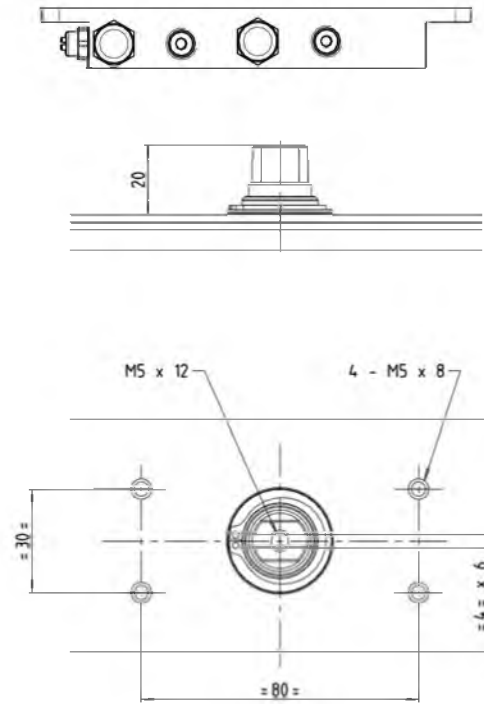
Dimensions


Variants

Mounting to linear actuator NAMUR



Base for actuators with VDI/VDE 3845 interface, not applicable to ACTAIR and DYNACTAIR



Purchase order data

SMARTRONIC AS-i	R001313	0	0	0	0	0	0	0	R	7	.	.	2	1	0	6	0	0
Sensors																		
Auto-calibration		0	0	0	0													
Position																		
Fictitious open/closed						0												
Actual-position feedback																		
None							0											
Electrical output																		
With plug								0										
2 cable glands, plastic, M20 IP67 (diameter: 6 to 12)								1										
2 cable glands, metal, M20 IP67 (diameter: 6 to 12)								2										
Directional control valve																		
4/3 closed in centre position - Position (POS)									R									
Power supply, directional control valve																		
24 V DC										7								
Actuator																		
ACTAIR 3 to 200, stop position: Closed																		2
ACTAIR 3 to 200, stop position: Open																		3
ACTAIR 400 to 1600																		4
DYNACTAIR 1.5 to 25, Fail Close in the event of air supply failure																		6
DYNACTAIR 1.5 to 25, Fail Open in the event of air supply failure																		7
DYNACTAIR 50 to 100, Fail Close in the event of air supply failure																		8
DYNACTAIR 50 to 100, Fail Open in the event of air supply failure																		9
DYNACTAIR 200 to 800, Fail Close in the event of air supply failure																		A
DYNACTAIR 200 to 800, Fail Open in the event of air supply failure																		B
Pneumatic quarter-turn actuator, double-acting																		W
Pneumatic quarter-turn actuator, single-acting																		X
Pneumatic linear actuator, double-acting																		Y
Pneumatic linear actuator, single-acting																		Z
Fail-safe position																		
Fail Close in the event of power supply failure																		A
Fail Open in the event of power supply failure																		B
Fail-in-last in the event of power supply failure																		C
SMARTRONIC																		
Intelligent positioner																		2
Field bus																		
AS-i S-7.A.*.5																		1
Heating resistor																		
None																		0
Position indicator																		
3D sight glass																		6
Configuration																		
None																		0
Diagnosis																		
None																		0



**Centred disc butterfly valves
with AMRING® elastomer liner**
*Robinet à papillon centré
à étanchéité élastomère AMRING®*
**Wartungsfreie weichdichtende
zentrische Absperrklappe AMRING®**

DN 40 - 1000

**Allowable pressure
Pression admissible
Zulässiger Betriebsdruck
PN 10 bar**

The actuator selection for lubricated medium proposed is defined for the maximum fluid velocity.
According to the working conditions and the hydraulic characteristics, upper fluid velocities can be admitted, therefore other actuator selection can be proposed: please, consult us.
In case of non lubricated medium, the maximum fluid velocity is 50 m/s.

Le choix de l'actionneur en milieu lubrifié proposé ci-après est donné à titre d'exemple pour les vitesses maximales de référence indiquées du fluide véhiculé dans le robinet.

En fonction des conditions de service et des caractéristiques hydrauliques du circuit, des vitesses supérieures peuvent être admises et donc un autre choix de l'actionneur peut être proposé : nous consulter.

Pour les robinets en milieu non lubrifié, la vitesse maximale de référence est 50 m/s.

Die folgende Antriebsauswahl gilt beispielhaft für Absperrklappen in flüssigen Medien für die angegebenen maximalen Strömungsgeschwindigkeiten.

Abhängig von den Betriebsbedingungen und den hydraulischen Kenndaten sind höhere Strömungsgeschwindigkeiten und weitere Antriebszuordnungen möglich. Bitte Rücksprache halten.

Für Absperrklappen in nicht flüssigen Medien beträgt die maximale Strömungsgeschwindigkeit 50 m/s.



Manual control - Handles
Commande manuelle - Poignées
Manuelle Antriebe - Handhebel

DN	NPS	(1) m/s	Mounting plate <i>Embase</i> Kopfflansch nach ISO 5211	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien		Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien
				Liners <i>Manchettes</i> Ringbälge XA, XC, XV & K	Other liners <i>Autres manchettes</i> Andere Ringbälge	All liners <i>Toutes manchettes</i> Alle Ringbälge
40	1 1/2	3,0	F05	S/SR(180) S/SR/SM/SP/SF/SFR(260)	S/SR(180) S/SR/SM/SP/SF/SFR(260)	S/SR(180) S/SR/SM/SP/SF/SFR(260)
50	2	3,0				
65	2 1/2	3,0				
80	3	3,0				
100	4	3,0	F05	S/SR(330) SM/SP/SF/SFR(330)	S/SR(330) SM/SP/SF/SFR(330)	S/SR(330) SM/SP/SF/SFR(330)
125	5	3,0	F05			
150	6	3,0	F07			
200	8	3,0	F07	SM(530)	SM(530) SM(530*)	SM(530) SM(530*)
250	10	3,0	F10			
300	12	3,0	F12			

(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

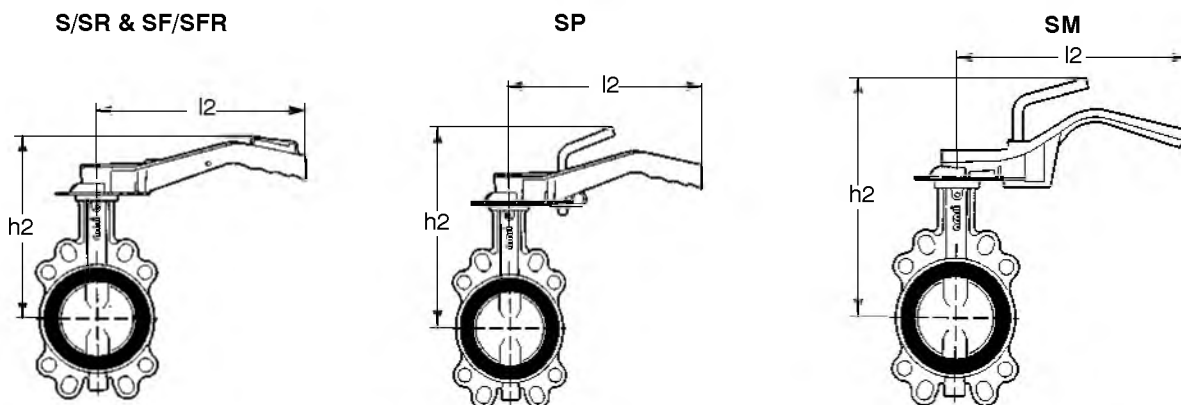
* Important effort to be exerted

* *Effort de manœuvre important, démultiplicateur manuel recommandé*

* Hohes Betätigungsmoment, Handgetriebe empfohlen

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

Handles • Poignées • Handhebel



DN	NPS	S/SR						SF/SFR		
		Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien			Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien			Lubricated medium and non lubricated medium <i>Milieu lubrifié et non lubrifié</i> Flüssige und nicht flüssige Medien		
		l2	h2	Weight* <i>Poids*</i> Gewicht*	l2	h2	Weight* <i>Poids*</i> Gewicht*	l2	h2	Weight* <i>Poids*</i> Gewicht*
40	1 1/2	180	160	0,5	180	160	0,5	260	180	1,4
50	2		165			165				
65	2 1/2		191			191				
80	3		197			197				
40	1 1/2	260	180	0,6	260	180	0,6	260	211	1,8
50	2		185			185				
65	2 1/2		211			211				
80	3		217			217				
100	4	330	248	0,7	330	248	0,7	330	262	1,8
125	5		262			262				
150	6		279			279				

Manual control - Handles Commande manuelle - Poignées Manuelle Antriebe - Handhebel

Dimensions (mm) and weights (kg)
 Encombremes (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DN		NPS		SP			SM					
				l2	h2	Weight* Poids* Gewicht*	l2	h2	Weight* Poids* Gewicht*	l2	h2	Weight* Poids* Gewicht*
				Lubricated medium and on non lubricated medium <i>Milieu lubrifié et non lubrifié</i> Flüssige und nicht flüssige Medien			Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K			Lubricated medium except liners <i>Milieu lubrifié sauf manchettes</i> Flüssige Medien außer Ringbälge XA, XC, XV, K ----- Non lubricated medium for all liners <i>Milieu non lubrifié toutes manchettes</i> Nicht flüssige Medien für alle Ringbälge		
40	1 1/2	260	205	0,7	260	215	1,3	260	215	1,3		
50	2		210			220			220			
65	2 1/2		236			246			246			
80	3		242			252			252			
100	4	330	263	0,8	330	273	1,6	330	273	1,6		
125	5		277			287			287			
150	6		294			304			304			
200	8					322			322			
250	10	530		530	355	3,3	530	355	3,3			
300	12				388			388				

* The indicated weights are those of the handle • Les poids indiqués sont ceux de la poignée • Gewichte gelten nur für Handhebel

Manual control - MN and MR reducers Commande manuelle - Démultiplicateurs MN et MR Manuelle Antriebe - Getriebe MN und MR

DN		NPS		Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien ----- All liners <i>Toutes manchettes</i> Alle Ringbälge				Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien ----- All liners <i>Toutes manchettes</i> Alle Ringbälge	
				(1) m/s	Liners XA, XC, XV & K <i>Manchettes XA, XC, XV & K</i> Ringbälge XA, XC, XV & K	Other liners <i>Autres manchettes</i> Andere Ringbälge			
40	1 1/2	3,0	MN 12	MR 25	MN 12	MR 25	MN 12	MR 25	
50	2	3,0							
65	2 1/2	3,0							
80	3	3,0							
100	4	3,0	MN 25	MR 25	MN 25	MR 25	MN 25	MR 25	
125	5	3,0							
150	6	3,0							
200	8	3,0							
250	10	3,0	MN 40	MR 50	MN 40	MR 50	MN 40	MR 50	
300	12	3,0							
350	14	3,0							
400	16	3,0							
450	18	2,5	MN 80	MR 50	MN 80	MR 100	MN 80	MR 100	
500	20	2,5							
550	22	2,0							
600	24	2,5							
650	26	2,0	MR 100	MR 200	MR 200	MR 200	MR 200	MR 200	
700	28	2,0							
750	30	2,0							
800	32	2,0							
900	36	1,5	MR 200	MR 400	MR 400	MR 400	MR 400	MR 400	
1000	40	1,5							

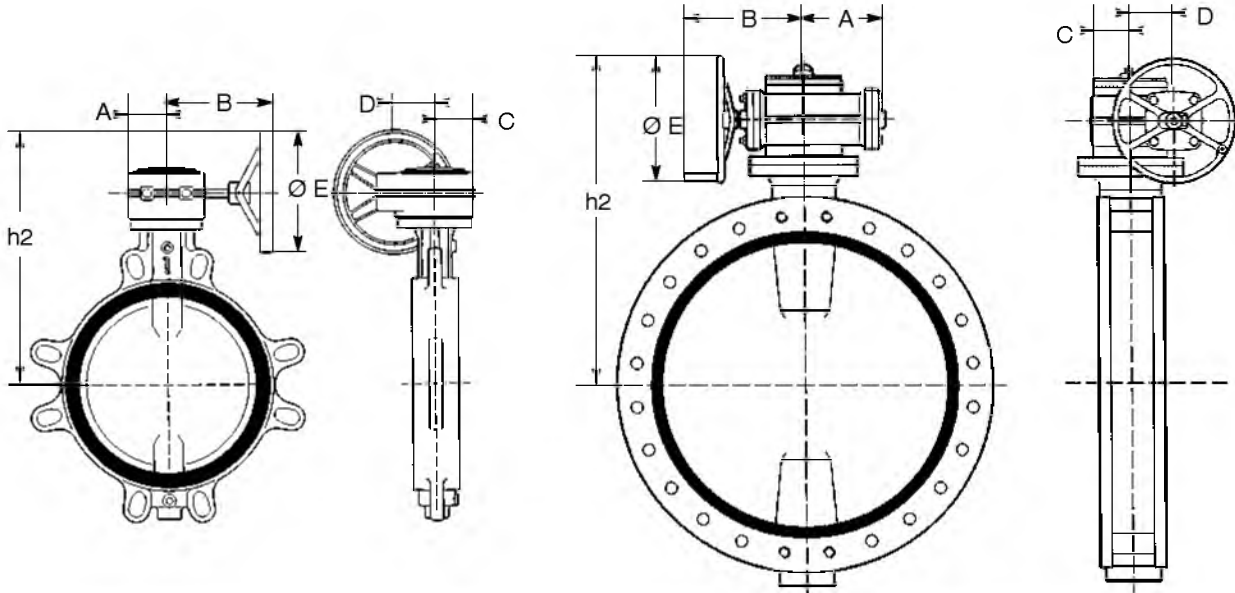
(1) Maximum fluid velocity • Vitesse maximale de référence • Strömungsgeschwindigkeit

Manual control - MN and MR reducers
Commande manuelle - Démultiplicateurs MN et MR
Manuelle Antriebe - Getriebe MN und MR

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

MN 12 - 80
MR 25 - 200

MR 400 - 1600



		MN															
		Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K								Lubricated medium except liners <i>Milieu lubrifié sauf manchettes</i> Flüssige Medien außer Ringbälge XA, XC, XV, K ----- Non lubricated medium all liners <i>Milieu non lubrifié toutes manchettes</i> Nicht flüssige Medien für alle Ringbälge							
DN	NPS	Type Type Typ	A	B	C	D	ØE	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	D	ØE	h2	Weight* Poids* Gewicht*
40	1 1/2	12	49	135	42	40	160	193	1,6	12	49	135	42	40	160	193	1,6
50	2							198								198	
65	2 1/2							224								224	
80	3							230								230	
100	4							251								251	
125	5	265	265														
150	6	25	64	202	60	50	200	300	2,3	25	64	202	60	50	200	300	2,3
200	8							328								328	
250	10							361								361	
300	12	40	70	225	60	60	200	422	3,4	80	90	245	70	75	250	429	5,0
350	14	80	90	245	70	75	250	483	5,0							483	

* The indicated weights are those of the actuator • *Les poids indiqués sont ceux du démultiplicateur* • Gewichte gelten nur für das Getriebe

Manual control - MN and MR reducers
Commande manuelle - Démultiplicateurs MN et MR
Manuelle Antriebe - Getriebe MN und MR

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

		MR															
		Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K								Lubricated medium except liners <i>Milieu lubrifié sauf manchettes</i> Flüssige Medien außer Ringbälge XA, XC, XV, K ----- Non lubricated medium all liners <i>Milieu non lubrifié toutes manchettes</i> Nicht flüssige Medien für alle Ringbälge							
DN	NPS	Type Type Typ	A	B	C	D	Ø E	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	D	Ø E	h2	Weight* Poids* Gewicht*
40	1 ½	MR25	62	184	66	64	225	256	7,0	MR25	62	184	66	64	225	256	7,0
50	2							261								261	
65	2 ½							287								287	
80	3							293								293	
100	4							314								314	
125	5							328								328	
150	6							345								345	
200	8							373								373	
250	10							406								418	
300	12	MR50	74	184	77	76	225	445	10,0	MR50	74	184	77	76	225	445	10,0
350	14							498								572	
400	16	MR100	86	233	88	88	350	617	15,0	MR100	86	233	88	88	350	617	15,0
450	18							647								658	
500	20	MR200	120	270	108	117	350	677	24,0	MR200	120	270	108	117	350	677	24,0
550	22							723								723	
600	24							743								743	
650	26	MR400	229	332	115	125	350	783	58,0	MR400	229	332	115	125	350	783	58,0
700	28							808								805	
750	30							860								830	
800	32	MR600	271	511	155	140	600	885	105,0	MR600	271	511	155	140	600	885	105,0
900	36							898								860	
1000	40							1005								1144	

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur • Gewichte gelten nur für das Getriebe

ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischem Drehantrieb für Armaturen)

		Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien		Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien
		Liners / Manchettes Ringbälge XA, XC, XV & K	Other liners /Autres manchettes Andere Ringbälge	All liners / Toutes manchettes Alle Ringbälge
DN	NPS			
40 - 350	1 ½ - 14	M31	M31	M31
400 - 800	16 - 32	MR 400	MR 400	MR 400
900	36		MR 800	MR 800
1000	40				MR800

ACTELEC 1/4 turn electric actuators Bernard (Deufra)
Actionneurs électriques 1/4 tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

DN	NPS	(1) m/s	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien				Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien		
			XA, XC, XV and K liners <i>Manchettes XA, XC, XV et K</i> Ringbälge XA, XC, XV und K	Throttling duty <i>Fonction régulation</i> Regel-funktion	Other liners <i>Autres manchettes</i> Andere Ringbälge	Throttling duty <i>Fonction régulation</i> Regel-funktion	All liners <i>Toutes manchettes</i> Alle Ringbälge	On-off function <i>Fonction tout ou rien</i> Absperr-funktion	Throttling duty <i>Fonction régulation</i> Regel-funktion
40	1 1/2	3,0	OA3 / OA6	OAP	OA3 / OA6	OAP	OA3 / OA6	OAP	
50	2	3,0			OA6				OA6
65	2 1/2	3,0			OA8				OA8
80	3	3,0			OA15				OA15
100	4	3,0	ASP	ASP	ASP	ASP	ASP	ASP	
125	5	3,0	AS50	AS50	AS50	AS50	AS50	AS50	
150	6	3,0			AS80				AS80
200	8	3,0			BS100				BS100
250	10	3,0	BS100	BS100	BS100	BS100	BS100	BS100	
300	12	3,0							
350	14	3,0							
400	16	3,0							
450	18	2,5							
500	20	2,5							

(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

Main electric equipments - On-off function
Principaux équipements électriques - Fonction tout ou rien
Standardausführung - Absperrfunktion

Type • Type • Typ	OA3	OA6	OA8	OA15	ASP	AS50	AS 80	BS100
Operating time in seconds <i>Temps de manœuvre</i> Standard	11	6	6	15	30	30	30	60
en secondes Stellzeiten in Sekunden Option			60	25	50	60		
Opening and closing limit switches <i>Contacts fin de course sur ouverture et fermeture</i> Endlagenschalter Auf / Zu	Standard							
Mechanical adjustable travel stops <i>Butées mécaniques de fin de course réglables</i> Verstellbare Endanschläge	Standard							
Opening and closing torque switches <i>Limiteurs de couple sur ouverture et fermeture</i> Drehmomentschaltung für beide Laufrichtungen						Standard		
Heating resistance 6W <i>Résistance chauffante 6W</i> Heizwiderstand 6W	Standard							

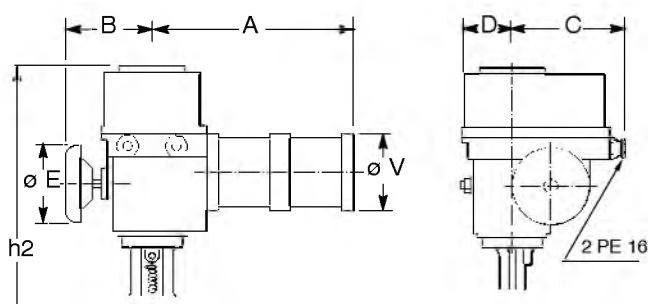
ACTELEC 1/4 turn electric actuators Bernard (Deufra)
Actionneurs électriques 1/4 tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

Main electric equipments - Throttling duties
Principaux équipements électriques - Fonction régulation
Standardausführung - Regelfunktion

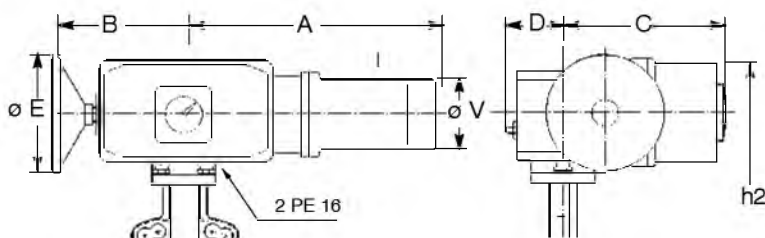
Type • Type • Typ	OAP	OA15	ASP	AS50	BS100
Operating time in seconds <i>Temps de manœuvre en secondes</i> Stellzeiten in Sekunden	60	25	60	60	60
Opening and closing limit switches <i>Contacts fin de course sur ouverture et fermeture</i> Endlagenschalter Auf / Zu	Standard				
Mechanical adjustable travel stops <i>Butées mécaniques de fin de course réglables</i> Verstellbare Endanschläge	Standard				
Opening and closing torque switches <i>Limiteurs de couple sur ouverture et fermeture</i> Drehmomentschaltung für beide Laufrichtungen			Standard		
Heating resistance 6W <i>Résistance chauffante 6W</i> Heizwiderstand 6W	Standard				

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

OA3, OA6, OA8, OAP & OA15



ASP, AS50, AS80 & BS100



ACTELEC 1/4 turn electric actuators Bernard (Deufra)
Actionneurs électriques 1/4 tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

DN	NPS	Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K									Lubricated medium except liners <i>Milieu lubrifié sauf manchettes</i> Flüssige Medien außer Ringbälge XA, XC, XV, K ----- Non lubricated medium all liners <i>Milieu non lubrifié toutes manchettes</i> Nicht flüssige Medien für alle Ringbälge								
		Type Type Typ	A	B	C	D	ØE	ØV	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	D	ØE	ØV	h2	Weight* Poids* Gewicht*
On-off function • Fonction tout ou rien • Absperrfunktion																			
40	1 1/2	OA3	148	116	145	73	90	100	339	6,0	OA3	148	116	145	73	90	100	321	6,0
50	2								344									322	
65	2 1/2								370									352	
80	3								376										
40	1 1/2	OA6	200	116	145	65	90	102	329	7,0	OA6	200	116	145	65	90	102	329	7,0
50	2								334									334	
65	2 1/2								360									360	
80	3								366									366	
100	4	387	387																
125	5	OA8	200	116	145	65	90	102	401	7,0	OA8	200	116	145	65	90	102	401	7,0
150	6	OA15	260	116	145	65	90	102	418	7,5	OA15	260	116	145	65	90	102	418	7,5
200	8	ASP	312	187	226	89	160	102	399	18,0	ASP	312	187	226	89	160	102	399	18,0
250	10								432									432	
300	12	AS50	340	187	226	89	250	139	459	18,0	AS50	340	187	226	89	250	139	459	18,0
350	14								512									543	
400	16	BS100	392	187	284	134	250	139	547	26,0	BS100	392	187	284	134	250	139	547	26,0
450	18								577										
500	20								607										
Throttling function • Fonction régulation • Regelfunktion																			
40	1 1/2	OAP	200	116	145	65	90	102	329	7,2	OAP	200	116	145	65	90	102	329	7,2
50	2								334									334	
65	2 1/2								360									360	
80	3								366									366	
100	4								387									387	
125	5	401	401																
150	6	OA15	260	116	145	65	90	102	418	7,5	OA15	260	116	145	65	100	102	418	7,5
200	8	ASP	312	187	226	89	160	102	399	18,0	ASP	312	187	226	89	160	102	399	18,0
250	10								432									432	
300	12	AS50	340	187	226	89	250	139	459	21,0	AS50	340	187	226	89	250	139	459	21,0
350	14								512									502	
400	16	BS100	392	187	284	134	250	139	547	29,0	BS100	392	187	284	134	250	139	547	29,0
450	18								577										
500	20								607										

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur • Gewichte gelten nur für den Antrieb

ACTELEC ¼ turn electric actuators Auma
Actionneurs électriques ¼ tour ACTELEC Auma
Elektrische Antriebe ACTELEC Auma

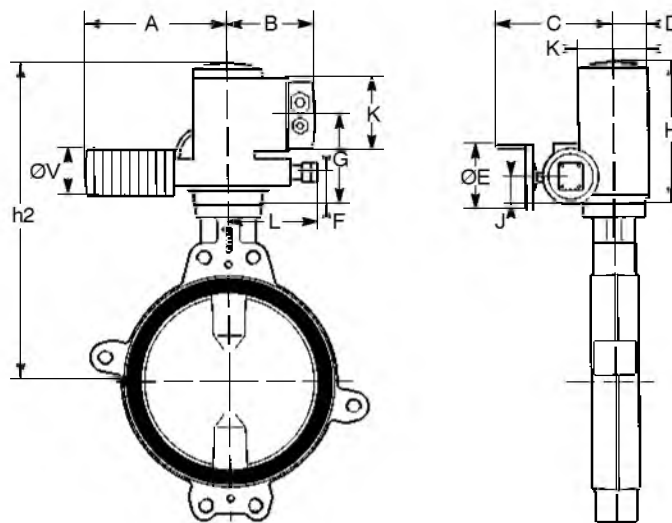
DN	NPS	(1) m/s	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien -----	Other liners <i>Autres manchettes</i> Andere Ringbälge	Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien -----
			Liners <i>Manchettes</i> Ringbälge XA, XC, XV & K		All liners <i>Toutes manchettes</i> Alle Ringbälge
40	1 ½	3,0	SG 05.1	SG 05.1	SG 05.1
50	2	3,0			
65	2 ½	3,0			
80	3	3,0			
100	4	3,0			
125	5	3,0			
150	6	3,0	SG 07.1	SG 07.1	SG 07.1
200	8	3,0			
250	10	3,0	SG 10.1	SG 10.1	SG 10.1
300	12	3,0			
350	14	3,0	SG 12.1	SG 12.1	SG 12.1
400	16	3,0			
450	18	2,5			
500	20	2,5	SG 12.1	SG 12.1	SG 12.1
550	22	2,0			
600	24	2,5			

(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

Operating times • Temps de manœuvre • Stellzeiten

Type • Type • Typ		SG 05.1	SG 07.1	SG 10.1	SG 12.1
Operating times	Standard	22 s	22 s	32 s	63 s
<i>Temps de manœuvre</i>	Option	8/11/16 s	8/11/16/32 s	16/22/45/63 s	22/32/45 s
Stellzeiten in Sekunden					

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)



ACTELEC 1/4 turn electric actuators Auma
Actionneurs électriques 1/4 tour ACTELEC Auma
Elektrische Antriebe ACTELEC Auma

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

DN	NPS	Type Type Typ	A	B	C	D	ØE	F	G	H	J	K	L	ØV	h2	Weight* Poids* Gewicht*
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Lubricated medium on XA, XC, XV and K liners
Milieu lubrifié avec manchettes XA, XC, XV et K
Flüssige Medien mit Ringbälgen XA, XC, XV und K

40	1 1/2	SG 05.1	291	195	191	58	160	50	170	275	82	115	137	105	380	19,0
50	2														385	
65	2 1/2														411	
80	3														417	
100	4														438	
125	5														452	
150	6	469														
200	8	SG 07.1	291	195	191	58	160	50	170	275	82	115	137	105	497	19,0
250	10														530	
300	12	SG 10.1	301	205	216	75	160	56	170	291	88	115	172	105	573	25,0
350	14														626	
400	16	SG 12.1	301	205	233	75	160	70	192	313	102	115	172	105	693	29,0
450	18														723	
500	20														753	

Lubricated medium except XA, XC, XV and K liners and non lubricated medium all liners
Milieu lubrifié sauf manchettes XA, XC, XV et K et milieu non lubrifié toutes manchettes
Flüssige Medien außer Ringbälge XA, XC, XV und K und nicht flüssige Medien für alle Ringbälge

40	1 1/2	SG 05.1	291	195	191	58	160	50	170	275	82	115	137	105	380	19,0
50	2														385	
65	2 1/2														411	
80	3														417	
100	4														438	
125	5														452	
150	6	469														
200	8	SG 07.1	291	195	191	58	160	50	170	275	82	115	137	105	497	19,0
250	10	SG 10.1	301	205	216	75	160	56	170	291	88	115	172	105	546	25,0
300	12														573	
350	14	SG 12.1	301	205	233	75	160	70	192	313	102	115	172	105	648	29,0
400	16														693	
450	18														723	

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'appareil • Gewichte gelten nur für den Antriebe

ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischem Drehantrieb für Armaturen)

		Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien -----		Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien -----	
		(1)	Liners <i>Manchettes</i> Ringbälge XA, XC, XV & K	Other liners <i>Autres manchettes</i> Andere Ringbälge	All liners <i>Toutes manchettes</i> Alle Ringbälge
DN	NPS	m/s			
40	1 1/2	3,0	31+SA 07.5 / 31+ASM0	31+SA 07.5 / 31+ASM0	31+SA 07.5 / 31+ASM0
50	2	3,0			
65	2 1/2	3,0			
80	3	3,0			
100	4	3,0			
125	5	3,0			
150	6	3,0			
200	8	3,0			
250	10	3,0			
300	12	3,0			
350	14	3,0			
400	16	3,0	200+SA 07.5 / 200+ASM0	200+SA 07.5 / 200+ASM0	200+SA 07.5 / 200+ASM0
450	18	2,5			
500	20	2,5			
550	22	2,5			
600	24	2,5			
650	26	2,0	400+SA 10.1 / 400+ASM1	400+SA 10.1 / 400+ASM1	400+SA 10.1 / 400+ASM1
700	28	2,0			
750	30	2,0			
800	32	2,0	400+SA 10.1 / 400+ASM1	800+SA 10.1 / 800+ASM1	800+SA 10.1 / 800+ASM1
900	36	1,5			
1000	40	1,5	500+SA 07.5 / 500+ASM0		

Key: ACTELEC type + motor reduction: SA = Auma, ASM = Bernard (Deufra)

Légende : Série ACTELEC + type du motoréducteur : SA = Auma, ASM = Bernard (Deufra)

Erklärung: Baureihe ACTELEC + Typ des Untersetzungsgetriebes: SA = Auma, ASM = Bernard (Deufra)

(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)

Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)

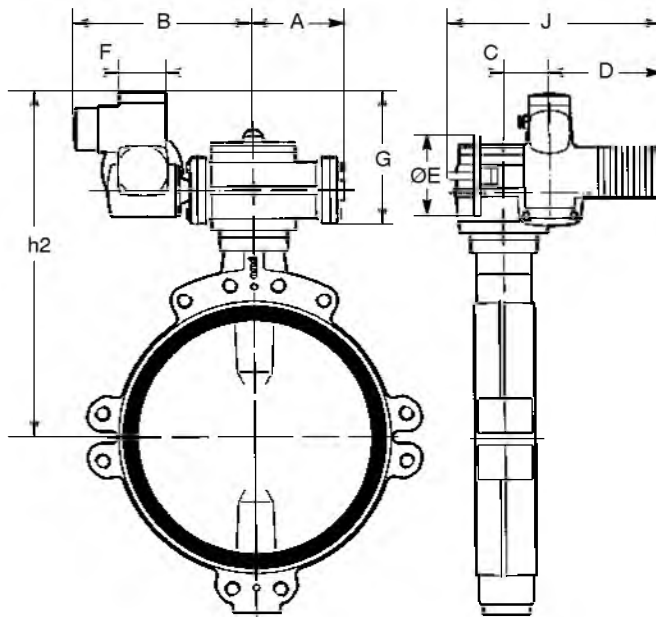
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischem Drehantrieb für Armaturen)

Dimensions (mm) and weights (kg)

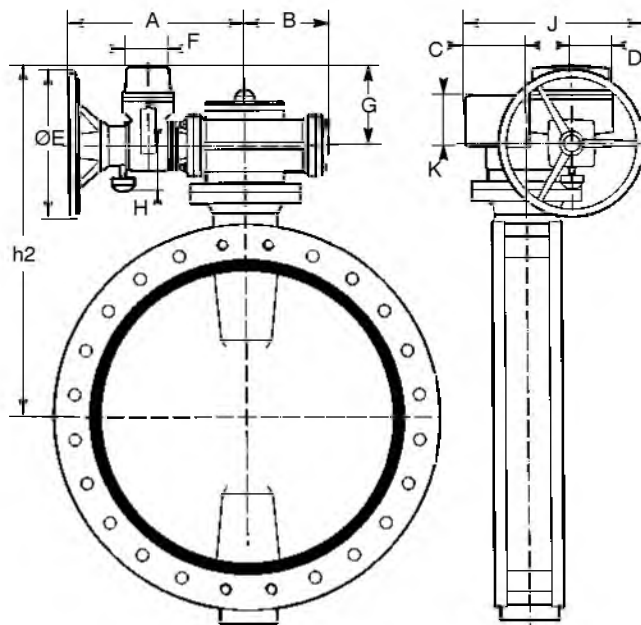
Encombrements (mm) et poids (kg)

Abmessungen (mm) und Gewichte (kg)

AUMA SA 07.5 & SA 10.1



BERNARD (Deufra) ASM0 & ASM1



ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischem Drehantrieb für Armaturen)
Dimensions (mm) and weights (kg)
Encombrements (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

DN	NPS	Lubricated medium XA, XC, XV and K liners Milieu lubrifié avec manchettes XA, XC, XV et K Flüssige Medien mit Ringbälgen XA, XC, XV und K												h2	Weight* Poids* Gewicht*											
		Type Type Typ	A	B	C	D	Ø E	F	G	H	J	K														
40	1 ½	31 + SA 07.5	125	398	40	265	160	115	237	101	514	-	411	46,0												
50	2												416													
65	2 ½												442													
80	3												448													
100	4												469													
125	5												483													
150	6												500													
200	8												528													
250	10												568													
300	12												594													
350	14												647													
40	1 ½												31 + ASM0		125	250	292	115	300	144	211	122	442	139	385	42,0
50	2																								390	
65	2 ½	416																								
80	3	422																								
100	4	443																								
125	5	457																								
150	6	474																								
200	8	502																								
250	10	548																								
300	12	568																								
350	14	621																								
400	16	200 + SA 07.5	229	469	40	265	160	115	237	101	514	-		712											98,0	
450	18													742												
500	20												772													
550	22												807													
600	24												827													
650	26												867													
700	28												892													
400	16												200 + ASM0	229	477	292	115	300	144	211	122	442	139	686		94,0
450	18	716																								
500	20	746																								
550	22	781																								
600	24	801																								
650	26	841																								
700	28	866																								
750	30	400 + SA 10.1	229	471	50	282	200	115	247	121	536	-												932	116,0	
800	32												957													
900	36												1007													
750	30	400 + ASM1	229	477	292	115	400	144	211	122	492	139	846	111,0												
800	32												871													
900	36												921													
1000	40	500 + SA 07.5	271	523	40	265	160	115	237	101	514	-	1081	150,0												
1000	40	500 + ASM0	271	531	292	115	300	144	211	122	442	139	1055	146,0												

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur seul • Gewichte gelten nur für den Antrieb

ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischem Drehantrieb für Armaturen)
Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

		Lubricated medium except XA, XC, XV and K and non lubricated medium all liners <i>Milieu lubrifié avec manchettes autres que XA, XC, XV et K et milieu non lubrifié toutes manchettes</i> Flüssige Medien außer Ringbälge XA, XC, XV, K und nicht flüssige Medien für alle Ringbälge												
DN	NPS	Type Type Typ	A	B	C	D	Ø E	F	G	H	J	K	h2	Weight* Poids* Gewicht*
40	1 1/2	31 + SA 07.5	125	398	40	265	160	115	237	101	514	-	411	46,0
50	2												416	
65	2 1/2												442	
80	3												448	
100	4												469	
125	5												483	
150	6												500	
200	8												528	
250	10												568	
300	12												594	
350	14												647	
40	1 1/2	31 + ASM0	125	250	292	115	300	144	211	122	442	139	385	42,0
50	2												390	
65	2 1/2												416	
80	3												422	
100	4												443	
125	5												457	
150	6												474	
200	8												502	
250	10												548	
300	12												568	
350	14												621	
400	16	200 + SA 07.5	229	469	40	265	160	115	237	101	514	-	712	98,0
450	18												742	
500	20												772	
550	22												807	
400	16	200 + ASM0	229	477	292	115	300	144	211	122	442	139	686	94,0
450	18												716	
500	20												746	
550	22												781	
600	24	400 + SA 10.1	229	471	50	282	200	115	247	121	536	-	837	118,0
650	26												877	
700	28												902	
750	30												932	
800	32													
600	24	400 + ASM1	229	477	292	115	400	144	211	122	492	139	751	111,0
650	26												791	
700	28												816	
750	30												846	
800	32													
900	36	800 + SA 10.1	271	525	50	282	200	115	247	121	536	-	1021	168,0
1000	40												1091	
900	36	800 + ASM1	271	531	292	115	400	144	211	122	492	139	935	163,0
1000	40												1005	

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur seul • Gewichte gelten nur für den Antrieb

ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

DN	NPS	(1) m/s	On-off function <i>Fonction tout ou rien</i> Absperrfunktion				Throttling duty <i>Fonction régulation</i> Regelfunktion		
			3,5 bar	4 bar	5 bar	6 bar	4 bar	5 bar	6 bar
			Control air pressure <i>Pression d'air moteur</i> Steuerdruck						
Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K									
40	1 1/2	3,0	ACTAIR 3				ACTAIR 3		
50	2	3,0	ACTAIR 3				ACTAIR 3		
65	2 1/2	3,0	ACTAIR 3				ACTAIR 3		
80	3	3,0	ACTAIR 6				ACTAIR 6		
100	4	3,0	ACTAIR 6				ACTAIR 6		
125	5	3,0	ACTAIR 12	ACTAIR 6			ACTAIR 12	ACTAIR 12	
150	6	3,0	ACTAIR 12				ACTAIR 12		
200	8	3,0	ACTAIR 25				ACTAIR 25		
250	10	3,0	ACTAIR 50	ACTAIR 25			ACTAIR 50	ACTAIR 50	
300	12	3,0	ACTAIR 50				ACTAIR 50		
350	14	3,0	ACTAIR 50				ACTAIR 50		
400	16	3,0	ACTAIR 100				ACTAIR 100		
450	18	2,5	ACTAIR 100				ACTAIR 100		
500	20	2,5	ACTAIR 100				ACTAIR 100		
550	22	2,0	ACTAIR 200				ACTAIR 200		
600	24	2,5	ACTAIR 200				ACTAIR 200		
650	26	2,0	ACTAIR 200				ACTAIR 200		
700	28	2,0	ACTAIR 400				ACTAIR 400		
750	30	2,0	ACTAIR 400				ACTAIR 400		
800	32	2,0	ACTAIR 400				ACTAIR 400		
900	36	1,5	ACTAIR 800				ACTAIR 800		
1000	40	1,5	ACTAIR 800				ACTAIR 800		
Lubricated medium except XA, XC, XV and K liners and non lubricated medium all liners <i>Milieu lubrifié avec manchettes autres que XA, XC, XV et K et milieu non lubrifié toutes manchettes</i> Flüssige Medien außer Ringbälgen XA, XC, XV und K und nicht flüssige Medien für alle Ringbälge									
40	1 1/2	3,0	ACTAIR 3				ACTAIR 3		
50	2	3,0	ACTAIR 3				ACTAIR 3		
65	2 1/2	3,0	ACTAIR 3				ACTAIR 3		
80	3	3,0	ACTAIR 6				ACTAIR 6		
100	4	3,0	ACTAIR 6				ACTAIR 6		
125	5	3,0	ACTAIR 12				ACTAIR 12		
150	6	3,0	ACTAIR 12				ACTAIR 12		
200	8	3,0	ACTAIR 25				ACTAIR 25		
250	10	3,0	ACTAIR 25				ACTAIR 25		
300	12	3,0	ACTAIR 50				ACTAIR 50		
350	14	3,0	ACTAIR 50				ACTAIR 50		
400	16	3,0	ACTAIR 100				ACTAIR 100		
450	18	2,5	ACTAIR 100				ACTAIR 100		
500	20	2,5	ACTAIR 100				ACTAIR 100		
550	22	2,0	ACTAIR 200				ACTAIR 200		
600	24	2,5	ACTAIR 200				ACTAIR 200		
650	26	2,0	ACTAIR 400				ACTAIR 400		
700	28	2,0	ACTAIR 400				ACTAIR 400		
750	30	2,0	ACTAIR 400				ACTAIR 400		
800	32	2,0	ACTAIR 800				ACTAIR 800		
900	36	1,5	ACTAIR 800				ACTAIR 800		
1000	40	1,5	ACTAIR 1600	ACTAIR 1600			ACTAIR 1600	ACTAIR 1600	

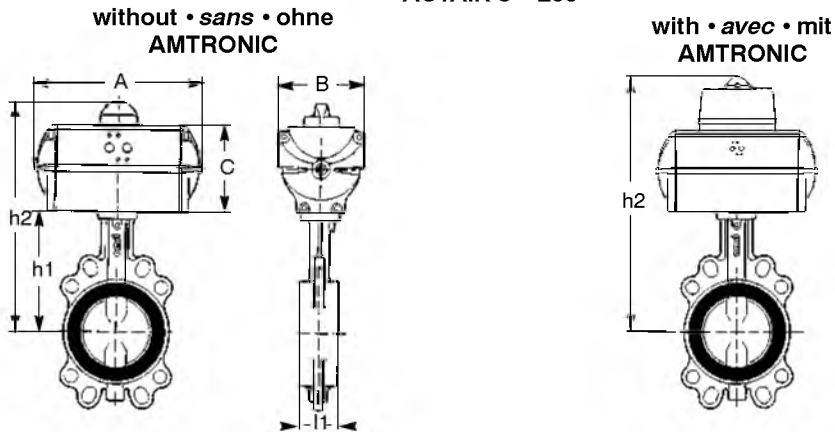
(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

(2) To respect for valve on lubricated medium • *A respecter pour robinet en milieu lubrifié* • Zu beachten bei Absperrklappen in flüssigen Medien

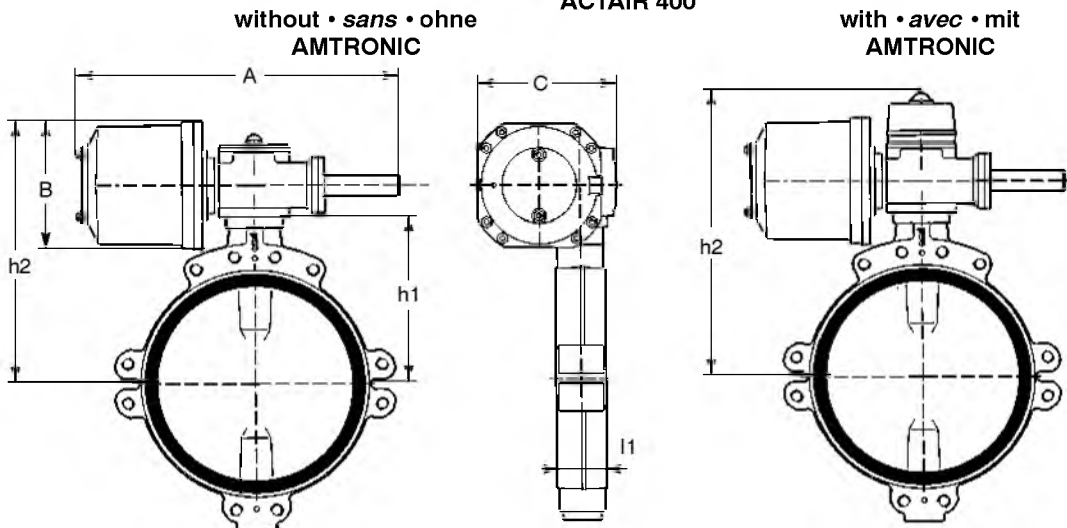
ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

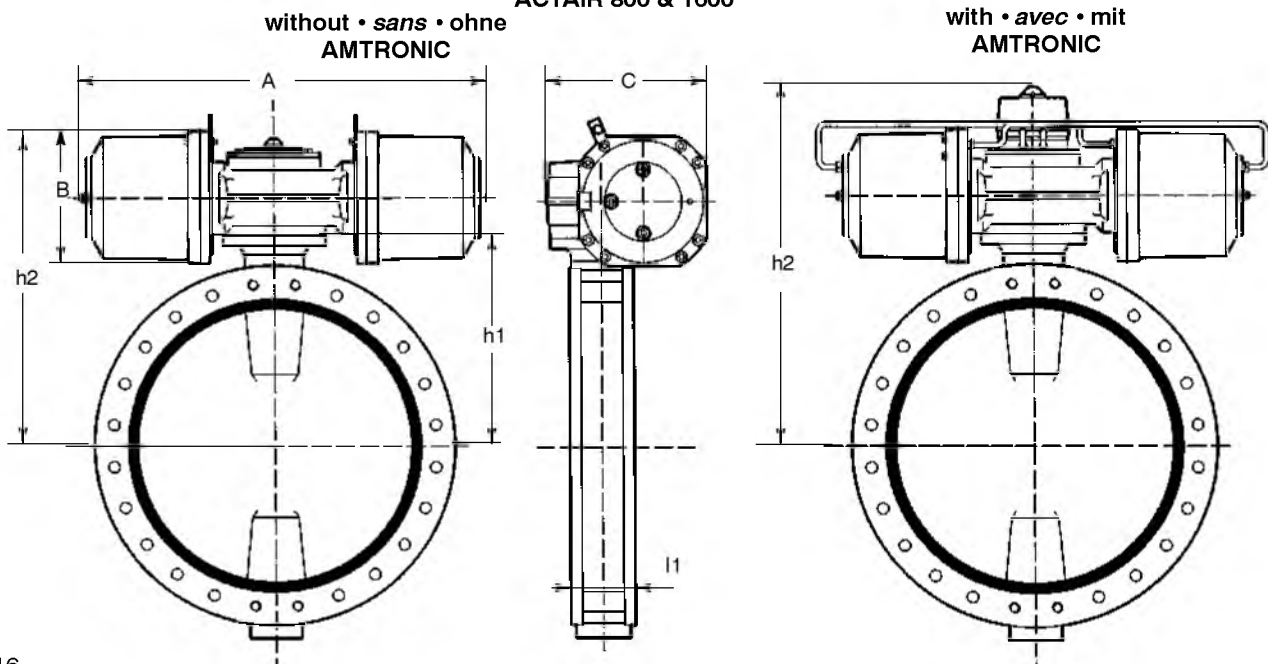
ACTAIR 3 - 200



ACTAIR 400



ACTAIR 800 & 1600



ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

For a control pressure: 5 bar • Pour une pression moteur : 5 bar • Für Steuerdruck: 5 bar

DN	NPS	l1	h1	On-off function without box <i>Fonction tout ou rien sans boîtier</i> Absperrfunktion ohne Gehäuse						Throttling duty with box <i>Fonction régulation avec boîtier</i> Regelfunktion mit Gehäuse					
				Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*

Lubricated medium with XA, XC, XV and K liners

Milieu lubrifié avec manchettes XA, XC, XV et K

Flüssige Medien mit Ringbälgen XA, XC, XV und K

40	1 1/2	33	105	3	194	100	98	224	2,8	3	194	100	98	340	4,5
50	2	43	109,5					229						345	
65	2 1/2	46	136					255						371	
80	3	46	142	6	218	114	116	261	3,9	12	272	132	142	394	5,5
100	4	52	163					300						415	
125	5	56	176,5	12	272	132	142	314	6,0	25	344	156	176	455	8,0
150	6	56	194					357						506	
200	8	60	222	25	344	156	176	419	11,0	50	424	174	217	534	13,0
250	10	68	255					452						567	
300	12	78	282	50	424	174	217	520	18,3	100	505	157	195	635	20,0
350	14	78	335					573						666	
400	16	102	380	100	505	157	195	596	30,0	200	592	174	217	711	32,0
450	18	114	410					626						763	
500	20	127	440					656						793	
550	22	154	475	200	592	174	217	713	48,0	400	964	380	430	828	50,0
600	24	154	495					733						848	
650	26	165	535					773						895	
700	28	165	560					798						920	
750	30	190	590	400	964	380	430	875	160,0	800	1490	380	549	950	170,0
800	32	190	615					900						975	
900	36	203	665					950						1060	
1000	40	216	735	800	1490	380	549	1034	290,0	800	1490	380	549	1130	300,0

Lubricated medium except XA, XC, XV and K liners and non lubricated medium all liners

Milieu lubrifié avec manchettes autres que XA, XC, XV et K et milieu non lubrifié toutes manchettes

Flüssige Medien außer Ringbälgen XA, XC, XV und K und nicht flüssige Medien für alle Ringbälge

40	1 1/2	33	105	3	194	100	98	224	2,8	3	194	100	98	340	4,5
50	2	43	109,5					229						345	
65	2 1/2	46	136					255						388	
80	3	46	142	6	218	114	116	279	3,9	6	218	114	116	394	5,5
100	4	52	163					300						441	
125	5	56	176,5	12	272	132	142	340	6,0	12	272	132	142	455	8,0
150	6	56	194					357						506	
200	8	60	222	25	344	156	176	419	11,0	25	344	156	176	534	13,0
250	10	68	255					493						608	
300	12	78	282	50	424	174	217	520	18,3	50	424	174	217	613	20,0
350	14	78	335					551						666	
400	16	102	380	100	505	157	195	596	30,0	100	505	157	195	733	32,0
450	18	114	410					648						763	
500	20	127	440					678						793	
550	22	154	475	200	592	174	217	713	48,0	200	592	174	217	835	50,0
600	24	154	495					780						855	
650	26	165	535					820						895	
700	28	165	560					845						920	
750	30	190	590	400	964	380	430	875	160,0	400	964	380	430	985	170,0
800	32	190	615					900						985	
900	36	203	665					950						1010	
1000	40	216	735	800	1490	380	549	1034	290,0	800	1490	380	549	1060	300,0

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur seul • Gewichte gelten nur für den Antrieb

DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

		(1)	On-off function <i>Fonction tout ou rien</i> Absperrfunktion				Throttling duty <i>Fonction régulation</i> Regelfunktion		
DN	NPS		(2) (m/s)	Control air pressure <i>Pression d'air moteur</i> Steuerdruck				4 bar	5 bar	6 bar
			3,5 bar	4 bar	5 bar	6 bar	4 bar	5 bar	6 bar
Lubricated medium with XA, XC, XV and K liners <i>Milieu lubrifié avec manchettes XA, XC, XV et K</i> Flüssige Medien mit Ringbälgen XA, XC, XV und K									
40	1 1/2	3,0							
50	2	3,0		DYN 3				DYN 3	
65	2 1/2	3,0		DYN 6				DYN 6	
80	3	3,0							
100	4	3,0		DYN 12				DYN 12	
125	5	3,0							
150	6	3,0		DYN 25				DYN 25	
200	8	3,0							
250	10	3,0		DYN 50				DYN 50	
300	12	3,0							
350	14	3,0		DYN 100				DYN 100	
400	16	3,0							
450	18	2,5		DYN 200				DYN 200	
500	20	2,5							
550	22	2,0		DYN 400				DYN 400	
600	24	2,5							
650	26	2,0		DYN 800				DYN 800	
700	28	2,0							
750	30	2,0		DYN 800				DYN 800	
800	32	2,0							
900	36	1,5		DYN 800				DYN 800	
1000	40	1,5							
Lubricated medium except XA, XC, XV and K liners and non lubricated medium all liners <i>Milieu lubrifié avec manchettes autres que XA, XC, XV et K et milieu non lubrifié toutes manchettes</i> Flüssige Medien außer Ringbälgen XA, XC, XV und K und nicht flüssige Medien für alle Ringbälge									
40	1 1/2	3,0							
50	2	3,0		DYN 3				DYN 3	
65	2 1/2	3,0		DYN 6				DYN 6	
80	3	3,0							
100	4	3,0		DYN 12				DYN 12	
125	5	3,0							
150	6	3,0		DYN 25				DYN 25	
200	8	3,0							
250	10	3,0		DYN 50				DYN 50	
300	12	3,0							
350	14	3,0		DYN 100				DYN 100	
400	16	3,0							
450	18	2,5		DYN 200				DYN 200	
500	20	2,5							
550	22	2,0		DYN 400				DYN 400	
600	24	2,5							
650	26	2,0		DYN 800				DYN 800	
700	28	2,0							
750	30	2,0		DYN 800				DYN 800	
800	32	2,0							
900	36	1,5		DYN 800				DYN 800	
1000	40	1,5							

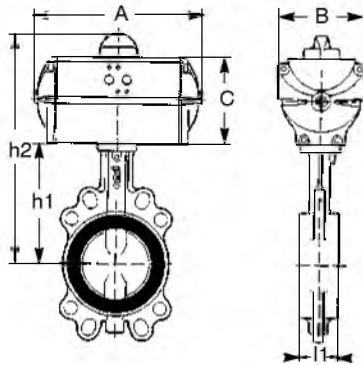
(1) Maximum fluid velocity • *Vitesse maximale de référence* • Strömungsgeschwindigkeit

(2) To respect for valve on lubricated medium • *A respecter pour robinet en milieu lubrifié* • Zu beachten bei Absperrklappen in flüssigen Medien.

DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

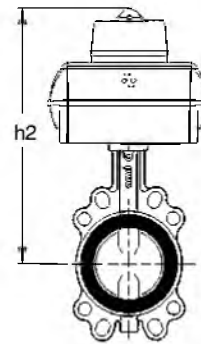
Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

without • sans • ohne
 AMTRONIC



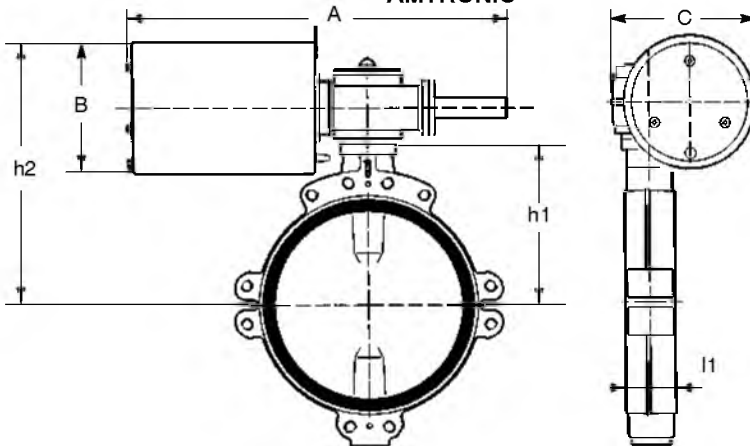
DYNACTAIR 3 -100

with • avec • mit
 AMTRONIC

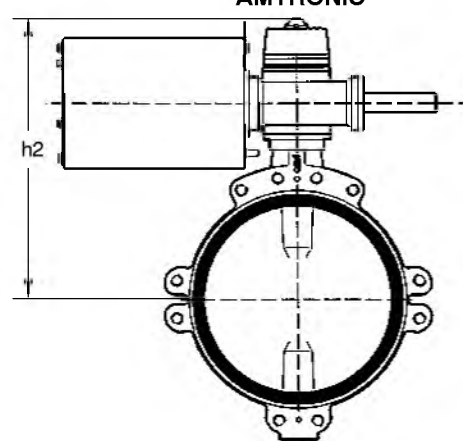


DYNACTAIR 200

without • sans • ohne
 AMTRONIC

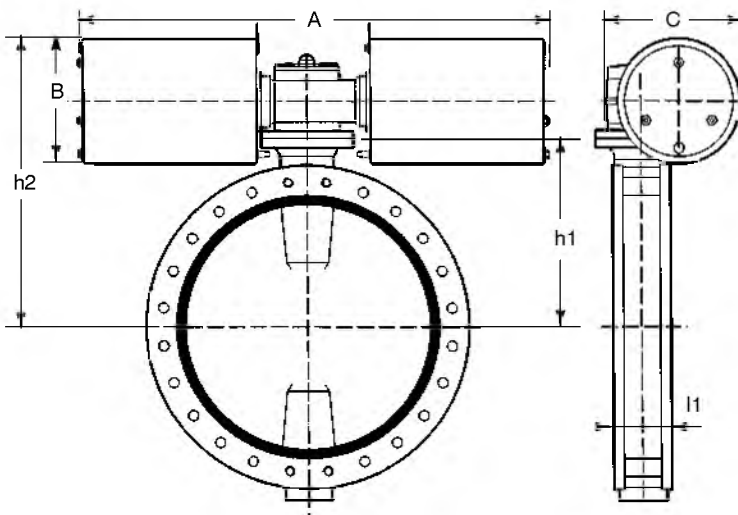


with • avec • mit
 AMTRONIC

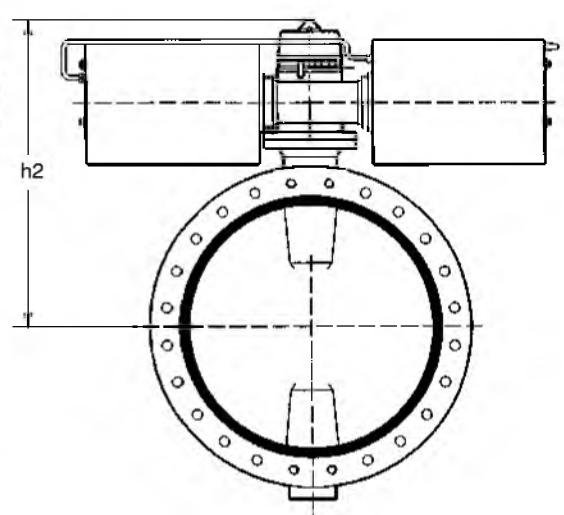


DYNACTAIR 400 & 800

without • sans • ohne
 AMTRONIC



with • avec • mit
 AMTRONIC



DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

For a control pressure: 5 bar • Pour une pression moteur : 5 bar • Für Steuerdruck: 5 bar

DN	NPS	l1	h1	On-off function without box • Fonction tout ou rien sans boîtier Absperrfunktion ohne Gehäuse						Throttling duty with box • Fonction régulation avec boîtier Regelfunktion mit Gehäuse					
				Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*

Lubricated medium with XA, XC, XV and K liners
Milieu lubrifié avec manchettes XA, XC, XV et K
Flüssige Medien mit Ringbälgen XA, XC, XV und K

40	1 1/2	33	105	3	218	114	116	242	4,5	3	218	114	116	357	5,5
50	2	43	109,5					247						362	
65	2 1/2	46	136					273						414	
80	3	46	142	6	272	132	142	305	7,3	6	272	132	142	420	8,0
100	4	52	163					326						475	
125	5	56	176,5	12	344	156	176	374	13,6	12	344	156	176	489	13,0
150	6	56	194	25	424	174	217	432	24,0	25	424	174	217	547	20,0
200	8	60	222					460						575	
250	10	68	255					493						586	
300	12	78	282	50	705	157	195	498	46,0	50	705	157	195	613	32,0
350	14	78	335					551						688	
400	16	102	380	100	812	174	217	618	75,0	100	812	174	217	733	50,0
450	18	114	410					648						763	
500	20	127	440					678						800	
550	22	154	475	200	1214	406	443	721	270,0	200	1214	406	443	835	280,0
600	24	154	495					741						855	
650	26	165	535					781						895	
700	28	165	560	400	1530	406	443	806	410,0	400	1530	406	443	920	425,0
750	30	190	590					836						950	
800	32	190	615					861						975	
900	36	203	665	800	1855	508	549	911	880,0	800	1855	508	549	1 025	900,0
1000	40	216	735					981						1 130	

Lubricated medium except XA, XC, XV and K liners and non lubricated medium all liners
Milieu lubrifié avec manchettes autres que XA, XC, XV et K et milieu non lubrifié toutes manchettes
Flüssige Medien außer Ringbälgen XA, XC, XV und K und nicht flüssige Medien für alle Ringbälge

40	1 1/2	33	105	3	218	114	116	242	4,5	3	218	114	116	357	5,5
50	2	43	109,5					247						388	
65	2 1/2	46	136					299						414	
80	3	46	142	6	272	132	142	305	7,3	6	272	132	142	454	8,0
100	4	52	163					360						475	
125	5	56	176,5	12	344	156	176	374	13,6	12	344	156	176	475	13,0
150	6	56	194	25	424	174	217	432	24,0	25	424	174	217	530	20,0
200	8	60	222					460						547	
250	10	68	255					471						553	
300	12	78	282	50	705	157	195	498	46,0	50	705	157	195	586	32,0
350	14	78	335					573						635	
400	16	102	380	100	812	174	217	618	75,0	100	812	174	217	688	50,0
450	18	114	410					656						740	
500	20	127	440					686						770	
550	22	154	475	200	1214	406	443	721	270,0	200	1214	406	443	800	280,0
600	24	154	495					741						835	
650	26	165	535					781						855	
700	28	165	560	400	1530	406	443	806	410,0	400	1530	406	443	895	425,0
750	30	190	590					836						920	
800	32	190	615					861						985	
900	36	203	665	800	1855	508	549	945	880,0	800	1855	508	549	1 010	900,0
1000	40	216	735					1 015						1 060	

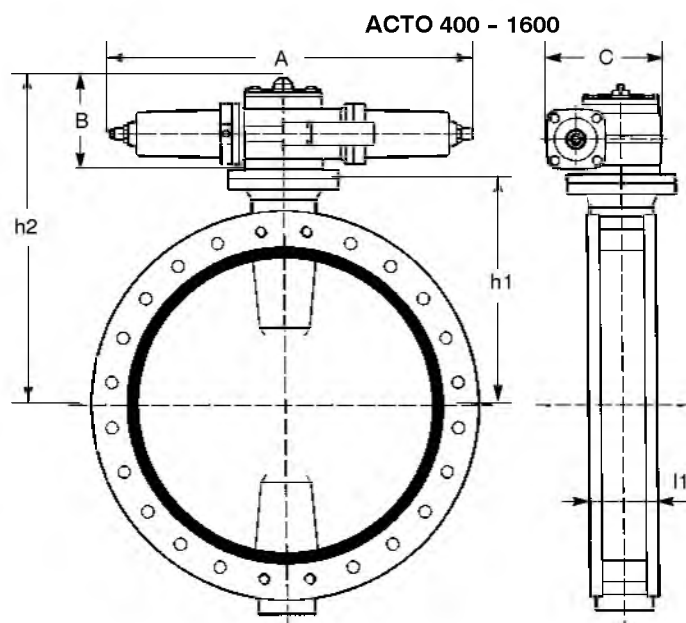
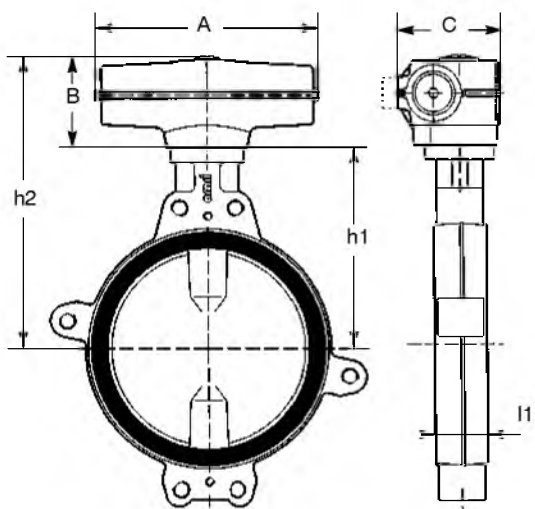
* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur seul • Gewichte gelten nur für den Antrieb

ACTO double acting hydraulic actuators
Actionneurs hydrauliques double effet ACTO
Hydraulische Antriebe doppelwirkend ACTO

DN	NPS	(1) (m/s)	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien						Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien		
			XA, XC, XV and K liners <i>Manchettes XA, XC, XV et K</i> Ringbälge XA, XC, XV und K			Other liners <i>Autres manchettes</i> Andere Ringbälge			All liners <i>Toutes manchettes</i> alle Ringbälge		
			Control oil pressure <i>Pression d'huile moteur</i> Steueröldruck								
			60 bar	90 bar	120 bar	60 bar	90 bar	120 bar	60 bar	90 bar	120 bar
40 - 125	1½ - 5	3,0	ACTO 25			ACTO 25			ACTO 25		
150	6	3,0	ACTO 50			ACTO 50			ACTO 50		
200	8	3,0	ACTO 100			ACTO 100			ACTO 100		
250	10	3,0	ACTO 200			ACTO 200			ACTO 200		
300	12	3,0	ACTO 400			ACTO 400			ACTO 400		
350	14	3,0	ACTO 800			ACTO 800			ACTO 800		
400	16	3,0	ACTO 1600			ACTO 1600			ACTO 1600		
450	18	2,5	ACTO 25			ACTO 25			ACTO 25		
500	20	2,5	ACTO 50			ACTO 50			ACTO 50		
550	22	2,0	ACTO 100			ACTO 100			ACTO 100		
600	24	2,5	ACTO 200			ACTO 200			ACTO 200		
650	26	2,0	ACTO 400			ACTO 400			ACTO 400		
700	28	2,0	ACTO 800			ACTO 800			ACTO 800		
750	30	2,0	ACTO 1600			ACTO 1600			ACTO 1600		
800	32	2,0	ACTO 25			ACTO 25			ACTO 25		
900	36	1,5	ACTO 50			ACTO 50			ACTO 50		
1000	40	1,5	ACTO 100			ACTO 100			ACTO 100		

(1) To respect for valve on lubricated medium • *A respecter pour robinet en milieu lubrifié* • Zu beachten bei Absperrklappen in flüssigen Medien.

Dimensions (mm) and weights (kg)
Encombrements (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)
ACTO 25 - 200



ACTO double acting hydraulic actuators
Actionneurs hydrauliques double effet ACTO
Hydraulische Antriebe doppelwirkend ACTO

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

Control oil pressure: 90 bar • Pression d'huile moteur : 90 bar • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*
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Lubricated medium with XA, XC, XV and K liners
Milieu lubrifié avec manchettes XA, XC, XV et K
Flüssige Medien mit Ringbälgen XA, XC, XV und K

40	1 ½	33	105	25	288	104	144	209	13,0
50	2	43	109,5					214	
65	2 ½	46	136					240	
80	3	46	142					246	
100	4	52	163					267	
125	5	56	176,5					281	
150	6	56	194					298	
200	8	60	222					326	
250	10	68	255	50	344	131	168	386	19,5
300	12	78	282					413	
350	14	78	335	100	406	174	202	509	33,5
400	16	102	380					554	
450	18	114	410	200	515	200	253	610	63,0
500	20	127	440					640	
550	22	154	475					675	
600	24	154	495					695	
650	26	165	535	400	994	246	325	781	95,0
700	28	165	560					806	
750	30	190	590					836	
800	32	190	615					861	
900	36	203	665					911	
1000	40	216	735					981	

Lubricated medium except XA, XC, XV and K liners and non lubricated medium
Milieu lubrifié sauf manchettes XA, XC, XV et K et milieu non lubrifié
Flüssige Medien außer Ringbälge XA, XV, K und XC und nicht flüssige Medien

40	1 ½	33	105	25	288	104	144	209	13,0
50	2	43	109,5					214	
65	2 ½	46	136					240	
80	3	46	142					246	
100	4	52	163					267	
125	5	56	176,5					281	
150	6	56	194					298	
200	8	60	222					353	
250	10	68	255	50	344	131	168	386	19,5
300	12	78	282	100	406	174	202	456	33,5
350	14	78	335					509	
400	16	102	380	200	515	200	253	580	63,0
450	18	114	410					610	
500	20	127	440					640	
550	22	154	475					721	
600	24	154	495	400	994	246	325	741	95,0
650	26	165	535					781	
700	28	165	560					806	
750	30	190	590					836	
800	32	190	615					861	
900	36	203	665					945	
1000	40	216	735	800	1110	280	403	1015	160,0

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur • Gewichte gelten nur für den Antrieb

DYNACTO spring return hydraulic actuators
Actionneurs hydrauliques simple effet DYNACTO
Hydraulische Antriebe einfachwirkend DYNACTO

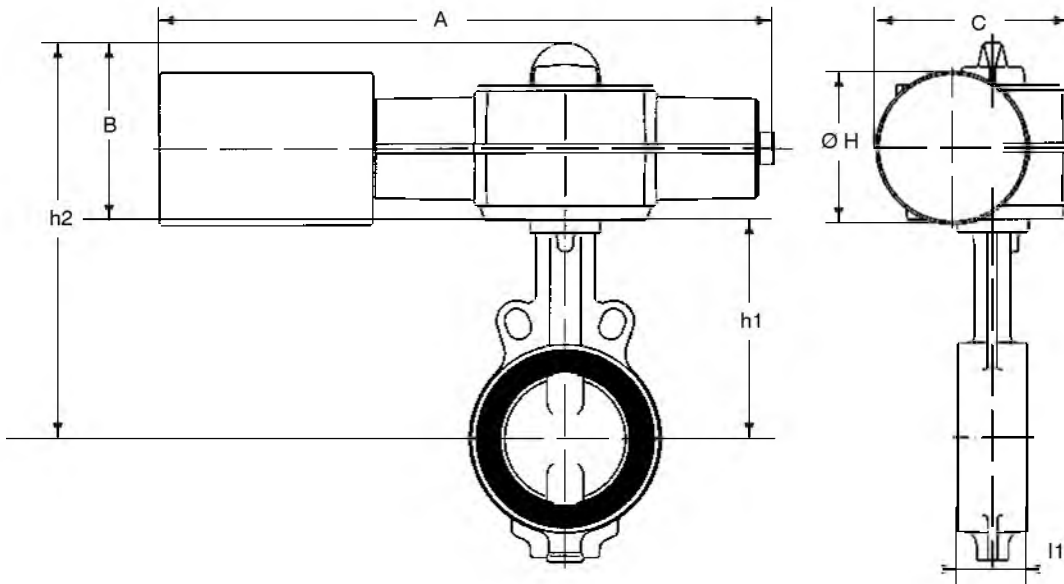
DN | NPS		(1) (m/s)	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien						Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien		
			Liners <i>Manchettes</i> Ringbälge XA, XC, XV & K			Other liners <i>Autres manchettes</i> Andere Ringbälge			All liners <i>Toutes manchettes</i> alle Ringbälge		
			Control oil pressure <i>Pression d'huile moteur</i> Steueröl Druck								
			60 bar	90 bar	120 bar	60 bar	90 bar	120 bar	60 bar	90 bar	120 bar
40 - 80	1½ - 3	3,0	DYN 12			DYN 12			DYN 12		
100	4	3,0	DYN 25	DYN 12		DYN 12			DYN 12		
125	5	3,0	DYN 25			DYN 25			DYN 25		
150	6	3,0	DYN 25			DYN 25			DYN 25		
200	8	3,0	DYN 50	DYN 25		DYN 50			DYN 50		
250	10	3,0	DYN 50			DYN 100	DYN 50		DYN 100	DYN 50	
300	12	3,0	DYN 50			DYN 100			DYN 100		
350	14	3,0	DYN 100			DYN 200	DYN 100		DYN 200	DYN 100	
400	16	3,0	DYN 100			DYN 100			DYN 100		
450	18	2,5	DYN 100			DYN 400	DYN 100		DYN 400	DYN 100	
500	20	2,5	DYN 200			DYN 200			DYN 200		
550	22	2,0	DYN 400	DYN 200		DYN 200			DYN 200		
600	24	2,5	DYN 400			DYN 400			DYN 400		
650	26	2,0	DYN 400			DYN 400			DYN 400		
700	28	2,0	DYN 400			DYN 400			DYN 400		
750	30	2,0	DYN 400			DYN 400			DYN 400		
800	32	2,0	DYN 400			DYN 400			DYN 400		
900	36	1,5	DYN 400			DYN 400			DYN 400		
1000	40	1,5	DYN 400			DYN 400			DYN 400		

(1) To respect for valve on lubricated medium • *A respecter pour robinet en milieu lubrifié* • Zu beachten bei Absperrklappen in flüssigen Medien.

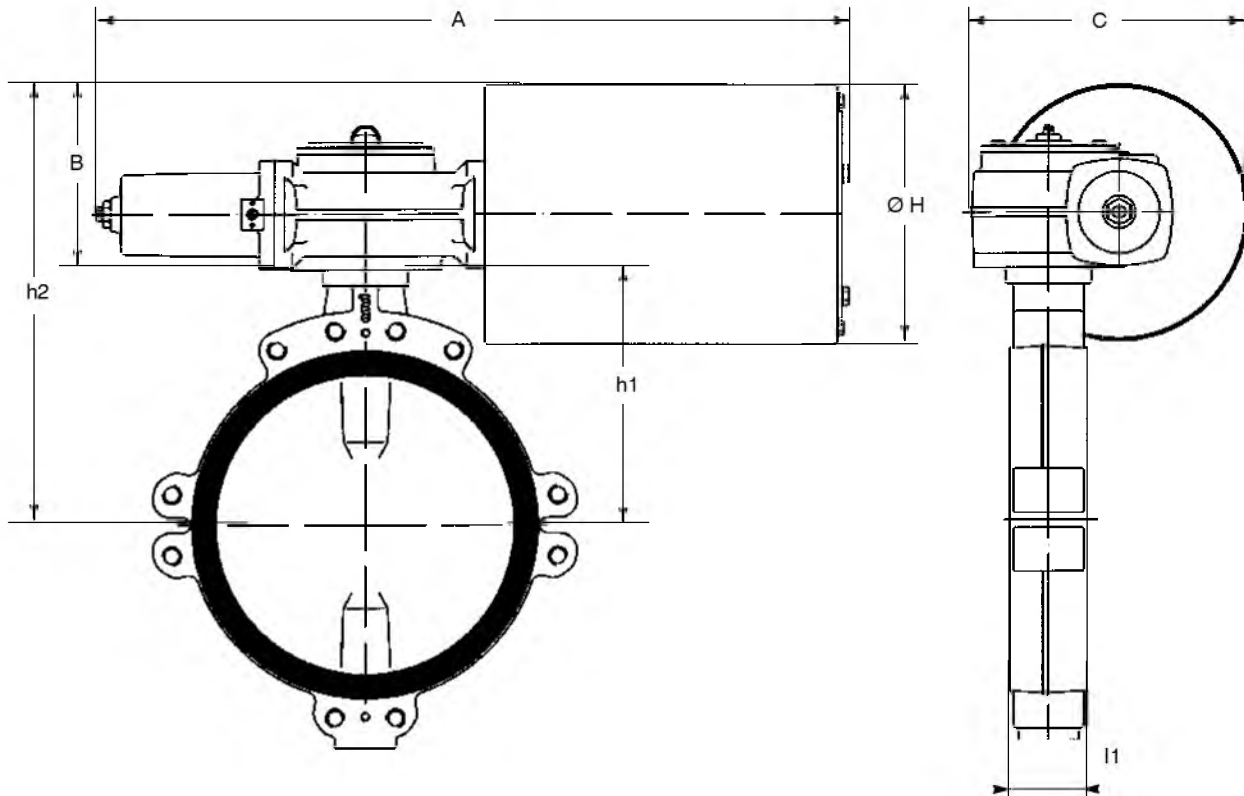
DYNACTO spring return hydraulic actuators
Actionneurs hydrauliques simple effet DYNACTO
Hydraulische Antriebe einfachwirkend DYNACTO

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DYNACTO 12 - 100



DYNACTO 200 & 400



DYNACTO spring return hydraulic actuators
Actionneurs hydrauliques simple effet DYNACTO
Hydraulische Antriebe einfachwirkend DYNACTO

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

Control oil pressure: 90 bar • Pression d'huile moteur : 90 bar • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type Type Typ	A	B	C	Ø H	h2	Weight* Poids* Gewicht*
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Lubricated medium with XA, XC, XV and K liners

Milieu lubrifié avec manchettes XA, XC, XV et K

Flüssige Medien mit Ringbälgen XA, XC, XV und K

40	1 ½	33	105	12	585	121	138	95	226	19,0
50	2	43	109						230	
65	2 ½	46	136						257	
80	3	46	142						263	
100	4	52	163						284	
125	5	56	177	25	655	151	171	127	298	29,0
150	6	56	194						345	
200	8	60	222	50	726	187	217	169	373	55,0
250	10	68	255						442	
300	12	78	282						502	
350	14	78	335	100	932	220	275	219	555	103,0
400	16	102	380						600	
450	18	114	410	200	1 247	298	443	406	708	240,0
500	20	127	440						738	
550	22	154	475						773	
600	24	154	495						793	
650	26	165	535	400	1 452	363	549	508	898	515,0
700	28	165	560						923	
750	30	190	590						953	
800	32	190	615						978	

Lubricated medium except XA, XC, XV and K liners and non lubricated medium

Milieu lubrifié sauf manchettes XA, XC, XV et K et milieu non lubrifié

Flüssige Medien außer Ringbälge XA, XV, K und XC und nicht flüssige Medien

40	1 ½	33	105	12	585	121	138	95	226	19,0
50	2	43	109						230	
65	2 ½	46	136						257	
80	3	46	142						263	
100	4	52	163						284	
125	5	56	177	25	655	151	171	127	328	29,0
150	6	56	194						345	
200	8	60	222	50	726	187	217	169	409	55,0
250	10	68	255						442	
300	12	78	282						502	
350	14	78	335	100	932	220	275	219	555	103,0
400	16	102	380						678	
450	18	114	410	200	1 247	298	443	406	708	240,0
500	20	127	440						738	
550	22	154	475						838	
600	24	154	495						858	
650	26	165	535	400	1 452	363	549	508	898	515,0

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur • Gewichte gelten nur für den Antrieb

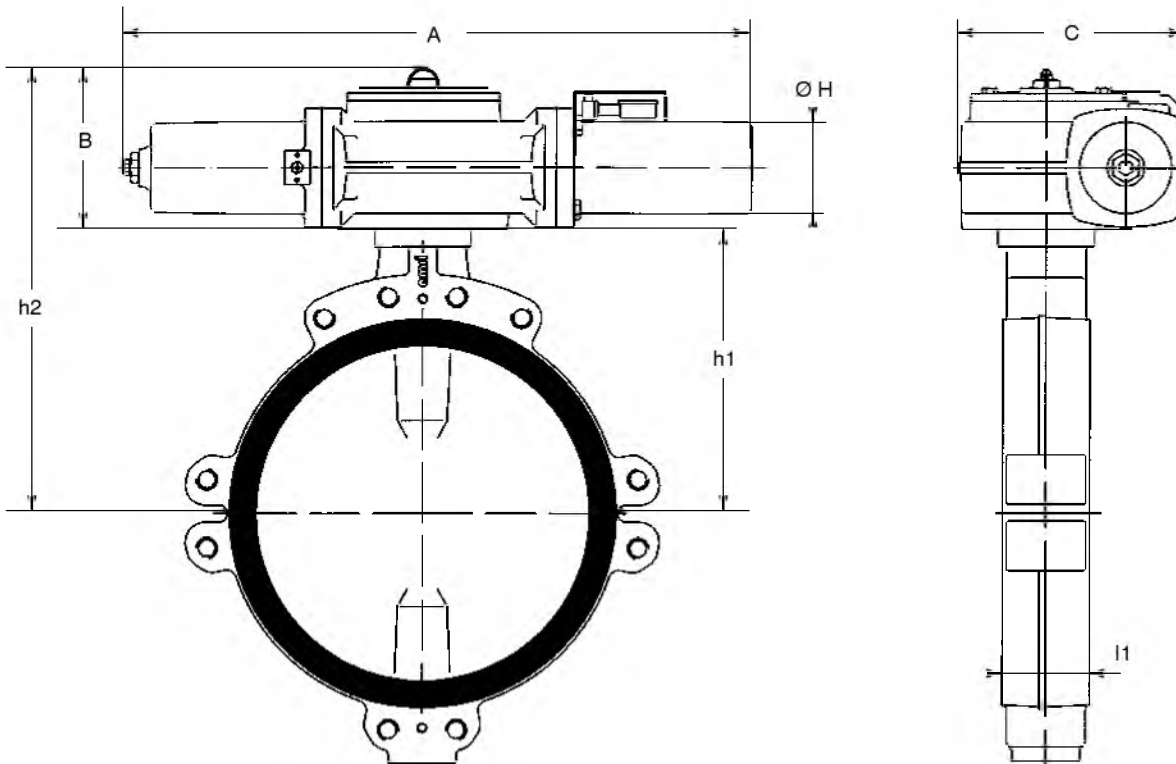
ENNACTO single acting hydraulic actuators
Actionneurs hydrauliques simple effet ENNACTO
Hydraulische Antriebe einfachwirkend ENNACTO

DN | NPS		(1) (m/s)	Lubricated medium <i>Milieu lubrifié</i> Flüssige Medien						Non lubricated medium <i>Milieu non lubrifié</i> Nicht flüssige Medien		
			Liners <i>Manchettes</i> Ringbälge XA, XC, XV & K			Other liners <i>Autres manchettes</i> Andere Ringbälge			All liners <i>Toutes manchettes</i> alle Ringbälge		
			Control oil pressure <i>Pression d'huile moteur</i> Steueröldruck								
			60 bar	90 bar	120 bar	60 bar	90 bar	120 bar	60 bar	90 bar	120 bar
300	12	3,0	[Shaded]				[Shaded]				[Shaded]
350	14	3,0	[Shaded]				[Shaded]				[Shaded]
400	16	3,0	[Shaded]				[Shaded]				[Shaded]
450	18	2,5	[Shaded]				[Shaded]				[Shaded]
500	20	2,5	ENNACTO 200				ENNACTO 200				ENNACTO 200
550	22	2,0	[Shaded]				[Shaded]				[Shaded]
600	24	2,5	[Shaded]				[Shaded]				[Shaded]
650	26	2,0	[Shaded]				[Shaded]				[Shaded]
700	28	2,0	[Shaded]				[Shaded]				[Shaded]
750	30	2,0	ENNACTO 400				ENNACTO 400				ENNACTO 400
800	32	2,0	[Shaded]				[Shaded]				[Shaded]
900	36	1,5	ENNACTO 800				ENNACTO 800				ENNACTO 800
1000	40	1,5	ENNACTO 800				[Shaded]				[Shaded]

(1) To respect for valve on lubricated medium • *A respecter pour robinet en milieu lubrifié* • Zu beachten bei Absperrklappen in flüssigen Medien.
 (2) ENNACTO 1600

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

ENNACTO 200 - 1600



ENNACTO single acting hydraulic actuators
Actionneurs hydrauliques simple effet ENNACTO
Hydraulische Antriebe einfachwirkend ENNACTO

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

Control oil pressure: 90 bar • Pression d'huile moteur : 90 bar • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type Type Typ	A	B	C	Ø H	h2	Weight* Poids* Gewicht*
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Lubricated medium with XA, XC, XV and K liners

Milieu lubrifié avec manchettes XA, XC, XV et K

Flüssige Medien mit Ringbälgen XA, XC, XV und K

450	18	114	410	200	970	246	325	125	656	105,0
500	20	127	440						686	
550	22	154	475						721	
600	24	154	495						741	
650	26	165	535						781	
700	28	165	560	400	1 106	280	403	162	840	170,0
750	30	190	590						870	
800	32	190	615						895	
900	36	203	665						945	
1000	40	216	735						800		1 123	330	500	162	1 065	340,0

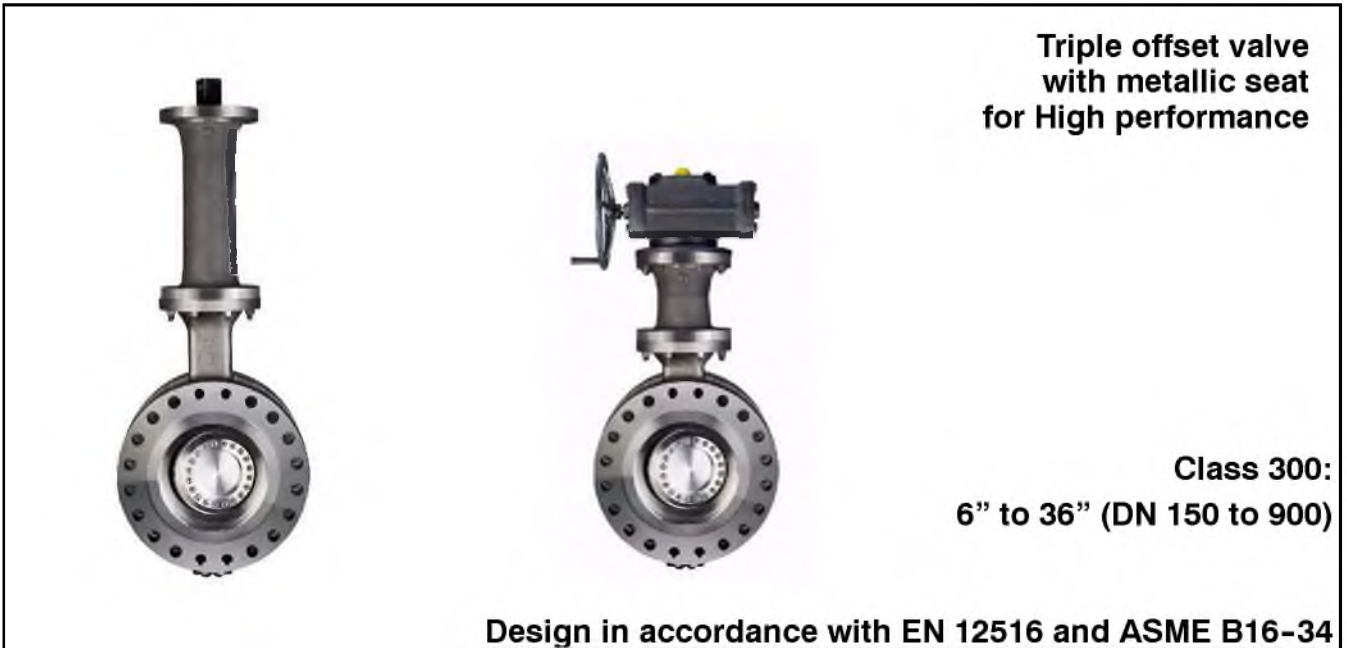
Lubricated medium except XA, XC, XV and K liners and non lubricated medium

Milieu lubrifié sauf manchettes XA, XC, XV et K et milieu non lubrifié

Flüssige Medien außer Ringbälge XA, XV, K und XC und nicht flüssige Medien

400	16	102	380	200	970	246	325	125	626	105,0
450	18	114	410						656	
500	20	127	440						686	
550	22	154	475						721	
600	24	154	495						775	
650	26	165	535	400	1 106	280	403	162	815	170,0
700	28	165	560						840	
750	30	190	590						870	
800	32	190	615						895	
900	36	203	665						995	
1000	40	216	735	800	1 123	330	500	162	1 065	340,0

* The indicated weights are those of the actuator • Les poids indiqués sont ceux de l'actionneur • Gewichte gelten nur für den Antrieb



Applications

- LNG process / All liquefied gases.
- Oil and gas, chemicals, petrochemicals, nuclear industry.
- Compressed gas, Hydrocarbon.

Working conditions

- Temperature :
MT versions: from -46°C min. up to $+260^{\circ}\text{C}$ max.
TBT versions: from -196°C min. up to $+200^{\circ}\text{C}$ max.
- Allowable pressure (PS): depends on the body material and the working temperature, see page 2.
- Operating under $\Delta P = PS$
- Vacuum service down to 0 absolute bar.
- Maximum fluid velocity under allowable pressure:
4 m/s for liquids and 50 m/s for clean gases.
- Lower neck extension seal for valve positionned at an angle
 $\pm 20^{\circ}\text{C}$ for vertical position.

Materials

See page 2.

Design

- Full-lug type body with raised faces (Type 4): DN 6" to 24"
- Flanged type body (Type 7): 6" to 36"
- Face-to-face according to:
Cl. 300 Type 4 -> API 609-B(A) cl. 300,
Cl. 300 Type 7 -> ISO 5752 serie 13, EN 558.1 serie 13.
- Marking in accordance with EN 19 standard.
- Steel body: paint grey colour, internal thickness 30 μm ,
Stainless steel body: pickling and passivation.

- The valves meet the safety requirements of the Pressure Equipments Directive 97/23/EC (PED) Appendix I for fluids of the groups 1 and 2.
- Fire-safe in accordance with ISO 10497.
- Zero leakage, bi-directional.
- The valves meet the requirements of EN ISO15848-1 rate B CO3 and are in accordance with TA-Luft (VDI Guideline 2440).
- The valves are SIL 3 capable in accordance with IEC 61508.

Connections

- PN 40 according to EN 1092-1 (DN 6" to 24"),
- ASME B16-5 cl. 300 UN/UNC (DN 6" to 24"),
- ASME B16-47 serie A class 300 (DN 28" to 36"),
- ASME B16-47 serie B class 300 (DN 28" to 36").

Standard variants

- Pneumatic actuator ACTAIR / DYNACTAIR
- Manual actuator MR
- Hydraulic actuator ACTO / DYNACTO
- Multi turn electric actuator ACTELEC

Options

- Bottom with purge plug
- ATEX version in accordance with 94/9/EC directive
- NACE in accordance with MR0175 / ISO15156

Data to be supplied when ordering

- TRIODIS valve in accordance with type series booklet 8613.1783-EN.
- Size + Type.
- Materials (body, disc, seat).
- Working conditions: nature of fluid, pressure, flow, temperature.
- Connection.
- Flange facing finish and type of contact faces.
- Actuation.



Materials

MT Version

Body	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619 + stellite	1
Steel ASTM A 216 gr. WCB + stellite	1p
Steel ASTM A 352 gr. LCB + stellite	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220 + stellite	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408 + stellite	6
Extension	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619	1
Steel ASTM A 216 gr. WCB	1p
Steel ASTM A 352 gr. LCB	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Shaft	KSB code
Stainless steel AISI 431 and EN 10272 1.4057 (from 0 °C min. up to +260 °C)	6h
Stainless steel ASTM A 564 gr. 630 and EN 10088-3 1.4542 (from -50 °C min. up to + 260 °C)	6e
Disc	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619	1
Steel ASTM A 216 gr. WCB	1p
Steel ASTM A 352 gr. LCB	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Seat	KSB code
Stainless steel Duplex	7e
Stainless steel Duplex + graphite	7f

Other materials, consult us.

TBT Version

Body	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408 + stellite	6
Extension	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Shaft	KSB code
Stainless steel ASTM A 479 gr. XM19	6r
Stainless steel ASTM A 479gr. 316L EN 10213 1.4404 (for reduced working pressure)	6
Stainless steel ASTM A 638 gr. 660 (for exceptional working conditions)	6f
Disc	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Seat	KSB code
Stainless steel Duplex	7e
Austenitic Stainless steel XM19	6r
Nickel Alloy UNS N06625	8j

Other materials, consult us.

Pressure / Temperature

In pressure class 300 (european materials), TRIODIS 300 valves are in accordance with EN 12516-1 standard and ASME B 16-34.

The values in the table below must be used for valves which have to comply with PED 97/23/CE:

Material Body + extension	Working pressure in bar at temperature °C									
	-196	-46	-29	-10	50	100	150	200	250	260
ASTM A 216 gr. WCC / EN10213 1.0619	Forbidden	Forbidden	51,7*	51,7	51,7	51,5	50,2	48,6	46,3	45,6
ASTM A 216 gr. WCB	Forbidden	Forbidden	51,1*	51,1	50,1	46,4	45,1	43,8	41,7	41,1
ASTM A 352 gr. LCB	Forbidden	47,9*	47,9*	47,9	47,3	45,1	43,9	42,5	40,6	40
ASTM A 352 gr. LCC / EN10213 1.6220	Forbidden	51,7*	51,7*	51,7	51,7	51,5	50,2	48,6	46,3	45,6
ASTM A 351 gr. CF8M / EN10213 1.4408	49,6	49,6	49,6	49,6	48,1	42,2	38,5	35,7	33,4	33

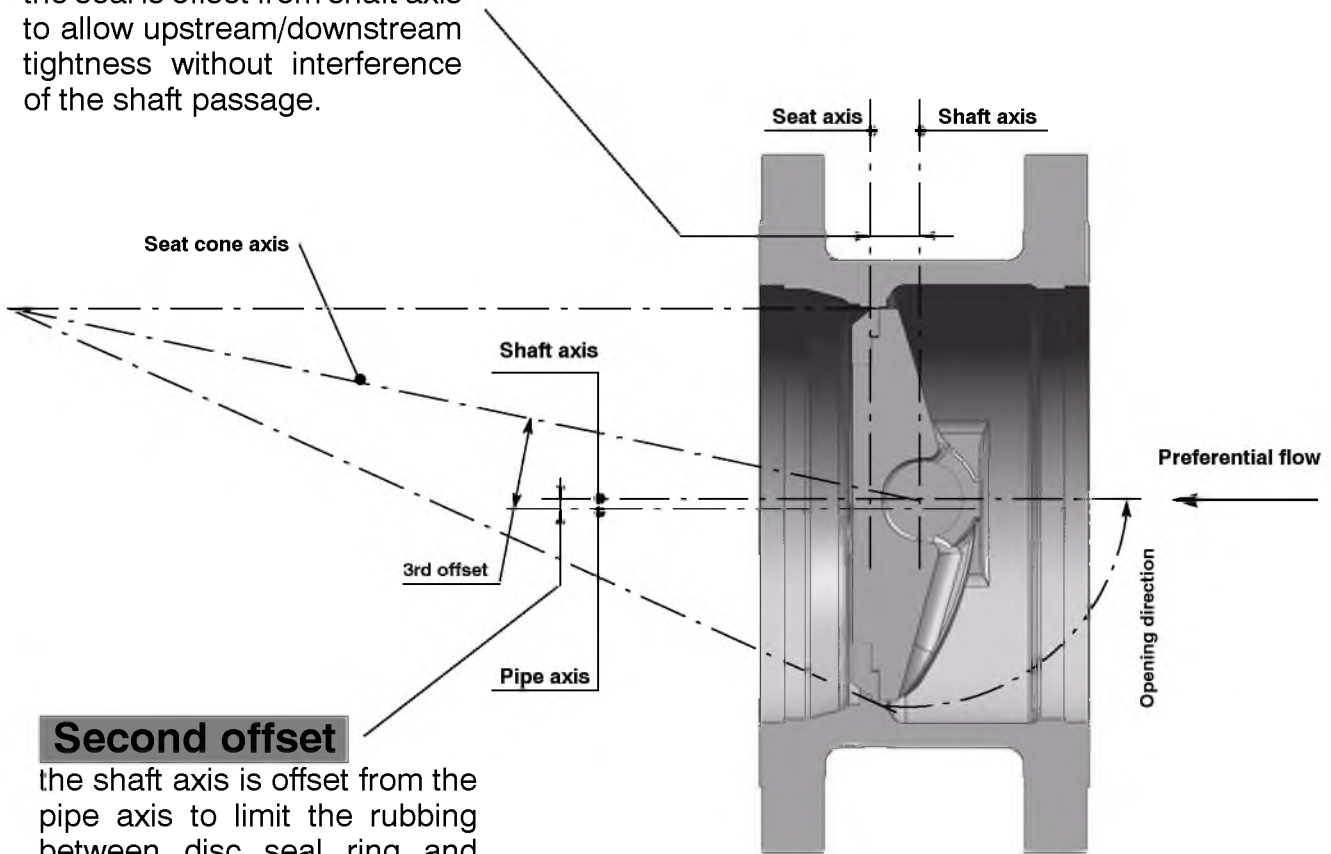
* Only according to ASME B16-34

Hydraulic characteristics

DN	NPS	Flow coefficient in full open position		Zeta
		Kv ₀	Cv ₀	
150	6	601	697	2,24
200	8	1131	1312	2,00
250	10	1948	2260	1,64
300	12	2778	3222	1,68
350	14	4130	4791	1,40
400	16	5192	6023	1,52
450	18	7745	8984	1,09
500	20	10410	12076	0,92
600	24	16138	18720	0,79
700	28	18489	21448	1,12
750	30	22370	25950	1,01
800	32	25432	29501	1,01
900	36	31555	36603	1,05

First offset

the seal is offset from shaft axis to allow upstream/downstream tightness without interference of the shaft passage.

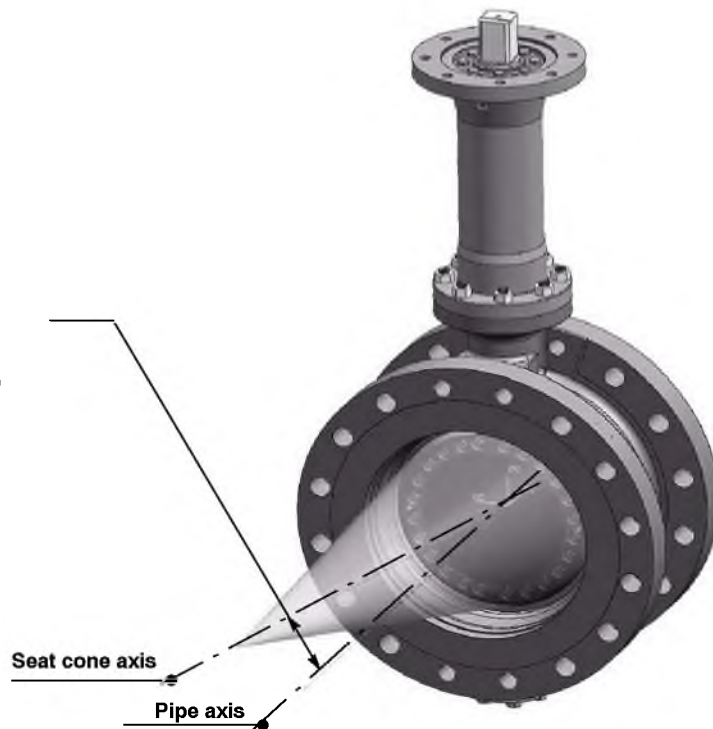


Second offset

the shaft axis is offset from the pipe axis to limit the rubbing between disc seal ring and body seat

Third offset

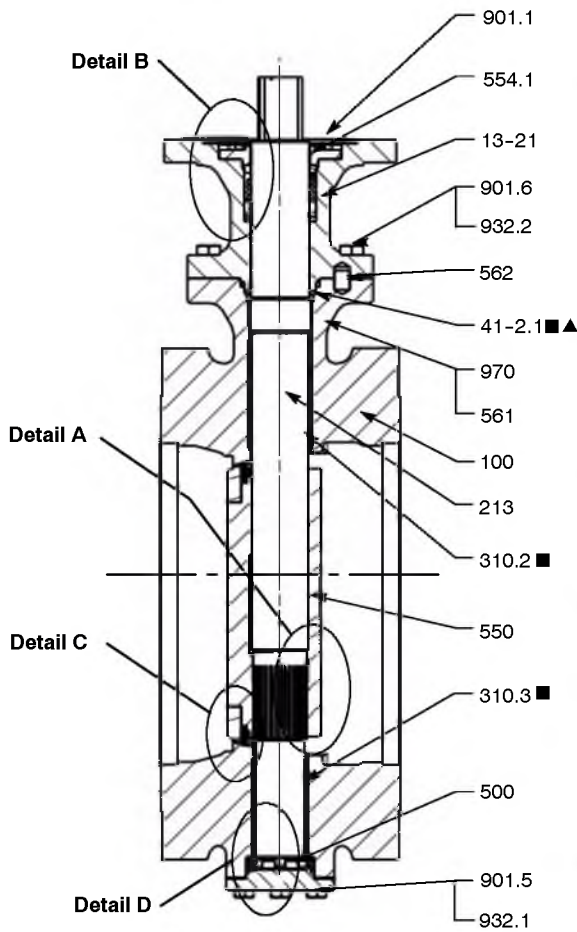
the seat cone axis is inclined of a specific angle from pipe axis:
 - to provide the perfect matching of the sealing conical surfaces so that the valve is bubble tighten at high pressure levels,
 - to eliminate rubbing during the operating of the valve in order to guarantee a long service life.



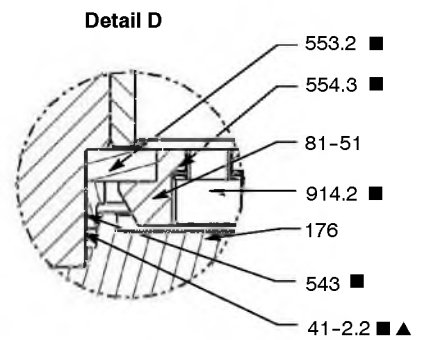
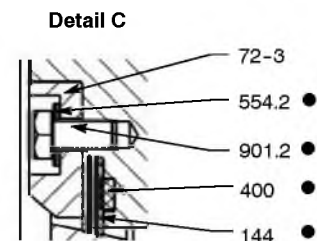
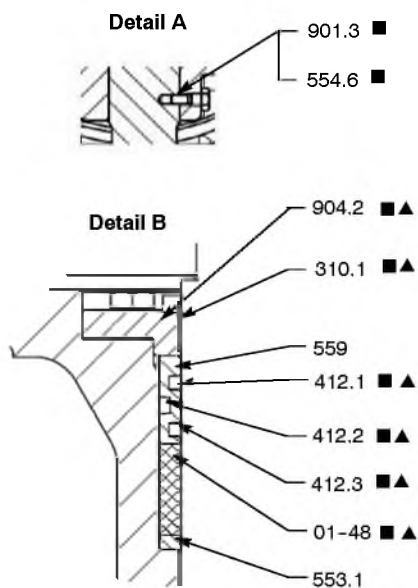
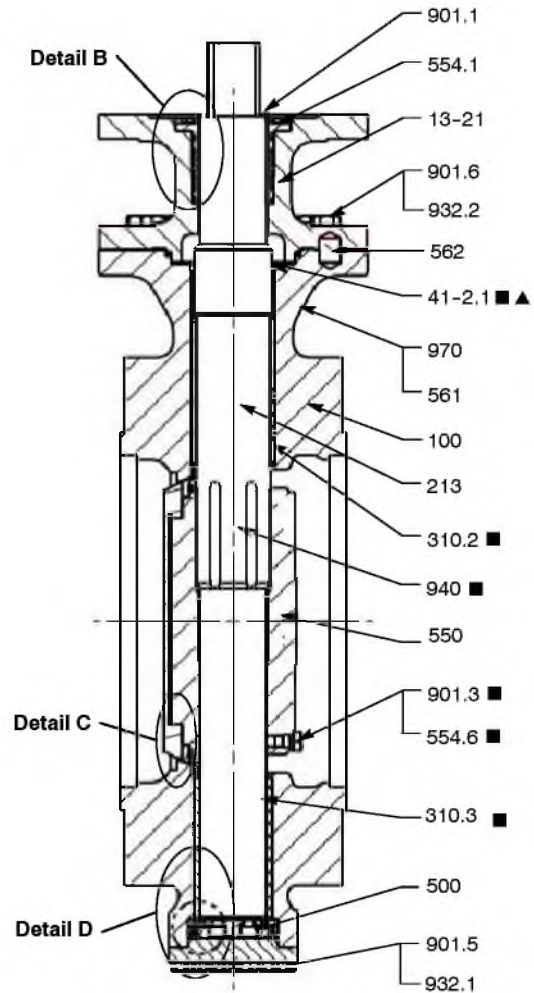
Construction

MT version (Type 7 represented)

Disc drive with splines
DN ≤ 16"



Disc drive with cylindrical keys
DN 18" to DN 36"



- Spare parts kit for seat
- Spare parts kit for bearing
- ▲ Spare parts kit for shaft sealing

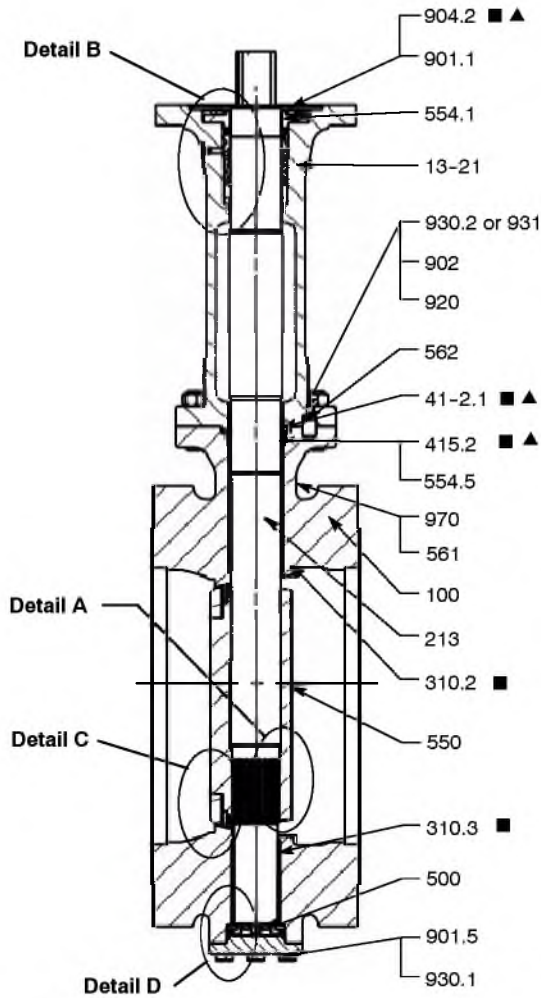
Parts list for MT version

Item	Designation	Materials
01-48	Sealing packing	Expanded graphite
100	Body	See page 2
13-21	Extension	See page 2
144	Seat	See page 2
176	Bottom	A516 gr 70 or Stainless Steel 316L
213	Shaft	See page 2
310.1	Self lubricating strip	Stainless steel + PTFE
310.2	Upper bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
310.3	Lower bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
400	Static gasket	Stainless steel 316L + graphite or expanded graphite
41-2.1	Extension static joint	Expanded graphite
41-2.2	Bottom static joint	Expanded graphite
412.1	O-Ring	VITON®
412.2	O-Ring	VITON®
412.3	O-Ring	VITON®
500	Anti static device	EN 10213 1.4310
543	Spacer bush	Stainless steel 316L
550	Disc	See page 2
553.1	Upper thrust insert	Stainless steel 316L
553.2	Thrust insert	Stainless steel 316L hard faced
554.1	Upper washer	Stainless steel 316L or EN 10025 S235
554.2	Nord Lock® washer	Stainless steel 316
554.3	Nord Lock® washer	Stainless steel 316
554.6	Nord Lock® washer	Stainless steel 316L
559	Gasket holder	Stainless steel 316L or EN 10025 S235
561	Grooved nail	EN 10213 1.4303
562	Pin	A638 gr. 660
72-3	Tightening flange	EN 10025 S355 or EN 10088-2 1.4462
81-51	Tightening part	Stainless steel 316L
901.1	Hexagon screw	Steel Cl. 8-8 or Stainless steel A4-70
901.2	Hexagon screw	Steel Cl. 8-8 or Stainless steel A4-80
901.3	Liaison screw	Stainless steel A4-70
901.5	Hexagon screw	Stainless steel A4-70
901.6	Hexagon screw	Stainless steel A4-70
904.2	Socket screw	Stainless steel A4-70
914.2	Hexagon socket head cap screw	Stainless steel A4-70
932.1	Lock washer	Stainless steel 316L
932.2	Lock washer	Stainless steel 316L
940	Cylindrical key	A638 GR 660 (for DN > 12")
970	Identity plate	Stainless steel 316 or equivalent

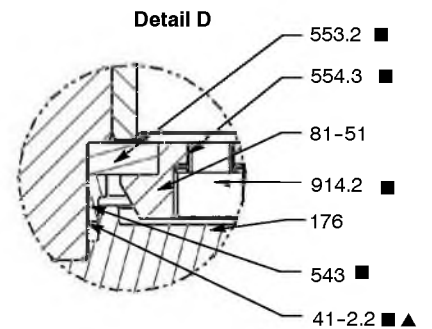
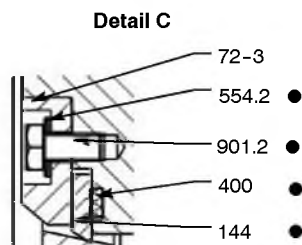
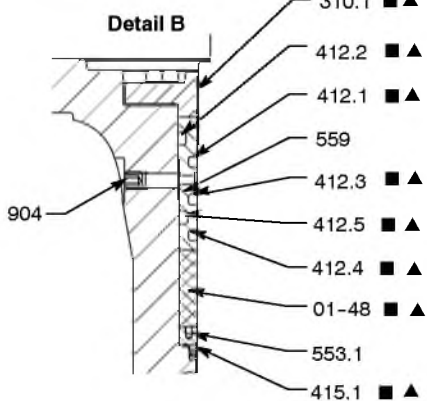
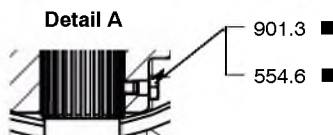
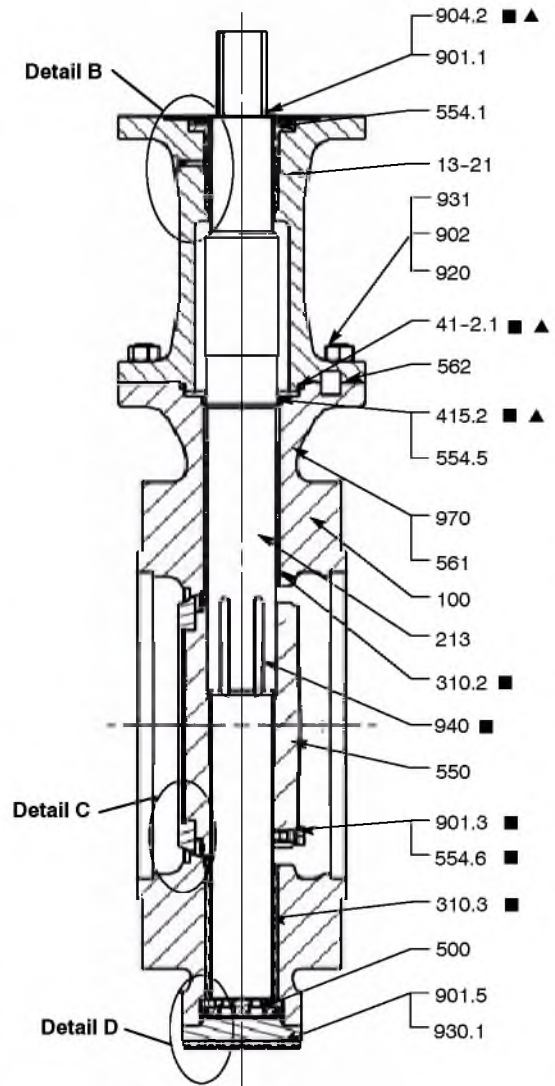
Construction

TBT version (Type 7 represented)

Disc drive with splines
DN ≤ 16"



Disc drive with cylindrical keys
DN 18" to DN 36"



- Spare parts kit for seat
- Spare parts kit for bearing
- ▲ Spare parts kit for shaft sealing

Parts list for TBT version

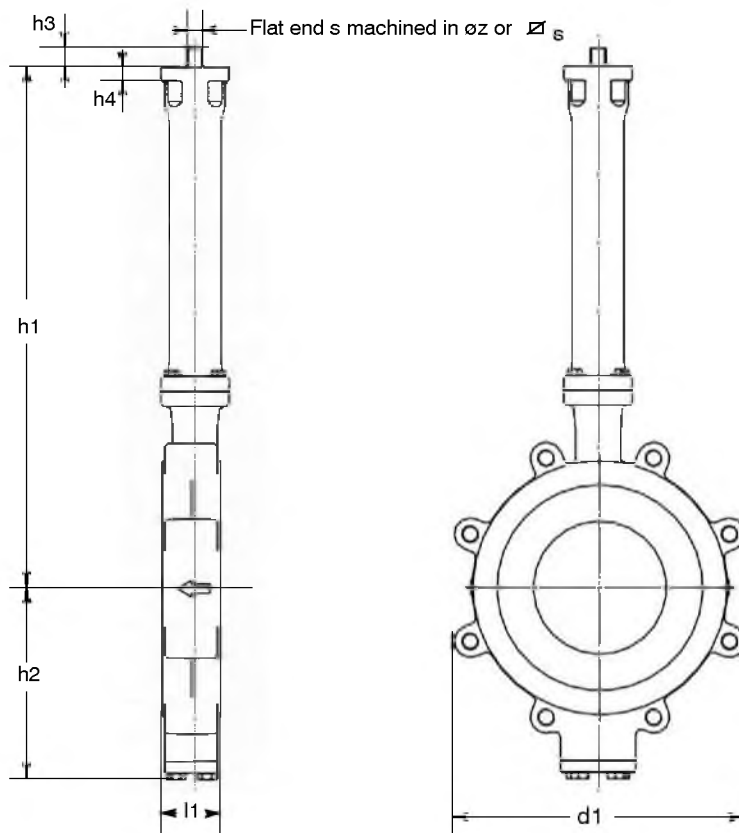
Item	Designation	Materials
01-48	Sealing packing	Expanded graphite
100	Body	See page 2
13-21	Extension	See page 2
144	Seat	See page 2
176	Bottom	Stainless steel 316L
213	Shaft	See page 2
310.1	Self lubricating strip	Stainless steel + PTFE
310.2	Upper bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
310.3	Lower bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
400	Static gasket	Stainless steel 316L+ graphite or expanded graphite
41-2.1	Extension static joint	Expanded graphite
41-2.2	Bottom static joint	Expanded graphite
412.1	O-Ring	HC Nitrile(*)
412.2	O-Ring	HC Nitrile(*)
412.3	O-Ring	HC Nitrile(*)
412.4	O-Ring	HC Nitrile(*)
412.5	O-Ring	HC Nitrile(*)
415.1	Lip Seal Ring	PTFE + ELGILOY
415.2	Lip Seal Ring	PTFE + ELGILOY (Option)
500	Anti static device	EN 10213 1.4310
543	Spacer bush	Stainless steel 316L
550	Disc	See page 2
553.1	Upper thrust insert	Stainless steel 316L
553.2	Thrust insert	Stainless steel 316L hard faced
554.1	Upper washer	Stainless steel 316L
554.2	Nord Lock® washer	Stainless steel 316
554.3	Nord Lock® washer	Stainless steel 316
554.5	Spacer	Stainless steel 316L (Option)
554.6	Nord Lock® washer	Stainless steel 316L
559	Gasket holder	Stainless steel 316L
561	Grooved nail	EN 10213 1.4303
562	Pin	A638 gr. 660
72-3	Tightening flange	EN 10088-2 1.4462 or Stainless steel 316L or A479 XM19
81-51	Tightening part	Stainless steel 316L
901.1	Hexagon screw	Stainless steel A4-70
901.2	Hexagon screw	Stainless steel A4-70
901.3	Liaison screw	Stainless steel A4-70
901.5	Hexagon screw	A320 GR. B8M cl.2
902	Stud bolt	A320 GR. B8M cl.2
904	Socket screw	Stainless steel A4-70
904.2	Socket screw	Stainless steel A4-70
914.2	Hexagon socket head cap screw	Stainless steel A4-70
920	Hexagon nut	A 194 GR. 8M
930.1	Lock retainer	Stainless steel 316L
930.2	Nut lock	Stainless steel 316L
931	Lock washer	Stainless steel 316L
940	Cylindrical key	A638 gr 660 (DN > 12")
970	Identity plate	Stainless steel 316 or equivalent

*HC Nitrile: Epichlorohydrin for ambient temperature below minus 25 °C.

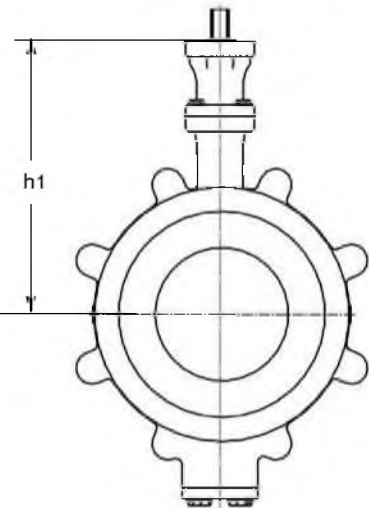
Dimensions

Full-lug type body - Type 4 Class 300

TBT version



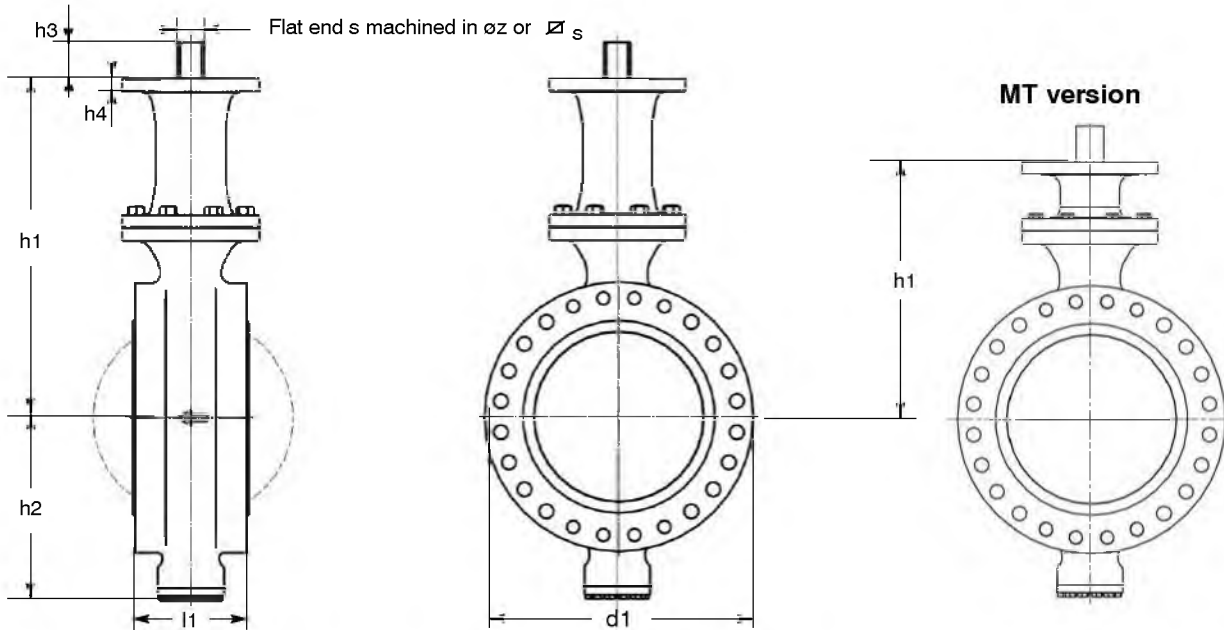
MT version



mm

DN*	NPS	d1	l1	MT		h2	Mounting plate ISO 5211		Flat shaft end			Square shaft end		Weight Kg	
				h1	TBT		n°	h4	s	øz	h3	∇ s	h3	MT	TBT
150	6	300	61	300	565	185	F10	15	22	28	40			21	40
200	8	365	75	345	635	210	F12	18				27	45	54	59
250	10	440	86	410	710	260	F14	23				36	55	75	95
300	12	505	95	480	785	290	F16	27				50	65	120	140
350	14	570	120	520	825	350		27						175	195
400	16	650	135	600	900	385	F25	30				60	80	270	300
450	18	690	152	660	960	430		30						315	350
500	20	745	162	725	1010	465	F30	34				70	105	439	493
600	24	885	184	810	1085	565		34						673	750

* For other diameters, please, consult us.

Dimensions
Flanged type body - Type 7 Class 300
TBT version


mm

DN*	NPS	d1	l1	TBT		h2	Mounting plate		Flat shaft end end			Square shaft end		Weight Kg	
				MT	h1		n°	h4	s	øz	h3	∇ s	h3	MT	TBT
150	6	320	140	300	565	185	F10	15	22	28	40			50	56
200	8	380	152	345	635	210	F12	18				27	45	92	102
250	10	450	165	410	710	260	F14	23				36	55	120	140
300	12	520	178	480	785	290	F16	27				50	65	180	205
350	14	585	190	520	825	350		27							250	270
400	16	660	216	600	900	385	F25	30				60	80	360	395
450	18	710	222	660	960	430		30							420	455
500	20	775	229	725	1000	465	F30	34				70	105	560	600
600	24	915	267	810	1085	565		34							840	920
ASME B16-47-A															
700	28	1035	292	910	1150	650	F35	38				80	110	1250	1350
750	30	1090	318	970	1210	680			90	1435	1520				
800	32	1150	318	1010	1250	735			110	1650	1800				
900	36	1270	330	1130	1380	750	F40	45				110	130	2000	2200
ASME B16-47-B															
700	28	920	292	910	1150	650	F35	38				80	110	1000	1100
750	30	990	318	970	1210	680			90	1200	1285				
800	32	1055	318	1010	1250	735			110	1400	1500				
900	36	1170	330	1130	1380	750	F40	45				110	130	1800	1900

* For other diameters, please, consult us.

Connections

The valves can be fitted between flanges according to EN 1092-1 PN 40, ASME B16.5 Cl. 300, ASME B16-47-A and ASME B16-47-B standards (other connections on request).

Full-lug type body - Type 4 - Class 300

DN	NPS	EN 1092-1 PN 40	ASME B16.5 Cl. 300
150	6	✓	✓
200	8	✓	✓
250	10	✓	✓
300	12	✓	✓
350	14	✓	✓
400	16	✓	✓
450	18	✓	✓
500	20	✓	✓
600	24	✓	✓

Flanged type body - Type 7 - Class 300

DN	NPS	EN 1092-1 PN 40	ASME B16.5 Cl. 300	ASME B16-47-A	ASME B16-47-B
150	6	✓	✓		
200	8	✓	✓		
250	10	✓	✓		
300	12	✓	✓		
350	14	✓	✓		
400	16	✓	✓		
450	18	✓	✓		
500	20	✓	✓		
600	24	✓	✓		
700	28			✓	✓
750	30			✓	✓
800	32			✓	✓
900	36			✓	✓

Fitting allowed

Flange facing

	Raised face RF	Flat face FF
Smooth finish	Standard	On request
Stock finish	On request	On request

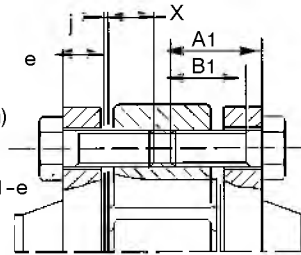
End of line and downstream dismantling

Possible, on request.

Bolting for full-lug type body - Type 4

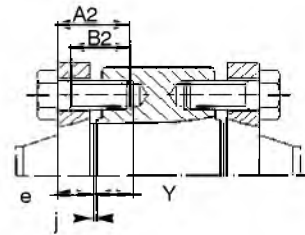
Screw length of the lugs
 $A1_{max} = e + X + j$

- e : Flange thickness (customer specification)
- X : Max. implantation of the screw
- j : Thickness of the flange gasket
- B1 : Min. threaded length of the screw $B1 > A1 - e$



Screw length at shaft passages
 $A2_{max} = e + Y + j$

- e : Flange thickness (customer specification)
- Y : Optimal implantation of the screw
- j : Thickness of the flange gasket
- B2 : Min. threaded length of the screw $B2 > A2 - e$



NB: We do not supply the bolting and flange gasket.

mm

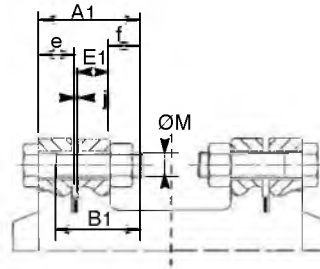
DN	NPS	EN 1092-1 PN 40					ASME B16-5 class 300				
		ØM	Screw A1		Screw A2		UN or UNC	Screw A1		Screw A2	
			X	Qty*	Y	Qty*		X	Qty*	Y	Qty*
150	6	M24	29	8			3/4"	29	12		
200	8	M27	35	12			7/8"	35	12		
250	10	M30	41	12			1"	40	12	20,5	4
300	12	M30	45	12	23	4	1"1/8	45	12	23	4
350	14	M33	53	12	26,5	4	1"1/8	50	16	20	4
400	16	M36	58	12	38,5	4	1"1/4	52	16	29	4
450	18	M36	58	16	32	4	1"1/4	54	20	27,5	4
500	20	M39	64	16	28,5	4	1"1/4	58	20	26	4
600	24	M45	75	16	33,5	4	1"1/2	65	20	30	4

* Quantity of screws by face

Bolting for flanged type body - Type 7

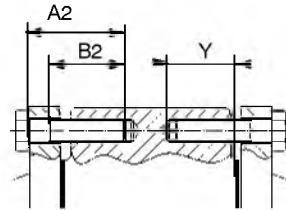
Screw length on flanges
A1 max. = e + j + E1 max. + f

E1 : Thickness of valve flange
e : Flange thickness (customer specification)
f : Overlength of the screw
j : Thickness of flange gasket
B1 : Min. threaded length of the screw $B1 > A1 - e$



Screw length at shaft passages
A2 max. = e + j + Y

e : Flange thickness (customer specification)
Y : Max. implantation of the screw
j : Thickness of flange gasket
B2 : Min. threaded length of the screw $B2 > A2 - e$



NB: We do not supply the bolting and flange gasket.

mm

DN	NPS	E1	EN 1092-1 PN 40				ASME B16-5 class 300				ASME B16-47-A				ASME B16-47-B								
			ØM	Screw A1		Screw A2		UN or UNC	Screw A1		Screw A2		UN or UNC	Screw A1		Screw A2							
				f	Qty*	Y	Qty*		f	Qty*	Y	Qty*		f	Qty*	Y	Qty*		f	Qty*	Y	Qty*	
150	6	36	M24	26	4	30	4	3/4 ⁽¹⁾	22	8	30	4											
200	8	45,5	M27	28	8	35	4	7/8 ⁽¹⁾	25	8	35	4											
250	10	49	M30	31	8	40	4	1 ⁽¹⁾	28	12	40	4											
300	12	54,5	M30	31	12	45	4	1 1/8	32	12	45	4											
350	14	58,5	M33	34	12	45	4	1 1/8	32	16	45	4											
400	16	60,5	M36	39	12	50	4	1 1/4	34	16	50	4											
450	18	67	M36	39	16	52	4	1 1/4	34	20	52	4											
500	20	69	M39	41	16	55	4	1 1/4	34	20	52	4											
600	24	74	M45	45	16	65	4	1 1/2	41	20	65	4											
700	28	84,5											1 5/8	48	20	56	8						
700	28	90																1 1/4	34	28	56	8	
750	30	100											1 3/4	54	20	62	8	1 3/8	38	28	62	8	
800	32	97											1 7/8	55	20	60	8						
800	32	103																1 1/2	41	24	60	8	
900	36	103,5											2"	55	24	48,5	8	1 5/8	48	24	48,5	8	

* Quantity of screws by face

(1) Only UNC.

Standard variants

Pneumatic actuator ACTAIR / DYNACTAIR

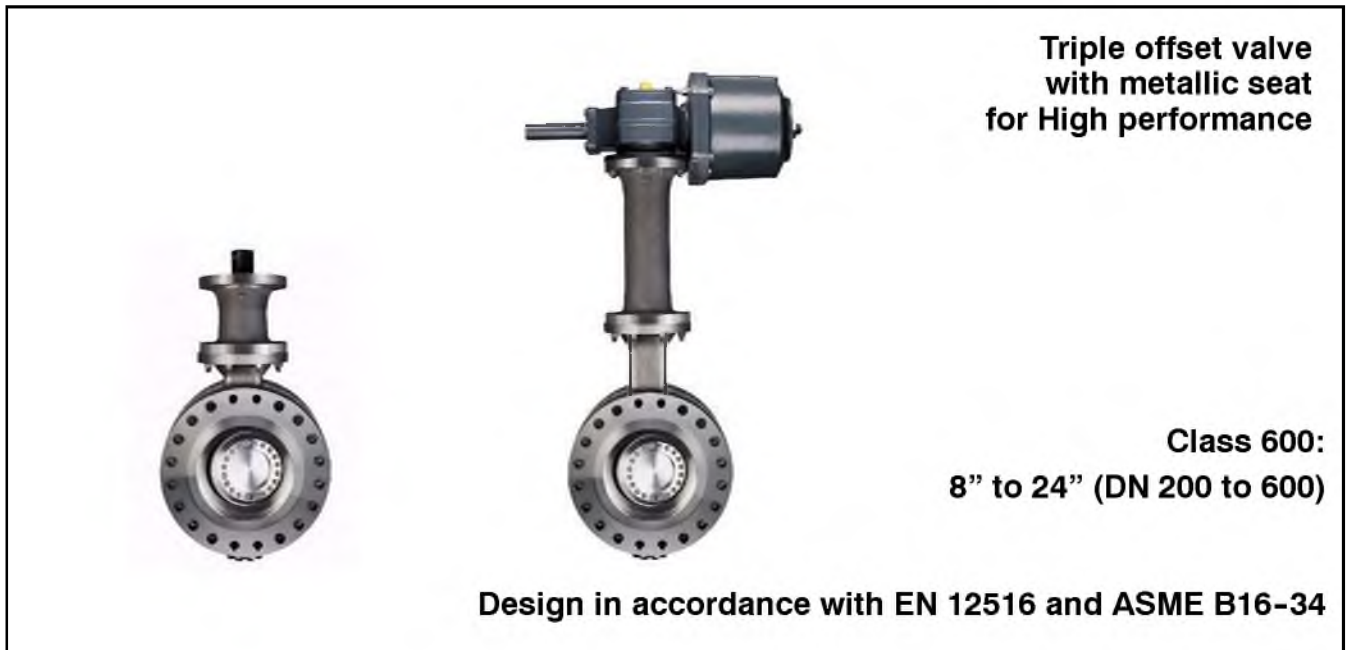


Manual actuator MR



Hydraulic actuator ACTO / DYNACTO





Applications

- LNG process / All liquefied gases.
- Oil and gas, chemicals, petrochemicals, nuclear industry.
- Compressed gas, Hydrocarbon.

Working conditions

- Temperature :
MT versions: from $-46\text{ }^{\circ}\text{C}$ min. up to $+260\text{ }^{\circ}\text{C}$ max.
TBT versions: from $-196\text{ }^{\circ}\text{C}$ min. up to $+200\text{ }^{\circ}\text{C}$ max.
- Allowable pressure (PS): depends on the body material and the working temperature, see page 2.
- Operating under $\Delta P = PS$
- Vacuum service down to 0 absolute bar.
- Maximum fluid velocity under allowable pressure:
4 m/s for liquids and 50 m/s for clean gases.
- Lower neck extension seal for valve positioned at an angle
 $\pm 20\text{ }^{\circ}$ from vertical position.

Materials

See page 2.

Design

- Full-lug type body with raised faces (Type 4): DN 8" to 24"
- Flanged type body (Type 7): 8" to 24"
- Face-to-face according to:
Cl. 600 Type 4 -> API 609-B (A) cl. 600,
Cl. 600 Type 7 -> ISO 5752 serie 14, EN 558.1 serie 14,
API 609-B (C) cl. 600.
- Marking in accordance with EN 19 standard.
- Steel body: paint grey colour, internal thickness $35\text{ }\mu\text{m}$,
Stainless steel body: pickling and passivation.

- The valves meet the safety requirements of the Pressure Equipments Directive 97/23/EC (PED) Appendix I for fluids of the groups 1 and 2.
- Fire-safe in accordance with ISO 10497.
- Zero leakage, bi-directional.
- The valves meet the requirements of EN ISO15848-1 rate B CO3 and are in accordance with TA-Luft (VDI Guideline 2440).
- The valves are SIL 3 capable in accordance with IEC 61508.

Connections

- ASME B16-5 cl. 600 UN/UNC,

Standard variants

- Pneumatic actuator ACTAIR / DYNACTAIR
- Manual actuator MR
- Hydraulic actuator ACTO / DYNACTO
- Multi turn electric actuator ACTELEC

Options

- Bottom with purge plug
- ATEX version in accordance with 94/9/EC directive
- NACE in accordance with MR0175 / ISO15156

Data to be supplied when ordering

- TRIODIS valve in accordance with type series booklet 8613.1786-EN.
- Size + Type.
- Materials (body, disc, seat).
- Working conditions: nature of fluid, pressure, flow, temperature.
- Connection.
- Flange facing finish and type of contact faces.
- Actuation.



Materials

MT Version

Body	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619 + stellite	1
Steel ASTM A 216 gr. WCB + stellite	1p
Steel ASTM A 352 gr. LCB + stellite	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220 + stellite	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408 + stellite	6
Extension	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619	1
Steel ASTM A 216 gr. WCB	1p
Steel ASTM A 352 gr. LCB	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Shaft	KSB code
Stainless steel AISI 431 and EN 10272 1.4057 (from 0 °C min. up to +260 °C)	6h
Stainless steel ASTM A 564 gr. 630 and EN 10088-3 1.4542 (from -50 °C min. up to + 260 °C)	6e
Disc	KSB code
Steel ASTM A 216 gr. WCC and EN 10213 1.0619	1
Steel ASTM A 216 gr. WCB	1p
Steel ASTM A 352 gr. LCB	1n
Steel ASTM A 352 gr. LCC and EN 10213 1.6220	1m
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Seat	KSB code
Stainless steel Duplex	7e
Stainless steel Duplex + graphite	7f

Other materials, consult us.

TBT Version

Body	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408 + stellite	6
Extension	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Shaft	KSB code
Stainless steel ASTM A 479 gr. XM19	6r
Stainless steel ASTM A 479 gr. 316L or equivalent (for reduced working pressure)	6
Stainless steel ASTM A 638 gr. 660 (for exceptional working conditions)	6f
Disc	KSB code
Stainless steel ASTM A 351 gr. CF8M and EN 10213 1.4408	6
Seat	KSB code
Stainless steel Duplex	7e
Austenitic Stainless steel XM19	6r
Nickel Alloy UNS N06625	8j

Other materials, consult us.

Pressure / temperature

In pressure class 600 (european materials), TRIODIS 600 valves are in accordance with EN 12516-1 standard and ASME B 16-34.

The values in the table below must be used for valves which have to comply with PED 97/23/CE:

Material Body + extension	Working pressure in bar at temperature ° C									
	-196	-46	-29	-10	50	100	150	200	250	260
ASTM A 216 gr. WCC / EN10213 1.0619	Forbidden	Forbidden	103,4*	103,4	103,4	103	100,3	97,2	92,6	91,2
ASTM A 216 gr. WCB	Forbidden	Forbidden	102,1*	102,1	100,1	92,7	90,2	87,6	83,4	82,2
ASTM A 352 gr. LCB	Forbidden	95,7*	95,7*	95,7	94,6	90,2	87,9	85,1	81,1	79,9
ASTM A 352 gr. LCC / EN10213 1.6220	Forbidden	103,4*	103,4*	103,4	103,4	103	100,3	97,2	92,6	91,2
ASTM A 351 gr. CF8M / EN10213 1.4408	99,3	99,3	99,3	99,3	96,2	84,4	77	71,3	66,8	66

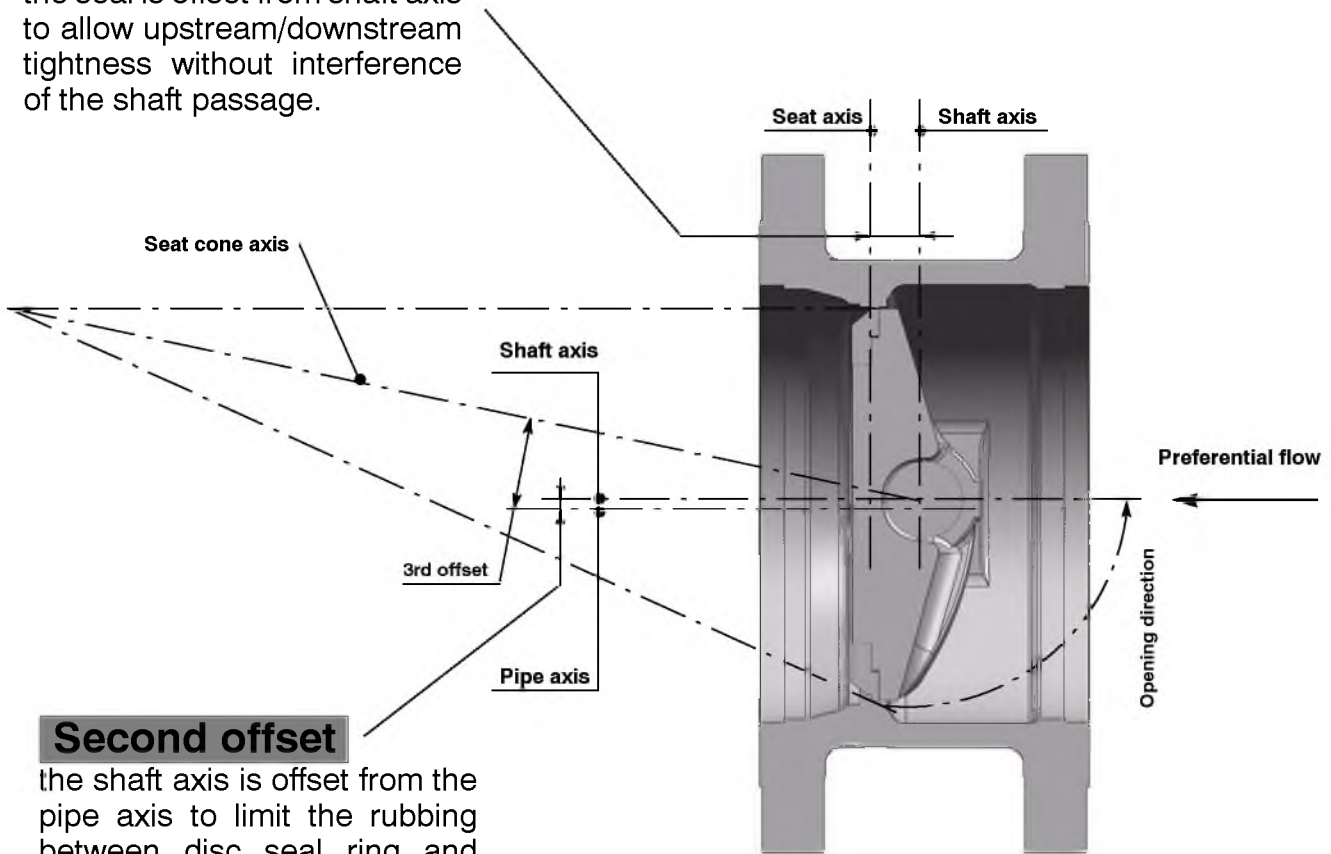
* Only according to ASME B16-34

Hydraulic characteristics

DN	NPS	Flow coefficient in full open position		Zeta
		Kv ₀	Cv ₀	
200	8	703	815	5,17
250	10	1318	1528	3,59
300	12	2076	2408	3,00
350	14	2719	3154	3,24
400	16	4159	4824	2,36
450	18	5139	5962	2,48
500	20	6765	7848	2,18
600	24	10073	11685	2,04

First offset

the seal is offset from shaft axis to allow upstream/downstream tightness without interference of the shaft passage.

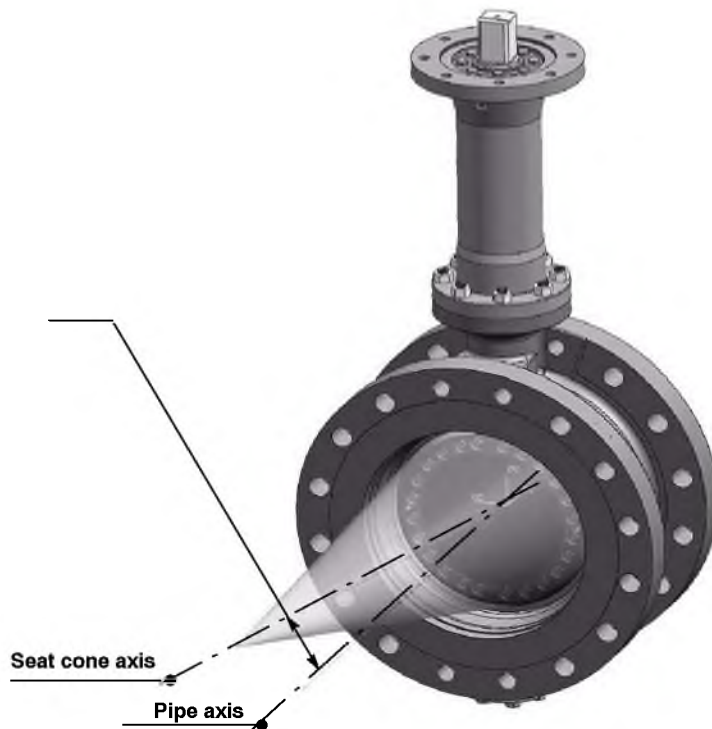


Second offset

the shaft axis is offset from the pipe axis to limit the rubbing between disc seal ring and body seat

Third offset

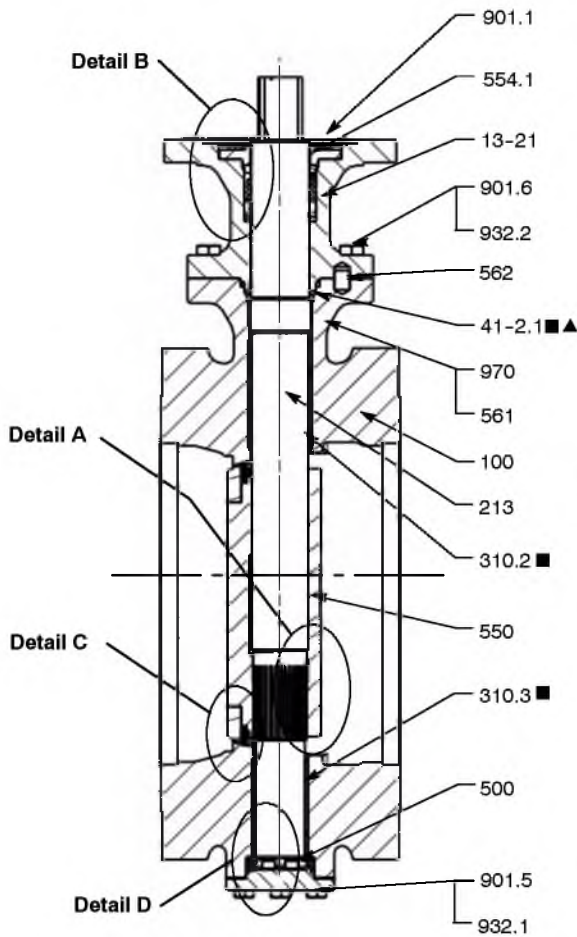
the seat cone axis is inclined of a specific angle from pipe axis:
 - to provide the perfect matching of the sealing conical surfaces so that the valve is bubble tighten at high pressure levels,
 - to eliminate rubbing during the operating of the valve in order to guarantee a long service life.



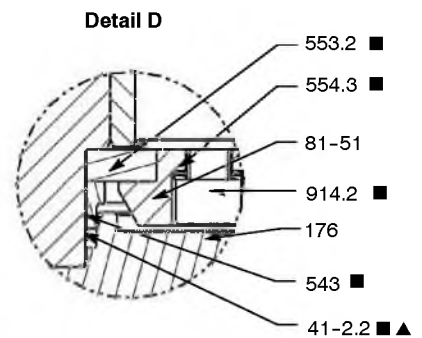
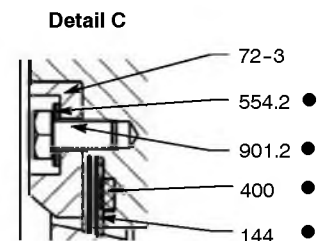
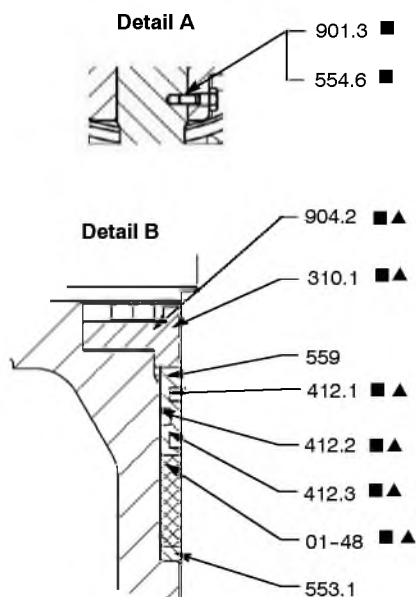
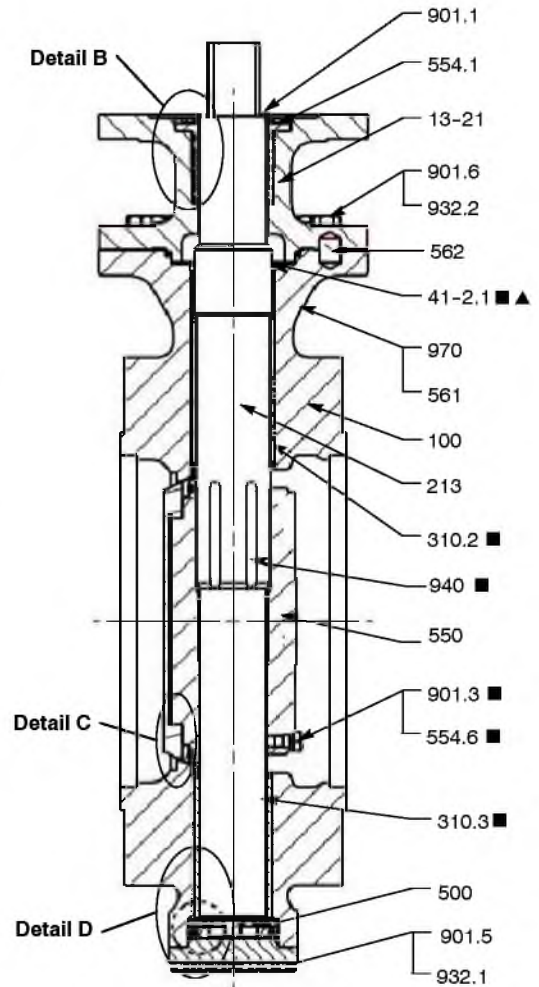
Construction

MT version (Type 7 represented)

Disc drive with splines
DN 8" and DN 10"



Disc drive with cylindrical keys
DN 12" to DN 24"



- Spare parts kit for seat
- Spare parts kit for bearing
- ▲ Spare parts kit for shaft sealing

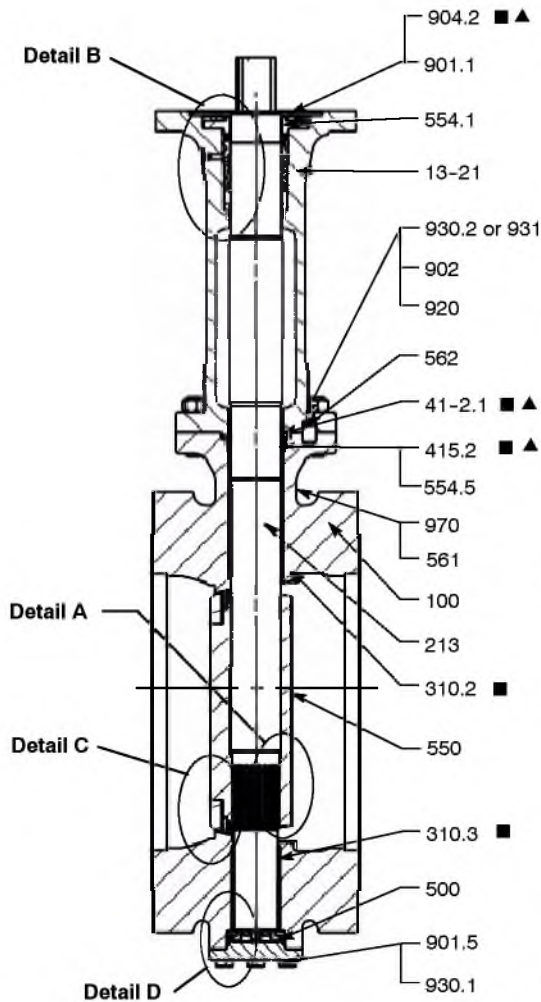
Parts list for MT version

Item	Designation	Materials
01-48	Sealing packing	Expanded graphite
100	Body	See page 2
13-21	Extension	See page 2
144	Seat	See page 2
176	Bottom	Stainless steel 316L or A516 gr 70
213	Shaft	See page 2
310.1	Self lubricating strip	Stainless steel + PTFE
310.2	Upper bearing	Stainless steel 316L or Stainless steel + PTFE
310.3	Lower bearing	Stainless steel 316L or Stainless steel + PTFE
400	Static gasket	Stainless steel 316L + graphite or expanded graphite
41-2.1	Extension static joint	Expanded graphite
41-2.2	Bottom static joint	Expanded graphite
412.1	O-Ring	VITON®
412.2	O-Ring	VITON®
412.3	O-Ring	VITON®
500	Anti static device	EN 10213 1.4310
543	Spacer bush	Stainless steel 316L
550	Disc	See page 2
553.1	Upper thrust insert	Stainless steel 316L
553.2	Thrust insert	Stainless steel 316L hard faced
554.1	Upper washer	Stainless steel 316L or EN 10025 S235
554.2	Nord Lock® washer	Stainless steel 316
554.3	Nord Lock® washer	Stainless steel 316
554.6	Nord Lock® washer	Stainless steel 316L
559	Gasket holder	Stainless steel 316L or EN 10025 S235
561	Grooved nail	EN 10213 1.4303
562	Pin	A638 gr. 660
72-3	Tightening flange	EN 10025 S235 or EN 10088-2 1.4462
81-51	Tightening part	Stainless steel 316L
901.1	Hexagon screw	Steel Cl. 8-8 or Stainless steel A4-70
901.2	Hexagon screw	Steel Cl. 8-8 or Stainless steel A4-80
901.3	Liaison screw	Stainless steel A4-70
901.5	Hexagon screw	Stainless steel A4-70
901.6	Hexagon screw	Stainless steel A4-70
904	Socket screw	Stainless steel A4-70
904.2	Socket screw	Stainless steel A4-70
914.2	Hexagon socket head cap screw	Stainless steel A4-70
932.1	Lock washer	Stainless steel 316L
932.2	Lock washer	Stainless steel 316L
940	Cylindrical key	A638 GR 660 (for DN > 10")
970	Identity plate	Stainless steel 316 or equivalent

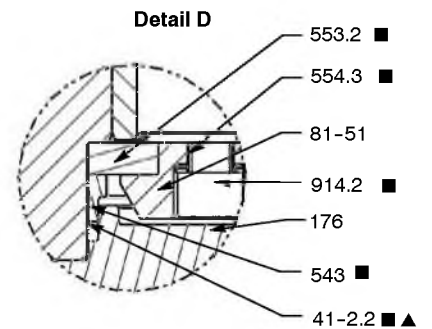
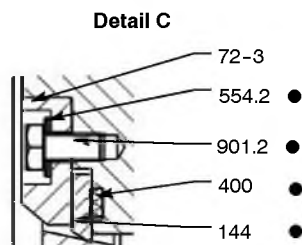
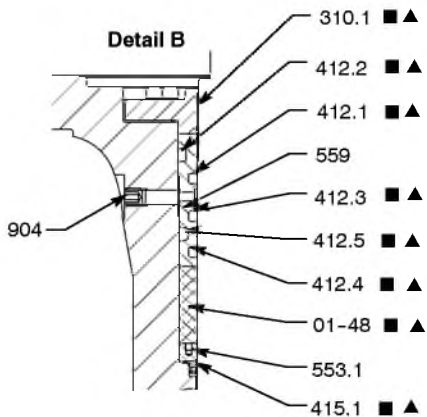
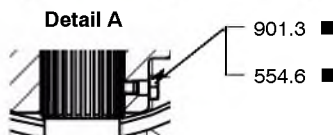
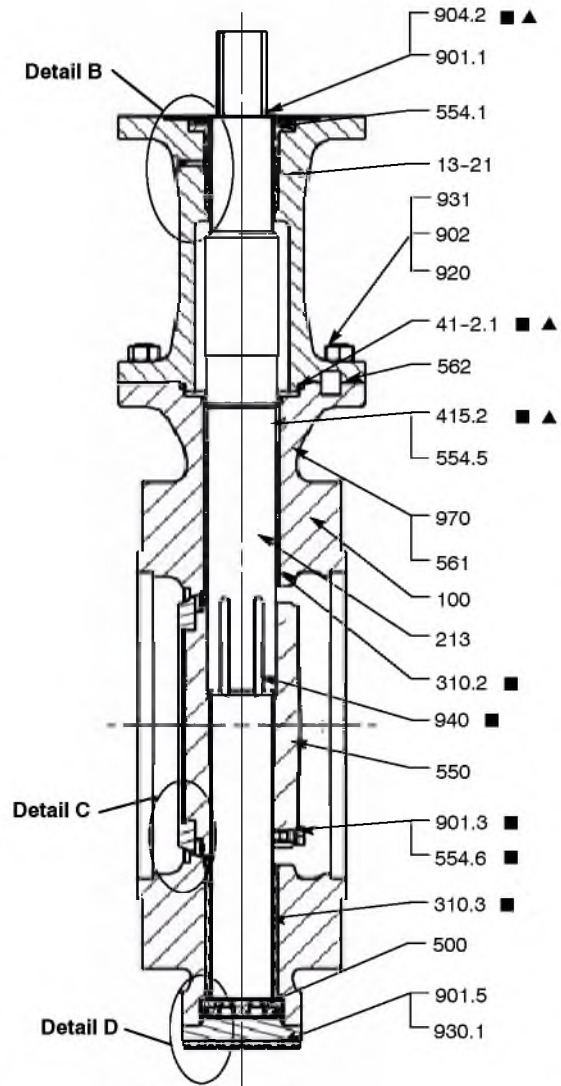
Construction

TBT version (Type 7 represented)

Disc drive with splines
DN 8" and DN 10"



Disc drive with cylindrical keys
DN 12" to DN 24"



- Spare parts kit for seat
- Spare parts kit for bearing
- ▲ Spare parts kit for shaft sealing

Parts list for TBT version

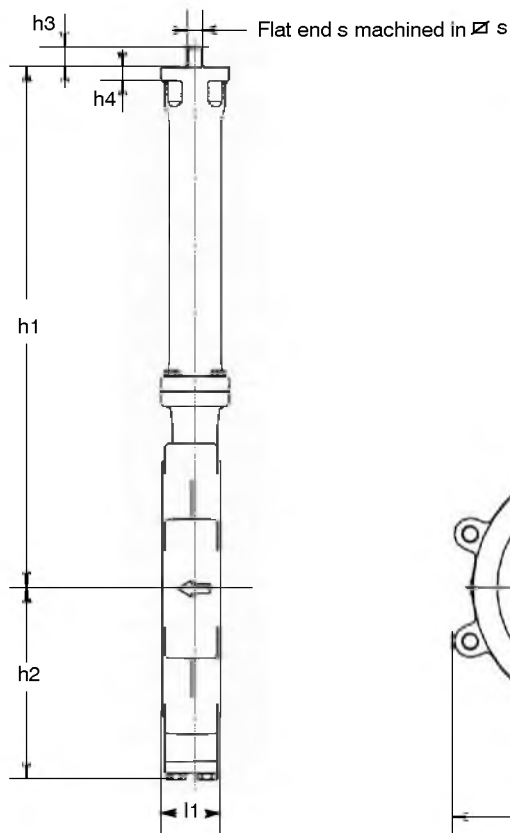
Item	Designation	Materials
01-48	Sealing packing	Expanded graphite
100	Body	See page 2
13-21	Extension	See page 2
144	Seat	See page 2
176	Bottom	Stainless steel 316L
213	Shaft	See page 2
310.1	Self lubricating strip	Stainless steel + PTFE
310.2	Upper bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
310.3	Lower bearing	Stainless steel 316L hard faced or Stainless steel + PTFE
400	Static gasket	Stainless steel 316L + graphite or expanded graphite
41-2.1	Extension static joint	Expanded graphite
41-2.2	Bottom static joint	Expanded graphite
412.1	O-Ring	HC Nitrile(*)
412.2	O-Ring	HC Nitrile(*)
412.3	O-Ring	HC Nitrile(*)
412.4	O-Ring	HC Nitrile(*)
412.5	O-Ring	HC Nitrile(*)
415.1	Lip Seal Ring	PTFE + ELGILOY
415.2	Lip Seal Ring	PTFE + ELGILOY (Option)
500	Anti static device	EN 10213 1.4310
543	Spacer bush	Stainless steel 316L
550	Disc	See page 2
553.1	Upper thrust insert	Stainless steel 316L
553.2	Thrust insert	Stainless steel 316L hard faced
554.1	Upper washer	Stainless steel 316L
554.2	Nord Lock® washer	Stainless steel 316
554.3	Nord Lock® washer	Stainless steel 316
554.5	Spacer	Stainless steel 316L (Option)
554.6	Nord Lock® washer	Stainless steel 316L
559	Gasket holder	Stainless steel 316L
561	Grooved nail	EN 10213 1.4303
562	Pin	A638 gr. 660
72-3	Tightening flange	Stainless steel 316L or EN 10088-2 1.4462 or A479 gr XM19
81-51	Tightening part	Stainless steel 316L
901.1	Hexagon screw	Stainless steel A4-70
901.2	Hexagon screw	Stainless steel A4-70
901.3	Liaison screw	Stainless steel A4-70
901.5	Hexagon screw	A320 GR. B8M cl.2
902	Stud bolt	A320 GR. B8M cl.2
904	Socket screw	Stainless steel A4-70
904.2	Socket screw	Stainless steel A4-70
914.2	Hexagon socket head cap screw	Stainless steel A4-70
920	Hexagon nut	A 194 GR. 8M
930.1	Lock retainer	Stainless steel 316L
930.2	Nut lock	Stainless steel 316L
931	Lock washer	Stainless steel 316L
940	Cylindrical key	A638 gr 660 (DN > 10")
970	Identity plate	Stainless steel 316 or equivalent

-HC Nitrile: Epichlorohydrin for ambient temperature below minus 25 °C.

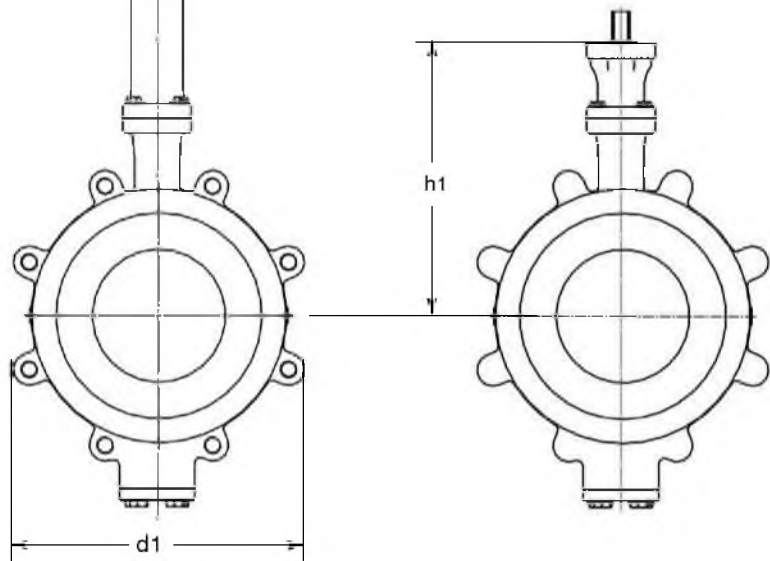
Dimensions

Full-lug type body - Type 4 Class 600

TBT version



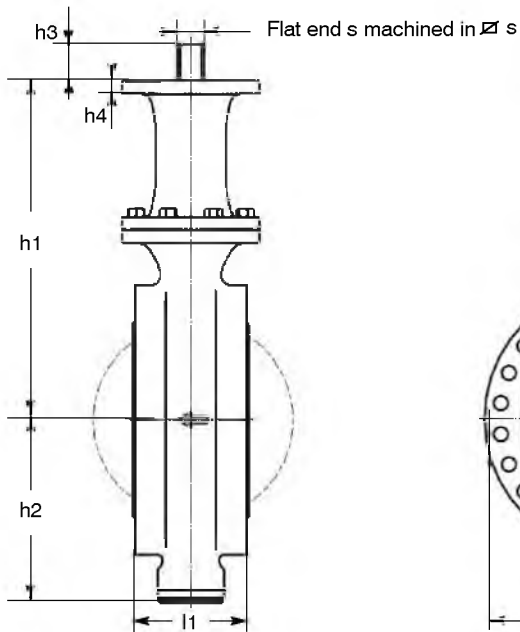
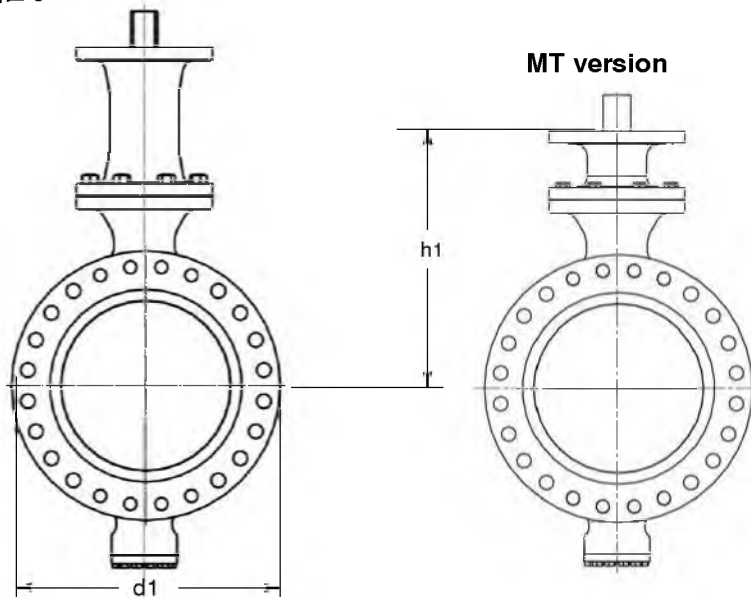
MT version



mm

DN*	NPS	d1	l1	h1		h2	Mounting plate ISO 5211		Square shaft end		Weight Kg	
				MT	TBT		n°	h4	45° s	h3	MT	TBT
200	8	390	102	390	690	245	F14	23	36	55	75	95
250	10	490	120	455	760	290	F16	27	50	65	135	155
300	12	540	140	550	770	320	F25	30	60	80	235	260
350	14	580	157	595	895	385	F25	30	60	80	295	325
400	16	665	178	650	925	420	F30	34	70	90	420	470
450	18	720	200	720	995	495	F30	34	70	100	545	585
500	20	790	218	785	1025	540	F35	38	80	110	715	785
600	24	940	235	915	1165	600	F40	45	110	130	1110	1210

For other diameters, please, consult us.

Dimensions
Flanged type body - Type 7 Class 600
TBT version

MT version


mm

DN*	NPS	d1	l1	MT		h2	Mounting plate ISO 5211		Square shaft end		Weight kg	
				h1	TBT		n°	h4	∠ s	h3	MT	TBT
200	8	420	230	390	690	245	F14	23	36	55	145	165
250	10	510	250	455	760	290	F16	27	50	65	240	260
300	12	560	270	550	770	320	F25	30	60	80	325	350
350	14	605	290	595	895	385	F25	30	60	80	410	440
400	16	685	310	650	925	420	F30	34	70	90	565	615
450	18	745	330	720	995	495	F30	34	70	100	715	755
500	20	815	350	785	1025	540	F35	38	80	110	935	1005
600	24	940	390	915	1165	600	F40	45	110	130	1330	1430

For other diameters, please, consult us.

Connections

The valves can be fitted between flanges according to ASME B16.5 Cl. 600 standards (other connections on request).

Full-Lug and Flanged type body - Type 4 / Type 7 - Class 600

DN	NPS	ASME B16.5 Cl. 600
200	8	✓
250	10	✓
300	12	✓
350	14	✓
400	16	✓
450	18	✓
500	20	✓
600	24	✓

Fitting allowed

Flange facing

	Raised face RF	Flat face FF
Smooth finish	Standard	On request
Stock finish	On request	On request
RTJ (Type 7 only)	On request	On request

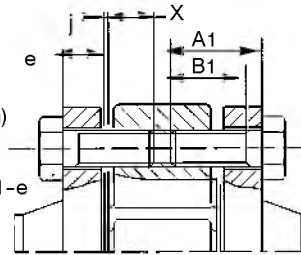
End of line and downstream dismantling

Possible, on request.

Bolting for full-lug type body - Type 4

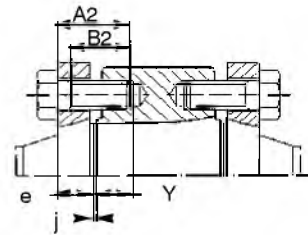
Screw length of the lugs
A1 max. = e + X + j

- e : Flange thickness (customer specification)
- X : Max. implantation of the screw
- j : Thickness of the flange gasket
- B1 : Min. threaded length of the screw $B1 > A1 - e$



Screw length at shaft passages
A2 max. = e + Y + j

- e : Flange thickness (customer specification)
- Y : Optimal implantation of the screw
- j : Thickness of the flange gasket
- B2 : Min. threaded length of the screw $B2 > A2 - e$



NB: We do not supply the bolting and flange gasket.

mm

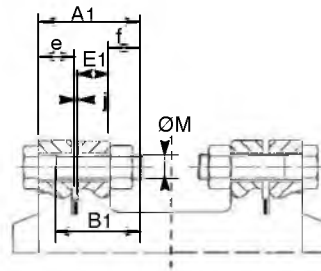
DN	NPS	ASME B16-5 class 600				
		UN or UNC	Screw A1		Screw A2	
			X	Qty*	Y	Qty*
200	8	1"1/8	47	8	37	4
250	10	1"1/4	56	12	28,5	4
300	12	1"1/4	56	16	32	4
350	14	1"3/8	62	16	32	4
400	16	1"1/2	65	16	40	4
450	18	1"5/8	70	16	41	4
500	20	1"5/8	70	20	42	4
600	24	1"7/8	80	20	40,5	4

* Quantity of screws by face

Bolting for flanged type body - Type 7

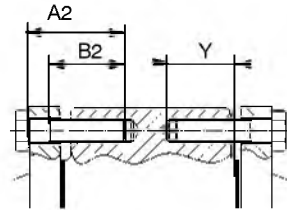
Screw length on flanges
A1 max. = e + j + E1 max. + f

- E1 : Thickness of valve flange
- e : Flange thickness (customer specification)
- f : Overlength of the screw
- j : Thickness of flange gasket
- B1 : Min. threaded length of the screw $B1 > A1 - e$



Screw length at shaft passages
A2 max. = e + j + Y

- e : Flange thickness (customer specification)
- Y : Max. implantation of the screw
- j : Thickness of flange gasket
- B2 : Min. threaded length of the screw $B2 > A2 - e$



NB: We do not supply the bolting and flange gasket.

mm

DN	NPS	E1 max.	ASME B16-5 class 600				
			UN or UNC	Screw A1		Screw A2	
				f	Qty*	Y	Qty*
200	8	66,5	1"1/8	32	8	46	4
250	10	77,5	1"1/4	34	12	51	4
300	12	80	1"1/4	34	16	55	4
350	14	84	1"3/8	38	16	57	4
400	16	90	1"1/2	41	16	57	4
450	18	97,5	1"5/8	48	16	63	4
500	20	102	1"5/8	48	16	69	8
600	24	114	1"7/8	58	16	72	8

* Quantity of screws by face

Standard variants

Pneumatic actuator ACTAIR / DYNACTAIR



Manual actuator MR



Hydraulic actuator ACTO / DYNACTO



Butterfly Valve

APORIS 16

DN 300 - 2000
PS 16 bar

Type Series Booklet



Butterfly Valves

Double-offset Butterfly Valves

APORIS 16



Main applications

- Water supply systems
- Water transport
- Cooling circuits
- General irrigation systems
- Pipelines and tank farms
- Water treatment

Fluids handled

- Hot water
- High-temperature hot water
- Cooling water
- Drinking water
- River water, lake water and groundwater

Operating data

Operating properties

Ambient characteristics	Value
Nominal pressure	16
Nominal size	DN 300 - 2000 Other nominal sizes on request.
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	0
Max. permissible temperature [°C]	+85
Max. permissible flow velocity at operating pressure	4 m/s. Higher velocities on request.

Design details

Design

- Flanged body with raised faces - T7: DN 300 - 2000
- Face-to-face length to ISO 5752 / EN 558 Series 14
- Downstream dismantling possible
- Dead-end service with counter flange possible
- Design to EN 593 and ISO 10631
- Top flange to ISO 5211
- Marked in accordance with EN 19
- Absolutely tight shut-off (no leakage visible to the naked eye) in either direction of flow in accordance with EN 12266-1, leakage rate A, and ISO 5208, category A.
- Corrosion-protected by epoxy coating, 250/300 µm

Variants

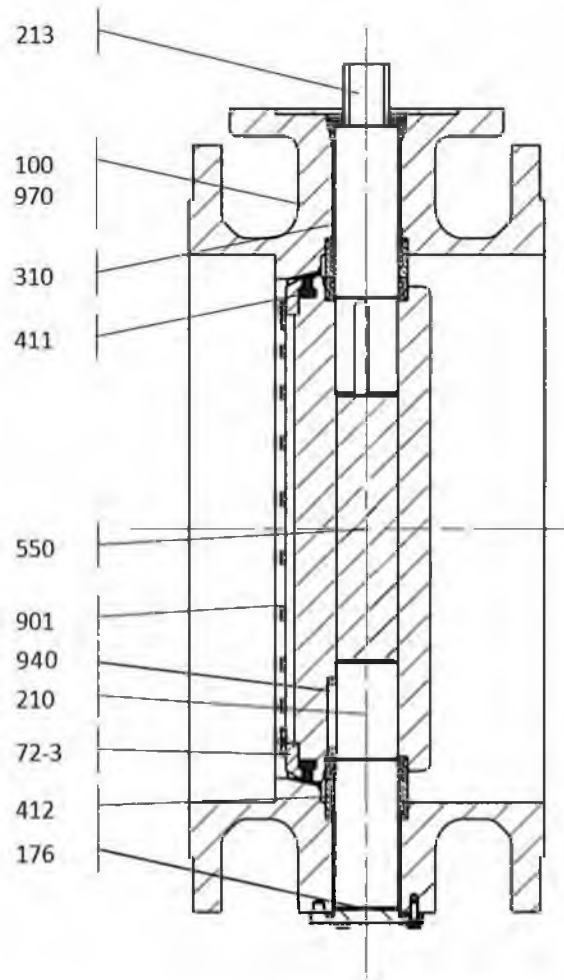
- Device for locking valve disc in open or closed position
- ACTAIR / DYNACTAIR pneumatic actuators
- ACTAIR NG / DYNACTAIR NG pneumatic actuators
- ACTELEC electric actuators
- HQ hydraulic actuators
- AMTROBOX limit switch box
- AMTRONIC valve controller with compressed air supply via directional control valve
- SMARTRONIC positioner and process controller

Product benefits

- Dry stem: The stem is not in contact with the fluid handled.
- Torque transmission by key
- Sealing to atmosphere is ensured.
- Integrally cast support feet for handling and storage
- Valve equipped with stainless steel bearing bushes with reinforced PTFE coating
- Valve approved for drinking water applications (EPDM joint ring and coating certified to WRAS and ACS)
- Valve actuation options:
 - Manual
 - Electric
 - Pneumatic
 - Hydraulic
- Variants on request
 - DN 100 to DN 250

Materials

Sectional drawing



List of components

Part No.	Description	DN	Materials	KSB code
100	Body	300 - 2000	Nodular cast iron EN-GJS-400-15	3g
176	Bottom	300 - 2000	Stainless steel	
210	Stem	300 - 2000	Duplex stainless steel 1.4462	7e
210	Stem	300 - 2000	Stainless steel 1.4542	6e
210	Stem	300 - 2000	Stainless steel 1.4028	6k
213	Actuating stem	300 - 2000	Duplex stainless steel 1.4462	7e
213	Actuating stem	300 - 2000	Stainless steel 1.4542	6e
213	Actuating stem	300 - 2000	Stainless steel 1.4028	6k
310	Bearing	300 - 2000	Steel with reinforced PTFE coating	
411	Seat	300 - 2000	EPDM, approved for drinking water applications to WRAS/ACS	
411*	Seat	300 - 2000	NBR	
412	O-ring	300 - 2000	EPDM, approved for drinking water applications to WRAS/ACS	
550	Valve disc	300 - 2000	Nodular cast iron EN-GJS-400-15	3g
72-3	Retaining flange	300 - 2000	Stainless steel 316L	
901	Bolts	300 - 2000	Stainless steel A4	
940	Key	300 - 2000	Stainless steel 1.4028	
970	Name plate	300 - 2000	Stainless steel	

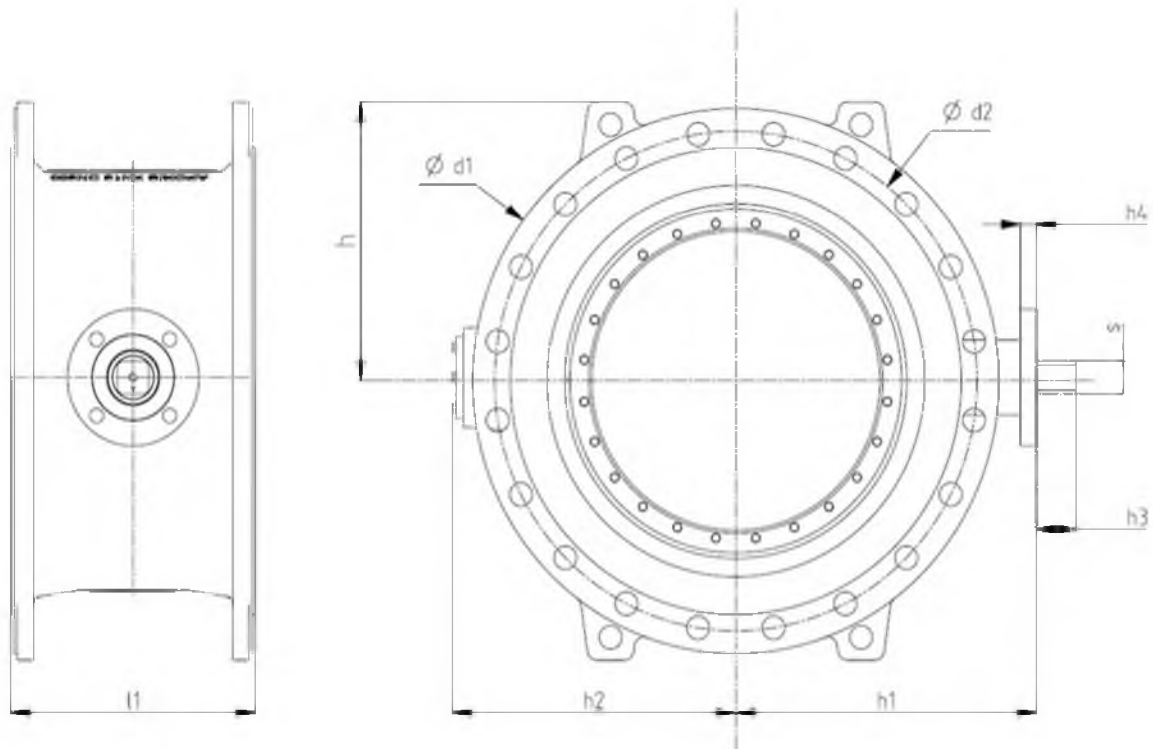
* Optional

Other materials on request

A stainless steel seat can be optionally added.

Dimensions

Drawings



Dimensions

PN 16

mm

DN	Connections	Ød1	Face-to-face length l1	h	h1	h2	Top flange to ISO 5211		Square stem end	
							No.	h4	∅ s	h3
300	EN 1092 PN 16	460	270	245	255	212	F10	15	27	45
400	EN 1092 PN 16	580	310	315	320	278	F12	18	36	55
500	EN 1092 PN 16	715	350	368	430	402	F16	26	50	65
600	EN 1092 PN 16	840	390	430	480	452	F16	26	50	65
700	EN 1092 PN 16	910	430	465	525	528	F25	30	70	90
800	EN 1092 PN 16	1025	470	518	580	582	F25	30	70	90
900	EN 1092 PN 16	1125	510	568	643	618	F30	40	70	90
1000	EN 1092 PN 16	1255	550	642	693	668	F30	40	70	90
1200	EN 1092 PN 16	1485	630	758	870	885	F35	40	90	90
1400	EN 1092 PN 16	1685	710	858	990	1008	F40	45	110	110
1600	EN 1092 PN 16	1930	790	980	1114	1130	F48	45	110	110
1800	EN 1092 PN 16	2130	870	1080	1280	1272	F48	50	140	140
2000	EN 1092 PN 16	2345	950	1188	1440	1448	F48	50	140	140

d2 to EN 1092-2

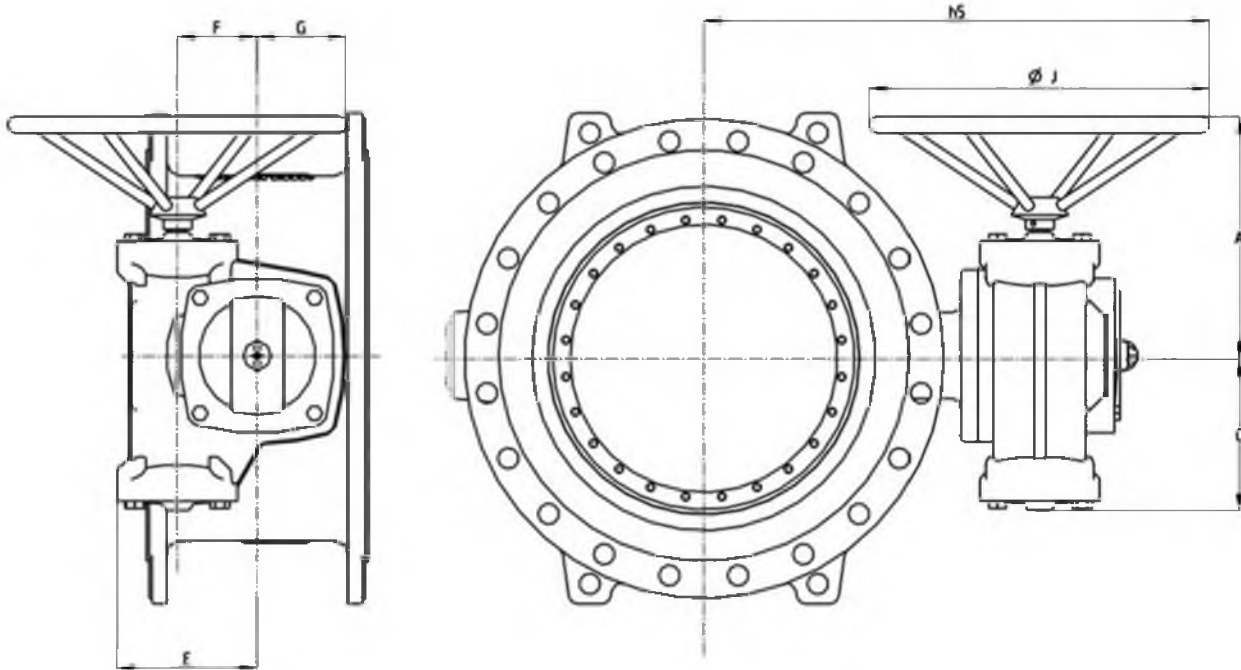
Actuator mounting

The torque for large-diameter valves depends on the hydraulic characteristics of the system.

The selection of actuators given below for lubricating fluids typically applies to maximum flow velocities of 2 m/s.

Higher flow velocities and further actuator/valve combinations are possible, depending on the operating conditions and hydraulic characteristics of the system: request particulars.

Manual actuation: manual gearboxes



PN 16

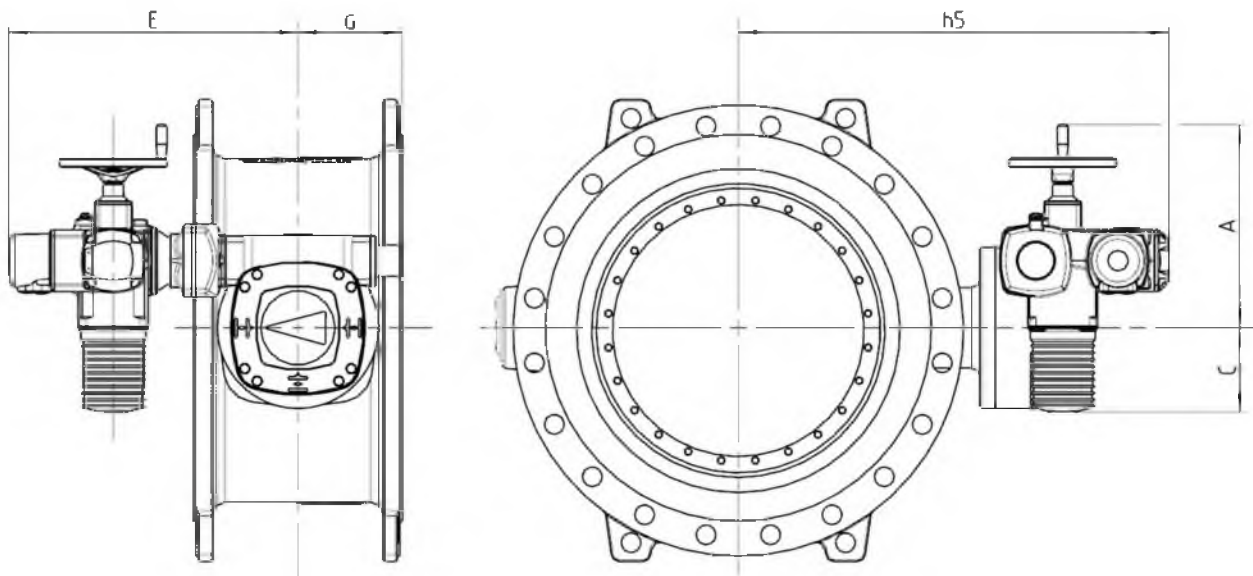
mm

DN	Actuators	A	C	E	F	G	øJ	h5	Weight kg
300	MR50	189	67	98	66	63	225	367	90
400	MR100	243	83	116	78	79	350	495	157
500	MR400	332	279	208	125	115	350	680	328
600	MR400	332	279	208	125	115	350	698	438
700	MR600	511	271	245	140	155	600	934	625
800	MR800	394	405	245	140	155	350	914	790
900	MR1200	661	555	318	180	180	350	1230	1160
1000	MR1600	447	348	318	180	180	800	971	1463
1200	AUMA GS200 + GZ16	600	400	315	200	215	800 max.	1410	2200
1400	AUMA GS200 + GZ25	700	490	365	250	268	800 max.	1496	3180
1600	AUMA GS200 + GZ30	780	550	555	315	340	800 max.	1659	4685
1800	AUMA GS400 + GZ35.1	On request							
2000	AUMA GS400 + GZ35.1	On request							

Other actuators on request

Optional: A 360-degree manual actuator can be selected.

Electric actuation



PN 16

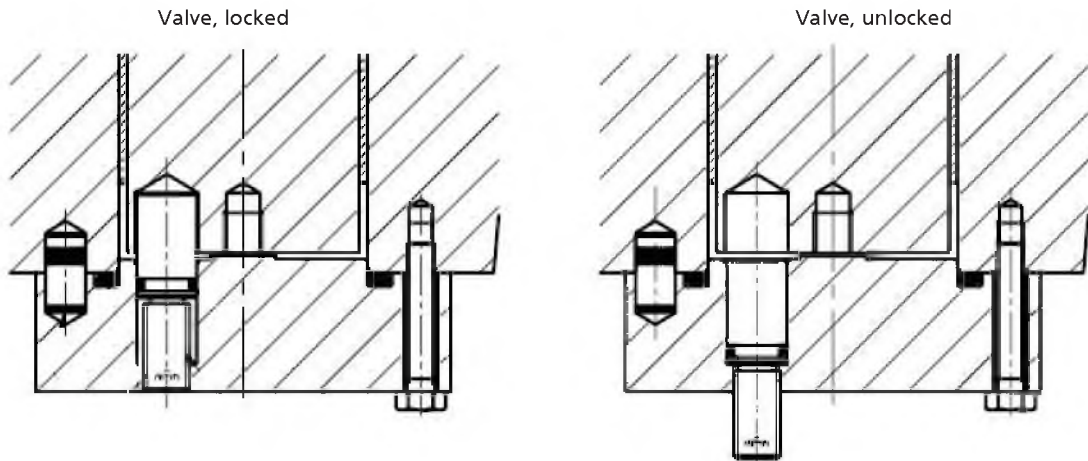
mm

DN	Actuators	A	C	E	G	h5	Weight kg
300	AUMA SQ10.2	265	254	248	65	616	108
400	AUMA SQ12.2	265	254	248	65	745	178
500	AUMA SQ14.2	265	254	248	65	880	311
600	AUMA GS100.3 + VZ4.3 + SA07.6	547	189	365	150	843	439
700	AUMA GS125.3 + VZ4.3 + SA10.2	552	194	390	125	890	591
800	AUMA GS125.3 + VZ4.3 + SA07.6	552	194	390	125	945	751
900	AUMA GS160.3 + VZ4.3 + SA07.6	552	194	390	125	1120	1147
1000	AUMA GS160.3 + VZ4.3 + SA07.2	813	455	390	125	1198	1470
1200	AUMA GZ200.3 + SA07.2	813	455	390	125	1343	2220
1400	AUMA GZ250.3 + SA10.2	815	455	407	129	1254	3188
1600	AUMA GZ315 + SA10.2	670	552	407	129	1506	4739
1800	On request						
2000	On request						

Other actuators on request

Variants

Locking device



The locking device allows the valve disc to be locked in open and closed position.



**Triple offset disc butterfly valve
with metallic seat**

DN 50 to 600 (2 to 24")

Pressure class: Class 150 and B 25

Design in accordance with EN 12516 and ASME B16-34

Applications

- Oil and gas, chemicals, petrochemicals.

Working conditions

- Temperature:
from -50°C min. up to $+260^{\circ}\text{C}$ max. for stainless steel body,
from -29°C min. up to $+260^{\circ}\text{C}$ max. for carbon steel body,
 $+380^{\circ}\text{C}$ in HT version.
The working temperature depends on the media and on the material of the seat.
- Allowable pressure (PS): depends on the body material and the working temperature, see page 2.
- Operating under $\Delta P = PS$ (except PN 25: ΔP limited to 20 bar).
- Vacuum service down to 0 absolute bar.
- Maximum fluid velocity under allowable pressure:
4 m/s for liquids and 50 m/s for clean gases.

Materials

See page 2.

Design

- Wafer type body (Type 1): DN 50 to 600
- Full-lug type body with raised faces (Type 4): DN 50 to 600
- Flanged type body (Type 7): DN 50 to 600 with Raised face or Flat face.
- Possible downstream dismantling and end of line for bodies types 4 and 7.
- Fire safe safety in accordance with BS 6755 Part 2 standard.
- TA-Luft in accordance with VDI 2440.
- Face-to-face in accordance with standards defined pages 8, 9 and 10.
- Possible mounting between flanges according to EN 1092-1, ASME and JIS B2220. See page 14.
- Actuation mounting plate in accordance with ISO 5211 and NF E 29-402 standard.

- Marking in accordance with EN 19 standard.
- Perfectly tight shut-off valves (zero leakage visible to the naked eye) in the two flow directions.
- Steel body: anticorrosion surface treatment, thickness $35\ \mu\text{m}$, in option = painting 2 or 3 layers.
Stainless steel body: pickling and passivation.
- The valves meet the safety requirements of the Pressure Equipments Directive 97/23/EC (PED) Appendix I for fluids of the groups 1 and 2.
- A remote valve can be considered as a partly completed machine in compliance with the requirements of the machinery directive 2006/42/EC.
- The valves comply with the requirements of the REACH regulation. See page 12.

Standard variants

- Pneumatic actuator ACTAIR / DYNACTAIR
- Electric actuator ACTELEC
- Hydraulic actuator ACTO
- Position detection AMTROBOX
- Pneumatic distribution for On-Off function AMTRONIC
- Positioner and control unit SMARTRONIC
- ATEX version in accordance with 94/9/EC directive

Remarks

- Operating instructions 8450.810/.-10

Data to be supplied when ordering

- TRIODIS 150 MT valve in accordance with type series booklet 8465.52/2-EN.
- Size.
- Materials (body, disc, seat).
- Working conditions: nature of fluid, pressure, flow, etc.
- Connection, flange facing finish and type of contact faces.
- Actuation.

Materials

Body	Temperature see § Pressure / temperature below	KSB code
Steel ASTM A 216 gr. WCC / 1.0619	-29 °C to +260 °C	1
Stainless steel ASTM A 351 gr. CF 8M / 1.4408	-50 °C to +260 °C	6
Shaft		KSB code
Stainless steel ASTM A 564 gr. 630 / 1.4542	-29 °C to +260 °C	6e
Disc		KSB code
Stainless steel ASTM A 351 gr. CF 8M / 1.4408 with hard chromium overlay on edge	-50 °C to +260 °C	6
AMRING® seat		KSB code
Copper	-50 °C to +150 °C	CU
Nickel	-50 °C to +260 °C	NI

The materials selection depends on the nature of the fluid and its temperature.

- Corrosive fluids:
 - Body and disc: stainless steel (code 6),
 - Seat: according to the fluid (agressiveness degree, working temperature). Please refer to the above table.
- Non-corrosive fluids
 - Body: steel (code1) or stainless steel (code 6)
 - Disc: stainless steel (code 6)
 - Seat: according to the working temperature. Please refer to the above table.

Pressure / temperature

In pressure class B 25 (european materials), TRIODIS 150 MT valves are in accordance with EN 12516-1 standard. The values in the table below must be used for valves which have to comply with PED 97/23/CE:

Pressure class	Material		Working pressure in bar at temperature °C									
	Body	Seat	-50	-10	20	100	135	150	180	200	220	260
B 25	1.0619	Metallic	forbidden	24.4	24.4	21.3	20.3	19.8	18.6	17.8	17.2	15.9
	1.4408	Metallic	24.3	24.3	24.3	20.7	19.3	18.7	17.8	17.2	16.7	15.8

* for temperature < -29° C and pressure > 8bar, please consult us.

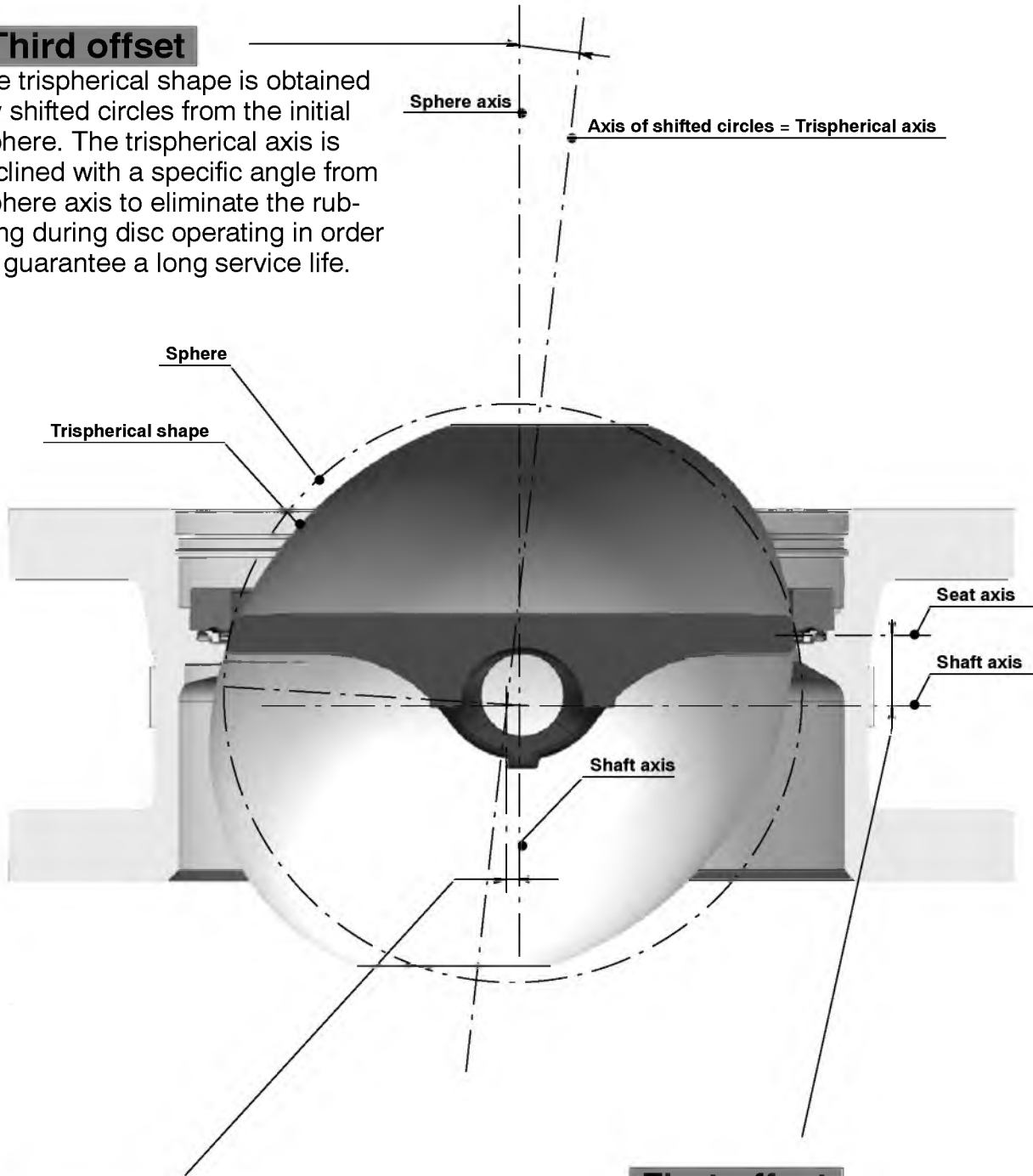
In pressure class 150 (ASTM materials), TRIODIS 150 MT valves meet ASME B 16-34 cl.150 "Standard class" requirements, according to the following table:

Pressure class	Material		Working pressure in bar at temperature °C									
	Body	Seat	-50	-29	38	100	135	150	180	200	220	260
Class 150	A 216 gr. WCC	Metallic	forbidden	20.0	20.0	17.7	16.4	15.8	14.7	14.0	13.2	11.7
	A 351 gr. CF8M	Metallic	19.0	19.0	19.0	16.0	15.2	14.8	15,6	13.5	13.0	11.7

Sealing System Design TRIODIS 150

Third offset

the trispherical shape is obtained by shifted circles from the initial sphere. The trispherical axis is inclined with a specific angle from sphere axis to eliminate the rubbing during disc operating in order to guarantee a long service life.



Second offset

the shaft axis is offset from the sphere axis to limit the rubbing between disc seat and body seal ring.

First offset

The seal is offset from the shaft axis to allow upstream/downstream tightness without interference with the shaft passage.

Upstream / downstream sealing

The TRIODIS 150 MT valve conforms to the following sealing standards.

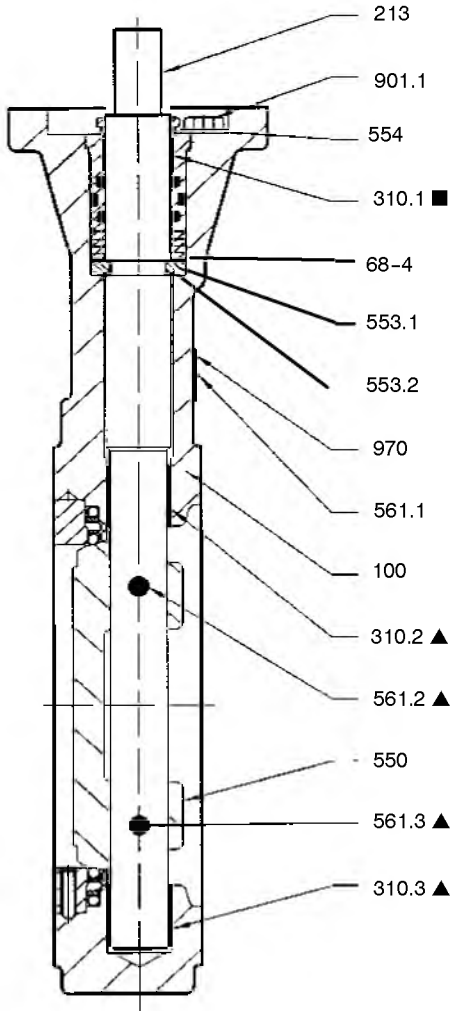
The TRIODIS 150 MT valve is a bi-directional valve with a preferential flow direction shown by an arrow on the body.

Valve	With metallic seat Standard version
On liquids	EN 12266-1 rate < D ISO 5208, category C API 598 MSS SP 61
On gas	EN 12266-1 rate < D ISO 5208 leakage < cat. D MSS SP 61

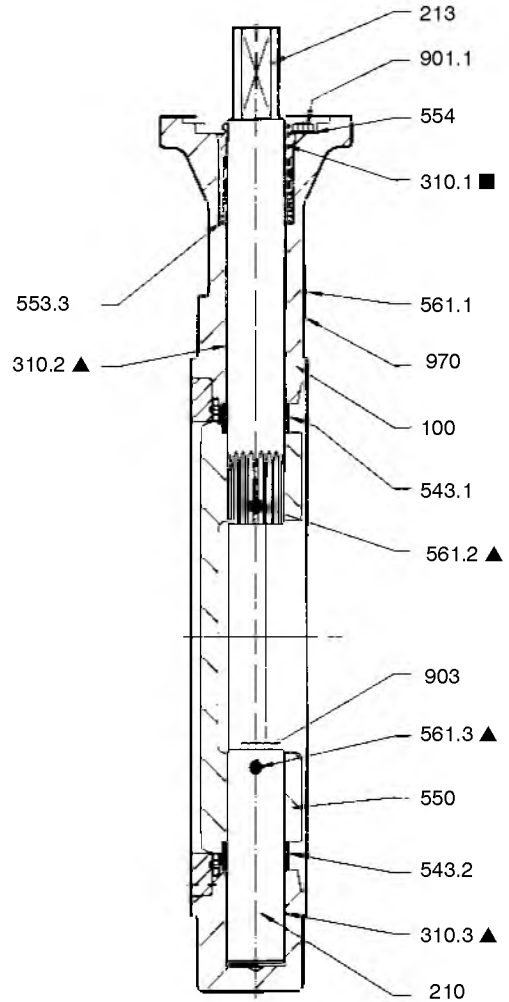
Construction

WAFER TYPE BODY AND FULL-LUG TYPE BODY

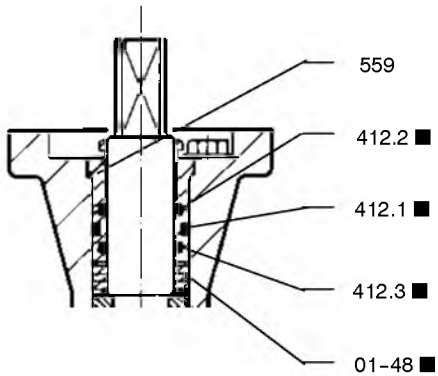
DN 50 to 250 (2" to 10")



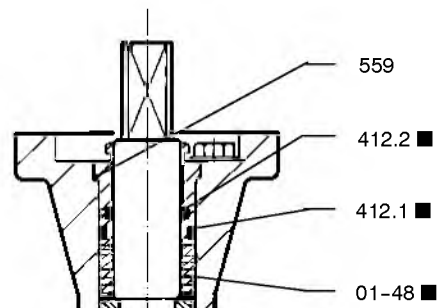
DN 300 to 600 (12" to 24")



Fire-safe packing gland version



TA-Luft packing gland version

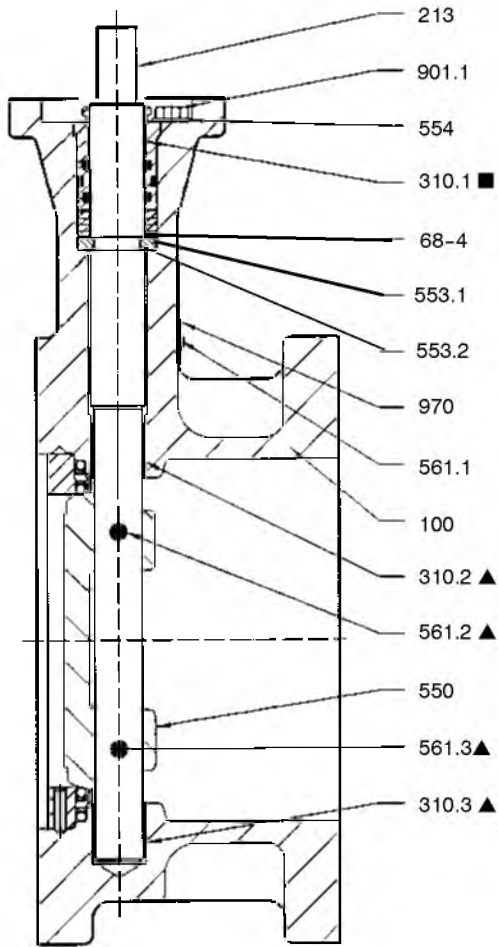


■ Spare parts kit for shaft sealing
▲ Bearing kit

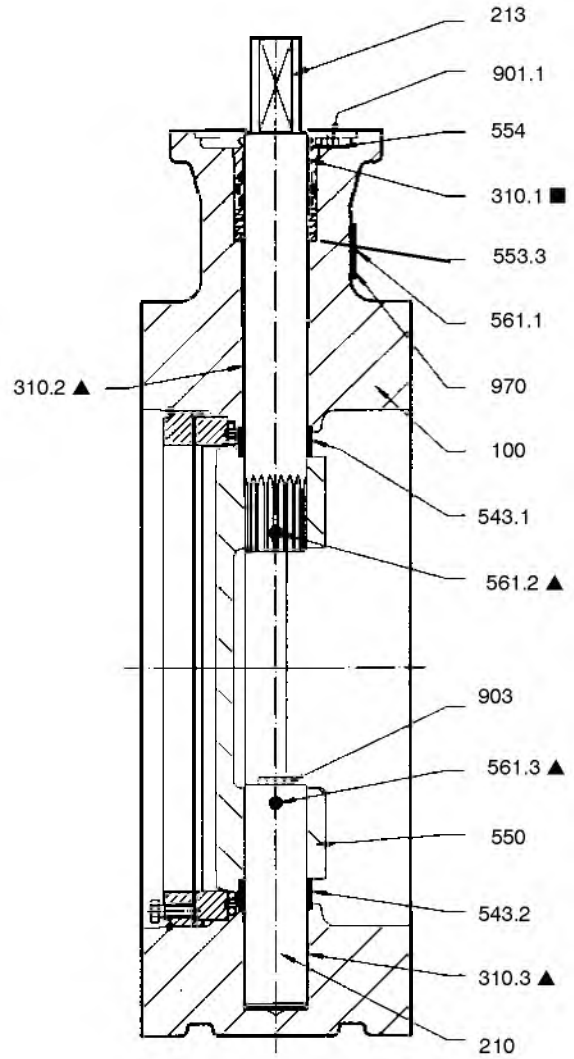
Construction

FLANGED TYPE BODY

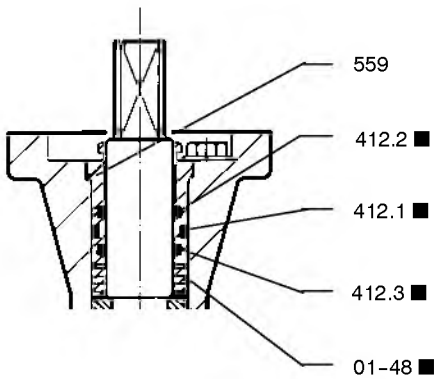
DN 50 to 250 (2" to 10")



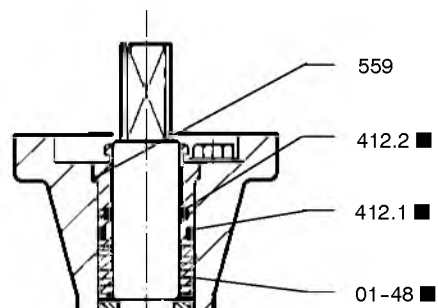
DN 300 to 600 (12" to 24")



Fire-safe packing gland version



TA-Luft packing gland version



- Spare parts kit for shaft sealing
- ▲ Bearing kit

Parts list

Item	Designation	DN	Materials
68-4	Foil	50 to 250	Stainless steel
100	Body	50 to 600	Carbon steel Stainless steel
210	Shaft	300 to 600	Stainless steel
213	Operating shaft	50 to 600	Stainless steel
310.1	Plain bearing	50 to 600	Stainless steel + PTFE
310.2	Plain bearing	50 to 600	Stainless steel + PTFE
310.3	Plain bearing	50 to 600	Stainless steel + PTFE
543.1	Spacer bush	300 to 600	Stainless steel
543.2	Spacer bush	300 to 600	Stainless steel
550	Disc	50 to 600	Stainless steel
553.1	Thrust	50 to 250	Stainless steel
553.2	Thrust	50 to 250	Stainless steel + PTFE
553.3	Thrust	300 to 600	Stainless steel
554	Washer	50 to 600	Stainless steel
561.1	Grooved nail	50 to 600	Stainless steel
561.2	Grooved pin	50 to 600	Stainless steel
561.3	Grooved pin	50 to 600	Stainless steel
901.1	Hexagon-head screw	50 to 600	Stainless steel cl. A4.70
903	Threaded plug	50 to 600	Stainless steel cl. A4.70
970	Identity plate	50 to 600	Stainless steel

Fire-safe packing (see page 12)

01-48	Fire-safe packing	50 to 600	Expanded graphite
412.1	O-Ring	50 to 600	VITON®
412.2	O-Ring	50 to 600	VITON®
412.3	O-Ring	50 to 600	VITON®
559	Gasket holder	50 to 600	Stainless steel

TA-Luft packing (see page 12)

01-48	TA-Luft packing	50 to 600	Expanded graphite SUPAGRAF CONTROL®
412.1	O-Ring	50 to 600	VITON®
412.2	O-Ring	50 to 600	VITON®
559	Gasket holder	50 to 600	Stainless steel

When ordering a spare parts kit, please give the valve commercial codification marked on the identity plate.

Flexible metallic seat

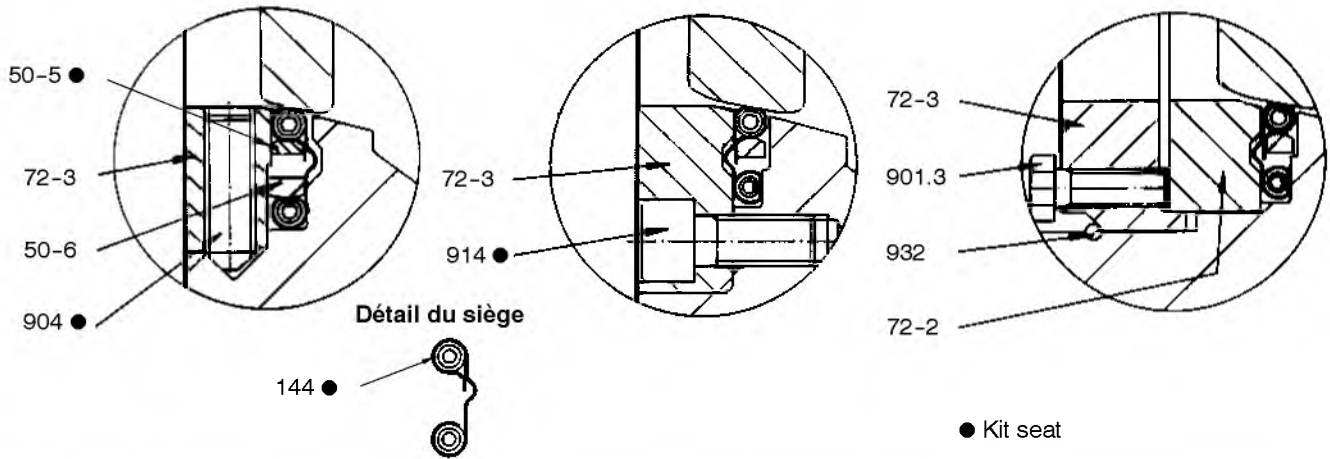
DN 50 to 250 (2" to 10")

All types of body

DN 300 to 600 (12" to 24")

Wafer type body
Full-lug type body

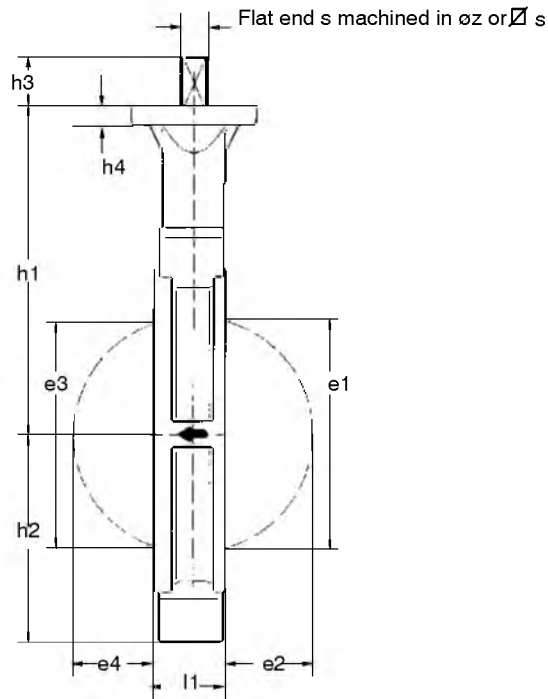
Flanged type body



Item	Designation	DN	Materials
50-5	Reaction ring	50 to 600	Stainless steel
50-6	Tightening ring	50 to 250	Stainless steel
72-2	Centring flange	300 to 600	Stainless steel
72-3	Tightening flange	50 to 600	Stainless steel
144	Metallic seat	50 to 600	In accordance with fluid (nickel in standard)
901	Hexagon-head screw	300 to 600	Stainless steel cl. A4.70
904	Grub screw	50 to 250	Stainless steel cl. A4.70
914	Cheese-head screw	300 to 600	Stainless steel cl. A4.70
932	Retaining ring	300 to 600	Stainless steel cl. A4.70

Dimensions

Wafer type body - Type 1



mm

DN	NPS	Face to face l1	h1	h2	Mounting plate ISO 5211		Square shaft end		Flat shaft end			Disc clearance			
					no.	h4	∠ s	h3	s	Ø Z	h3	e1	e2	e3	e4
50	2	43	175	54	F07	16	-	-	14	18	30	36	9	-	-
65	2 ½	46	190	67	F07	16	-	-	14	18	30	49	13	13	1
80	3	50	205	74	F07	16	-	-	14	18	30	62	18	38	6
100	4	52	225	90	F07	16	-	-	14	18	30	81	24	67	17
125	5	56	240	102	F07	16	-	-	14	18	30	103	33	91	23
150	6	56	250	120	F10	18	-	-	19	25	35	131	48	117	33
200	8	60	290	151	F10	18	-	-	22	28	40	177	70	163	51
250	10	68	325	182	F12	20	25	40	-	-	-	226	91	212	70
300	12	78	375	237	F14	22	30	55	-	-	-	266	106	254	87
350	14	92	405	274	F14	22	36	60	-	-	-	309	123	297	103
400	16	102	440	300	F16	26	40	75	-	-	-	360	145	346	121
450	18	114	475	329	F16	26	40	75	-	-	-	420	169	408	147
500	20	127	510	355	F25	30	50	85	-	-	-	456	182	444	160
600	24	154	585	449	F25	30	50	85	-	-	-	546	213	537	197

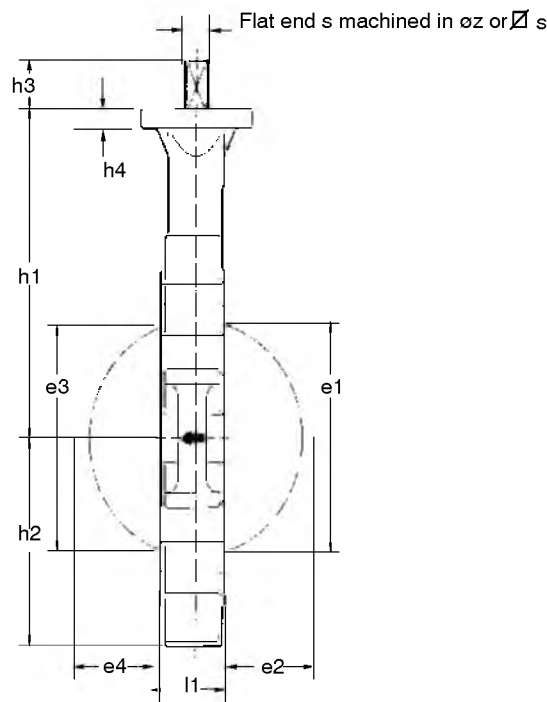
Face to face

DN	NPS	Wafer type
50 to 300 (1)	2" to 12" (1)	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 20
350	14"	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 25
400 to 600	16" to 24"	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 20

(1) DN 80- 3" : only in accordance with API 609 table 2 class 150 standard.

Dimensions

Full-lug type body - Type 4



mm

DN	NPS	Face to face l1	h1	h2	Mounting plate ISO 5211		Square shaft end		Flat shaft end			Disc clearance			
					n°	h4	\sqrt{s}	h3	s	$\varnothing Z$	h3	e1	e2	e3	e4
50	2	43	175	60	F07	16	-	-	14	18	30	36	9	-	-
65 ¹⁾	2 1/2	46	190	67	F07	16	-	-	14	18	30	49	13	13	1
65 ²⁾	2 1/2	46	190	85	F07	16	-	-	14	18	30	49	13	13	1
80 ³⁾	3	50	205	74	F07	16	-	-	14	18	30	62	18	38	6
80 ⁴⁾	3	50	205	94	F07	16	-	-	14	18	30	62	18	38	6
100	4	52	225	105	F07	16	-	-	14	18	30	81	24	67	17
125	5	56	240	123	F07	16	-	-	14	18	30	103	33	91	23
150	6	56	250	135	F10	18	-	-	19	25	35	131	48	117	33
200	8	60	290	155	F10	18	-	-	22	28	40	177	70	163	51
250	10	68	325	202	F12	20	25	40	-	-	-	226	91	212	70
300	12	78	375	237	F14	22	30	55	-	-	-	266	106	254	87
350	14	92	405	274	F14	22	36	60	-	-	-	309	123	297	103
400	16	102	440	300	F16	26	40	75	-	-	-	360	145	346	121
450	18	114	475	329	F16	26	40	75	-	-	-	420	169	408	147
500	20	127	510	356	F25	30	50	85	-	-	-	456	182	444	160
600	24	154	585	449	F25	30	50	85	-	-	-	546	213	537	197

- 1) Mounting between flanges EN 1092-1 PN 10 and 16 - 4 holes, ASME B16-5 cl.150 and JIS B222010K.
- 2) Mounting between flanges EN 1092-1 PN 10 and 16 - 8 holes, PN 25 and JIS B2220 16K and 20K.
- 3) Mounting between flanges ASME B16-5 cl. 150.
- 4) Mounting between flanges EN 1092-1 PN 10, 16, 25 and JIS B2220 10K, 16K and 20K.

Face to face

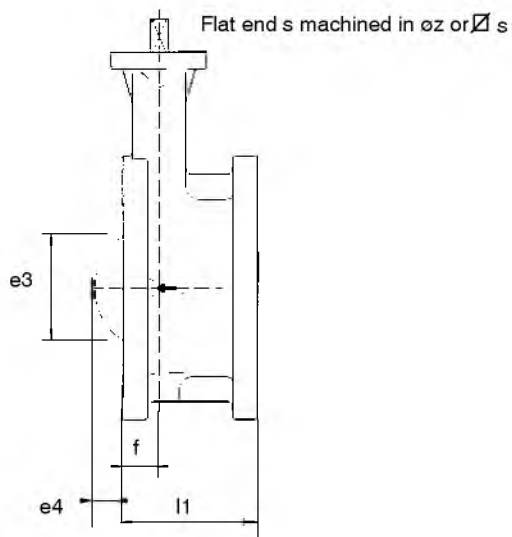
DN	NPS	Full-lug type
50 to 300 (1)	2" to 12" (1)	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 20
350	14"	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 25
400 to 600	16" to 24"	EN 558-1 series 20 ; API 609 table 2 class 150 and ISO 5752 series 20

(1) DN 80- 3" : only in accordance with API 609 table 2 class 150 standard.

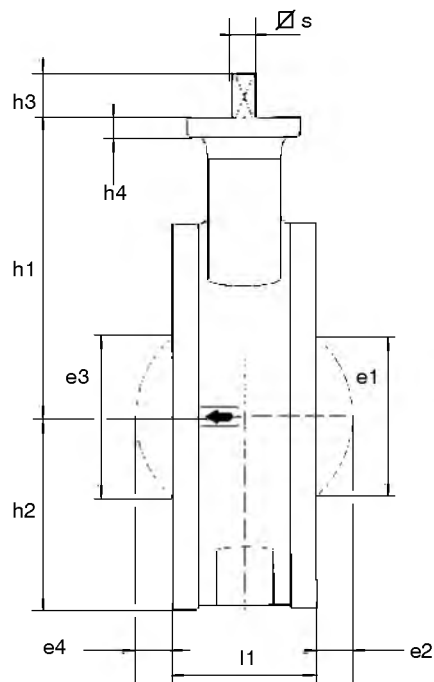
Dimensions

Flanged type body - Type 7

DN 50 to 250 - 2" to 10"



DN 300 to 600 - 12" to 24"



DN	NPS	Face to face			Mounting plate ISO 5211		Square shaft end		Flat shaft end			Disc clearance				
		l1	f	h1	h2	n°	h4	∅ s	h3	s	∅ Z	h3	e1	e2	e3	e4
50	2	108	28,5	175	76	F07	16	-	-	14	18	30	-	-	-	-
65	2 ½	112	33,5	190	89	F07	16	-	-	14	18	30	-	-	-	-
80	3	114	33,5	205	95	F07	16	-	-	14	18	30	-	-	18	2
100	4	127	36,0	225	115	F07	16	-	-	14	18	30	-	-	52	8
125	5	140	38,0	240	127	F07	16	-	-	14	18	30	-	-	81	17
150	6	140	38,0	250	140	F10	18	-	-	19	25	35	-	-	112	29
200	8	152	42,5	290	172	F10	18	-	-	22	28	40	-	-	158	46
250	10	165	46,5	325	203	F12	20	25	40	-	-	-	27	1	208	65
300	12	178	-	375	242	F14	22	30	55	-	-	-	214	52	197	42
350	14	190	-	405	274	F14	22	36	60	-	-	-	263	70	245	58
400	16	216	-	440	300	F16	26	40	75	-	-	-	306	82	289	70
450	18	222	-	475	329	F16	26	40	75	-	-	-	376	111	359	97
500	20	229	-	510	356	F25	30	50	85	-	-	-	417	128	399	112
600	24	267	-	585	449	F25	30	50	85	-	-	-	505	157	487	141

Face to face

The face to face dimensions of TRIODIS 150 MT valves with flanged type body are in accordance with ISO 5752 series 13, EN 558-1 series 13 standards.

Operating torque

DN	NPS	Operating torque * for applications on lubricated medium (in Nm) - Flexible metallic seat										
		0	2	4	6	8	10	12	14	16	18	20
50	2	40	40	40	40	40	40	40	50	50	50	50
65	2 ½	40	40	40	40	40	40	40	50	50	50	50
80	3	40	40	40	40	40	40	40	50	50	50	50
100	4	70	70	70	70	70	70	70	70	90	90	90
125	5	100	100	100	100	100	100	110	120	130	130	150
150	6	160	160	160	160	160	160	180	190	210	220	240
200	8	280	280	280	280	280	280	310	340	370	400	420
250	10	500	500	500	500	500	500	560	610	670	720	780
300	12	770	770	770	770	770	770	850	950	1 040	1 130	1 220
350	14	1 160	1 160	1 160	1 160	1 160	1 160	1 300	1 450	1 590	1 740	1 880
400	16	1 640	1 640	1 640	1 640	1 640	1 640	1 840	2 040	2 240	2 440	2 640
450	18	2 140	2 140	2 140	2 140	2 140	2 450	2 770	3 080	3 400	3 710	4 030
500	20	2 300	2 300	2 300	2 300	2 720	3 140	3 550	3 970	4 390	4 810	5 220
600	24	2 820	2 820	2 820	3 450	4 080	4 710	5 340	5 970	6 600	7 230	7 860

DN	NPS	Operating torque * for applications on non lubricated medium (in Nm) - Flexible metallic seat										
		0	2	4	6	8	10	12	14	16	18	20
50	2	80	80	80	80	80	80	90	100	100	100	100
65	2 ½	90	90	90	90	90	90	90	100	100	100	100
80	3	100	100	100	100	100	100	100	100	100	100	100
100	4	120	120	120	120	120	120	120	130	140	150	160
125	5	190	190	190	190	190	190	200	220	230	240	250
150	6	300	300	300	300	300	300	320	340	360	380	400
200	8	500	500	500	500	500	500	550	590	630	660	700
250	10	860	860	860	860	860	860	930	1 000	1 070	1 140	1 200
300	12	1 260	1 260	1 260	1 260	1 260	1 260	1 370	1 480	1 590	1 700	1 800
350	14	1 860	1 860	1 860	1 860	1 860	1 860	2 030	2 200	2 370	2 530	2 700
400	16	2 680	2 680	2 680	2 680	2 680	2 680	2 920	3 150	3 390	3 620	3 850
450	18	3 550	3 550	3 550	3 550	3 550	3 900	4 260	4 620	4 980	5 340	5 700
500	20	3 900	3 900	3 900	3 900	4 370	4 840	5 310	5 790	6 260	6 730	7 200
600	24	5 150	5 150	5 150	5 840	6 550	7 260	7 970	8 680	9 390	10 100	10 800

* The safety coefficient to define the adapted actuator is included in the torque value.

Hydraulic characteristics

DN	NPS	Flow coefficient in full open position		Zeta
		Kv ₀	Cv ₀	
50	2	70	80	2,04
65	2 ½	110	145	2,35
80	3	190	220	1,81
100	4	340	400	1,38
125	5	600	700	1,08
150	6	980	1 140	0,84
200	8	1 850	2 150	0,75
250	10	3 350	3 880	0,56
300	12	4 870	5 650	0,55
350	14	7 070	8 200	0,48
400	16	10 350	12 000	0,38
450	18	12 500	14 500	0,42
500	20	15 090	17 500	0,44
600	24	22 410	26 000	0,41

Fire-Safe version

Metallic seated valves are Fire-Safe approved in accordance with BS 6755 Part 2 standard. This certification covers the upstream/downstream tightness (metallic seat) and the shaft sealing system (Fire-Safe graphite packing).
Fire-Safe version is advised for the full lug type bodies T4 or flanged type bodies T7.

REACH regulation

The valves comply with the requirements of the REACH regulation. None of substances included in the candidate list and in Annex XIV of this regulation are present in our valves above a concentration of 0.1% weight by weight (article 33/REACH).

ATEX Option

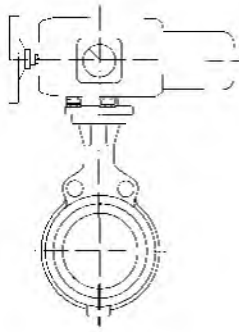
Adapted construction (option) for ATEX Group II - Category 2 - Zones 1+21 in accordance with 94/9/CE Directive .

Definition of possible configurations

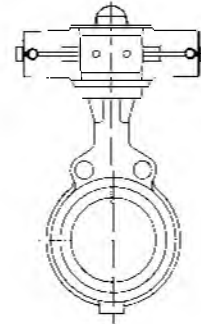
Seat type	Graphite packing	Certification		Option ATEX
		Fire-Safe	TA-Luft	
Plastomer	TA-Luft SUPAGRAPH CONTROL®	NO	YES	YES
Metallic	Fire-Safe	YES	NO	YES
	TA-Luft SUPAGRAPH CONTROL®	NO	YES	YES

Standard variants

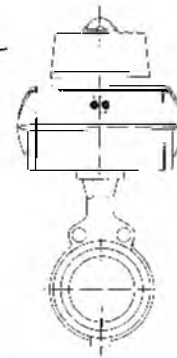
ACTELEC electric actuator



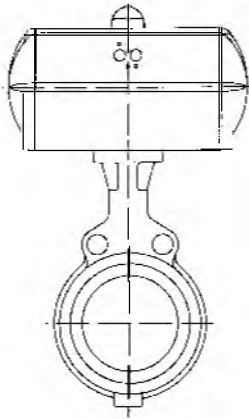
ACTO hydraulic actuator



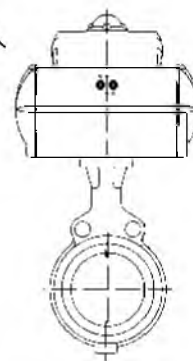
**Pneumatic distribution for On-Off function
AMTRONIC
Positioner and control unit SMARTRONIC**



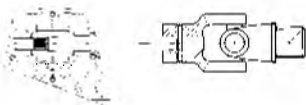
Pneumatic actuators ACTAIR / DYNACTAIR



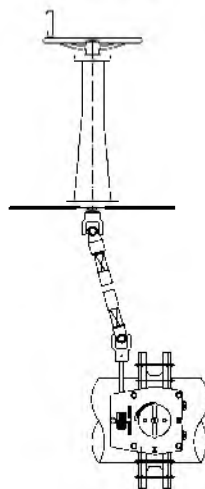
**Position detection
AMTROBOX,
AMTROBOX S,
AMTROBOX R,
AMTROBOX EEx-ed,
AMTROBOX EEx-ia**



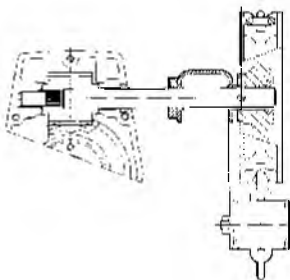
Cardan joint



Deck stand



Chain wheel



Connections

The valves can be fitted between flanges according to EN 1092-1 PN 10, PN 16 and PN 25 ; ASME B16.5 class 150 ; JIS B2220 10K , 16K and 20K standards. Other connections on request.

CAUTION : The ISO 7005 PN 20 connection is in process of disappearance, use preferably ASME B16-5 class 150 standard.

Wafer type body - Type 1 -

DN	NPS	EN 1092-1			ASME B16.5 cl. 150	ISO 7005 PN 20	JIS B2220		
		PN 10	PN 16	PN 25			10K	16K	20K
50	2	✓	✓	✓	✓	✓	✓		
65	2 ½	✓	✓	✓	✓	✓	✓	✓	✓
80	3	✓	✓	✓	✓	✓	✓	✓	✓
100	4	✓	✓	✓	✓	✓	✓	✓	✓
125	5	✓	✓	✓	✓	✓	✓	✓	✓
150	6	✓	✓	✓	✓	✓	✓	✓	✓
200	8	✓	✓	✓	✓	✓	✓	✓	✓
250	10	✓	✓	✓	✓	✓	✓	✓	✓
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓	✓	✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓
450	18	✓	✓	✓	✓	✓	✓	✓	✓
500	20	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓	✓	✓	✓

Full-lug type body - Type 4 -

DN	NPS	EN 1092-1			ASME B16.5 cl. 150	ISO 7005 PN 20	JIS B2220		
		PN 10	PN 16	PN 25			10K	16K	20K
50	2	✓	✓	✓	✓	✓	✓		
65	2 ½	✓	✓	✓	✓	✓	✓	✓	✓
80	3	✓	✓	✓	✓	✓	✓	✓	✓
100	4	✓	✓	✓	✓	✓	✓	✓	✓
125	5	✓	✓	✓	✓	✓	✓	✓	✓
150	6	✓	✓	✓	✓	✓	✓		
200	8	✓	✓	✓	✓	✓	✓	✓	✓
250	10	✓	✓	✓	✓	✓	✓	✓	✓
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓	✓	✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓
450	18	✓	✓	✓	✓	✓	✓	✓	✓
500	20	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓			

Flanged type body - Type 7

DN	NPS	EN 1092-1			ASME B16.5 cl150	ISO 7005 PN 20	JIS B2220		
		PN 10	PN 16	PN 25			10K	16K	20K
50	2	✓	✓	✓	✓	✓	✓	✓	✓
65	2 ½	✓	✓	✓	✓	✓	✓	✓	✓
80	3	✓	✓	✓	✓	✓	✓	✓	✓
100	4	✓	✓	✓	✓	✓	✓	✓	✓
125	5	✓	✓		✓	✓	✓		
150	5	✓	✓		✓	✓	✓		
200	8	✓	✓		✓	✓	✓	✓	✓
250	10	✓	✓		✓	✓	✓		
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓		✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓
450	18	✓	✓	✓	✓	✓	✓		
500	20	✓	✓		✓	✓	✓		
600	24	✓	✓	✓	✓	✓	✓	✓	✓

✓ Fitting allowed

█ Please consult us

End of line and downstream dismantling

Use as end of line and downstream dismantling of the standard valves Type 4 and Type 7 at room temperature for DN and the differential pressure (ΔPS) are defined hereafter.

End of line and downstream dismantling are not allowed for valves Type 1 (wafer body).

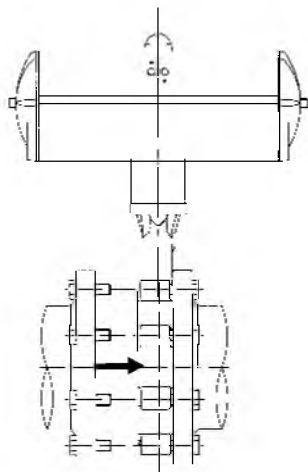
TRIODIS 150 MT	Gases or liquids		Liquids*	
	hazardous **	non hazardous **	hazardous **	non hazardous **
class 150	All DN: on request	All DN: $\Delta PS = 15 \text{ bar max.}$	All DN: $\Delta PS = 15 \text{ bar max.}$	All DN: $\Delta PS = 15 \text{ bar max.}$
B 25	All DN: on request	All DN: $\Delta PS = 19 \text{ bar max.}$	All DN: $\Delta PS = 19 \text{ bar max.}$	All DN: $\Delta PS = 19 \text{ bar max.}$

* Liquids having a vapour pressure at the maximum allowable temperature of not more than 0,5 bar above atmospheric pressure (1013 mbar).

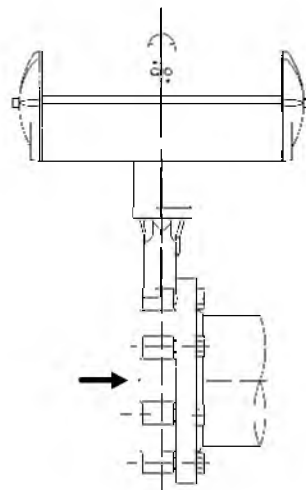
** Fluids hazardous and not hazardous according to PED.

NB: A valve fitted at the end of a pipe with a blind flange downstream is not to be considered as an end of pipe service.

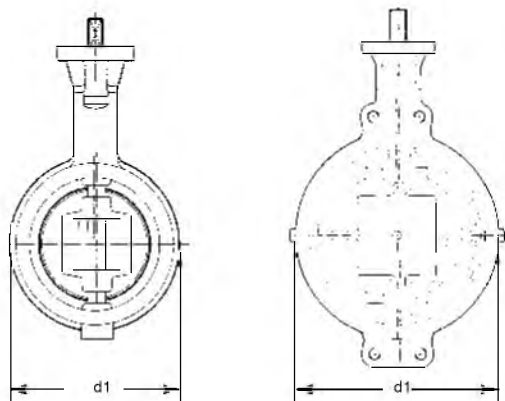
Downstream dismantling



End of line mounting

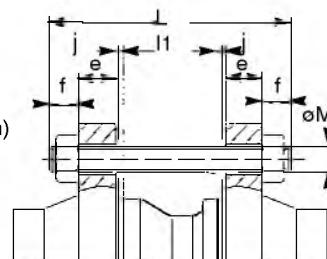


Bolting and weight for wafer type body - Type 1



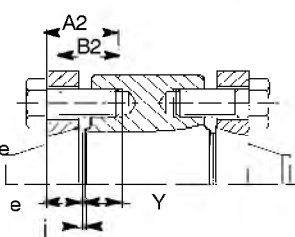
Tie-rod length
 $L = l1 + 2e + 2f + 2j$

- l1 : Valve face to face
- e : Flange thickness (customer specification)
- f : Overlength of the tie-rod
- j : Thickness of the flange gasket



Screw length at shaft passages
 $A2 \text{ max.} = e + Y + j$

- e : Flange thickness (customer specification)
- Y : Max. implantation of the screw
- j : Thickness of the flange gasket
- B2 : Min. threaded length of the screw $B2 > A2 - e$



The drawings are not the correct representation of our manufacture (quantity for threaded and plain holes).

NB: We do not supply the bolting

DN	NPS	d1	l1	EN 1092-1 PN 10 (1)				EN 1092-1 PN 16 (1)				EN 1092-1 PN 25				ISO 7005 PN 20				Weight kg				
				ØM	f	Qty	Y	Qty*	ØM	f	Qty	Y	Qty*	ØM	f	Nb	Y	Qty*	ØM		f	Qty	Y	Qty*
50	2	105	43	M16	20	4			M16	20	4			M16	20	4			M16	20	4			5.0
65	2 1/2	124	46	M16	20	4/8			M16	20	4/8			M16	20	8			M16	20	4			6.0
80	3	144	50	M16	20	8			M16	20	8			M16	20	8			M16	20	4			7.0
100	4	164	52	M16	20	8			M16	20	8			M20	24	8			M16	20	8			9.5
125	5	194	56	M16	20	8			M16	20	8			M24	29	8			M20	24	8			12.0
150	6	219	56	M20	24	8			M20	24	8			M24	29	8			M20	24	8			17.0
200	8	275	60	M20	24	8			M20	24	12			M24	29	12			M20	24	8			24.0
250	10	330	68	M20	24	12			M24	29	12			M27	32	12			M24	29	12			36.0
300	12	376	78	M20	24	12			M24	29	12			M27	32	12	26	4	M24	29	12			58.0
350	14	413	92	M20	24	12	33	4	M24	29	12	33	4	M30	35	12	27	4	M27	27	12			79.0
400	16	470	102	M24	29	12	44	4	M27	32	12	44	4	M33	38	12	44	4	M27	27	12	44	4	110.0
450	18	530	114	M24	29	16	24	4	M27	32	16	24	4	M33	39	16	22	4	M30	31	12	40	4	146.0
500	20	572	127	M24	29	16	32	4	M30	35	16	31	4	M33	38	16	31	4	M30	31	16	31	4	188.0
600	24	680	154	M27	32	16	43	4	M33	38	16	48	4	M36	42	16	47	4	M33	34	16	47	4	293.0

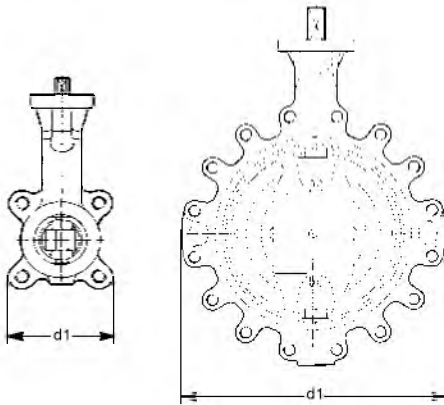
DN	NPS	d1	l1	ASME B16-5 cl.150				JIS B2220 10K				JIS B2220 16K and 20K				Weight kg									
				UNC	f	Qty	Y	Qty*	ØM	f	Qty	Y	Qty*	ØM	f		Qty	Y	Qty*						
50	2	105	43	5/8"	20	4			M16	20	4													5.0	
65	2 1/2	124	46	5/8"	20	4			M16	20	4			M16	20	8									6.0
80	3	144	50	5/8"	20	4			M16	20	8			M20	24	8									7.0
100	4	164	52	5/8"	20	8			M16	20	8			M20	24	8									9.5
125	5	194	56	3/4"	24	8			M20	24	8			M22	26	8									12.0
150	6	219	56	3/4"	24	8			M20	24	8			M22	26	12									17.0
200	8	275	60	3/4"	24	8			M20	24	12			M22	26	12									24.0
250	10	330	68	7/8"	29	12			M22	26	12			M24	29	12									36.0
300	12	376	78	7/8"	29	12			M22	26	12	24	4	M24	29	12	26	4							58.0
350	14	413	92	1"	32	12			M22	26	12	39	4	M30x3	35	12	41	4							79.0
400	16	470	102	1"	32	12	44	4	M24	29	12	42	4	M30x3	35	12	44	4							110.0
450	18	530	114	1 1/8"	35	12	40	4	M24	29	16	24	4	M30x3	35	16	24	4							146.0
500	20	572	127	1 1/8"	35	16	31	4	M24	29	16	32	4	M30x3	35	16	32	4							188.0
600	24	680	154	1 1/4"	38	16	47	4	M30	35	20	37	4	M36x3	42	20	36	4							293.0

* Quantity of screws at shaft passages by face

** Quantity of nuts = quantity of tie-rods x 2

(1) Variant 4 tie-rods possible for DN 65

Bolting and weight for full-lug type body - Type 4

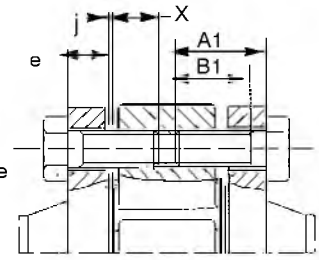


The drawings are not the correct representation of our manufacture (quantity for full-lug holes).

NB: We do not supply the bolting

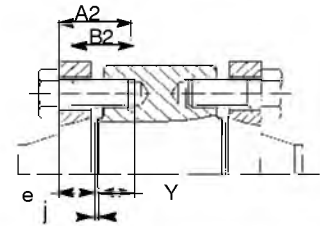
Screw length
A1 max. = e + X + j

- e : Flange thickness (customer specification)
- X : Max. implantation of the screw
- j : Thickness of the flange gasket
- B1 : Min. threaded length of the screw B1 > A1-e



Screw length at shaft passages
A2 max. = e + Y + j

- e : Flange thickness (customer specification)
- Y : Max. implantation of the screw
- j : Thickness of the flange gasket
- B2 : Min. threaded length of the screw B2 > A2-e



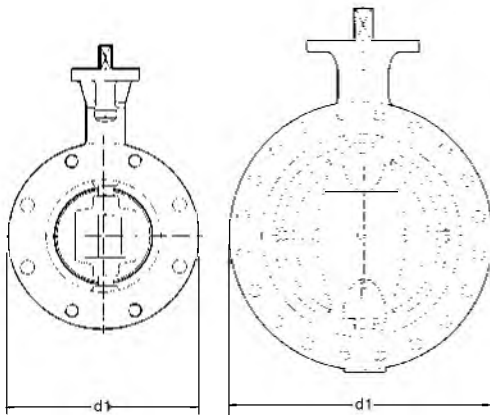
DN	NPS	d1	EN 1092-1 PN 10 (1)				EN 1092-1 PN 16 (2)				EN 1092-1 PN 25				ISO 7005 PN 20				Weight kg				
			ØM	X	Qty*	Y	Qty*	ØM	X	Qty*	Y	Qty*	Ø M	X	Qty*	Y	Qty*	Ø M		X	Qty*	Y	Qty*
50	2	120	M16	20	4			M16	20	4			M16	20	4			M16	20	4			6.5
65	2 1/2	130	M16	20	4			M16	20	4								M16	20	4			7.5
65	2 1/2	174	M16	20	4			M16	20	8			M16	20	8								8.8
80	3	188	M16	21	8			M16	21	8			M16	21	8			M16	21	4			9.0
100	4	210	M16	21	8			M16	21	8			M20	26	8			M16	21	8			11.2
125	5	246	M16	20	8			M16	20	8			M24	27	8			M20	25	8			15.4
150	6	270	M20	24	8			M20	24	8			M24	27	8			M20	24	8			18.5
200	8	310	M20	26	8													M20	26	8			30.0
200	8	340						M20	26	12			M24	29	12								31.0
250	10	417	M20	26	12			M24	30	12			M27	33	12			M24	30	12			48.0
300	12	478	M20	26	12			M24	30	8	35	4						M24	26	12			70.0
300	12	476											M27	33	12	26	4						72.5
350	14	523																M27	39	12			99.0
350	14	542	M20	37	16			M24	37	16			M30	42	16								108.0
400	16	606	M24	42	16			M27	44	16			M33	44	16			M27	44	16			130.0
450	18	630																M30	51	12	40	4	167.0
450	18	657	M24	40	16	24	4	M27	44	16	24	4	M33	39	16	22	4						207.0
500	20	716	M24	42	16	32	4	M30	51	16	31	4	M33	55	16	31	4	M30	51	16	31	4	237.0
600	24	834	M27	43	20			M33	52	16	48	4	M36	57	16	47	4	M33	52	16	47	4	363.0

DN	NPS	d1	ASME B16-5 class 150				JIS B2220 10K				JIS B2220 16K and 20K				Weight kg								
			UNC	X	Qty*	Y	Qty*	ØM	X	Qty*	Y	Qty*	ØM	X		Qty*	Y	Qty*					
50	2	120	5/8"	20	4			M16	20	4													6.5
65	2 1/2	130	5/8"	20	4			M16	20	4													7.5
65	2 1/2	174											M16	20	8								8.8
80	3	188	5/8"	21	4			M16	21	8			M20	24	8								9.0
100	4	210	5/8"	21	8			M16	21	8			M20	26	8								11.2
125	5	246	3/4"	25	8			M20	25	8			M22	27	8								15.4
150	6	270	3/4"	24	8			M20	24	8													18.5
200	8	310	3/4"	26	8																		30.0
200	8	340						M20	29	12			M22	29	12								31.0
250	10	417	7/8"	30	12			M22	32	12			M24	31	12								48.0
300	12	478	7/8"	26	12																		70.0
300	12	476						M22	24	16			M24	30	16								72.5
350	14	523	1"	39	12																		99.0
350	14	542						M22	36	16			M30x3	34	16								108.0
400	16	606	1"	44	16			M24	42	16			M30x3	44	16								130.0
450	18	630	1 1/8"	51	12	40	4																167.0
450	18	657						M24	40	16	24	4	M30x3	49	16	26	4						207.0
500	20	716	1 1/8"	51	16	31	4	M24	42	16	32	4	M30x3	51	16	32	4						237.0
600	24	834	1 1/4"	52	16	47	4																363.0

* Quantity of screws by face
 18

(1) Variant 4 screws by face possible for DN 65

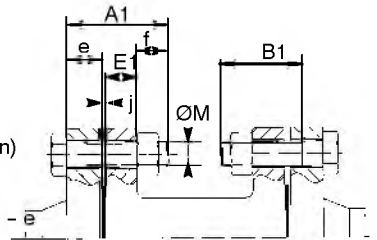
Bolting and weight for flanged type body - Type 7



The drawings are not the correct representation of our manufacture (quantity for threaded and plain holes).

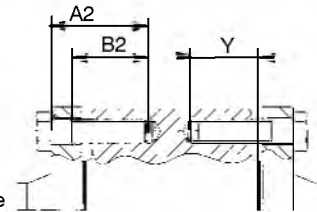
Screw length on flanges
A1 max. = e + j + E1 maxi + f

- E1 : Thickness of valve flange
- e : Thickness of flange (customer specification)
- f : Overlength of the screw
- j : Thickness of flange gasket
- B1 : Min. threaded length of the screw $B1 > A1 - e$



Screw length at shaft passages
A2 max. = e + j + Y

- e : Thickness of flange (customer specification)
- Y : Max. implantation of the screw at shaft passages
- j : Thickness of the flange gasket
- B2 : Min. threaded length of the screw $B2 > A2 - e$



NB: We do not supply the bolting

DN	NPS	d1	E1	EN 1092-1 PN 10 (1)				EN 1092-1 PN 16 (1)				EN 1092-1 PN 25				ISO 7005 PN 20				weight kg				
				ØM	f	Qty*	Y	Qty*	ØM	f	Qty*	Y	Qty*	ØM	f	Qty*	Y	Qty*	ØM		f	Qty*	Y	Qty*
50	2	152	22	M16	20	4			M16	20	4			M16	20	4			M16	20	4			10.0
65	2 1/2	178	22,5	M16	20	4			M16	20	4								M16	20	4			13.0
65	2 1/2	178	22,5	M16	20	4	24	4	M16	20	4	24	4	M16	20	4	24	4						13.0
80	3	190	27	M16	20	4	24	4	M16	20	4	24	4	M16	20	4	24	4	M16	20	4			16.0
100	4	229	27	M16	20	4	24	4	M16	20	4	24	4	M20	24	4	24	4	M16	20	4	24	4	23.5
125	5	254	27	M16	20	4	24	4	M16	20	4	24	4						M20	24	4	24	4	27.5
150	6	279	28,5	M20	24	4	25	4	M20	24	4	25	4						M20	24	4	25	4	32.0
200	8	343	31,5	M20	24	4	28	4	M20	24	8	28	4						M20	24	4	28	4	52.0
250	10	406	33,5	M20	24	8	30	4	M24	29	8	30	4						M24	29	8	30	4	73.0
300	12	483	35,0	M20	24	8	32	4	M24	29	8	32	4	M27	32	12	32	4	M24	29	8	32	4	115.0
350	14	535	38,0	M20	24	12	35	4	M24	29	12	35	4						M27	32	8	35	4	147.0
400	16	600	40,0	M24	29	12	37	4	M27	32	12	37	4	M33	38	12	37	4	M27	32	12	37	4	207.0
450	18	635	42,5	M24	29	16	39	4	M27	32	16	39	4	M33	38	16	39	4	M30	35	12	39	4	243.0
500	20	700	46,0	M24	29	16	42	4	M30	35	16	42	4						M30	35	16	42	4	335.0
600	24	826	52,0	M27	32	16	48	4	M33	38	16	48	4	M36	42	16	48	4	M33	38	16	48	4	463.0

DN	NPS	d1	E1	ASME B16-5 cl 150				JIS B2220 10K				JIS B2220 16K and 20K				weight kg							
				UNC	f	Qty*	Y	Qty*	ØM	f	Qty*	Y	Qty*	ØM	f		Qty*	Y	Qty*				
50	2	152	22,0	5/8"	20	4			M16	20	4			M16	20	4	19	4					10.0
65	2 1/2	178	22,5	5/8"	20	4			M16	20	4			M16	20	4	22	4					13.0
80	3	190	27,0	5/8"	20	4			M16	20	8			M20	24	4	24	4					16.0
100	4	229	27,0	5/8"	20	4	24	4	M16	20	4	4	24	M20	24	4	24	4					23.5
125	5	254	27,0	3/4"	24	4	24	4	M20	24	4	4	24										27.5
150	6	279	28,5	3/4"	24	4	25	4	M20	24	4	4	25										32.0
200	8	343	31,5	3/4"	24	4	28	4	M20	24	8	4	28	M22	27	8	28	4					52.0
250	10	406	33,5	7/8"	29	8	30	4	M22	27	8	4	30										73.0
300	12	483	35,0	7/8"	29	8	32	4	M22	27	12	4	32	M24	29	12	32	4					115.0
350	14	535	38,0	1"	32	8	35	4	M22	27	12	4	35	M30X3	35	12	35	4					147.0
400	16	600	40,0	1"	32	12	37	4	M24	29	12	4	37	M30X3	35	12	37	4					207.0
450	18	635	42,5	1 1/8"	35	12	39	4	M24	29	16	4	39										243.0
500	20	700	46,0	1 1/8"	35	16	42	4	M24	29	16	4	42										335.0
600	24	826	52,0	1 1/4"	38	16	48	4	M30	35	20	4	48	M36X3	42	20	48	4					463.0

* Quantity of screws by face

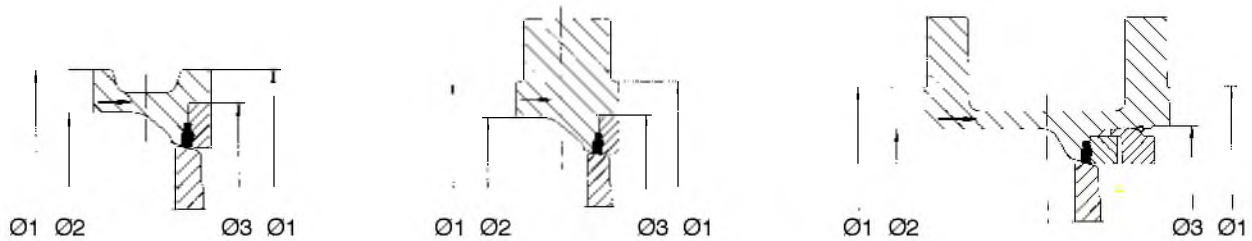
(1) Variant 4 screws by face possible for DN 65

Flanging dimensions

TRIODIS 150 MT valves are designed to be fitted with flat gaskets or spiral-wound gaskets between any type of flanges and connection standards currently used.

SEALING AREA ON FLANGE FACES

In order to ensure a correct connection, the dimensions of flange gaskets must be compatible with the dimensions mentioned in the table below.

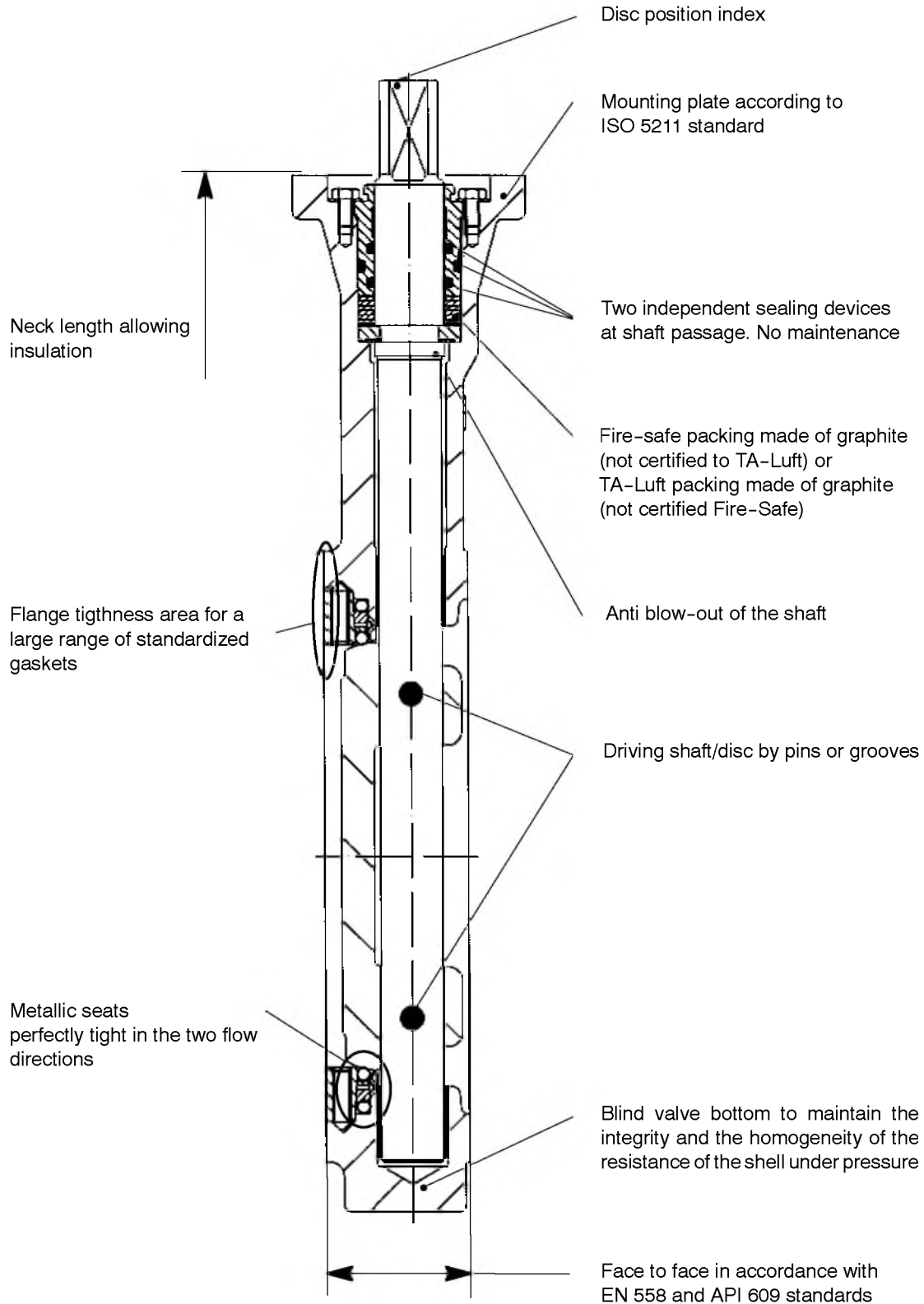


DN	NPS	Wafer type body			Full-lug type body			Flanged type body		
		Ø1	Ø2	Ø3	Ø1	Ø2	Ø3	Ø1	Ø2	Ø3
50	2	93	62	73	91.9	62	73	91.9	61	73
65	2	111	74	91	104.6	74	91	104.6	73	91
80	3	127	91	106	127.0	90	106	127.0	98	106
100	4	158	121	128	157.2	117	128	157.2	124	128
125	5	180	142	148	185.7	142	148	185.7	148	148
150	6	201	169	173	215.9	168	173	215.9	173	173
200	8	260	219	226	269.7	219	226	269.7	226	226
250	10	315	273	274	323.9	273	274	323.9	277	274
300	12	364*	320	331	381.0	327	331	381.0	326	324
350	14	413	355	386	412.8**	363	386	412.8	375	372
400	16	470	408	438	469.9	414	438	469.9	430	425
450	18	530	464	498	533.4	468	498	533.4	468	489
500	20	572	510	538	584.2	518	538	584.2	526	529
600	24	680	610	644	692.2	623	644	692.2	630	625

* Ø1: 375 for EN 1092-1 PN 25 and JIS B2220 10K, 16K, 20K

** Ø1: 438 for EN 1092-1 PN 10, 16, 25 and JIS B2220 10K, 16K, 20K

Product features - to our customer's benefit

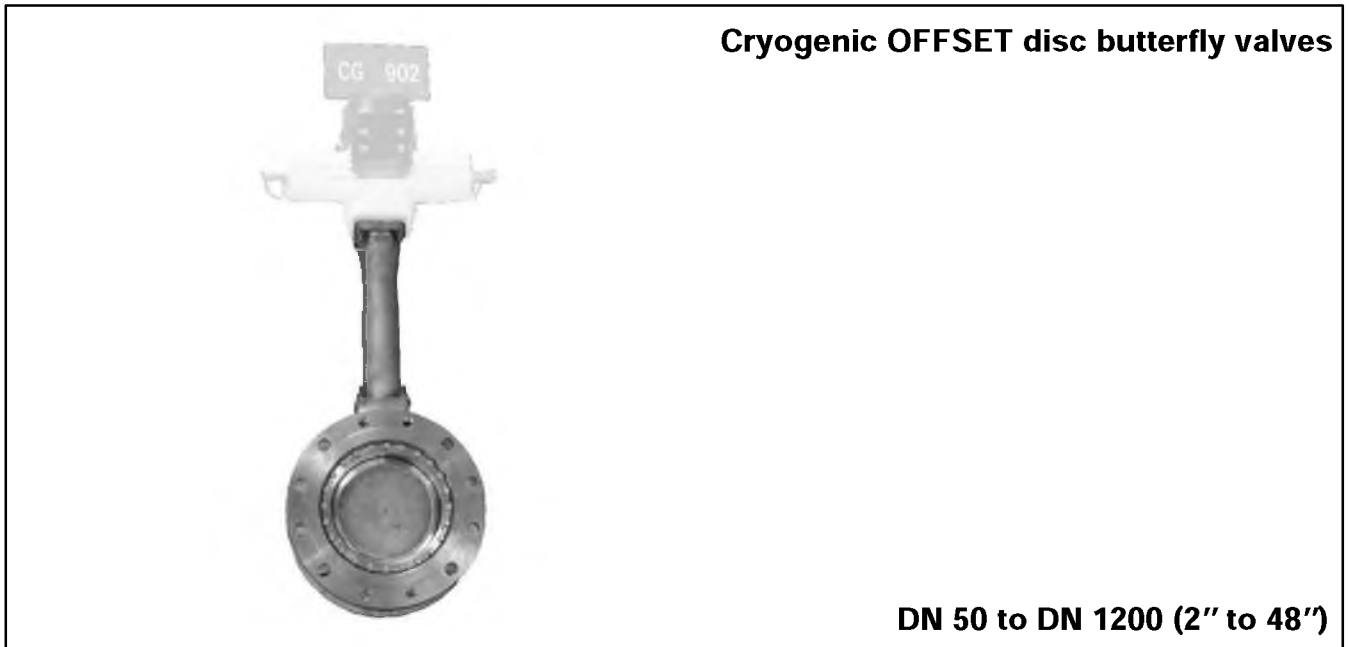


This leaflet is not contractual and may be amended without notice.

23.01.13

8405.52/2-10





Applications

- LNG process / All liquefied gases.

Working conditions

- Temperature: from -250 °C to +200 °C.
- Maximum working pressure: 20 bar.
- Rating: ASME B16.34 Class 150.

Materials

See page 2.

Design

- Flanged body with raised faces (Type 6): DN 50 (2") to DN 1200 (48").
- Fire-safe agreement according to BS 6755 part 2 and API 6FA.
- The valves meet the safety requirements of the pressure Equipments Directive 97/23EC (PED) Appendix I for fluids of the groups 1 and 2.
- Face to face according to ISO 5752 series 13 and EN 558.1 series 13 Standards.

- PN10 / PN 16 / PN 20 in accordance with ISO 7005,
- ASME B 16.5 Class 150,
- ASME B16.47 Class 150 series A and B,
- MSS SP 44 Class 150,
- API 605,
- Other drilling patterns on request.

Standard option

- Lip Seal Ring for installation in any position (> 75 ° from vertical positions) (standard for marine applications).
- Drip plate for insulation.
- Electrical continuity.

Standard variants

- Manual actuator MR
- Pneumatic actuator ACTAIR / DYNACTAIR
- Electric actuator ACTELEC
- Hydraulic actuator ACTO / DYNACTO / ENNACTO
- Limit switches box AMTROBOX R

Connections

Materials

Body	KSB code
Stainless steel ASTM A 351 gr. CF 8M / 1.4408	6
Disc	KSB code
Stainless steel ASTM A 351 gr. CF 8M / 1.4408 with hard chromium overlay on edge	6
Stainless steel ASTM A 351 gr. CF 8M / 1.4408 with stellite overlay on edge	6s
Operating shaft	KSB code
Stainless steel A479 gr. 316L *	6 *
Stainless steel A638 gr. 660	6f
Stainless steel A479 gr. XM19	6r
Bonnet	KSB code
Stainless steel ASTM A 351 gr. CF 8M / 1.4408	6
Seat	KSB code
Copper	CU

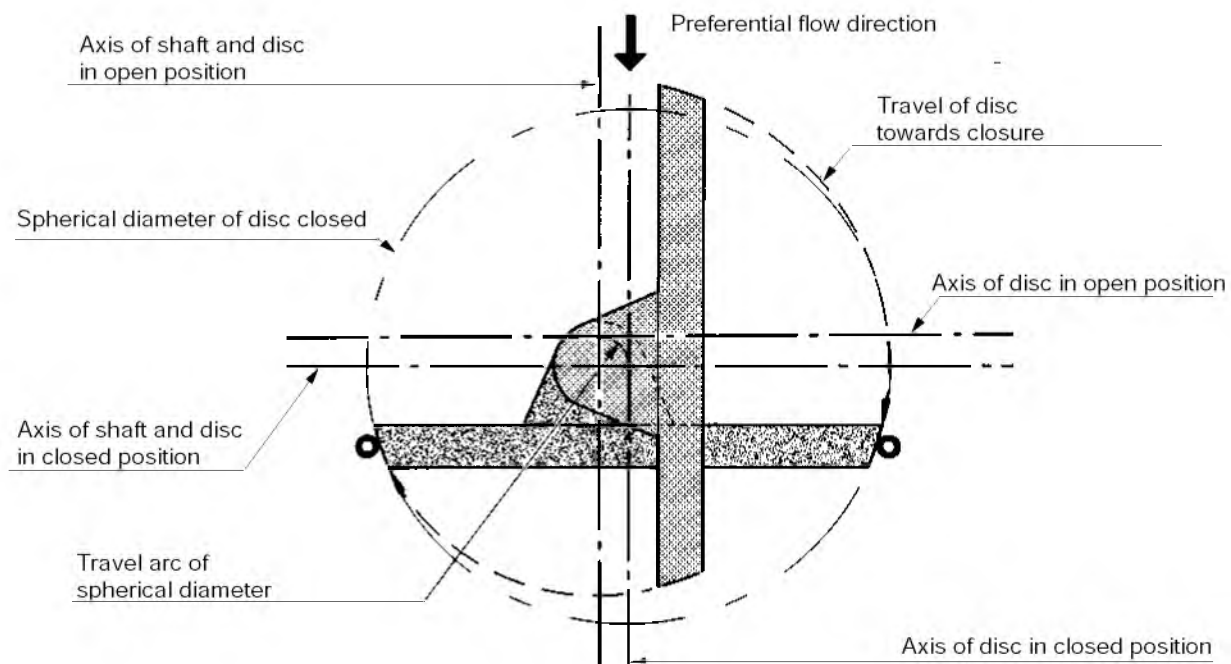
* Caution: The working pressure is limited. Please consult us.

Kinematics

The compression of the seating disc edge onto the seat is achieved by double-eccentric kinematics. The axis of the shafts is off-set to valve axis and eccentric to pipe axis.

This design eliminates the possibility of friction during operation and, as a result ensures long life service while maintaining tight shut-off characteristics.

These tight shut-off characteristics comply with to the most severe requirements and Standards.

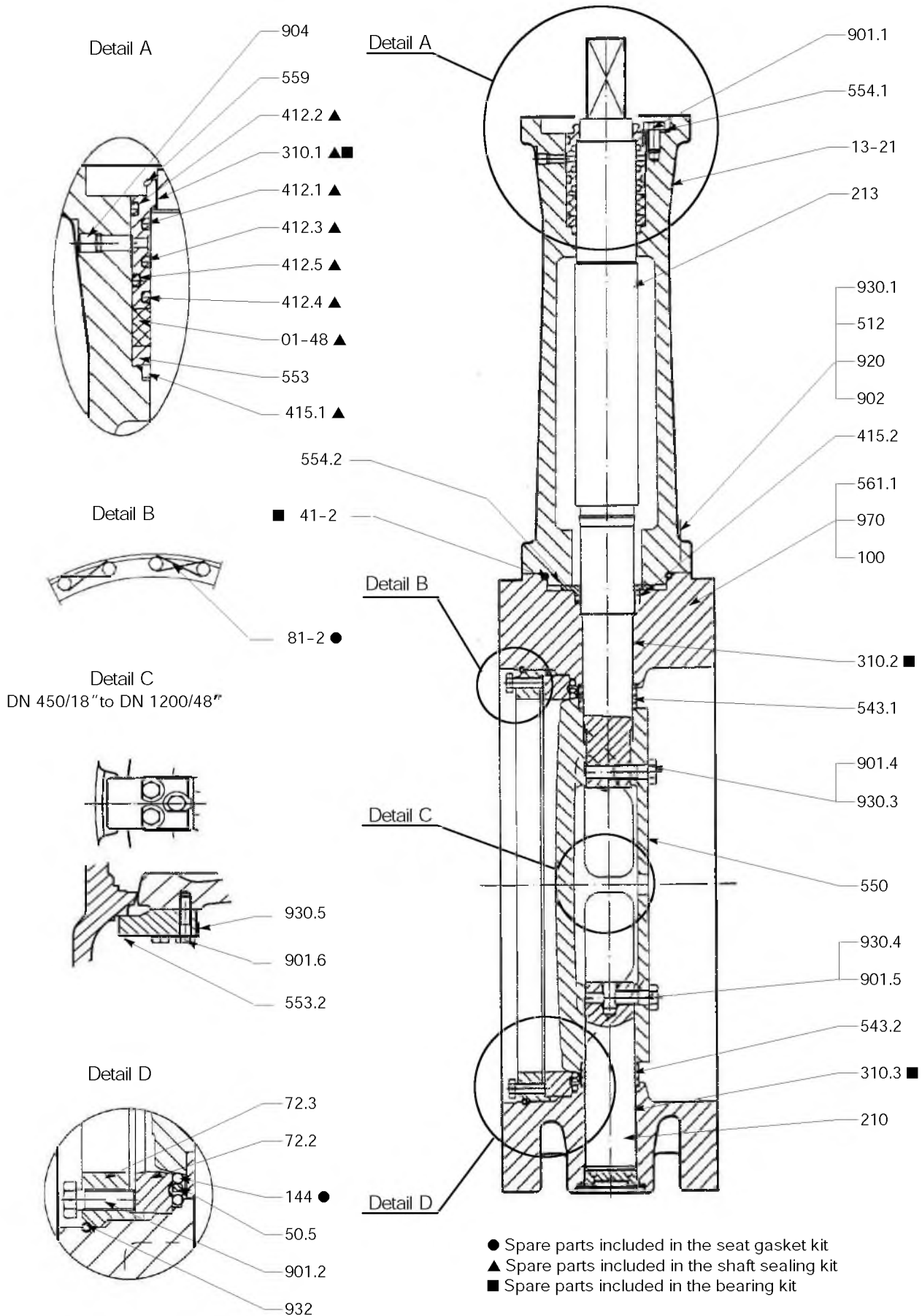


The DANAIS TBT II Flanged is a bi-directional valve with a preferential flow direction shown by an arrow on the body.

Hydraulic characteristics

DN	NPS	Flow coefficient in full open position		Zeta
		K _{v0}	C _{v0}	
50	2	70	80	2.04
65	2 ½	110	145	2.35
80	3	190	220	1.81
100	4	340	400	1.38
125	5	600	700	1.08
150	6	980	1 140	0.84
200	8	1 850	2 150	0.75
250	10	3 350	3 880	0.56
300	12	4 870	5 650	0.55
350	14	7 070	8 200	0.48
400	16	10 350	12 000	0.38
450	18	12 500	14 500	0.42
500	20	15 090	17 500	0.44
550	22	18 280	21 200	0.44
600	24	22 410	26 000	0.41
650	26	26 300	30 500	0.41
700	28	29 650	34 400	0.44
750	30	32 820	38 070	0.47
800	32	37 330	43 300	0.47
850	34	42 790	49 600	0.46
900	36	53 840	62 450	0.36
1000	40	58 290	67 600	0.47
1050	42	67 390	78 170	0.43
1200	48	80 000	92 800	0.52

Construction



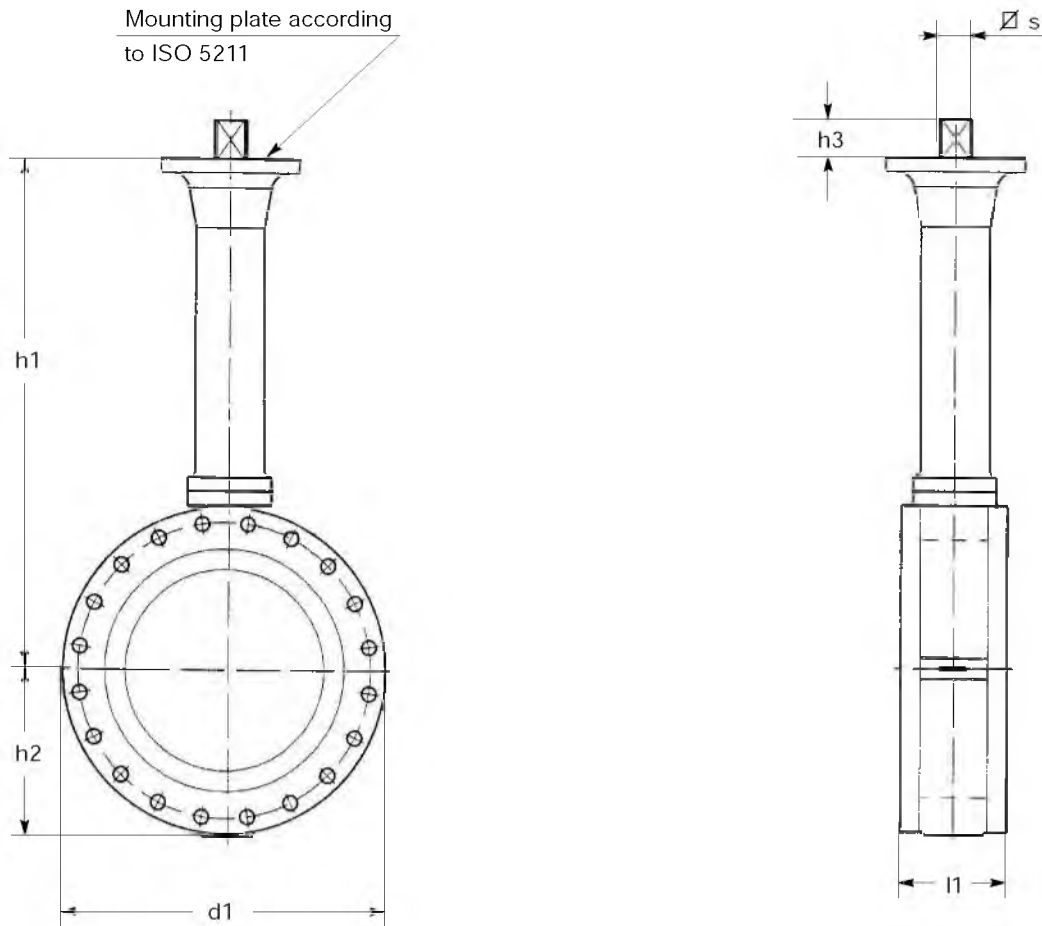
Parts list

Item	Designation	Materials
01-48	Sealing packing	Expanded graphite
100	Body	Stainless steel A351 gr CF8M (1.4408)
13-21	Extension	Stainless steel A351 gr CF8M (1.4408)
144	Seat	Copper
210	Shaft	Stainless steel A479 gr. 316L
213	Operating shaft	Stainless steel A479 gr. 316L or A638 gr. 660 (*) or A479 gr. XM19
310.1	Self lubricating strip	Stainless steel + PTFE
310.2	Self lubricating strip	Stainless steel + PTFE
310.3	Self lubricating strip	Stainless steel + PTFE
41-2	Static joint	Nickel
412.1	O-ring	HC Nitrile(**)
412.2	O-ring	HC Nitrile(**)
412.3	O-ring	HC Nitrile(**)
412.4	O-ring	HC Nitrile(**)
412.5	O-ring	HC Nitrile(**)
415.1	Lip seal ring	PTFE + Elgiloy
415.2	Lip seal ring (Standard for marine applications) (Optional for others applications)	PTFE + Elgiloy
50-5	Reaction ring	A638 gr. 660
512	Adjusting ring	Z 3 CND 17-11-02 / 316L
543.1	Spacer bush	Z 3 CND 17-11-02 / 316L
543.2	Spacer bush	Z 3 CND 17-11-02 / 316L
550	Disc	Stainless steel A351 gr CF8M (1.4408) with hard chromium or stellite overlay on edge
553	Thrust insert	Z3 CND 17-11-02 / 316L
553.2	Thrust	Stainless steel 316L
554.1	Washer	Stainless steel
554.2	Plain washer	Stainless steel
559	Gasket holder	Z3 CND 17-11-02 / 316L
561.1	Grooved pin	Z3 CND 17-12-02 / 316L
72-2	Centering flange	Z3 CND 17-11-01 / 316L
72-3	Tightening flange	Z3 CND 17-11-01 / 316L
81-2	Wire	Z3 CN 18-09
901.1	Hexagon head screw	A4-80 Stainless steel
901.2	Hexagon head screw	A4-80 Stainless steel
901.4	Hexagon head screw	A4-80 Stainless steel
901.5	Hexagon head screw	A4-80 Stainless steel
901.6	Hexagon head screw	A4-70 Stainless steel
902	Stud	A320 gr. B8 M cl. 2
904	Socket screw	A4-70 Stainless steel
920	Hexagon nut	A 194 gr. 8 M
930.1	Retainer	Stainless steel 316 or equivalent
930.3	Retainer	Stainless steel 316 or equivalent
930.3	Nut lock	Stainless steel 316
930.4	Nut lock	Stainless steel 316 or equivalent
930.5	Retainer (DN ≥ 700) or wire (DN 450 to 650)	Stainless steel 316 or equivalent
932	Inner ring	Stainless steel 316 or equivalent
970	Identity plate	Stainless steel 316 or equivalent

(*) For DN550, only A638 gr. 660 or A479 gr. XM19 available

(**) HC Nitrile: Epichlorohydrin for ambient temperature below minus 25 °C.

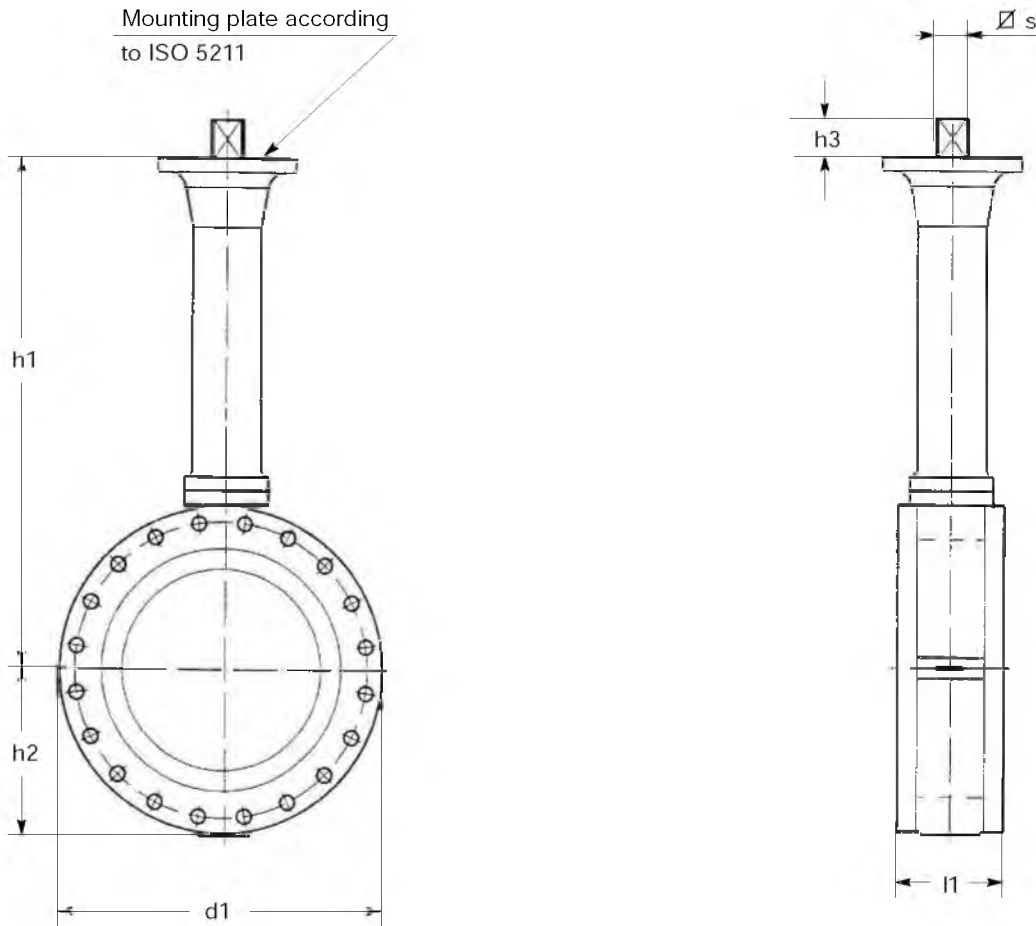
Dimensions - DN 50 to 600



mm

DN	NPS	h1	h2	d1	l1	z	ISO plate	∅ s		h3	Weight Kg
								6*	6f / 6r		
50	2	480	76	152	108	445	F10	19	19	35	12
65	2½	495	89	178	112	452	F10	19	19	35	15
80	3	510	95	190	114	459	F10	19	19	35	20
100	4	530	115	229	127	467	F10	19	19	35	30
125	5	545	127	254	140	478	F10	19	19	35	35
150	6	580	140	279	140	490	F12	25	25	45	41
200	8	610	172	343	152	525	F12	30	30	55	51
250	10	640	203	406	165	500	F12	30	30	55	95
300	12	665	242	483	178	495	F14	36	36	60	133
350	14	700	274	535	190	520	F14	36	36	60	147
400	16	750	300	600	216	515	F16	40	40	76	218
450	18	800	329	635	222	532	F16	46	46	76	242
500	20	850	356	700	229	558	F25	50	50	85	457
550	22	885	382	756	267	585	F25		50	85	472
600	24	975	449	826	267	630	F25	55	50	85	520

* The working pressure is limited. Please consult us.

Dimensions - DN 650 to 1200


mm

DN	NPS	h1	h2	API	MSS	l1	ISO plate	∅ s		h3	Weight kg
				(1)	(2)			6*	6f / 6r		
650	26	1020	446	786	870	292	F30	70	70	104	774
700	28	1050	472	837	927	292	F30	70	70	104	1032
750	30	1100	532	887	985	292	F30	70	70	104	1153
800	32	1135	547	941	1061	318	F30	70	70	104	1274
850	34	1200	565	1005	1112	318	F35	80	80	**	1520
900	36	1175	591	1057	1169	330	F35	80	80	109	1736
1000	40	1280	698	1175	1289	410	F40		90	**	2287
1050	42	1440	705	1226	1346	410	F40		90	112	2621
1200	48	1490	810	1392	1512	470	F40		110	132	3840

(1) API 605 class 150 or ASME B16.47 series B class 150

(2) MSS SP44 class 150 or ASME B16.47 series A class 150

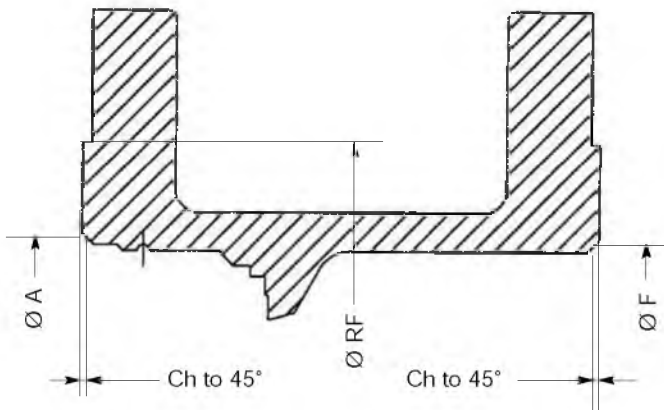
* The working pressure is limited. Please, consult us.

** According to actuator.

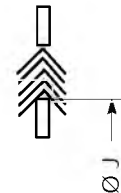
Dimensions for flange gasket definition

In order to ensure a correct connection, the dimensions of flange gaskets must be compatible with the dimensions mentioned in the table below.

Connection according to ASME B16.5 class 150 and ASME B16.47 class 150 série A.



NB: We do not supply the gasket



DN	NPS	Ø A ^{±0,5}	Ø F ⁰⁻¹⁰
80	3	94,5	90,5
100	4	128,5	127
150	6	177	176
200	8	230	228
250	10	278	279
300	12	326	330
350	14	376,5	377
400	16	426,5	432
450	18	490,5	477
500	20	530,5	528
550	22	581	587
600	24	627	638
650	26	673	679
700	28	707	713
750	30	760,5	760
800	32	813	816,5
850	34		
900	36	918	924
1000	40		
1050	42	1066	1054
1200	48	1184	1176

Ø J
104,5
138,5
187
240
286
337
387
439
499
541
594
647
690
725
773
828,5
936
1078
1196

Please consult us

Flange facing finish

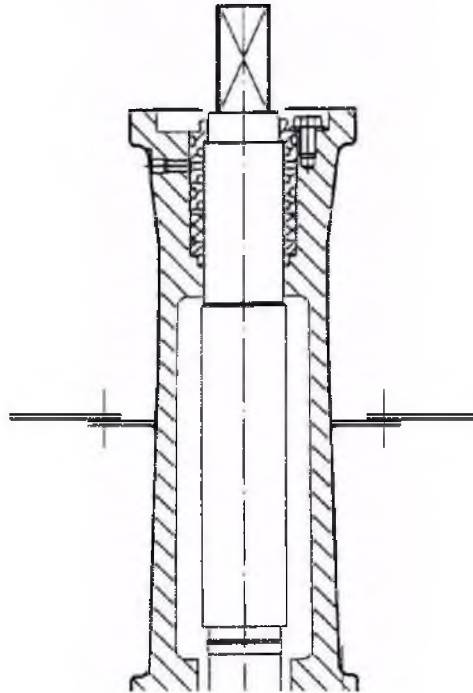
Serrated spiral finish according to ASME B16.5 class 150 or ASME B16.47 class 150 série A.

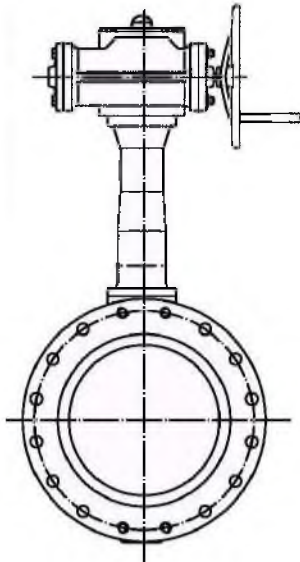
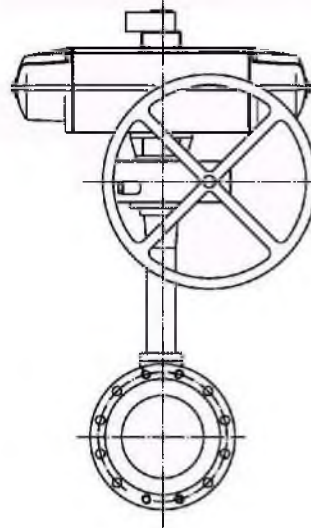
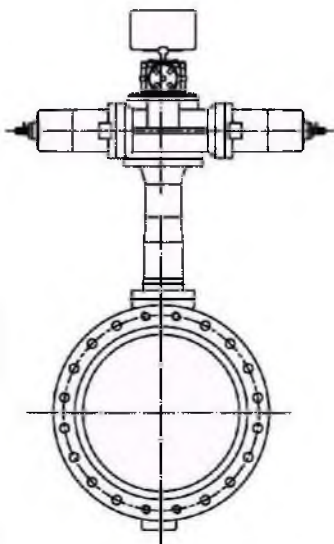
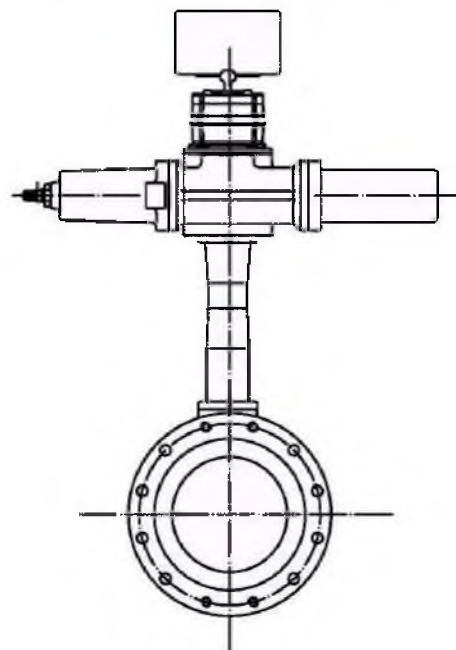
Standard: Stock finish (Ra 6,3 to Ra 12,5)

Optional: Smooth finish (Ra 3,2 and Ra 6,3)

Option

Drip Plate for insulation



Standard variants**MR manual reducer****ACTAIR / DYNACTAIR pneumatic actuator with manual override****ACTO hydraulic actuator****ENNACTO hydraulic actuator**

Butterfly Valve

APORIS-DEB02

PN 10/16/25
DN 150-2200
Epoxy-coated
Flanged Ends

Type Series Booklet



Butterfly Valves

Double-offset Butterfly Valves

APORIS-DEB02



Main applications

- Irrigation systems
- Cooling circuits
- Seawater desalination / reverse osmosis
- Shipbuilding
- Water treatment
- Water supply systems

Fluids handled

- Service water
- River, lake and groundwater
- Cooling water
- Seawater
- Drinking water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16/25
Nominal size	DN 150-2200
Max. permissible pressure	25 bar
Max. permissible temperature	80 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-15	JS1030	Up to 80 °C

Design details

Design

- Double-flanged body with short face-to-face length to EN 558/14
- UNI flanges PN 10, PN 16, PN 25
- Design to BS 5155
- In compliance with API 598
- Marked in accordance with EN 19
- Perfectly tight shut-off in either direction of flow (no leakage visible to the naked eye)
- Mechanical stop on the valve
- Locking device
- Valve certified for drinking water applications to WRAS (elastomer and coating)
- Manual actuator (gearbox)

Variants

- Limit switches
- PN 40 pressure class and flanges
- Design to AWWA C504
- Pneumatic actuators
- Electric actuators

Product benefits

- Body with flanged ends, suitable for downstream dismantling and dead-end service
- Long-term, reliable shut-off and sealing to atmosphere

Related documents

- Operating manual V999011/1.10

On all enquiries / orders please specify

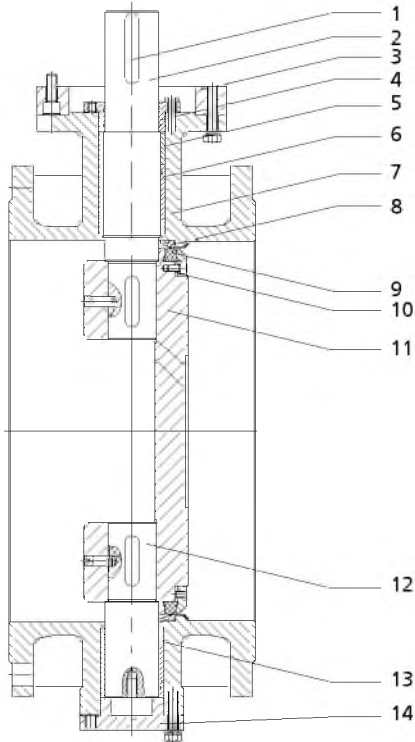
1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C

Nominal pressure	Nominal size	Permissible operating pressures ¹⁾
PN	DN	Up to +80°C
10	150-2200	10,0
16	150-2200	16,0
25	150-1400	25,0

Materials

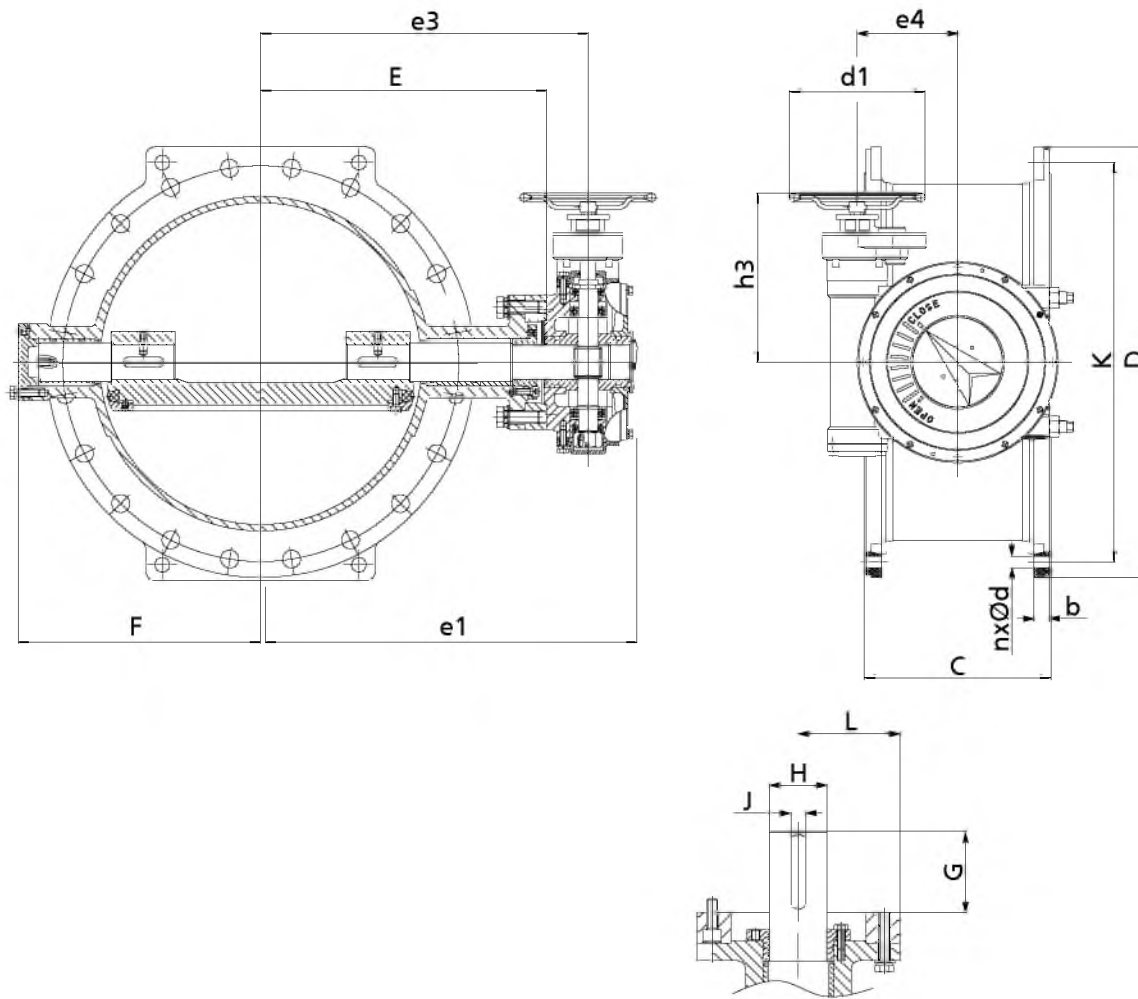


Overview of available materials

Part No.	Description	Material	Material number	Note
1	Key	X20Cr13	1.4021	
2	Upper stem	X17CrNi16-2	1.4057	
3	Flanges	EN-GJS-400-15	EN-JS1030	
4	Stem nut	Carbon steel		
5	Adjusting ring	Aluminium bronze		
6	Upper stem bush	QAL9-2		
7	Body	EN-GJS-400-15	EN-JS1030	Epoxy-coated
8	Body gasket	X2CrNiMo17-12-2	1.4404	
9	Disc seal	EPDM		
10	Circlip	X6CrNiMoTi17-12-2	1.4571	
11	Disc	EN-GJS-400-15	EN-JS1030	Epoxy-coated
12	Lower stem	X17CrNi16-2	1.4057	
13	Lower stem bush	Aluminium bronze		
14	Bottom cover	EN-GJS-400-15	EN-JS1030	Epoxy-coated

¹⁾ Static load

Dimensions



Dimensions in mm

PN	DN	C	F	E	G	H	J	K	L	b	h3	e1	e3	e4	d1	n-Ød	D	Top flange ²⁾	[kg]
10	150	210	170	200	40	22	6	240	90	19,0	155	284	235	43,2	180	8-23	285	F07	30
	200	230	197	233	45	30	8	195	125	20,0	200	337	278	64,0	250	8-23	340	F10	41
	250	250	223	261	60	30	8	350	125	22,0	200	367	308	64,0	250	12-23	395	F10	56
	300	270	251	295	70	40	12	400	15	24,5	238	418	350	64,0	250	12-23	445	F12	80
	350	290	294	330	80	40	12	160	150	24,5	238	453	385	94,0	250	16-23	505	F12	106
	400	310	329	386	90	50	14	515	175	24,5	275	546	456	132,0	400	16-28	565	F14	139
	450	330	365	411	100	50	14	165	175	25,5	275	571	481	132,0	400	20-28	615	F14	170
	500	350	394	445	90	65	18	620	210	26,5	391	605	515	185,0	400	20-28	670	F16	222
	600	390	454	519	120	65	18	725	210	30,0	391	715	605	185,0	400	20-31	780	F16	308
	700	430	537	585	100	85	22	840	300	32,5	391	785	670	185,0	400	24-31	895	F25	470
	800	470	593	641	120	85	22	950	300	35,0	441	871	741	233,0	400	24-34	1015	F25	622
	900	510	657	706	125	90	25	1050	300	37,5	441	936	806	233,0	400	28-34	1115	F25	870
	1000	550	722	771	125	100	28	1160	300	40,0	491	1059	896	296,0	400	28-37	1230	F25	1087
	1200	630	845	893	155	120	32	1380	350	45,0	512	1181	1018	296,0	400	32-41	1455	F30	1424
	1400	710	967	1019	155	120	32	1590	415	46,0	602	1405	1194	410,0	400	36-44	1675	F35	2494
	1600	790	1113	1111	198	150	36	1820	475	49,0	602	1497	1286	410,0	400	40-50	1915	F40	3221
1800	870	1251	1244	333	128	32	2020	475	52,0	739	1702	1464	512,5	400	44-50	2115	F48	4356	
2000	950	1370	1330	400	170	40	2230	560	55,0	739	1920	1660	512,5	400	48-50	2325	F48	6382	
2200	1000	1420	1450	400	200	40	2440	560	60,0	-	-	-	-	-	52-55	2550	F48	8510	

²⁾ ISO 5211

PN	DN	C	F	E	G	H	J	K	L	b	h3	e1	e3	e4	d1	n-Ød	D	Top flange ²⁾	[kg]
16	150	210	167	200	40	22	6	240	90	19,0	155	284	235	43,2	180	8-23	285	F07	30
	200	230	197	233	55	30	8	295	125	20,0	200	337	278	64,0	250	12-23	340	F10	44
	250	250	224	282	60	40	12	355	150	22,0	238	367	308	94,0	250	12-28	405	F12	66
	300	270	267	313	80	40	12	410	150	24,5	238	418	350	94,0	250	12-28	460	F12	90
	350	290	303	357	90	50	14	470	175	26,5	275	453	385	132,0	250	16-28	520	F14	123
	400	310	339	396	110	50	14	525	175	28,0	275	546	456	132,0	250	16-31	580	F14	163
	450	330	379	443	100	65	18	585	210	30,0	391	571	481	185,0	400	20-31	640	F16	211
	500	350	404	469	120	65	18	650	210	31,5	391	605	515	185,0	400	20-34	715	F16	275
	600	390	486	545	120	85	22	725	300	36,0	391	715	605	185,0	400	20-37	840	F25	438
	700	430	537	590	120	85	22	840	300	39,5	441	785	670	233,0	400	24-37	910	F25	600
	800	470	606	655	140	90	25	950	300	43,0	441	871	741	233,0	400	24-47	1025	F25	785
	900	510	699	711	150	100	28	1050	350	46,5	491	936	806	296,0	400	28-41	1125	F30	984
	1000	550	776	791	170	110	28	1160	350	50,0	491	1059	896	296,0	400	28-44	1255	F30	1400
	1200	630	874	921	240	128	32	1380	415	57,0	602	1181	1018	410,0	400	32-50	1485	F35	2240
	1400	710	1034	1038	190	170	40	1590	475	60,0	739	1405	1194	512,5	400	36-50	1685	F40	3100
	1600	790	1175	1188	400	170	40	1820	560	65,0	739	1497	1286	512,5	400	40-57	1930	F48	4237
	1800	870	1320	1335	400	170	40	2020	560	70,0	-	-	-	-	-	44-57	2130	F48	6200
2000	950	1460	1475	400	200	45	2230	560	75,0	-	-	-	-	-	48-62	2345	F48	8200	
2200	1000	1650	1665	400	200	45	2440	560	90,0	-	-	-	-	-	52-62	2555	F48	14000	
25	150	210	188	219	50	30	8	250	125	20,0	200	284	235	64,0	250	8-28	300	F10	43
	200	230	221	245	80	40	12	310	175	22,0	238	337	278	94,0	250	12-28	360	F14	61
	250	250	265	280	80	40	12	370	175	24,5	238	367	308	94,0	250	12-31	425	F14	92
	300	270	298	312	110	50	14	430	210	27,5	275	418	350	132,0	250	16-31	485	F16	137
	350	290	318	365	120	55	16	490	210	30,0	275	453	385	132,0	250	16-34	555	F16	155
	400	310	369	416	120	65	18	550	210	32,0	391	546	456	185,0	400	16-37	620	F16	240
	450	330	375	458	120	65	18	600	210	34,5	391	571	481	185,0	400	20-37	670	F16	308
	500	350	420	484	150	85	22	660	300	36,5	441	605	515	233,0	400	20-37	730	F25	376
	600	390	499	555	170	85	22	770	300	42,0	441	715	605	233,0	400	20-41	845	F25	525
	700	430	601	615	230	100	28	875	350	46,5	491	785	670	296,0	400	24-44	960	F30	775
	800	470	668	697	230	100	28	990	415	51,0	491	871	741	296,0	400	24-50	1085	F35	1025
	900	510	730	750	200	125	32	1090	415	55,5	602	936	806	410,0	400	28-50	1185	F35	1455
	1000	550	819	828	321	140	36	1210	475	60,0	602	1059	896	410,0	400	28-57	1320	F40	1910
	1200	630	995	1004	260	170	40	1310	560	64,5	739	1181	1018	512,5	400	32-57	1530	F48	2822
1400	710	1150	1124	279	170	40	1640	560	74,0	739	1405	1194	512,5	400	36-62	1755	F48	4250	

Mating dimensions - Standards

Face-to-face lengths: EN 558/14
Flanges: DIN EN 1092

²⁾ ISO 5211

BOAX-CBV type CBV13

Centered disc Butterfly valve

PN 10 / 16
DN 50 - 1200



Benefits at a glance

- Flanged type body T7: suitable for downstream dismantling and dead-end service
- Permanent and reliable shut-off and sealing to atmosphere
- Contains no asbestos, CFC, PCB or substances impairing paint adhesion
- Approved for drinking water applications (rubber and painting WRAS certified)
- Manual gearbox operated

Applications

- Flow shut-off or regulation
- For water supply, treatment, distribution, sewage, irrigation, potable water, high pure water, sea water, air, gas, oil

Operating data

- Maximum permissible pressure: 16 bar
- Maximum permissible temperature: 115 °C

Materials

- Body: ductile iron
- Disc: stainless steel
- Shaft: stainless steel 316
- Liner: EPDM: from -10 °C to +115 °C
NBR: from -10 °C to +80 °C

Design

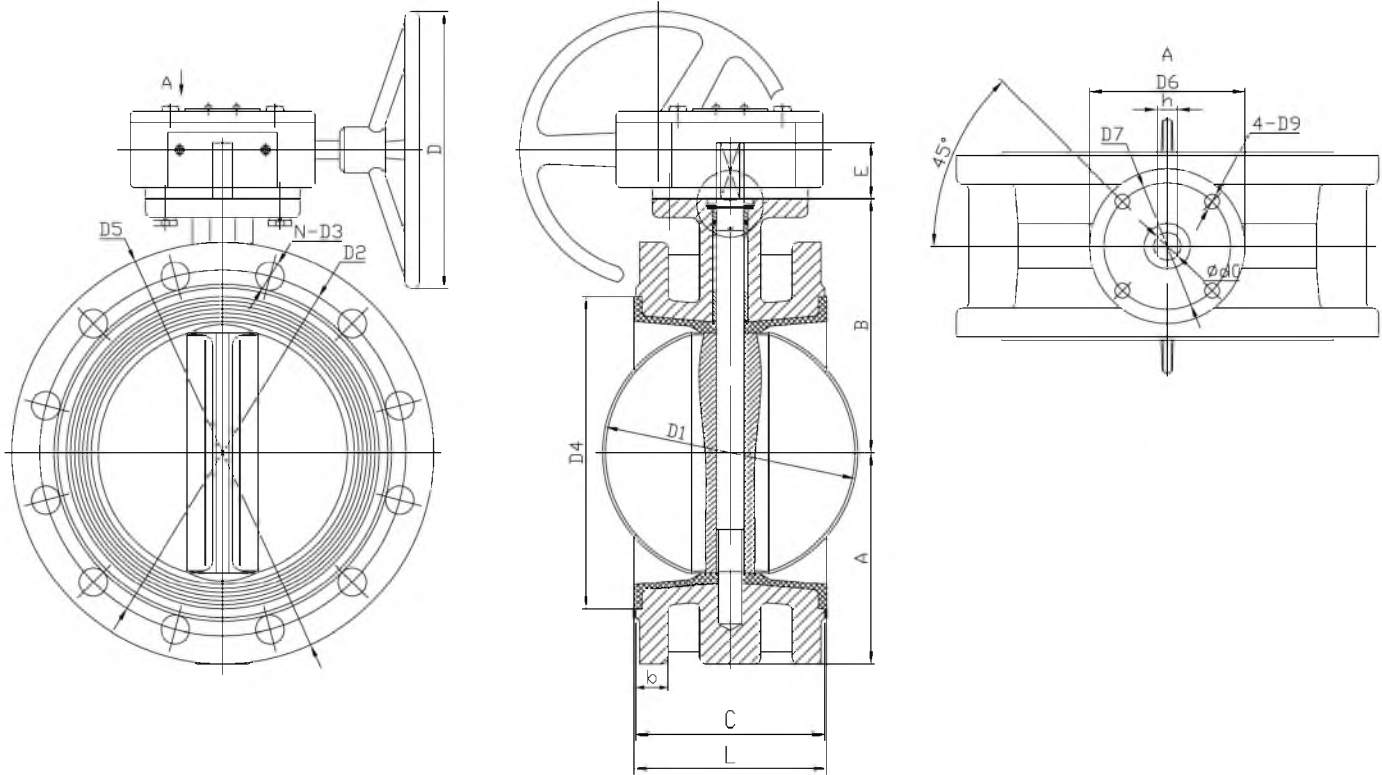
- Valve perfectly tight shut-off (no visible leakage at the naked eye) in either flow direction
- In accordance with API 598 – AWWA C504
- Flanged type body with raised faces (T7)
- Top flange to ISO 5210
- Face-to-face length to ISO 5752 EN 558 series 13 (Double flanged short) / BS 5155
- Design to BS5155 – AWWA C504
- Pressure rating PN 10/16 bar
- Line connection to EN 1092 PN 10/16
- Marking to EN 19

Standard variants

- Pneumatic actuators
- Electric actuators
- Limit switches

Other DNs, materials, variants,? Please contact us for your personal quotation

Overall dimensions



Standard Model

DN	PN	Dimensions (mm)															N	Weight (kg)								
		D1	D2	D3	D4	D5	D6	D7	D9	d0	h	A	B	C	E	L			b							
50	10/16	52.9	125	19	95	165	90	70	10	12.6	9	83	120	108	32	111	19.0	4	12.9							
65		64.5	145		114	185						93	130	112		115			14.9							
80		78.8	160		128	200						100	145	114		117			16.6							
100		104	180		150	220						114	155	127		130			19.3							
125		123.3	210	180	250	14	170	140	143	143	8	24.8														
150		155.6	240	200	285								143	190	140	143	28.2									
200		202.5	295	23	262	340	125	102	12	22.1	17	170	205	152	40	155	20.0	12	44.8							
250		250.5	350		310	395				125	102	12	28.5	22		198	235		165	40	168	22.0	64.0			
300		301.6	400		364	445				14	125	14	31.6	-		279	310		190	45	194	24.5	16	105.0		
350		333.4	460		415	505																			150	125	14	31.6	-	279	310	190	45	194	24.5	105.0
400		389.7	515	28	460	565	175	140	18	38	-	300	340	216	52/72	221	25.5	20	137.0							
450		440.7	565		510	615				175	140	18	42.9	-		345			375	222	52/72	227	25.5	190.4		
500		491.6	620		560	670				22	165	22	41.1	-		355			430	229	64/82	234	26.5	20	240.2	
600		592.5	725		31	660							780	210		165			22	50.6	-	410	500	267	70/82	272	30.0	327.7
700		10	695.0	840	34	770	895	300	254	18	63.4	-	478	560	292	66/82	299	32.5	24	417.6						
800			794.7	950		871	1015						300	254	18		63.4	-		560	640	318	66/82	325	35.0	580.0
900	864.7		1050	972		1115	28						254	18	75		-	584		665	330	118	338	37.5	28	763.0
1000	965.0		1160	37		1080									1230		254	18		85	-	657	735	410	142	418	40.0	950.0
1200	1160.6		1380	41	1270	1455	350	298	22	105	-	799	917	470	150	478	45.0	32	1560.0							

Hydraulic characteristics

DN	NPS	Flow coefficient valve in fully open position		Zeta
		Kvo	Cvo	
50	2	116.4	135	0.74
65	2 ½	189.7	220	0.79
80	3	260.3	302	0.97
100	4	517.2	600	0.60
125	5	881.0	1022	0.50
150	6	1361.2	1579	0.44
200	8	2703.4	3136	0.35
250	10	4603.4	5340	0.29
300	12	7112.1	8250	0.26
350	14	10273.3	11917	0.23
400	16	14127.6	16388	0.20
450	18	18711.2	21705	0.19
500	20	21058.6	27908	0.23
600	24	37169.0	43116	0.15
700	28	42672.4	49500	0.21
800	32	58836.2	68250	0.19
900	36	74461.2	86375	0.19
1000	40	103232.8	119750	0.15
1200	48	147623.3	171243	0.15

Operating torques *)

DN	NPS	Operating torques *) (in Nm)	
		10 bar (lubricated)	16 bar (lubricated)
50	2	17.5	17.5
65	2 ½	25.0	25.0
80	3	33.8	33.8
100	4	62.5	62.5
125	5	106.3	106.3
150	6	156.3	156.3
200	8	297.5	297.5
250	10	525.0	525.0
300	12	837.5	837.5
350	14	1217.5	1217.5
400	16	1641.3	1641.3
450	18	2243.8	2243.8
500	20	2897.5	2897.5
600	24	4658.8	4658.8
700	28	6162.5	
800	32	8113.8	
900	36	9901.3	
1000	40	16811.3	
1200	48	23646.3	

*) The safety coefficient to define the adapted actuator is included in the torque value.

Combined Butterfly/Check Valve

DUALIS

DN 500 to 1400
PN 6 up to 40 bar

Type Series Booklet



Butterfly Valves

Combined Butterfly/Check Valve

DUALIS



Main applications

- Water
- Energy
- Industry

Fluids handled

- Seawater
- Drinking water
- Brackish water
- Grey water
- Solids-laden fluids
- Corrosive fluids
- Gas

Operating data

Operating properties

Characteristic	Value
Max. permissible pressure	40 bar (depending on valve design)
Max. permissible temperature	-10 °C to +65 °C
Enclosure	IP 65 Motor: IP 55

Design details

Design

- DUALIS consists of a (centred-disc or offset-disc) butterfly valve and a (single-acting) counterweight actuator closing the valve by force of gravity.

- The counterweight actuator is mounted on the valve's top flange and directly connected to the actuating stem. It consists of the following components:
 - Mechanical section: bracket, lever arm, hydraulic cylinder, counterweights
 - Hydraulic power pack
 - Limit switch box
 - Terminal box for site connection by customer
- DUALIS combines two functions:
 - the on/off butterfly valve function required of a pump discharge valve in pumping stations
 - the check valve function required for:
 - absolutely tight shut-off of sections of piping,
 - piping protection by means of flow velocity monitoring system,
 - protection of turbines in barrages/dams.
- Please request particulars for installation in regions with seismic hazards. Other solutions may be provided.

Product benefits

- Absolutely reliable, gravity-powered closing system
- Two-speed closing action prevents surge pressures.
- Modular design
- The valve can be opened using an emergency hand pump.
- Safety locking option by manually locking the counterweight actuator
 - in open position
 - in closed position

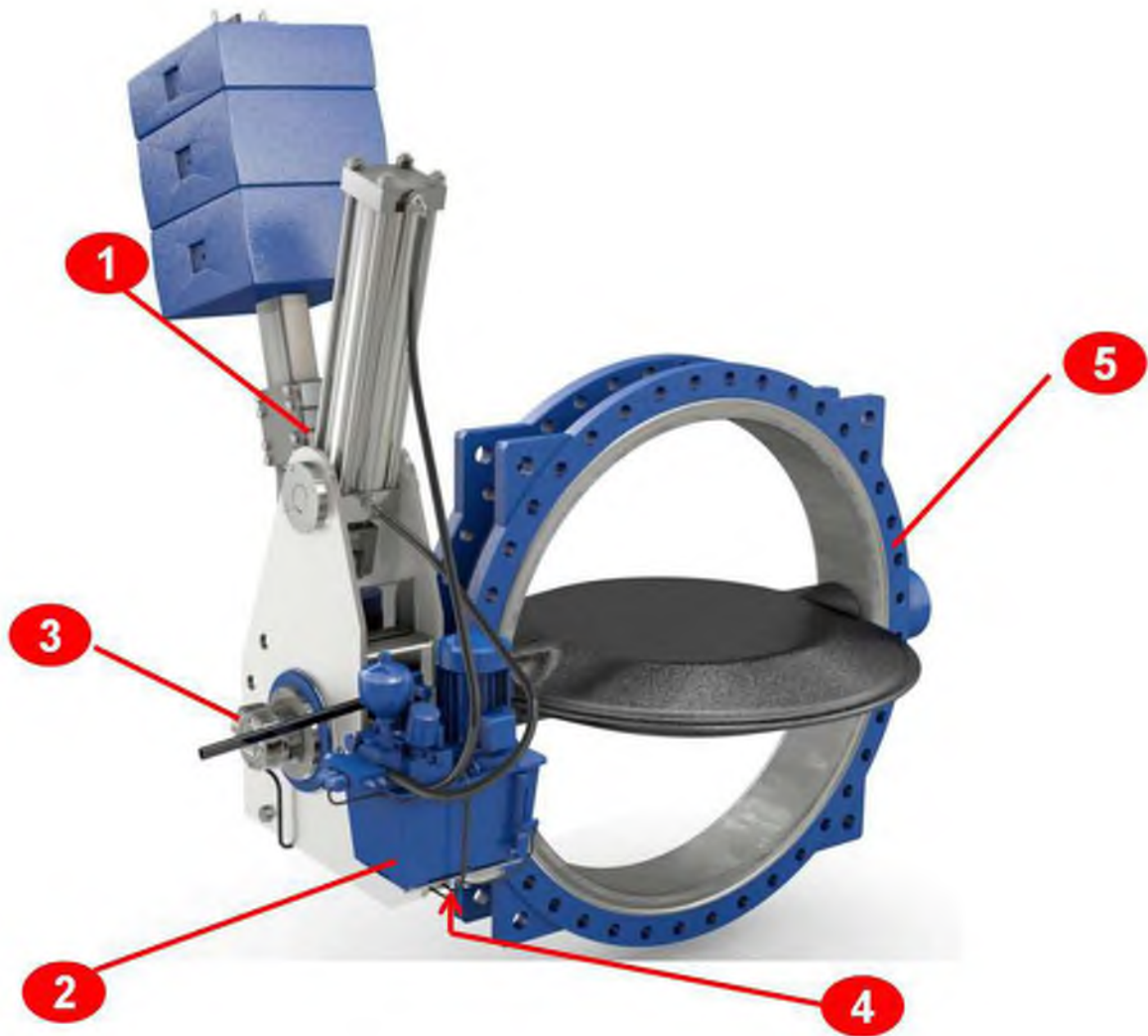
Related documents

Document	Reference No.
ISORIA 10 type series booklet	8444.1
ISORIA 16 type series booklet	8445.1
ISORIA 20 type series booklet	8446.1
ISORIA 25 type series booklet	8447.1
MAMMOUTH type series booklet	8612.12

Document	Reference No.
DANAIS type series booklet	8460.11

Also available for other KSB valves or commercial quarter-turn valves on request.

Configuration



- 1 : Counterweight
- 2 : Integrated hydraulic power pack
- 3 : Limit switch box

- 4 : Terminal box
- 5 : Butterfly valve

Illustration

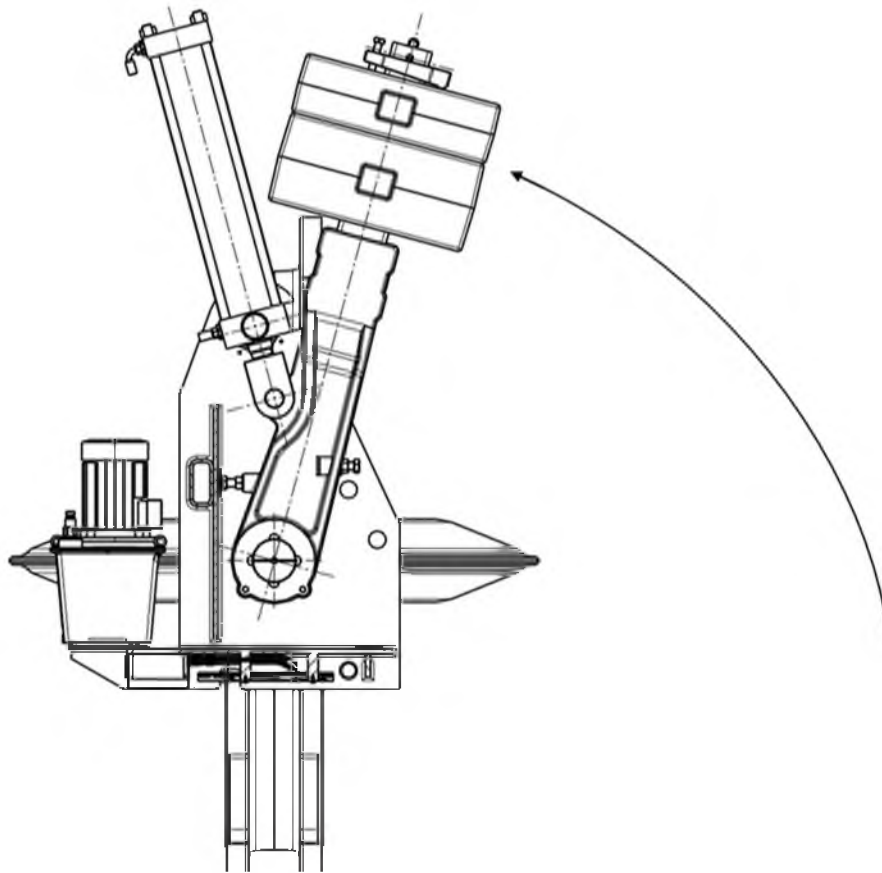
Illustration shows standard centred-disc design.

The counterweight actuator can also be mounted on offset-disc butterfly valves.

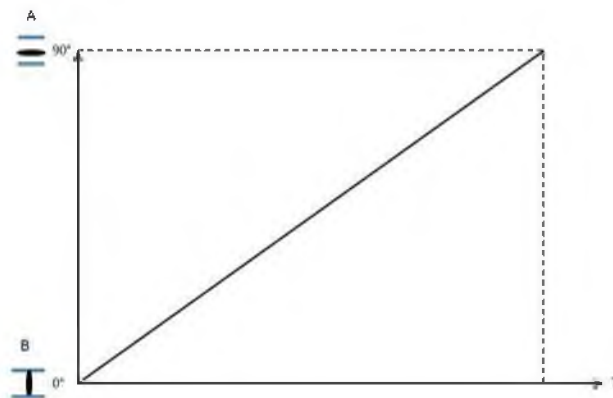
Function

Opening the valve

The valve is opened by means of a cylinder driven by the hydraulic power pack. During the opening process, the hydraulic cylinder moves the lever arm to the raised ("armed") position. When the valve is open, the cylinder rod is retracted.



The opening speed is constant as standard. It can be set by KSB or by the operator.

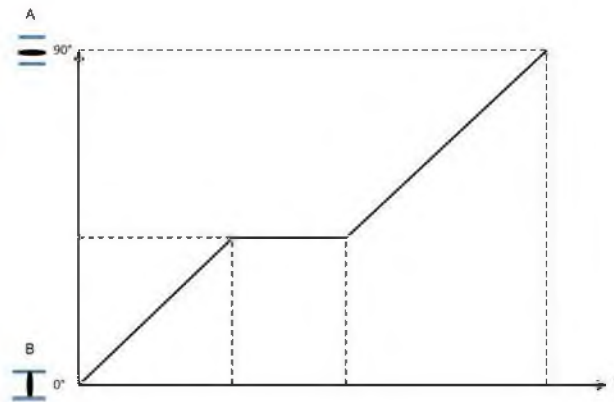


- A: Open
- B: Closed
- T: Time

Opening options

The opening action can be interrupted and resumed by the operator.

- The speed can be set by KSB or by the operator.
- Several stop-and-go cycles are possible during a single actuation.



A: Open
B: Closed
T: Time

Stop-and-go cycles are linked to the start commands for the pump in the system.

Holding in open position

To hold the valve open, the pressure inside the hydraulic cylinder needs to be monitored.

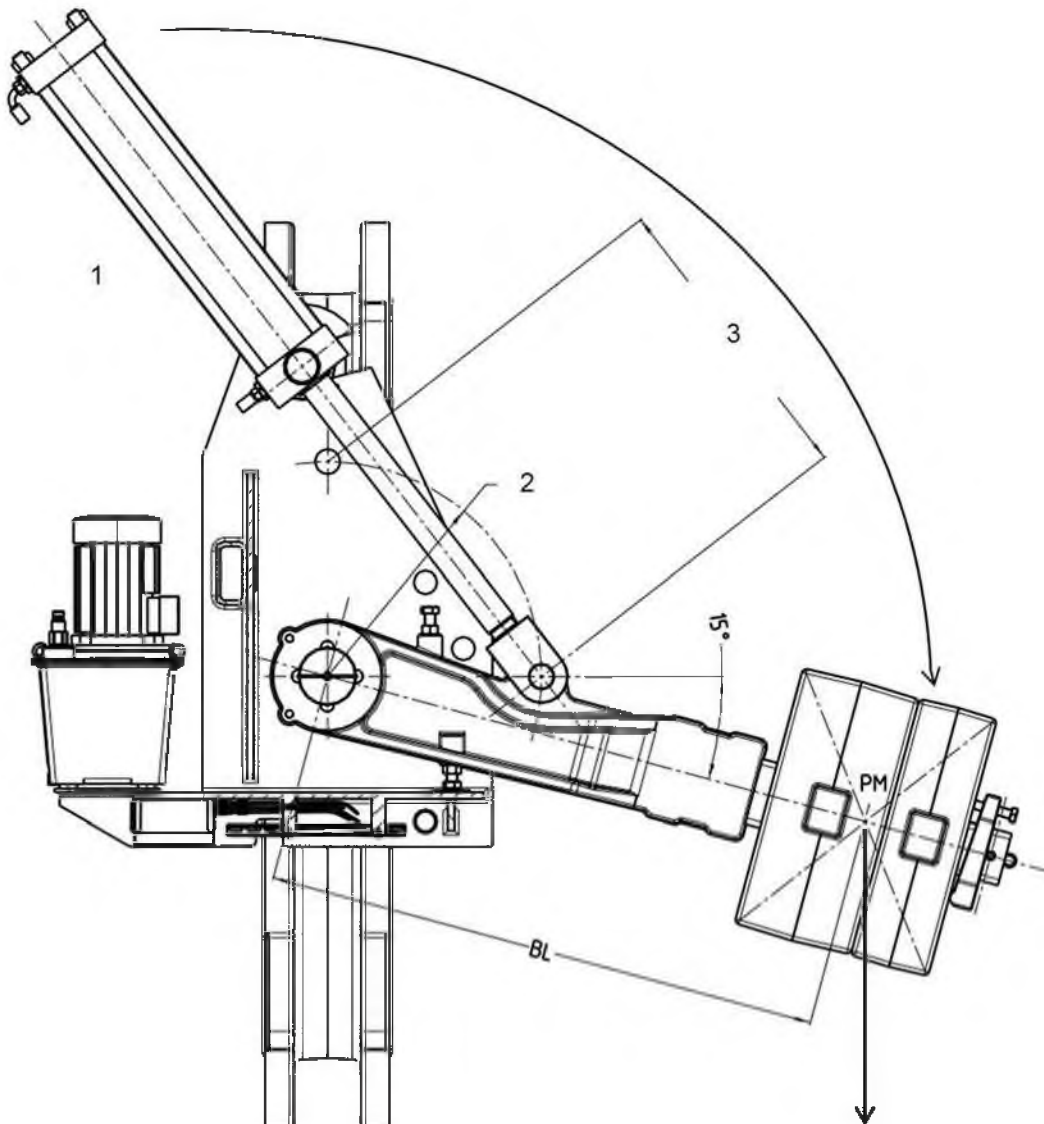
The pressure is continuously measured by a pressure sensor connected to the operator's monitoring system.

An accumulator compensates for pressure fluctuations in the system and maintains a defined minimum pressure. If the pressure drops below this limit, the hydraulic pump will re-charge the accumulator. Any pressure drop below this limit is detected by the sensor and signalled to the operator for the pump set of the hydraulic power pack to be started. The pump supplies hydraulic oil to the cylinder until the pressure required for the counterweight to be held in the raised ("armed") position has been restored.

Valve closure

The valve is closed by the counterweight being lowered either as a result of a site-supplied, process-related signal or, optionally, following a signal triggered by a power failure.

The lowering process of the counterweight is controlled until the valve is fully closed. Two-speed closing can be provided if required by the customer's process (slowing down before the valve is fully closed). When the valve is closed, the cylinder rod is in extended position.

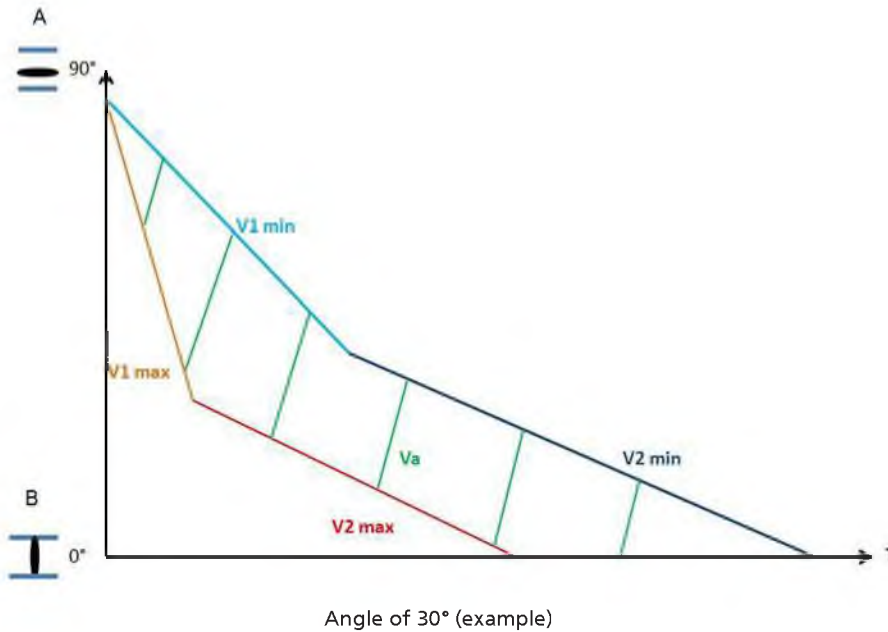


The valve is closed by the lowering of the counterweight.

- 1: Extended cylinder
- 2: Angle traversed between open and closed positions
- 3: Cylinder stroke

Closing options

Valve closure can be effected at two different speeds as required by the operator.



A: Open
B: Closed
T: Time
Va: Adjustable speed

V1 min: Minimum speed 1
V2 min: Minimum speed 2
V1 max: Maximum speed 1
V2 max: Maximum speed 2

General data of DUALIS

- Designed for a service life of 20 years
- Sound level: less than 75 dB A at a distance of 1 metre
- Cylinder to ISO 6020/2 type MT1
- Designed and manufactured in accordance with ISO 9001
- Machinery Directive 2006/42/EC (EN ISO 12100)

The complete unit meets the requirements of the applicable European directives. The electrical systems and components which meet the relevant European directives (EMC Directive, Low-voltage Directive) are CE-marked.

As a component, the valve with the complete counterweight assembly is not regarded as "completed machinery" capable of functioning autonomously in accordance with Machinery Directive EN 292-2. This directive stipulates that the CE symbol must not be used in this case, and no EC Declaration of Conformity may be issued. However, a Declaration of Incorporation will be issued for actuated valves intended for installation in other machinery.

Coating

The coating provides corrosion protection.

Scope

The following components are coated:

- The mechanical section of the counterweight assembly (bracket, lever arm, cylinder, counterweights)
- The hydraulic power pack

The entire counterweight assembly (mechanical section and hydraulic power pack) is coated in the same colour.

Coating systems

Standard industrial environment: standard two-layer system	
P30	AMERCOAT 124 zinc epoxy - 50 µm + CELLUTOP T polyurethane, grey RAL 7016 - 80 µm
EN ISO 12944 Class C3 - optional	
P61	AMERCOAT 124 zinc epoxy - 50 µm + AMERCOAT 71 TC epoxy - 50 µm + CELLUTOP T polyurethane, grey RAL 7016 - 80 µm
EN ISO 12944 Class C4 (high) - optional	
P71	AMERCOAT 124 zinc epoxy - 50 µm + AMERCOAT 400 MIO epoxy - 125 µm + CELLUTOP T polyurethane, grey RAL 7016 - 80 µm
EN ISO 12944 Class C5 (very high) - optional	
P81	AMERCOAT 124 zinc epoxy - 50 µm + AMERCOAT 71 TC .. epoxy - 50 µm + AMERLOCK 400 MIO epoxy - 125 µm CELLUTOP T polyurethane, grey RAL 7016 - 80 µm

Other coatings on request

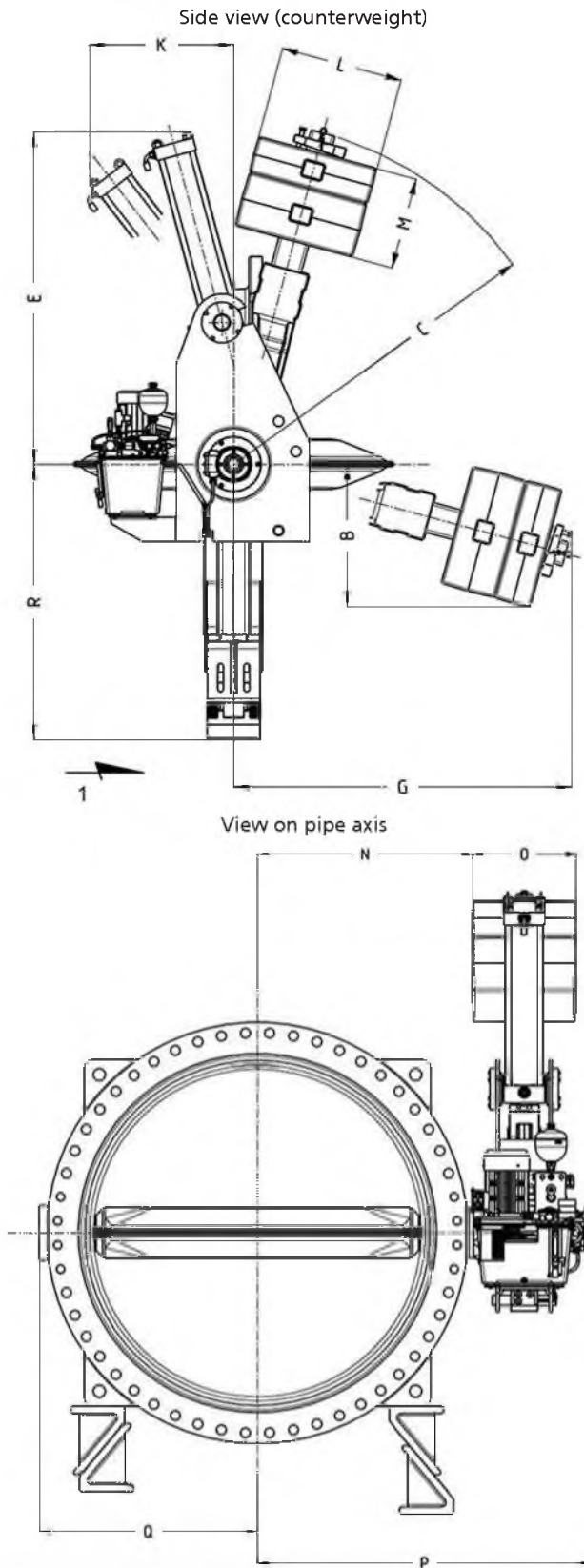
Warranty

The warranty period for components with a standard coating is one year from delivery.
For a longer warranty period, multi-layer coatings are required.

EN - ISO 12944 - Part 2 Classification of environments		
Corrosivity category of environment	Examples of typical environments in a temperate climate (informative only)	
	Exterior	Interior
C3	Urban and industrial atmospheres, moderate sulphur dioxide pollution. Coastal areas with low salinity.	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies.
C4 (high)	Industrial areas and coastal areas with moderate salinity.	Chemical plants, swimming pools, coastal ship- and boatyards.
C5-I (very high / industrial)	Industrial areas with high humidity and aggressive atmosphere.	Buildings or areas with permanent condensation and with high pollution.
C5-M (very high / marine)	Coastal and offshore areas with high salinity.	Buildings or areas with permanent condensation and with high pollution.

Dimensions

Drawing



Dimensions

DN	NPS	1)	2)	3)	B	Radius C	E	G	K	L	M	N	O	P	Q	R
ISORIA 10 / MAMMOUTH 10																
500	20	R380	2200	40	518	1186	1270	1175	560	500	180	342	400	1012	358	/
600	24	R380	2200	45	518	1186	1270	1175	560	500	180	397	400	1067	439	/
	26	R380	2200	45	518	1186	1270	1175	560	500	180	437	400	1107	451	/
700	28	R380	2200	50	518	1186	1270	1175	560	500	180	462	400	1132	482	/
	30	R380	3150	65	518	1186	1270	1175	560	500	270	492	400	1162	513	/
800	32	R380	3150	65	518	1186	1270	1175	560	500	270	517	400	1187	546	/
900	36	R380	4000	85	518	1186	1270	1175	560	500	360	567	400	1237	588	/
1000	40	R380	5300	70	592	1472	1260	1450	565	500	360	637	400	1307	646	/
	42	R380	5300	75	592	1472	1260	1450	565	500	360	655	400	1325	674	1055
1100	44	R380	5300	75	592	1472	1260	1450	565	500	360	680	400	1350	703	1076
1200	48	R380	8500	90	592	1472	1260	1450	565	500	450	730	400	1400	756	1112
	54	R480	8500	60	664	1543	1615	1520	680	600	360	877	500	1557	968	1210
1400	56	R480	8500	60	664	1543	1615	1520	680	600	360	902	500	1582	993	1235
ISORIA 16 / MAMMOUTH 16																
500	20	R380	2200	40	518	1186	1270	1175	560	500	180	342	400	1012	358	/
600	24	R380	2200	45	518	1186	1270	1175	560	500	180	397	400	1067	439	/
	26	R380	4000	65	518	1186	1270	1175	560	500	360	437	400	1107	451	/
700	28	R380	4000	70	518	1186	1270	1175	560	500	360	462	400	1132	482	/
	30	R380	4000	70	518	1186	1270	1175	560	500	360	492	400	1162	513	/
800	32	R380	4000	75	518	1186	1270	1175	560	500	360	517	400	1187	546	/
900	36	R380	5300	65	592	1472	1260	1450	565	500	360	567	400	1237	588	/
1000	40	R380	6500	75	592	1472	1260	1450	565	500	360	637	400	1307	646	/
1100	44	R480	8500	60	664	1543	1615	1520	680	600	360	752	500	1432	843	1100
ISORIA 20 / MAMMOUTH 20																
500	20	R380	2200	40	518	1186	1270	1175	560	500	180	342	400	1012	358	/
600	24	R380	3150	55	518	1186	1270	1175	560	500	270	397	400	1047	438	/
ISORIA 25 / MAMMOUTH 25																
500	20	R380	3150	50	518	1186	1270	1175	560	500	270	342	400	1012	358	/
600	24	R380	4000	65	518	1186	1270	1175	560	500	360	397	400	1047	438	/

The counterweight actuator can be adapted to any type of centred-disc or offset-disc butterfly valve made by KSB or other manufacturers.

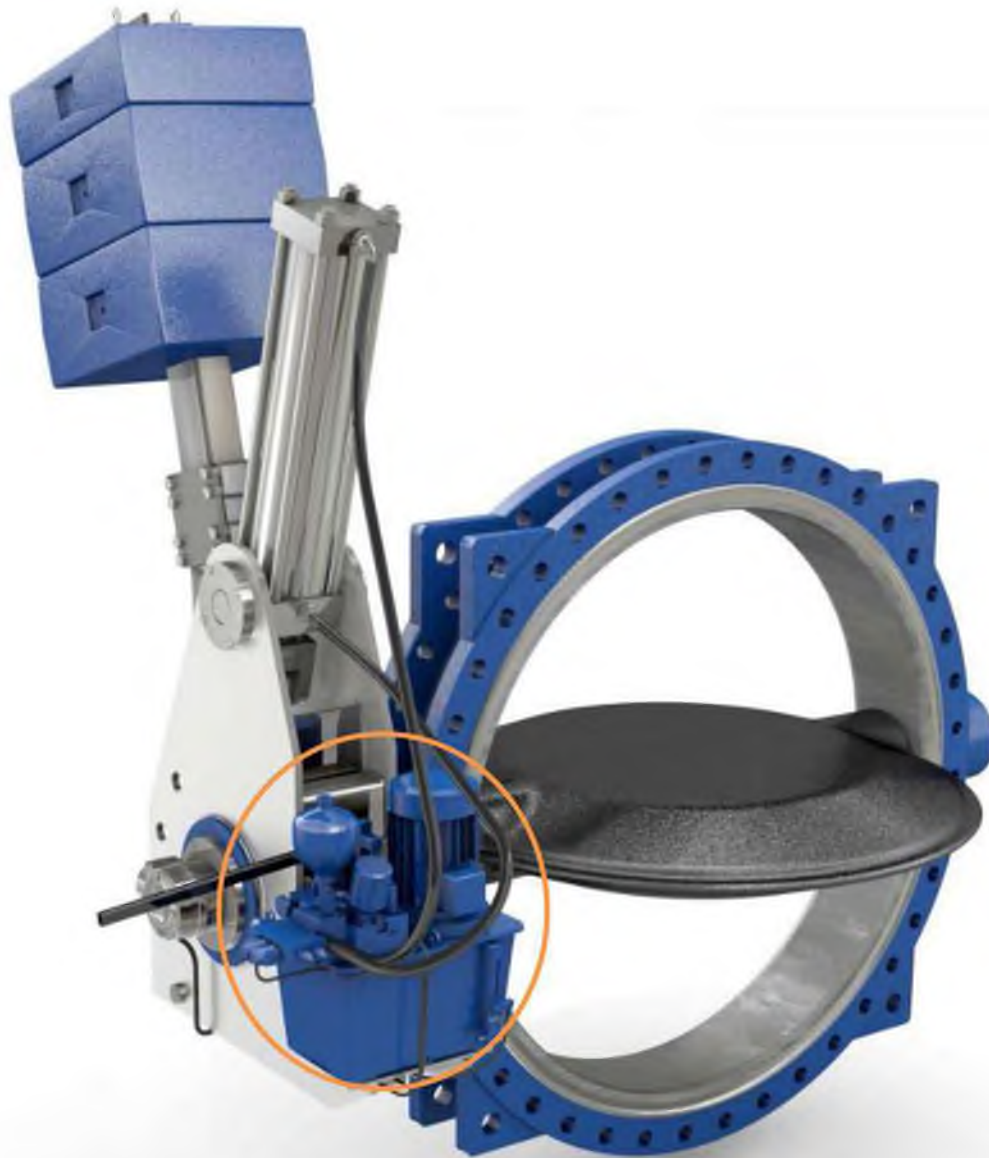
Request particulars.

-
- 1) Type of counterweight
 - 2) Torque [Nm]
 - 3) Minimum hydraulic pressure for raising the counterweight [bar]
-

Other components

Hydraulic power pack

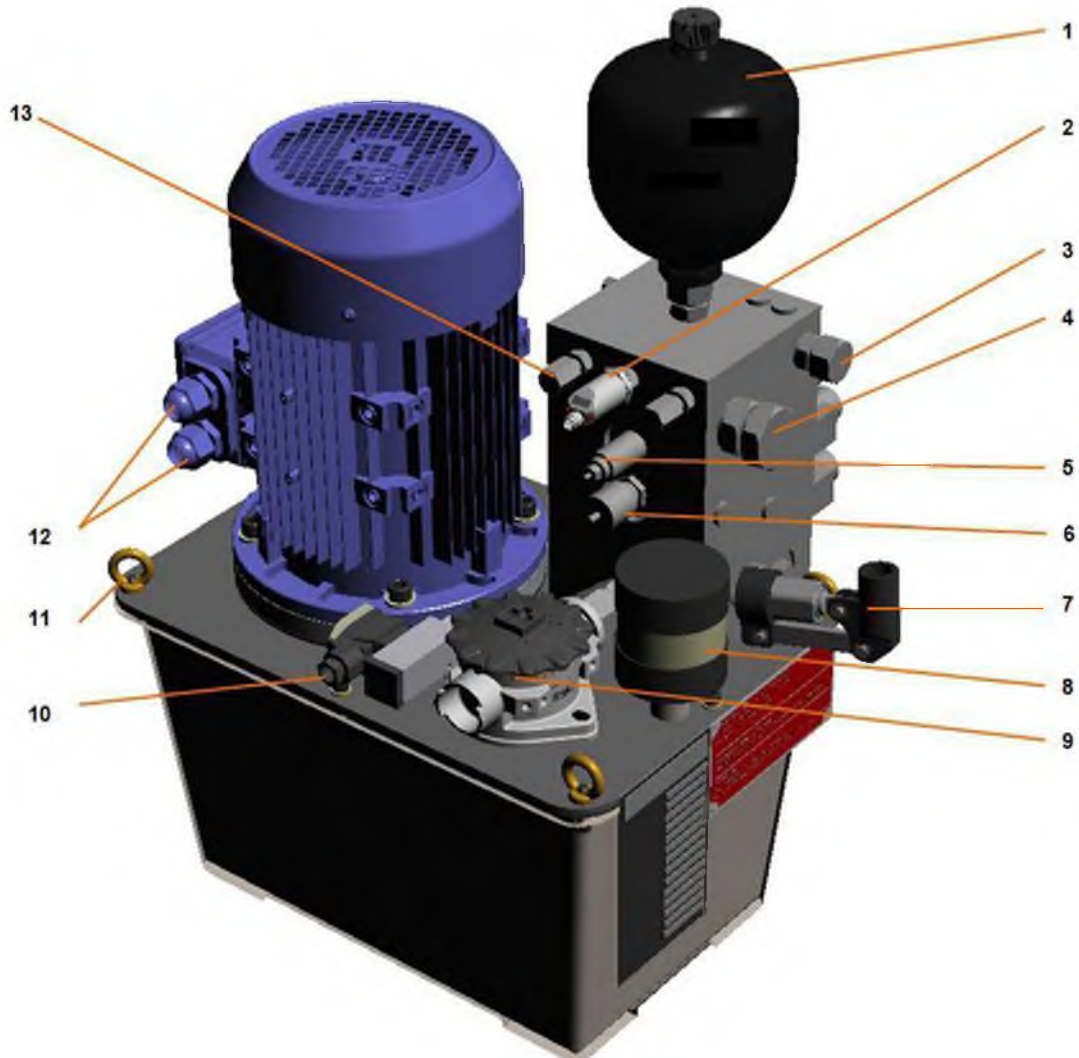
Position



Technical data of the hydraulic power pack

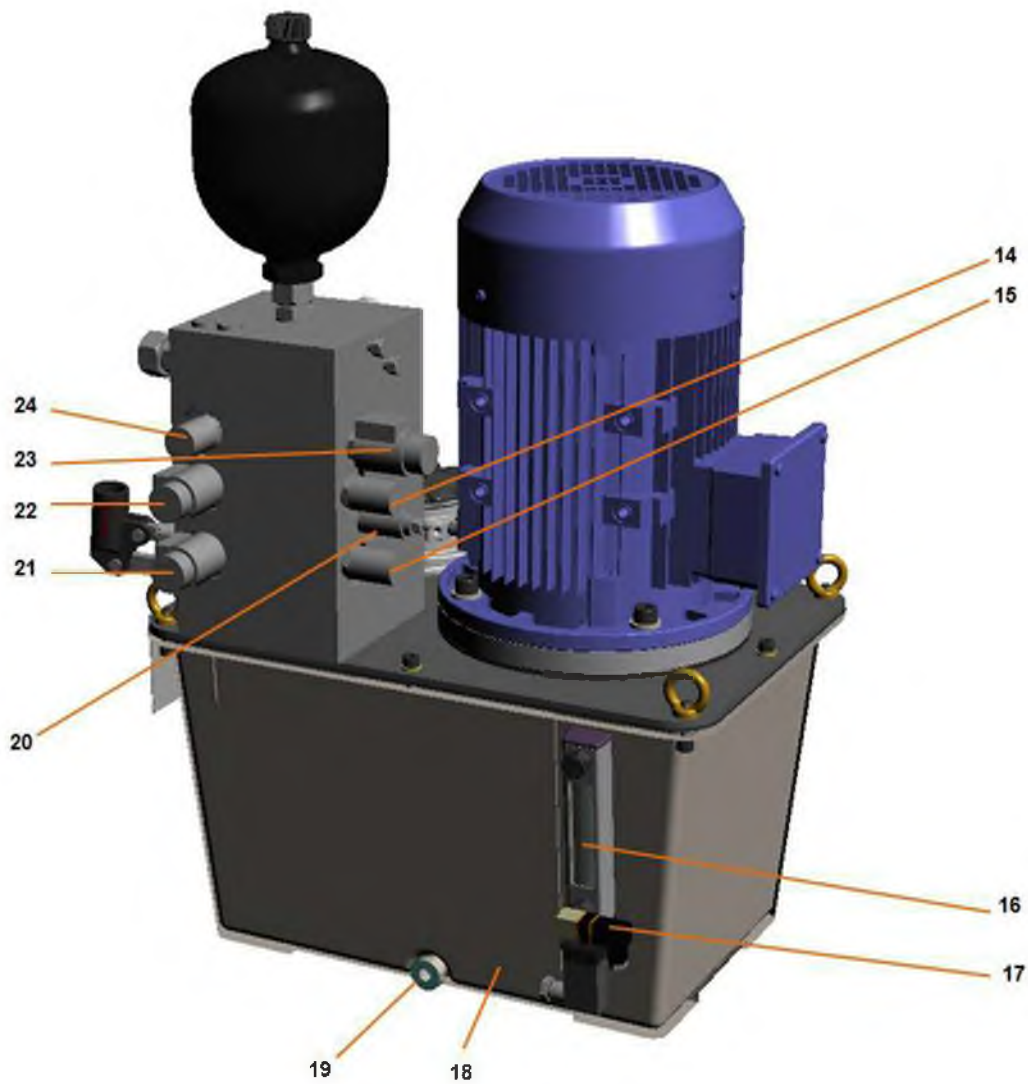
The hydraulic power pack is supplied and fitted by KSB.

3D front view with list of components



- | | | | |
|----|---|-----|-------------------------|
| 1: | Accumulator - AC.01 | 8: | Air filter - BDM.01 |
| 2: | Pressure sensor - CP.01 | 9: | Oil filter - FR.01 |
| 3: | Cylinder supply port | 10: | Clogging sensor - IC.01 |
| 4: | Cylinder return port | 11: | Suspension lug |
| 5: | Lead-sealed pressure limiter - LPCE.02 (accumulator protection) | 12: | Motor terminal strip |
| 6: | Flow limiter - LD.04 for draining the accumulator | 13: | Connection - PP.01 |
| 7: | Hand pump | | |

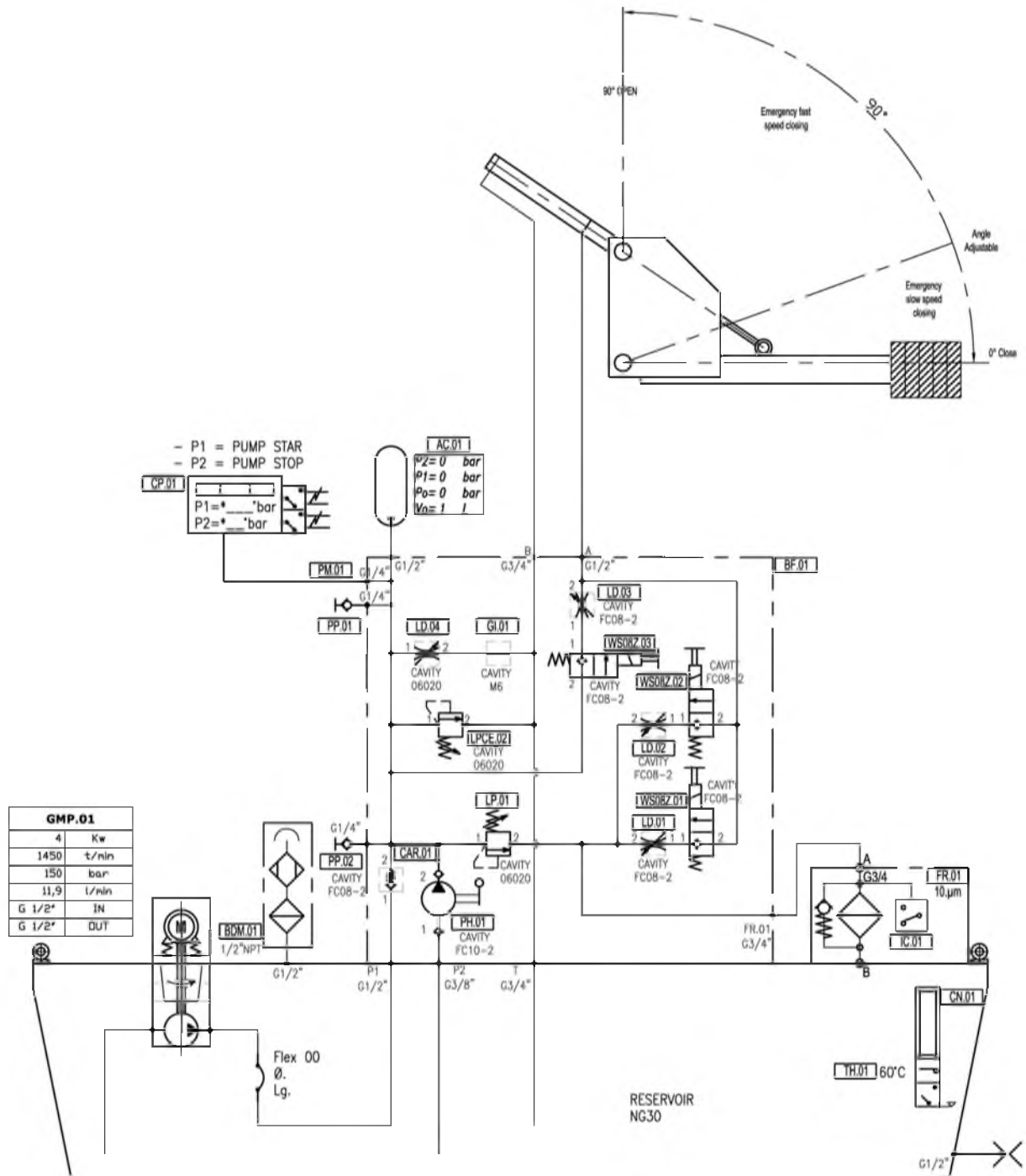
3D rear view with list of components



- 14: Flow limiter - LD.01 (closing speed)
- 15: Flow limiter - LD.02 (closing speed)
- 16: Oil level - CN.01 (contact)
- 17: Temperature sensor - TH.01
- 18: Oil reservoir
- 19: Drain plug

- 20: Pressure limiter - LP.01
- 21: Solenoid valve closure - WS08.Z02
- 22: Solenoid valve closure - WS08.Z01
- 23: Solenoid valve closure - WS08.Z03
- 24: Flow limiter - LD.03 (opening speed)

Hydraulic schematic

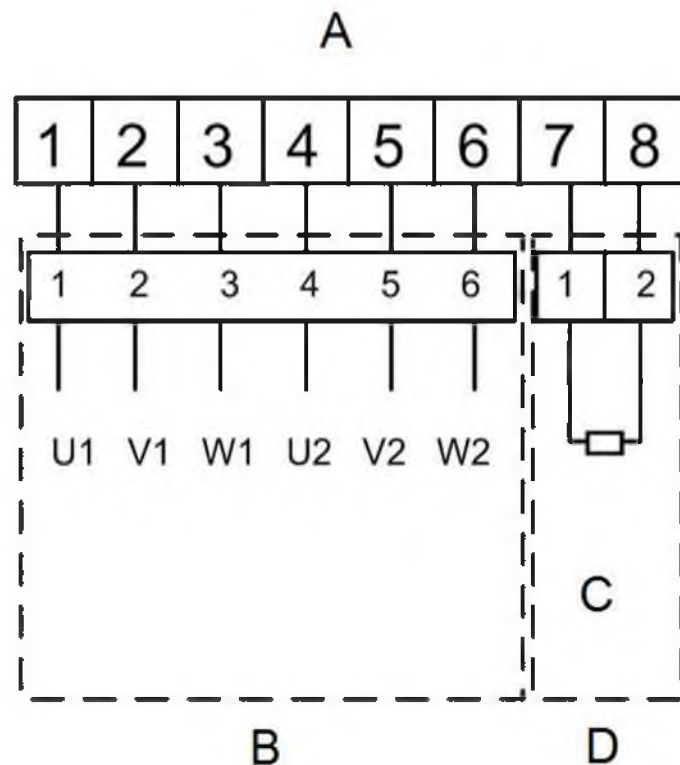


Technical data

Description	Data
Effective volume	30 litres
Reservoir material	Aluminium as standard (optional: steel)
Lid material:	Coated steel (thickness as per specification)
Maximum pressure	160 bar
Oil used	ISO VG 46
Ambient temperature range	-20 to +55 °C
Oil temperature range	+10 to +50 °C
Fluid level sensor	FSK127
Air filter mesh width	2 µm
Return filter mesh width	10 µm

Motor type	Weight	Dimensions (L x W x H)	Pump flow rate required
	[kg]	[mm]	[l/min]
0,75 kW	46,5	490 x 340 x 560	2,32
1,1 kW	49,5	490 x 340 x 580	3,6
1,5 kW	51,5	490 x 340 x 600	4,6
2,2 kW	56,5	490 x 340 x 629	6,1
3 kW	59,5	490 x 340 x 629	9,1
4 kW	64,5	490 x 340 x 647	11,9

Wiring diagram



- A: Motor unit
- B: 6-pole motor
- C: Heating
- D: Optional

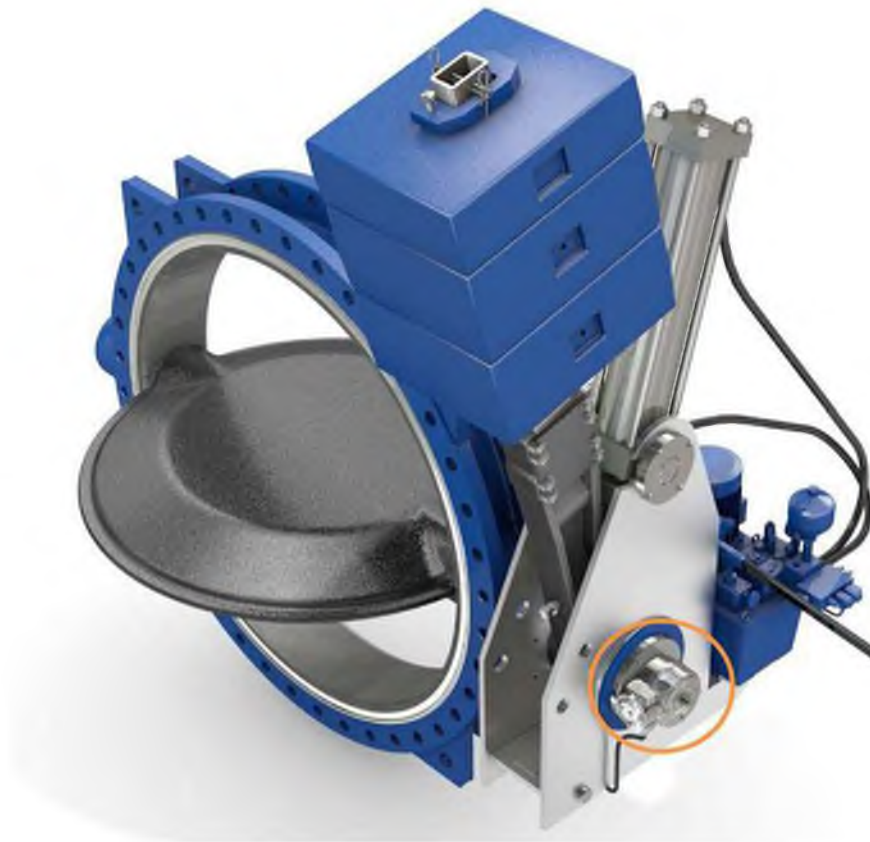
Hydraulic power pack control

Electrical or mechanical control	WS08Z.03	WS08Z.02	WS08Z.01
Opening	ON	OFF	OFF
Stop-and-go mode	OFF	OFF	OFF
Normal closing, high speed	OFF	OFF	ON
Normal closing, low speed	OFF	ON	OFF

Setting the speed		Component	Clockwise	Anti-clockwise
Setting of low speed, normal closing	SD08-01 C-N-V	LD.02	-	+
Setting of high speed, normal closing	SD08-01 C-N-V	LD.01	-	+
Setting of opening speed	SD08-01 C-N-V	LD.03	-	+

AMTROBOX limit switch box

Position



Technical data

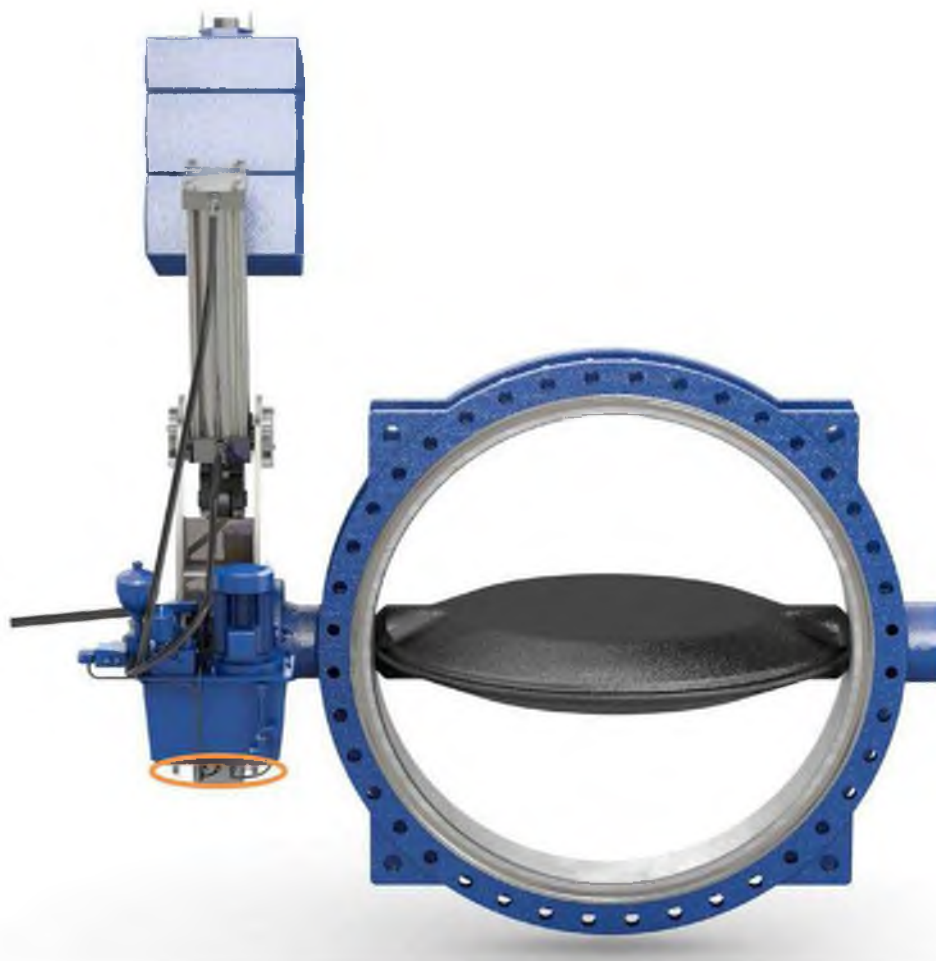
- Housing made of cast iron with anti-corrosive coating
- Position indicator function:
 - Open or closed positions indicated by means of electric limit switches or proximity sensors
 - Inductive proximity sensors (1/Open and 1/Closed, one intermediate position possible on request)
 - Actual-position feedback, 4-20 mA, passive - 2-wire system (optional)
- Housing enclosure: IP 68

For more information refer to KSB type series booklet, reference No. 8524.11.



Terminal box

Position

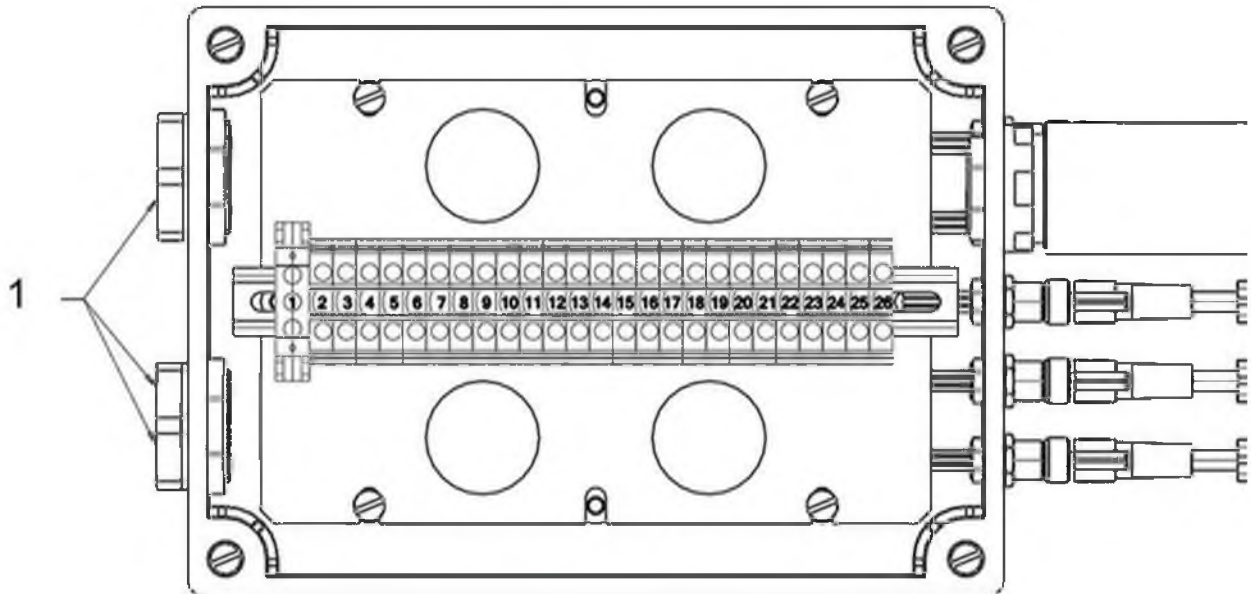


Technical data

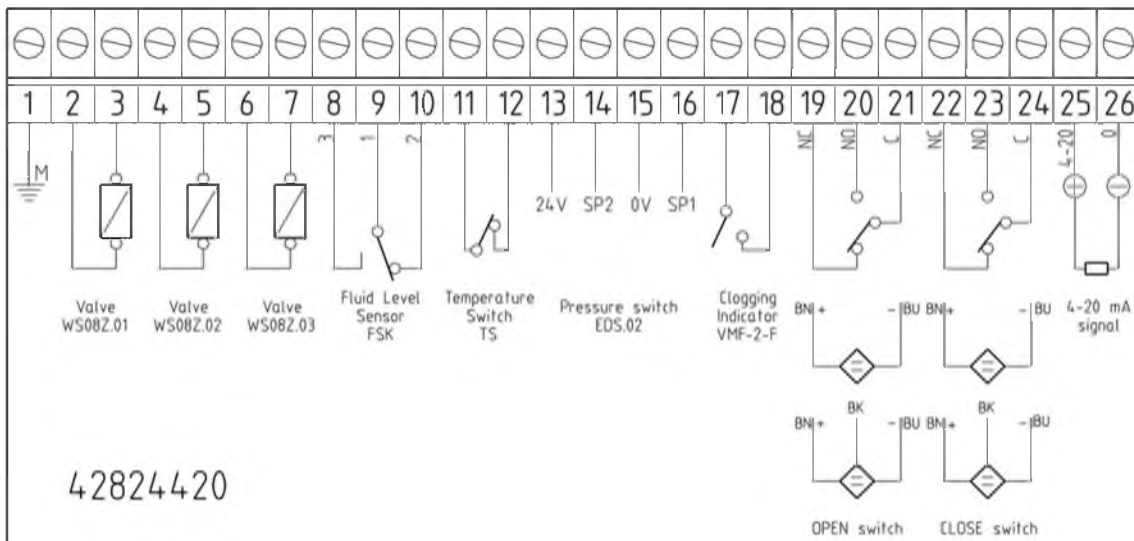
- Plastic housing: IP 67 to EN 60529
- Customer-supplied connection: 3 x ISO M25, thread pitch 1.5
- Supplied with 3 plugs (IP 67) as standard
- Connection of centralised instrumentation as shown in schematic below
- Cable diameter for connection to terminal strip: 0.2 to 4 mm²



Connection to terminal strip



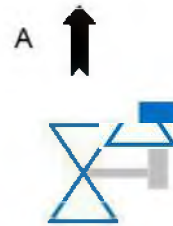
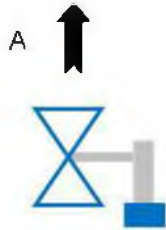
1 Customer-supplied connection: 3 x ISO M25, thread pitch 1.5



Variants

Options

- Centralised monitoring and programming via PLC
- Version with tropicalised motor for humid environments
- Application-specific coating
- KSB also supplies an electrical control cabinet tailored to the customer's requirements (on request).
- DUALIS can be installed in the piping in four installation positions:



Counterweight mounted on the right (when looking in the flow direction) and dropping in anti-clockwise direction

Counterweight mounted on the right (when looking in the flow direction) and dropping in clockwise direction



Counterweight mounted on the left (when looking in the flow direction) and dropping in anti-clockwise direction

Counterweight mounted on the left (when looking in the flow direction) and dropping in clockwise direction

A: Flow direction

Specifications required for enquiries/orders

Recommendations

- DUALIS is designed for fail-closed operation as standard, but it can also be used in fail-open mode if required for safety reasons (on request).
- The valve must always be installed with the stem in the horizontal position to ensure the perfect function of the unit.
- Observe all installation instructions supplied.
- After installation in the piping has been completed, a protective cage must be fitted around the counterweight assembly in order to protect the operators and users.

This guard is not included in KSB's standard scope of supply.

Torque / top flange / stem depending on DN and PN

ISORIA

DN	NPS	Pressure				
		6 bar	10 bar	16 bar	20 bar	25 bar
500	20	V hyd < 5.1 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 60 mm	V hyd < 5.1 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 60 mm	V hyd < 5.1 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 60 mm	V hyd < 5.1 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 60 mm	V hyd < 5.6 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 60 mm
600	24	V hyd < 3.85 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 65 mm	V hyd < 3.85 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 65 mm	V hyd < 3.1 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 65 mm	V hyd < 3.9 m/s Torque: 3150 mdaN Flange: F16 Stem Ø: 75 mm	V hyd < 4.2 m/s Torque: 4000 mdaN Flange: F16 Stem Ø: 75 mm
650	26	V hyd < 3.2 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 70 mm	V hyd < 3.2 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 70 mm	V hyd < 5.0 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 70 mm	/	/
700	28	V hyd < 3.25 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 70 mm	V hyd < 3.25 m/s Torque: 2200 mdaN Flange: F16 Stem Ø: 70 mm	V hyd < 4.7 m/s Torque: 4000 mdaN Flange: F16 Stem Ø: 70 mm	/	/
750	30	V hyd < 2.8 m/s Torque: 3150 mdaN Flange: F16 Stem Ø: 80 mm	V hyd < 2.8 m/s Torque: 3150 mdaN Flange: F16 Stem Ø: 80 mm	V hyd < 3.8 m/s Torque: 4000 mdaN Flange: F16 Stem Ø: 80 mm	/	/
800	32	V hyd < 2.8 m/s Torque: 3150 mdaN Flange: F16 Stem Ø: 80 mm	V hyd < 2.8 m/s Torque: 3150 mdaN Flange: F16 Stem Ø: 80 mm	V hyd < 3.35 m/s Torque: 4000 mdaN Flange: F16 Stem Ø: 80 mm	/	/
900	36	V hyd < 2.6 m/s Torque: 4000 mdaN Flange: F25 Stem Ø: 90 mm	V hyd < 2.6 m/s Torque: 4000 mdaN Flange: F25 Stem Ø: 90 mm	V hyd < 2.95 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 90 mm	/	/
1000	40	V hyd < 2.25 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 2.25 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 2.5 m/s Torque: 6500 mdaN Flange: F25 Stem Ø: 100 mm	/	/

V hyd = max. fluid velocity in m/s
Please contact us for higher flow velocities.
Please contact us for higher pressures (up to 40 bar).

MAMMOUTH

DN	NPS	Pressure				
		6 bar	10 bar	16 bar	20 bar	25 bar
1050	42	V hyd < 2.3 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 2.3 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	/	/	/
1100	44	V hyd < 2.1 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 2.1 m/s Torque: 5300 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 1.75 m/s Torque: 9600 mdaN Flange: F30 Stem Ø: 140 mm	/	/
1200	48	V hyd < 2.0 m/s Torque: 6500 mdaN Flange: F25 Stem Ø: 100 mm	V hyd < 2.0 m/s Torque: 6500 mdaN Flange: F25 Stem Ø: 100 mm	/	/	/
1300	52	/	/	/	/	/
1350	54	V hyd < 1.35 m/s Torque: 8500 mdaN Flange: F30 Stem Ø: 140 mm	V hyd < 1.35 m/s Torque: 8500 mdaN Flange: F30 Stem Ø: 140 mm	/	/	/
1400	56	V hyd < 1.2 m/s Torque: 8500 mdaN Flange: F30 Stem Ø: 140 mm	V hyd < 1.2 m/s Torque: 8500 mdaN Flange: F30 Stem Ø: 140 mm	/	/	/

V hyd = max. fluid velocity in m/s

Please contact us for higher flow velocities.

Please contact us for higher pressures (up to 40 bar).



The actuator selection for lubricated medium proposed is defined for the maximum fluid velocity.
According to the working conditions and the hydraulic characteristics, upper fluid velocities can be admitted, therefore other actuator selection can be proposed: please consult us.

Le choix de l'actionneur en milieu lubrifié est donné à titre d'exemple pour les vitesses maximales de référence indiquées du fluide véhiculé dans le robinet.

En fonction des conditions de service et des caractéristiques hydrauliques du circuit, des vitesses supérieures peuvent être admises et donc un autre choix de l'actionneur peut être proposé : nous consulter.

Die folgende Antriebsauswahl gilt beispielhaft für Absperrklappen in flüssigen Medien für die angegebenen maximalen Strömungsgeschwindigkeiten.

Abhängig von den Betriebsbedingungen und den hydraulischen Kenndaten sind höhere Strömungsgeschwindigkeiten und weitere Antriebszuordnungen möglich. Bitte Rücksprache halten.

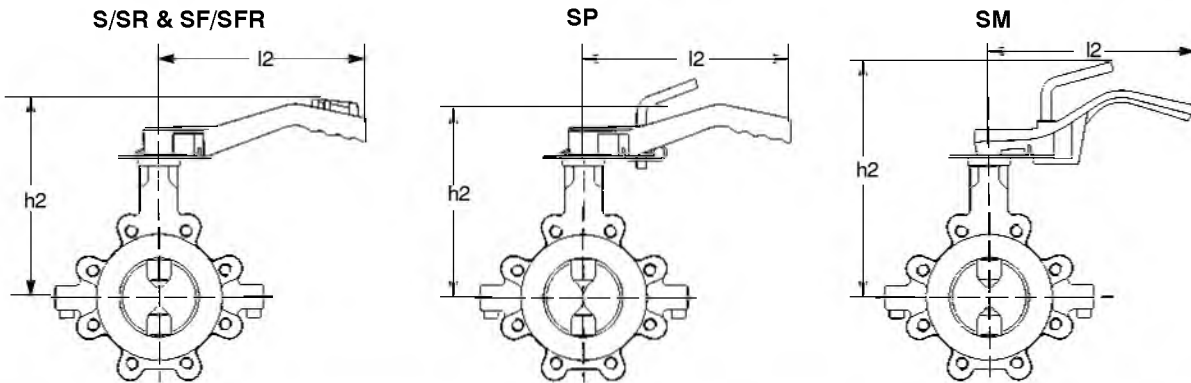
CE

Manual control - Handles
Commande manuelle - Poignées
Manuelle Antriebe - Handhebel

DN	NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	Mounting plate <i>Embase</i> Kopfflansch nach ISO 5211	Handles <i>Poignées</i> Handhebel
40	1 1/2	5,0	F05	S/SR (180) S/SR/SM/SP/SF/SFR (260)
50	2	5,0	F05	
65	2 1/2	5,0	F05	
80	3	5,0	F05	S/SR/SM/SP/SF/SFR (260)
100	4	5,0	F05	
125	5	5,0	F05	S/SR/SM/SP/SF/SFR (330)
150	6	5,0	F07	
200	8	5,0	F07	
				SM (530)

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

Handles • *Poignées* • Handhebel



DN	NPS	l2	h2	Weight* <i>Poids*</i> Gewicht*	l2	h2	Weight* <i>Poids*</i> Gewicht*
				S/SR	SF/SFR		
40	1 1/2	180	180	0,5	260	200	1,4
50	2		190			210	
65	2 1/2		200			220	
80	3	260	235	0,6	260	235	1,8
100	4		250			250	
125	5	330	280	0,7	330	280	1,8
150	6		295			325	
				SP	SM		
40	1 1/2	260	193	0,7	260	207	1,3
50	2		203			217	
65	2 1/2		213			227	
80	3		228			242	
100	4	330	243	0,8	330	257	1,6
125	5		277			288	
150	6		292			292	
200	8				530	340	3,3

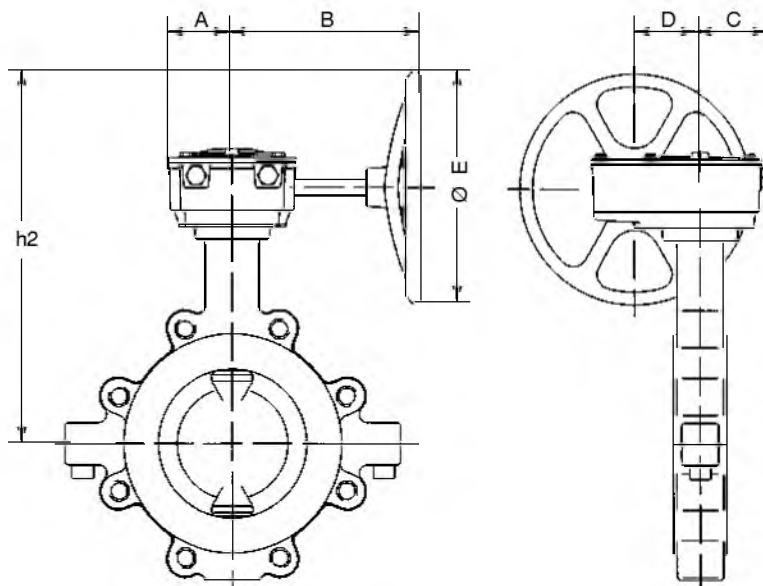
* The indicated weights are those of the handle • *Les poids indiqués sont ceux de la poignée seule* • Gewichte gelten nur für Handhebel.

Manual control - MN and MR reducers
Commande manuelle - Démultiplicateurs MN et MR
Manuelle Antriebe - Getriebe MN und MR

DN	NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	Reducers <i>Actionneurs</i> Getriebe	
			MN	MR
40	1 ½	5,0	MN 12	MR 25
50	2	5,0		
65	2 ½	5,0		
80	3	5,0		
100	4	5,0		
125	5	5,0	MN 25	MR 50
150	6	5,0		
200	8	5,0		
250	10	5,0	MN 40	MR 100
300	12	5,0		
350	14	5,0	MR 200	MR 200
400	16	5,0		
450	18	5,0		
500	20	5,0	MR 200	MR 200
600	24	5,0		

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

MN 12 - 80
MR 25 - 200



Manual control - MN and MR reducers
Commande manuelle - Démultiplicateurs MN et MR
Manuelle Antriebe - Getriebe MN und MR

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

DN	NPS	Type Type Typ	MN					h2	Weight* Poids* Gewicht*
			A	B	C	D	ØE		
40	1 ½	MN 12	49	135	42	40	140	223	1,6
50	2							233	
65	2 ½							243	
80	3							258	
100	4							273	
125	5	MN 25	64	202	60	50	225	339	2,3
150	6	354							
200	8	384							
250	10	MN 40	70	225	60	60	225	418	3,4
300	12							453	

DN	NPS	Type Type Typ	MR					h2	Weight* Poids* Gewicht*
			A	B	C	D	ØE		
40	1 ½	MR 25	62	184	66	64	225	276	7,0
50	2							286	
65	2 ½							296	
80	3							311	
100	4							326	
125	5							346	
150	6							361	
200	8							391	
250	10	MR 50	74	184	77	76	225	438	10,0
300	12							473	
350	14	MR 100	86	233	88	88	350	586	15,0
400	16							611	
450	18							661	
500	20	MR 200	120	270	108	117	350	698	24,0
600	24							753	

* The indicated weights are those of the reducer • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe.

ACTELEC 1/4 turn electric actuators Bernard (Deufra)
Actionneurs électriques 1/4 tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

DN	NPS	Maximum fluid velocity Vitesse maximale de référence Strömungsgeschwindigkeit (m/s)	On/off function Fonction tout ou rien Absperrfunktion	Throttling duties Fonction régulation Regelfunktion
40	1 1/2	5,0	OA3 / OA6	OAP
50	2	5,0		
65	2 1/2	5,0		
80	3	5,0		
100	4	5,0		
125	5	5,0	OA6	
150	6	5,0	OA15	OA15
200	8	5,0	AS25	ASP
250	10	5,0	AS50	AS50
300	12	5,0		
350	14	5,0	AS80	BS100
400	16	5,0	BS100	
450	18	5,0		

Main electric equipments - On-off function
Principaux équipements électriques - Fonction tout ou rien
Standardausführung - Absperrfunktion

Type • Type • Typ	OA3	OA6	OA15	AS18	AS25	AS50	AS80	BS100	
Operating times in seconds Temps de manœuvre en secondes Stellzeiten in Sekunden	Standard	6	6	15	5	10	30	30	60
	Option		25		60	60			
Opening and closing limit switches Contacts fin de course sur ouverture et fermeture Endlagenschalter Auf / Zu	Standard								
Mechanical adjustable travel stops Butées mécaniques de fin de course réglables Verstellbare Endanschläge	Standard								
Opening and closing torque switches Limiteurs de couple sur ouverture et fermeture Drehmomentschaltung für beide Laufrichtungen				Standard					
Heating resistance 6W Résistance chauffante 6W Heizwiderstand 6W	Standard								

Main electric equipments - Throttling duties
Principaux équipements électriques - Fonction régulation
Standardausführung - Regelfunktion

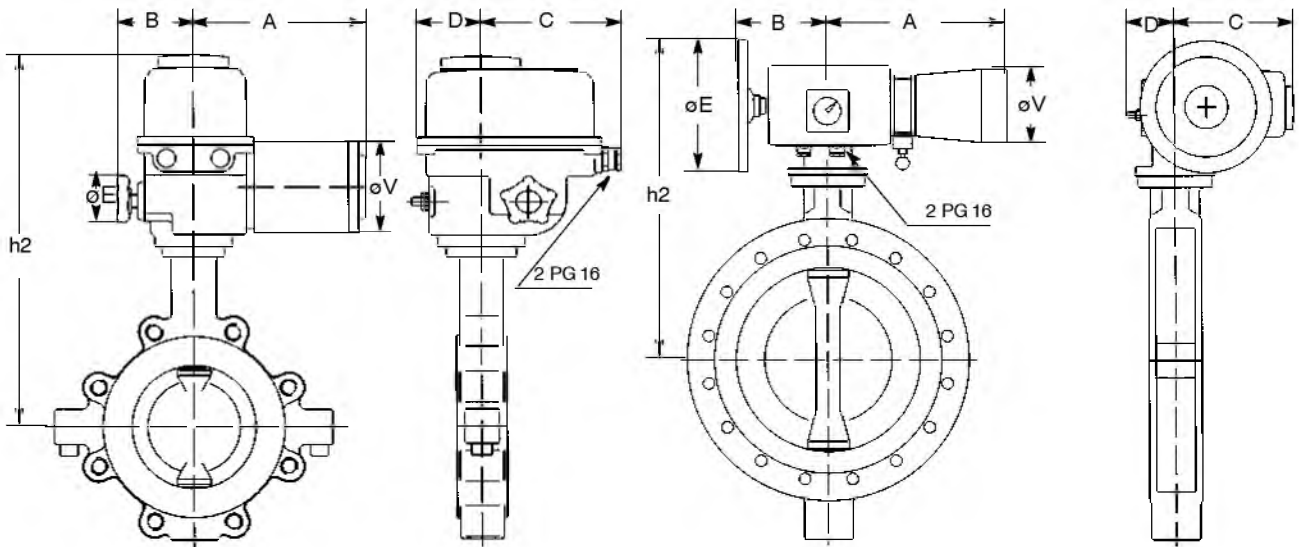
Type • Type • Typ	OAP	OA15	ASP	AS50	BS100
Operating time in seconds Temps de manœuvre en secondes Stellzeiten in Sekunden	60	25	60	60	60
Opening and closing limit switches Contacts fin de course sur ouverture et fermeture Endlagenschalter Auf / Zu	Standard				
Mechanical adjustable travel stops Butées mécaniques de fin de course réglables Verstellbare Endanschläge	Standard				
Opening and closing torque switches Limiteurs de couple sur ouverture et fermeture Drehmomentschaltung für beide Laufrichtungen			Standard		
Heating resistance 6W Résistance chauffante 6W Heizwiderstand 6W	Standard				

ACTELEC ¼ turn electric actuators Bernard (Deufra)
Actionneurs électriques ¼ tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

OA3, OA6, OAP & OA15

AS18, AS25, ASP, AS50, AS80 & BS100



DN	NPS	Type Type Typ	On/off function Fonction tout ou rien Absperrfunktion							h2	Weight* Poids* Gewicht*
			A	B	C	D	E	V			
40	1 ½	OA3	148	90	145	65	60	100	341	5,0	
50	2								351		
65	2 ½								361		
80	3								376		
40	1 ½	OA6	200	90	145	65	60	106	349	5,7	
50	2								359		
65	2 ½								364		
80	3								384		
100	4								399		
125	5	419									
150	6	OA15	260	112	145	65	100	106	434	7,5	
200	8	AS25	312	187	226	89	165	139	417	18,0	
250	10	AS50	340	187	226	89	250	139	452	18,0	
300	12								487		
350	14	AS80	340	187	226	89	250	139	557	20,0	
400	16	BS100	392	187	284	134	250	139	541	26,0	
450	18								591		

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

ACTELEC 1/4 turn electric actuators Bernard (Deufra)
Actionneurs électriques 1/4 tour ACTELEC Bernard (Deufra)
Elektrische Antriebe ACTELEC Bernard (Deufra)

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DN	NPS	Throttling duty Fonction régulation Regelfunktion								Weight* Poids* Gewicht*
		Type Type Typ	A	B	C	D	E	V	h2	
40	1 1/2	OAP	200	90	145	65	60	106	349	7,2
50	2								359	
65	2 1/2								369	
80	3								384	
100	4								399	
125	5								419	
150	6	OA15	260	112	145	65	100	106	434	7,5
200	8	ASP	312	187	226	89	165	139	417	16,0
250	10	AS50	340	187	226	89	250	139	452	18,0
300	12								487	
350	14	BS100	392	187	284	134	250	139	516	26,0
400	16								541	

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

ACTELEC 1/4 turn electric actuators Auma
Actionneurs électriques 1/4 tour ACTELEC Auma
Elektrische Antriebe ACTELEC Auma

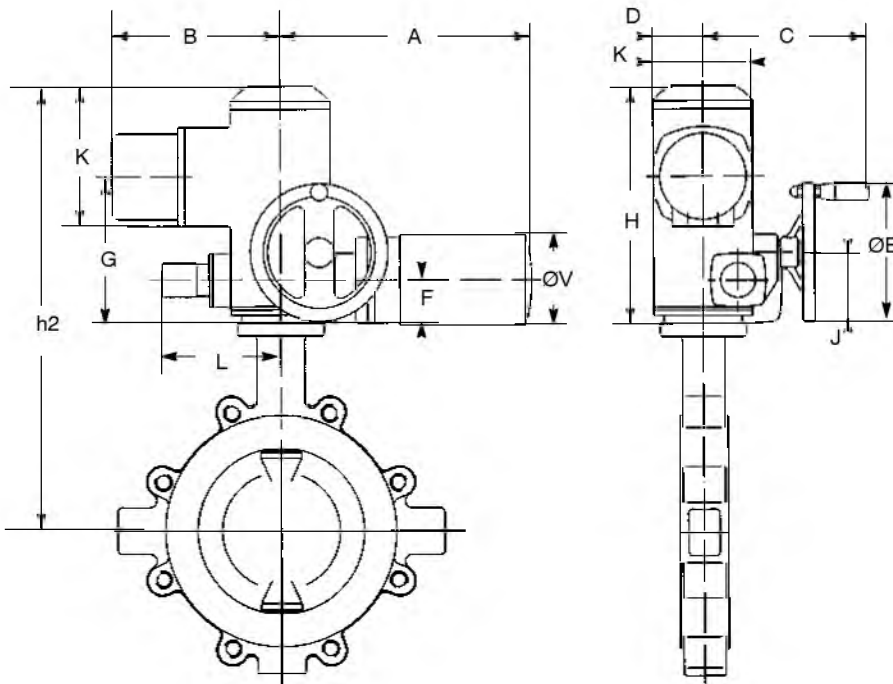
DN	NPS	Maximum fluid velocity Vitesse maximale de référence Strömungsgeschwindigkeit (m/s)	Actuators Actionneurs Antrieb
40	1 1/2	5,0	SG 05.1
50	2	5,0	
65	2 1/2	5,0	
80	3	5,0	
100	4	5,0	
125	5	5,0	
150	6	5,0	SG 07.1
200	8	5,0	
250	10	5,0	
300	12	5,0	SG 10.1
350	14	5,0	SG 12.1
400	16	5,0	
450	18	5,0	

Operating times
Temps de manœuvre
Stellzeiten

Type • Type • Typ		SG 05.1	SG 07.1	SG 10.1	SG 12.1
Operating times Temps de manœuvre Stellzeiten in Sekunden	Standard	22 s	22 s	32 s	63 s
	Option	8/11/16 s	8/11/16/32 s	16/22/45/63 s	22/32/45 s

ACTELEC 1/4 turn electric actuators Auma
Actionneurs électriques 1/4 tour ACTELEC Auma
Elektrische Antriebe ACTELEC Auma

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)



DN	NPS	Type Type Typ	A	B	C	D	E	F	G	H	J	K	L	V	h2	Weight* Poids* Gewicht*
40	1 1/2	SG 05.1	291	195	191	58	160	50	170	275	82	115	137	105	400	19,0
50	2														410	
65	2 1/2														420	
80	3														435	
100	4														450	
125	5														470	
150	6	485														
200	8	SG 07.1	291	195	191	58	160	50	170	275	82	115	137	105	515	19,0
250	10														550	
300	12	SG 10.1	301	205	216	75	160	56	170	291	88	115	172	105	601	25,0
350	14	SG 12.1	301	205	233	75	160	70	192	313	102	115	172	105	662	29,0
400	16														687	
450	18														737	

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

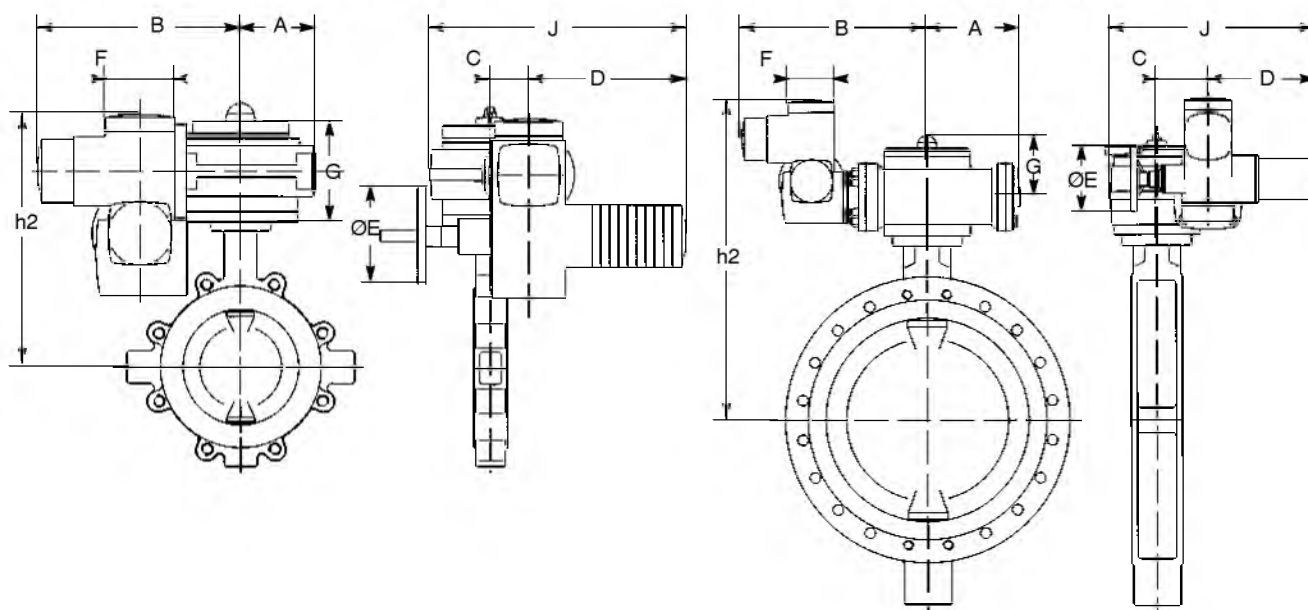
ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischen Drehantrieben für Armaturen)

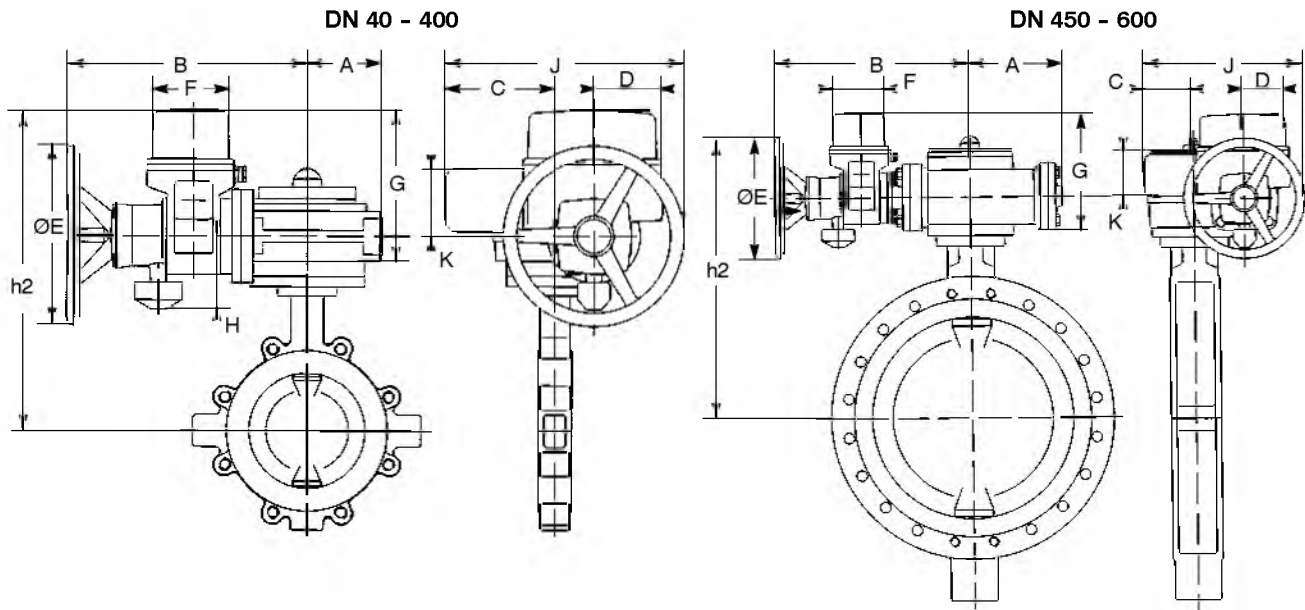
DN	NPS	Maximum fluid velocity Vitesse maximale de référence Strömungs-geschwindigkeit (m/s)	Actuators Actionneurs Antrieb
40	1 ½	5,0	ACTELEC 31 + SA 07.5 / ACTELEC 31 + ASM0
50	2	5,0	
65	2 ½	5,0	
80	3	5,0	
100	4	5,0	
125	5	5,0	
150	6	5,0	
200	8	5,0	
250	10	5,0	
300	12	5,0	
350	14	5,0	
400	16	5,0	
450	18	5,0	
500	20	5,0	
600	24	5,0	

Key: ACTELEC type + Motor reduction gear type: SA = Auma, ASM = Bernard (Deufra)

Légende : série ACTELEC + type du motoréducteur : SA = Auma, ASM = Bernard (Deufra)

Erklärung: Baureihe ACTELEC + Typ des Untersetzungsgetriebe: SA = Auma, ASM = Bernard (Deufra)

Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)
AUMA SA 07.5
DN 40 - 400
DN 450 - 600


ACTELEC electric actuators (AMRI reducer with multi-turn electric actuator)
Actionneurs électriques ACTELEC (démultiplicateur AMRI avec servomoteur électrique multi-tours)
Elektrische Antriebe ACTELEC (AMRI Getriebe mit elektrischen Drehantrieben für Armaturen)
Dimensions (mm) and weights (kg)
Encombremments (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)
BERNARD (Deufra) ASM0


DN	NPS	Type Type Typ	A	B	C	D	E	F	G	H	J	K	h2	Weight* Poids* Gewicht*	
40	1 1/2	31 + SA 07.5	125	398	40	265	160	115	237	101	514	-	431	46,5	
50	2												441		
65	2 1/2												451		
80	3												466		
100	4												481		
125	5												501		
150	6												516		
200	8												546		
250	10												581		
300	12												616		
350	14	655	31 + ASM0	125	250	292	115	300	144	211	122	442	139	405	42,5
400	16	680													
40	1 1/2	405													
50	2	415													
65	2 1/2	425													
80	3	440													
100	4	455													
125	5	475													
150	6	490													
200	8	520													
250	10	555													
300	12	590													
350	14	629													
400	16	654													
450	18	756	200 + SA 07.5	229	469	40	265	160	115	237	101	514	-	756	78,0
500	20	782													
600	24	837													
450	18	730	200 + ASM0	229	477	292	115	300	144	211	122	442	139	730	74,0
500	20	756													
600	24	811													

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe
10

ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

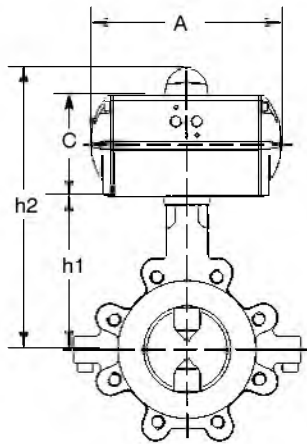
DN		NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	On-off function <i>Fonction tout ou rien</i> Absperrfunktion				Throttling duty <i>Fonction régulation</i> Regelfunktion		
				Control air pressure <i>Pression d'air moteur</i> Steuerdruck						4 bar	5 bar	6 bar
				3.5 bar	4 bar	5 bar	6 bar	4 bar	5 bar	6 bar
40	1 ½	5,0								
50	2	5,0								
65	2 ½	5,0								
80	3	5,0								
100	4	5,0								
125	5	5,0								
150	6	5,0								
200	8	5,0								
250	10	5,0								
300	12	5,0								
350	14	5,0								
400	16	5,0								
450	18	5,0								
500	20	5,0								
600	24	5,0								

ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

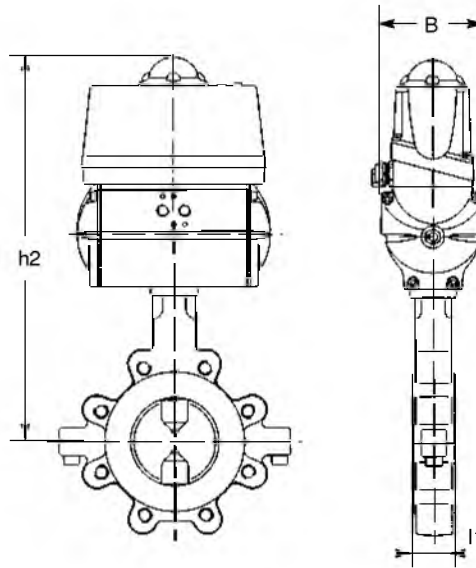
Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

ACTAIR 3 - 50

without • sans • ohne
 AMTRONIC

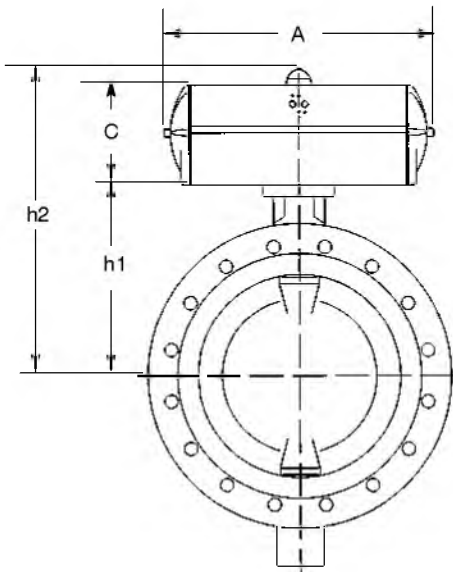


with • avec • mit
 AMTRONIC

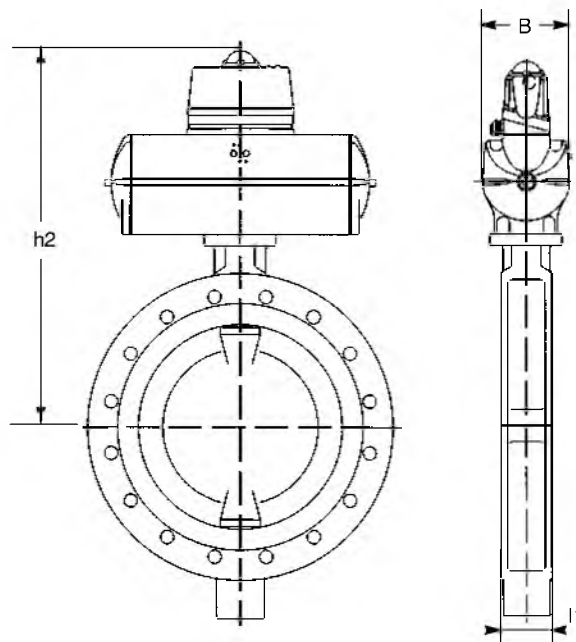


ACTAIR 100 & 200

without • sans • ohne
 AMTRONIC



with • avec • mit
 AMTRONIC



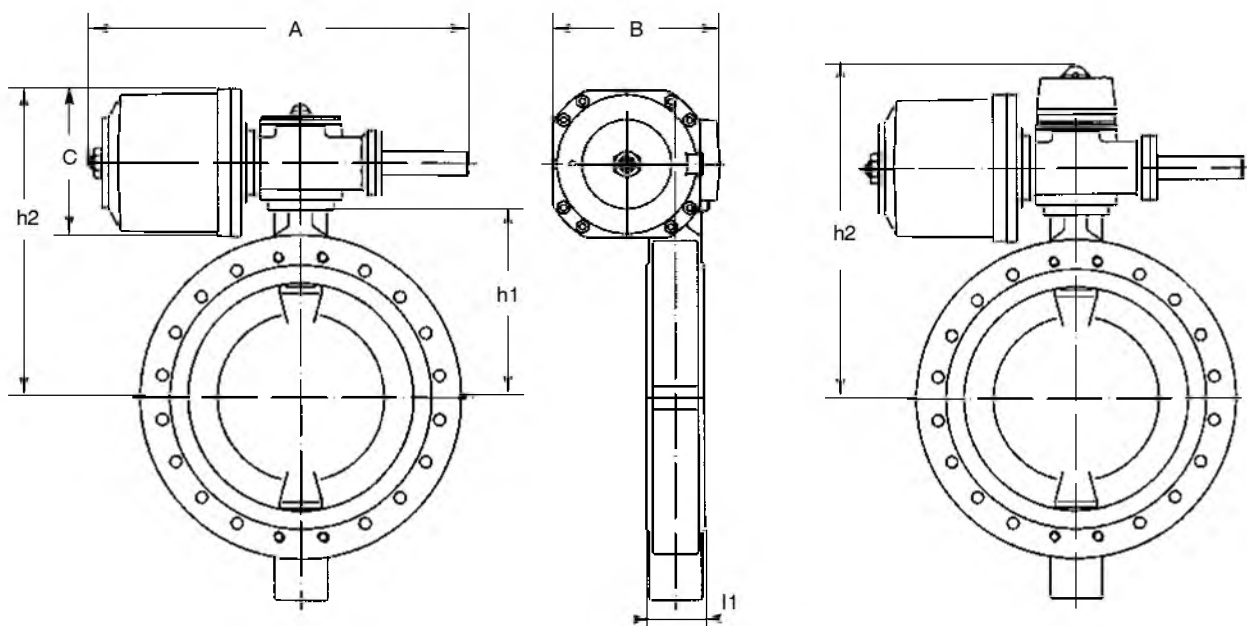
ACTAIR double acting pneumatic actuators
Actionneurs pneumatiques double effet ACTAIR
Pneumatische Antriebe doppelwirkend ACTAIR

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

ACTAIR 400

without • sans • ohne
 AMTRONIC

with • avec • mit
 AMTRONIC



For a control pressure: 5 bar • Pour une pression moteur : 5 bar • Für Steuerdruck: 5 bar

DN	NPS	l1	h1	On-off function without box Fonction tout ou rien sans boîtier Absperrfunktion ohne Gehäuse						Throttling duty with box Fonction régulation avec boîtier Regelfunktion mit Gehäuse					
				Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*
40	1 1/2	33	105	3	194	100	98	244	2,8	3	194	100	98	360	4,3
50	2	43	109					254						370	
65	2 1/2	46	136					264						380	
80	3	46	142					279						412	
100	4	52	163	6	218	114	116	312	3,9	6	218	114	116	427	5,4
125	5	56	176					332						473	
150	6	56	194	12	272	132	142	374	6,0	12	272	132	142	428	7,5
200	8	60	222	25	344	156	176	437	11,0	25	344	156	176	552	12,5
250	10	68	255					472						628	
300	12	78	282	50	424	174	217	548	18,3	50	424	174	217	663	20,0
350	14	78	335	100	505	157	195	565	30,0	100	505	157	195	680	31,5
400	16	102	380					590						705	
450	18	114	410					640						777	
500	20	127	440	200	592	174	217	688	48,0	200	592	174	217	803	49,5
600	24	154	495					743						913		170,0

* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

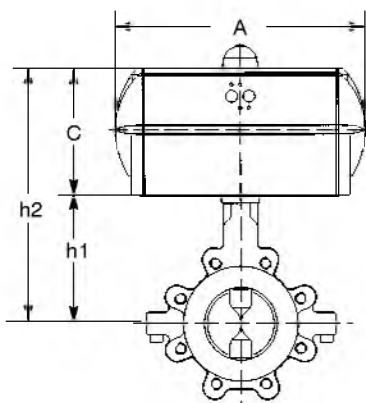
DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

DN		NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungs- geschwindigkeit (m/s)	On-off function <i>Fonction tout ou rien</i> Absperrfunktion				Throttling duty <i>Fonction régulation</i> Regelfunktion		
				Control air pressure <i>Pression d'air moteur</i> Steuerdruck						4 bar	5 bar	6 bar
				3.5 bar	4 bar	5 bar	6 bar	4 bar	5 bar	6 bar
40	1 ½	5,0								
50	2	5,0			DYN 3				DYN 3	
65	2 ½	5,0								DYN 1,5
80	3	5,0			DYN 6				DYN 6	
100	4	5,0								
125	5	5,0			DYN 12				DYN 12	
150	6	5,0								
200	8	5,0			DYN 25				DYN 25	
250	10	5,0								
300	12	5,0			DYN 50				DYN 50	
350	14	5,0								
400	16	5,0			DYN 100				DYN 100	
450	18	5,0								
500	20	5,0			DYN 200				DYN 200	
600	24	5,0								
					DYN 400				DYN 400	

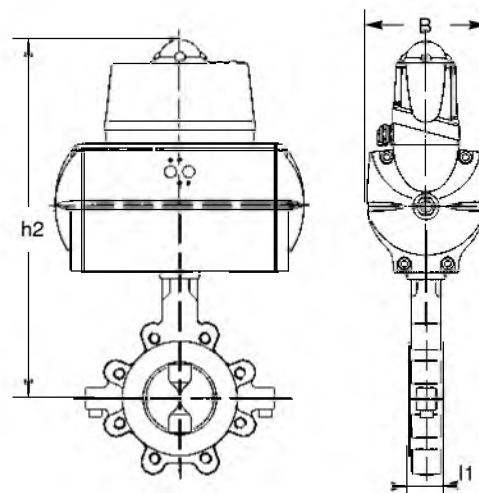
Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

DYNACTAIR 1,5 - 25

without • sans • ohne
AMTRONIC



with • avec • mit
AMTRONIC



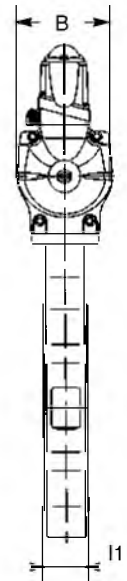
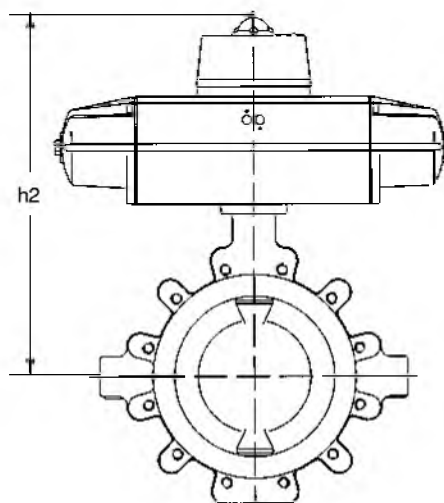
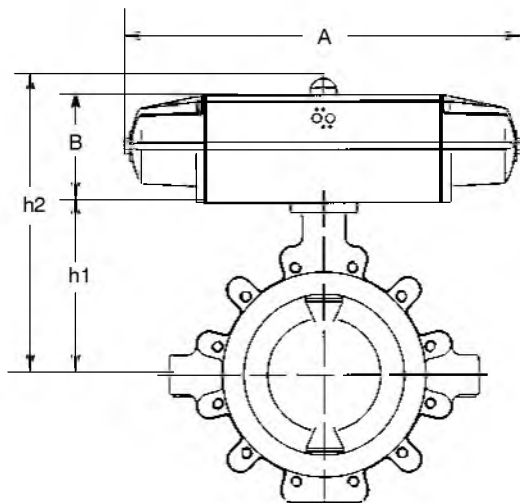
DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

Dimensions (mm) and weights (kg)
 Encombrements (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DYNACTAIR 50 & 100

without • sans • ohne
 AMTRONIC

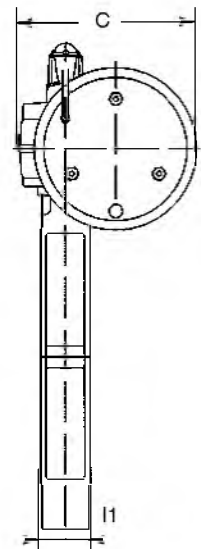
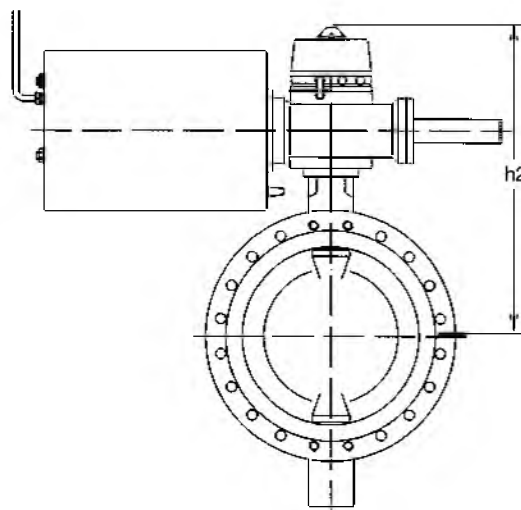
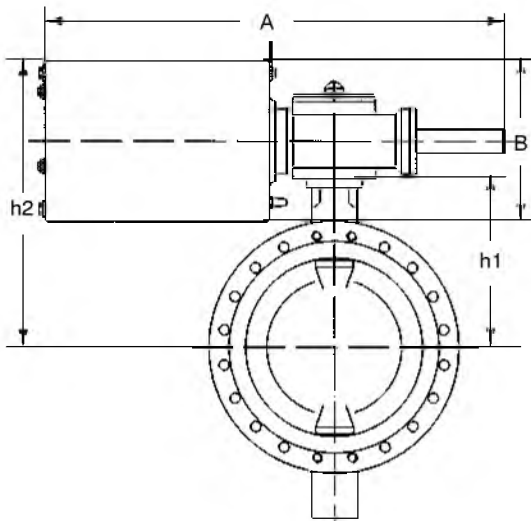
with • avec • mit
 AMTRONIC



DYNACTAIR 200

without • sans • ohne
 AMTRONIC

with • avec • mit
 AMTRONIC



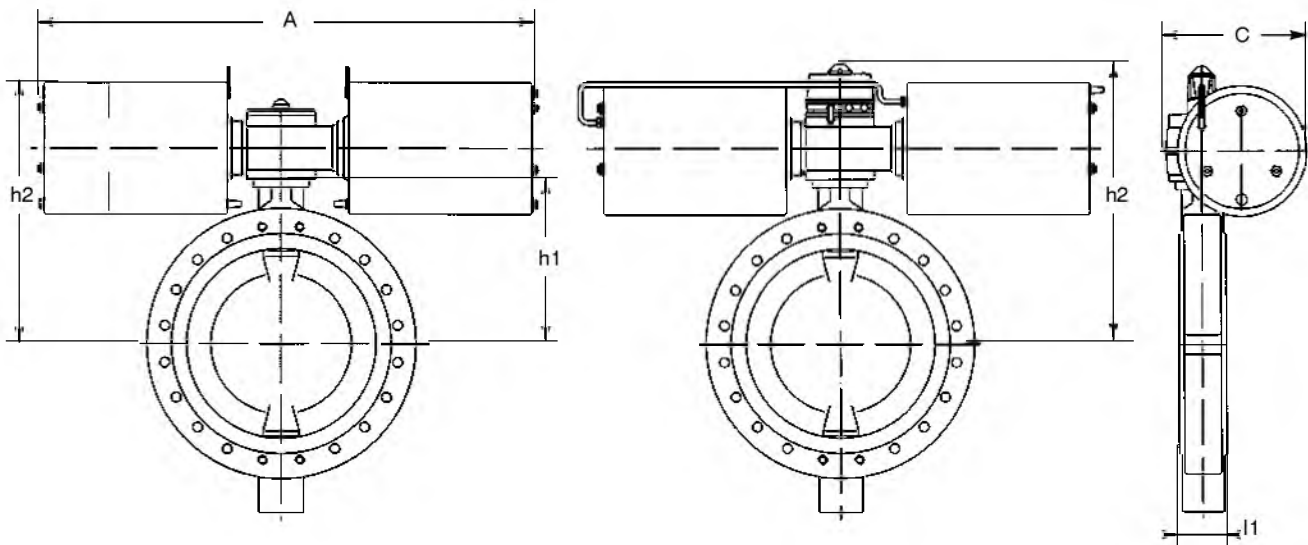
DYNACTAIR spring return pneumatic actuators
Actionneurs pneumatiques simple effet DYNACTAIR
Pneumatische Antriebe einfachwirkend DYNACTAIR

Dimensions (mm) and weights (kg)
 Encombremments (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DYNACTAIR 400

without • sans • ohne
 AMTRONIC

with • avec • mit
 AMTRONIC



For a control pressure: 5 bar • Pour une pression moteur : 5 bar • Für Steuerdruck: 5 bar

DN	NPS	l1	h1	On-off function without box <i>Fonction tout ou rien sans boîtier</i> Absperrfunktion ohne Gehäuse						Throttling duty with box <i>Fonction régulation avec boîtier</i> Regelfunktion mit Gehäuse					
				Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*	Type Type Typ	A	B	C	h2	Weight* Poids* Gewicht*
40	1 ½	33	105	1,5	194	100	98	244	3,2	3	218	114	116	377	6,0
50	2	43	109	3	218	114	116	272	4,5					387	
65	2 ½	46	136	6	272	132	142	282	7,3	6	272	132	142	423	8,8
80	3	46	142					323						438	
100	4	52	163	12	344	156	176	338	13,6	12	344	156	176	487	15,1
125	5	56	176					392						507	
150	6	56	194	25	424	174	217	407	24,0	25	424	174	217	563	25,5
200	8	60	222					478						571	
250	10	68	255	50	705	157	195	491	46,0	50	705	157	195	606	47,5
300	12	78	282					526						641	
350	14	78	335	100	812	174	217	587	75,0	100	812	174	217	702	76,5
400	16	102	380					612						727	
450	18	114	410	200	1 214	406	443	662	270,0	200	1 214	406	443	784	280,0
500	20	127	440					696						810	
600	24	154	495	200	1 214	406	443	751	270,0	400	1 530	406	443	865	425,0

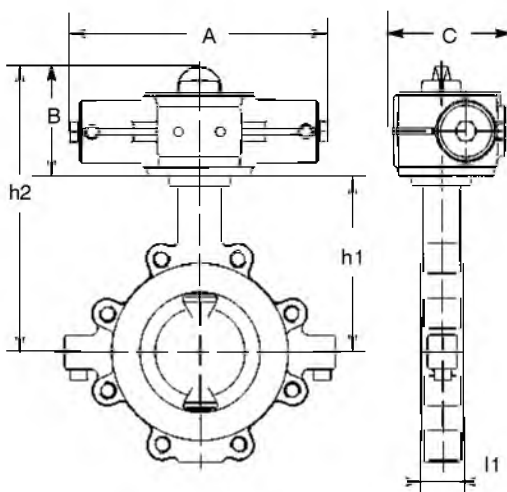
* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

ACTO double acting hydraulic actuators
Actionneurs hydrauliques double effet ACTO
Hydraulische Antriebe doppelwirkend ACTO

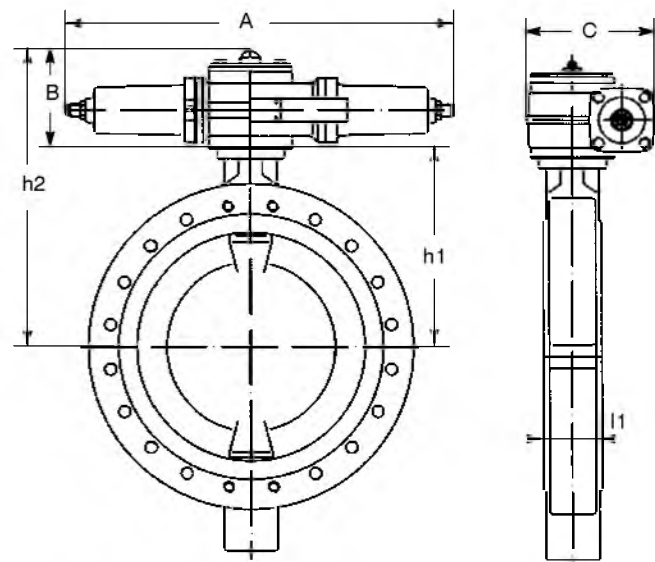
DN	NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	Control oil pressure <i>Pression d'huile moteur</i> Steueröldruck		
			60 bar	90 bar	120 bar
40 - 150	1½ - 6	5,0	ACTO 25		
200	8	5,0	ACTO 50		
250	10	5,0			
300	12	5,0	ACTO 100		
350	14	5,0			
400	16	5,0	ACTO 200		
450	18	5,0			
500	20	5,0	ACTO 400		
600	24	5,0			

Dimensions (mm) and weights (kg)
Encombrements (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

ACTO 25 - 100



ACTO 200



Control oil pressure: 90 bar • *Pression d'huile moteur : 90 bar* • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type <i>Type</i> Typ	A	B	C	h2	Weight* <i>Poids*</i> Gewicht*
40	1½	33	105	25	288	104	144	229	13,0
50	2	43	109					239	
65	2½	46	136					249	
80	3	46	142					264	
100	4	52	163					279	
125	5	56	176					299	
150	6	56	194					314	
200	8	60	222	50	344	131	168	371	19,5
250	10	68	255					406	
300	12	78	282					441	
350	14	78	335	100	406	174	202	523	33,5
400	16	102	380					548	
450	18	114	410					624	
500	20	127	440	200	515	200	253	650	63,0
600	24	154	495					751	
				400	994	246	325	751	95,0

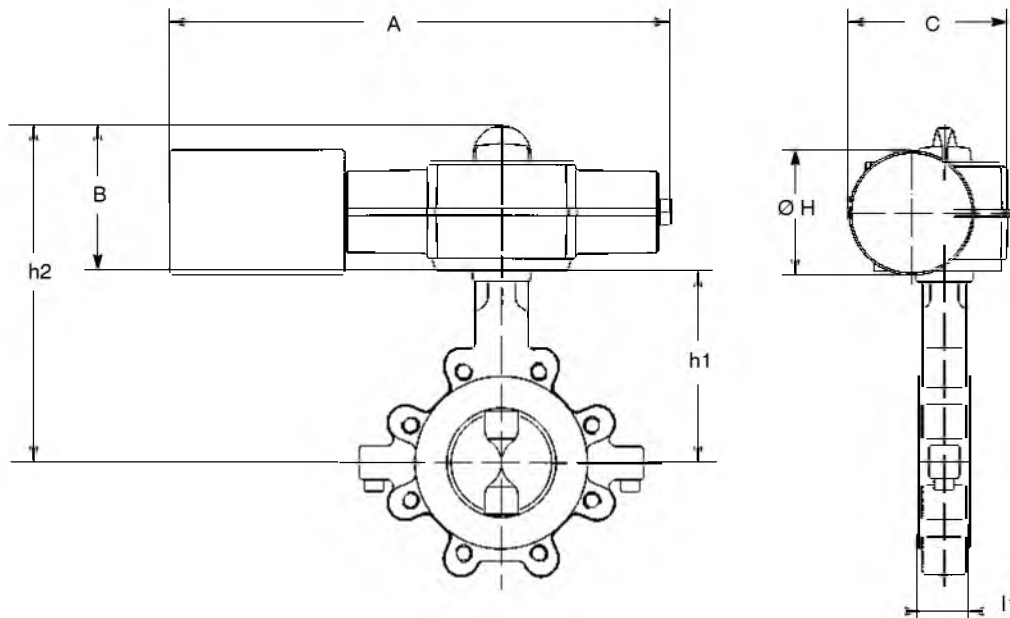
* The indicated weights are those of the actuator • *Les poids indiqués sont ceux du démultiplicateur seul* • Gewichte gelten nur für das Getriebe

DYNACTO spring return hydraulic actuators
Actionneurs hydrauliques simple effet DYNACTO
Hydraulische Antriebe einfachwirkend DYNACTO

DN	NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	Control oil pressure <i>Pression d'huile moteur</i> Steueröldruck		
			60 bar	90 bar	120 bar
40	1 ½	5,0	DYNACTO 12	DYNACTO 12	DYNACTO 12
50	2	5,0			
65	2 ½	5,0			
80	3	5,0			
100	4	5,0			
125	5	5,0	DYNACTO 25	DYNACTO 25	DYNACTO 25
150	6	5,0			
200	8	5,0	DYNACTO 50	DYNACTO 50	DYNACTO 50
250	10	5,0			
300	12	5,0			
350	14	5,0	DYNACTO 100	DYNACTO 100	DYNACTO 100
400	16	5,0			
450	18	5,0			
500	20	5,0	DYNACTO 200	DYNACTO 200	DYNACTO 200
600	24	5,0			
			DYNACTO 400		

Dimensions (mm) and weights (kg)
Encombremets (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

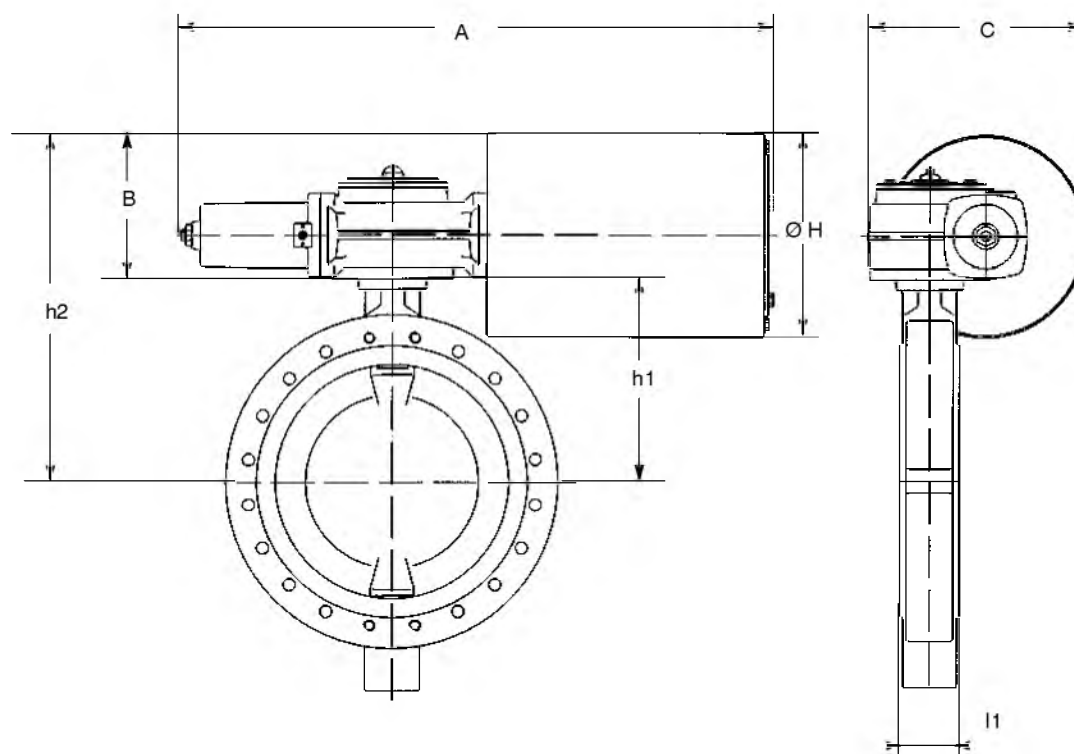
DYNACTO 12 - 100



DYNACTO spring return hydraulic actuators
Actionneurs hydrauliques simple effet DYNACTO
Hydraulische Antriebe einfachwirkend DYNACTO

Dimensions (mm) and weights (kg)
 Encombremets (mm) et poids (kg)
 Abmessungen (mm) und Gewichte (kg)

DYNACTO 200 & 400



Control oil pressure: 90 bar • Pression d'huile moteur : 90 bar • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type Type Typ	A	B	C	Ø H	h2	Weight* Poids* Gewicht*
40	1 ½	33	105	12	585	121	138	95	226	19,0
50	2	43	109						230	
65	2 ½	46	136						257	
80	3	46	142						263	
100	4	52	163						284	
125	5	56	176						297	
150	6	56	194	25	655	151	171	127	345	29,0
200	8	60	222	50	726	187	217	169	409	55,0
250	10	68	255						475	
300	12	78	282						502	
350	14	78	335	100	932	220	275	219	555	103,0
400	16	102	380						678	
450	18	114	410	200	1 247	298	443	406	708	240,0
500	20	127	440						738	
600	24	154	495						400		1 452	363	549	505	858	515,0

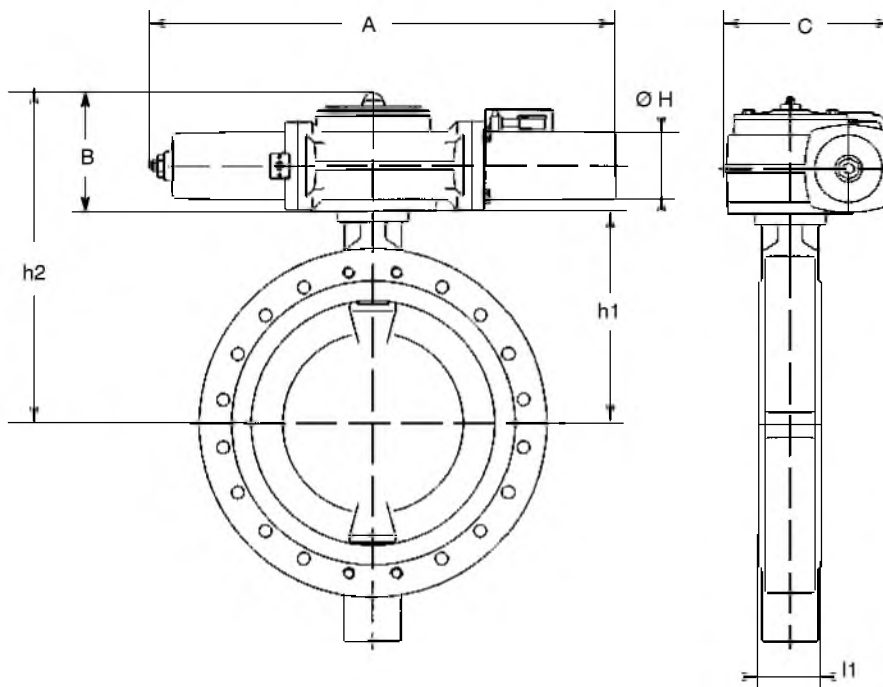
* The indicated weights are those of the actuator • Les poids indiqués sont ceux du démultiplicateur seul • Gewichte gelten nur für das Getriebe

ENNACTO single acting hydraulic actuators
Actionneurs hydrauliques simple effet ENNACTO
Hydraulische Antriebe einfachwirkend ENNACTO

DN	NPS	Maximum fluid velocity <i>Vitesse maximale de référence</i> Strömungsgeschwindigkeit (m/s)	Control oil pressure <i>Pression d'huile moteur</i> Steueröldruck		
			60 bar	90 bar	120 bar
400	16	5,0	ENNACTO 200		
450	18	5,0			
500	20	5,0			
600	24	5,0	ENNACTO 400		

Dimensions (mm) and weights (kg)
Encombrements (mm) et poids (kg)
Abmessungen (mm) und Gewichte (kg)

ENNACTO 200 & 400



Control oil pressure: 90 bar • *Pression d'huile moteur : 90 bar* • Steueröldruck: 90 bar

DN	NPS	l1	h1	Type <i>Type</i> Typ	A	B	C	Ø H	h2	Weight* <i>Poids*</i> Gewicht*
450	18	114	410	200	970	246	325	325	656	105,0
500	20	127	440						686	
600	24	154	495	400	1 106	280	403	403	775	170,0

* The indicated weights are those of the actuator • *Les poids indiqués sont ceux du démultiplicateur seul* • Gewichte gelten nur für das Getriebe

This leaflet is not contractual and may be amended without notice

06.03.09

0166.11/4-90

Electric Actuator

ACTELEC

Direct-mount Quarter-turn Actuator,
Types SQ5.2 to SQ12.2
AUMA

Type Series Booklet



Electric Actuators

Electric Quarter-turn Actuators by AUMA

ACTELEC SQ05.2 to SQ12.2



Main applications

- Water
- Energy
- Industry

Operating data

Operating properties

Characteristic	Value
ACTELEC	ACTELEC SQ05.2 ACTELEC SQ07.2 ACTELEC SQ10.2 ACTELEC SQ12.2
Max. permissible temperature	-40 °C to +80 °C
Enclosure	IP68 (8 m, 96 hours)
Motor protection	Thermal class F
Power supply	Three-phase: 230 V / 50 Hz 400 V / 50 Hz Single-phase: 110 - 120 V / 50 Hz, 60 Hz 220 - 240 V / 50 Hz, 60 Hz

Design details

- ACTELEC SQ05.2 / SQ12.2 electric quarter-turn actuators cover torques of up to 1200 Nm.
- Actuator/valve interface to ISO 5211
- They are suitable for all fields of application and all types of quarter-turn valves (centred-disc or offset-disc butterfly valves, ball valves, etc.).
- The actuators are equipped with removable adapters allowing them to be mounted on valves with different types of stem end (square or flat ends).

- The valves meet the requirements of the REACH 1907/2006 regulation. None of the substances listed in the candidate list and in Annex XIV of the regulation is present in a concentration above 0.1 % (w/w) (Article 33/REACH).
- The electric actuators are suitable for opening and closing valves in intermittent operation S2 - 15 min.
- Polyurethane coating, thickness 140 µm, colour: RAL 7037 grey
- Electrical motor protection by temperature switch
 - 2 electrical switches for stopping the motor in the limit position (1 switch for Open and 1 switch for Closed)
 - Torque limitation
- 2 torque switches for OPEN and CLOSED positions
- Heating resistor prevents condensation
- Manual override via handwheel
- Position indicator
- One or several adjustable limit stops
- Gear kinematics irreversible in any position

Variants

- Integrated electrical control system for remote control = MATIC version
- Additional electrical switches, adjustable across the entire stroke, for remote position indication (limit or intermediate positions)
- Double switch with torque switch
- Actual-position feedback via 1000-ohm potentiometer or 4-20 mA signal
- Communication interface - Intelligence - Field buses
- Other supply voltages
- ATEX design in compliance with the 94/9/EC Directive

Technical data

Type series

Valve interface

Size	Interface standardised to ISO*	Max. permissible stem dimensions			
		Height	Square end	Flat end	Key
ACTELEC SQ05.2	F05 / F07	35	22	22	Contact KSB.
ACTELEC SQ07.2	F07 / F10	35/60	22	22	
ACTELEC SQ10.2	F10 / F12	45/75	30	27	
ACTELEC SQ12.2	F12 / F14	55/95	36	41	

Three-phase current, 400 V, 50 Hz

Size	Actuating time [sec/90°]	Nominal power [kW]	Nominal current [A]	Starting current [A]
ACTELEC SQ05.2	8	0,04	0,4	1,0
	11 (standard)	0,04	0,4	1,0
	16	0,02	0,4	1,0
	22	0,02	0,4	1,0
ACTELEC SQ07.2	8	0,06	0,6	1,6
	11	0,06	0,6	1,6
	16	0,03	0,4	1,0
	22 (standard)	0,03	0,4	1,0
ACTELEC SQ10.2	32	0,01	0,3	0,7
	16	0,06	0,6	1,6
	22	0,06	0,6	1,6
	32 (standard)	0,04	0,5	1,0
ACTELEC SQ12.2	45	0,04	0,5	1,0
	63	0,02	0,3	0,7
	22	0,10	0,8	2,0
	32	0,06	0,6	1,6
ACTELEC SQ12.2	45	0,06	0,6	1,6
	63 (standard)	0,04	0,5	1,0

Three-phase current, 230 V, 50 Hz

Size	Actuating time [sec/90°]	Nominal power [kW]	Nominal current [A]	Starting current [A]
ACTELEC SQ05.2	8	0,04	0,7	1,7
	11 (standard)	0,04	0,7	1,7
	16	0,02	0,7	1,7
	22	0,02	0,7	1,7
ACTELEC SQ07.2	8	0,06	1,0	2,8
	11	0,06	1,0	2,8
	16	0,03	0,7	1,7
	22 (standard)	0,03	0,7	1,7
	32	0,01	0,5	1,2
ACTELEC SQ10.2	16	0,06	1,0	2,8
	22	0,06	1,0	2,8
	32 (standard)	0,04	0,9	1,7
	45	0,04	0,9	1,7
	63	0,02	0,5	1,2
ACTELEC SQ12.2	22	0,10	1,4	3,5
	32	0,06	1,0	2,8
	45	0,06	1,0	2,8
	63 (standard)	0,04	0,9	1,7

Single-phase alternating current 110 - 120 V / 50 Hz

Size	Actuating time [sec/90°]	Nominal power [kW]	Nominal current [A]	Starting current [A]
ACTELEC SQ05.2	11 (standard)	0,04	2,3	4,6
ACTELEC SQ07.2	22 (standard)	0,03	2,3	4,6
ACTELEC SQ10.2	32 (standard)	0,04	2,3	4,6
ACTELEC SQ12.2	63 (standard)	0,04	2,3	4,6

Single-phase alternating current 220 - 240 V / 50 Hz

Size	Actuating time [sec/90°]	Nominal power [kW]	Nominal current [A]	Starting current [A]
ACTELEC SQ05.2	11 (standard)	0,04	1,1	2,3
ACTELEC SQ07.2	22 (standard)	0,03	1,1	2,3
ACTELEC SQ10.2	32 (standard)	0,04	1,1	2,3
ACTELEC SQ12.2	63 (standard)	0,04	1,1	2,3

Technical specification

On/off control

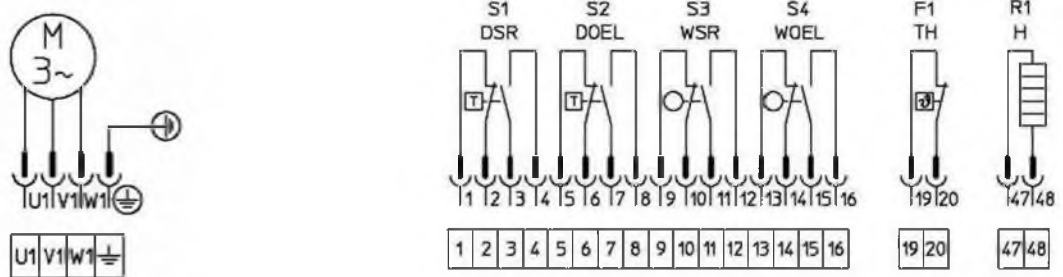
ACTELEC		SQ05.2	SQ07.2	SQ10.2	SQ12.2
Nominal torque [Nm]		150	300	600	1200
Actuating time in seconds	Standard	11	22	32	63
	Optional	8-16-22	8-11-16-32	16-22-45-63	22-32-45
Electrical switches for stopping the motor		Standard			
Adjustable mechanical travel stops		Standard			
Torque switches for OPEN and CLOSED positions		Standard			
Heating resistor 6 W - 110-250 V AC/DC power supply		Standard			
Manual override - number of handwheel turns		16	16	15	30
Power supply					
230 V or 400 V three-phase		Circuit diagram KMS TP100/001			
110 - 120 V or 220 - 240 V single-phase		Circuit diagram KMS1 TP100/001			
Other versions					
Integrated MATIC control system	230 V or 400 V three-phase	Circuit diagram MPS1110KS3 + F18E1 / KMS TP100/001			
	110 - 120 V or 220 - 240 V single-phase	Circuit diagram MPS1130KC3 - F18E1 / KMS(1) TP100/001			
Explosion protection		Available on request / Contact KSB.			

Circuit diagram

On/off control

Power supply 230 V or 400 V, three-phase, 50 Hz

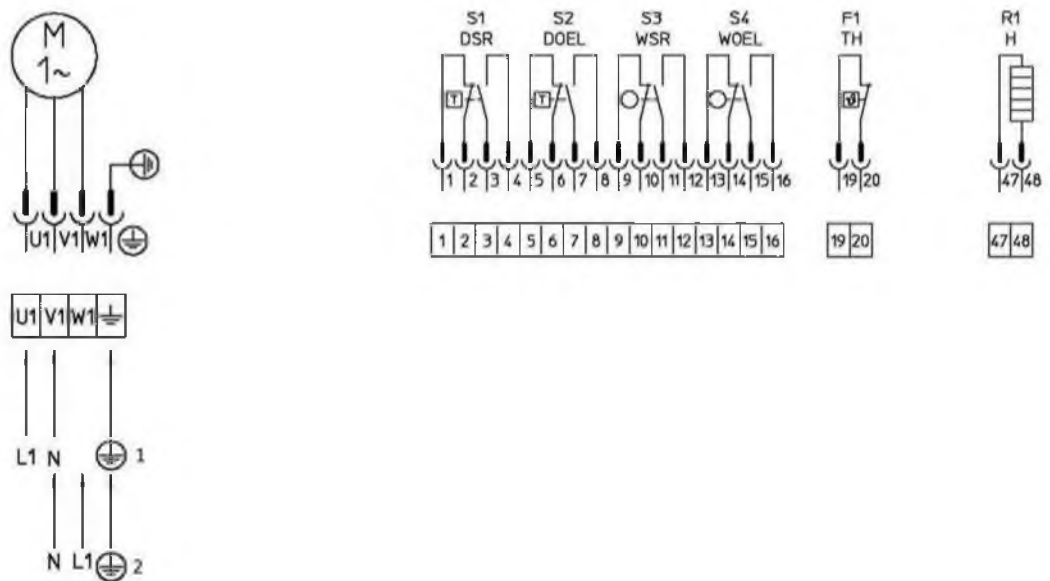
Circuit diagram KMS TP100/001



- | | | |
|-------------|--------|------------------------------------|
| Key: | S1 DSR | Torque switch CLOSE, clockwise |
| | S2 DÖL | Torque switch OPEN, anti-clockwise |
| | S3 WSR | Limit switch CLOSE, clockwise |
| | S4 WÖL | Limit switch OPEN, anti-clockwise |
| | F1 TH | Thermal (motor) protection |
| | R1 H | Heating resistor |

Power supply 110 V - 220 V or 220 V - 240 V, single-phase, 50 Hz

Circuit diagram KMS1 TP100/001

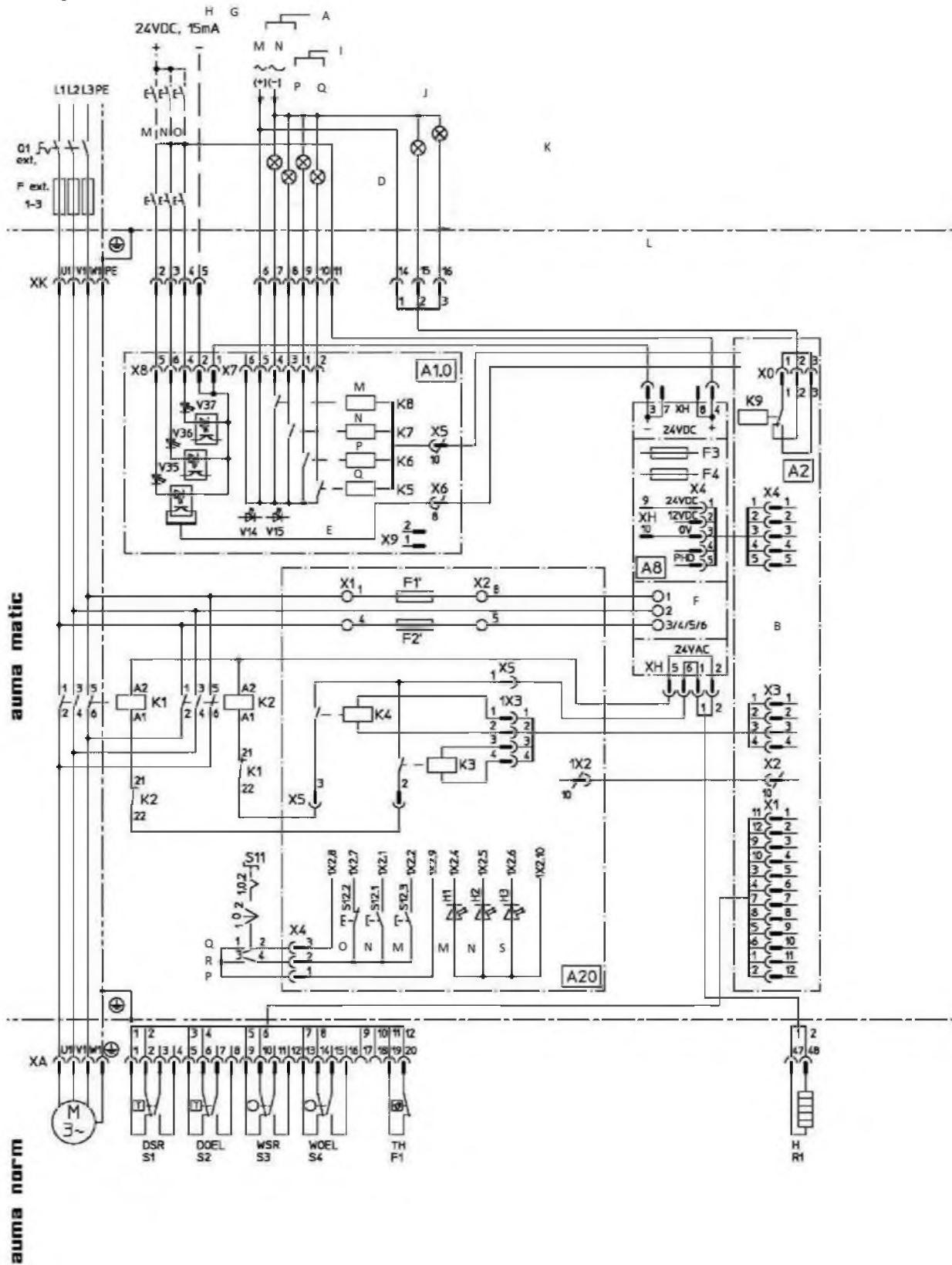


- | | | |
|-------------|--------|------------------------------------|
| Key: | S1 DSR | Torque switch CLOSE, clockwise |
| | S2 DÖL | Torque switch OPEN, anti-clockwise |
| | S3 WSR | Limit switch CLOSE, clockwise |
| | S4 WÖL | Limit switch OPEN, anti-clockwise |
| | F1 TH | Thermal (motor) protection |
| | R1 H | Heating resistor |
-
- | | |
|---|----------------|
| 1 | Clockwise |
| 2 | Anti-clockwise |

Version with integrated MATIC control system

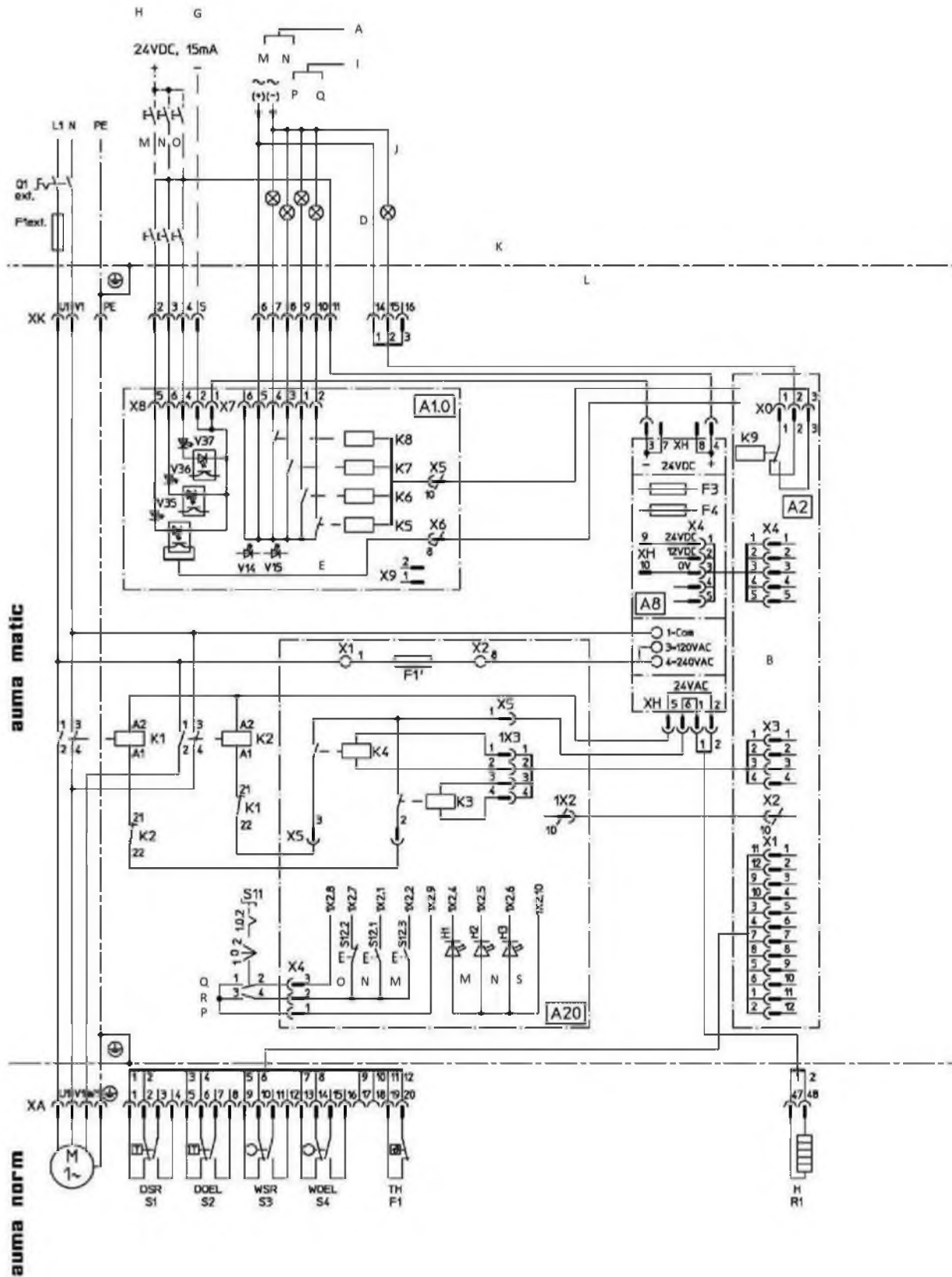
Power supply 230 V or 400 V, three-phase

Circuit diagram MPS 1110KC3 - F18E1 - KMS TP 100-001



Power supply 230 V, single-phase

Circuit diagram MPS 1130KC3 - F18E1 - KMS1 TP 100-001



Key to circuit diagrams MPS 1110KS3 - F18E1 - KMS TP 100/001 and MPS 1130KS3 - F18E1 - KMS1 TP 100/001

A		Information A
B		Information B
C		Information C
D		Information D
E		Information E
F		Information F
G		Information G
H		External power supply, direct or alternating current
I		Position S11
J		General fault message signal - operational
K		Switching capacity of K5-K9 signal max. 250 V AC / 0.5 A / cos phi - 1 or 24 V DC / 2A
L		AUMA limit of scope of supply
M		Closed
N		Open
O		Stop
P		Local
Q		Remote control
R		Off
S		Fault
S 1	DSR	Torque switch, closing, clockwise
S 2	DÖL	Torque switch, opening, anti-clockwise
S 3	WSR	Limit switch CLOSE, clockwise
S 4	WÖL	Limit switch OPEN, anti-clockwise
S 3/2	WSR 1	Double switch for limit position with WSR / WÖL
S 4/2	WÖL 1	Double switch for limit position with WSR / WÖL
F 1	Th	Temperature switch (motor protection)
R1	H	Heating resistor
A 1.0		Interface board
A 2		Logic board
A 7		Positioner board
A 8		Power supply unit board
A 20		Signalling and control board
A 21		Signalling and control board
F 1'		Primary fuses - power supply
F 2'		Primary fuses - power supply
F 3		Secondary fuses
F 4		Secondary fuses
K 1		Changeover contact
K 2		Changeover contact
K 3		Control relay for changeover contact
K 4		Control relay for changeover contact
K 5 to K 9		Signalling relay
S 11		Local-OFF-Remote selector switch
S 11/2		Local-OFF-Remote selector switch
S 12.1		Pushbutton OPEN
S 12.2		Pushbutton STOP
S 12.3		Pushbutton CLOSE
S 13		Changeover switch for travel-dependent or torque-dependent closing
V 14		LED*, phase sequence and failure
V 15		LED*, torque switch tripped before limit position has been reached
V 35		LED, command CLOSE received from control station
V 36		LED, command OPEN received from control station
V 37		LED, command OFF received from control station

* If LEDs V 14 and V 15 are lit at the same time, the temperature switch has tripped.

Information details

Information A

Operation (opening and closing) can be indicated by integration of the flashing light (S5).

Opening direction: connections X_{k6} - X_{k7}

Closing direction: connections X_{k6} - X_{k8}

In the limit position, the contacts remain closed.

For connection to an external PLC the flashing signal can be switched off, see AUMA MATIC operating manual.

Information B

If changeover switch S 13 is in position "1", closing is controlled via limit switch WSR (S3).

The actuator stops and a fault message is generated if the torque switch DSR (S1) responds before or as the limit position is reached.

If changeover switch S 13 is in position "2", closing is controlled via torque switch DSR (S1).

The WSR (S3) switch serves as a signalling system. It must be set to trip shortly before the limit position CLOSED is reached.

If the torque switch trips before the limit switch, the actuator stops and a fault message is generated.

For detailed information on programming of the logic board, particularly regarding latching in REMOTE mode, refer to the AUMA MATIC operating manual.

Information D

The following faults, indicating operating malfunctions, are identified and transmitted to a relay with changeover contacts, from where they can be transmitted to the control station:

- Power failure
- Incorrect phase sequence
- Phase failure
- Temperature switch has tripped
- Torque switch has tripped before limit position has been reached

Storage of the fault messages can be disabled by programming the unit accordingly, see AUMA MATIC operating manual.

Information E

Input signals to DIN 19240. The nominal amperage of inputs X_{k2} , X_{k3} and X_{k4} is 10 - 15 mA.

If the internal voltage of 24 V DC is used for remote control, the external contacts used must be volt-free.

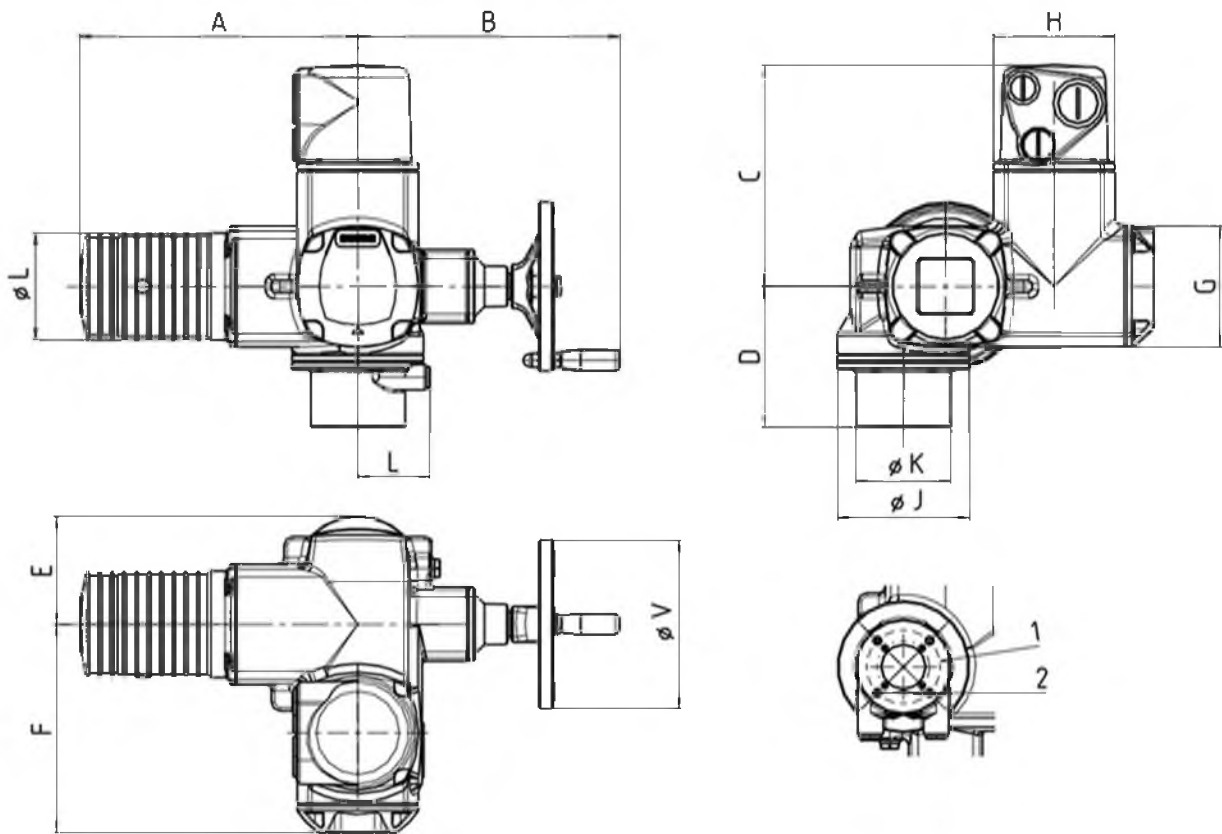
Information F

The actuator will not operate in the case of incorrect phase sequence or phase failure. These faults will be indicated by the LED V14 on the interface board. The various faults indicated are listed in the "Information D" item.

Information G

Volt-free contacts are provided for signalling. The internal control voltage (X_{k11} / 24V+ or X_{k5} / 24V-) must not be used for external lamps, relays, etc.

Dimensions



- 1: bore diameter $\phi d1$
- 2: 4 evenly spaced holes $\phi d2$

[mm]

Size	A	B	C	D	ϕE	F	G	H	ϕJ	ϕK	L	ϕV	ISO 5211 interface			Weight [kg]
													Ref.	$\phi d1$	$\phi d2$	
ACTELEC SQ05.2	265	249	210	134	90	198	115	115	125	90	69	160	F05	50	M6	29
	265	249	210	134	90	198	115	115	125	90	69	160	F07	70	M8	
ACTELEC SQ07.2	265	249	210	134	90	198	115	115	125	90	69	160	F07	70	M8	29
	265	249	210	160	90	198	115	115	125	125	69	160	F10	102	M10	
ACTELEC SQ10.2	265	254	210	151	115	198	115	115	160	125	86	200	F10	102	M10	32
	265	254	210	183	115	198	115	115	160	150	86	200	F12	125	M12	
ACTELEC SQ12.2	265	254	210	175	115	198	115	115	210	150	109	200	F12	125	M12	45
	265	254	210	215	115	198	115	115	210	175	109	200	F14	140	M16	

Hydraulic Actuator

HQ

HQ 10/10GS/10S - 200/200GS/200S:
Force Transmission via Rack-and-pinion Kinematics
HQ 400/400GS/400S - 1600/1600GS/1600S:
Force Transmission via Toggle-lever kinematics
Output Torques up to 55,000 Nm
Pressure up to 160 bar

Type Series Booklet



Hydraulic Actuators

Single-acting and Double-acting Hydraulic Actuators

HQ 10 - 1600



Main applications

- Shipbuilding
- Water
- Waste water
- Energy
- Industry

Operating data

Operating properties

Characteristic	Value
HQ	HQ 10/10GS/10S HQ 25/25GS/25S HQ 50/50GS/50S HQ 100/100GS/100S HQ 200/200GS/200S HQ 400/400GS/400S HQ 800/800GS/800S HQ 1600/1600GS/1600S
Max. permissible pressure	160 bar
Max. permissible temperature	Standard: HQ 10/10GS/10S - 1600/1600GS/1600S: -20 to +100 °C Variant: HQ 10/10GS/10S - 1600/1600GS/1600S: -45 °C to +100 °C
Output torque	HQ 10 - 1600: up to 55,000 Nm HQ 10GS - 1600GS: up to 28,000 Nm

Characteristic	Value
	HQ 10S - 1600S: up to 17,000 Nm
Enclosure	IP68

Design details

Design

The HQ type series comprises actuator types HQ, HQ GS and HQ S:

- Double-acting hydraulic actuators HQ 10, HQ 25, HQ 50, HQ 100 and HQ 200 with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Double-acting hydraulic actuators HQ 400, HQ 800 and HQ 1600 with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- Single-acting hydraulic actuators with gas cartridge, types HQ 10GS, HQ 25GS, HQ 50GS, HQ 100GS and HQ 200GS, with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Single-acting hydraulic actuators with gas cartridge, types HQ 400GS, HQ 800GS and HQ 1600GS, with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- Single-acting hydraulic actuators with spring cartridge, types HQ 10S, HQ 25S, HQ 50S, HQ 100S and HQ 200S, with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Single-acting hydraulic actuators with spring cartridge, types HQ 400S, HQ 800S and HQ 1600S, with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- They are suitable for all fields of application and all types of quarter-turn valves (centred-disc or offset-disc butterfly valves, ball valves, etc.).
- Actuator/valve interface to ISO 5211
- Used with a biodegradable, non-flammable oil
- The actuators are equipped with adapters allowing them to be mounted on valves with different types of stem end (square or flat ends).

The standard model of these actuators is suitable for immersion in up to 40 metres of (fresh or salt) water, unrefined petroleum products or other products (enclosure IP68 in continuous operation) if the valve/actuator interface is sealed tightly.

A special model with a special coating system is available for immersion in light petroleum products.

They are equipped with two assemblies consisting of adjustable travel stops and drain valve, and also feature an emergency connection valve and position indicator.

Coating

- **Standard model:**
 - Anti-corrosive primer coat applied by cathodic electrocoating, colour: black, thickness: 25 - 39 µm
 - Three-coat anti-corrosive coating consisting of a 150-µm epoxy primer coat, a 50-µm epoxy coat and a 50-µm polyurethane coat (green). Total thickness = 250 µm.

This protective coating has been tested in our laboratories and qualified for operation in salt spray environments in accordance with the NFX 41-002 standards.

- Customer-specific coatings can be applied on request.

▪ **Submerged actuators:**

- Anti-corrosive primer coat applied by cathodic electrocoating, colour: black, thickness: 25 - 39 μm
- Two-coat anti-corrosive coating consisting of a bituminous epoxy coat, thickness 150 μm , and a grey epoxy coat, thickness 150 μm , total thickness = 300 μm .

This protective coating has been tested in our laboratories and qualified for operation in salt spray environments in accordance with the NFX 41-002 standards.

- Customer-specific coatings can be applied on request.

Technical data

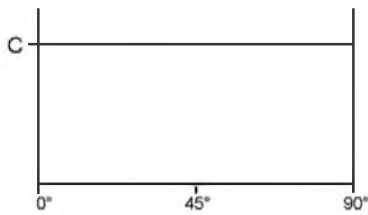
Function

Standard HQ actuators are designed for valve closure in clockwise direction.

HQ 10 - 200: force transmission via rack-and-pinion kinematics

The rack-and-pinion kinematics provide a constant torque throughout the stroke. The translatory movement of the piston/rack assembly generated by the control pressure causes a clockwise quarter rotation of the pinion and, consequently, a quarter rotation of the valve stem connected to the pinion.

Curve of rack-and-pinion kinematics



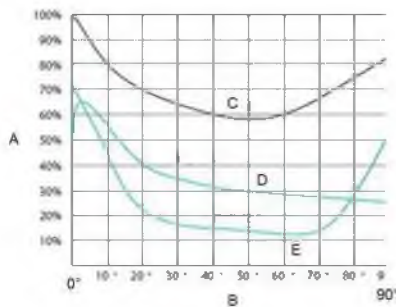
C: Output torque
 0° to 90°: Angle of rotation
 0°: Closed
 90°: Open

HQ 400 - 1600: force transmission via toggle-lever kinematics

The toggle-lever kinematics develop a variable torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.

These kinematics are particularly suited for actuating ball valves as demonstrated by the torque curve below.

Curve of toggle-lever kinematics



A: Output torque
 B: Cylinder rotation
 0° to 90°: Angle of rotation
 0°: Closed
 90°: Open
 C: Cylinder
 D: Butterfly valve
 E: Ball valve

Double-acting hydraulic actuators HQ 10 to HQ 1600

Max. pressure of control medium: 160 bar. Please contact us for higher pressures. Being symmetrically designed, the opening chamber and the closing chamber have the same capacity.

Characteristics

HQ size	Max. permissible output torque at a pressure of			Capacity in cm ³
	80 bar	135 bar	160 bar	
10	110	185	219	23
25	298	503	597	62
50	558	942	1117	115
100	1074	1812	2148	222
200	2416	4077	4832	499
400	8480	14310	16961	1276
800	15188	25630	30377	2285
1600	27626	46618	55251	4156

Type series

Thanks to an ISO 5211 interface, the actuators can be mounted directly on all valves that comply with this standard. An installation kit is available for also mounting them on all other quarter-turn valves. The actuators are equipped with removable adapters allowing them to be mounted on valves with different types of stem end (square, flat, etc.). The actuator can be mounted onto the valve in 4 different positions, offset by 90°.

HQ size	Interface standardised to ISO	Max. permissible stem dimensions		
		Square end	Flat end	Height
10	F05 and F07	19	19	50
25	F07 and F10	28	28	65
50	F10 and F12	27	36	75
100	F12, F14 and KSB1	36	46	90
200	F14, F16 and KSB2	55	75	120
400	F16 and F25	60	85	120
800	F16, F25 and F30	77	105	165
1600	F30 and F35	90	120	210

Properties of the cathoretic primer

The cathoretic coating process is based on a coating material in an aqueous solution which acts like an electrolyte. The coating particles migrate onto the part to be coated and are deposited to form a protective coating of uniform thickness.

The organic EPOXY coating (EYC-648/EYP-648), which is 25 to 39 µm thick, provides the components with an extraordinary level of corrosion resistance and

- excellent resistance to chemicals as well as excellent corrosion behaviour (salt spray testing to ASTM B 117-73),
- good resistance to solvents and insulating characteristics,
- good mechanical properties, etc.

This elastic coating is insensitive to scratches and impacts.

Control medium

- Mineral oil, biodegradable, non-flammable (HFA - HFB - HFC)
- Viscosity: 10 cst (mm²/sec) to 400 (mm²/sec)
- Cleanliness class: Class 9 to NAS 1638, equivalent to Class 18/15 to ISO 4408. Filtration recommended.
- Variant: hydraulic fluid type HFD: Contact KSB.

Single-acting hydraulic actuators with gas cartridge, types HQ 10GS - HQ 1600GS

These single-acting hydraulic actuators are designed for actuating all types of quarter-turn valves. They develop output torques of up to 27,762 Nm (2832.8 kgf.m).

The maximum operating pressure is 160 bar (16 MPa) and the maximum gas pressure is 150 bar (15 MPa).

The gas cartridge of these single-acting hydraulic actuators has the following advantages:

- Easy field maintenance
 - Straightforward setting of the torque via pressure N2
 - Monitoring of the torque, taking into account the pressure gauge reading
- The rack-and-pinion kinematics have the following advantages:

- Precise and reliable function
- Constant output torque
- High performance achieved with space-saving design
- Reliability and long service life
- Submerged operation possible

The toggle-lever kinematics have the following advantages:

- Precise and reliable function
- Suited for the torque
- Develops a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.
- Reliability and long service life
- Submerged operation possible

Characteristics

HQ size	Max. permissible output torque with 150-bar gas cartridge (15 MPa) (Nm)	Max. permissible oil pressure (bar) (MPa)	Capacity (cm ³)	Actuator flange, standardised to ISO
10GS - TU250-038	41	160 (16)	23	F05, F07
10GS - TU500-038	73		62	F07, F10
25GS - TU500-050	95		115	F10, F12
25GS - TU750-050	152			
50GS - TU750-064	201		222	F10, F12, F14
50GS - TB750-064	193			
50GS - TU1500-064	405			
100GS - TB1500-080	495			
100GS - TU3000-080	485		499	F14, F16
100GS - TU3000-125	991			
200GS - TU3000-125	1529		1276	F14, F16 / F25
200GS - TB3000-125	1770			
400GS - TU3000-250	4744		2285	F16, F25, F30
400GS - TB3000-250	4700			
800GS - TU50000-300	9844		4156	F30, F35
800GS - TB5000-300	9698			
1600GS - TU7500-300	17667			
1600GS - TU10000-300	29444			

Example: TU 250 corresponds to a value of 250 kgF (kilogram force) at a pressure of 150 bar and an ambient temperature of 20 °C.

Single-acting hydraulic actuators with spring cartridge, types HQ 10S - HQ 1600S

These single-acting hydraulic actuators are designed for actuating all types of quarter-turn valves. They develop output torques of up to 17,351 Nm (1770.5 kgf.m).

The maximum operating pressure is 160 bar (16 MPa) and the maximum gas pressure is 150 bar (15 MPa).

The spring cartridge of these single-acting hydraulic actuators has the following advantages:

- Spring cartridge easy to replace at the site
- Stroke set between two limit positions by adjustable travel stops

- Welded design for optimum size and added safety

The rack-and-pinion kinematics have the following advantages:

- Precise and reliable function
- Constant output torque
- High performance achieved with space-saving design
- Reliability and long service life

- Submerged operation possible

The toggle-lever kinematics have the following advantages:

- Precise and reliable function
- Suited for the torque
- Develops a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.
- Reliability and long service life
- Submerged operation possible

Characteristics

HQ size	Max. permissible output torque with spring cartridge (Nm)	Max. permissible oil pressure (bar) (MPa)	Capacity (cm ³)	Actuator flange, standardised to ISO
10S	183	160 (16)	23	F05, F07
25S	597		62	F07, F10
50S	1117		115	F10, F12
100S	2148		222	F10, F12, F14
200S	4310		499	F14, F16
400S	16961		1276	F14, F16 / F25
800S	27793		2285	F16, F25, F30
1600S	55251		4156	F30, F35

Hydraulic connection

Standard version: direct connection

The control fluid supply is connected directly at the actuator:

- HQ 10 - 1600: All sizes of the HQ models available come with three types of threaded ports for hydraulic connection: 1/4" gas-threaded, 3/8" gas-threaded and 1/2" gas-threaded.
- Up to HQ 400 we recommend using the 1/4" and 3/8" threaded ports.

Caution: If connected directly, the actuator will only maintain its stroke position as long as control pressure is applied. If this cannot be warranted by the control system, we recommend fitting a distributor plate with piloted check valves (safety block BL0020). See schematic below.

Optional version with distributor plate: HQ 10 - 1600

The control medium supply is connected via a hydraulic distributor plate:

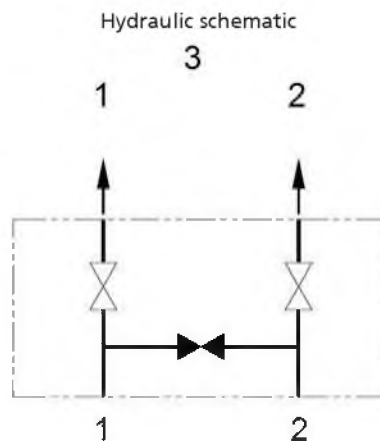
- HQ 10 - 200: mounted directly on the actuator housing
- HQ 400 - 1600: mounted on the actuator with a sub-block (BL0004) via the two 3/8" gas-threaded ports
- 3 distributor plate variants are available, see schematics below.

Shut-off function: BL0032, BL0033 and BL0034

General description:

The shut-off valve block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It is used for interrupting the hydraulic oil supply to the hydraulic actuator using shut-off valves; a bypass valve can be used for flushing the hydraulic line.

- Max. permissible pressure: 160 bar (16 MPa)
- Hydraulic connection: 1/4" gas-threaded port
 - BL0032 = 1/4" G
 - BL0033 = 3/8" G
 - BL0034 = 1/2" G
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 30 l/min at 120 bar (12 MPa)



- 1: Open
- 2: Closed
- 3: To actuator

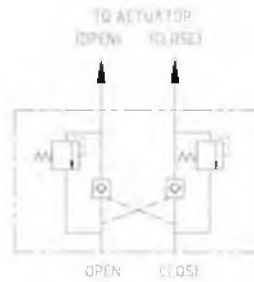
Safety block BL0020

General description:

The safety block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It consists of a spool actuating two piloted check valves. It is used for interrupting the hydraulic oil supply to the hydraulic actuator; a bypass valve can be used for flushing the hydraulic line.

- Max. permissible pressure: 160 bar (16 MPa)
- Hydraulic connection: 1/4" gas-threaded port
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 25 l/min at 120 bar (12 MPa)

Hydraulic schematic



- 1: Open
- 2: Closed
- 3: To actuator

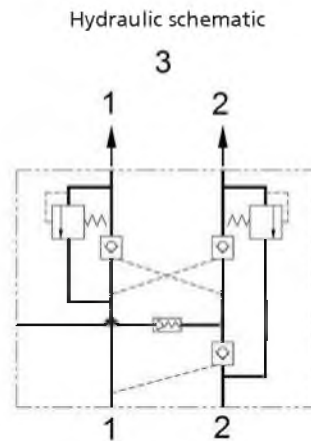
ESD block (BL 0012)

General description:

The ESD block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It consists of 3 piloted check valves and 2 emergency valves.

In an emergency, the actuator is operated (opening/closing) from an external source acting like an accumulator (ESD block).

- Max. permissible pressure: 160 bar (16 MPa)
- Max. pressure in an emergency: 177 bar (17.7 MPa)
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 39 l/min at 120 bar (12 MPa)



- 1: Open
- 2: Closed
- 3: To actuator

Variants

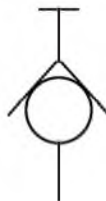
Note: The ESD system must always be controlled by a central hydraulic power unit located at a distance from the valve's/ actuator's place of installation. Quick-connect coupling with integrated dust filter

Applications

The quick-connect coupling is used for hydraulic actuators, solenoid valves and other hydraulic equipment.

- Connection of emergency hand pump
- Venting and flushing of hydraulic cylinder
- Pressure verification of hydraulic equipment

Hydraulic symbol:



Quick-action coupling

Applications

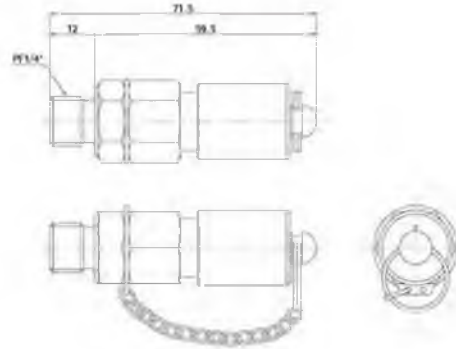
The quick-action coupling (SUS316) meets the requirements of ISO 7241-1, Series B, size 6.3. It is used for hydraulic actuators, solenoid valves and other hydraulic equipment.

- Connection of emergency hand pump
- Venting and flushing of hydraulic cylinder
- Pressure verification of hydraulic equipment

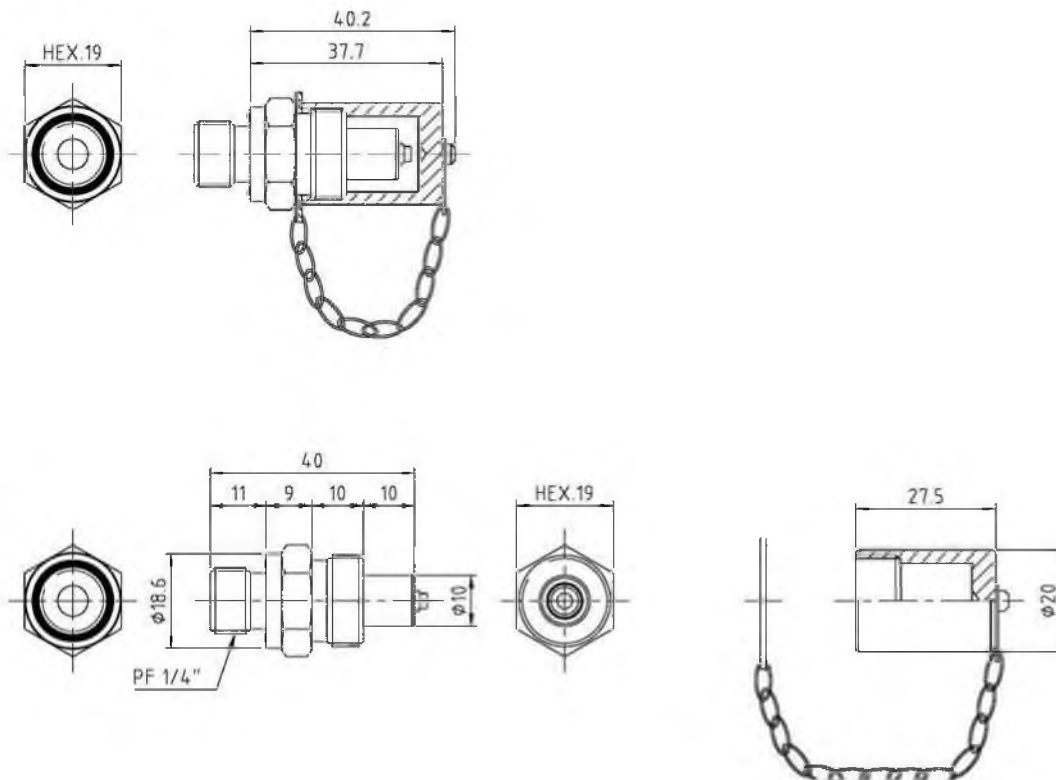
Hydraulic symbol:



Drawing



Drawings

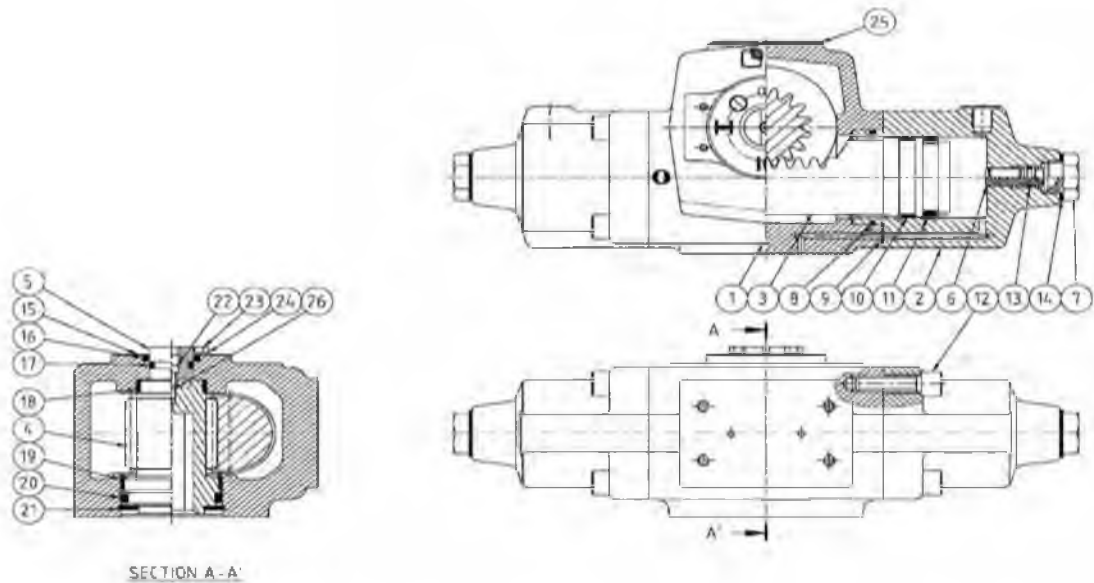


With the exception of the chain, which is made of stainless steel 304, the quick-action coupling is made of stainless steel 316.

Materials

Sectional drawing of HQ 10 - 200

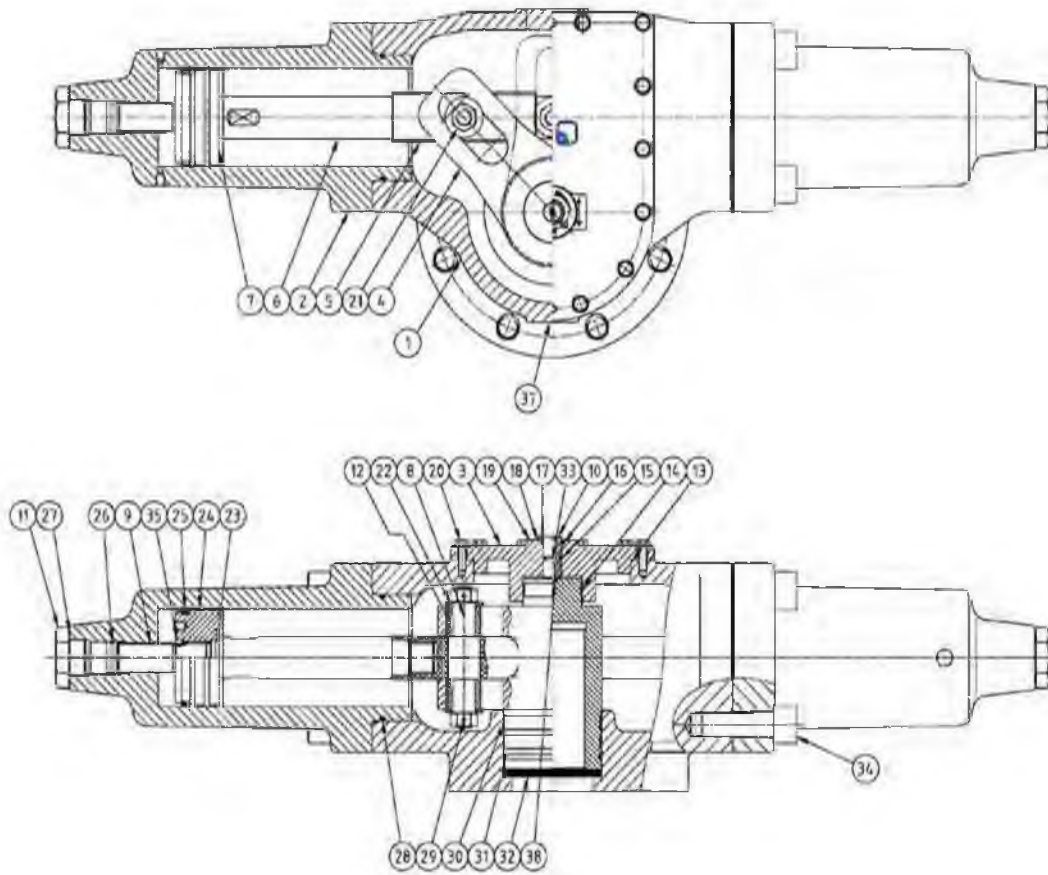
Section A-A



List of components of HQ 10 - 200

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel
07	Plug	Carbon steel 545C (1.1191)
08	O-ring	Nitrile
09	O-ring	Nitrile
10	Wear ring	Plastic (phenol)
11	Ring	Plastic (urethane)
12	Fastening screws/bolts	Steel
13	O-ring	Nitrile
14	Joint ring	Copper
15	Information label	Stainless steel 316
16	Dust seal	Plastic (urethane)
17	O-ring	Nitrile
18	Strap	Plastic (phenol)
19	Strap	Plastic (phenol)
20	O-ring	Nitrile
21	Circlip	Steel SWP-A (ASTM A-228)
22	Fastening nut	Steel
23	Hexagon nut	Stainless steel 316
24	Washer	Stainless steel 316
25	Name plate	Stainless steel 316
26	O-ring	Nitrile

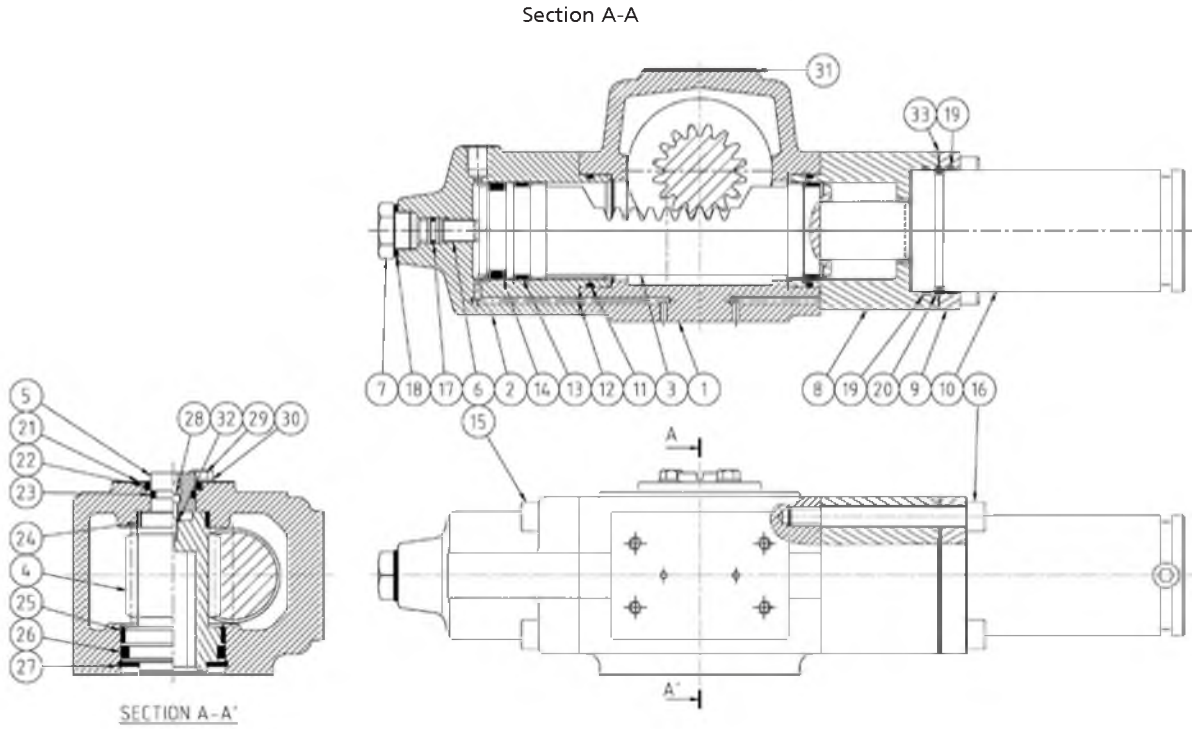
Sectional drawing of HQ 400 - 1600



List of components of HQ 400 - 1600

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	Piston	Carbon steel 545C (1.1191)
08	Lever hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	O-ring	Nitrile
14	Wear ring	Plastic (phenol)
15	O-ring	Nitrile
16	Dust seal	Plastic (urethane)
17	Hexagon nut	Stainless steel 316
18	Washer	Stainless steel 316
19	Information label	Stainless steel 316
20	Hexagon nut	Stainless steel 316
21	Nut	Carbon steel 545C (1.1191)
22	Washer	Bronze (BC3)
23	O-ring	Nitrile
24	Wear ring	Plastic (phenol)
25	Ring	Plastic (urethane)
26	O-ring	Nitrile
27	Joint ring	Copper
28	O-ring	Nitrile
29	Adjusting screw	Nitrile
30	Strap	Steel SCM 440
31	O-ring	Plastic (phenol)
32	Circlip	Nitrile
33	Fastening nut	Steel SWP-A (ASTM A-228)
34	Fastening nut	Steel SCM 440
35	Adjusting screw	Steel SCM 440
36	-	
37	Name plate	Stainless steel 316
38	O-ring	Nitrile

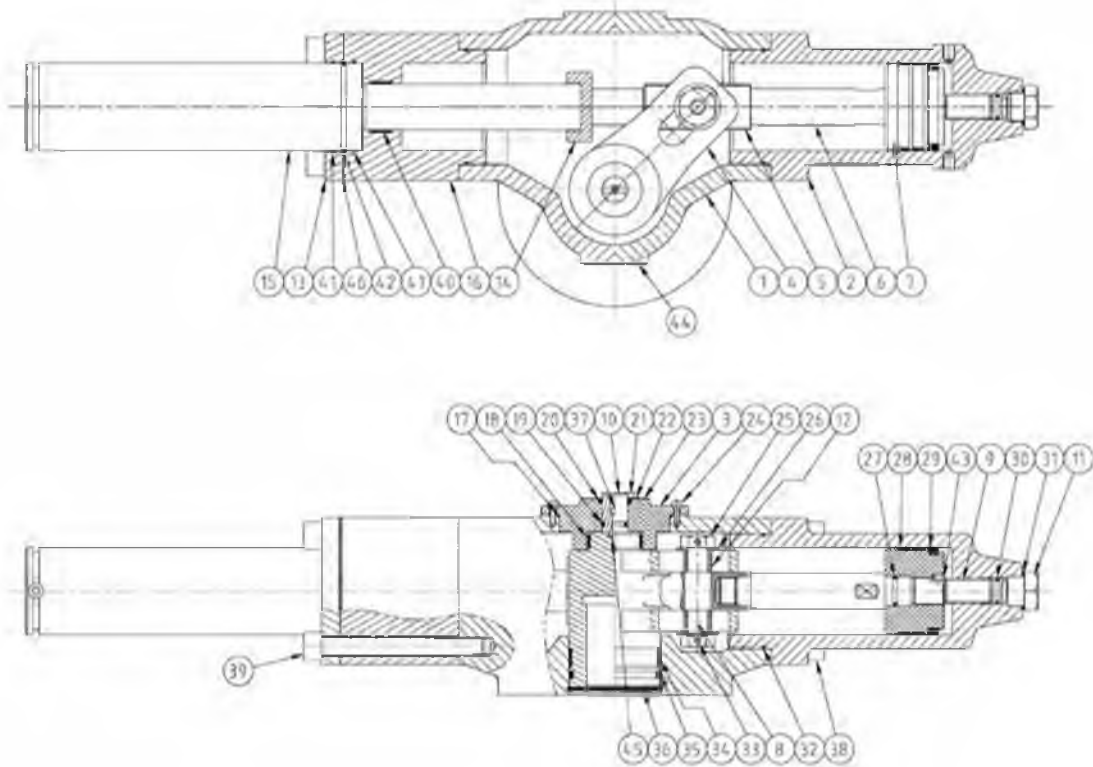
Sectional drawing of HQ 10GS - 200GS



List of components of HQ 10GS - 200GS

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel SCM 440
07	Plug	Carbon steel 545C (1.1191)
08	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
09	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
10	Gas cartridge	-
11	O-ring	Nitrile
12	O-ring	Nitrile
13	Wear ring	Plastic (phenol)
14	Ring	Plastic (urethane)
15	Fastening screws/bolts	Steel SCM 440
16	Fastening screws/bolts	Steel SCM 440
17	O-ring	Nitrile
18	Joint ring	Copper
19	O-ring	Nitrile
20	Ring	Steel SWP-A (ASTM A-228)
21	Name plate	Stainless steel 316
22	Dust seal	Plastic (urethane)
23	O-ring	Nitrile
24	Strap	Plastic (phenol)
25	Strap	Plastic (phenol)
26	O-ring	Nitrile
27	Circlip	Steel SWP-A (ASTM A-228)
28	Fastening nut	Steel SCM 440
29	Hexagon nut	Stainless steel 316
30	Washer	Stainless steel 316
31	Name plate	Stainless steel 316
32	O-ring	Nitrile
33	Joint ring, gas cartridge	Asbestos-free

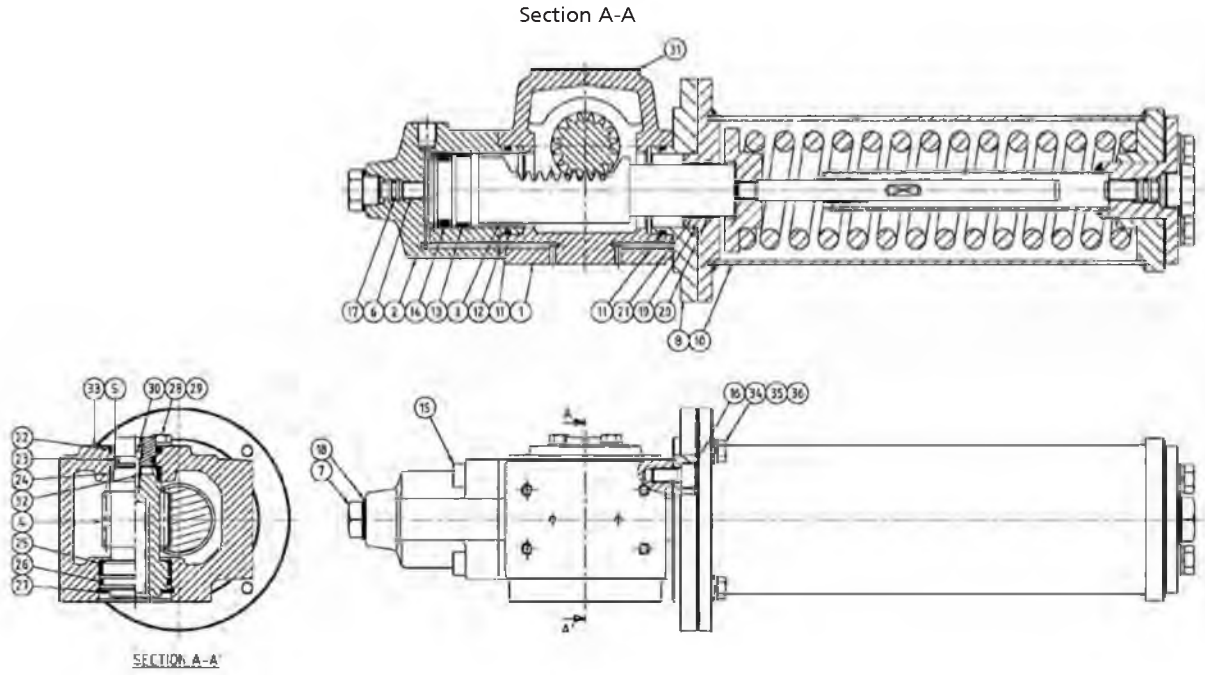
Sectional drawing of HQ 400GS - 1600GS



List of components of HQ 400GS - 1600GS

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	Piston	Carbon steel 545C (1.1191)
08	Fork hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	Flange, gas cartridge	Carbon steel 545C (1.1191)
14	Rod assembly, gas cartridge	Steel SCM 440
15	Gas cartridge	-
16	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
17	O-ring	Nitrile
18	Wear ring	Plastic (phenol)
19	O-ring	Nitrile
20	Dust seal	Plastic (urethane)
21	Hexagon nut	Stainless steel 316
22	Washer	Stainless steel 316
23	Information label	Stainless steel 316
24	Hexagon nut	Stainless steel 316
25	Nut	Carbon steel 545C (1.1191)
26	Washer	Bronze (BC3)
27	O-ring	Nitrile
28	Wear ring	Plastic (phenol)
29	Ring	Plastic (urethane)
30	O-ring	Nitrile
31	Joint ring	Copper
32	O-ring	Nitrile
33	Adjusting screw	Steel SCM 440
34	Strap	Plastic (phenol)
35	O-ring	Nitrile
36	Circlip	Steel SWP-A (ASTM A-228)
37	Fastening nut	Steel SCM 440
38	Fastening screws/bolts	Steel SCM 440
39	Fastening screws/bolts	Steel SCM 440
40	Wear ring	Plastic (phenol)
41	O-ring	Nitrile
42	Ring	Steel SWP-A (ASTM A-228)
43	Adjusting screw	Steel SCM 440
44	Name plate	Stainless steel 316
45	O-ring	Nitrile
46	Joint ring, gas cartridge	Asbestos-free

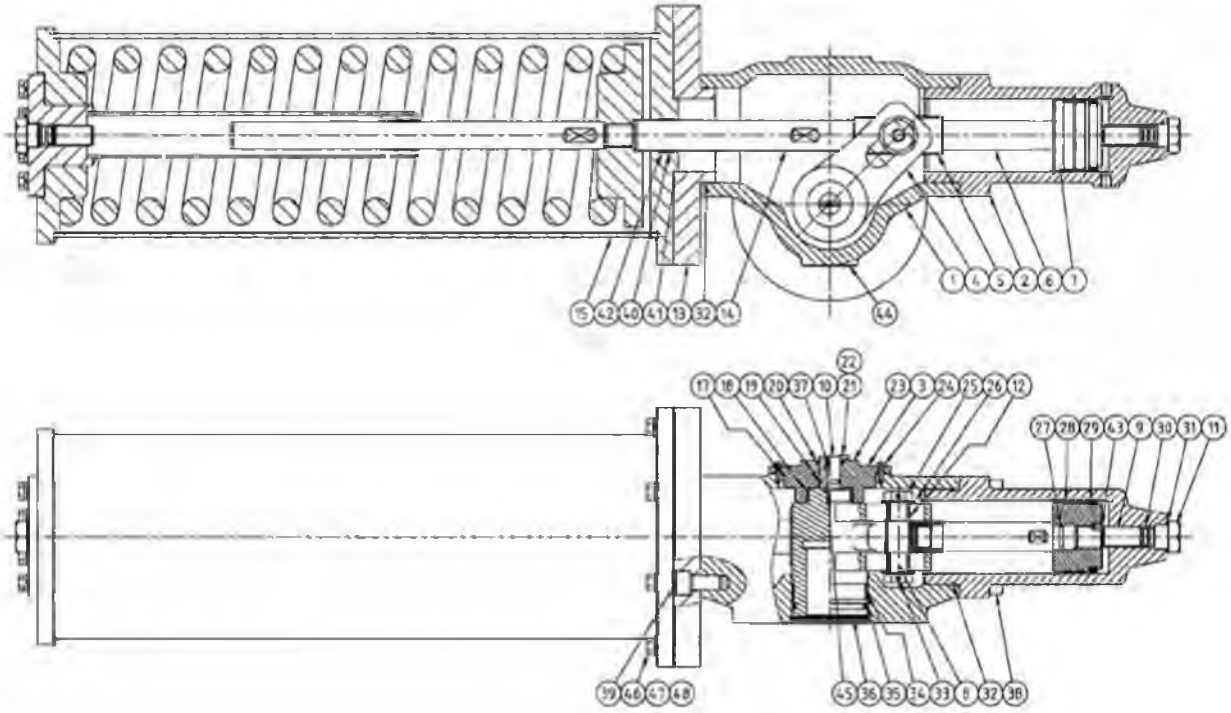
Sectional drawing of HQ 10S - 200S



List of components of HQ 10S - 200S

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel SCM 440
07	Plug	Carbon steel 545C (1.1191)
08	Flange, spring cartridge	Carbon steel 545C (1.1191)
09	-	
10	Spring cartridge assembly	-
11	O-ring	Nitrile
12	O-ring	Nitrile
13	Wear ring	Plastic (phenol)
14	Ring	Plastic (urethane)
15	Fastening screws/bolts	Steel SCM 440
16	Fastening screws/bolts	Steel SCM 440
17	O-ring	Nitrile
18	Joint ring	Copper
19	O-ring	Nitrile
20	O-ring	Nitrile
21	Name plate	PTFE (Teflon 8500)
22	Dust seal	Plastic (urethane)
23	O-ring	Nitrile
24	Strap	Plastic (phenol)
25	Strap	Plastic (phenol)
26	O-ring	Nitrile
27	Circlip	Steel SWP-A (ASTM A-228)
28	Fastening nut	Stainless steel 316
29	Hexagon nut	Stainless steel 316
30	Washer	Steel SCM 440
31	Fastening nut	Stainless steel 316
32	Name plate	Stainless steel 316
33	O-ring	Nitrile
34	Hexagon nut	Stainless steel 316
35	Washer, spring cartridge	Carbon steel 545C (1.1191)
36	Washer	Carbon steel 545C (1.1191)

Sectional drawing of HQ 400S - 1600S

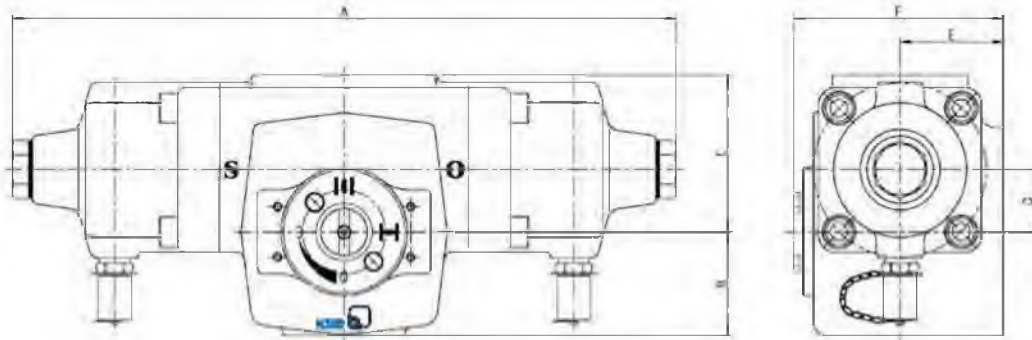


List of components of HQ 400S - 1600S

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	End cap	Carbon steel 545C (1.1191)
08	Fork hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	Flange, spring cartridge	Carbon steel 545C (1.1191)
14	Rod assembly, spring cartridge	Steel SCM 440
15	Spring cartridge	-
16		
17	O-ring	Nitrile
18	Wear ring	Plastic (phenol)
19	O-ring	Nitrile
20	Dust seal	Plastic (urethane)
21	Hexagon nut	Stainless steel 316
22	Washer	Stainless steel 316
23	Information label	Stainless steel 316
24	Hexagon nut	Stainless steel 316
25	Nut	Carbon steel 545C (1.1191)
26	Washer	Bronze (BC3)
27	O-ring	Nitrile
28	Wear ring	Plastic (phenol)
29	Ring	Plastic (urethane)
30	O-ring	Nitrile
31	Joint ring	Copper
32	O-ring	Nitrile
33	Adjusting screw	Steel SCM 440
34	Strap	Plastic (phenol)
35	O-ring	Nitrile
36	Circlip	Steel SWP-A (ASTM A-228)
37	Fastening nut	Steel SCM 440
38	Fastening screws/bolts	Steel SCM 440
39	Fastening screws/bolts	Steel SCM 440
40	Wear ring	PTFE (Teflon 8500)
41	O-ring	Nitrile
42	O-ring	Nitrile
43	Adjusting screw	Steel SCM 440
44	Name plate	Stainless steel 316
45	O-ring	Nitrile
46	Hexagon nut	Carbon steel 545C (1.1191)
47	Disc spring	Carbon steel 545C (1.1191)
48	Washer	Carbon steel 545C (1.1191)

Dimensions

Drawings of HQ 10 - 200

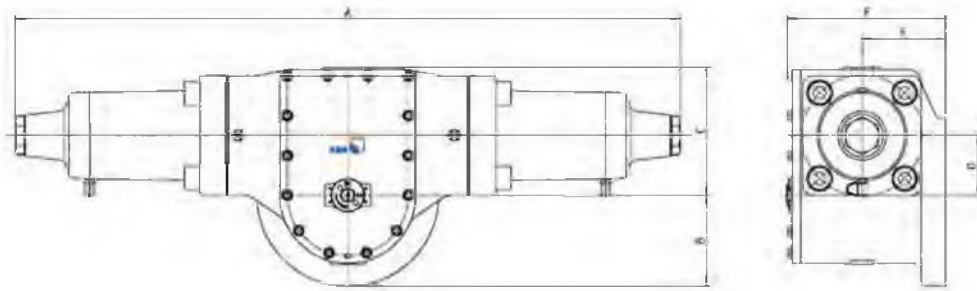


Dimensions of HQ 10 - 200

[mm]

HQ Type	A	B	C	D	E	F	ISO 5211 interface			Weight [kg]
							Ref.	Ø d1	Ø d2	
10	290	42,5	64,5	22	47	97	F05	50	M6	8
							F07	70	M8	
25	325	52	80,5	30	56	112	F07	70	M8	14
							F10	102	M10	
50	399	62	93,5	37	62	126	F10	102	M10	23
							F12	125	M12	
100	479	73	115,5	48	78	154	F12	125	M12	39
							F14	140	M16	
200	635	91	145	69	93,5	183,5	F14	140	M16	76
							F16	165	M20	

Drawings of HQ 400 - 1600

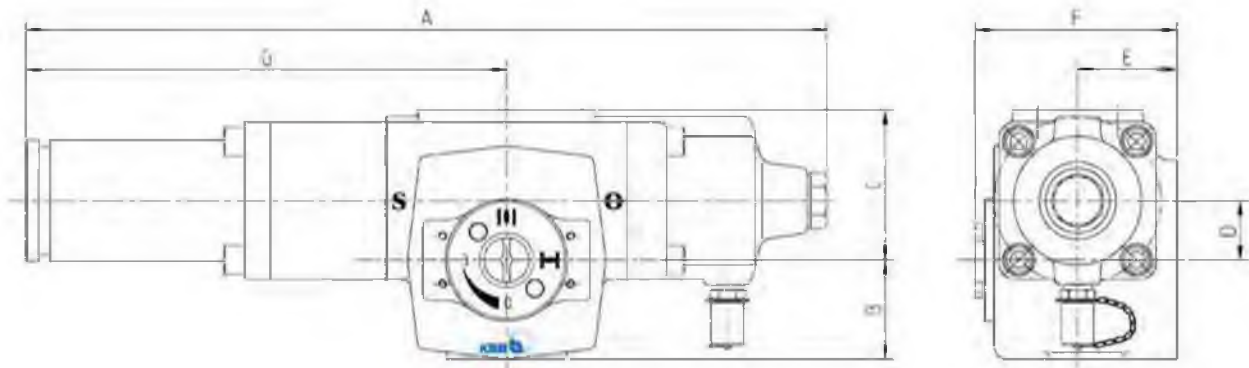


Dimensions of HQ 400 - 1600

[mm]

HQ Type	A	B	C	D	E	F	ISO 5211 interface				Weight [kg]
							Ref.	Ø d1	Ø d2	n	
400	920	127	193	90	113	219	F16	165	M20	4	100
		150					F25	254	M16	8	104
800	1278	158	233,5	110	150	282	F16	165	M20	4	160
		167					F25	254	M16	8	184
		175					F30	298	M20	8	209
1600	1516	190	290	135	190	363	F30	298	M16	8	328
		207,5					F35	298	M20	8	343

Drawings of HQ 10GS - 200GS

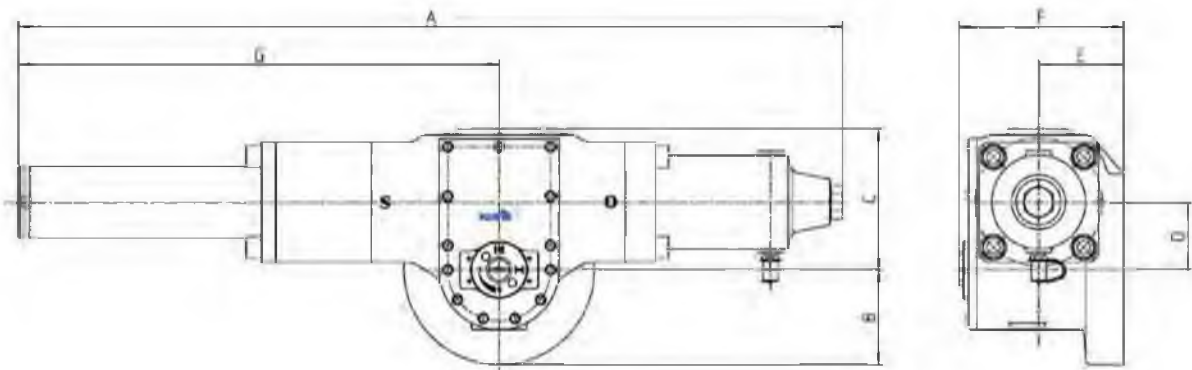


Dimensions of HQ 10GS - 200GS

[mm]

HQ Type	A	B	C	D	E	F	G	ISO 5211 interface			Weight [kg]
								Ref.	Ø d1	Ø d2	
10GS-TU250	311,6	42,5	64,5	22	47	97	166,6	F05	50	M6	9
								F07	70	M8	
10GS-TU500	346,7	42,5	64,5	22	47	97	201,7	F05	50	M6	10
								F07	70	M8	
25GS-TU500	399	52	80,5	30	56	112	236,5	F07	70	M8	17
								F10	102	M10	
25GS-TU750	408	52	80,5	30	56	112	245,5	F07	70	M8	18
								F10	102	M10	
50GS-TU750	486,5	62	93,5	37	62	126	287	F10	102	M10	28
								F12	125	M12	
50GS-TU1500	500,5	62	93,5	37	62	126	301	F10	102	M10	30
								F12	125	M12	
100GS-TU1500	586,7	73	115,5	48	78	154	344,2	F12	125	M12	46
								F14	140	M16	
100GSTU3000	596,7	73	115,5	48	78	154	354,2	F12	125	M12	48
								F14	140	M16	
200GS-TU3000	801	91	145	69	93,5	183,5	482,5	F14	140	M16	86
								F16	165	M20	

Drawings of HQ 400GS - 1600GS

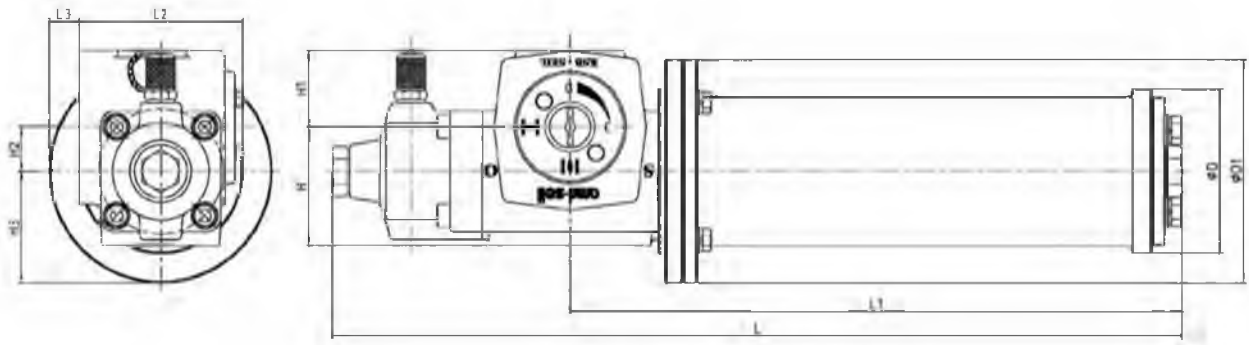


Dimensions of HQ 400GS - 1600GS

[mm]

HQ Type	A	B	C	D	E	F	G	ISO 5211 interface				Weight [kg]
								Ref.	Ø d1	Ø d2	n	
400GS-TU3000	963,5	127	193	90	113	219	641	F16	165	M20	4	138
		150						F25	254	M16	8	142
800GS-TU5000	1408	158	233,5	110	150	282	769	F16	165	M20	4	282
		167						F25	254	M16	8	290
		175						F30	298	M20	8	297
1600GS-TU7500	1595	190	290	135	190	363	837	F30	298	M16	8	535
		207,5						F35	298	M20	8	552
1600GS-TU10000	1597	190	290	135	190	363	839	F30	298	M16	8	570
		207,5						F35	298	M20	8	591

Drawings of HQ 10S - 200S

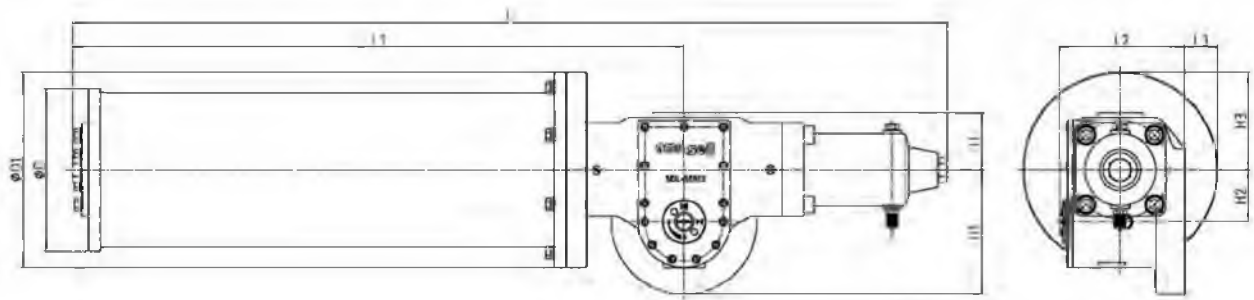


Dimensions of HQ 10S - 200S

[mm]

HQ Type	L	L1	L2	L3	H	H1	H2	H3	D	D1	ISO 5211 interface			Weight [kg]
											Ref.	Ø d1	Ø d2	
10S	468	323	97	21	64,5	42,5	22	67	96	136	F05	50	M6	15
											F07	70	M8	
25S	580	418	112	20	80,5	52	30	76	111	152	F07	70	M8	28
											F10	102	M10	
50S	696,5	497	126	36,5	93,5	63	37	98,5	149	197	F10	102	M10	50
											F12	125	M12	
100sS	896,5	654	154	52	115,5	73	48	130	202	260	F12	125	M12	65
											F14	140	M16	
200S	1150,5	832	183,5	50,5	145	91	69	144	240	288	F14	140	M16	120
											F16	165	M20	

Drawings of HQ 400S - 1600S



Dimensions of HQ 400S - 1600S

[mm]

HQ Type	L	L1	L2	L3	H	H1	H2	H3	D	D1	ISO 5211 interface				Weight [kg]
											Ref.	Ø d1	Ø d2	n	
400S	1529	1069	219	57	103	217	90	170	282	340	F16	165	M20	4	203
						240					F25	254	M16	8	205
800S	2024	1385	282	106	123,5	259	110	256	424	512	F16	165	M20	4	389
						272					F25	254	M16	8	397
						285					F30	298	M20	8	403
1600S	2411	1653	363	92	155	342,5	135	282	474	564	F30	298	M16	8	740
											F35	298	M20	8	752

Variants

Manual override option

Dec clutchable manual override HQ 10 - 1600

A manual override via declutchable manual gearbox with handwheel can be mounted between the valve and the actuator. It overrides the hydraulic actuator and can be used in either clutched (engaged) or declutched (disengaged) position. In this case, the hydraulic actuator is always fitted with a bypass connecting the two chambers and enabling safe use of the declutchable override.

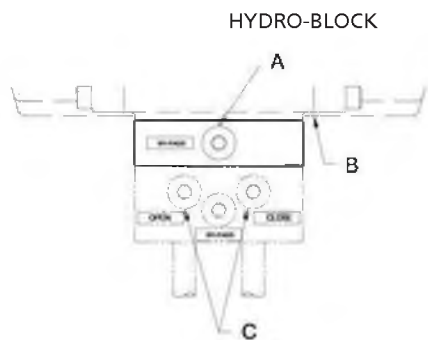
Note: The override must not be used when the actuator is pressurised. Do not declutch the manual override as long as the actuator is pressurised.

Using the manual override:

- Close the shut-off valves (Open/Close) in the HYDRO-BLOCK.
- Open bypass valve No. 1 in the bypass valve block.
- Pull the locking device to set the lever to "manual" position.
- Turn the handwheel to actuate the valve.
 - Clockwise to close the valve
 - Anti-clockwise to open the valve.

Note:

- After the manual override has been used, the lever must be in the "Remote" position to enable remote control of the valve.
- Always take the shut-off valves to the open position and the bypass valve to the closed position.



- A: Bypass valve
- B: Hydraulic actuator
- C: Shut-off valves
- D: Locking device

Open/closed position signalling: HQ 10 - 1600

AMTROBOX R limit switch box

This limit switch box is made of grey cast iron with anti-corrosive coating. Open/closed position signalling function:

- open/closed position signalling via electrical microswitches or inductive proximity sensors (1 for Open and 1 for Closed, 1 for one intermediate position on request)
- proportional signalling via angle sensor (voltage signal or 4-20 mA signal)

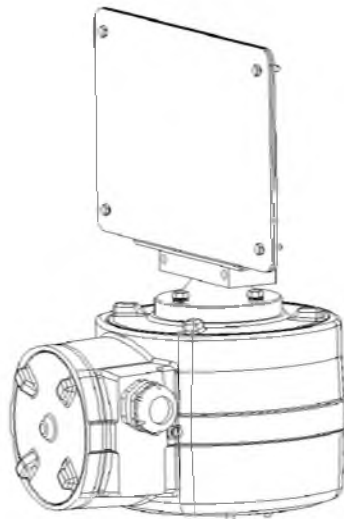
Housing: IP67

Options:

- intrinsically safe version EEx ia IIC T A6



Position signalling function: visual signalling by flag

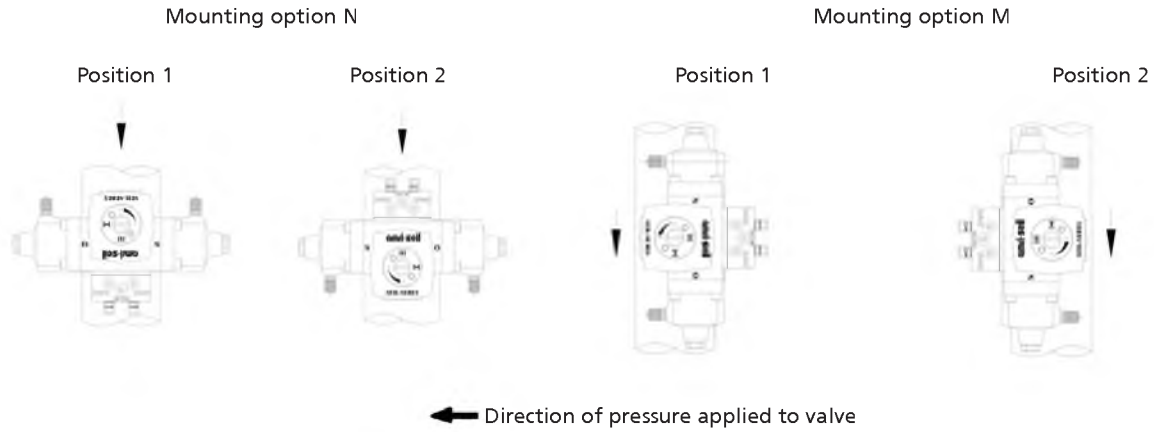


Mounting onto the valve

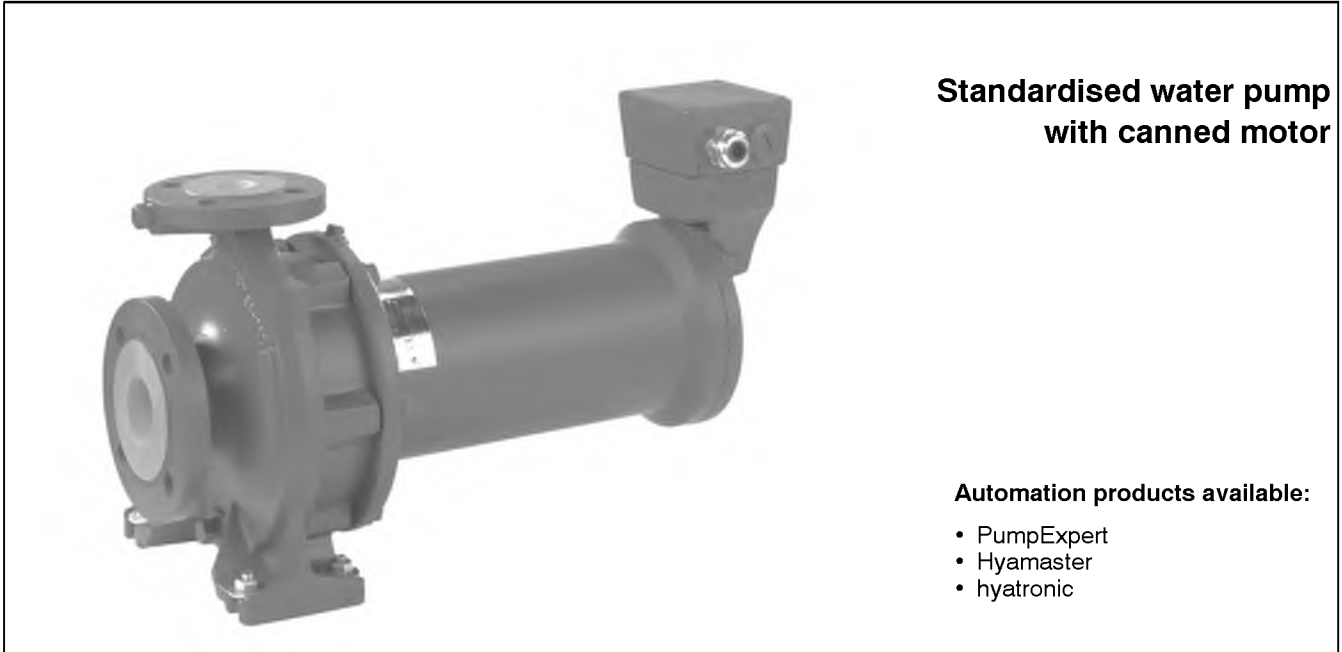
HQ hydraulic actuators can be mounted onto the valve in 4 different positions, offset by 90°.

If the valve is supplied with the actuator mounted, and unless otherwise specified in the purchase order, the actuator is mounted onto the valve according to mounting option N, position 1.

If the actuator is equipped with a declutchable override, it is mounted onto the valve according to mounting option M, position 2.



The mounting position can be modified at the site; proceed as described above. Also adhere to the instructions given in the maintenance manual.



**Standardised water pump
with canned motor**

Automation products available:

- PumpExpert
- Hyamaster
- hyatronic

Fields of Application

For handling aggressive, inflammable, toxic, volatile or valuable liquids in the chemical and petrochemical industries as well as in environmental and industrial engineering.

Etaseco is also suitable for applications requiring low noise emissions, particularly smooth running or long service intervals (operating reliability).

Design

Etaseco

Horizontal/vertical, sealless volute casing pump in back pull-out design, with fully enclosed canned motor, fitted with a radial impeller, single-stage, single-entry.

The connection dimensions of the pump casing comply with EN 733.

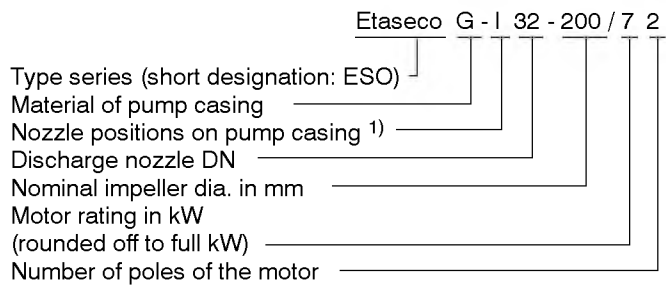
Etaseco-I

Inline pump in back pull-out design, with fully enclosed canned motor, fitted with a radial impeller, single-stage, single-entry.

Drive

Three-phase, asynchronous canned motor, enclosure IP 55, without explosionproof status. Thermal motor protection by means of PTC thermistors. The motor design is in accordance with IEC 60 034 (DIN VDE 0530).

Designation



1) without letter: 90° (axial suction nozzle, radial discharge nozzle)
- I: 180° (suction and discharge nozzle in opposite position)

Operating Data

Capacities	Q up to 250 m ³ /h
Heads	H up to 100 m
Motor ratings	P ₂ from 1,4 to 18 kW
Product temperature	t - 40 to 140 °C
p ₂	up to 16 bar ²⁾

2) The sum of inlet pressure and head at zero flow point must not exceed the value indicated.

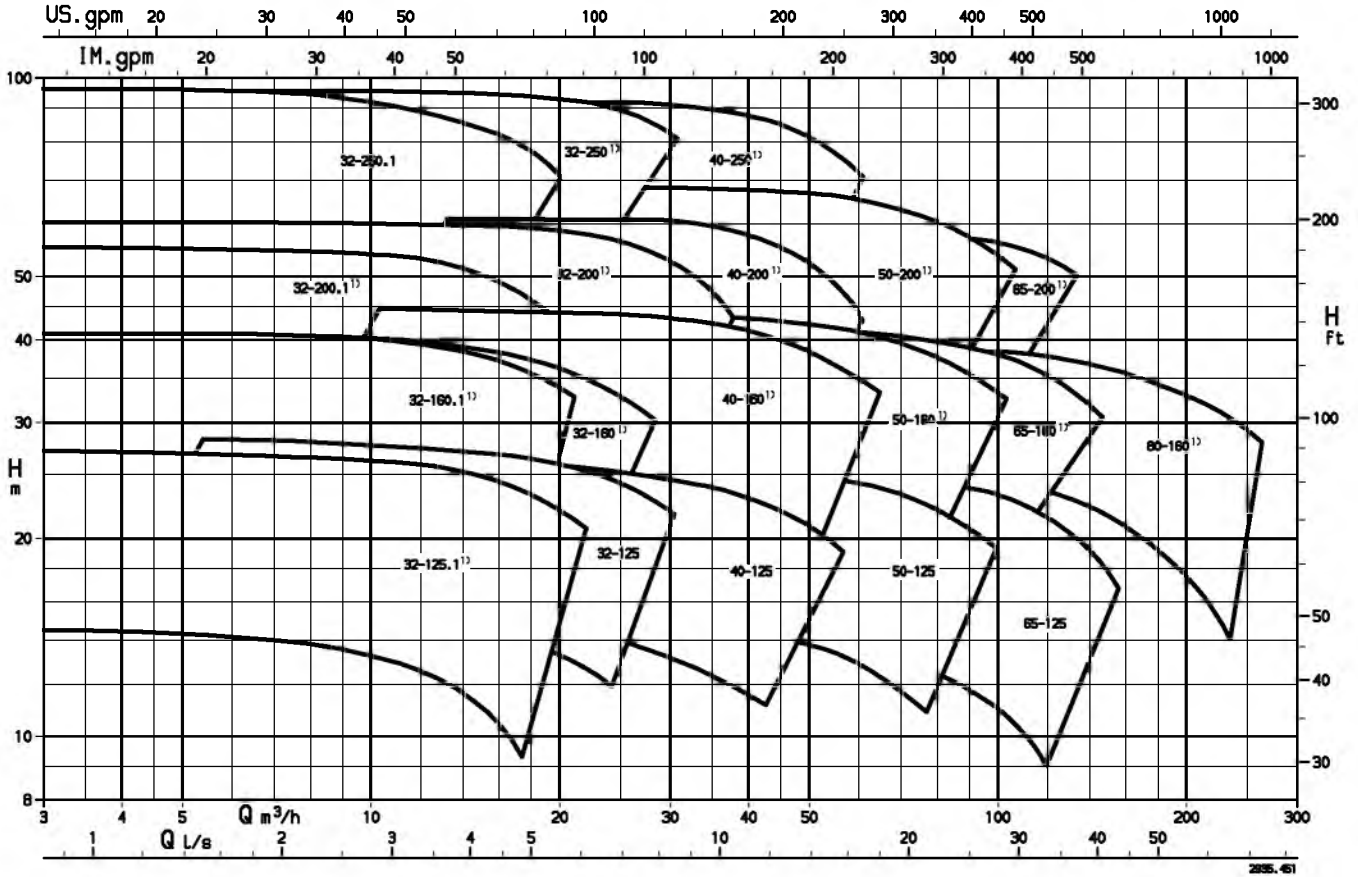
Certification

Certified quality management ISO 9001.

Selection Chart

Etaseco G, S

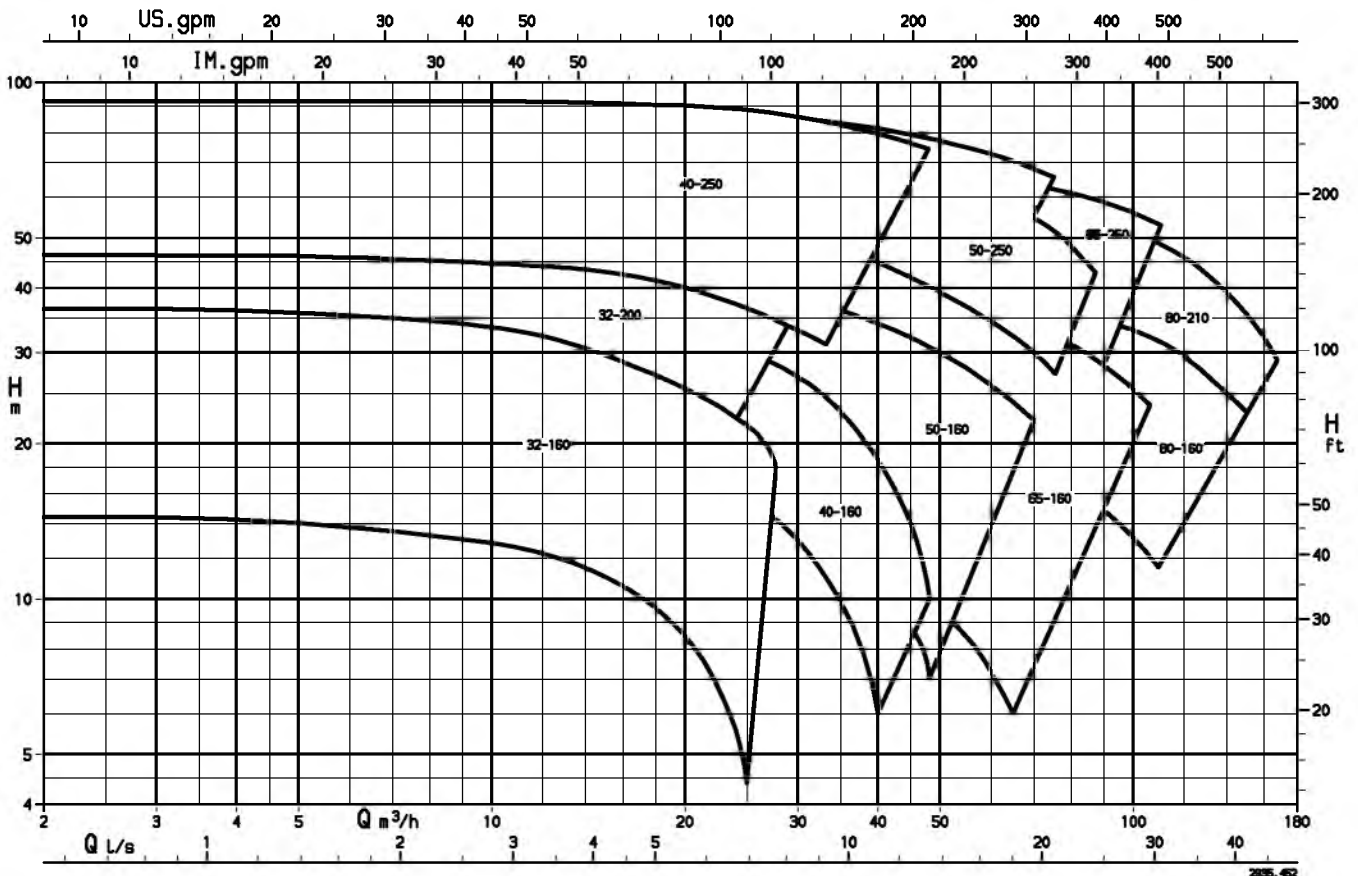
n = 2900 1/min



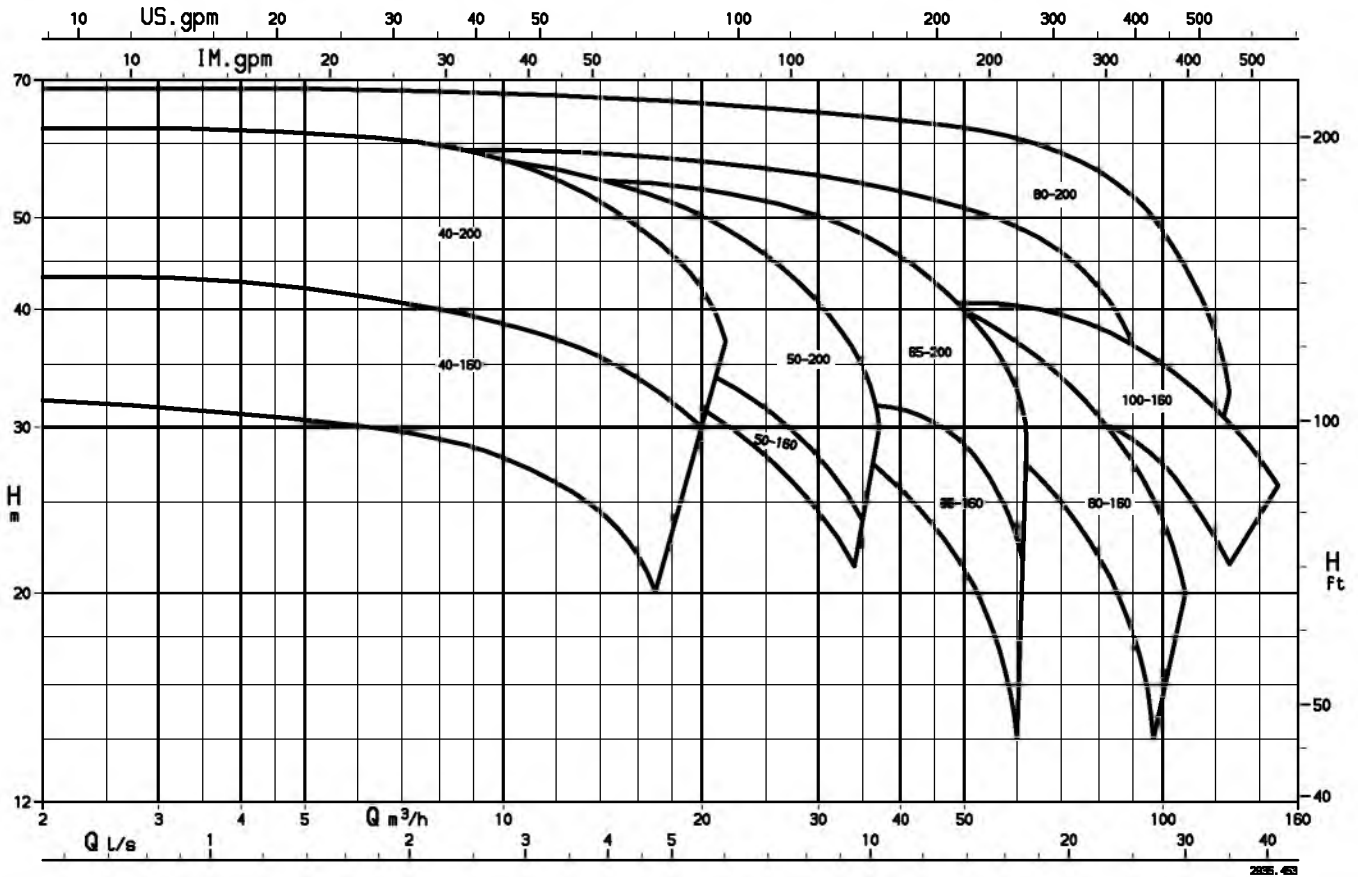
1) Etaseco also available in nodular cast iron

Etaseco G-I

n = 2900 1/min



Etaseco S-I
n = 2900 1/min



Pump/Motor Modular System

Code	Size																							
	32-125.1	32-160.1	32-200.1	32-250.1	32-125	32-160	32-200	32-250	40-125	40-160	40-200	40-250	50-125	50-160	50-200	50-250	65-125	65-160	65-200	65-250	80-160	80-200	80-210	100-160
12	0,1	0,1	-	-	0	0,1,2	-	-	0	0,1,2,3	-	-	0	0,1,2,3	-	-	0	2,3	-	-	3	-	-	-
22	0,1	0,1	-	-	0	0,1,2	-	-	0	0,1,2,3	-	-	0	0,1,2,3	-	-	0	2,3	-	-	3	-	-	-
42	0,1	0,1	0,1	0	0	0,1,2	0,1,2	0,1	0	0,1,2,3	0,1,3	0,1,2	0	0,1,2,3	0,1,3	2	0	0,1,2,3	0,1,3	2	0,1,2,3	3	2	2,3
52	0,1	0,1	0,1	0	0	0,1,2	0,1,2	0,1	0	0,1,2,3	0,1,3	0,1,2	0	0,1,2,3	0,1,3	2	0	0,1,2,3	0,1,3	2	0,1,2,3	3	2	2,3
72	-	0,1	0,1	0	-	0,1,2	0,1,2	0,1	-	0,1,2,3	0,1,3	0,1,2	0	0,1,2,3	0,1,3	2	0	0,1,2,3	0,1,3	2	0,1,2,3	3	2	2,3
112	-	0,1	0,1	0	-	0,1,2	0,1,2	0,1	-	0,1,2,3	0,1,3	0,1,2	0	0,1,2,3	0,1,3	2	0	0,1,2,3	0,1,3	2	0,1,2,3	3	2	2,3
152	-	0,1	0,1	0	-	0,1,2	0,1,2	0,1	-	0,1,2,3	0,1,3	0,1,2	0	0,1,2,3	0,1,3	2	0	0,1,2,3	0,1,3	2	0,1,2,3	3	2	2,3

0 = Etaseco G 1 = Etaseco S 2 = Etaseco G-I 3 = Etaseco S-I - = combination not possible

Material

Part No.	Description	Material G	Material S
102	Volute casing	JL 1040 ⁵⁾	JS 1025 ⁶⁾
161	Casing cover	JS 1025 ¹⁾⁶⁾	JS 1025 ⁶⁾
230	Impeller	JL 1040 ⁵⁾	JL 1040 ⁵⁾
344 ²⁾	Bearing bracket lantern	JS 1025 ⁶⁾	JS 1025 ⁶⁾
412.21/22	O-ring	FPM	FPM
412.02/.11/.41/.71	O-ring (set)	EPDM ³⁾	EPDM ³⁾
529.06/21	bearing sleeve	Sicadur ^{® 8)}	Sicadur ^{® 8)}
545.06/21	bearing bush	Sicadur ^{® 8)}	Sicadur ^{® 8)}
811	casing	St 35.8 ⁷⁾	St 35.8 ⁷⁾
817.01	can	2.4610	2.4610
818	shaft	1.4021	1.4021

- 1) for motors 12 and 22: JL 1040
- 2) omitted for motors 12 and 22
- 3) also available in FPM
- 4) Pairing of bearing: 1.4462/carbon upon request
- 5) to EN 1561 = GJL-250
- 6) to EN 1563 = GJS-400-18-LT
- 7) for motors 12 and 22 also available in JS1025
- 8) Sicadur [®] = SiC ⁴⁾



Advantages at a Glance

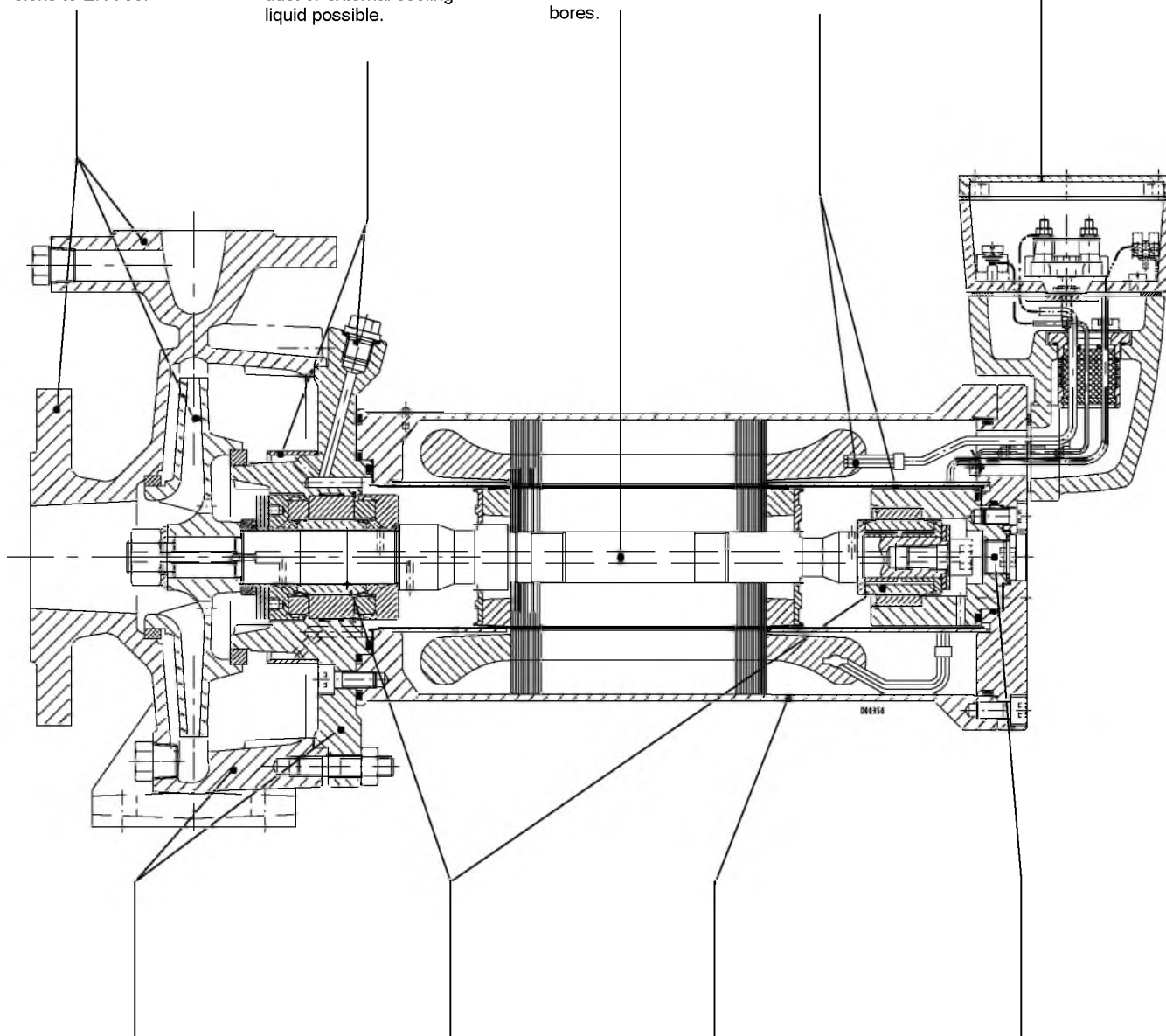
Reliable due to well-proven hydraulic elements of the ETA pump range with excellent efficiencies and NPSH values. Connecting dimensions to EN 733.

High operating reliability due to hydraulic separator: minimised solids content in the cooling flow. Additional connection for filtered product or external cooling liquid possible.

High functional reliability due to self-venting feature of the pump unit via the hollow shaft and radial bores.

Safe due to thermal motor protection and corrosion-resistant materials for can and rotor cladding.

Simple electrical installation Terminal box as on standardised IEC motors



Space-saving and easy to install due to close-coupled design

Long service life due to high-quality plain bearings with long inspection intervals.

Leakage-free, maintenance-free and low-noise, due to canned motor technology

Easy drainage and cleaning, due to flushing connection

Drive

Fully enclosed three-phase, asynchronous canned motor, enclosure IP 55. Thermal motor protection by means of PTC thermistors. The motor design is in accordance with IEC 60 034 (DIN VDE 0530)

Acceptance Tests / Guarantees

- **Materials Tests:**
Test report 2.2 on request
- **Product test**
Inspection certificate 3.1, on request, for:
pressure test of complete pump as per EN 10 204
- **Hydraulic tests:**

The following acceptance tests may be performed and certified at extra charge:

Performance test ISO 9906

NPSH test

Warranties are given within the scope of the valid delivery conditions.

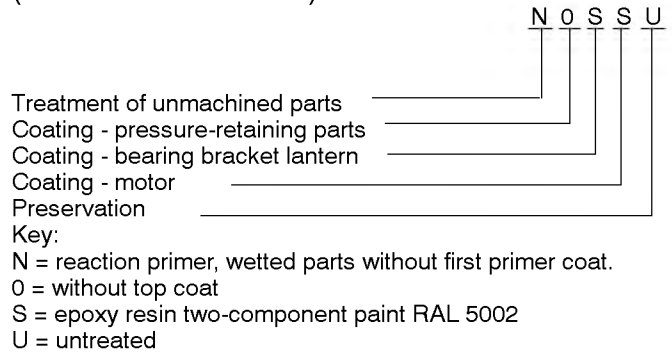
Recommended Stock of Spare Parts for 2 Years' Operation

With a view to the special design of the pump sets, the manufacturer has developed a special concept for spare parts and after-sales services.

Consequently, the manufacturer will always have replacement drives on stock in order to restore the pump set's availability in

Coating and Preservation

(to works standard AN 1865)



the plant as quickly as possible. Repairs of the drive at the site are not provided for, except for replacing spare parts.

Depending on the number of pump sets installed, the operator should keep the following spare parts on stock:

Part No.	Part description	Number of pumps (incl. standby pumps)						
		2	3	4	5	6	8	10 and more
		Quantity of spare parts						
161	Casing cover	-	-	-	1	1	1	10%
230	Impeller	1	1	2	2	2	3	30%
314.01/.02	Thrust bearing	-	-	-	1	1	1	10%
344	Bearing bracket lantern 1)2)	-	-	-	1	1	1	10%
382	Bearing carrier	-	-	-	1	1	1	10%
515.23/.24	Taper lock ring	-	-	-	1	1	1	10%
529.06/.21	Bearing sleeve	-	-	-	1	1	1	10%
	Motor unit 1)	-	-	-	1	1	1	10%
818	Rotor 1)	-	-	-	1	1	1	10%
	Set of sealing elements	2	2	4	4	6	8	100%
	Motor	-	-	-	1	1	1	10%

1) If more than 5 identical motors are in operation, we recommend to keep a complete motor on stock instead of the parts indexed 1).

2) not fitted on motor sizes 12 and 22

Technical data

		Pump sizes																									
		Unit	32-125.1	32-160.1	32-200.1	32-250.1	32-125	32-160	32-200	32-250	40-125	40-160	40-200	40-250	50-125	50-160	50-200	50-250	65-125	65-160	65-200	65-250	80-160	80-200	80-210	100-160	
General	impeller outlet width	mm	5	5.6	6	8	9.6	5.6	6	8	14	12	9	8	20	16	11.5	12	25.6	21	17	14	31.5	23.5	17	36	
	impeller inlet Ø	mm	50	56	56	58	56	56	56	58	70	70	68	70	76.5	75.5	75.5	80	96	92	93	97	124	115	93	142	
	max. impeller Ø	mm	see individual curve																								
	min. impeller Ø	mm	see individual curve																								
Pressure limit	max. operating pressure	bar	16 bar																								
	max. test pressure	bar	1.5 x max. permissible pump discharge pressure																								
Temp. limit	max. product temp.	°C	140 °C																								

Motor Data

General:

Three-phase asynchronous motor

Operating mode to DIN VDE 0530: S1

Starting method:

all motors d.o.l.: for 400 V Y/Δ starting is possible for motors 42 to 152

Voltages:

50 Hz: 400 V, 500 V; from motor 42 upwards, 690 V is also possible
 60 Hz: 480 V, 600 V

Admissible voltage tolerance:

± 10%

Enclosure to DIN VDE 0530:

IP 55

Thermal class:

H

Monitoring:

PTC thermistors in standard pump design; thermal motor protection possible; (temperature in the rotor chamber can be monitored by means of PT 100 on the support sleeve)

Motor Data for 2-pole Motors

Motor code	Motor size DS	Product temp. °C	Operating data at rated power								Start- ing current for d.o.l. starting a multiple of J _N	Start- ing torque M _N	Pull- out torque M _N	Mo- ment of inertia J kgm ²	Weight (compl. drive) kg
			Rated current J _N (A) at			Speed n _N 1/min	Rated power P ₂ kW	Effi- ciency 1) %	Service factor cos φ	Torque M _N Nm					
			400 V	500 V	690 V										
12	90.2-1.1	40	3.7	3.0	-	2790	1.7	76.0	0.88	5.8	4.2	1.9	2)	0.003	35
		70	3.7	3.0	-	2790	1.7	76.0	0.88		4.2				
		100	3.3	2.7	-	2820	1.5	76.5	0.86		4.7				
		140	2.6	2.1	-	2880	1.1	76.5	0.80		6.0				
22	90.2-2.2	40	7.2	5.8	-	2785	3.2	75.1	0.86	11.0	4.3	2.0	2)	0.003	35
		70	6.7	5.4	-	2810	2.9	75.6	0.84		4.7				
		100	5.8	4.7	-	2845	2.4	75.8	0.80		5.4				
		140	4.1	3.3	-	2930	1.1	68.2	0.58		7.6				
42	112.2-4	40	12.3	9.8	7.1	2840	5.5	79.3	0.82	18.5	4.3	1.7	2)	0.006	57
		70	10.8	8.6	6.3	2860	4.8	79.6	0.81		4.8				
		100	9.5	7.6	5.5	2885	4.1	79.5	0.79		5.5				
		140	6.6	5.3	3.8	2940	2.3	75.1	0.68		7.9				
52	112.2-5.5	40	17.1	13.7	9.9	2860	8.1	81.6	0.84	27.1	5.0	2.0	2)	0.008	62
		70	15.6	12.5	9.1	2880	7.3	81.7	0.83		5.5				
		100	13.3	10.7	7.7	2900	6.0	81.2	0.81		6.4				
		140	9.1	7.3	5.3	2945	3.3	76.2	0.69		9.5				
72	132.2-7.5	40	22.9	18.3	13.3	2865	11.4	82.4	0.87	38.1	4.4	1.7	2)	0.021	72
		70	20.4	16.3	11.8	2880	10.2	82.9	0.87		4.9				
		100	17.7	14.2	10.3	2900	8.8	83.0	0.87		5.6				
		140	12.5	10.0	7.2	2940	5.9	81.3	0.84		8.0				
112	132.2-11	40	30.3	24.2	17.6	2905	15.0	83.1	0.86	49.4	5.6	2.4	2)	0.026	72
		70	27.4	21.9	15.9	2915	13.4	82.9	0.85		6.2				
		100	23.4	18.7	13.6	2930	11.1	82.1	0.83		7.3				
		140	15.7	12.6	9.1	2960	6.0	76.1	0.73		10.9				
152	132.2-15	40	35.9	28.7	20.8	2900	18.5	83.7	0.89	60.9	5.6	2.2	2)	0.030	85
		70	32.1	25.7	18.6	2910	16.4	83.6	0.88		6.2				
		100	28.0	22.4	16.3	2920	14.0	83.1	0.87		7.1				
		140	18.9	15.1	11.0	2950	8.3	78.9	0.81		10.6				

1) without liquid fill

2) Contact KSB.

Documentation

Printed documentation in compliance with CE requirements

- Product introduction
- Sectional drawing with list of components
- Dimensions table
- Installation plan
- Performance curves 50 Hz / 60 Hz
- Operating instructions
- Certificate of conformity

Noise Characteristics

Motor code	Motor size DS	Surface sound pressure level L pA (dB) ¹⁾
12	90.2-1.1	48.5
22	90.2-2.2	48.5
42	112.2-4	52
52	112.2-5.5	53
72	132.2-7.5	55
112	132.2-11	58
152	132.2-15	60

1) Measured at a distance of 1 m from the pump outline (to DIN 45635, Parts 1 and 24)

Accessories available

- **PTC tripping unit** (connection see fig. 1)
 The PTC tripping unit (OA1) protects and monitors motors equipped with thermistors (PTCs). The standard Etaseco pump is equipped with thermistors. The temperature sensors are fitted into the stator windings of the motor where they directly measure the temperature rise in the motor. The following operating conditions can be monitored directly:

- sluggish starting
- high switching frequency
- single-phase operation
- high ambient temperature
- insufficient cooling

The tripping unit works independently of the rated motor current, insulation class and starting method.

- **Pump performance control unit (motor load control unit)** monitors the effective power consumption of the motor. Two potentiometers can be set to the maximum and/or minimum power consumption. If the motor power consumption falls short of, or exceeds, the set limit values, 2 LEDs will signal underload, or overload, respectively. Following an adjustable trip delay of 1 ... 10 s, the corresponding output relay is activated. The control unit also features an adjustable start-up delay of 1 ... 30 s, as well as an LED for signaling that the unit is operational.

- monitoring maximum power limits the max. flow rate with a view to cavitation-free pump operation and motor overloading.
- monitoring minimum power protects the pump from dry-running if medium is not available (no-load power)

N.B.: For rated motor currents above 5 A, a current transformer is required for the motor load control unit.

- **Motor standstill heater**

By the motor standstill heater a lowered heating voltage is applied to the motor as compared to the mains voltage. The current flowing at this voltage heats up the motor winding, thus also heating up the liquid in the rotor chamber. The liquid temperature in the rotor chamber can be set to a limit value via a temperature sensor (PT 100) mounted at the rotor chamber.

Due to the functioning of the standstill heater a rotation of the motor shaft is not possible.

- **Main flow filter** (see fig. 2)

A main flow filter can be installed between the pump discharge nozzle and the plant pipeline. While the pumped product flows in axial direction, a partial flow is tapped in radial direction and used for motor cooling and bearing lubrication. After the partial flow has been routed through a strainer (0.08 x 2 mm longitudinal slots), hardly any solids can enter the rotor chamber. The main flow filter is selfcleaning, as the main flow passes parallel to the strainer surface and carries away the solids.

Sealing liquid connection 10 E

For solids-laden products, connection 10 E can be fed with pumped product passed through a self-cleaning main flow filter (fig. 2) or with an external sealing liquid (fig. 3), thus preventing contaminations from entering the rotor chamber. If a KSB filter is used, pump dimension h2 will increase by 60 mm. Any external sealing liquid used must be compatible with the pumped product. **It is advisable to use PTC thermistors i.e. monitoring the temperature in the stator windings, in both cases, in order to prevent motor failures caused by insufficient cooling flow.**

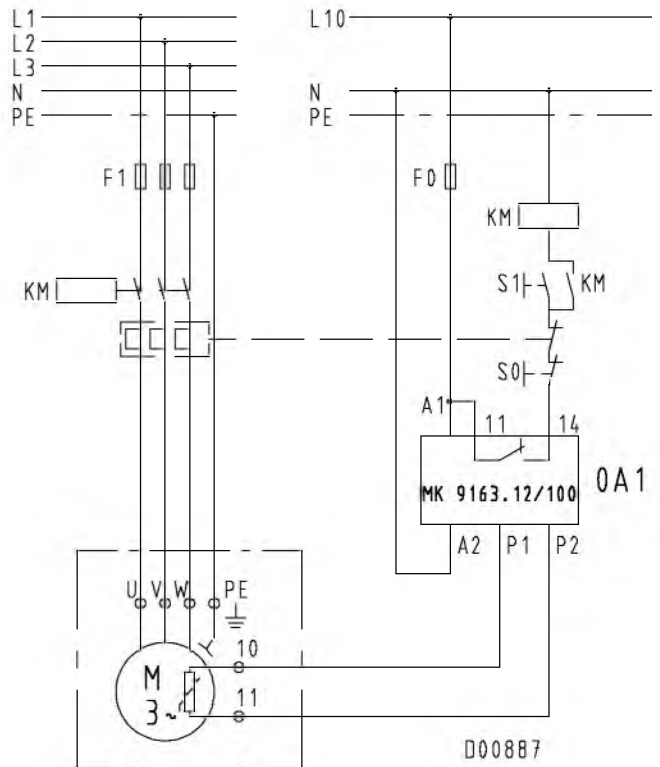


Fig. 1 Standard wiring diagram

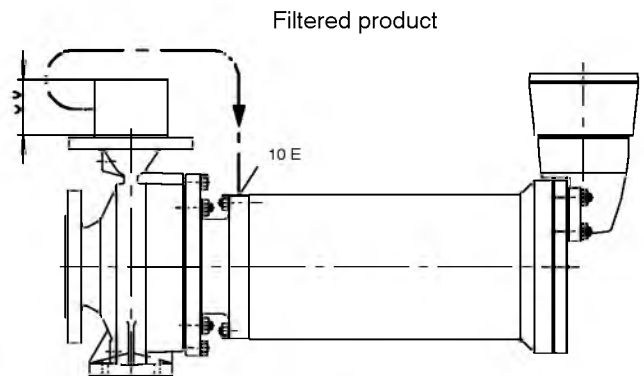


Fig. 2 Sealing with filtered product

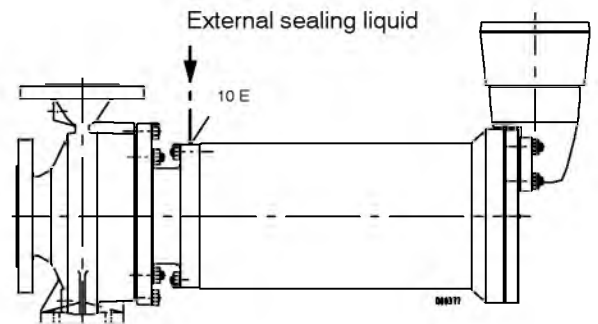
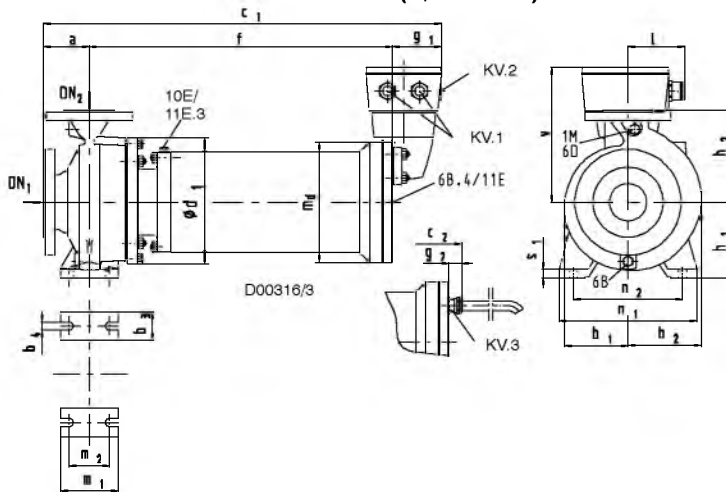


Fig. 3 Sealing with external liquid

Pumped product ^{4) 5)}	Application limits	
	Content max. %	Temp. max. °C
Alkaline cleaning agents		30
Ammonia water	25	30
Bottle rinsing lyes		50
Castor oil ¹⁾		
Caustic soda ⇒ Sodium hydroxide	29	30
Cider		
Corn oil ¹⁾		
Cutting oil		
Edible oil ¹⁾		
Glycol-water mixture		
Hydraulic oil		
Linseed oil		
Lubricating oil		
Metal cleaning lyes, pH ≤ 12		50
Mineral oil		
Oil-water emulsion		
Peanut oil ¹⁾		
Potassium bicarbonate	10	20
Potassium carbonate	50	30
Potassium hydroxide	29	30
Rape oil ¹⁾		
Safety refrigerants, water-free (e.g. Frigen, Freons)		
Silicone oil		
Sodium bicarbonate	10	20
Sodium carbonate	10	30
Sodium hydroxide ⇒ caustic soda	29	30
Sodium nitrate	40	30
Soybean oil ¹⁾		
Turbine oil (not SFD oils, not combustible)		
Vaseline		
Vegetable oils, pure ¹⁾		
Water ²⁾		
Bath water		40
Boiler water		
Cooling water		40
Dam water		25
Drinking water		40
Fire-fighting water		25
Heating water ³⁾		
Partly desalinated water		40
Pure water		40
Pure water with 10 % soda		30
Raw water		40
Rinsing water		40
Slightly contaminated water		25

- 1) not food-approved
- 2) General criteria for results of water analysis: pH value ≥ 6.5; chloride (Cl) content ≤ 150 mg/kg. Chlorine (Cl₂) ≤ 0.6 mg/kg. Please contact KSB if limits are exceeded.
- 3) conductivity at 25 °C: < 250 μS/cm. SiO₂ (silicate) content ≤ 10 mg/l.
- 4) O-ring material FPM: admissible upto -30 °C only
EPDM: admissible upto -40 °C
- 5) Carbon bearings can only be used for products with a low solids content (< 20 ppm) and low particle hardness (Mohs' hardness ≤ |4|)

Dimensions Table Etaseco (G/S variant)

Pump dimensions

Dimensions in mm

Pump size	Pump dimensions													Total weight (approx., kg)					Ød ₁ + ³	
	DN ₁)	DN ₂)	a	b ₁	b ₂	b ₃	b ₄	h ₁	h ₂	m ₁	m ₂	n ₁	n ₂	s ₁	12/22	42	52	72/112		152
32-125.1/..	50	32	80	113	113	50	14	112	140	100	70	190	140	15	52	74	81	-	-	225
32-160.1/..	50	32	80	116	125	50	14	132	160	100	70	240	190	15	53	76	83	107	119	225
32-200.1/..	50	32	80	128 ²⁾	137 ²⁾	50	14	160	180	100	70	240	190	18	-	82	89	113	125	275
32-250.1/..	50	32	100	164	171	65	14	180	225	125	95	320	250	18	-	89	96	120	132	320
32-125/...	50	32	80	113	113	50	14	112	140	100	70	190	140	15	53	75	82	-	-	225
32-160/...	50	32	80	113	125	50	14	132	160	100	70	240	190	15	54	76	83	107	119	225
32-200/...	50	32	80	132 ²⁾	141	50	14	160	180	100	70	240	190	18	-	82	89	113	125	275
32-250/...	50	32	100	170	176	65	14	180	225	125	95	320	250	18	-	90	97	121	133	320
40-125/...	65	40	80	113	113	50	14	112	140	100	70	210	160	15	54	76	83	-	-	225
40-160/...	65	40	80	115	131	50	14	132	160	100	70	240	190	15	56	78	85	109	121	225
40-200/...	65	40	100	115 ²⁾	131 ²⁾	50	14	160	180	100	70	265	212	18	-	83	90	114	126	275
40-250/...	65	40	100	165	178	65	14	180	225	125	95	320	250	18	-	91	98	122	134	320
50-125/...	65	50	100	113	128	50	14	132	160	100	70	240	190	18	57	79	86	110	122	225
50-160/...	65	50	100	126	147	50	14	160	180	100	70	265	212	18	59	81	88	112	124	225
50-200/...	65	50	100	145	165	50	14	160	200	100	70	265	212	18	-	85	92	116	128	275
65-125/...	80	65	100	120	148	65	14	160	180	125	95	280	212	18	62	84	91	115	127	225
65-160/...	80	65	100	130	158	65	14	160	200	125	95	280	212	18	-	87	94	118	130	225
65-200/...	80	65	100	154	177	65	14	180	225	125	95	320	250	18	-	90	97	121	133	275
80-160/...	100	80	125	153	192	65	14	180	225	125	95	320	250	18	-	96	103	127	139	225

1) DN = EN 1092-2/DN../PN 16/21/B

 2) in addition observe Ød₁
Dimensions of pump set

Pump size	Motor size																											
	12/22										42/52				72/112/152													
	c ₁	c ₂	f	g ₁	g ₂	m _d	v	l			c ₁	c ₂	f	g ₁	g ₂	m _d	v	l		c ₁	c ₂	f	g ₁	g ₂	m _d	v	l	
32-125.1/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	-	-	-	-	-	-	-	-	-	-	-	-
32-160.1/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	787	730	621	86	29	240	251	112	112	112	112	
32-200.1/...	-	-	-	-	-	-	-	-	695	634	529	86	25	210	235	112	787	730	621	86	29	240	251	112	112	112	112	
32-250.1/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
32-125/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	-	-	-	-	-	-	-	-	-	-	-	
32-160/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	787	730	621	86	29	240	251	112	112	112	112	
32-200/...	-	-	-	-	-	-	-	-	695	634	529	86	25	210	235	112	787	730	621	86	29	240	251	112	112	112	112	
32-250/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
40-125/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	-	-	-	-	-	-	-	-	-	-	-	
40-160/...	561	512	409	72	23	170	187	84	695	634	529	86	25	210	235	112	787	730	621	86	29	240	251	112	112	112	112	
40-200/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
40-250/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
50-125/...	581	532	409	72	23	170	187	84	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
50-160/...	581	532	409	72	23	170	187	84	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
50-200/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
65-125/...	581	532	409	72	23	170	187	84	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
65-160/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
65-200/...	-	-	-	-	-	-	-	-	715	654	529	86	25	210	235	112	807	750	621	86	29	240	251	112	112	112	112	
80-160/...	-	-	-	-	-	-	-	-	740	679	529	86	25	210	235	112	832	775	621	86	29	240	251	112	112	112	112	

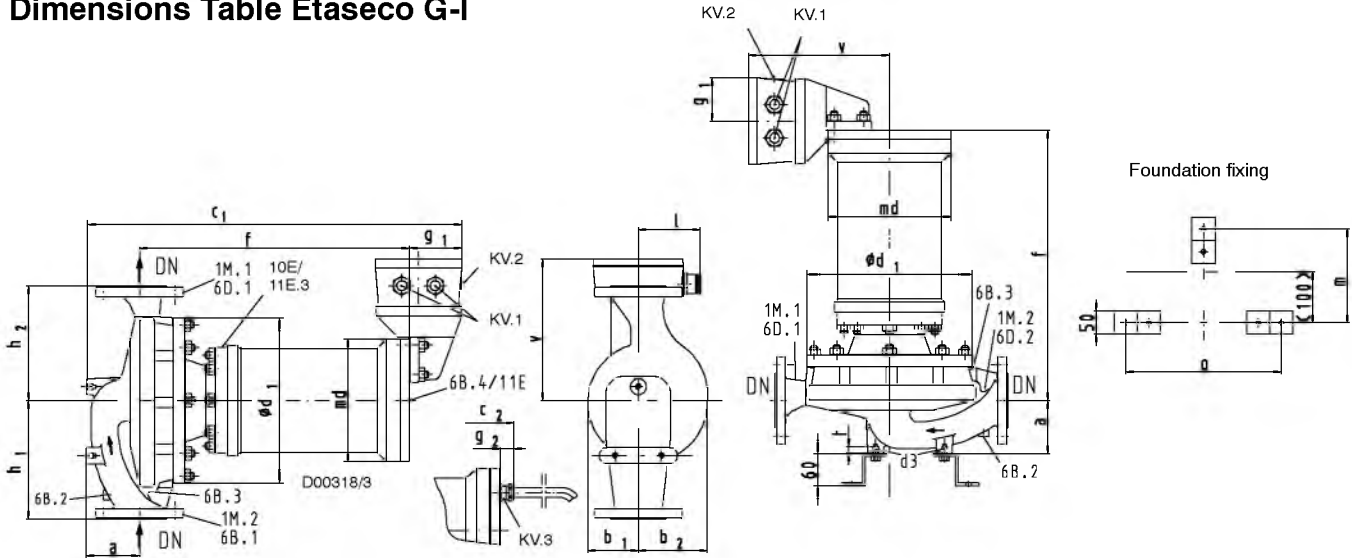
Pump connections

Connections	Pump size	Description	
32-.../...	32-.../...		
40-.../...	40-.../...		
50-.../...	50-.../...		
65-.../...	65-.../...		
80-.../...	80-.../...		
Material variant			
G			
S			
1 M	Rc 3/8	G ³ / ₈	Pressure gauge connection
6 B	Rc 3/8	G ³ / ₈	Casing drain
6 D	Rc 3/8	G ³ / ₈	Casing - priming and venting

Rc = ISO 7/1 G = ISO 228/1

Motor connections

Connections	Motor sizes		Description
	12/22	42/52/72/112/152	
6 B.4	G 3/8	G 3/8	Motor drain
10 E	G 1/4	G 1/4	Barrier fluid inlet
11 E	G 3/8	G 3/8	Flushing liquid inlet
11 E.3	G 1/4	G 1/4	Flushing liquid inlet or sealing liquid inlet
KV.1	PG 21	PG 29	Terminal box version Electrical connection - power cable
KV.2	PG 11	PG 11	Terminal box version Electrical connection - auxiliary cable
KV.3	PG 16	PG 21 (DS 112)	Variant free cable end

Dimensions Table Etaseco G-I

Pump dimensions

Dimensions in mm

Pump size	Pump dimensions											Total weight (approx., kg)					Motor size	Ød ₁ ⁺³
	DN ¹⁾	a	b ₁	b ₂	d ₃	h ₁	h ₂	t	m	o	12/22	42	52	72/112	152			
32-160/...	32	69	112	120	M10	160	160	12,5	175	190	53	75	82	106	118	225		
32-200/...	32	95	129 ²⁾	135 ²⁾	M10	190	190	12,5	175	190	-	81	88	112	124	275		
40-160/...	40	80	112	119	M10	160	160	12,5	175	190	54	76	83	107	119	225		
40-250/...	40	95	161	168	M10	220	220	12,5	175	190	-	89	96	120	132	320		
50-160/...	50	85	113	125	M10	170	170	12,5	175	190	57	79	86	110	122	225		
50-250/...	50	100	160	175	M10	220	220	12,5	175	210	-	93	100	124	136	320		
65-160/...	65	100	113	125	M10	170	170	12,5	175	210	59	81	88	112	124	225		
65-250/...	65	105	167	190	M10	225	250	12,5	175	230	-	98	105	129	141	320		
80-160/...	80	97	113	135	M10	180	180	12,5	175	230	-	87	94	118	130	225		
80-210/...	80	151	140	160	M10	250	250	12,5	195	230	-	96	103	127	139	275		
100-160/...	100	118	114	144	M10	250	200	12,5	195	230	-	91	98	122	134	225		

1) DN = EN 1092-2/DN.../PN 16/21/B

 2) in addition observe Ød₁

can be mounted with three angle steel feet

Dimensions of pump set

Pump size	Motor size																							
	12/22									42/52						72/112/152								
Baugröße	c ₁	c ₂	f	g ₁	g ₂	m _d	v	l	c ₁	c ₂	f	g ₁	g ₂	m _d	v	l	c ₁	c ₂	f	g ₁	g ₂	m _d	v	l
32-160/...	568	519	427	72	23	170	187	84	702	641	547	86	25	210	235	112	794	737	639	86	29	240	251	112
32-200/...	-	-	-	-	-	-	-	-	721	660	540	86	25	210	235	112	814	757	633	86	29	240	251	112
40-160/...	577	528	425	72	23	170	187	84	711	650	545	86	25	210	235	112	804	747	638	86	29	240	251	112
40-250/...	-	-	-	-	-	-	-	-	721	660	540	86	25	210	235	112	814	757	633	86	29	240	251	112
50-160/...	587	538	430	72	23	170	187	84	721	660	550	86	25	210	235	112	813	756	642	86	29	240	251	112
50-250/...	-	-	-	-	-	-	-	-	730	669	544	86	25	210	235	112	822	765	636	86	29	240	251	112
65-160/...	606	557	434	72	23	170	187	84	740	679	554	86	25	210	235	112	832	775	646	86	29	240	251	112
65-250/...	-	-	-	-	-	-	-	-	745	684	554	86	25	210	235	112	837	780	646	86	29	240	251	112
80-160/...	-	-	-	-	-	-	-	-	746	685	563	86	25	210	235	112	839	782	656	86	29	240	251	112
80-210/...	-	-	-	-	-	-	-	-	765	704	528	86	25	210	235	112	857	800	620	86	29	240	251	112
100-160/...	-	-	-	-	-	-	-	-	762	701	558	86	25	210	235	112	854	797	650	86	29	240	251	112

Pump connections

Connections	Pump sizes		Description
	32-.../...	100-.../...	
	40-.../...		
	50-.../...		
	65-.../...		
	80-.../...		
1 M.1/2	Rc 3/8	Rc 1/2	Pressure gauge connection
6 B.1/.2 ²⁾ /3	Rc 3/8	Rc 1/2	Casing drain
6 D.1/2	Rc 3/8	Rc 1/2	Casing - priming and venting

Rc = ISO 7/1

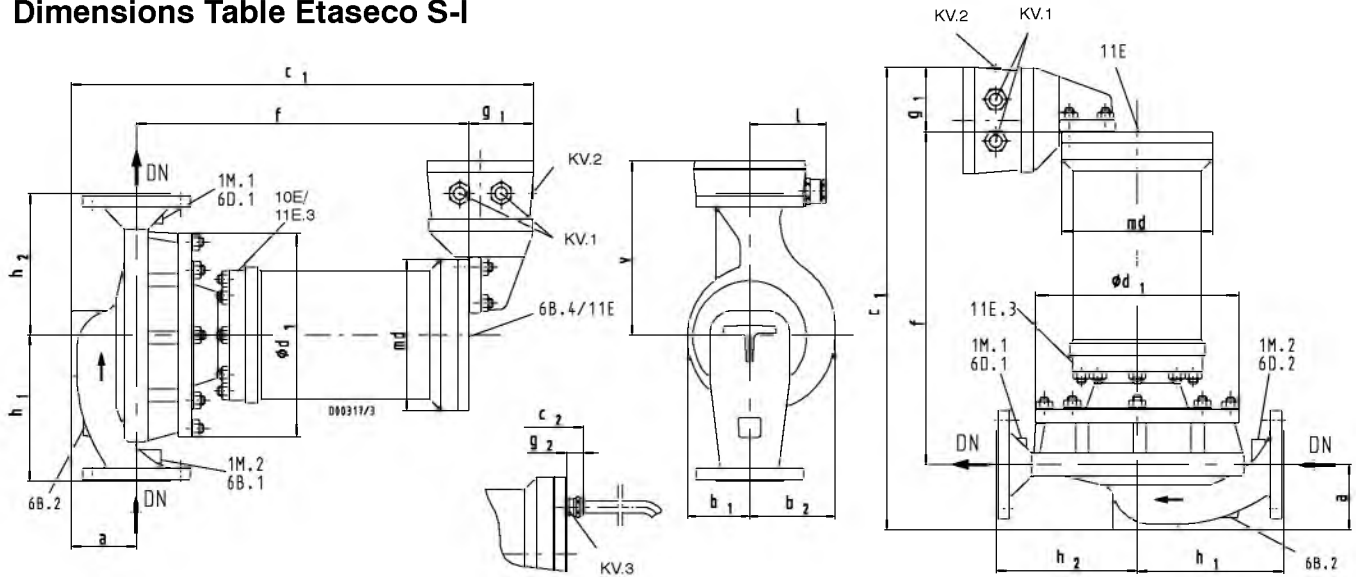
2) 6B.2 only on pump sizes 80-120, 100-125 and 100-160

Motor connections

Connections	Motor sizes		Description
	12/22	42/52/72/112/152	
6 B.4	G 3/8	G 3/8	Motor drain
10 E	G 1/4	G 1/4	Barrier fluid inlet
11 E	G 3/8	G 3/8	Flushing liquid inlet
11 E.3	G 1/4	G 1/4	Flushing liquid inlet or sealing liquid inlet
KV.1	PG 21	PG 29	Terminal box version Electrical connection - power cable
KV.2	PG 11	PG 11	Terminal box version Electrical connection - auxiliary cable
KV.3	PG 16	PG 21 (DS 112)	Variant free cable end

G = ISO 228/1

PG = DIN 40430

Dimensions Table Etaseco S-I

Pump dimensions

Dimensions in mm

Pump size	Pump dimensions						Total weight (approx.. kg)						Ød ₁ +3
	DN ¹⁾	a	b ₁	b ₂	h ₁	h ₂	Motor size						
							12/22	42	52	72/112	152		
40-160/...	40	75	113	113	155.0	165.0	54	76	83	107	119	225	
40-200/...	40	85	136 ²⁾	136 ²⁾	180.0	210.0	-	82	89	113	125	275	
50-160/...	50	78	113	120	160.0	180.0	56	78	85	109	121	225	
50-200/...	50	91	138	138	205.0	220.0	-	85	92	116	128	275	
65-160/...	65	100	113	118	160.0	180.0	59	81	88	112	124	225	
65-200/...	65	102	136 ²⁾	138	240.0	235.0	-	90	97	121	133	275	
80-160/...	80	108	113	128	180.0	180.0	64	87	94	118	130	225	
80-200/...	80	136	138	154	262.5	237.5	-	91	98	122	134	275	
100-160/...	100	114	114	144	250.0	200.0	-	92	99	123	135	225	

- 1) DN = EN 1092-2/DN.../PN 16/21/B
 2) In addition observe Ø d₁

Dimensions of pump set

Pump size	Motor size																												
	12/22									42/52						72/112/152													
	c ₁	c ₂	f	g ₁	g ₂	m _d	v	l		c ₁	c ₂	f	g ₁	g ₂	m _d	v	l		c ₁	c ₂	f	g ₁	g ₂	m _d	v	l			
Baugröße																													
40-160/...	567	590	420	72	23	170	187	84	702	641	541	86	25	210	235	112	794	737	633	86	29	240	251	112					
40-200/...	-	-	-	-	-	-	-	-	719	658	548	86	25	210	235	112	811	754	640	86	29	240	251	112					
50-160/...	575	598	425	72	23	170	187	84	710	649	546	86	25	210	235	112	802	745	638	86	29	240	251	112					
50-200/...	-	-	-	-	-	-	-	-	723	662	546	86	25	210	235	112	816	759	639	86	29	240	251	112					
65-160/...	606	629	434	72	23	170	187	84	740	679	554	86	25	210	235	112	833	776	647	86	29	240	251	112					
65-200/...	-	-	-	-	-	-	-	-	730	669	542	86	25	210	235	112	822	765	634	86	29	240	251	112					
80-160/...	616	639	436	72	23	170	187	84	750	689	556	86	25	210	235	112	843	786	649	86	29	240	251	112					
80-200/...	-	-	-	-	-	-	-	-	751	690	529	86	25	210	235	112	843	786	621	86	29	240	251	112					
100-160/...	-	-	-	-	-	-	-	-	758	697	558	86	25	210	235	112	736	679	650	86	29	240	251	112					

Pump connections

Connections	Pump sizes		Description
	40-.../...	100-.../...	
	50-.../...		
	65-.../...		
	80-.../...		
1 M.1/2	G 3/8	G 1/2	Pressure gauge connection
6 B.1/2 ²⁾	G 3/8	G 1/2	Casing drain
6 D.1/2	G 3/8	G 1/2	Casing - priming and venting

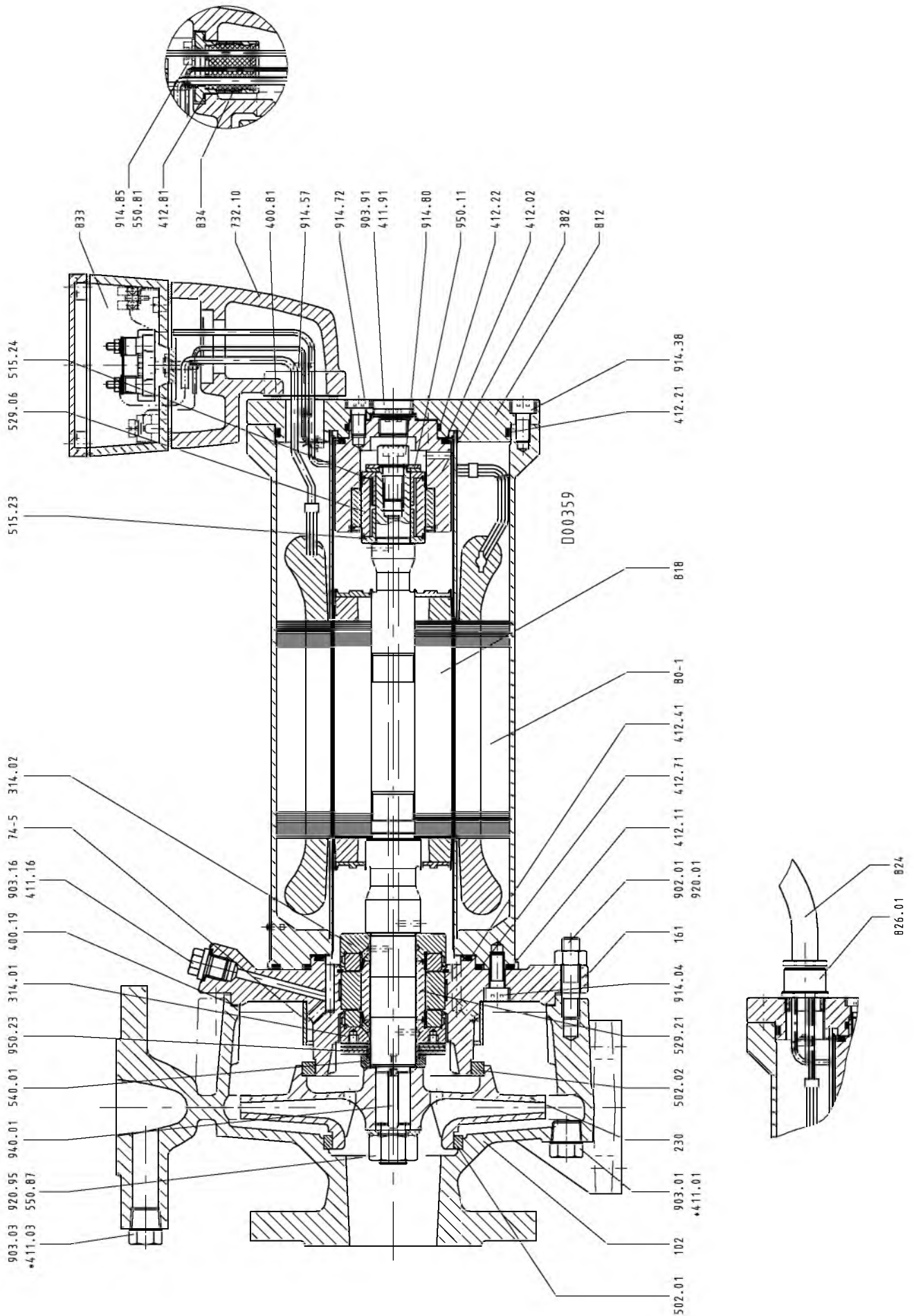
- 2) 6B.2 only on pump sizes 80-200 and 100-160

Motor connections

Connections	Motor sizes		Description
	12/22	42/52/72/112/152	
6 B.4	G 3/8	G 3/8	Motor drain
10 E	G 1/4	G 1/4	Barrier fluid inlet
11 E	G 3/8	G 3/8	Flushing liquid inlet
11 E.3	G 1/4	G 1/4	Flushing liquid inlet or sealing liquid inlet
KV.1	PG 21	PG 29	Terminal box version Electrical connection - power cable
KV.2	PG 11	PG 11	Terminal box version Electrical connection - auxiliary cable
KV.3	PG 16	PG 21 (DS 112)	Variant free cable end

G = ISO 228/1
 PG = DIN 40430

Motors DS 90 (motor sizes 12 and 22) with SSiC bearings

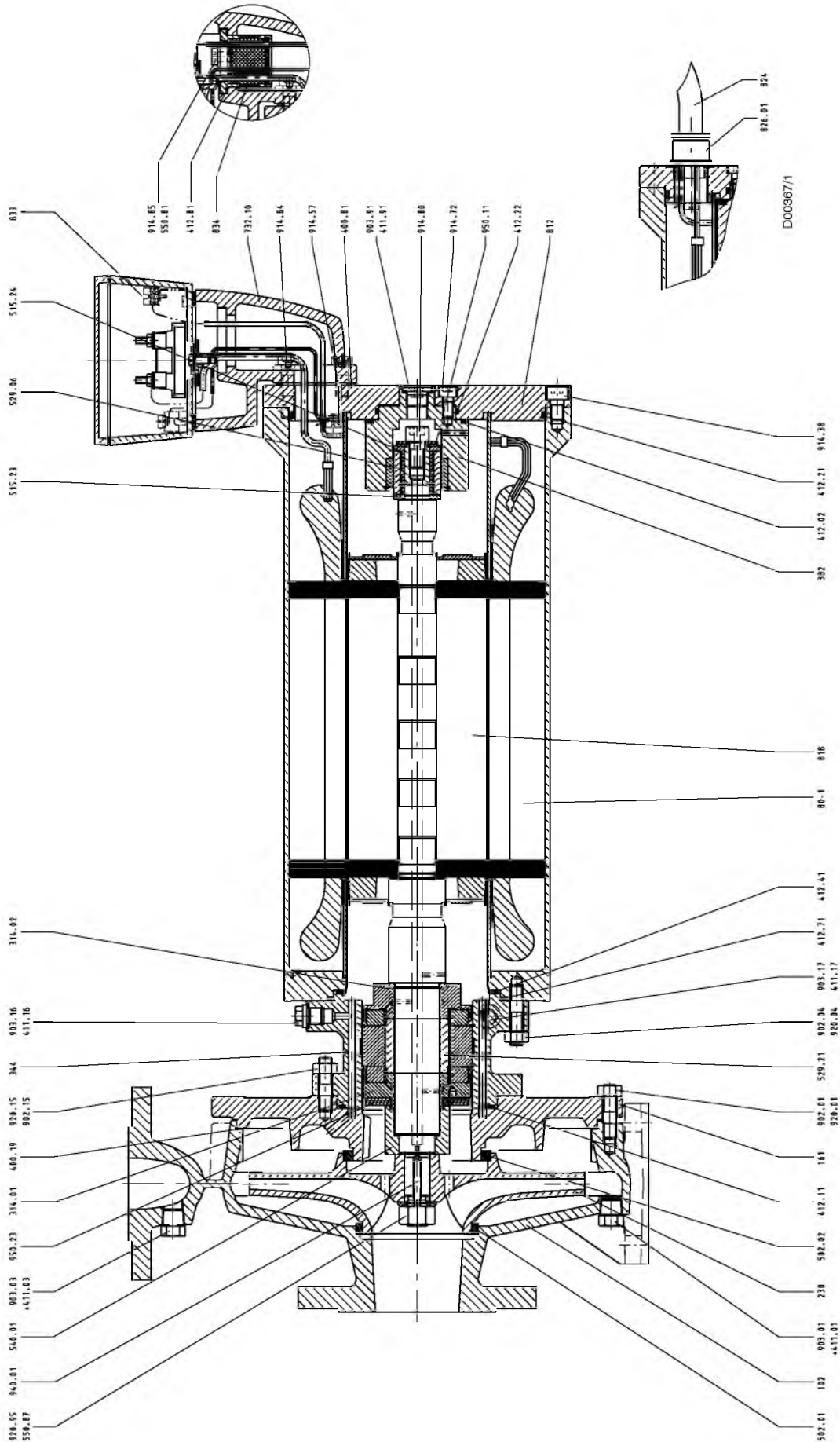


When ordering spare parts please always specify the type series/pump size, works No. (stamped on the name plate and on the suction nozzle flange), motor No. (serial No.), year of construction, quantity required, part No., part description, material, medium handled, sectional drawing No. and mode of dispatch.

Part No.	Part description	Scope of supply
102	Volute casing	with joint ring 411.01/.03, casing wear ring 502.01, stud 902.01, screwed plug 903.01/.03, hex. nut 920.01
161	Casing cover	with bearing bush, gasket 400.19, joint ring 411.16, separator 74-5, screwed plug 903.16
230	Impeller	with casing wear ring 502.02
310.10	Plain bearing, pump end	consisting of thrust bearing 314.01/.02, bearing sleeve 529.21, cup spring 950.23
310.11	Plain bearing, motor end	consisting of taper lock ring 515.23/.24, bearing sleeve 529.06, socket head cap screw 914.80, cup spring 950.11
382	Bearing carrier	with bearing bush, joint ring 411.91, screwed plug 903.91, socket head cap screw 914.72
80-1	Motor unit	with O-ring 412.21/.22, cover 812, support, stator, motor housing, can, socket head cap screw 914.04/.38
818	Rotor	with bush 540.01, key 940.01
834	Sealed terminal gland ¹⁾	with disc 550.81, socket head cap screw 914.85
920.95	Hex. nut	with disc 550.87
99-9	Set of sealing elements	consisting of 400.19/.81, 411.01/.03/.16/.91, 412.02/.11/.21/.22/.41/.71/.81
	Terminal box ¹⁾	consisting of gasket 400.81, O-ring 412.81, holder 732.10, terminal box 833, socket head cap screw 914.57
	Cable gland ¹⁾	consisting of cable 824, cable gland 826.01

1) if fitted

Motors DS 112 (motor sizes 42 and 52) and DS 132 (motor sizes 72, 112 and 152) with SSiC bearings



When ordering spare parts please always specify the type series/pump size, works No. (stamped on the name plate and on the suction nozzle flange), motor No. (serial No.), year of construction, quantity required, part No., part description, material, medium handled, sectional drawing No. and mode of dispatch.

Part No.	Part description	Scope of supply
102	Volute casing	with joint ring 411.01/.03, casing wear ring 502.01, stud 902.01, screwed plug 903.01/.03, hex. nut 920.01
161	Casing cover	with gasket 400.19, stud 902.15, nut 920.15
230	Impeller	with casing wear ring 502.02
310.10	Plain bearing, pump end	consisting of thrust bearing 314.01/.02, bearing sleeve 529.21, cup spring 950.23
310.11	Plain bearing, motor end	consisting of taper lock ring 515.23/.24, bearing sleeve 529.06, socket head cap screw 914.80, cup spring 950.11
344	Bearing bracket lantern	with bearing bush, joint ring 411.16, screwed plug 903.16
382	Bearing carrier	with bearing bush, joint ring 411.91, screwed plug 903.91, socket head cap screw 914.72
80-1	Motor unit	with support, stator, motor housing, can, O-ring 412.21/.22/.41/.71, cover 812, stud 902.04, socket head cap screw 914.38, nut 920.04
818	Rotor	with bush 540.01, key 940.01
834	Sealed terminal gland ¹⁾	with disc 550.81, socket head cap screw 914.85
920.95	Hex. nut	with disc 550.87
99-9	Set of sealing elements	consisting of 400.19/.81, 411.01/.03/.16/.17/.91, 412.02/.11/.21/.22/.41/.71/.81
	Terminal box ¹⁾	consisting of gasket 400.81, O-ring 412.81, holder 732.10, terminal box 833, socket head cap screw 914.57/.84
	Cable gland ¹⁾	consisting of cable 824, cable gland 826.01

1) if fitted

Strainer

BOACHEM-FSA

PN 10-40
DN 15-400
Flanged Ends

Type Series Booklet



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Type Series Booklet BOACHEM-FSA

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Check Valves and Strainers

Strainers to DIN/EN

BOACHEM-FSA



Main applications

- Food and beverages industry
- Petrochemical industry
- Process engineering
- Sugar industry

Fluids handled

- Aggressive fluids
- Steam
- Explosive fluids
- Solids-laden fluids
- Flammable fluids
- Fluids containing gas
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Volatile fluids
- Fluids containing mineral oils
- Oil
- Feed water
- Thermal oil
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10 - 40
Nominal size	DN 15 - 400
Max. permissible pressure	40 bar
Min. permissible temperature	-10 °C
Max. permissible temperature	+400 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Material number	Temperature limit
GX5CrNiMo19-11-2	1.4408	Up to 400 °C

Design details

Design

- Y-pattern strainer
- Screen made of stainless steel
- Fully confined cover gasket
- Materials free from non-ferrous metals
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Oil and grease-free
- Serrated gasket (PTFE-coated)
- Applications down to -60 °C
- Fine screen
- Heating jacket made of 1.4541/1.4301 or 1.4571/1.4404
- Other flange designs

Product benefits

- Fully confined cover gasket
- Strainer insert made of stainless steel

Related documents

- BOACHEM-ZXAB bellows-type globe valve, see type series booklet 8150.1.
- BOACHEM-ZYAB bellows-type Y-pattern globe valve, see type series booklet 8151.1.
- BOACHEM-ZXA globe valve with gland packing, see type series booklet 8149.1.
- BOACHEM-ZYA Y-pattern globe valve with gland packing, see type series booklet 8148.1.
- BOACHEM-RXA non-return valve, see type series booklet 8147.1.
- Operating manual 8115.8

On all enquiries/orders please specify

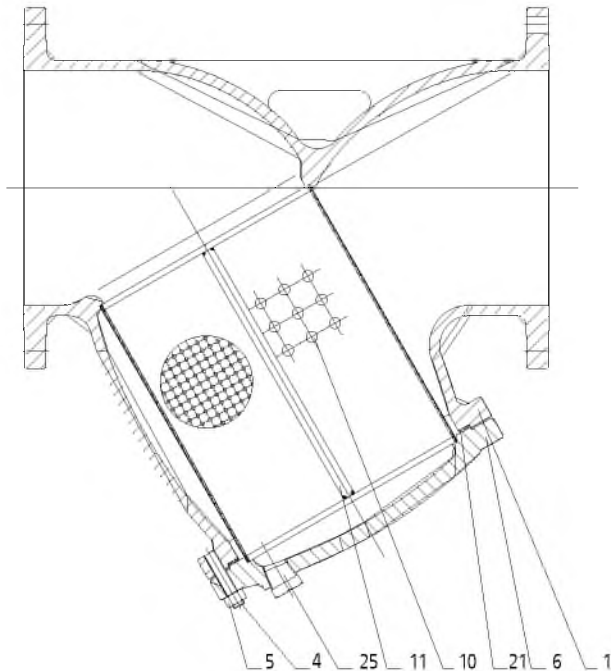
1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to EN 1092-1)¹⁾

Nominal pressure PN	Material	20	100	150	200	250	300	350	400
10	1.4408	10	10	9	8,4	7,9	7,4	7,1	6,8
16		16	16	14,5	13,4	12,7	11,8	11,4	10,9
25		25	25	22,7	21	19,8	18,5	17,8	17,1
40		40	40	36,3	33,7	31,8	29,7	28,5	27,4

Materials

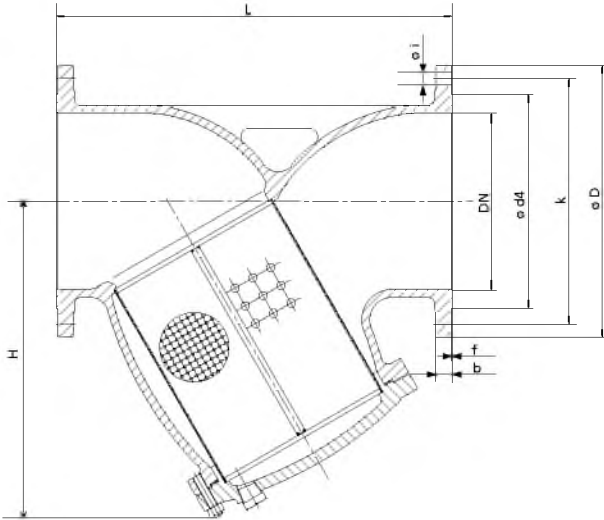


Parts list

Part No.	Description	Material	Material number
1	Body	G X 5 CrNiMo 19-11-2	1.4408
4	Bolt	A4-70	
5	Nut	A4-70	
6	Cover	G X 5 CrNiMo 19-11-2	1.4408
10	Screen	X5 CrNiMo 18-10	1.4408
11	Supporting cage	X5 CrNiMo 18-10	1.4401
21	Gasket	CrNiSt/graphite	
25	Drain plug	X5 CrNiMo 18-10	1.4401

¹⁾ The valves are suitable for temperatures down to -10 °C.

Dimensions



Dimensions in mm

PN	DN	L	Ø D	k	No. of bolt holes z	Ø i	Ø d ₄ x f	b	H	[kg]
10-40	15	130	95	65	4	14	45 x 2	16	100	5
	20	150	105	75	4	14	58 x 2	18	110	6
	25	160	115	85	4	14	68 x 2	18	120	7,5
	32	180	140	100	4	18	78 x 2	18	125	9
	40	200	150	110	4	18	88 x 2	18	150	10,5
10/16	65	290	185	145	4	18	122 x 3	18	185	20
	80	310	200	160	8	18	138 x 3	20	190	24
	100	350	220	180	8	18	158 x 3	20	200	29
	125	400	250	210	8	18	188 x 3	22	280	53
	150	480	285	240	8	22	212 x 3	22	310	75
10	200	600	340	295	8	22	268 x 3	24	390	125
	250	730	395	350	12	22	320 x 3	26	455	235
	300	850	445	400	12	22	370 x 4	26	665	400
	350	980	505	460	16	22	430 x 4	26	725	600
	400	1100	565	515	16	26	482 x 4	26	783	900
16	200	600	340	295	12	22	268 x 3	24	390	125
	250	730	405	355	12	26	320 x 3	26	455	239
	300	850	460	410	12	26	378 x 4	28	665	408
	350	980	520	470	16	26	438 x 4	30	725	611
	400	1100	580	525	16	30	490 x 4	32	783	922
25/40	65	290	185	145	8	18	122 x 3	22	185	24
	80	310	200	160	8	18	138 x 3	24	190	28
	100	350	235	190	8	22	162 x 3	24	200	43
	125	400	270	220	8	26	188 x 3	26	280	71
	150	480	300	250	8	26	218 x 3	28	310	99
25	200	600	360	310	12	26	278 x 3	30	390	140
	250	730	425	370	12	30	335 x 3	32	455	252
	300	850	485	430	16	30	395 x 4	34	665	420
	350	980	555	490	16	33	450 x 4	38	725	630
	400	1100	620	550	16	36	505 x 4	40	783	945
40	200	600	375	320	12	30	285 x 3	34	390	148
	250	730	450	385	12	33	345 x 3	38	455	266
	300	850	515	450	16	33	410 x 4	42	665	499
	350	980	580	510	16	36	465 x 4	46	725	676
	400	1100	660	585	16	39	535 x 4	50	783	978

Dimensions in mm

PN	DN	Standard mesh				Fine mesh			
		Kv [m³/h]	Zeta value	Mesh width	Wire diameter	Kv [m³/h]	Zeta value	Mesh width	Wire diameter
10-40	15	9,0	1,0	0,75	1,0	8,6	1,1	0,5	1,0
	20	15,0	2,0	0,75	1,0	14,3	2,1	0,5	1,0
	25	21,0	2,0	0,75	1,0	20,0	2,1	0,5	1,0
	32	26,0	3,0	0,75	1,0	24,7	3,2	0,5	1,0
	40	32,0	4,0	1,0	1,0	30,4	4,2	0,8	1,0
10/16	50	42,0	6,0	1,0	1,0	39,9	6,3	0,8	1,0
	65	68,0	6,0	1,0	1,0	64,6	6,3	0,8	1,0
	80	100,0	7,0	1,0	1,0	95,0	7,4	0,8	1,0
	100	165,0	6,0	1,2	1,2	156,8	6,3	1,0	1,2
	125	237,0	7,0	1,2	1,2	225,2	7,4	1,0	1,2
10	150	318,0	8,0	1,2	1,2	302,1	8,4	1,0	1,2
	200	600,0	7,0	2,1	1,2	570,0	7,4	2,0	1,2
	250	824,0	9,0	3,0	2,0	782,8	9,5	2,1	2,0
	300	1520,0	6,0	3,0	2,0	1444,0	6,3	2,1	2,0
	350	1650,0	9,0	3,0	2,0	1567,5	9,5	2,1	2,0
16	400	2150,0	9,0	3,0	2,0	2042,5	9,5	2,1	2,0
	200	600,0	7,0	2,1	1,2	570,0	7,4	2,0	1,2
	250	824,0	9,0	3,0	2,0	782,8	9,5	2,1	2,0
	300	1520,0	6,0	3,0	2,0	1444,0	6,3	2,1	2,0
	350	1650,0	9,0	3,0	2,0	1567,5	9,5	2,1	2,0
25/40	400	2150,0	9,0	3,0	2,0	2042,5	9,5	2,1	2,0
	65	68,0	6,0	1,0	1,0	64,6	6,3	0,8	1,0
	80	100,0	7,0	1,0	1,0	95,0	7,4	0,8	1,0
	100	165,0	6,0	1,2	1,2	156,8	6,3	1,0	1,2
	125	237,0	7,0	1,2	1,2	225,2	7,4	1,0	1,2
25	150	318,0	8,0	1,2	1,2	302,1	8,4	1,0	1,2
	200	600,0	7,0	2,1	1,2	570,0	7,4	2,0	1,2
	250	824,0	9,0	3,0	2,0	782,8	9,5	2,1	2,0
	300	1520,0	6,0	3,0	2,0	1444,0	6,3	2,1	2,0
	350	1650,0	9,0	3,0	2,0	1567,5	9,5	2,1	2,0
40	400	2150,0	9,0	3,0	2,0	2042,5	9,5	2,1	2,0
	200	600,0	7,0	2,1	1,2	570,0	7,4	2,0	1,2
	250	824,0	9,0	3,0	2,0	782,8	9,5	2,1	2,0
	300	1520,0	6,0	3,0	2,0	1444,0	6,3	2,1	2,0
	350	1650,0	9,0	3,0	2,0	1567,5	9,5	2,1	2,0
	400	2150,0	9,0	3,0	2,0	2042,5	9,5	2,1	2,0

Mating dimensions – Standards

Face-to-face lengths: EN 558-1/1, ISO 5752/1

Flanges: Mating dimensions to DIN EN 1092-1, ISO 7005

Flange facing: DIN EN 1092-1, type B1

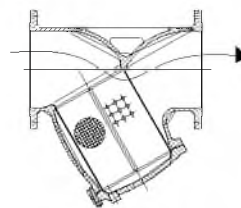
Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

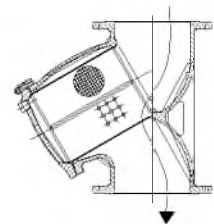
Installation instructions

The flow direction must correspond to the arrow indicated on the valve body.

In both horizontal and vertical pipes, we recommend to install the strainer with the screen hanging downwards to facilitate cleaning.



Horizontal installation



Vertical installation

Strainer

BOA-S

PN 6/16/25
DN 15-400

Type Series Booklet



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Check Valves and Strainers

Strainers to DIN/EN

BOA-S



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Process engineering
- Chemical industry
- Petrochemical industry
- Sugar industry
- Heat recovery systems
- Boiler feed applications
- Boiler recirculation
- Pulp and paper industry

Fluids handled

- Hot water
- Saturated steam
- Thermal oil
- Liquids and gases not chemically or mechanically aggressive to the valve materials.
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value	
	EN-GJL-250	EN-GJS-400-18-LT
Nominal pressure	PN 6/16	PN 16/25
Nominal size	DN 15 - 400	DN 15 - 300
Max. permissible pressure [bar]	16	25
Min. permissible temperature [°C]	-10	-10
Max. permissible temperature [°C]	+300	+350

Selection as per pressure/temperature ratings (⇒ Page 6)

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 300 °C
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Design details

Design

- Y-pattern strainer
- Screen made of stainless steel
- Screen accurately guided in cover and body
- Outside confined cover gasket
- Drain plug
- Size DN 150 and above: additional screen cage made of perforated stainless steel sheet
- Flanges to DIN EN 1092-2 Type 21
- Exterior coating: blue, RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Fine mesh
- High temperature resistant paint, aluminium grey (EN-GJS-400-18-LT only)
- Other flange designs (EN-GJS-400-18-LT only)
- Certification to customer specification

Product benefits

- Long service life due to stainless steel screen.
- Time and cost saving replacement of screen without removing the body insulation by using the studs as centering aids.
- Standard drain plug for easy inspection and drainage of strainer, particularly of large-diameter strainers.

Related documents

Information/documents

Document	Reference number
Operating manual	0570.8

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

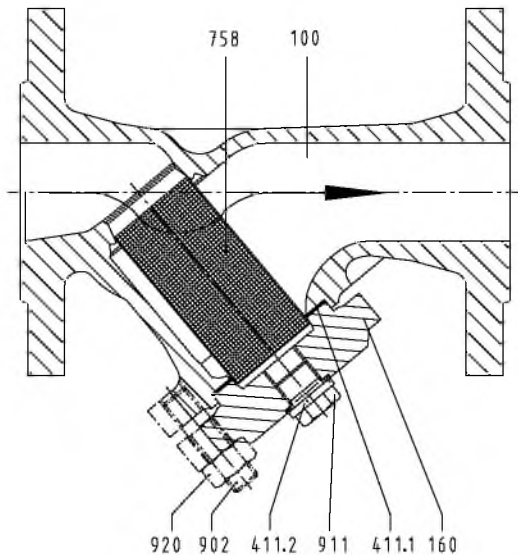
1. Type
2. Nominal pressure
3. Nominal size

4. Material
5. Variants
6. Reference number

Pressure/temperature ratings

Test pressure and operating pressure

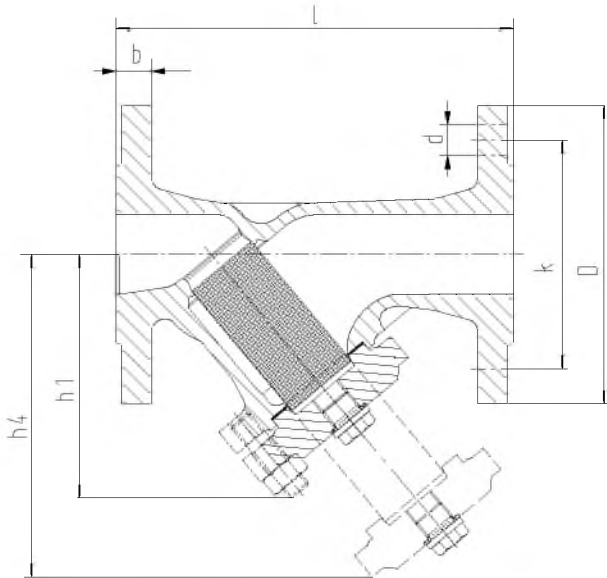
PN	Material	Shell and leak test	Permissible operating pressure [bar] ¹⁾²⁾							
		With water	[°C]							
		Tests P10 and P11 to DIN EN 12266-1	[bar]							
			-10 to +120	150	180	200	230	250	300	350
6	EN-GJL-250	9	6	5,4	5	4,8	4,4	4,2	3,6	-
16		24	16	14,4	13,4	12,8	11,8	11,2	9,6	-
16	EN-GJS-400-18-LT	24	16	15,5	-	14,7	-	13,9	12,8	11,2
25		37,5	25	24,3	-	23	-	21,8	20	17,5

Materials

Fig. 1: BOA-S
Parts list

Part No.	Description	PN	Material	Note
100	Body	6, 16	EN-GJL-250 (5.1301)	-
		16, 25	EN-GJS-400-18-LT (5.3103)	-
160 ³⁾	Cover	6,16	EN-GJL-250 (5.1301)	-
		16, 25	EN-GJS-400-18-LT (5.3103)	-
411.1 ⁴⁾	Joint ring	6, 16	CrNi steel/graphite	-
		16, 25	CrNi steel/graphite	-
411.2	Joint ring	6, 16, 25	A4	-
758 ⁴⁾	Screen	6, 16	X 6 CrNiTi 18 10 (1.4541)	-
		16, 25	X 5 CrNi 18 10 (1.4301)	-
191	Screen cage	6, 16	X 6 CrNiTi 18 10 (1.4541)	≥ DN 150
		16, 25	X 5 CrNi 18 10 (1.4301)	≥ DN 150
902	Stud	6, 16	5.6 or 8.8	gal ZN
		16, 25	C 35 E	gal ZN

- 1) Intermediate temperatures can be derived by linear interpolation.
- 2) Static load
- 3) Spare part (complete with screw plug)
- 4) Spare part

Part No.	Description	PN	Material	Note
911	Drain plug	6, 16	A4 or A2	-
		16, 25	C 35 E	gal ZN
920	Hexagon nut	6, 16	5-2 or 8	gal ZN
		16, 25	C 35 E	gal ZN

Dimensions and weights
Dimensions and weights of EN-GJL-250 (5.1301) variant

Fig. 2: BOA-S

Dimensions [mm] and weights [kg]

PN	DN	l	D	k	n × d	b	h ₁	h ₄	Drain plug	[kg]
6	15	130	80	55	4 × 11	12	90	135	G 3/8"	2,5
	20	150	90	65	4 × 11	14	100	160	G 3/8"	3
	25	160	100	75	4 × 11	14	115	180	G 3/8"	4,5
	32	180	120	90	4 × 14	16	135	215	G 3/8"	5,5
	40	200	130	100	4 × 14	16	150	240	G 3/8"	7
	50	230	140	110	4 × 14	16	160	250	G 3/8"	9
	65	290	160	130	4 × 14	16	180	285	G 1/2"	13
	80	310	190	150	4 × 18	18	215	330	G 1/2"	19
	100	350	210	170	4 × 18	18	240	395	G 1/2"	26
	125	400	240	200	8 × 18	20	280	455	G 1/2"	38
150	480	265	225	8 × 18	20	330	525	G 1/2"	54	
200	600	320	280	8 × 18	22	405	650	G 1/2"	110	
16	15	130	95	65	4 × 14	14	90	135	G 3/8"	3
	20	150	105	75	4 × 14	16	100	160	G 3/8"	4
	25	160	115	85	4 × 14	16	115	180	G 3/8"	5
	32	180	140	100	4 × 18	18	135	215	G 3/8"	7
	40	200	150	110	4 × 18	18	150	240	G 3/8"	9
	50	230	165	125	4 × 18	20	160	250	G 3/8"	12
	65	290	185	145	4 × 18	20	180	285	G 1/2"	16
	80	310	200	160	8 × 18	22	215	330	G 1/2"	21
	100	350	220	180	8 × 18	24	240	395	G 1/2"	30
	125	400	250	210	8 × 18	26	280	455	G 1/2"	43
	150	480	285	240	8 × 22	26	330	525	G 1/2"	61
	200	600	340	295	12 × 22	30	405	650	G 1/2"	121
	250	730	405	355	12 × 26	32	540	870	G 1/2"	154
	300	850	460	410	12 × 26	32	680	1110	G 1/2"	255
350	980	520	470	16 × 28	36	755	1200	G 1 1/2"	373	
400	1100	580	525	16 × 31	38	835	1320	G 1 1/2"	540	

Dimensions [mm]

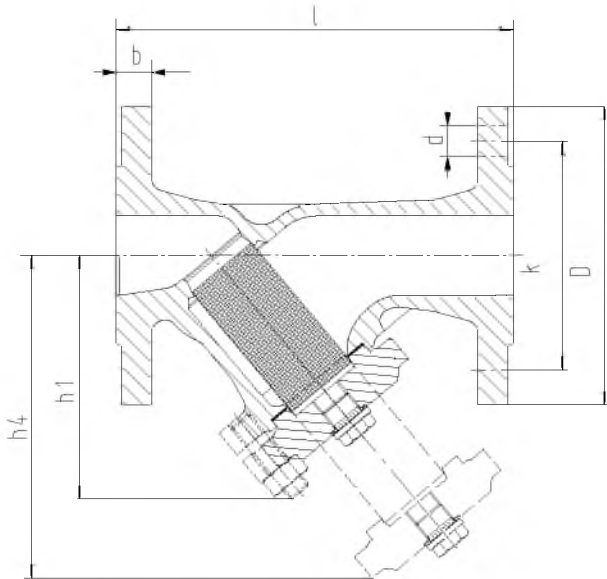
PN	DN	Standard mesh				Fine mesh			
		Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter	Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter
6	15	5,7	2,5	1,0	0,5	5,3	2,9	0,25	0,16
	20	10,4	2,4	1,0	0,5	9,5	2,8	0,25	0,16
	25	16,4	2,3	1,0	0,5	15,1	2,7	0,25	0,16
	32	27,3	2,3	1,0	0,5	24,7	2,7	0,25	0,16
	40	42	2,3	1,0	0,5	38,2	2,8	0,25	0,16
	50	64,7	2,4	1,0	0,5	57,2	3,0	0,25	0,16
	65	96	3,1	1,25	0,63	81,1	4,3	0,25	0,16
	80	149	3,0	1,25	0,63	119	4,6	0,25	0,16
	100	223	3,2	1,6	1,0	181	4,9	0,25	0,16
	125	347	3,2	1,6	1,0	281	5,0	0,25	0,16
	150	480	3,5	1,6	1,0	380	5,6	0,25	0,16
200	853	3,5	1,6	1,0	672	5,7	0,25	0,16	
16	15	5,7	2,5	1,0	0,5	5,3	2,9	0,25	0,16
	20	10,4	2,4	1,0	0,5	9,5	2,8	0,25	0,16
	25	16,4	2,3	1,0	0,5	15,1	2,7	0,25	0,16
	32	27,3	2,3	1,0	0,5	24,7	2,7	0,25	0,16
	40	42	2,3	1,0	0,5	38,2	2,8	0,25	0,16
	50	64,7	2,4	1,0	0,5	57,2	3,0	0,25	0,16
	65	96	3,1	1,25	0,63	81,1	4,3	0,25	0,16
	80	149	3,0	1,25	0,63	119	4,6	0,25	0,16
	100	223	3,2	1,6	1,0	181	4,9	0,25	0,16
	125	347	3,2	1,6	1,0	281	5,0	0,25	0,16
	150	480	3,5	1,6	1,0	380	5,6	0,25	0,16
	200	853	3,5	1,6	1,0	672	5,7	0,25	0,16
	250	1104	5,1	1,6	1,0	838	8,9	0,25	0,16
	300	1450	6,1	1,6	1,0	1090	10,9	0,25	0,16
	350	1800	7,4	1,6	1,0	1339	13,1	0,25	0,16
	400	2200	8,4	1,6	1,0	1640	14,9	0,25	0,16

Mating dimensions as per standard

Face-to-face lengths: DIN EN 558/1, ISO 5752/1

Flanges: DIN EN 1092-2, flange type 21

Flange facing: DIN EN 1092-2, type B

Dimensions and weights of EN-GJS-400-18-LT (5.3103) variant

Fig. 3: BOA-S

Dimensions [mm] and weights [kg]

PN	DN	l	D	k	n × d	b	h ₁	h ₄	Drain plug	[kg]
16	15	130	95	65	4 × 14	16	75	115	G 1/2"	3,5
	20	150	105	75	4 × 14	18	75	115	G 1/2"	4
	25	160	115	85	4 × 14	18	90	135	G 1/2"	5,5
	32	180	140	100	4 × 18	20	90	135	G 1/2"	7
	40	200	150	110	4 × 18	20	110	170	G 1/2"	9
	50	230	165	125	4 × 18	22	120	190	G 1/2"	12
	65	290	185	145	4 × 18	24	140	220	G 1/2"	16
	80	310	200	160	8 × 18	26	165	265	G 1"	21
	100	350	220	180	8 × 18	28	220	340	G 1"	28
	125	400	250	210	8 × 18	30	260	410	G 1"	41
	150	480	285	240	8 × 22	30	300	475	G 1"	58
	200	600	340	295	12 × 22	34	360	580	G 1"	121
25	250	730	405	355	12 × 26	36	470	680	G 1"	154
	300	850	460	410	12 × 26	36	560	820	G 1"	255
	15	130	95	65	4 × 14	16	75	115	G 1/2"	3,5
	20	150	105	75	4 × 14	18	75	115	G 1/2"	4
	25	160	115	85	4 × 14	18	90	135	G 1/2"	5,5
	32	180	140	100	4 × 18	20	90	135	G 1/2"	7
	40	200	150	110	4 × 18	20	110	170	G 1/2"	9
	50	230	165	125	4 × 18	22	120	190	G 1/2"	12
	65	290	185	145	8 × 18	24	140	220	G 1/2"	16
	80	310	200	160	8 × 18	26	165	265	G 1"	21
	100	350	235	190	8 × 22	28	220	340	G 1"	32
	125	400	270	220	8 × 26	30	260	410	G 1"	47
150	480	300	250	8 × 26	34	300	475	G 1"	64	
200	600	360	310	12 × 26	34	360	580	G 1"	133	

Dimensions [mm]

PN	DN	Standard mesh				Fine mesh			
		Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter	Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter
16	15	6,3	2,1	1,25	0,71	5,0	3,2	0,25	0,17
	20	11,3	2,0	1,25	0,71	9,0	3,2	0,25	0,17
	25	18,5	1,8	1,25	0,71	14,8	2,9	0,25	0,17
	32	22,5	3,3	1,25	0,71	18,0	5,2	0,25	0,17
	40	37,5	2,9	1,25	0,71	30,0	4,6	0,25	0,17
	50	60,0	2,8	1,25	0,71	48,0	4,4	0,25	0,17
	65	110,5	2,3	2,0	0,50	85,0	4,0	0,25	0,17
	80	170,3	2,3	2,0	0,50	131,0	3,8	0,25	0,17

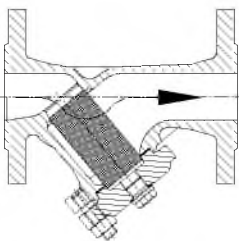
PN	DN	Standard mesh				Fine mesh			
		Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter	Kv [m ³ /h]	Zeta value	Mesh width	Wire diameter
16	100	245,7	2,7	2,0	0,50	189,0	4,5	0,25	0,17
	125	416,0	2,3	2,0	0,50	320,0	3,8	0,25	0,17
	150	608,4	2,2	2,0	0,50	494,0	3,3	0,25	0,17
	200	999,7	2,6	2,0	0,50	818,0	3,8	0,25	0,17
	250	1440,4	3,0	2,0	0,50	1184,0	4,5	0,25	0,17
	300	1976,0	3,3	2,0	0,50	1631,0	4,9	0,25	0,17
25	15	6,3	2,1	1,25	0,71	5,0	3,2	0,25	0,17
	20	11,3	2,0	1,25	0,71	9,0	3,2	0,25	0,17
	25	18,5	1,8	1,25	0,71	14,8	2,9	0,25	0,17
	32	22,5	3,3	1,25	0,71	18,0	5,2	0,25	0,17
	40	37,5	2,9	1,25	0,71	30,0	4,6	0,25	0,17
	50	60,0	2,8	1,25	0,71	48,0	4,4	0,25	0,17
	65	110,5	2,3	2,0	0,50	85,0	4,0	0,25	0,17
	80	170,3	2,3	2,0	0,50	131,0	3,8	0,25	0,17
	100	245,7	2,7	2,0	0,50	189,0	4,5	0,25	0,17
	125	416,0	2,3	2,0	0,50	320,0	3,8	0,25	0,17
	150	608,4	2,2	2,0	0,50	494,0	3,3	0,25	0,17
	200	999,7	2,6	2,0	0,50	818,0	3,8	0,25	0,17

Mating dimensions as per standard

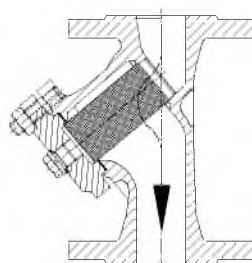
Face-to-face lengths: DIN EN 558/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21-2
 Flange facing: DIN EN 1092-2, type B

Installation instructions

- The flow direction must correspond to the arrow indicated on the valve body.
- In both horizontal and vertical pipes, installing the strainer with the screen hanging downwards is recommended to facilitate cleaning.



Horizontal installation



Vertical installation

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water⁵⁾

Fluids handled	A ⁶⁾	B ⁷⁾
Brackish water ⁸⁾	✘	✘
Service water ⁸⁾	✓	✓
Fire-fighting water	✓	✓
Chlorinated water (≤ 0.6 mg/kg)	✓	✓
Deionised water (demineralised water) ⁹⁾	○	○
Distilled water ⁹⁾	○	○
Boiler feed water	✓	✓
Hot water	✓	✓
High-temperature hot water	✓	✓
Condensate	✓	✓
Oil-free cooling water	✓	✓
Oil-containing cooling water	✓	✓
Ozonised water (≤ 0.5 mg/kg)	✓	✓
Pure water	✓	✓
Seawater	✘	✘
Scale-forming water ⁸⁾	○	○
Raw water ⁸⁾	✓	✓
Partly desalinated water ⁹⁾	○	○
Fully desalinated water ⁹⁾	○	○
Municipal waste water ⁸⁾¹⁰⁾	✓	✓
Industrial waste water ⁸⁾¹¹⁾	✓	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	A ⁶⁾	B ⁷⁾
Vegetable oils	✓	✓
Mineral oils	✓	✓
Synthetic oils	✓	✓
Crude oil	✓	✓
Petroleum	✓	✓
Light fuel oil	✓	✓

Fluids handled	A ⁶⁾	B ⁷⁾
Linseed oil	✓	✓
Oil/water emulsion ⁸⁾	✓	✓
Jet fuel	○ ¹²⁾	✓
Petrol	○ ¹²⁾	✓
Kerosene	○ ¹²⁾	✓

Chemical resistance chart for refrigerants

Fluids handled	A ⁶⁾	B ⁷⁾
Ammonium hydroxide (≤ 30 %, ≤ 25 °C)	✓	✓
Glycol (ethylene glycol)	✓	✓
Propylene glycol	✓	✓
Water/glycol mixture (20 % $\leq c \leq 50$ %, ≤ 90 °C)	✓	✓
Inorganic cooling brine, pH 7.5	✓	✓

Chemical resistance chart for thermal oils

Fluids handled	A ⁶⁾	B ⁷⁾
Synthetic thermal oils	✓	✓
Mineral-based thermal oils	✓	✓

Chemical resistance chart for acids

Fluids handled	A ⁶⁾	B ⁷⁾
Hydrochloric acid	✘	✘
Sulphuric acid (pure, technical, concentrated)	✘	✘
Sulphurous acid	✘	✘
Fatty acid	✘	✘
Nitric acid	✘	✘

Chemical resistance chart for cleaning agents

Fluids handled	A ⁶⁾	B ⁷⁾
Lye for bottle rinsers (e.g. P3) ≤ 80 °C ⁸⁾	○	○
Lye for metal cleaning ≤ 80 °C ⁸⁾	○	○

Chemical resistance chart for steam

Fluids handled	A ⁶⁾	B ⁷⁾
Saturated steam	○ ¹²⁾	✓

Chemical resistance chart for other fluids

Fluids handled	A ⁶⁾	B ⁷⁾
Sodium hydroxide (≤ 50 %, ≤ 50 °C)	○	○
Natural gas	✓	✓
Oil-containing compressed air	✓	✓
Dry chlorine (≤ 30 °C)	○	✓
Ammonia	✓	✓
Butane (liquefied gas)	✓	✓
Aqueous glycerine	✓	✓
Carbon dioxide (gas)	✓	✓
Carbon dioxide (aqueous solution)	✘	✘

- 5) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 6) EN-GJL-250, Tmax. +300 °C
- 7) EN-GJS-400-18-LT, Tmax. +350 °C
- 8) Without solids
- 9) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 10) Biologically treated
- 11) Non-corrosive, non-abrasive
- 12) EN-GJS-400-18-LT is recommended for safety reasons (ductility).

Mag-drive Pump

Magnochem-Bloc

Type Series Booklet



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Type Series Booklet Magnochem-Bloc

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Seal-less Pumps

Mag-drive Pumps

Magnochem-Bloc



Main applications

- Chemical industry
- District heating
- Industrial recirculation systems
- Air-conditioning systems
- Condensate transport
- Cooling circuits
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering
- Hot-water heating systems
- Sugar industry

Fluids handled

- Aggressive fluids
- Explosive fluids
- Flammable fluids
- Toxic fluids
- Valuable fluids
- Fluids which are injurious to health
- Malodorous fluids

Operating data

Operating properties

Characteristic	Value	
	50 Hz	60 Hz
Flow rate	Q [m ³ /h]	≤ 625 ≤ 754
Head	H [m]	≤ 162 ≤ 236
Fluid temperature	T ₁ [°C]	-20 to +200
Ambient temperature	T ₂ [°C]	-20 to +40
Operating pressure	p [bar]	≤ 40

Designation

Example: MACB050-032-2501CCHX1A

Key to the designation

Code	Description
MACB	Type series (full name: Magnochem-Bloc)
050	Nominal suction nozzle diameter [mm]
032	Nominal discharge nozzle diameter [mm]
250	Nominal impeller diameter [mm]
1	Hydraulic system, e.g. 1 = hydraulic system optimised for part-load operation
C	Casing material, e.g. C = stainless steel
C	Impeller material, e.g. C = stainless steel
H	Additional code, e.g. H = heatable casing
X	Special design
1	Nominal diameter of magnetic coupling, e.g. 1 = 85 mm
A	Effective length of magnetic coupling, e.g. A = 10 mm

Further information on the designation

(⇒ Page 35)

Design details

Design

- Volute casing pump
- Horizontal installation
- Vertical installation
- Close-coupled design
- Single-stage
- Meets the technical requirements to ISO 5199
- Ratings to ISO 2858 complemented by pumps of nominal diameters DN 25

Pump casing

- Single or double volute, depending on the pump size
- Radially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings
- Heatable
- Draining facility

Impeller type

- Closed radial impeller with multiply curved vanes
- Discharge-side sealing clearance reduces axial thrust

Shaft seal

- Seal-less, with magnetic coupling
- Containment shroud as sealing element
- **Optional:** leakage barrier

Casing cover variants

- Internal circulation
- Low-boiling fluids
- External circulation
 - With fluid handled
 - With barrier fluid
- Dead-end configuration

In addition:

- Flushing connection
- Heatable
- Draining facility
- Internal ring filter or main flow filter

Bearings

Drive-end bearings:

- Shaft supported by motor

Pump-end bearing:

- Hydrodynamic plain bearings
- Product-lubricated

Automation

Automation options:

- PumpDrive
- PumpMeter

Materials

Overview of available materials

Part. No.	Description	Material	Material variant S=standard, O=option										
			CC	CD	VC	VD	EG	EC	ED	YG	YC	YD	DD
102	Casing	Stainless steel 1.4408/ A743 Gr CF8 M	S	S	-	-	-	-	-	-	-	-	-
		Stainless steel 1.4408	-	-	S ¹⁾	S ¹⁾	-	-	-	-	-	-	-
		Duplex stainless steel 1.4593/1.4517/ A995 GR 1B	-	-	-	-	-	-	-	-	-	-	S
		Steel GP240GH+N/ A216 Gr WCB	-	-	-	-	S	S	S	-	-	-	-
		1.7706	-	-	-	-	-	-	-	S	S	S	-
132.01	Intermediate piece, containment shroud	Stainless steel 1.4408/ A743 GR CF8M	S	S	-	-	-	-	-	-	-	-	
		Stainless steel 1.4408	-	-	S	S	-	-	-	-	-	-	
		Steel GP240GH+N/ A216 Gr WCB	-	-	-	-	S	S	S	S	S	S	-
		Duplex stainless steel 1.4593/ 1.4517/A995 Gr CD4MCuN	-	-	-	-	-	-	-	-	-	-	S
132.03	Intermediate piece, motor	Steel GP240GH+N/ A216 Gr WCB	S	S	S	S	S	S	S	S	S	S	
161	Casing cover	Stainless steel 1.4408/ A743 GR CF8M	S ²⁾	S ²⁾	-	-	-	-	-	-	-	-	
		Stainless steel 1.4408	-	-	S ²⁾	S ²⁾	-	-	-	-	-	-	
		Duplex stainless steel 1.4593/1.4517/A995 Gr CD4MCuN	-	-	-	-	-	-	-	-	-	-	S ²⁾
		Steel GP240GH+N/ A216 Gr WCB	-	-	-	-	S ²⁾	S ²⁾	S ²⁾	S ²⁾	S ²⁾	S ²⁾	-
23-2.02	Auxiliary impeller	CrNiMo St INT	S	S	S	S	S	S	S	S	S	-	
210.03	Shaft (plain bearing)	Duplex stainless steel 1.4462/ UNS S31803	S	S	S	S	S	S	S	S	S	S	
		1.4313+QT780/ A479 UNS S41500	O	O	O	O	O	O	O	O	O	O	-
230	Impeller	Stainless steel 1.4408/ A743 GR CF8M	S	-	S	-	-	S	-	-	S	-	
		Grey cast iron EN-GJL-250/ A48 CL 35B	-	-	-	-	S	-	-	S	-	-	
		Duplex stainless steel 1.4593/1.4517/A995 GR 1B	-	S	-	S	-	-	S	-	-	S	S
344	Bearing bracket lantern	Steel GP240GH+N/ A216 Gr WCB	S	S	S	S	S	S	S	S	S	S	
386.01/ 386.02	Thrust bearing ring	SiC	S	S	S	S	S	S	S	S	S	S	
		SiC, DLC-coated	O	O	O	O	O	O	O	O	O	O	O
391.01	Bearing ring carrier	Stainless steel 1.4408/ A743 Gr CF8M	S	S	S	S	S	S	S	S	S	-	
		Duplex stainless steel 1.4593/ 1.4517/A995 Gr CD4MCuN	-	-	-	-	-	-	-	-	-	-	S
411.10	Joint ring	CrNi steel/graphite	O	O	O	O	O	O	O	S	S	S	O
		Thermoplastic	S	S	S	S	S	S	S	-	-	-	S
		Gylon 3501E	O	O	O	O	O	O	O	-	-	-	O
502.01/ 502.02	Casing wear ring	Grey cast iron GG/cast iron	-	-	-	-	O	O	O	O	O	-	
		CrNiMo steel	O	O	O	O	-	-	-	-	-	-	
		Duplex steel	-	-	-	-	-	-	-	-	-	-	O
		CrNi steel VG 434	-	-	-	-	O	O	O	O	O	O	-
		None	S	S	S	S	S	S	S	S	S	S	S
503	Impeller wear ring	CrNiMo steel	O	-	O	-	-	O	-	-	O	-	
		Stainless steel 1.4027+QT	-	-	-	-	O	-	-	O	-	-	
		Duplex steel	-	O	-	O	-	-	O	-	-	O	O
		None	S	S	S	S	S	S	S	S	S	S	S
529.21/ 529.22	Bearing sleeve	SiC	S	S	S	S	S	S	S	S	S	S	
		SiC, DLC-coated	O	O	O	O	O	O	O	O	O	O	O

- 1) Heatable casing optionally available.
- 2) Heatable casing cover optionally available.

Part. No.	Description	Material	Material variant S=standard, O=option										
			CC	CD	VC	VD	EG	EC	ED	YG	YC	YD	DD
545.21/ 545.22	Bearing bush	SSiC	S	S	S	S	S	S	S	S	S	S	S
82-15	Containment shroud	1.4571-2.4610	S	S	S	S	S	S	S	S	S	S	-
		1.4462-2.4610	-	-	-	-	-	-	-	-	-	-	S
		Zirconium oxide	O	O	O	O	O	O	O	O	O	O	O	O
818.01	Inner rotor	1.4571-SAMCO	S	S	S	S	S	S	S	S	S	S	-
		1.4462-SAMCO	-	-	-	-	-	-	-	-	-	-	-
818.02	Outer rotor	ST-SAMCO	S	S	S	S	S	S	S	S	S	S	S
920.95	Impeller nut	A4/AISI 316	S	S	S	S	S	S	S	S	S	S	-
		Duplex stainless steel 1.4462/ UNS S31803	-	-	-	-	-	-	-	-	-	-	-
940.01	Key	1.4571+C/A276 TP316 COND B	S	S	S	S	S	S	S	S	S	S	-
		Duplex stainless steel 1.4462/ UNS S31803	-	-	-	-	-	-	-	-	-	-	-
Leakage barrier shaft seal ring													
184	Clamping ring	C45+N/ A108 UNS G10450	O	O	O	O	O ³⁾	O ³⁾	O ³⁾	-	-	-	O ³⁾
400.01	Gasket	Thermoplastic	O	O	O	O	O ³⁾	O ³⁾	O ³⁾	-	-	-	O ³⁾
412.28/ 97/98	O-ring	FKM 80	O	O	O	O	O ³⁾	O ³⁾	O ³⁾	-	-	-	O ³⁾
420.97	Shaft seal ring	GYLON-MS	O	O	O	O	O ³⁾	O ³⁾	O ³⁾	-	-	-	O ³⁾
723.97	Flange	C45+N/ A108 UNS G10450	O	O	O	O	O ³⁾	O ³⁾	O ³⁾	-	-	-	O ³⁾

Coating and preservation

- Coating and preservation to KSB standard

- Temperature maintenance and heating facility for casing and casing cover

Product benefits

- High operating reliability:
 - Only static seals are required.
 - Optional leakage barrier
 - Containment shroud protected by anti-rub feature on outer rotor and inner rotor
 - Self-draining facility of containment shroud
 - Pump does not need to be drained before drive unit is fitted/removed.
- Broad application range:
 - Product-lubricated plain bearings made of silicon carbide (DLC coating optionally available)
 - Modular design principle for hydraulic system and magnetic coupling
 - Large number of operating modes

Acceptance tests and warranty

- Materials testing
 - Test report 2.2 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test

The duty point of each pump is guaranteed according to ISO 9906/2A.

The following acceptance tests can be performed and certified at extra charge:

 - Performance test to ISO 9906
 - NPSH test
- Other tests (e.g. vibrations, strength) on request.
- Warranty

Warranties are given within the scope of the valid terms and conditions of sale and delivery.

3) Only applies up to PN16.

Pressure limits and temperature limits

Pressure limits and temperature limits of the hydraulic system

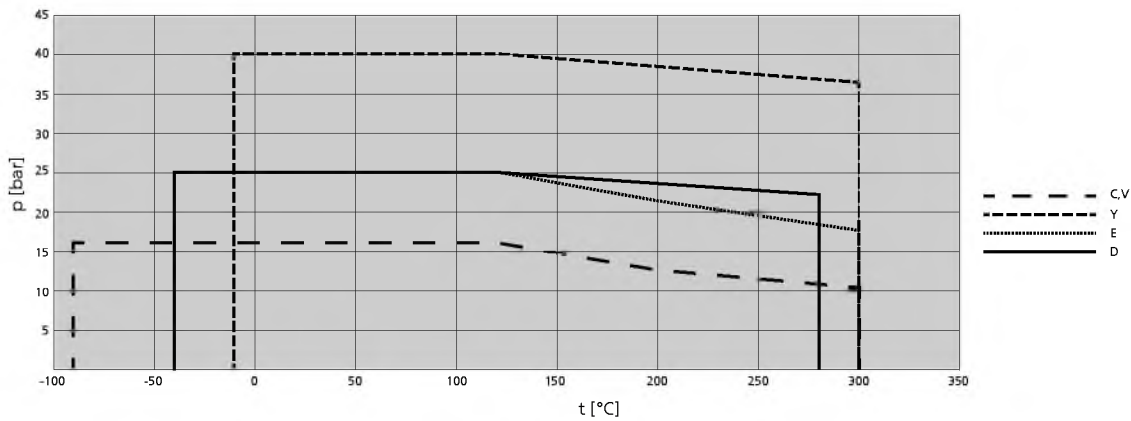


Fig. 1: Pressure limits and temperature limits of the hydraulic system
The pressure limits and temperature limits depend on the configuration.

Pressure limits and temperature limits of ASME flanges

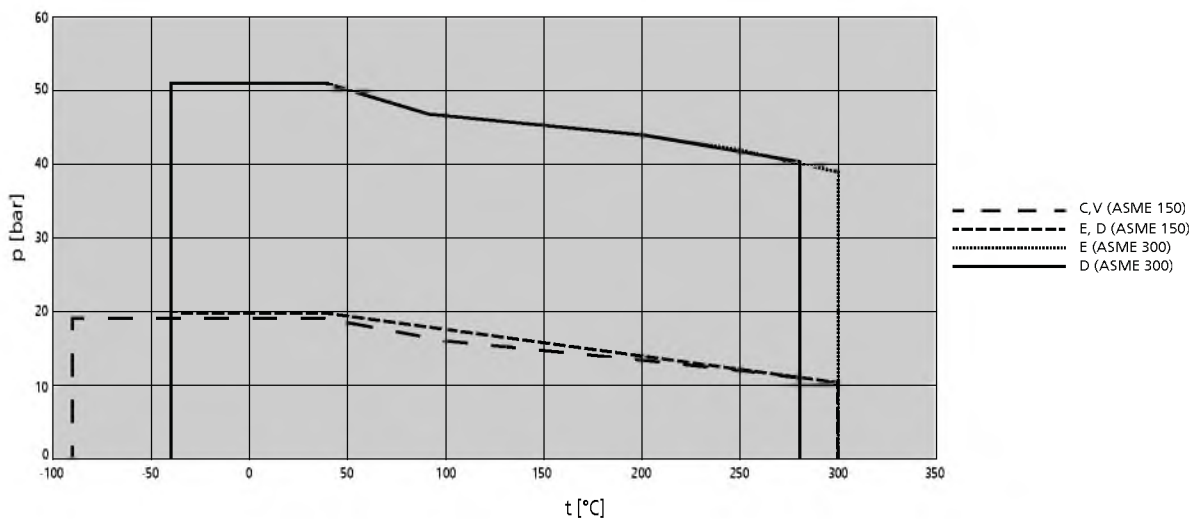


Fig. 2: Pressure limits and temperature limits of ASME flanges⁴⁾

On models with ASME flanges, the pressure limits and temperature limits are determined by the lowest value given in the "Pressure limits and temperature limits of the hydraulic system" diagram and the "Pressure and temperature limits of ASME flanges" diagram.

4) If material Y (ASME 300) is used, the pressure limits and temperature limits are higher than those stipulated for the hydraulic system.

Technical data

Technical data

Size	Bearing bracket	Impeller					Volute casing design ⁵⁾	Hydraulic system design ⁶⁾	Heatable casing	Heatable casing cover	Nominal diameter					
		Impeller outlet diameter	Free passage	Impeller inlet diameter	Impeller diameter						Magnetic coupling length [mm]					
					Max.	Min.					85		123		172	
		[mm]	[mm]	[mm]	[mm]	[mm]					Min.	Max.	Min.	Max.	Min.	Max.
											10	60	10	70	10	100
040-025-160	CS40	6	5,7	44	169	130	E	L	X	X	X	X	-			
040-025-200	CS40	6	5,7	44	209	160	E	L	-	X	X	X	-			
050-032-125	CS40	10	5,7	63	139	110	E	E	X	X	X	X	-			
050-032-125.1	CS40	7	6,0	52	139	114	E	E	-	X	X	X	-			
050-032-160	CS40	9	5,8	63	174	135	E	E	X	X	X	X	-			
050-032-160.1	CS40	6	5,4	52	170	138	E	L	X	X	X	X	-			
050-032-200	CS40	7	6,7	62	209	178	E	E	X	X	X	X	-			
050-032-200.1	CS40	6	5,3	54	204	138	E	E	X	X	X	X	-			
050-032-250	CS50	8	7,1	63	261	212	E	E	X	X	X	X	X			
050-032-250.1	CS50	6	5,2	58	254	220	E	E	X	X	X	X	X			
065-040-125	CS40	14	9,6	74	139	110	E	E	-	X	X	X	-			
065-040-160	CS40	13	11,5	70	174	135	E	E	X	X	X	X	-			
065-040-160.1	CS40	9	8,5	65	169	130	E	L	-	X	X	X	-			
065-040-200	CS40	9	8,9	69	209	175	E	E	X	X	X	X	-			
065-040-200.1	CS40	7	6,6	65	209	160	E	L	-	X	X	X	-			
065-040-250	CS50	8	8,0	73	260	214	E	E	X	X	X	X	X			
065-040-250.1	CS50	7	6,6	68	260	200	E	L	X	X	X	X	X			
065-040-315	CS50	8	7,1	75	326	278	E	E	X	X	X	X	X			
080-050-125	CS40	20	11,6	88	142	114	E	E	-	X	X	X	-			
080-050-160	CS40	17	11,6	87	174	135	E	E	X	X	X	X	-			
080-050-160.1	CS40	15	9	82	169	130	E	L	-	X	X	X	-			
080-050-200	CS40	14	11,9	83	219	180	E	E	X	X	X	X	-			
080-050-200.1	CS40	12	6,7	82	209	160	E	L	-	X	X	X	-			
080-050-250	CS50	11	10,0	84	260	220	E	E	X	X	X	X	X			
080-050-250.1	CS50	10	7,0	85	260	200	E	L	-	X	X	X	X			
080-050-315	CS50	10	9,5	86	323	270	E	E	X	X	X	X	X			
080-050-315.1	CS50	8	7,6	85	320	260	E	L	X	X	X	X	X			
100-065-125	CS40	26	12,9	99	141	114	E	L	-	X	X	X	-			
100-065-160	CS50	21	12,2	92	174	132	E	L	-	X	X	X	X			
100-065-200	CS50	17	13,3	100	219	180	E	L	X	X	X	X	X			
100-065-250	CS50	15	14,3	101	260	220	E	L	-	X	X	X	X			
100-065-315	CS60	14	13	107	320	270	E	E	-	X	X	X	X			
125-080-160	CS50	32	15,1	124	174	122	E	E	-	X	X	X	X			
125-080-200	CS50	25	15,2	115	219	180	D	L	X	X	X	X	X			
125-080-200.1	CS50	22	11,9	116	209	140	D	L	-	X	X	X	X			
125-080-250	CS50	19	15,8	115	269	220	D	L	X	X	X	X	X			
125-080-315	CS60	19	17,8	115	334	281	D	L	X	X	X	X	X			
125-080-400	CS60	15	14,3	129	398	330	E	E	X	X	X	X	X			
125-100-160	CS50	38	16,4	135	185	155	E	L	-	X	X	X	X			
125-100-200	CS50	33	17,9	142	219	179	D	L	-	X	X	X	X			
125-100-250	CS60	27	18,8	145	262	216	D	L	X	X	X	X	X			
125-100-315	CS60	23	19,9	142	334	280	D	E	-	X	X	X	X			
125-100-400	CS60	18	17,1	142	401	329	E	E	-	X	X	X	X			
150-125-200	CS60	41	21,1	160	224	162	D	L	-	X	X	X	X			
150-125-250	CS60	37	22,4	162	269	218	E	E	-	X	X	X	X			
150-125-315	CS60	31	22,6	162	334	280	D	E	X	X	X	X	X			
150-125-400	CS60	26	20,9	162	419	330	D	E	X	X	X	X	X			
200-150-200	CS60	60	25,2	179	224	158	E	-	-	X	X	X	X			
200-150-250	CS60	49	23,0	191	269	220	E	L	X	X	X	X	X			

5) E = single volute, D = double volute

6) E = extended-flow hydraulic system, L = standard-flow hydraulic system

Weight

 Weight of pump [kg]⁷⁾

Size	Bearing bracket	Motor									
		90S 90L	100L 112M	132S 132M	160M 160L 180M 180L	200	225M, 2 poles	225S, 4-6 poles 225M, 4-6 poles	250M, 2 poles	250M, 4-6-poles 280S, 2 poles 280M, 2 poles	280S, 4-6 poles 280M, 4-6 poles
040-025-160	CS40	68	79	83	-	-	-	-	-	-	-
040-025-200	CS40	81	92	95	100	-	-	-	-	-	-
050-032-125	CS40	65	76	80	-	-	-	-	-	-	-
050-032-125.1	CS40	65	77	80	-	-	-	-	-	-	-
050-032-160	CS40	68	79	82	-	-	-	-	-	-	-
050-032-160.1	CS40	68	80	83	-	-	-	-	-	-	-
050-032-200	CS40	81	93	96	99	-	-	-	-	-	-
050-032-200.1	CS40	82	93	97	100	-	-	-	-	-	-
050-032-250	CS50	125	138	164	170	185	193	194	207	207	208
050-032-250.1	CS50	125	138	164	170	185	193	194	207	207	208
065-040-125	CS40	66	78	81	-	-	-	-	-	-	-
065-040-160.1	CS40	72	83	87	-	-	-	-	-	-	-
065-040-160	CS40	70	81	85	-	-	-	-	-	-	-
065-040-200	CS40	83	95	98	104	-	-	-	-	-	-
065-040-200.1	CS40	86	98	101	107	-	-	-	-	-	-
065-040-250	CS50	126	139	165	171	186	194	195	208	208	209
065-040-250.1	CS50	125	137	164	169	185	193	194	207	207	208
065-040-315	CS50	161	173	200	205	219	227	228	241	241	242
080-050-125	CS40	71	83	86	-	-	-	-	-	-	-
080-050-160	CS40	73	84	88	92	-	-	-	-	-	-
080-050-160.1	CS40	77	88	92	96	-	-	-	-	-	-
080-050-200	CS40	86	97	101	105	-	-	-	-	-	-
080-050-200.1	CS40	87	98	102	106	-	-	-	-	-	-
080-050-250	CS50	129	142	168	174	189	197	198	211	211	212
080-050-250.1	CS50	133	146	172	178	193	201	202	215	215	216
080-050-315	CS50	166	178	205	210	223	231	232	245	245	246
080-050-315.1	CS50	160	172	198	204	217	225	226	239	239	240
100-065-125	CS40	76	88	91	96	-	-	-	-	-	-
100-065-160	CS50	119	133	160	165	179	187	188	201	201	202
100-065-200	CS50	119	134	160	166	179	187	188	201	201	202
100-065-250	CS50	141	154	180	186	201	209	210	223	223	224
100-065-315	CS60	170	183	209	215	230	238	239	252	252	253
125-080-160	CS50	122	136	163	168	182	190	191	204	204	205
125-080-200	CS50	135	147	174	180	194	202	203	216	216	217
125-080-200.1	CS50	136	148	175	181	195	203	204	217	217	218
125-080-250	CS50	160	172	198	204	219	227	228	241	241	242
125-080-315	CS60	195	207	234	239	254	262	263	276	276	277
125-080-400	CS60	218	231	258	263	291	299	300	313	313	314
125-100-160	CS50	137	151	178	183	197	205	206	219	219	220
125-100-200	CS50	148	160	186	192	207	215	216	229	229	230
125-100-250	CS60	170	182	208	214	228	236	237	250	250	251
125-100-315	CS60	204	217	243	249	263	271	272	285	285	286
125-100-400	CS60	227	245	272	277	287	295	296	309	309	310
150-125-200	CS60	171	183	209	215	230	238	239	252	252	253
150-125-250	CS60	173	186	212	218	233	241	242	255	255	256
150-125-315	CS60	236	248	275	280	295	303	304	317	317	318
150-125-400	CS60	290	302	329	334	349	357	358	371	371	372
200-150-200	CS60	207	219	246	251	267	275	276	289	289	290
200-150-250	CS60	200	213	239	245	260	268	269	282	282	283

7) The weight data applies to a pump of max. possible length and with the largest magnetic coupling diameter. The weight data only applies to unheated models without motor.

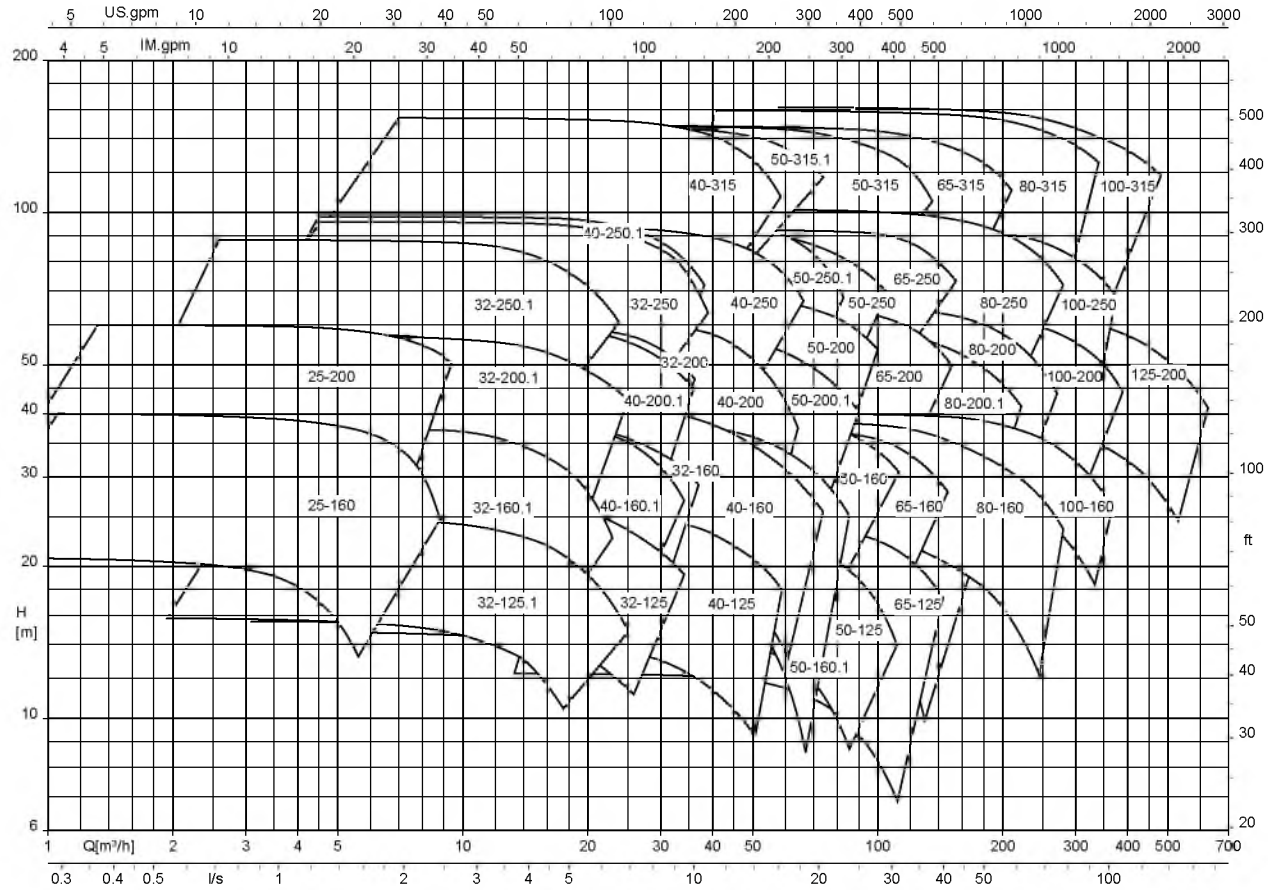
Motor weight

Motor	Weight ⁸⁾ [kg]
90S	13
90L	16
100L	24
112M	29
132S	39
132M	53
160M	74
160L	90
180M	165
180L	180
200L	240
225S	300
225M	330
250M	435
280S	640
280M	660

8) Weight applies to a 4-pole standard Siemens motor

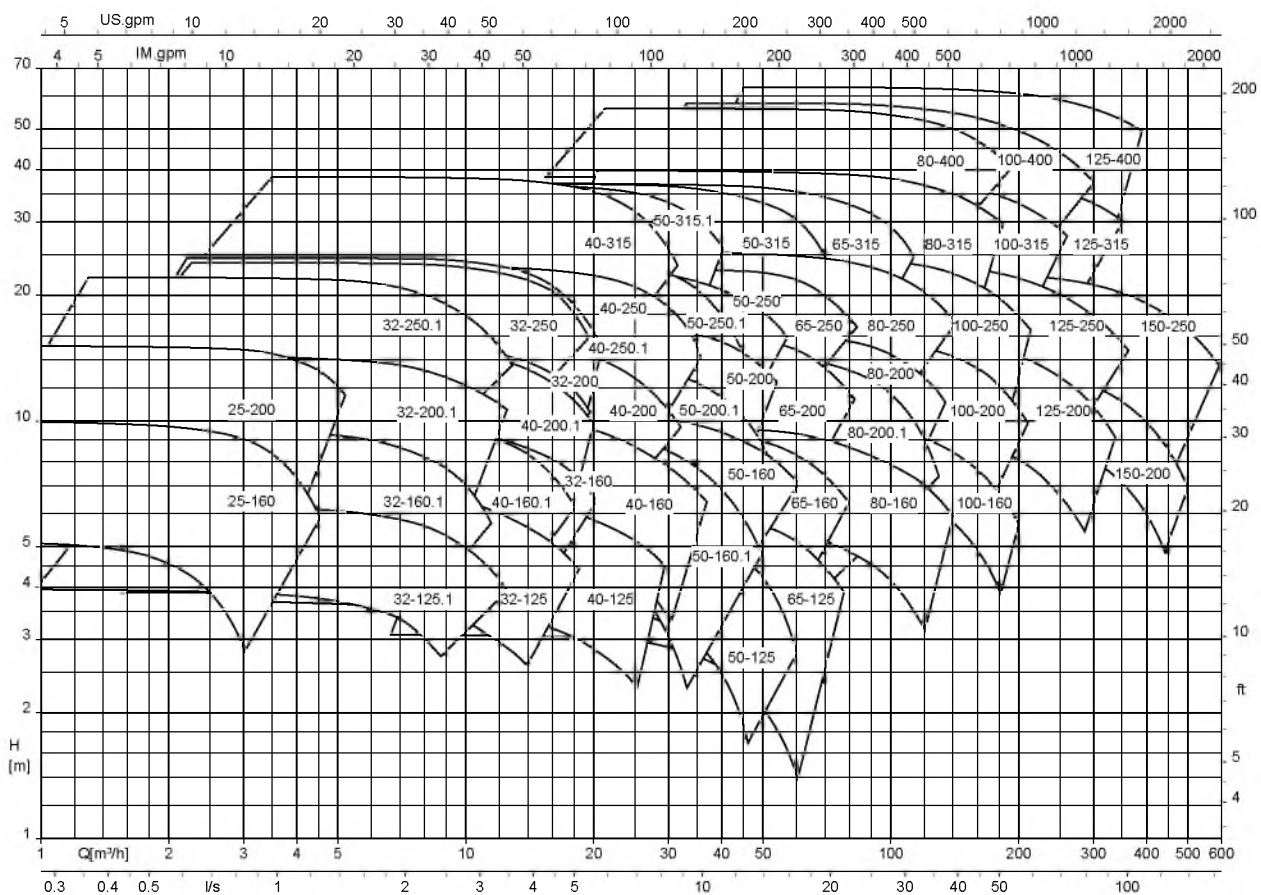
Selection charts

Magnechem-Bloc, n = 2900 rpm



The following sizes are **only** available in the countries indicated:

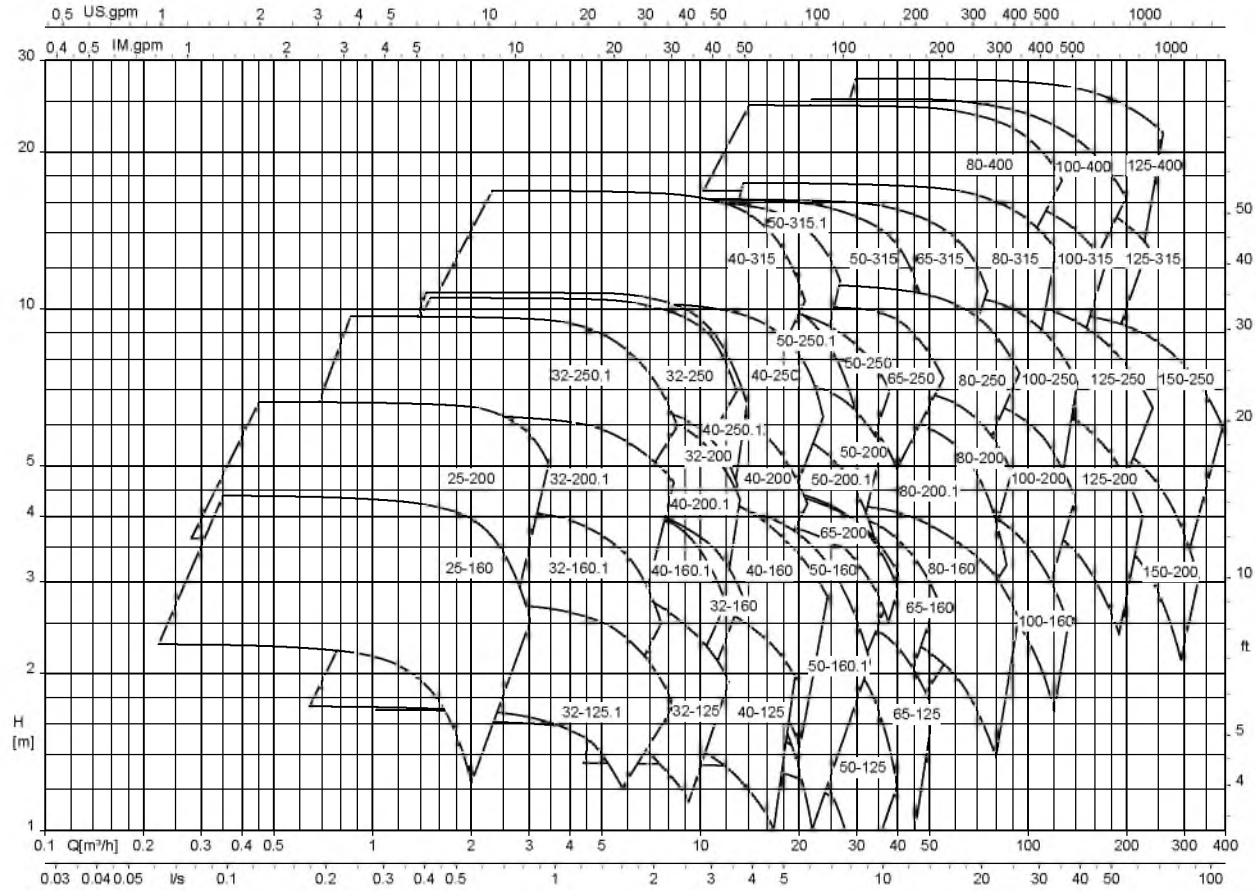
- Europe: 040-200.1, 050-160.1, 050-200.1, 050-250.1, 080-200.1

Magnochem-Bloc, n = 1450 rpm


The following sizes are only available in the countries indicated:

- Europe: 040-200.1, 050-160.1, 050-200.1, 050-250.1, 080-200.1

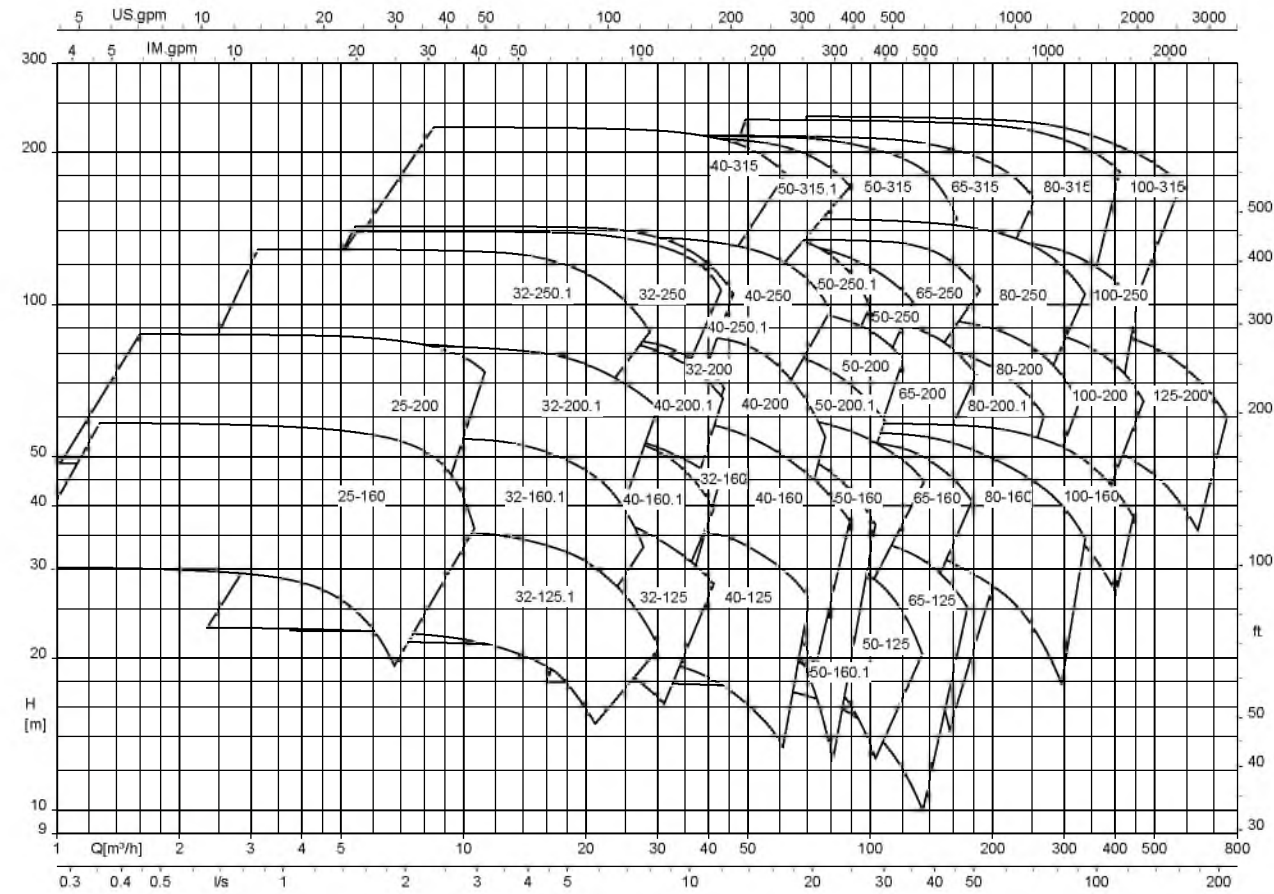
Magnechem-Bloc, n = 960 rpm



The following sizes are only available in the countries indicated:

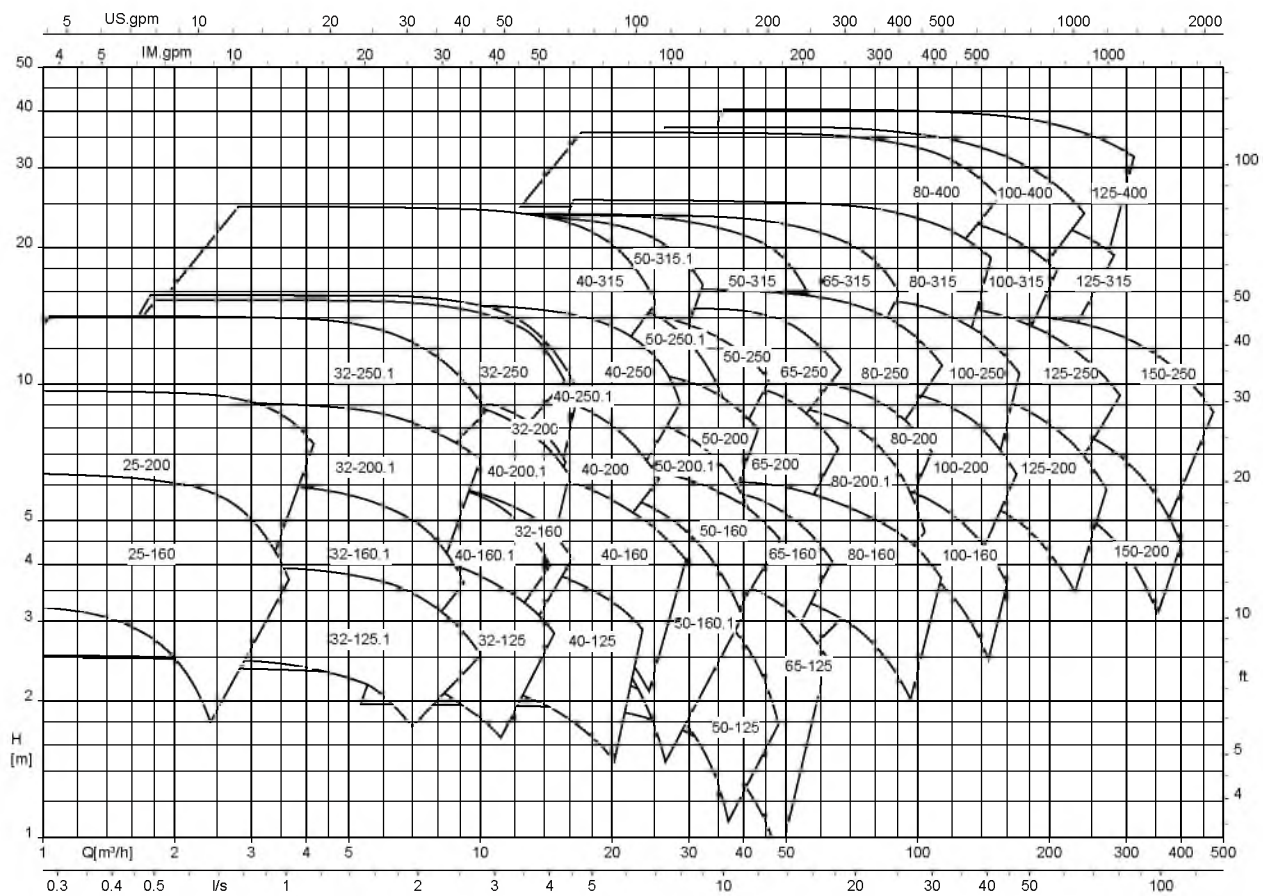
- Europe: 040-200.1, 050-160.1, 050-200.1, 050-250.1, 080-200.1

Magnochem-Bloc, n = 3500 rpm



The following sizes are only available in the countries indicated:

- Europe: 040-200.1, 050-160.1, 050-200.1, 050-250.1, 080-200.1

Magnochem-Bloc, n = 1160 rpm


The following sizes are only available in the countries indicated:

- Europe: 040-200.1, 050-160.1, 050-200.1, 050-250.1, 080-200.1

Dimensions and connections

Dimensions of the pump set

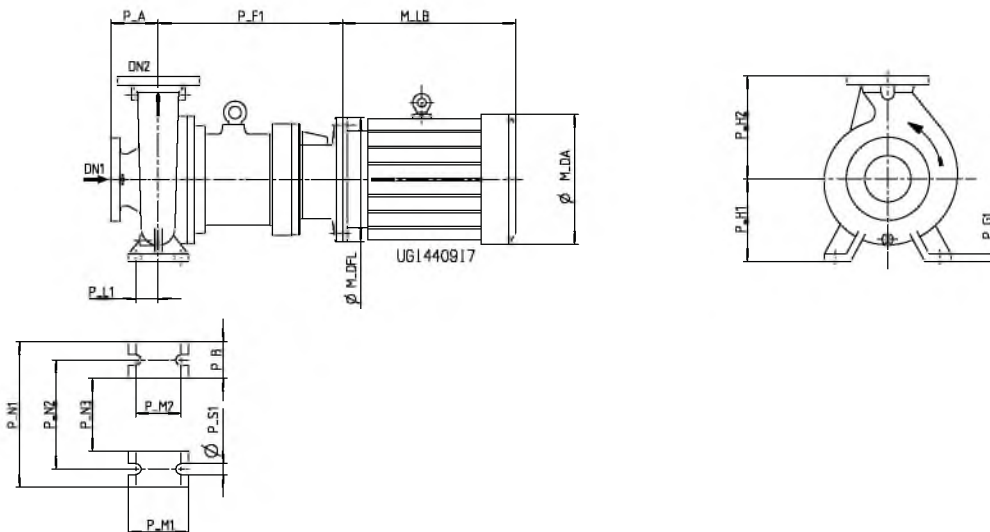


Fig. 3: Dimensions for installation without mounting plate and without support foot

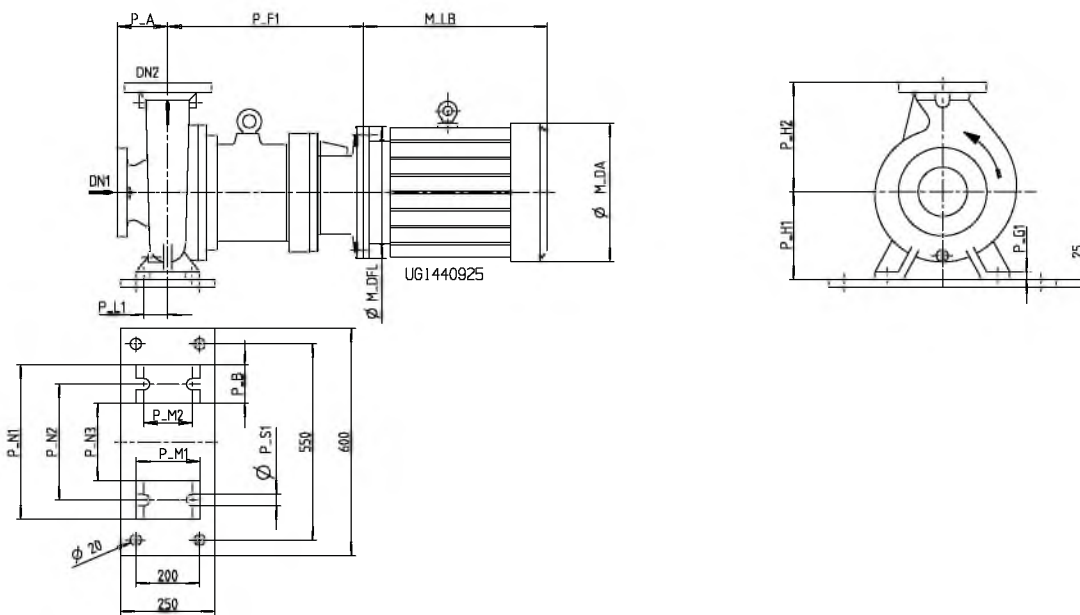


Fig. 4: Dimensions for installation with mounting plate

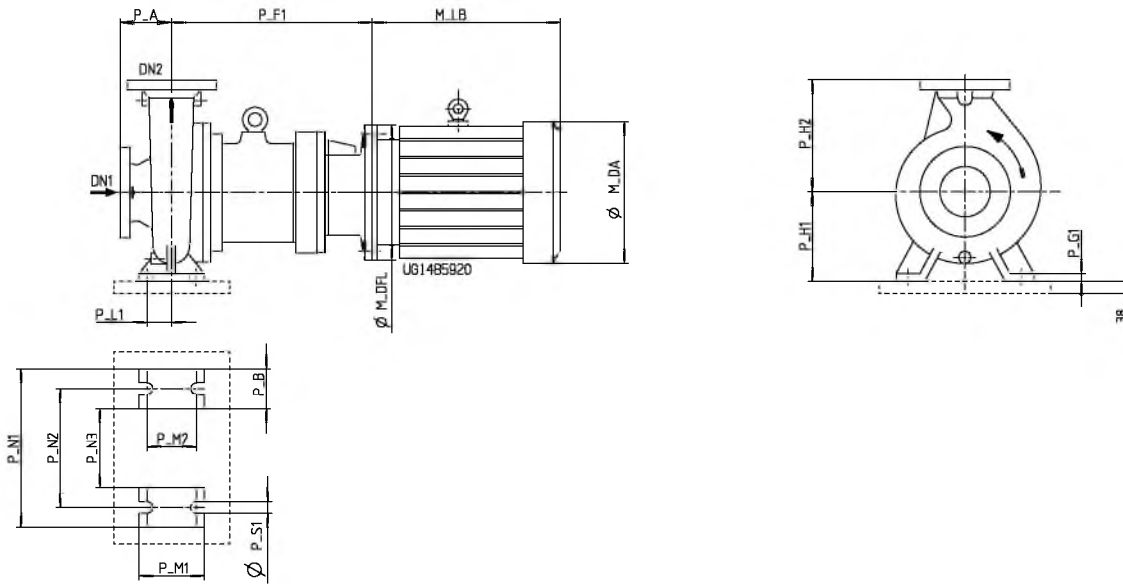


Fig. 5: Dimensions for installation with site-supplied mounting plate (mounting plate is not included in KSB' scope of supply.)

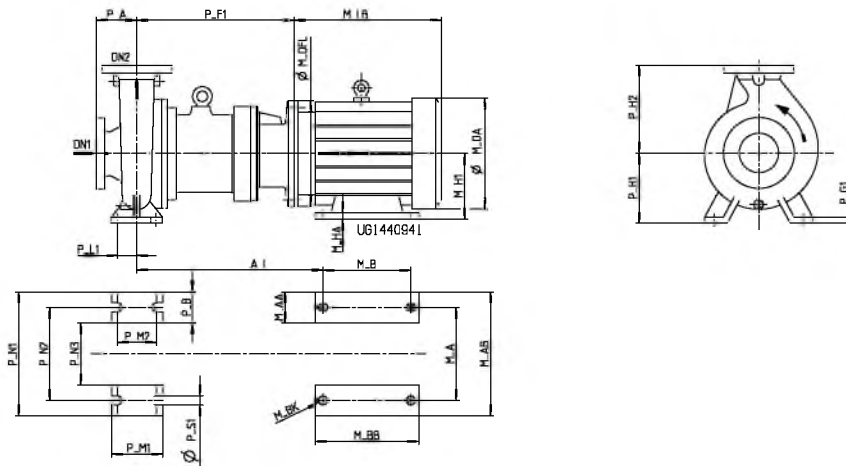
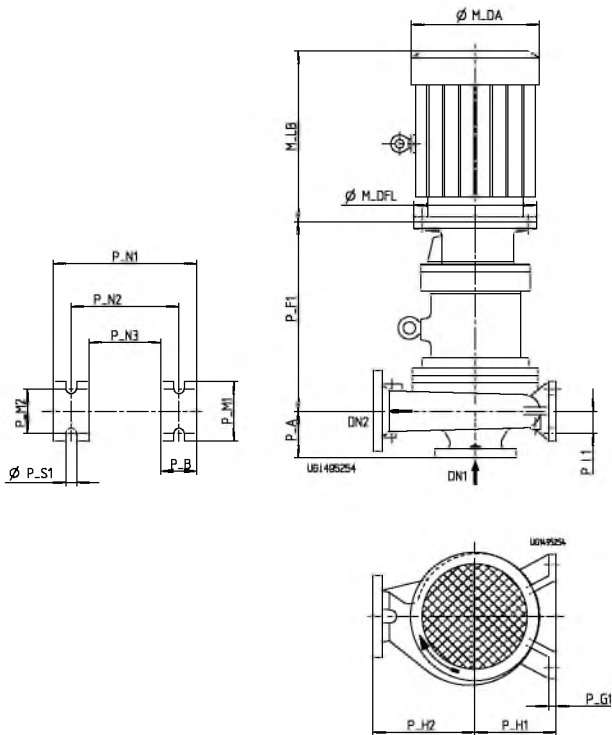


Fig. 6: Dimensions for installation with motor feet


Fig. 7: Dimensions for vertical installation

Technical data of mounting plate

Dimensions [mm]	Weight [kg]
<p>Height: 25</p>	24

Pump dimensions

Size	Bearing bracket	Pump dimensions													
		DN1	DN2	P_A	P_B	P_G1	P_H1	P_H2	P_L1	P_M1	P_M2	P_N1	P_N2	P_N3	ϕP_{S1}
040-025-160 ⁹⁾	CS40	40	25	80	50	15	132	160	35	100	70	240	190	140	14
040-025-200 ¹⁰⁾	CS40	40	25	80	50	15	160	180	35	100	70	240	190	140	14
050-032-125 ¹¹⁾¹²⁾	CS40	50	32	80	50	15	112	140	35	100	70	190	140	90	14
050-032-125.1 ¹¹⁾¹²⁾	CS40	50	32	80	50	15	112	140	35	100	70	190	140	90	14
050-032-160 ⁹⁾	CS40	50	32	80	50	15	132	160	35	100	70	240	190	140	14
050-032-160.1 ⁹⁾	CS40	50	32	80	50	15	132	160	35	100	70	240	190	140	14

9) A mounting plate with a height of 25 mm is supplied for motor size 132.

10) A mounting plate with a height of 25 mm is supplied for motor size 160 or 180.

11) A mounting plate with a height of 25 mm is supplied for motor size 100 or 112.

12) A mounting plate with a height of 38 mm is required for motor size 132. This mounting plate is not included in the scope of supply.

Size	Bearing bracket	Pump dimensions													
		DN1	DN2	P_A	P_B	P_G1	P_H1	P_H2	P_L1	P_M1	P_M2	P_N1	P_N2	P_N3	Ø P_S1
050-032-200 ¹⁰⁾	CS40	50	32	80	50	18	160	180	35	100	70	240	190	140	14
050-032-200.1 ¹⁰⁾	CS40	50	32	80	50	18	160	180	35	100	70	240	190	140	14
050-032-250	CS50	50	32	100	65	18	180	225	47,5	125	95	320	250	190	14
050-032-250.1	CS50	50	32	100	65	18	180	225	47,5	125	95	320	250	190	14
065-040-125 ¹¹⁾¹²⁾	CS40	65	40	80	50	15	112	140	35	100	70	210	160	110	14
065-040-160 ⁹⁾	CS40	65	40	80	50	15	132	160	35	100	70	240	190	140	14
065-040-160.1 ⁹⁾	CS40	65	40	80	50	15	132	160	35	100	70	240	190	140	14
065-040-200 ¹⁰⁾	CS40	65	40	100	50	18	160	180	35	100	70	265	212	165	14
065-040-200.1 ¹⁰⁾	CS40	65	40	100	50	18	160	180	35	100	70	265	212	165	14
065-040-250	CS50	65	40	100	65	18	180	225	47,5	125	95	320	250	190	14
065-040-250.1	CS50	65	40	100	65	18	180	225	47,5	125	95	320	250	190	14
065-040-315	CS50	65	40	125	65	18	200	250	47,5	125	95	345	280	215	14
080-050-125 ⁹⁾	CS40	80	50	100	50	18	132	160	35	100	70	240	190	140	14
080-050-160 ¹⁰⁾	CS40	80	50	100	50	18	160	180	35	100	70	265	212	165	14
080-050-160.1 ¹⁰⁾	CS40	80	50	100	50	18	160	180	35	100	70	265	212	165	14
080-050-200 ¹⁰⁾	CS40	80	50	100	50	18	160	200	35	100	70	265	212	165	14
080-050-200.1 ¹⁰⁾	CS40	80	50	100	50	18	160	200	35	100	70	265	212	165	14
080-050-250	CS50	80	50	125	65	18	180	225	47,5	125	95	320	250	190	14
080-050-250.1	CS50	80	50	125	65	18	180	225	47,5	125	95	320	250	190	14
080-050-315	CS50	80	50	125	65	18	225	280	47,5	125	95	345	280	215	14
080-050-315.1	CS50	80	50	125	65	18	225	280	47,5	125	95	345	280	215	14
100-065-125 ¹⁰⁾	CS40	100	65	100	65	18	160	180	47,5	125	95	280	212	150	14
100-065-160 ¹⁰⁾	CS50	100	65	100	65	18	160	200	47,5	125	95	280	212	150	14
100-065-200	CS50	100	65	100	65	18	180	225	47,5	125	95	320	250	190	14
100-065-250	CS50	100	65	125	80	20	200	250	60	160	120	360	280	200	18
100-065-315	CS60	100	65	125	80	20	225	280	60	160	120	400	315	240	18
125-080-160	CS50	125	80	125	65	18	180	225	47,5	125	95	320	250	190	14
125-080-200	CS50	125	80	125	65	18	180	250	47,5	125	95	345	280	215	14
125-080-200.1	CS50	125	80	125	65	18	180	250	47,5	125	95	345	280	215	14
125-080-250	CS50	125	80	125	80	18	225	280	60	160	120	400	315	240	18
125-080-315	CS60	125	80	125	80	20	250	315	60	160	120	400	315	240	18
125-080-400	CS60	125	80	125	80	20	280	355	60	160	120	435	355	275	18
125-100-160	CS50	125	100	125	80	18	200	280	60	160	120	360	280	200	19
125-100-200	CS50	125	100	125	80	18	200	280	60	160	120	360	280	200	18
125-100-250	CS60	125	100	140	80	18	225	280	60	160	120	400	315	240	18
125-100-315	CS60	125	100	140	80	18	250	315	60	160	120	400	315	240	18
125-100-400	CS60	125	100	140	100	20	280	355	75	200	150	500	400	300	23
150-125-200	CS60	150	125	140	80	20	250	315	60	160	120	400	315	240	19
150-125-250	CS60	150	125	140	80	20	250	355	60	160	120	400	315	240	18
150-125-315	CS60	150	125	140	100	20	280	355	75	200	150	500	400	300	23
150-125-400	CS60	150	125	140	100	20	315	400	75	200	150	500	400	300	23
200-150-200	CS60	200	150	180	100	20	280	400	75	200	150	550	450	350	24
200-150-250	CS60	200	150	160	100	20	280	375	75	200	150	500	400	300	23

Pump dimensions

Size	Bearing bracket	Motor size ¹³⁾						
		90S 90L	100L 112M	132S 132M	160M 160L 180M 180L	200	225M, 2 poles 225S, 4-6 poles 225M, 4-6 poles	250M, 2 poles 250M, 4-6 poles 280S, 2 poles 280M, 2 poles 280S, 4-6 poles 280M, 4-6 poles
		P_F1						
040-025-160 ⁹⁾	CS40	314	319	345	-	-	-	-
040-025-200 ¹⁰⁾	CS40	314	319	345	379	-	-	-
050-032-125 ¹¹⁾¹²⁾	CS40	314	319	345	-	-	-	-

13) From motor size 200, always with motor foot

Size	Bearing bracket	Motor size ¹³⁾						
		90S 90L	100L 112M	132S 132M	160M 160L 180M 180L	200	225M, 2 poles 225S, 4-6 poles 225M, 4-6 poles	250M, 2 poles 250M, 4-6 poles 280S, 2 poles 280M, 2 poles 280S, 4-6 poles 280M, 4-6 poles
		P_F1						
050-032-125.1 ¹¹⁾¹²⁾	CS40	314	319	345	-	-	-	-
050-032-160 ⁹⁾	CS40	314	319	345	-	-	-	-
050-032-160.1 ⁹⁾	CS40	314	319	345	-	-	-	-
050-032-200 ¹⁰⁾	CS40	314	319	345	379	-	-	-
050-032-200.1 ¹⁰⁾	CS40	314	319	345	379	-	-	-
050-032-250	CS50	399	404	430	464	504	524	534
050-032-250.1	CS50	399	404	430	464	504	524	534
065-040-125 ¹¹⁾¹²⁾	CS40	314	319	345	-	-	-	-
065-040-160 ⁹⁾	CS40	314	319	345	-	-	-	-
065-040-160.1 ⁹⁾	CS40	314	319	345	-	-	-	-
065-040-200 ¹⁰⁾	CS40	314	319	345	379	-	-	-
065-040-200.1 ¹⁰⁾	CS40	314	319	345	379	-	-	-
065-040-250	CS50	399	404	430	464	504	524	534
065-040-250.1	CS50	399	404	430	464	504	524	534
065-040-315	CS50	399	404	430	464	504	524	534
080-050-125 ⁹⁾	CS40	314	319	345	-	-	-	-
080-050-160 ¹⁰⁾	CS40	314	319	345	379	-	-	-
080-050-160.1 ¹⁰⁾	CS40	314	319	345	379	-	-	-
080-050-200 ¹⁰⁾	CS40	314	319	345	379	-	-	-
080-050-200.1 ¹⁰⁾	CS40	314	319	345	379	-	-	-
080-050-250	CS50	399	404	430	464	504	524	534
080-050-250.1	CS50	399	404	430	464	504	524	534
080-050-315	CS50	399	404	430	464	504	524	534
080-050-315.1	CS50	399	404	430	464	504	524	534
100-065-125 ¹⁰⁾	CS40	314	319	345	379	-	-	-
100-065-160 ¹⁰⁾	CS50	399	404	430	464	504	524	534
100-065-200	CS50	399	404	430	464	504	524	534
100-065-250	CS50	399	404	430	464	504	524	534
100-065-315	CS60	399	404	430	464	504	524	534
125-080-160	CS50	399	404	430	464	504	524	534
125-080-200	CS50	399	404	430	464	504	524	534
125-080-200.1	CS50	399	404	430	464	504	524	534
125-080-250	CS50	399	404	430	464	504	524	534
125-080-315	CS60	399	404	430	464	504	524	534
125-080-400	CS60	399	404	430	464	504	524	534
125-100-160	CS50	399	404	430	464	504	524	534
125-100-200	CS50	399	404	430	464	504	524	534
125-100-250	CS60	399	404	430	464	504	524	534
125-100-315	CS60	399	404	430	464	504	524	534
125-100-400	CS60	399	404	430	464	504	524	534
150-125-200	CS60	399	404	430	464	504	524	534
150-125-250	CS60	399	404	430	464	504	524	534
150-125-315	CS60	399	404	430	464	504	524	534
150-125-400	CS60	399	404	430	464	504	524	534
200-150-200	CS60	399	404	430	464	504	524	534
200-150-250	CS60	399	404	430	464	504	524	534

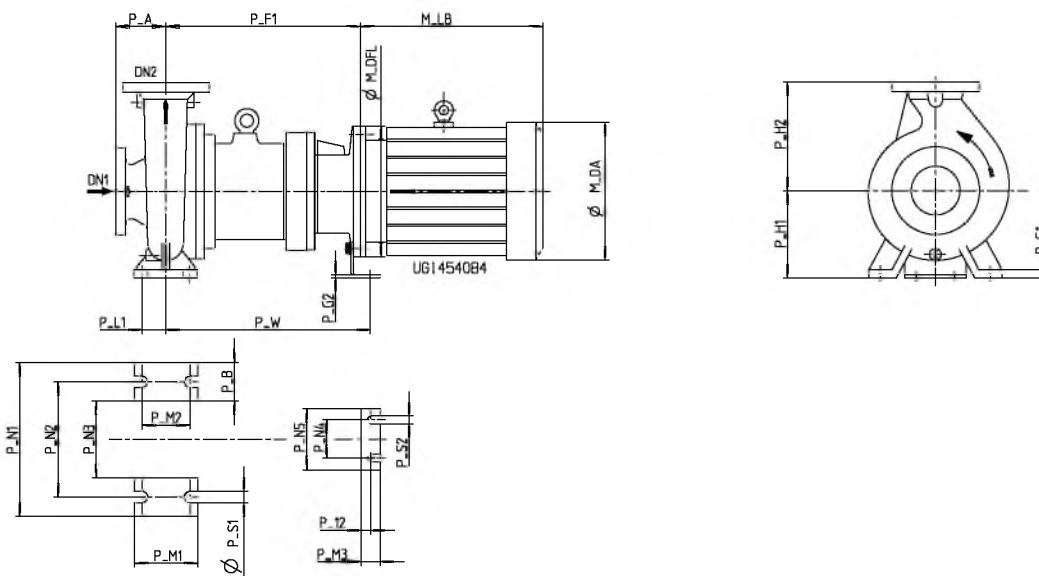
14) The figures indicated refer to the maximum dimensions.

15) The dimension applies to a motor combined with a CS50 or CS60 bearing bracket.

Motor dimensions

Motor dimensions

Designation	90S	90L	100L	112M	132S	132M	160M	160L	180M	180L	200L	2 poles				4 poles				
												225M	250M	280S	280M	225M	225S	250M	280S	280M
M_LB ¹⁴⁾	282	308	382	371	413	441	546	552	610	610	669	755	817	925	980	725	695	817	925	980
M_DA ¹⁴⁾	190	190	213	234	266	298	325	325	370	370	422	468	520	575	575	468	460	520	575	575
M_DFL	200	200	250	250	300	300	350	350	350	350	400	450	550	550	550	450	450	550	550	550
A_L ¹⁵⁾	-	-	-	-	-	-	-	-	-	-	637	673	702	724	724	673	673	702	724	724
M_H1	-	-	-	-	-	-	-	-	-	-	200	225	250	280	280	225	225	250	280	280
M_A	-	-	-	-	-	-	-	-	-	-	318	356	406	457	457	356	356	406	457	457
M_AA ¹⁴⁾	-	-	-	-	-	-	-	-	-	-	85	100	100	100	100	100	100	100	100	100
M_AB ¹⁴⁾	-	-	-	-	-	-	-	-	-	-	400	450	506	557	557	450	450	506	557	557
M_B	-	-	-	-	-	-	-	-	-	-	305	311	349	368	419	311	286	349	368	419
M_BB ¹⁴⁾	-	-	-	-	-	-	-	-	-	-	388	410	425	480	530	410	385	425	480	530
M_BK	-	-	-	-	-	-	-	-	-	-	19	19	24	24	24	19	19	24	24	24
M_HA ¹⁴⁾	-	-	-	-	-	-	-	-	-	-	30	35	40	40	40	35	35	40	40	40

Dimensions of pump with support foot

Fig. 8: Dimensions for installation with support foot

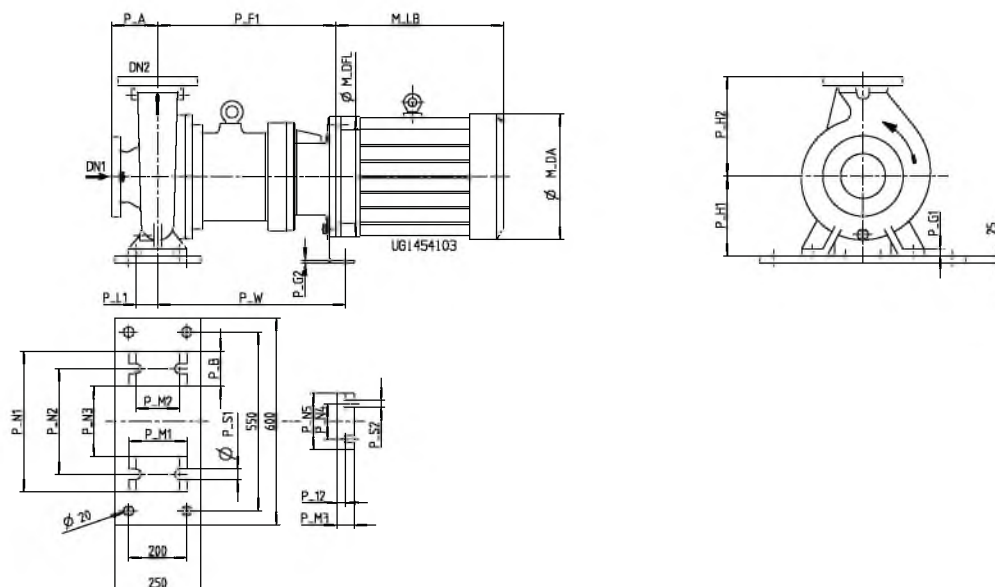


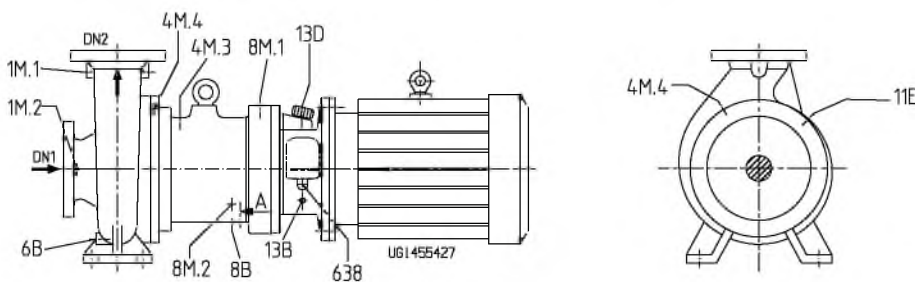
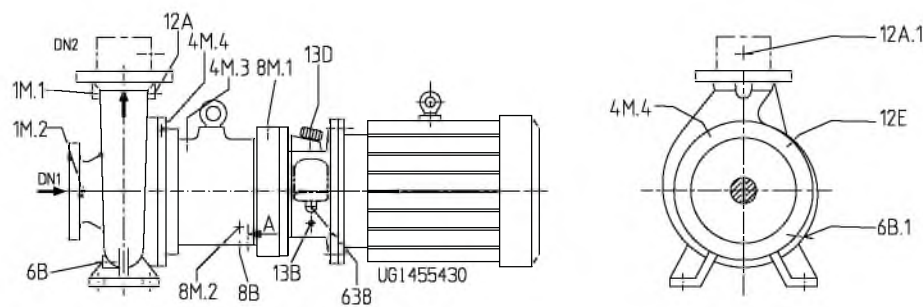
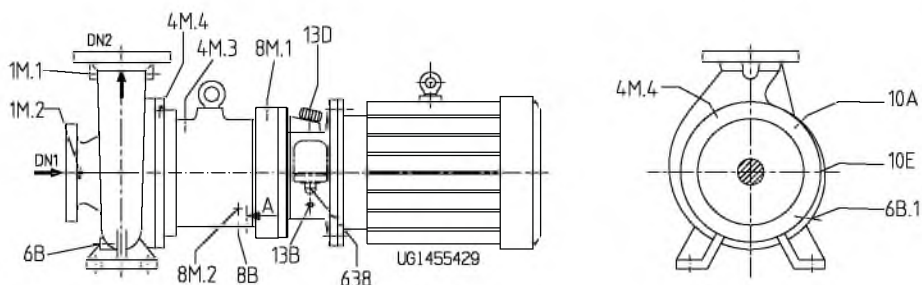
Fig. 9: Dimensions for installation with support foot and mounting plate

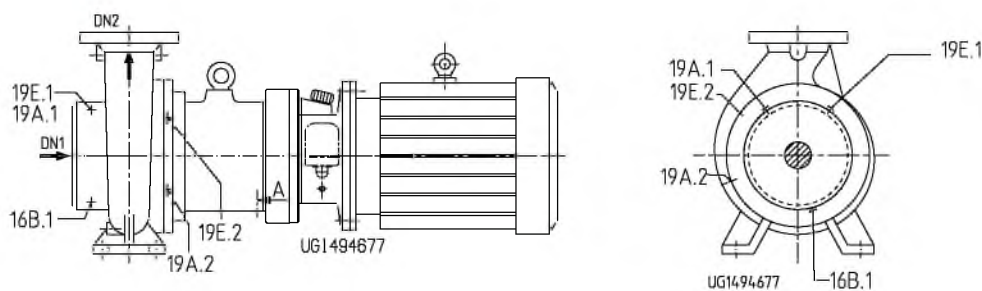
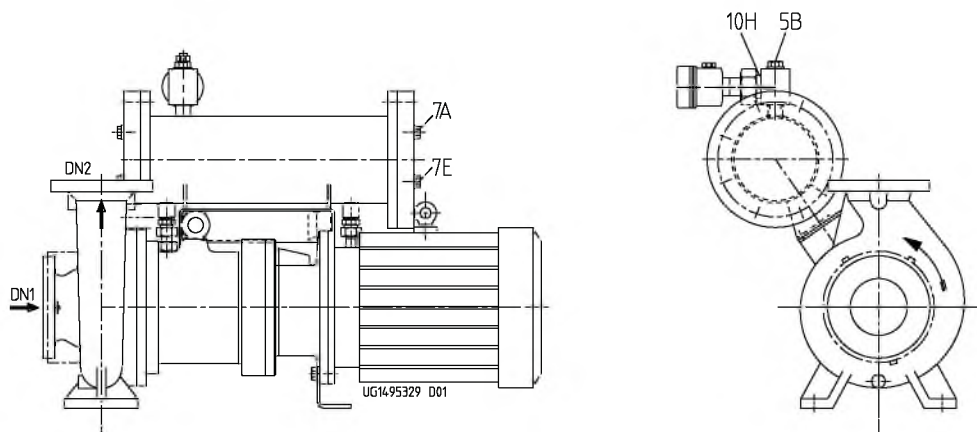
Dimensions of pump with support foot¹⁶⁾

Size	Bearing bracket	P_W	P_S2	P_N4	P_N5	P_12	P_M3	P_G2
040-025-160	CS40	-	-	-	-	-	-	-
040-025-200	CS40	370	14	110	160	20	48	4
050-032-125	CS40	-	-	-	-	-	-	-
050-032-125.1	CS40	-	-	-	-	-	-	-
050-032-160	CS40	-	-	-	-	-	-	-
050-032-160.1	CS40	-	-	-	-	-	-	-
050-032-200	CS40	370	14	110	160	20	48	4
050-032-200.1	CS40	370	14	110	160	20	48	4
050-032-250	CS50	455	14	110	160	20	48	4
050-032-250.1	CS50	455	14	110	160	20	48	4
065-040-125	CS40	-	-	-	-	-	-	-
065-040-160	CS40	-	-	-	-	-	-	-
065-040-160.1	CS40	-	-	-	-	-	-	-
065-040-200	CS40	370	14	110	160	20	48	4
065-040-200.1	CS40	370	14	110	160	20	48	4
065-040-250	CS50	455	14	110	160	20	48	4
065-040-250.1	CS50	455	14	110	160	20	48	4
065-040-315	CS50	455	14	110	160	20	48	4
080-050-125	CS40	-	-	-	-	-	-	-
080-050-160	CS40	370	14	110	160	20	48	4
080-050-160.1	CS40	370	14	110	160	20	48	4
080-050-200	CS40	370	14	110	160	20	48	4
080-050-200.1	CS40	370	14	110	160	20	48	4
080-050-250	CS50	455	14	110	160	20	48	4
080-050-250.1	CS50	455	14	110	160	20	48	4
080-050-315	CS50	455	14	110	160	20	48	4
080-050-315.1	CS50	455	14	110	160	20	48	4
100-065-125	CS40	370	14	110	160	20	48	4
100-065-160	CS50	455	14	110	160	20	48	4
100-065-200	CS50	455	14	110	160	20	48	4
100-065-250	CS50	455	14	110	160	20	48	4
100-065-315	CS60	455	14	110	160	20	48	4
125-080-160	CS50	455	14	110	160	20	48	4
125-080-200	CS50	455	14	110	160	20	48	4
125-080-200.1	CS50	455	14	110	160	20	48	4

16) A support foot is only supplied for motor sizes 160M, 160L, 180M, 180L.

Size	Bearing bracket	P_W	P_S2	P_N4	P_N5	P_12	P_M3	P_G2
125-080-250	CS50	455	14	110	160	20	48	4
125-080-315	CS60	453	14	110	160	20	48	6
125-080-400	CS60	453	14	110	160	20	48	6
125-100-160	CS50	455	14	110	160	20	48	4
125-100-200	CS50	455	14	110	160	20	48	4
125-100-250	CS60	455	14	110	160	20	48	4
125-100-315	CS60	453	14	110	160	20	48	6
125-100-400	CS60	453	14	110	160	20	48	6
150-125-200	CS60	453	14	110	160	20	48	6
150-125-250	CS60	453	14	110	160	20	48	6
150-125-315	CS60	453	14	110	160	20	48	6
150-125-400	CS60	453	14	110	160	20	48	6
200-150-200	CS60	453	14	110	160	20	48	6
200-150-250	CS60	453	14	110	160	20	48	6

Connections

Fig. 10: Connections for operating modes: internal circulation and low-boiling fluids

Fig. 11: Connections for operating modes: external circulation and external circulation with main flow filter

Fig. 12: Connections for dead-end configuration operating mode


Fig. 13: Connections for heating ¹⁷⁾

Fig. 14: Connections for heat exchanger

Connections at the volute casing

Connection	Description	Discharge nozzle		
		≤ DN 50	DN 65 - DN 80	≥ DN 100
1M.1	Pressure gauge	G1/4	G3/8	G1/2
1M.2	Pressure gauge	G1/4	G3/8	G1/2
6B ¹⁸⁾	Fluid drain (volute casing)	G1/4	G3/8	G1/2
12A	Circulation liquid OUT	G1/4	G3/8	G1/2
16B.1	Condensate drain (volute casing)		G1/4	
19A.1	Heating liquid OUT (volute casing)		G3/8	
19E.1	Heating liquid IN (volute casing)		G3/8	

Connections for casing cover 161, bearing bracket lantern 344, intermediate piece 132.03, main flow filter

Connection	Description	Bearing bracket CS40/CS50/CS60 with MD 85/123/172
4M.3	Temperature monitoring of containment shroud, Pt100 resistance thermometer	G1/4
4M.4	Temperature monitoring of containment shroud, thermocouple	G1/4
6B.1	Containment shroud drain	G1/4
8B	Bearing bracket lantern drain	G1/4
8M.1	Leakage monitoring (gas, vapour)	G1/4
8M.2	Leakage monitoring (liquid)	G3/4
10A	Barrier fluid OUT	G1/4
10E	Barrier fluid IN	G1/4
11E	Flushing liquid, containment shroud IN	G1/4
12A.1	Main flow filter OUT	G1/4
12E	Circulation liquid IN	G1/4
13B	Oil drain	G1/4
13D	Vent plug	Diameter 20

17) Only possible for operating modes: internal circulation, low-boiling fluids and dead-end configuration

18) Design with DN 15 flange if drain line is provided.

Connection	Description	Bearing bracket CS40/CS50/CS60 with MD 85/123/172
19A.2	Heating liquid OUT (casing cover)	G3/8
19E.2	Heating liquid IN (casing cover)	G3/8
638	Constant level oiler	Rp 1/4

Connections for heat exchanger

Connection	Description	Heat exchanger size	Connection size
7A	Cooling liquid OUT	76	G 3/8
		115	G 3/4
		152	G 1
7E	Cooling liquid IN	76	G 3/8
		115	G 3/4
		152	G 1
5B	Vent	76	G 3/4
		115	
		152	
10H	Monitoring and check	76	G 1
		115	
		152	

Flange design

Overview of available flange designs

Material	Standard	Pressure class
C	EN 1092-1	PN16
	Drilled to ASME B16.5	Class 150
V	EN 1092-1	PN16
	Drilled to ASME B16.5	Class 150
E	EN 1092-1	PN16
	Drilled to ASME B16.5	Class 150/Class 300
E	EN 1092-1	PN25
	Drilled to ASME B16.5	Class 150/Class 300
Y	EN 1092-1	PN40
	Drilled to ASME B16.5	Class 300
D	EN 1092-1	PN16
	Drilled to ASME B16.5	Class 150/Class 300
D	EN 1092-1	PN25
	Drilled to ASME B16.5	Class 150/Class 300
Heatable casing	EN 1092-1	PN16
	Drilled to ASME B16.5	Class 150

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump
- KSB surface-cooled IEC frame three-phase current squirrel-cage motor
- Mounting plate
- Mounting plate adjusting elements for installation without foundation

Special accessories

- As required

Accessories

- Temperature monitoring (metal containment shroud)

- Pt100 resistance thermometer
- Mineral-insulated thermocouple
- Fill level monitoring as dry running protection
 - Liquiphant level transmitter
- Monitoring for containment shroud leakage
 - Liquiphant level transmitter
 - Contact pressure gauge
 - Pressure switch
 - Pressure transducer
- Monitoring of pump power to detect dry running and/or asynchronous operation of the magnetic coupling and to protect against overload operation
 - Motor load monitor

Electronic analysis equipment as well as additional components for operation in potentially explosive atmospheres can also be ordered from KSB.

General assembly drawings

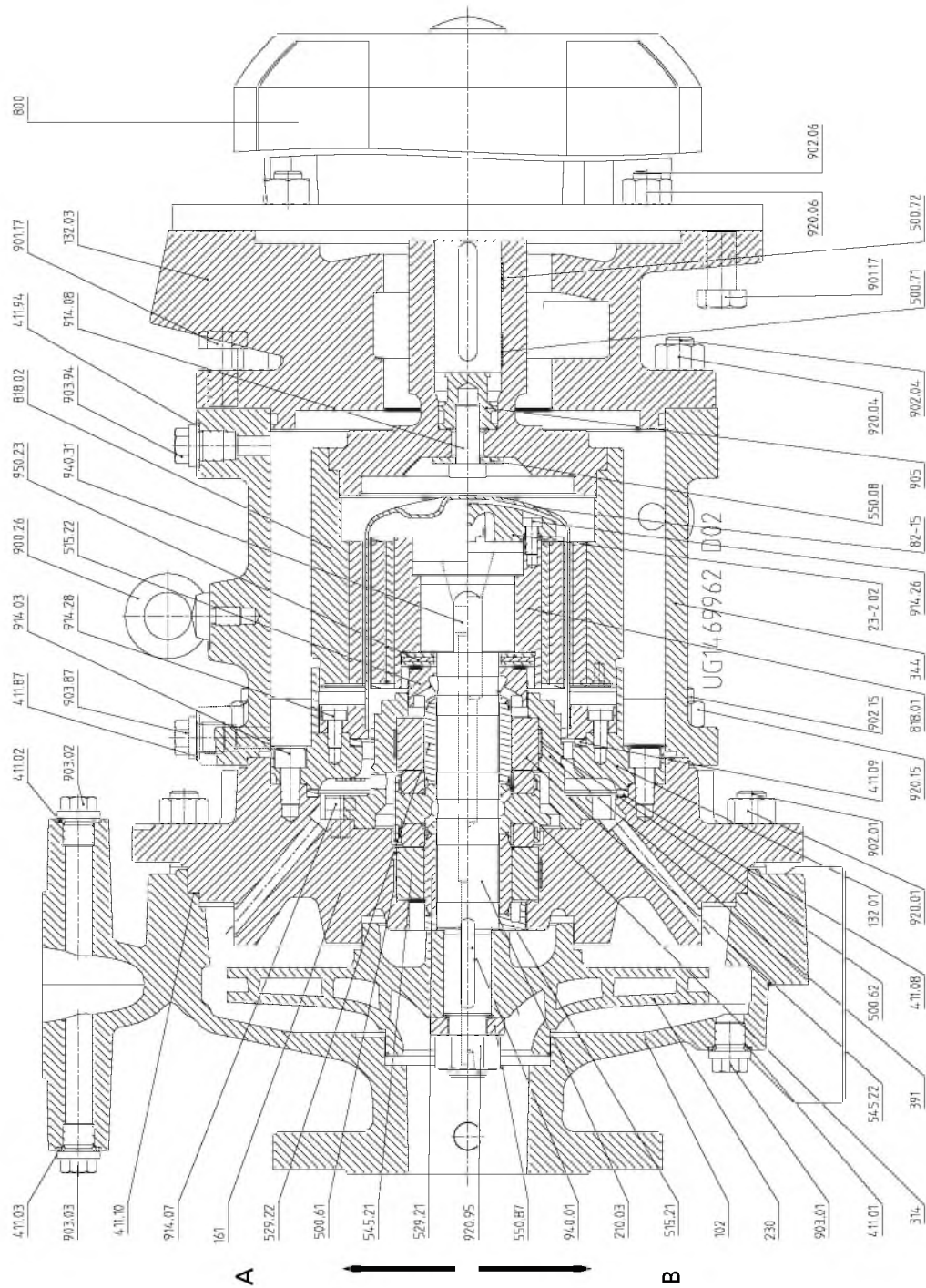


Fig. 15: General assembly drawing of model with bolted cover and intermediate piece

A	Internal circulation, external circulation	B	Low-boiling fluids, dead-end configuration
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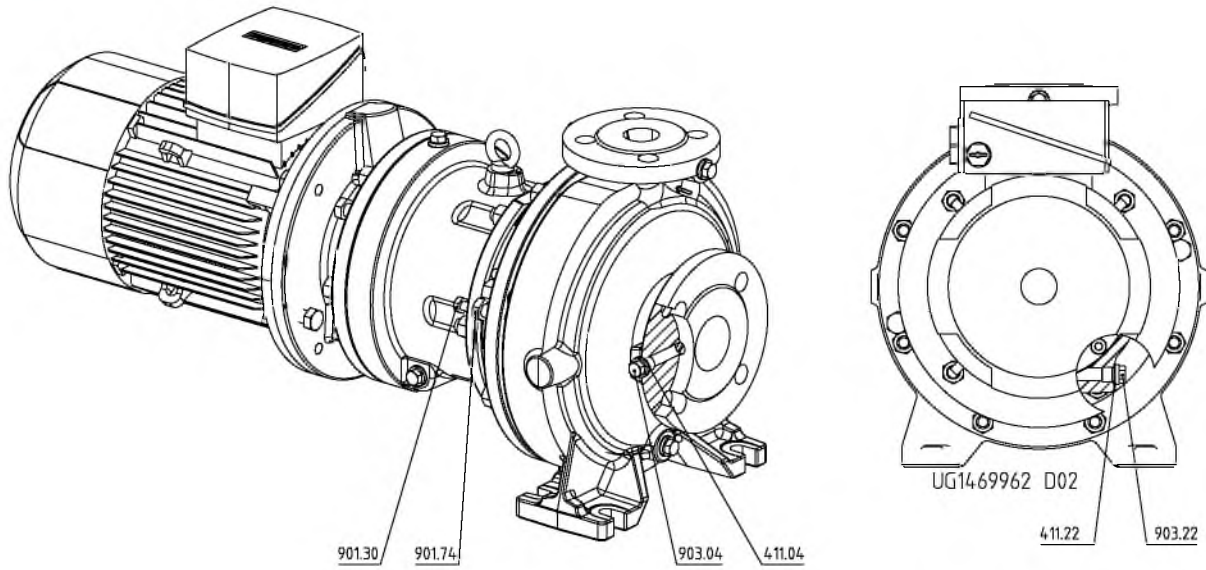


Fig. 16: Fitting the discharge cover on the pump casing on designs with bolted cover

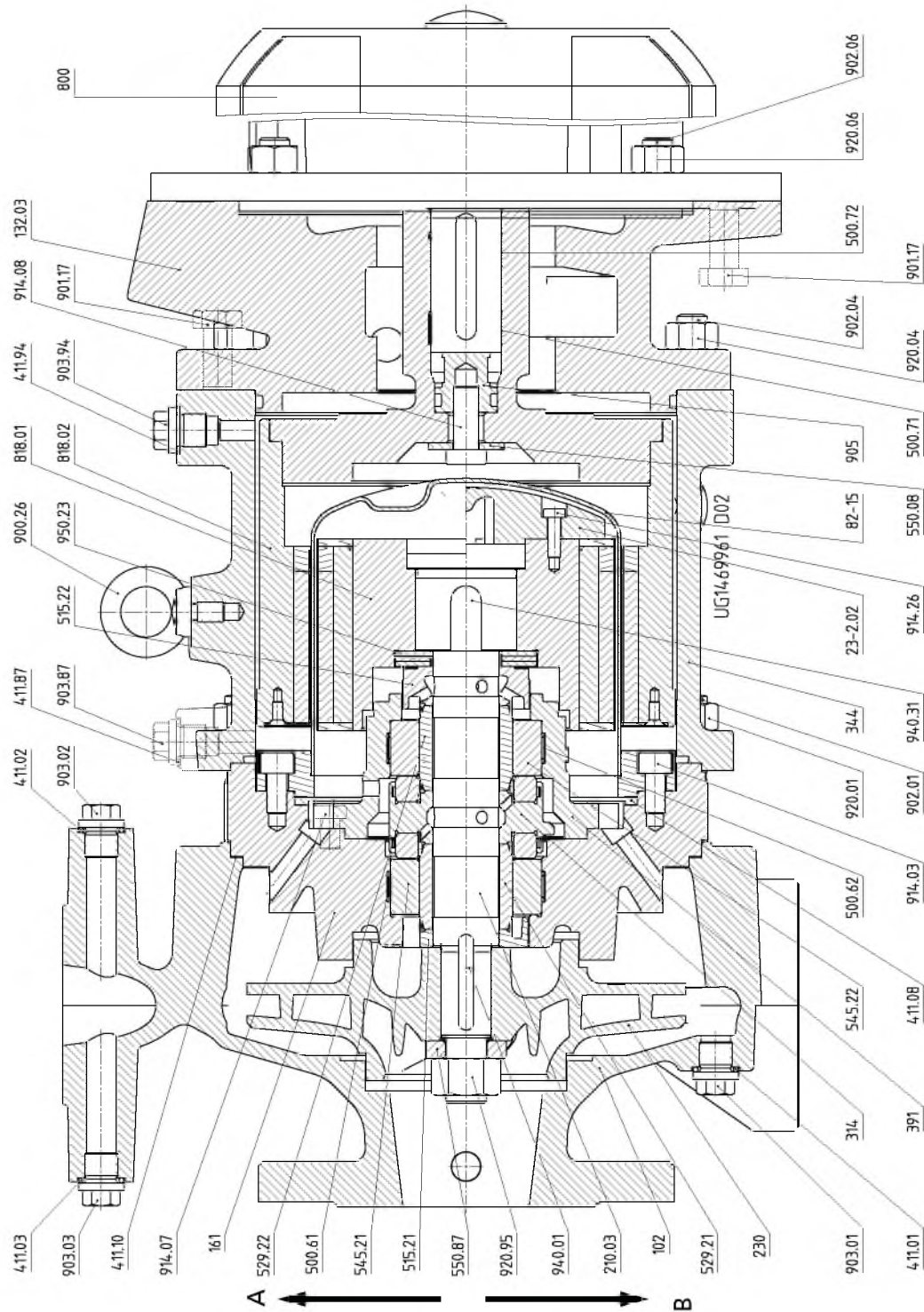


Fig. 17: General assembly drawing of model with clamped cover and without intermediate piece

A	Internal circulation, external circulation	B	Low-boiling fluids, dead-end configuration
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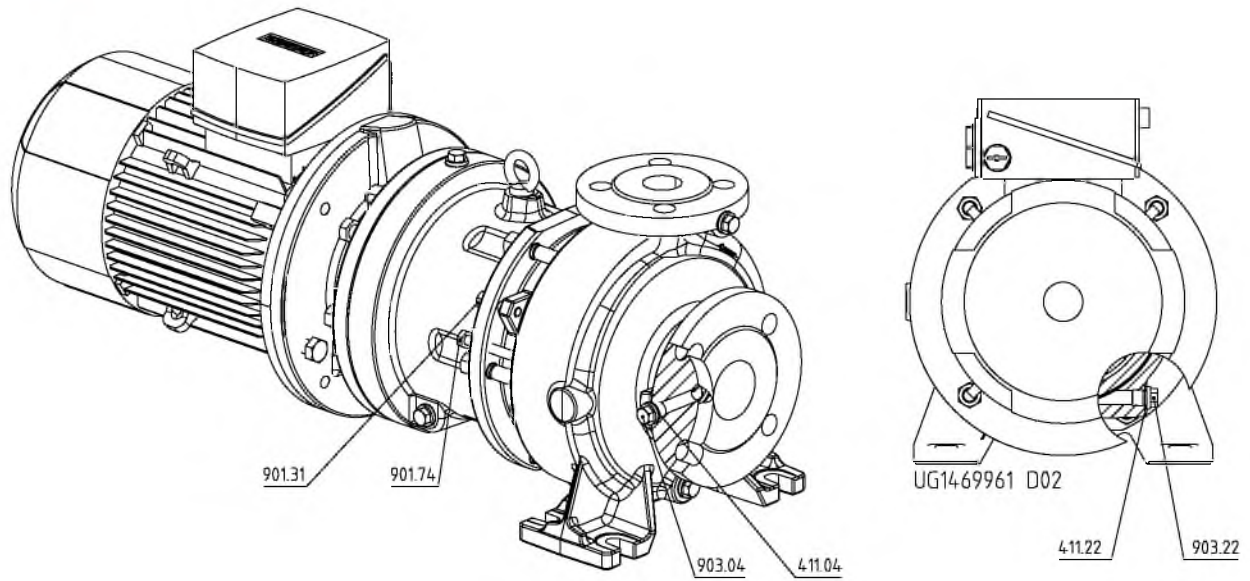


Fig. 18: Fitting the discharge cover on the pump casing on designs with bolted cover

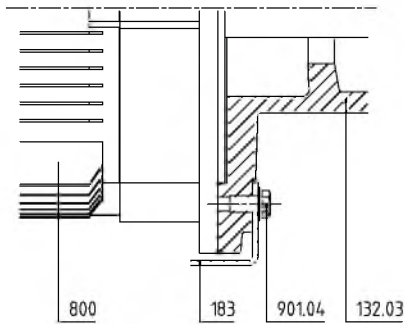


Fig. 19: Fitting the support foot for motors 160 and 180

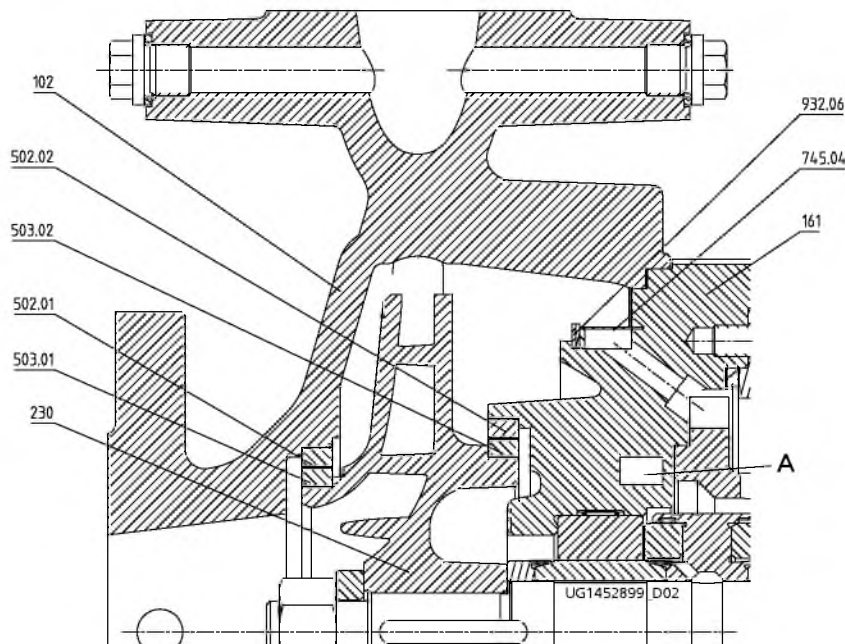


Fig. 20: Model with volute casing and ring filter, heating chamber, casing wear ring and impeller wear ring

A Heating chamber

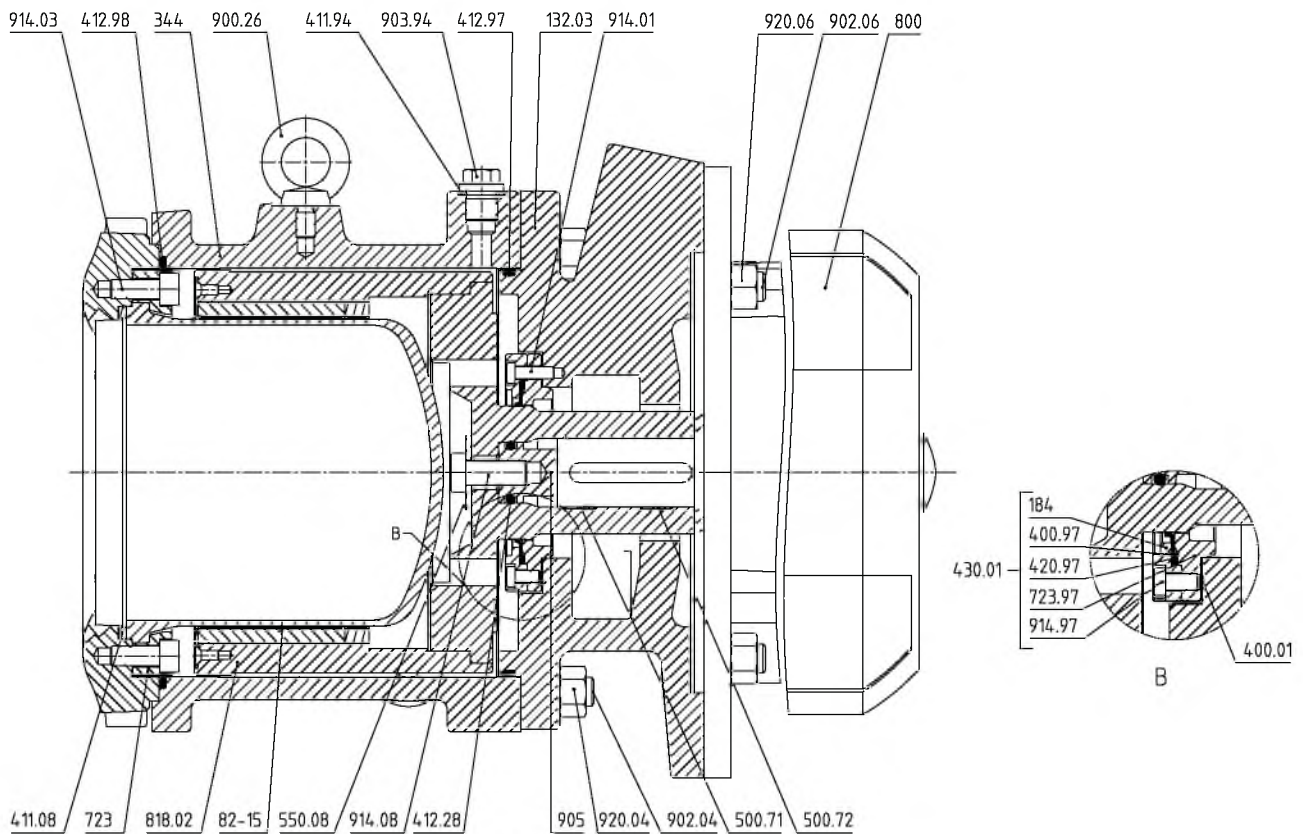


Fig. 21: Model with ceramic containment shroud and leakage barrier with shaft seal ring

List of components

Part No.	Comprising	Description
102	102	Volute casing
	411.01 ¹⁹⁾ / .02 ¹⁹⁾ / .03 ¹⁹⁾ / .04 ¹⁹⁾	Joint ring
	502.01 ¹⁹⁾	Casing wear ring
	902.01	Stud
	903.01 ¹⁹⁾ / .02 ¹⁹⁾ / .03 ¹⁹⁾ / .04 ¹⁹⁾	Screw plug
	920.01	Hexagon nut
132.03	132.03	Intermediate piece
161	161	Casing cover
502.02 ¹⁹⁾	502.02 ¹⁹⁾	Casing wear ring
183	183 ¹⁹⁾	Support foot
210.03	210.03	Shaft
	550.87	Disc
	920.95	Nut
	940.01/.31	Key
	230	230	Impeller
23-2.02	503.01 ¹⁹⁾ / .02 ¹⁹⁾	Impeller wear ring
	23-2.02 ¹⁹⁾	Auxiliary impeller
310	914.26 ¹⁹⁾	Hexagon socket head cap screw
	310	Plain bearing assembly
	500.61	Locking element
	500.62	Locking element
	515.21	Taper lock ring
	515.22	Taper lock ring
529.21	Plain bearing sleeve	
529.22	Plain bearing sleeve	
545.21	Plain bearing bush	
545.22	Plain bearing bush	

¹⁹⁾ Not on all versions

Part No.	Comprising	Description
314	314	Thrust bearing
344	344	Bearing bracket lantern
391	391	Bearing ring carrier
411.08	411.08	Joint ring
411.09	411.09	Joint ring
411.10	411.10	Joint ring
411.22 / 87 / 94	411.22 / 87 / 94	Joint ring
500.71 / 72	500.71 / 72	Locking elements
509.02	509.02	Intermediate ring
550.08	550.08	Disc
800	800	Motor
818.01	818.01	Inner rotor
818.02	818.02	Outer rotor
82-15	82-15	Containment shroud
	132.01	Containment shroud intermediate piece
	723 ²⁰⁾	Containment shroud flange
	914.03	Hexagon socket head cap screw
	914.28	Hexagon socket head cap screw
900.26	900.26	Eyebolt
901.04	901.04 ¹⁹⁾	Hexagon head bolt
901.17	901.17	Hexagon head bolt
901.30	901.30	Hexagon head bolt
901.31	901.31	Hexagon head bolt
901.74	901.74	Hexagon head bolt
902.04	902.04	Stud
902.06	902.06	Stud
902.15	902.15	Stud
903.22 / 87 / 94	903.22 / 87 / 94	Screw plug
905	905	Threaded connecting element
914.07	914.07	Hexagon socket head cap screw
914.08	914.08	Hexagon socket head cap screw
920.04	920.04	Nut
920.06	920.06	Nut
920.15	920.15	Nut
950.23	950.23	Disc spring
Casing cover design with ring filter		
745.04	745.04	Filter
932.06	932.06	Circlip
Models with leakage barrier – shaft seal ring		
340.01	340.01	Shaft seal
	184	Clamping ring
	400.97	Gasket
	420.97	Shaft seal ring
	723.97	Flange
	914.97	Hexagon socket head cap screw
400.01	400.01	Gasket
412.28 / 97 / 98	412.28 / 97 / 98	O-ring
914.01	914.01	Hexagon socket head cap screw

20) For versions with containment shroud only

Plain bearings arrangement
Designation example for a magnetic coupling: A 31

Key to designation of magnetic coupling

Code	Description
A	Components and position
A	Without 509.02
B	With 509.02 / 950.23 left
C	With 509.02 / 950.23 right

Code	Description
3	Number of disc springs
2	2x 950.23
3	3x 950.23
1	Variant with 515.xx on thrust bearing
1	515.11, single-piece
2	515.11 / 515.12, two-piece

Overview of plain bearings arrangement

Size	Bearing bracket	Nominal diameter of magnetic coupling [mm]		
		85	123	172
		1	2 ²¹⁾	3 ²¹⁾
040-25-160	CS40	A31	A31	-
040-25-200	CS40	A31	A31	-
050-32-125	CS40	A31	A31	-
050-32-125.1	CS40	A31	A31	-
050-32-160	CS40	A31	A31	-
050-32-160.1	CS40	A31	A31	-
050-32-200	CS40	A31	A31	-
050-32-200.1	CS40	A31	A31	-
050-32-250	CS50	B21	B21	A21
050-32-250.1	CS50	B21	B21	A21
065-40-125	CS40	A31	A31	-
065-40-160	CS40	A31	A31	-
065-40-160.1	CS40	A31	A31	-
065-40-200	CS40	A31	A31	-
065-40-200.1	CS40	A31	A31	-
065-40-250	CS50	B21	B21	A21
065-40-250.1	CS50	B21	B21	A21
065-40-315	CS50	B21	B21	A21
080-50-125	CS40	A31	A31	-
080-50-160	CS40	A31	A31	-
080-50-160.1	CS40	A31	A31	-
080-50-200	CS40	A31	A31	-
080-50-200.1	CS40	A31	A31	-
080-50-250	CS50	B21	B21	A21
080-50-250.1	CS50	B21	B21	A21
080-50-315	CS50	B21	B21	A21
080-50-315.1	CS50	B21	B21	A21
100-65-125	CS40	A31	A31	-
100-65-160	CS50	B21	B21	A21
100-65-200	CS50	B21	B21	A21
100-65-250	CS50	B21	B21	A21
100-65-315	CS60	B21	B21	A21
125-80-160	CS50	B21	B21	A21
125-80-200	CS50	B21	B21	A21
125-80-200.1	CS50	B21	B21	A21
125-80-250	CS50	B21	B21	A21
125-80-315	CS60	B21	B21	A21
125-80-400	CS60	B21	B21	A21
125-100-160	CS50	B21	B21	A21
125-100-200	CS50	B21	B21	A21
125-100-250	CS60	B21	B21	A21
125-100-315	CS60	B21	B21	A21
125-100-400	CS60	B21	B21	A21
150-125-200	CS60	B21	B21	A21
150-125-250	CS60	B21	B21	A21

21) Nominal diameter of magnetic coupling as per name plate

Size	Bearing bracket	Nominal diameter of magnetic coupling [mm]		
		85	123	172
		1	2 ²¹⁾	3 ²¹⁾
150-125-315	CS60	B21	B21	A21
150-125-400	CS60	B21	B21	A21
200-150-200	CS60	B21	B21	A21
200-150-250	CS60	B21	B21	A21

Plain bearings arrangement

Description	Illustration
Case A21 <ul style="list-style-type: none"> Bearing brackets CS50 and CS60 Magnetic coupling 172 	
Case B21 <ul style="list-style-type: none"> Bearing brackets CS50 and CS60 Magnetic couplings 85 and 123 	
Case A31 <ul style="list-style-type: none"> Bearing bracket CS40 Magnetic coupling 85/123 	

Detailed designation
Designation example

Position																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
M	A	C	D	0	5	0	-	0	3	2	-	2	5	0	1	C	C	-	X	1	A	E	N	-	-	1	3	2	S	6	B
See name plate and data sheet																See data sheet															

Designation key

Position	Code	Description
1-4	Pump type	
	MACD	Magnochem
	MACB	Magnochem-Bloc
5-16	Size	
	050	Nominal suction nozzle diameter [mm]
	032	Nominal discharge nozzle diameter [mm]

Position	Code	Description
5-16	2501	Nominal impeller diameter [mm]
17	Pump casing material	
	C	1.4408/A743CF8M
	E	GP240GH+N/WCB
	Y	1.7706
	V	1.4408
18	Impeller material	
	D	Noridur 1.4593/1.4517/A995 CD4MCuN
	G	JL 1040/A48CL35
	C	1.4408/A743CF8M
19	Heatable model	
	H	Heatable casing
	-	Standard
20	Special design	
	L	Standard-flow hydraulic system to ISO 2858
	E	Extended-flow hydraulic system
	X	Special design
21	Magnetic coupling diameter	
	5	265
	4	235
	3	172
	2	123
	1	85
22	Magnetic coupling length	
	Q	170
	P	160
	O	150
	N	140
	M	130
	L	120
	K	110
	J	100
	I	90
	H	80
	G	70
	F	60
	E	50
	D	40
	C	30
B	20	
A	10	
23-26	Operating modes	
	IPRH	Low-boiling fluids, ring filter, heatable
	IPR-	Low-boiling fluids, ring filter
	IP-H	Low-boiling fluids, heatable
	IP--	Low-boiling fluids
	INRH	Internal circulation, ring filter, heatable
	INR-	Internal circulation, ring filter
	IN-H	Internal circulation, heatable
	IN--	Internal circulation
	EP-H	Dead-end configuration, heatable
	EP--	Dead-end configuration
EN--	External circulation with fluid handled	
EF--	External circulation with barrier fluid	
27-30	IEC motor frame size	
	090S	090S
	100L	100L
	112M	112M
	---	Other

Position	Code	Description
31	Number of poles	
	2	2 poles
	4	4 poles
	6	6 poles
32	Product generation	
	B	Magnochem Global Pump product generation

Diaphragm Valve

SISTO-16

PN16
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Legal information/Copyright

Type Series Booklet SISTO-16

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Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-16



- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fuels
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Cleaning agents
- Brine
- Drinking water
- Other fluids on request.

Operating data

Characteristic	Value
Nominal pressure	PN 16
Nominal size ¹⁾	DN 15-200
Max. permissible pressure	16 bar
Max. permissible temperature ²⁾	+160 °C

Main applications

- Chemical industry
- Industry/process engineering
- Air-conditioning systems
- Power stations
- Seawater desalination/reverse osmosis
- Mining
- Process engineering
- Hot-water heating systems

Fluids handled

- Faecal-free waste water
- Aggressive fluids
- Inorganic fluids
- Service water
- Steam
- River, lake and groundwater
- Gas
- Fluids posing a health hazard
- Toxic fluids

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ³⁾	F14	5,5 - 10
D300 ³⁾	F14	5,5 - 7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

1) From DN 100 we recommend installing a gearbox for operating pressures > 10 bar.

2) The temperatures indicated are for orientation only; they are not valid for all operating conditions.

3) Double piston

Body materials

Overview of available materials

Material	Material number	Temperature limit ²⁾
EN-GJL-250	5.1301	-10 °C to +160 °C

- Two-piece diaphragm made of TFM/EPDM; temperature limit +160 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
 - Rising handwheel
 - Shut-off and sealing to atmosphere by spiral-supported, completely enclosed diaphragm
 - Position indicator with integrated stem protection
 - Manufactured and tested to EN 13397
 - Marked in accordance with DIN EN 19 (ISO 5209)
 - The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
 - Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.
- Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).
- The valves meet the requirements specified in TA-Luft (German Technical Guidelines on Air Quality Control, VDI 2440).

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Body coated with PA (Rilsan); temperature limit +90 °C⁴⁾
- Leakage detection hole and additional stem seal
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of EPDM/W270; temperature limit +90 °C
- Diaphragm made of EPDM-V (vacuum); temperature limit +140 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Maximum service life and pressure limit**
Maximised diaphragm life and pressure limit thanks to completely enclosed, spiral-supported diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.

⁴⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**
Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.
- **Fast checking of valve position**
The valve's position can be easily checked via a clear visual indicator, also visible from a distance.
- **Reliable operation**
The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure

6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	4,0	65	141,0
20	11,5	80	195,0
25	14,0	100	304,0
32	35,0	125	298,0
40	43,0	150	601,0
50	72,0	200	478,0

Pressure/temperature ratings

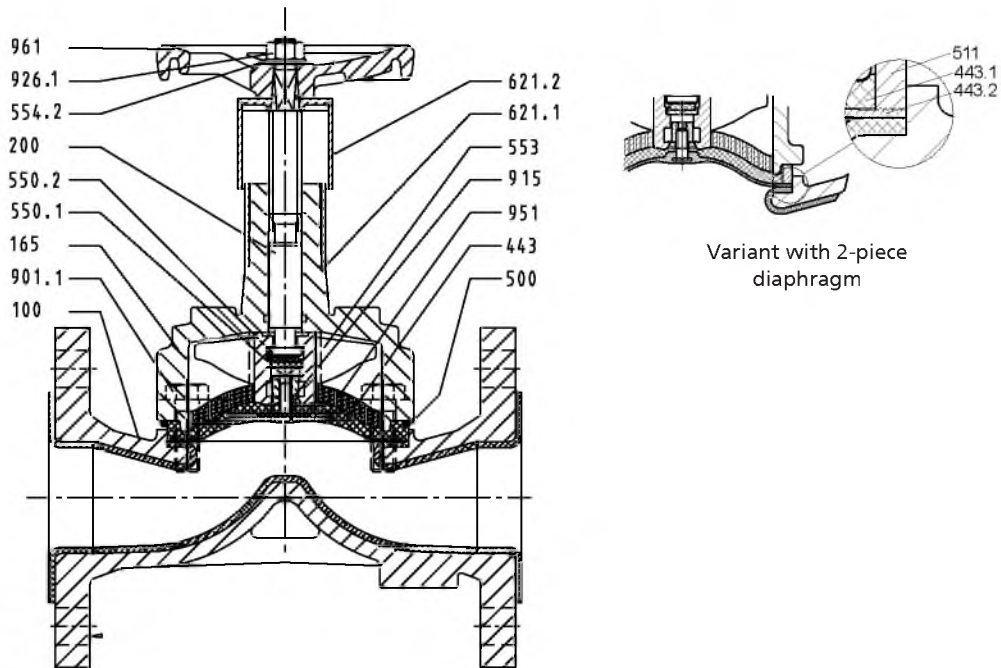
Permissible operating pressures in bar at temperatures in °C⁵⁾

Nominal pressure	Material	-10 to +140	+160
16	5.1301	16	12

5) Intermediate temperatures can be derived by linear interpolation.

Materials

SISTO-16 manually operated valve



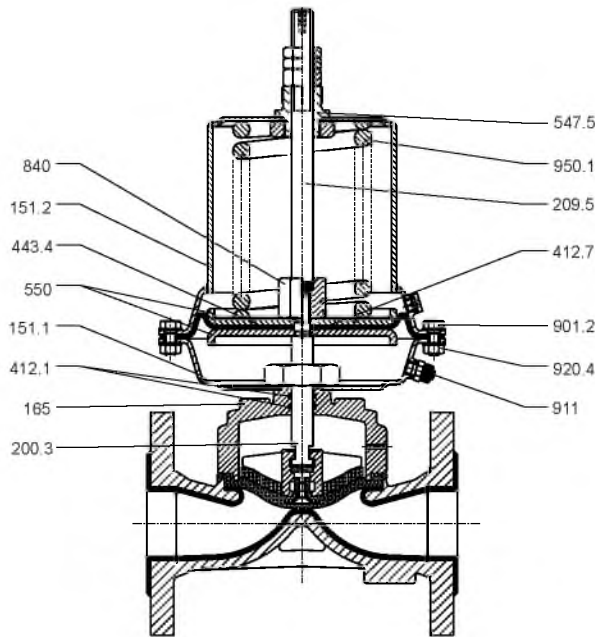
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	Standard, DN 15; DN 200 = 5.3103 (JS1049) DN15 with PFA lining = 1.0619
165	Bonnet	EN-GJL-250	5.1301	Standard; DN 15 = 1.0619
200	Stem	X14CrMoS17	1.4104	
443 ⁶⁾	Diaphragm	EPDM		Standard
443.1 ⁶⁾	Backing diaphragm	EPDM		
443.2 ⁶⁾	Diaphragm	TFM		
500	Ring	St 37 / A2E		
511	Backing ring	St 37 / A2E		
550.1	Bearing disc	11SMnPb30	1.0718	For DN 32-200
550.2	PTFE disc	PTFE/graphite		For DN 32-200
553	Compressor	EN-GJS-400-15	5.3106	GD-ZnAl4Cu1 for DN 15-25
554.2	Washer	A2		
621.1	Position indicator, lower part	ASA Luran		For DN 32-200
621.2	Position indicator, upper part	ASA Luran		
901.1	Hexagon head bolt	A2-70		
915	Floating nut	11SMnPb30	1.0718	
926.1	Prevailing torque nut	A2-70		
951	Support spiral	St 2K BK		From MD65
961	Handwheel	EN-GJL-200	5.1300	For DN15 = PC

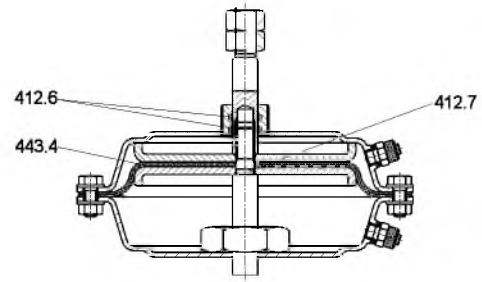
⁶⁾ Recommended spare parts

Materials

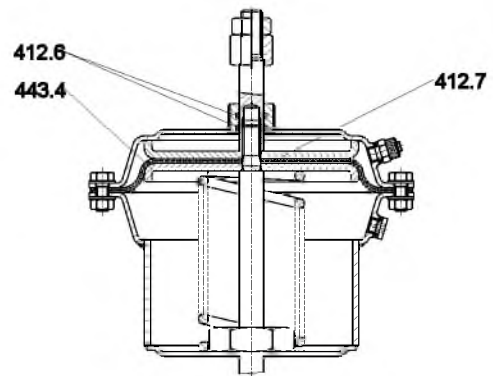
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

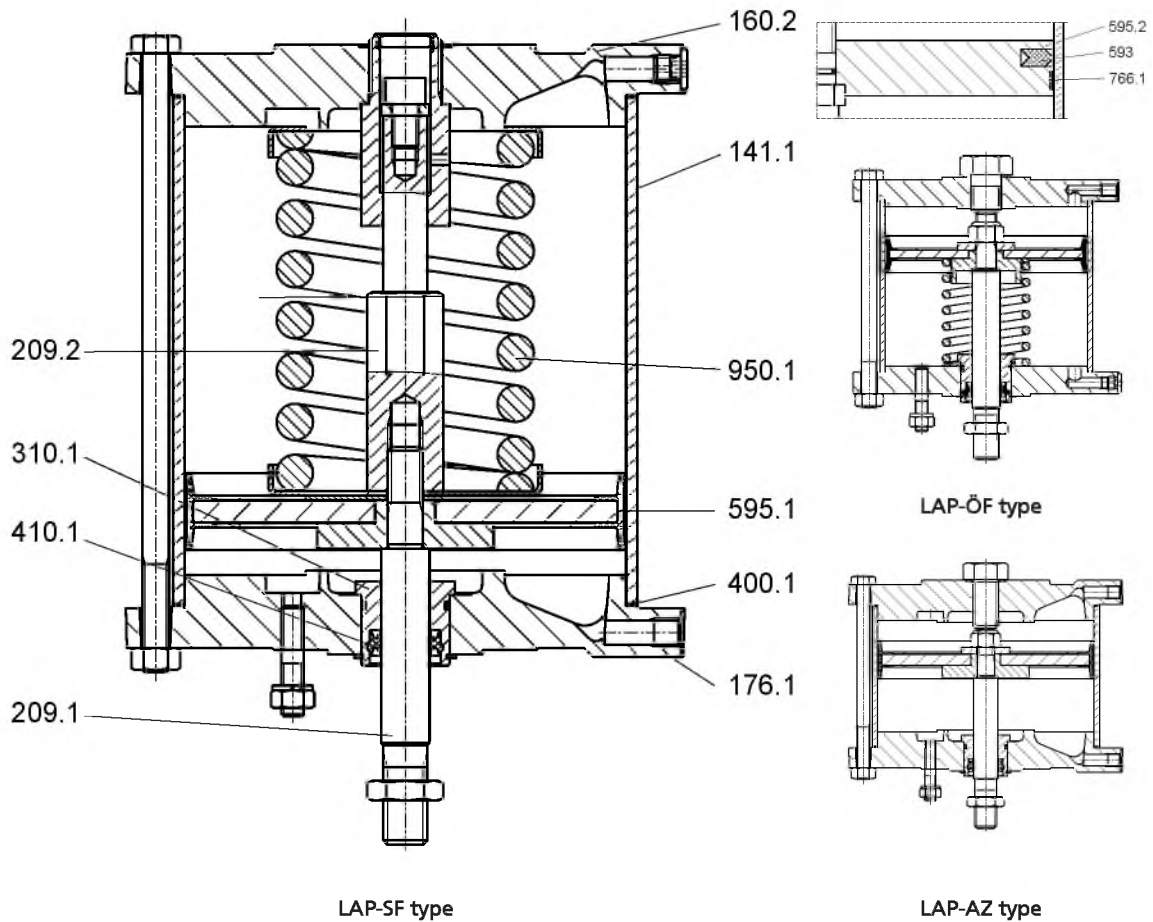
Parts list

Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/galvanised		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	NBR		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
840	Coupling	X14CrMoS17	1.4104	
901.2	Hexagon head bolt	8.8 A2E		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



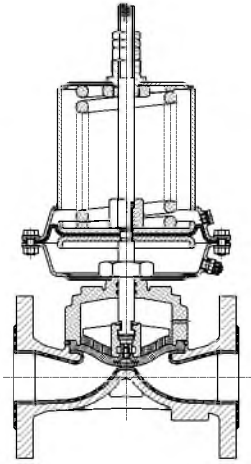
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

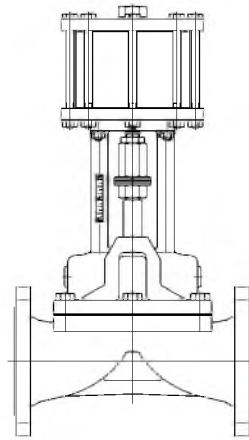
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

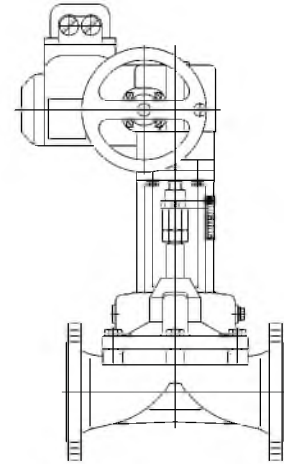
SISTO-16



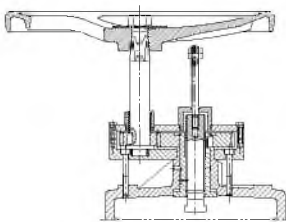
With SISTO-LAD



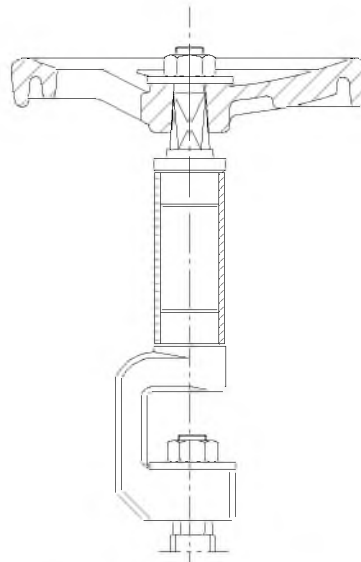
With SISTO-LAP



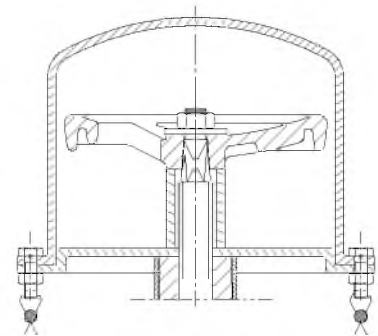
With electric actuator



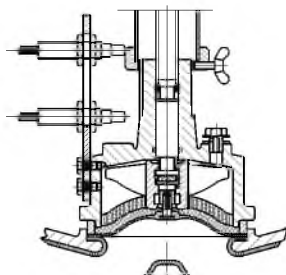
Gearbox



Stem extension



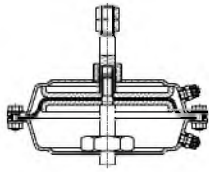
Lead-sealable cap



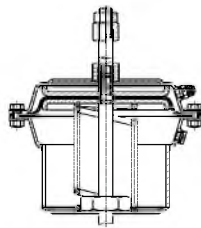
Limit switches, leakage detection
hole,
locking device

Variants

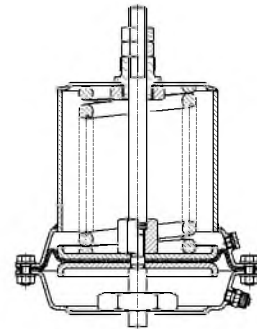
SISTO-LAD diaphragm actuator and accessories



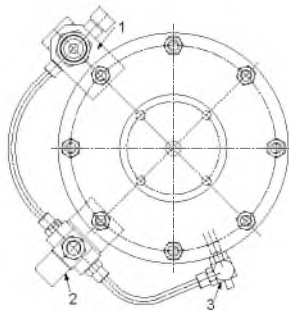
LAD-AZ type



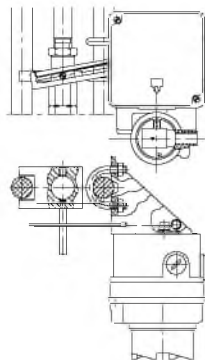
LAD-ÖF type



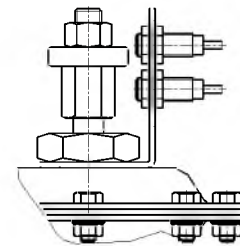
LAD-SF type



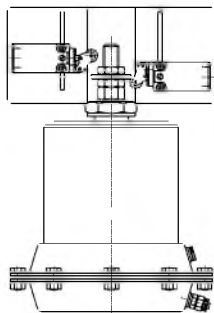
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



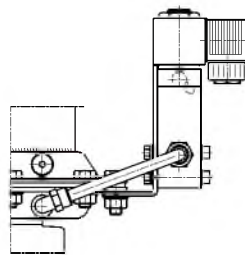
Configuration with positioner



Configuration with proximity sensor



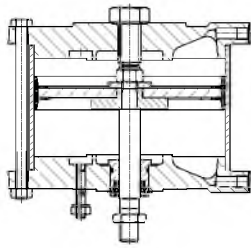
Configuration with mechanical limit switches



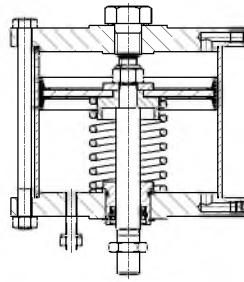
Configuration with solenoid valve

Variants

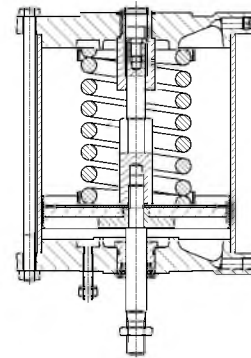
SISTO-LAP piston actuator and accessories



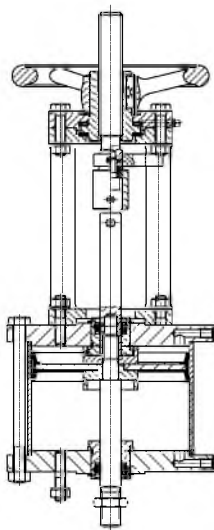
LAP-AZ type



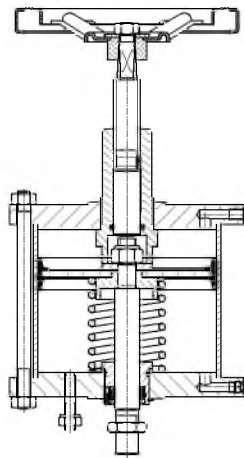
LAP-ÖF type



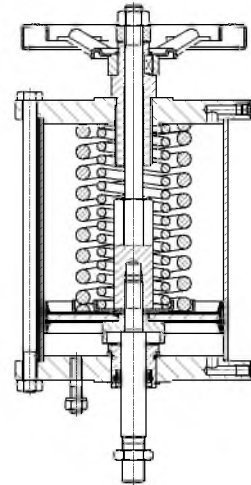
LAP-SF type



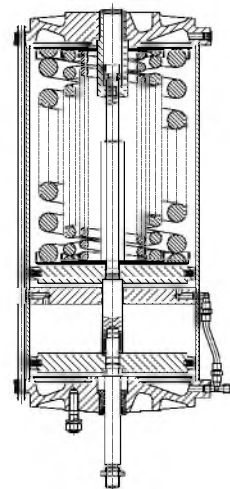
LAP-AZ type
with emergency handwheel



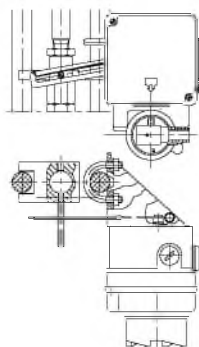
LAP-ÖF type
with emergency handwheel



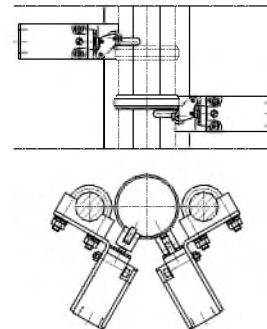
LAP-SF type
with emergency handwheel



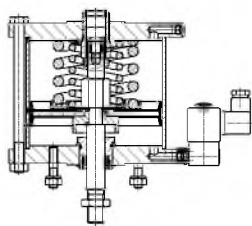
LAP-SF type
Double piston



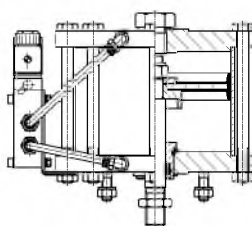
Configuration with
positioner



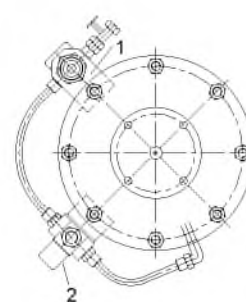
Configuration with position
switches



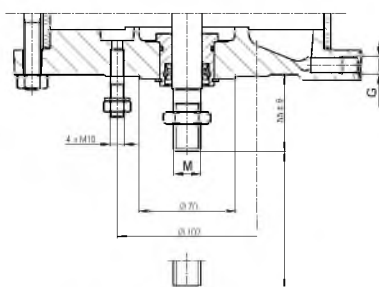
LAP-SF type with 3/2 directional control valve



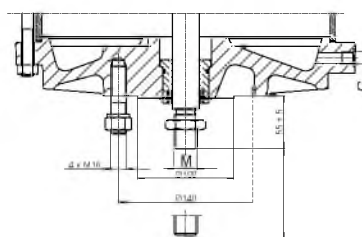
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons DØ 300/F14 (optional)

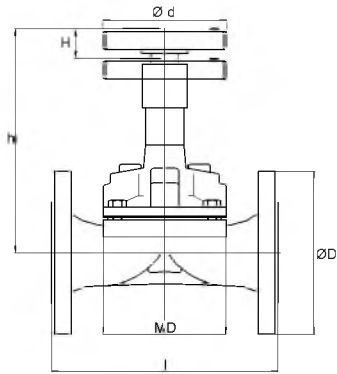
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

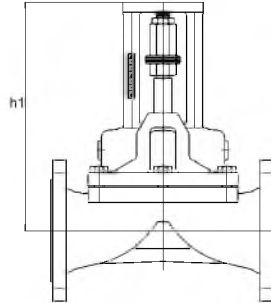
⁹⁾ See "Symbols key" table

Dimensions

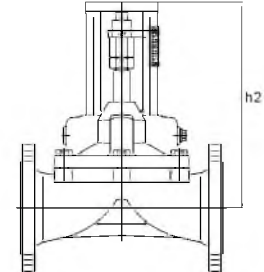
SISTO-16 manually operated valve



Manually operated valve



Prepared for SISTO-LAP



Prepared for electric actuator

Dimensions in mm

DN	Diaphragm (MD)	l	Ø D	H	Manually operated valve				Prepared for actuator		
					h ¹⁰⁾	Ø d	Handwheel turns approx.	[kg]	Centre-to-top height		
									SISTO-LAP h ¹⁰⁾	Electric actuator h ²¹⁰⁾	
				F 07/F 10	F14						
15	40	130	95	8	104	60	3	3,0	On request	On request	-
20	65	150	105	13	150	100	4	3,5	210	210	-
25	65	160	115	13	150	100	4	4,0	210	210	-
32	92	180	140	22	192	100	7	7,0	230	230	-
40	92	200	150	22	192	100	7	7,5	230	230	-
50	115	230	165	30	231	125	8	11,0	250	250	-
65	168	290	185	45	322	200 (250) ¹¹⁾	9	20,5	305	320	-
80	168	310	200	45	322	200 (250) ¹¹⁾	9	23,0	305	320	-
100	202	350	220	60	388	250 (315) ¹¹⁾	12	36,5	355	370	-
125	202	400	250	60	388	250 (315) ¹¹⁾	12	44,0	355	370	-
150	280	480	285	80	512	400 (500) ¹¹⁾	13	80,0	435	460	480
200	280	600	340	80	512	400 (500) ¹¹⁾	13	95,0	435	460	480

Mating dimensions - Standards

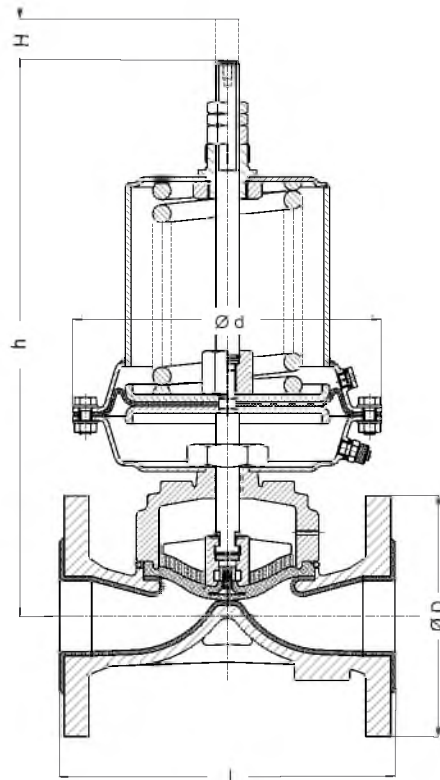
Face-to-face length: EN 558-1 R1
 Flange dimensions: DIN EN 1092-2
 Flange facing: DIN EN 1092-2 type B

¹⁰⁾ Add 5 mm to centre-to-top height for rubber-lined valves

¹¹⁾ On option for operating pressures > 10 bar

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

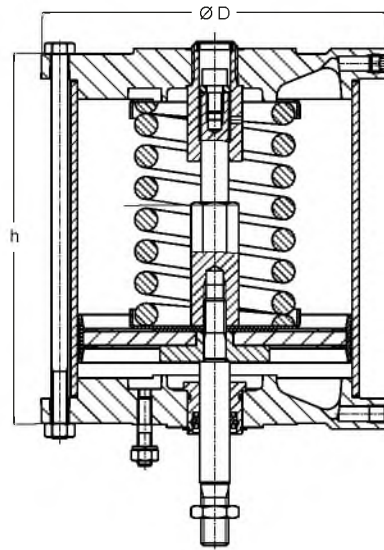
DN	Diaphragm	l	Ø D	H	Ø d			h ¹²⁾¹³⁾			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	40	130	95	8	160	165	225	225	210	-	-	-	-	-	-	-	9,5	-	-
20	65	150	105	13	160	165	225	225	210	205	275	325	-	-	-	-	10,0	12,0	-
25	65	160	115	13	160	165	225	225	210	205	275	325	-	-	-	-	11,0	13,0	-
32	92	180	140	22	160	210	270	270	210	210	280	330	307	350	520	520	12,5	14,5	-
40	92	200	150	22	160	210	270	270	210	210	280	330	307	350	520	520	15,0	17,0	-
50	115	230	165	30	-	-	-	-	210	210	280	330	307	370	540	540	-	20,5	26,5
65	168	290	185	45	-	-	-	-	-	-	-	-	307	430	600	600	-	-	34,0
80	168	310	200	45	-	-	-	-	-	-	-	-	307	430	600	600	-	-	40,0
100	202	350	220	60	-	-	-	-	-	-	-	-	307	530	700	700	-	-	54,0
125	202	400	250	60	-	-	-	-	-	-	-	-	307	530	700	700	-	-	68,0

¹²⁾ Add 5 mm for rubber-lined valves

¹³⁾ Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	30	170	168	11
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	30	255	170	17
LAP-AZ200-F10	45	255	190	17
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	60	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F10	60	355	254	32
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F10	80	355	274	35
LAP-AZ-300-F14	80	355	274	35
LAP-AZ-D250-F14	80	355	424	47
LAP-AZ-D300-F14	80	355	432	61
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-80.101-F10	30	130	151	6
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.101-F10	30	170	151	8
LAP-ÖF-160.102-F10	30	210	188	12
LAP-ÖF-160.102-F10	45	210	208	13
LAP-ÖF-200.102-F10	30	255	210	19
LAP-ÖF-200.102-F10	45	255	210	19
LAP-ÖF-200.001-F10	45	255	310	22
LAP-ÖF-200.001-F10	60	255	330	23
LAP-ÖF-250.002-F10	60	305	380	32
LAP-ÖF-250.002-F10	80	305	400	35

Type	Stroke	Ø D	h	[kg]
LAP-ÖF-250.002-F14	60	305	400	32
LAP-ÖF-250.002-F14	80	305	400	35
LAP-ÖF-300.002-F10	60	355	414	51
LAP-ÖF-300.012-F14	80	355	434	53
LAP-ÖF-D250.012-F14	80	305	504	54
LAP-ÖF-D300.012-F14	80	355	572	74
Actuator function: air-to-open/spring-to-close				
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	60	305	380	42
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.005-F14	80	355	732	99
LAP-SF-D300.345-F14	80	355	732	122

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	16	9	↓	↓	↓
LAD-AZ-150	35	↑	16	11	↓	↓
LAD-AZ-220	56	↑	↑	16	11	6
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	14	7	↓	↓	↓
LAD-ÖF-150.102	35	16	16	9	↓	↓
LAD-ÖF-220.001	56	↑	↑	16	10	5
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	9	4	↓	↓	↓
LAD-SF-150.002	35	16	13	7	↓	↓
LAD-SF-220.003.7	56	↑	↑	16	8	3
LAD-SF-220.004.7S*	56	↑	↑	↑	12	6

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	12	↓	↓	↓	↓
LAD-AZ-150	35	16	16	6	↓	↓
LAD-AZ-220	56	↑	↑	15	6	↓
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	10	↓	↓	↓	↓
LAD-ÖF-150.102	35	16	14	5	↓	↓
LAD-ÖF-220.001	56	↑	16	13	3	↓
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	4	↓	↓	↓	↓
LAD-SF-150.002	35	16	9	3	↓	↓
LAD-SF-220.003.7	56	↑	16	8	↓	↓
LAD-SF-220.004.7S	56	↑	↑	16	7	4

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125	DN 150-200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	12	7	3	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	10	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	5	↓	↓
LAP-AZ-160-F10	30	↑	↑	16	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	9	5	↓
LAP-AZ-200-F10	30/45	↑	↑	↑	15	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	8	3
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	12	6
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	9
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	12
LAP-AZ-D300-F14*	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-OF-80.101-F10	15/30	8	4	2	↓	↓	↓
LAP-OF-125.101-F10	15/30	16	16	8	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	↑	16	8	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	↑	14	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	↑	6	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	16	9	4
LAP-OF-300.002-F10*	60	↑	↑	↑	↑	15	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	7
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	16	10
LAP-OF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	8	↓	↓	↓	↓	↓
LAP-SF-80.001-F10	30	↑	5	2	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	13	6	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	10	4	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	14	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	16	9	↓	↓
LAP-SF-200.003-F10	60/80	↑	↑	↑	↓	4	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	14	↓	↓
LAP-SF-250.004F10/F14	60/80	↑	↑	↑	↓	7	3
LAP-SF-300.034-F10	60	↑	↑	↑	16	11	↓
LAP-SF-300.034-F14*	80	↑	↑	↑	↑	↓	5
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	16	8
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	11

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125	DN 150-200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	10	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	5	↓	↓	↓
LAP-AZ-160-F10	30	↑	↑	10	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	3	↓	↓
LAP-AZ-200-F10	30/45	↑	↑	16	9	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↓	3	↓
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	10	↓
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	5
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	10
LAP-AZ-D300-F14*	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-OF-80.101-F10	15/30	5	↓	↓	↓	↓	↓
LAP-OF-125.101-F10	15/30	16	↓	↓	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	16	8	↓	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	16	↓	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	6	↓	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	12	3	↓
LAP-OF-300.002-F10*	60	↑	↑	↑	16	11	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	2
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	16	8
LAP-OF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	4	↓	↓	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	8	3	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	5	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	7	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	9	3	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	16	8	↓	↓
LAP-SF-300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	↑	5
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	10

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-20

PN16

Maintenance-free

With or without Lining

Flanged Ends

With Handwheel or Actuator

Type Series Booklet



SISTO

Legal information/Copyright

Type Series Booklet SISTO-20

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Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-20



- Service water
- Steam
- River, lake and groundwater
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fuels
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Cleaning agents
- Brine
- Drinking water
- Other fluids on request.

Main applications

- Chemical industry
- Homogenisation
- Industrial recirculation systems
- Nuclear power stations
- Air-conditioning systems
- Paint shops
- Seawater desalination/reverse osmosis
- Mixing
- Paper and cellulose industry
- Petrochemical industry
- Refineries
- Flue gas desulphurisation
- Shipbuilding
- Process engineering
- Heat recovery systems
- Hot-water heating systems
- Water treatment
- Sugar industry

Fluids handled

- Faecal-free waste water
- Aggressive fluids
- Inorganic fluids

Operating data

Characteristic	Standard	Value
Nominal pressure	DIN	PN 16
Nominal size ¹⁾	DIN	DN 15-200
Max. permissible pressure		16 bar
Max. permissible temperature ²⁾		+160 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ³⁾	F14	5,5 - 10
D300 ³⁾	F14	5,5 - 7

¹⁾ From DN 100 we recommend installing a gearbox for operating pressures > 10 bar.

²⁾ The temperatures indicated are for orientation only; they are not valid for all operating conditions.

³⁾ Double piston

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	-20 °C to +160 °C
GX5CrNiMo 19-11-2	1.4408	

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by spiral-supported, completely enclosed diaphragm
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.
Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).
- The valves meet the requirements specified in TA-Luft (German Technical Guidelines on Air Quality Control, VDI 2440).

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body lined with PTFE; temperature limit +160 °C
- Body lined with TFM; temperature limit +160 °C
- Body lined with PTFE, antistatic; temperature limit +160 °C
- Body lined with PFA (DN15 only); temperature limit +160 °C
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Body coated with PA (Rilsan); temperature limit +90 °C⁴⁾
- Leakage detection hole and additional stem seal
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of EPDM/W270; temperature limit +90 °C
- Diaphragm made of EPDM-V (vacuum); temperature limit +140 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C
- Two-piece diaphragm made of TFM/EPDM; temperature limit +160 °C
- Three-piece diaphragm made of TFM/PVDF/EPDM; temperature limit +140 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Overview of variants

DN	Body material	Bonnet material	Lining				Coating	
			None	PTFE/TFM	IIR	NRH	Rilsan	ECTFE (Halar)
15	1.0619	1.0619	-	PFA only	-	-	-	-
15	5.3103	1.0619	x	-	-	-	x	x
15	1.4408	1.0619	x	-	-	-	-	-
20-200	5.3103	5.3103	x	x	x	x	x	x
20-200	1.4408	5.3103	x	x	-	-	-	-

⁴⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Maximum service life and pressure limit**
Maximised diaphragm life and pressure limit thanks to completely enclosed, spiral-supported diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**

Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.

- **Fast checking of valve position**
The valve's position can be easily checked via a clear visual indicator, also visible from a distance.
- **Reliable operation**
The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	4,0	65	141,0
20	11,5	80	195,0
25	14,0	100	304,0
32	35,0	125	298,0
40	43,0	150	601,0
50	72,0	200	478,0

Pressure/temperature ratings

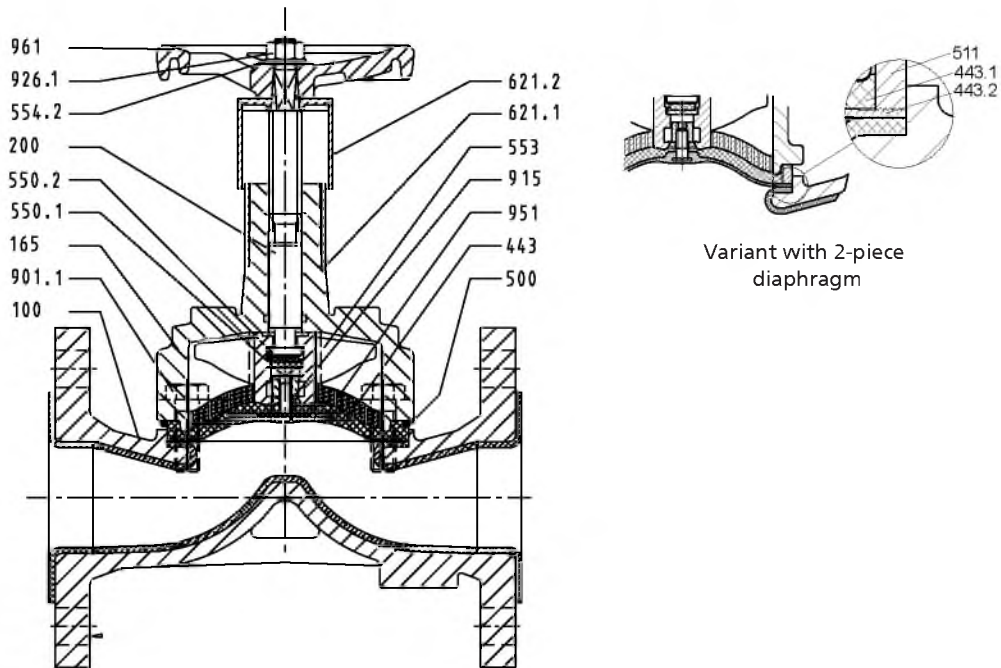
Permissible operating pressures in bar at temperatures in °C⁵⁾

Nominal pressure	Material	-20 to +140	+160
16	5.3103	16	12
	1.4408		
	1.0619		

5) Intermediate temperatures can be derived by linear interpolation.

Materials

SISTO-20 manually operated valve



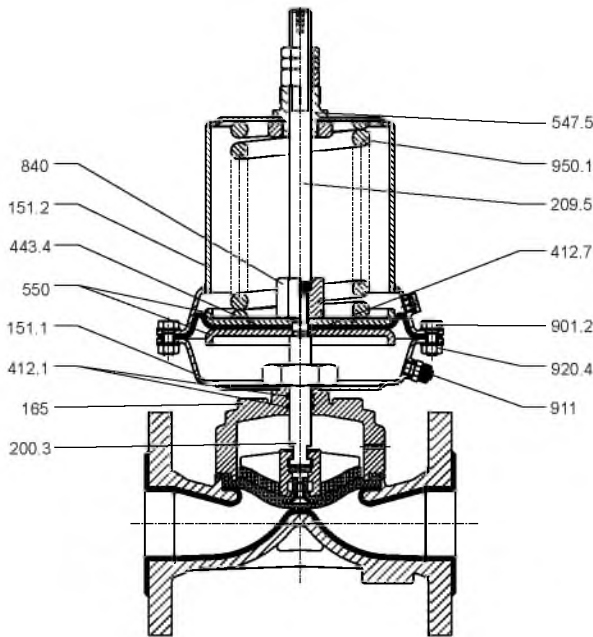
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJS-400-18-LT	5.3103	Standard, DN15 with PFA lining = 1.0619
165	Bonnet	EN-GJS-400-18-LT	5.3103	Standard; DN 15 = 1.0619
200	Stem	X14CrMoS17	1.4104	
443 ⁶⁾	Diaphragm	EPDM		Standard
443.1 ⁶⁾	Backing diaphragm	EPDM		
443.2 ⁶⁾	Diaphragm	TFM		
500	Ring	St 37 / A2E		
511	Backing ring	St 37 / A2E		
550.1	Bearing disc	11SMnPb30	1.0718	For DN 32-200
550.2	PTFE disc	PTFE/graphite		For DN 32-200
553	Compressor	EN-GJS-400-15	5.3106	GD-ZnAl4Cu1 for DN 15-25; DN15 = 1.0619
554.2	Washer	A2		
621.1	Position indicator, lower part	ASA Luran		
621.2	Position indicator, upper part	ASA Luran		
901.1	Hexagon head bolt	A2-70		PTFE/TFM variant: material 8.8
915	Floating nut	11SMnPb30	1.0718	
926.1	Prevailing torque nut	A2-70		
951	Support spiral	St 2K BK		From MD 65
961	Handwheel	EN-GJL-200	5.1300	DN 15 = PC

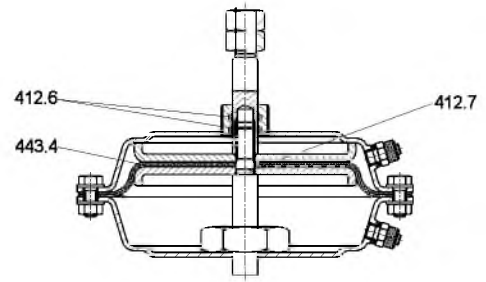
⁶⁾ Recommended spare parts

Materials

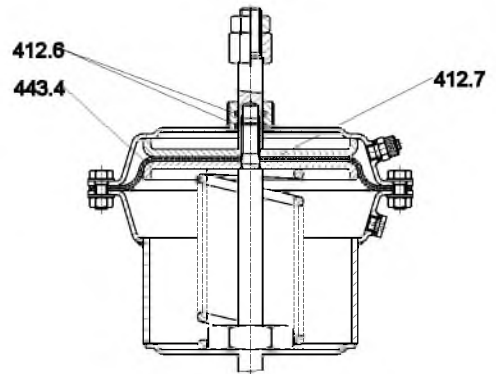
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

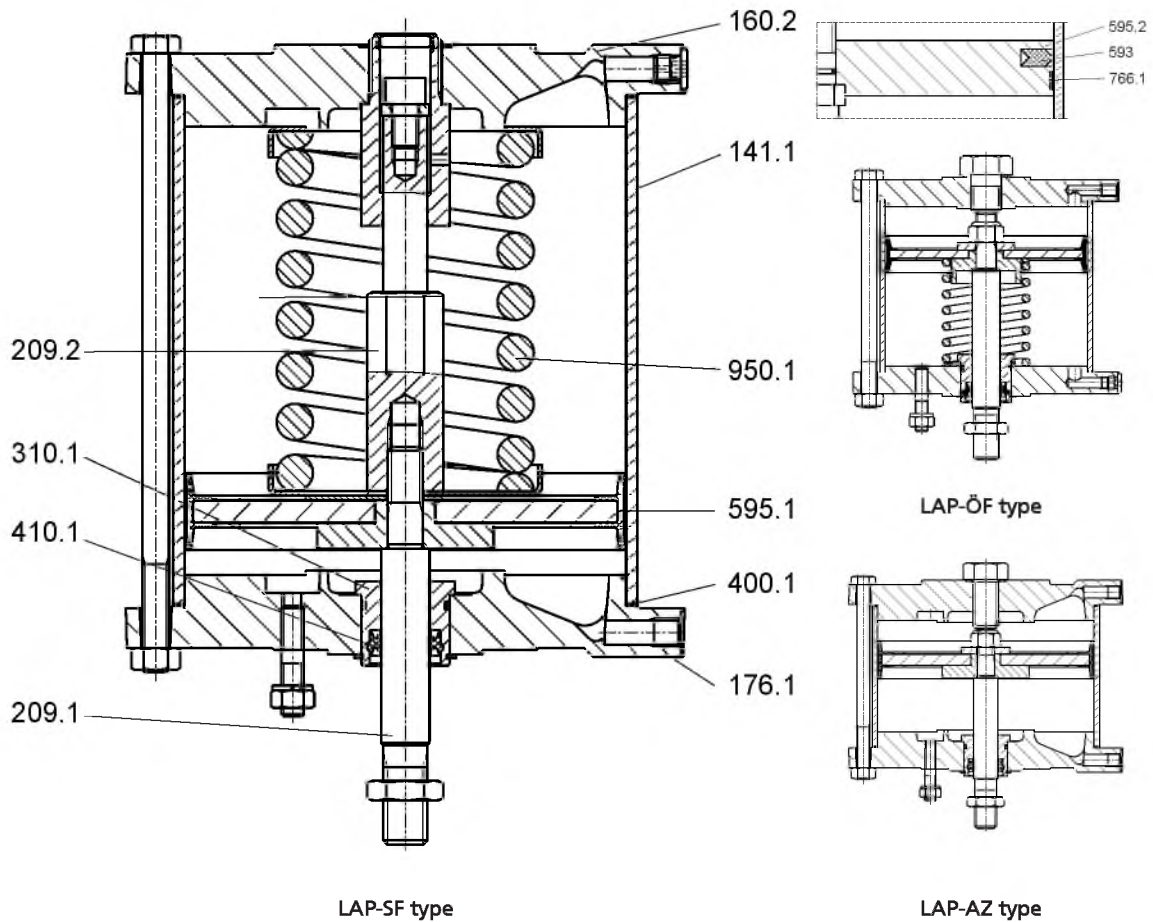
Parts list

Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/galvanised		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	NBR		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
840	Coupling	X14CrMoS17	1.4104	
901.2	Hexagon head bolt	8.8 A2E		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



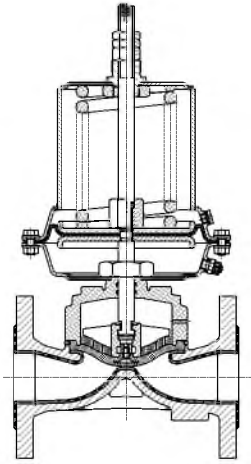
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

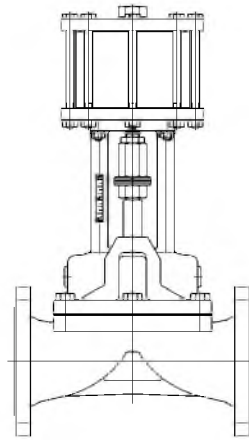
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

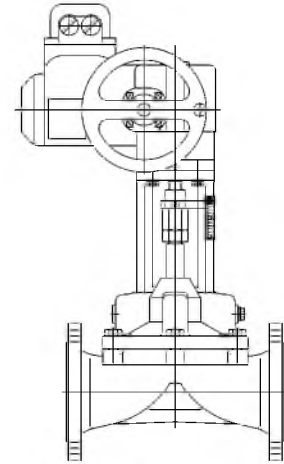
SISTO-20



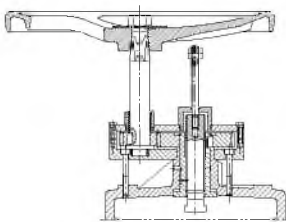
With SISTO-LAD



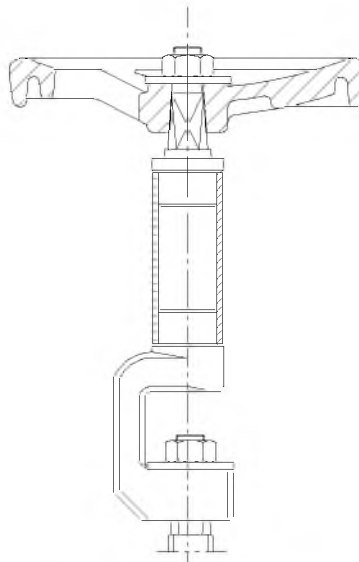
With SISTO-LAP



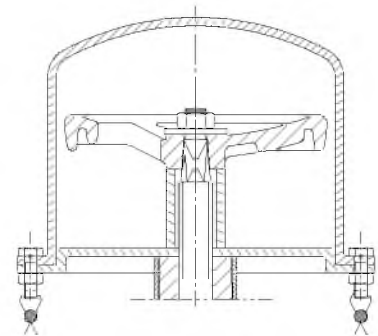
With electric actuator



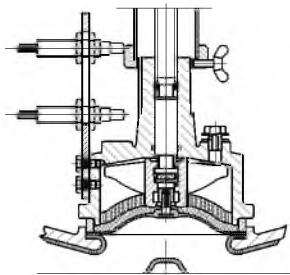
Gearbox



Stem extension



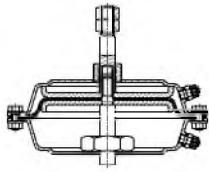
Lead-sealable cap



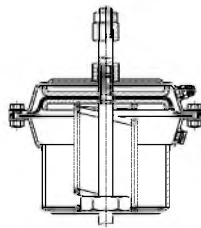
Limit switches, leakage detection
hole,
locking device

Variants

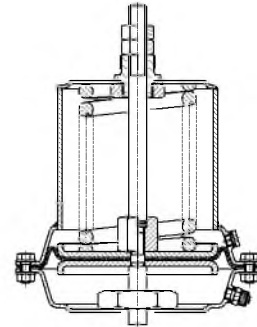
SISTO-LAD diaphragm actuator and accessories



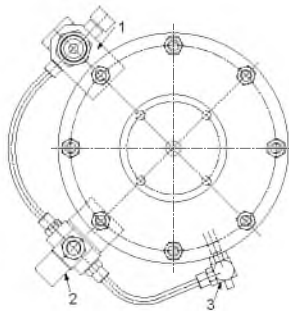
LAD-AZ type



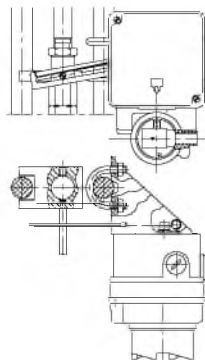
LAD-ÖF type



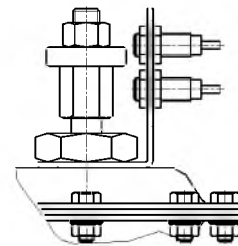
LAD-SF type



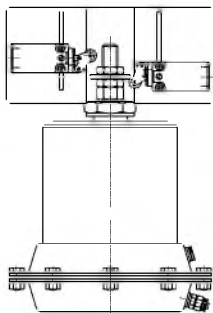
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



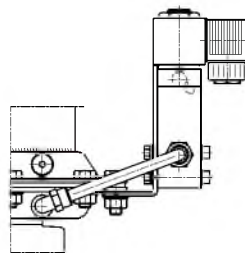
Configuration with positioner



Configuration with proximity sensor



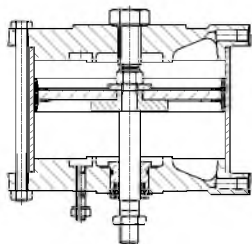
Configuration with mechanical limit switches



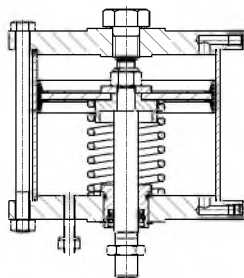
Configuration with solenoid valve

Variants

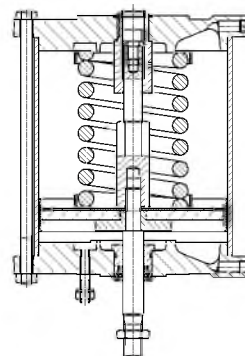
SISTO-LAP piston actuator and accessories



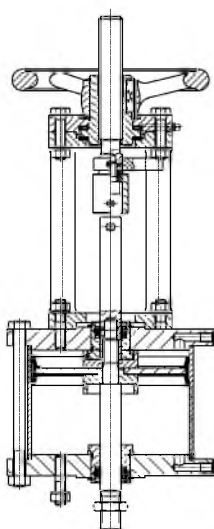
LAP-AZ type



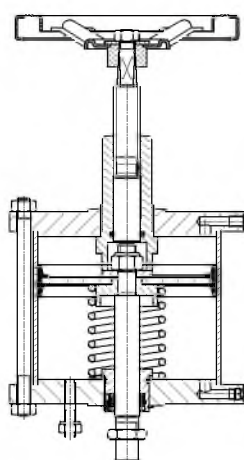
LAP-ÖF type



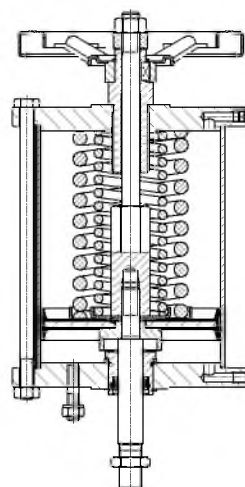
LAP-SF type



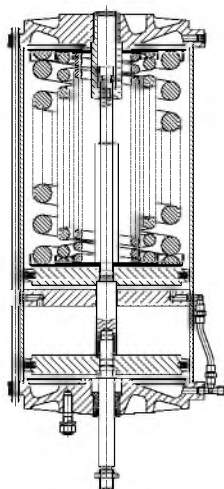
LAP-AZ type
with emergency handwheel



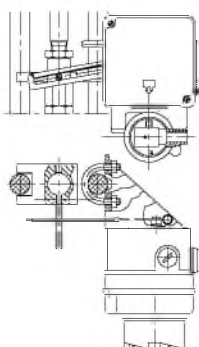
LAP-ÖF type
with emergency handwheel



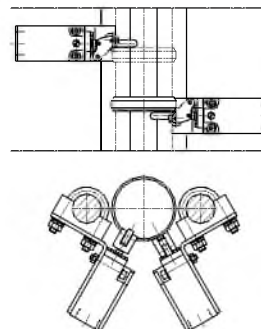
LAP-SF type
with emergency handwheel



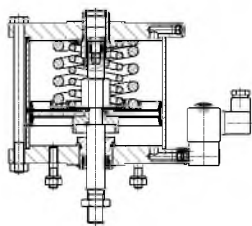
LAP-SF type
Double piston



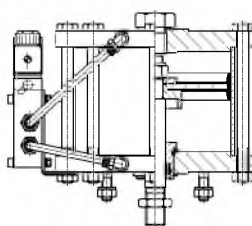
Configuration with
positioner



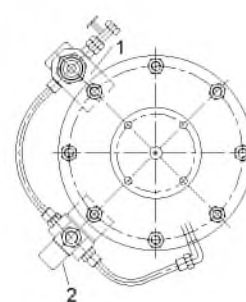
Configuration with position
switches



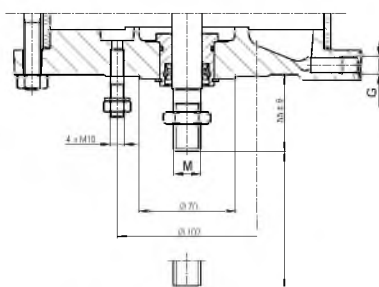
LAP-SF type with 3/2 directional control valve



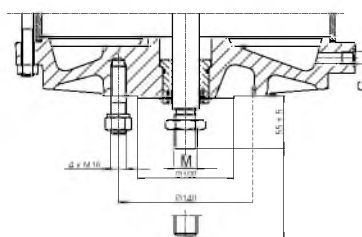
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons Ø 300/F14 (optional)

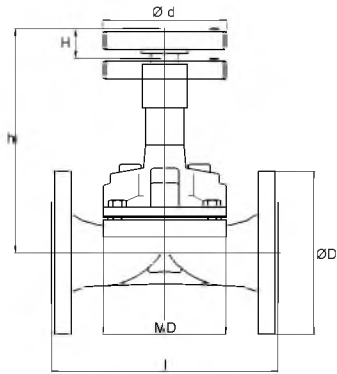
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

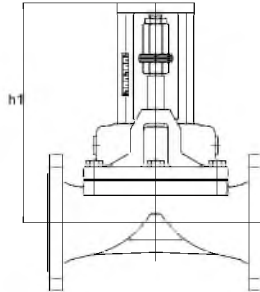
⁹⁾ See "Symbols key" table

Dimensions

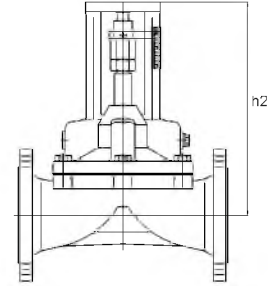
SISTO-20 manually operated valve



Manually operated valve



Prepared for SISTO-LAP



Prepared for electric actuator

Dimensions in mm

DN	Diaphragm (MD)	I	Ø D	H	Manually operated valve				Prepared for actuator		
					h ¹⁰⁾	Ø d	Handwheel turns approx.	[kg]	Centre-to-top height		
									SISTO-LAP h ¹¹⁾	Electric actuator h ^{2 11)}	F 07/F 10	F14
15	40	130	95	8	104	60	3	3,0	On request	On request	-
20	65	150 ¹²⁾	105	13	150	100	4	3,5	210	210	-
25	65	160	115	13	150	100	4	4,0	210	210	-
32	92	180	140	22	192	100	7	7,0	230	230	-
40	92	200	150	22	192	100	7	7,5	230	230	-
50	115	230	165	30	231	125	8	11,0	250	250	-
65	168	290	185	45	322	200 (250) ¹³⁾	9	20,5	305	320	
80	168	310	200	45	322	200 (250) ¹³⁾	9	23,0	305	320	
100	202	350	220	60	388	250 (315) ¹³⁾	12	36,5	355	370	
125	202	400	250	60	388	250 (315) ¹³⁾	12	44,0	355	370	
150	280	480	285	80	512	400 (500) ¹³⁾	13	80,0	435	460	480
200	280	600	340	80	512	400 (500) ¹³⁾	13	95,0	435	460	480

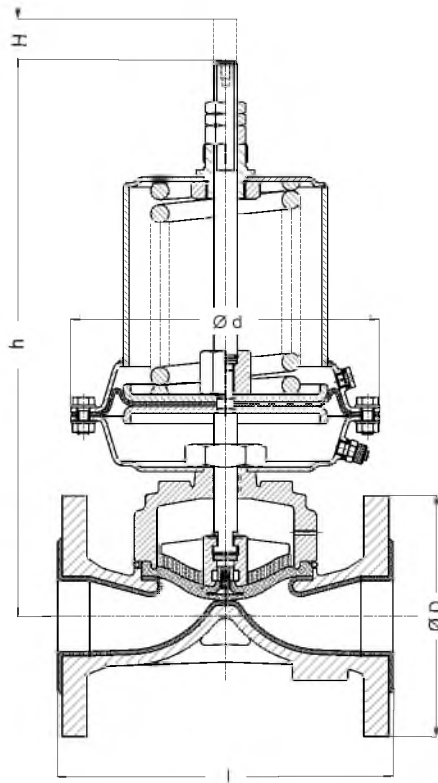
Mating dimensions - Standards

Face-to-face length: EN 558-1 R1
 Flange dimensions: DIN EN 1092-2
 DIN EN 1092-1
 Flange facing: DIN EN 1092-2 type B
 DIN EN 1092-1 type B

¹⁰⁾ Add 5 mm to centre-to-top height for rubber-lined valves
¹¹⁾ Add 5 mm to centre-to-top height for rubber-lined valves
¹²⁾ For PTFE-lined stainless steel variant: face-to-face length 160
¹³⁾ On option for operating pressures > 10 bar

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

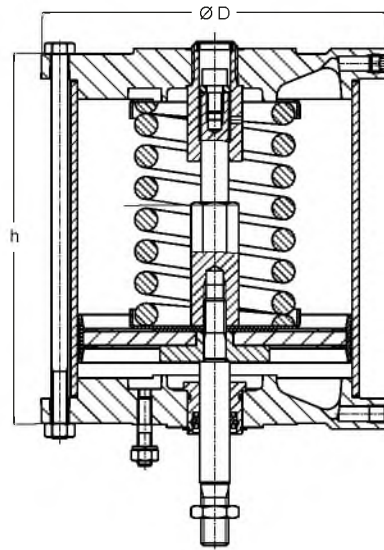
DN	Diaphragm	l	Ø D	H	Ø d			h ¹⁴⁾¹⁵⁾			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	40	130	95	8	160	165	225	225	210	-	-	-	-	-	-	-	9,5	-	-
20	65	150	105	13	160	165	225	225	210	205	275	325	-	-	-	-	10,0	12,0	-
25	65	160	115	13	160	165	225	225	210	205	275	325	-	-	-	-	11,0	13,0	-
32	92	180	140	22	160	210	270	270	210	210	280	330	307	350	520	520	12,5	14,5	-
40	92	200	150	22	160	210	270	270	210	210	280	330	307	350	520	520	15,0	17,0	-
50	115	230	165	30	-	-	-	-	210	210	280	330	307	370	540	540	-	20,5	26,5
65	168	290	185	45	-	-	-	-	-	-	-	-	307	430	600	600	-	-	34,0
80	168	310	200	45	-	-	-	-	-	-	-	-	307	430	600	600	-	-	40,0
100	202	350	220	60	-	-	-	-	-	-	-	-	307	530	700	700	-	-	54,0
125	202	400	250	60	-	-	-	-	-	-	-	-	307	530	700	700	-	-	68,0

¹⁴⁾ Add 5 mm for rubber-lined valves

¹⁵⁾ Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	$\varnothing D$	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	30	170	168	11
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	30	255	170	17
LAP-AZ200-F10	45	255	190	17
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	60	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F10	60	355	254	32
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F10	80	355	274	35
LAP-AZ-300-F14	80	355	274	35
LAP-AZ-D250-F14	80	355	424	47
LAP-AZ-D300-F14	80	355	432	61
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-80.101-F10	30	130	151	6
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.101-F10	30	170	151	8
LAP-ÖF-160.102-F10	30	210	188	12
LAP-ÖF-160.102-F10	45	210	208	13
LAP-ÖF-200.102-F10	30	255	210	19
LAP-ÖF-200.102-F10	45	255	210	19
LAP-ÖF-200.001-F10	45	255	310	22
LAP-ÖF-200.001-F10	60	255	330	23
LAP-ÖF-250.002-F10	60	305	380	32
LAP-ÖF-250.002-F10	80	305	400	35

Type	Stroke	Ø D	h	[kg]
LAP-ÖF-250.002-F14	60	305	400	32
LAP-ÖF-250.002-F14	80	305	400	35
LAP-ÖF-300.002-F10	60	355	414	51
LAP-ÖF-300.012-F14	80	355	434	53
LAP-ÖF-D250.012-F14	80	305	504	54
LAP-ÖF-D300.012-F14	80	355	572	74
Actuator function: air-to-open/spring-to-close				
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	60	305	380	42
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.005-F14	80	355	732	99
LAP-SF-D300.345-F14	80	355	732	122

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	16	9	↓	↓	↓
LAD-AZ-150	35	↑	16	11	↓	↓
LAD-AZ-220	56	↑	↑	16	11	6
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	14	7	↓	↓	↓
LAD-ÖF-150.102	35	16	16	9	↓	↓
LAD-ÖF-220.001	56	↑	↑	16	10	5
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	9	4	↓	↓	↓
LAD-SF-150.002	35	16	13	7	↓	↓
LAD-SF-220.003.7	56	↑	↑	16	8	3
LAD-SF-220.004.7S*	56	↑	↑	↑	12	6

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	12	↓	↓	↓	↓
LAD-AZ-150	35	16	16	6	↓	↓
LAD-AZ-220	56	↑	↑	15	6	↓
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	10	↓	↓	↓	↓
LAD-ÖF-150.102	35	16	14	5	↓	↓
LAD-ÖF-220.001	56	↑	16	13	3	↓
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	4	↓	↓	↓	↓
LAD-SF-150.002	35	16	9	3	↓	↓
LAD-SF-220.003.7	56	↑	16	8	↓	↓
LAD-SF-220.004.7S	56	↑	↑	16	7	4

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125	DN 150-200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	12	7	3	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	10	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	5	↓	↓
LAP-AZ-160-F10	30	↑	↑	16	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	9	5	↓
LAP-AZ-200-F10	30/45	↑	↑	↑	15	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	8	3
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	12	6
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	9
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	12
LAP-AZ-D300-F14*	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-OF-80.101-F10	15/30	8	4	2	↓	↓	↓
LAP-OF-125.101-F10	15/30	16	16	8	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	↑	16	8	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	↑	14	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	↑	6	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	16	9	4
LAP-OF-300.002-F10*	60	↑	↑	↑	↑	15	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	7
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	16	10
LAP-OF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	8	↓	↓	↓	↓	↓
LAP-SF-80.001-F10	30	↑	5	2	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	13	6	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	10	4	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	14	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	16	9	↓	↓
LAP-SF-200.003-F10	60/80	↑	↑	↑	↓	4	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	14	↓	↓
LAP-SF-250.004F10/F14	60/80	↑	↑	↑	↓	7	3
LAP-SF-300.034-F10	60	↑	↑	↑	16	11	↓
LAP-SF-300.034-F14*	80	↑	↑	↑	↑	↓	5
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	16	8
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	11

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65-80	DN 100-125	DN 150-200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	10	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	5	↓	↓	↓
LAP-AZ-160-F10	30	↑	↑	10	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	3	↓	↓
LAP-AZ-200-F10	30/45	↑	↑	16	9	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↓	3	↓
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	10	↓
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	5
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	10
LAP-AZ-D300-F14*	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-ÖF-80.101-F10	15/30	5	↓	↓	↓	↓	↓
LAP-ÖF-125.101-F10	15/30	16	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	30/45	↑	16	8	↓	↓	↓
LAP-ÖF-200.102-F10	30/45	↑	↑	16	↓	↓	↓
LAP-ÖF-200.001-F10	45/60	↑	↑	↑	6	↓	↓
LAP-ÖF-250.002-F10/F14	60/80	↑	↑	↑	12	3	↓
LAP-ÖF-300.002-F10*	60	↑	↑	↑	16	11	↓
LAP-ÖF-300.012-F14	80	↑	↑	↑	↑	↑	2
LAP-ÖF-D250.012-F14	80	↑	↑	↑	↑	16	8
LAP-ÖF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	4	↓	↓	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	8	3	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	5	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	7	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	9	3	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	16	8	↓	↓
LAP-SF-300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	↑	5
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	10

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-16S

PN16
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-16S



- Service water
- Steam
- River, lake and groundwater
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fuels
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Cleaning agents
- Brine
- Drinking water
- Other fluids on request.

Main applications

- Chemical industry
- Homogenisation
- Industrial recirculation systems
- Nuclear power stations
- Air-conditioning systems
- Paint shops
- Seawater desalination/reverse osmosis
- Mixing
- Paper and cellulose industry
- Petrochemical industry
- Refineries
- Flue gas desulphurisation
- Shipbuilding
- Process engineering
- Heat recovery systems
- Hot-water heating systems
- Water treatment
- Sugar industry

Fluids handled

- Faecal-free waste water
- Aggressive fluids
- Inorganic fluids

Operating data

Characteristic	Value
Nominal pressure	PN 16
Nominal size ¹⁾	DN 15-200
Max. permissible pressure	16 bar
Max. permissible temperature ²⁾	+160 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ³⁾	F14	5,5 - 10
D300 ³⁾	F14	5,5 - 7

1) From DN 100 we recommend installing a gearbox for operating pressures > 10 bar.

2) The temperatures indicated are for orientation only; they are not valid for all operating conditions.

3) Double piston

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Body materials

Overview of available materials

Material	Material number	Temperature limit ²⁾
EN-GJS-400-18-LT	5.3103	-20 °C to +160 °C

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by spiral-supported, completely enclosed diaphragm
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).

- The valves meet the requirements specified in TA-Luft (German Technical Guidelines on Air Quality Control, VDI 2440).

- Limit switches
- Locking device
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body lined with PTFE; temperature limit +160 °C
- Body lined with TFM; temperature limit +160 °C
- Body lined with PTFE, antistatic; temperature limit +160 °C
- Body lined with PFA (DN15 only); temperature limit +160 °C
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Body coated with PA (Rilsan); temperature limit +90 °C⁴⁾
- Leakage detection hole and additional stem seal
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of EPDM/W270; temperature limit +90 °C
- Diaphragm made of EPDM-V (vacuum); temperature limit +140 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C
- Two-piece diaphragm made of TFM/EPDM; temperature limit +160 °C
- Three-piece diaphragm made of TFM/PVDF/EPDM; temperature limit +140 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Variants

- Actuator (electric or pneumatic)

Overview of variants

DN	Body material	Bonnet material	Lining				Coating	
			None	PTFE/TFM	IIR	NRH	Rilsan	ECTFE (Halar)
15	1.0619	1.0619	-	PFA only	-	-	-	-
20-200	5.3103	5.3103	x	x	x	x	x	x

⁴⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Maximum service life and pressure limit**
Maximised diaphragm life and pressure limit thanks to completely enclosed, spiral-supported diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**

Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.

- **Fast checking of valve position**
The valve's position can be easily checked via a clear visual indicator, also visible from a distance.
- **Reliable operation**
The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	4,0	80	195,0
20	11,5	100	304,0
25	14,0	125	298,0
40	43,0	150	601,0
50	72,0	200	478,0
65	141,0		

Pressure/temperature ratings

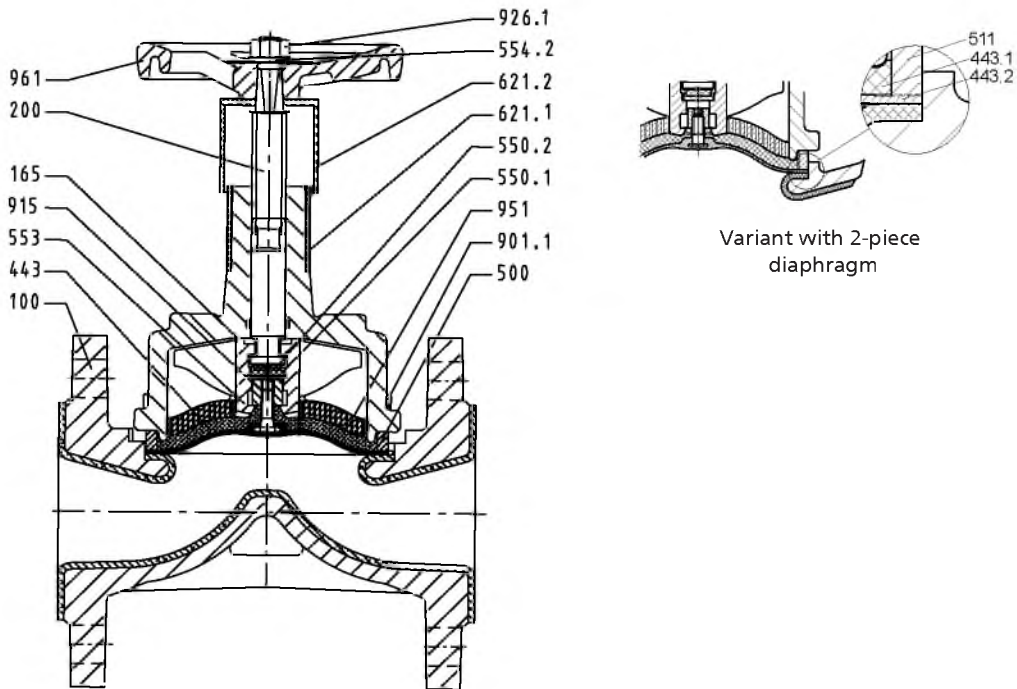
Permissible operating pressures in bar at temperatures in °C⁵⁾

Nominal pressure	Material	-20 to +140	+160
16	5.3103	16	12
	1.0619		

5) Intermediate temperatures can be derived by linear interpolation.

Materials

SISTO16S manually operated valve



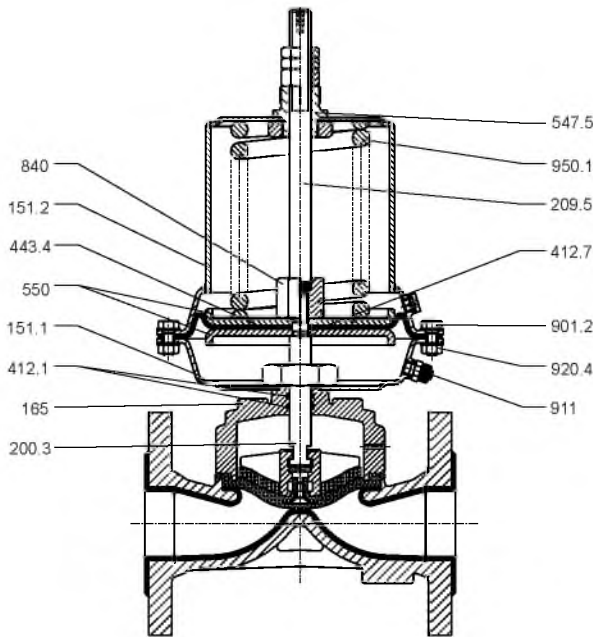
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJS-400-18-LT	5.3103	Standard/DN 15 = 1.0619 with PFA lining
165	Bonnet	EN-GJS-400-18-LT	5.3103	Standard; DN 15 = 1.0619
200	Stem	X14CrMoS17	1.4104	
443 ⁶⁾	Diaphragm	EPDM		Standard
443.1 ⁶⁾	Backing diaphragm	EPDM		
443.2 ⁶⁾	Diaphragm	TFM		
500	Ring	St 37 /A2E		
511	Backing ring	St 37 /A2E		
550.1	Bearing disc	11SMnPb30	1.0718	For DN 40-200
550.2	PTFE disc	PTFE/graphite		For DN 40-200
553	Compressor	EN-GJS-400-15	5.3106	GD-ZnAl4Cu1 for DN 20-32
554.2	Washer	A2		
621.1	Position indicator, lower part	ASA Luran		
621.2	Position indicator, upper part	ASA Luran		
901.1	Hexagon head bolt	A2-70		PTFE/TFM variant: material 8.8
915	Floating nut	11SMnPb30	1.0718	
926.1	Prevailing torque nut	A2-70		
951	Support spiral	St 2K BK		From MD 65
961	Handwheel	EN-GJL-200	5.1300	DN 15 = PC

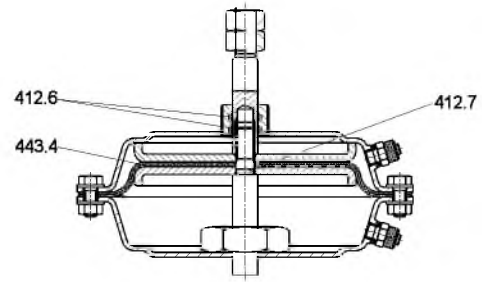
⁶⁾ Recommended spare parts

Materials

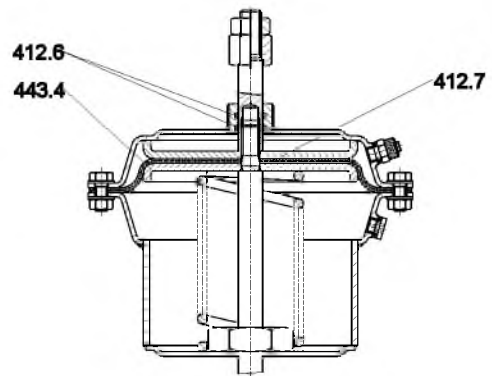
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

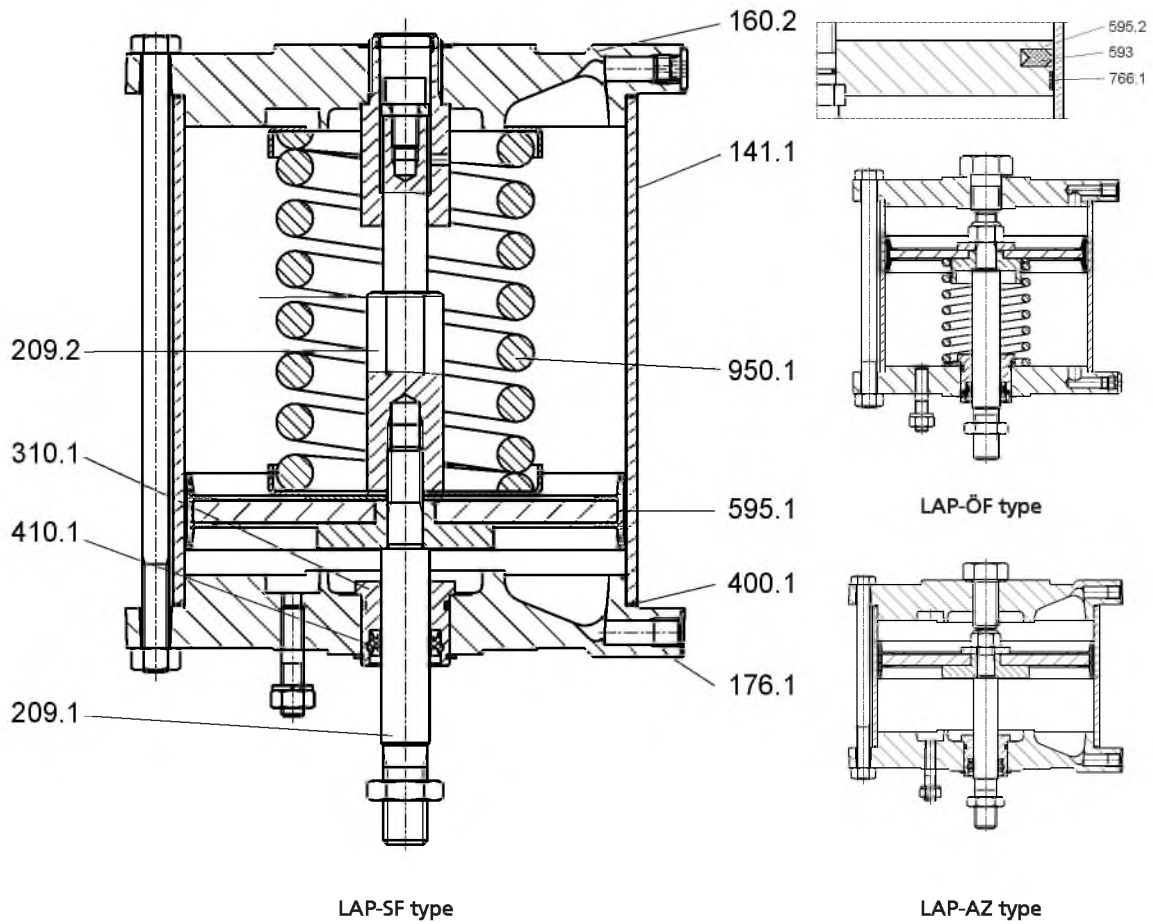
Parts list

Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/galvanised		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	NBR		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
840	Coupling	X14CrMoS17	1.4104	
901.2	Hexagon head bolt	8.8 A2E		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



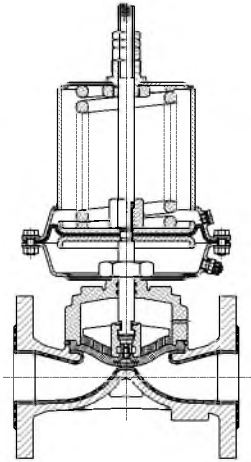
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

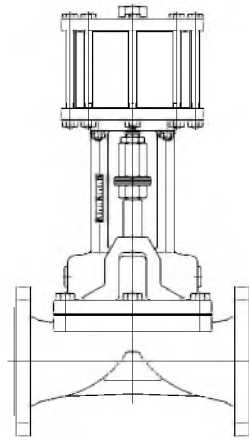
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

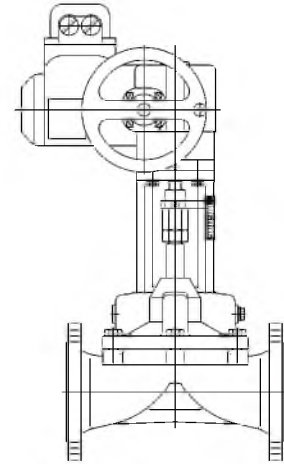
SISTO-16S



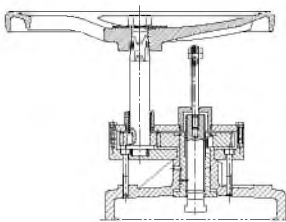
With SISTO-LAD



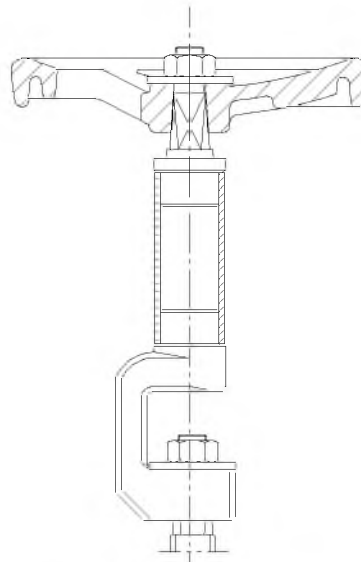
With SISTO-LAP



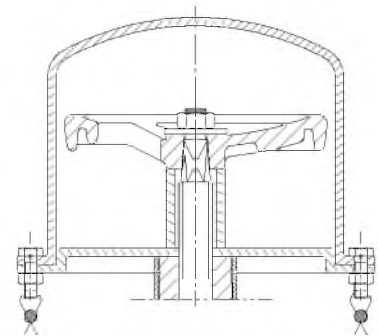
With electric actuator



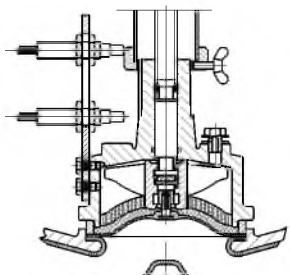
Gearbox



Stem extension



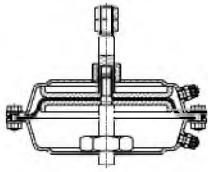
Lead-sealable cap



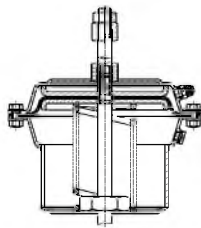
Limit switches, leakage detection
hole,
locking device

Variants

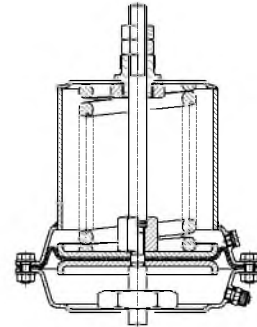
SISTO-LAD diaphragm actuator and accessories



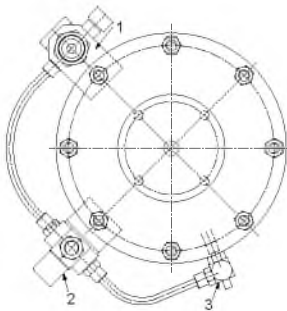
LAD-AZ type



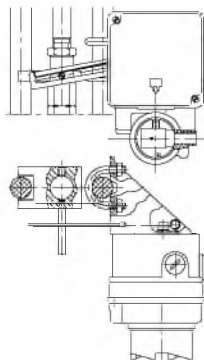
LAD-ÖF type



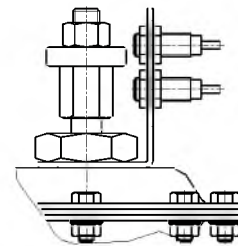
LAD-SF type



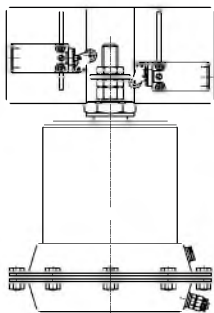
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



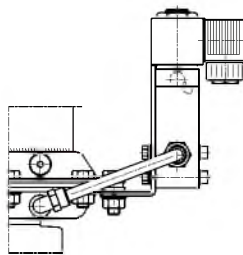
Configuration with positioner



Configuration with proximity sensor



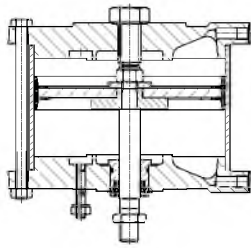
Configuration with mechanical limit switches



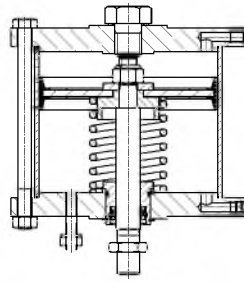
Configuration with solenoid valve

Variants

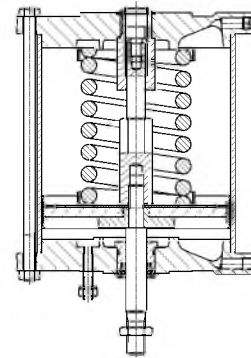
SISTO-LAP piston actuator and accessories



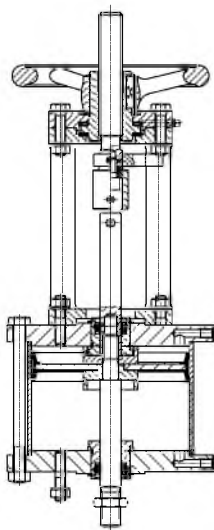
LAP-AZ type



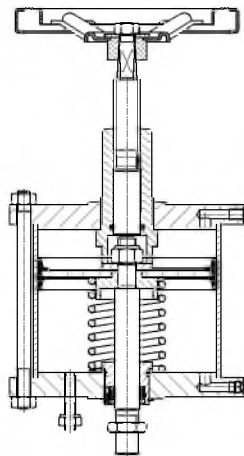
LAP-ÖF type



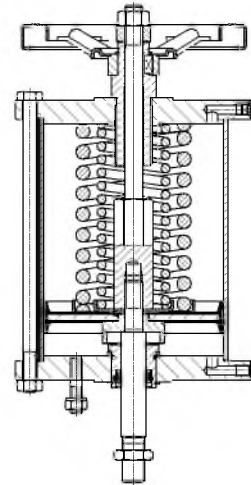
LAP-SF type



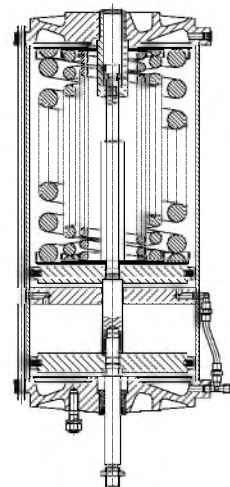
LAP-AZ type
with emergency handwheel



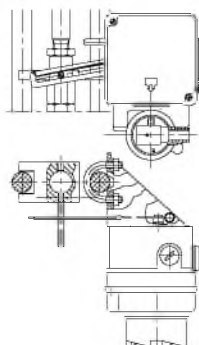
LAP-ÖF type
with emergency handwheel



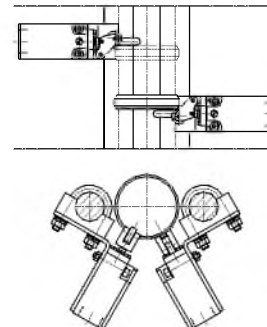
LAP-SF type
with emergency handwheel



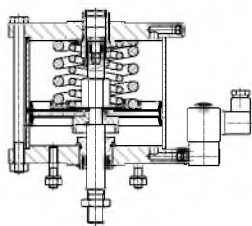
LAP-SF type
Double piston



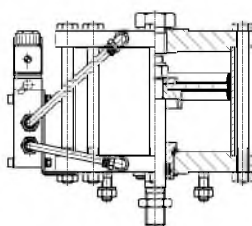
Configuration with
positioner



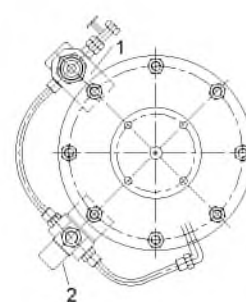
Configuration with position
switches



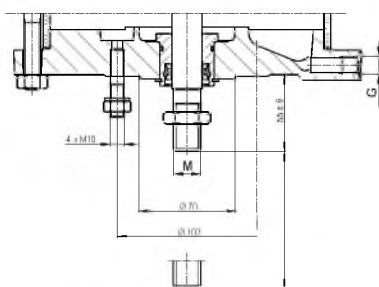
LAP-SF type with 3/2 directional control valve



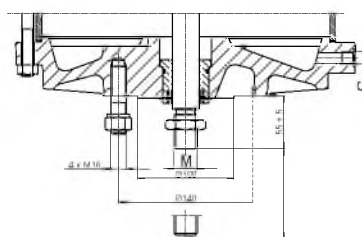
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons DØ 300/F14 (optional)

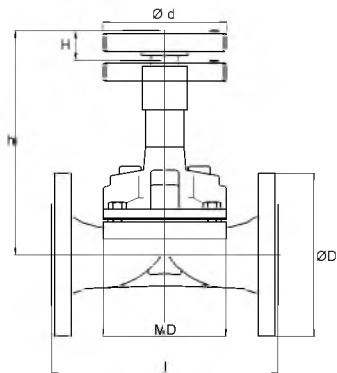
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

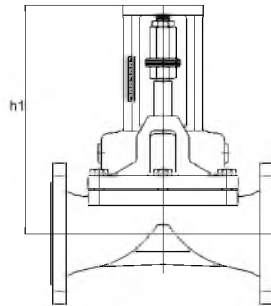
⁹⁾ See "Symbols key" table

Dimensions

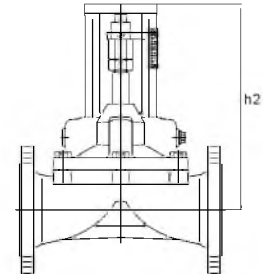
SISTO16S manually operated valve



Manually operated valve



Prepared for SISTO-LAP



Prepared for electric actuator

Dimensions in mm

DN	Diaphragm (MD)	l ⁽¹⁰⁾	Ø D	H	Manually operated valve				Prepared for actuator		
					h ⁽¹¹⁾	Ø d	Handwheel turns approx.	[kg]	Centre-to-top height		
									SISTO-LAP h ⁽¹¹⁾	Electric actuator h ⁽¹¹⁾	
				F 07/F 10	F14						
15 ⁽¹²⁾	40	108	95	8	104	60	3	3,0	On request	On request	-
20	65	117	105	13	150	100	4	3,4	210	210	-
25	65	127	115	13	150	100	4	3,8	210	210	-
40	92	159	150	22	192	100	7	7,0	230	230	-
50	115	190	165	30	231	125	8	10,5	250	250	-
65	115	216	185	30	231	125	8	12,5	250	250	-
80	168	254	200	45	322	200 (250) ⁽¹³⁾	9	21,5	305	320	
100	202	305	220	60	388	250 (315) ⁽¹³⁾	12	35,0	355	370	
125	202	356	250	60	388	250 (315) ⁽¹³⁾	12	40,0	355	370	
150	280	406	285	80	512	400 (500) ⁽¹³⁾	13	72,0	435	460	480
200	280	521	340	80	512	400 (500) ⁽¹³⁾	13	90,0	435	460	480

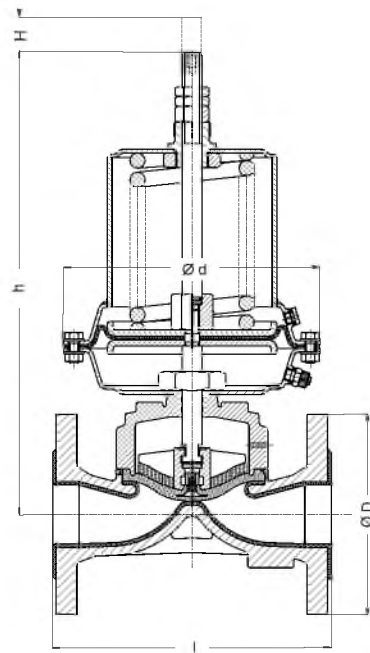
Mating dimensions - Standards

Face-to-face length: EN 558-1 R7
 Flange dimensions: DIN EN 1092-2
 ASME B 16.5 - 2013 Cl. 150
 Flange facing: DIN EN 1092-2 type B

¹⁰⁾ Add 6 mm to face-to-face length for rubber-lined and PTFE/TFM-lined valves
¹¹⁾ Add 5 mm to centre-to-top height for rubber-lined valves
¹²⁾ With PFA lining only
¹³⁾ On option for operating pressures > 10 bar

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

DN	Diaphragm	l ¹⁴⁾	Ø D	H	Ø d			h ¹⁵⁾¹⁶⁾			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	40	108	95	8	160	165	225	225	-	-	-	-	-	-	-	-	9,5	-	-
20	65	117	105	9	160	165	225	225	210	205	275	325	-	-	-	-	10,0	12,0	-
25	65	127	115	21	160	165	225	225	210	205	275	325	-	-	-	-	11,0	13,0	-
40	92	159	150	21	160	210	270	270	210	210	280	330	307	350	520	520	15,0	17,0	-
50	115	190	165	33	-	-	-	-	210	210	280	330	307	370	540	540	-	20,5	26,5
65	115	216	185	45	-	-	-	-	210	-	-	-	307	430	600	600	-	-	34,0
80	168	254	200	46	-	-	-	-	-	-	-	-	307	430	600	600	-	-	40,0
100	202	305	220	59	-	-	-	-	-	-	-	-	307	530	700	700	-	-	54,0
125	202	356	250	73	-	-	-	-	-	-	-	-	307	530	700	700	-	-	68,0

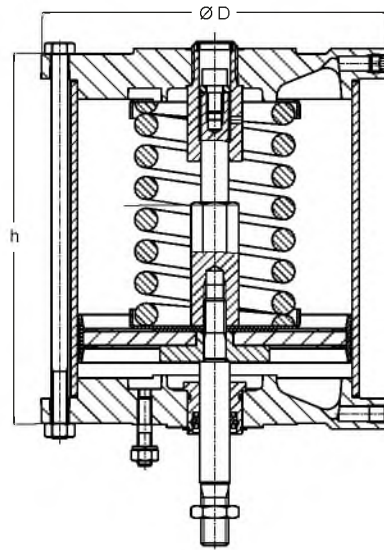
14) Add 6 mm for rubber-lined and PTFE/TFM-lined valves

15) Add 5 mm for rubber-lined valves

16) Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	$\varnothing D$	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	30	170	168	11
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	30	255	170	17
LAP-AZ200-F10	45	255	190	17
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	60	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F10	60	355	254	32
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F10	80	355	274	35
LAP-AZ-300-F14	80	355	274	35
LAP-AZ-D250-F14	80	355	424	47
LAP-AZ-D300-F14	80	355	432	61
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-80.101-F10	30	130	151	6
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.101-F10	30	170	151	8
LAP-ÖF-160.102-F10	30	210	188	12
LAP-ÖF-160.102-F10	45	210	208	13
LAP-ÖF-200.102-F10	30	255	210	19
LAP-ÖF-200.102-F10	45	255	210	19
LAP-ÖF-200.001-F10	45	255	310	22
LAP-ÖF-200.001-F10	60	255	330	23
LAP-ÖF-250.002-F10	60	305	380	32
LAP-ÖF-250.002-F10	80	305	400	35

Type	Stroke	Ø D	h	[kg]
LAP-ÖF-250.002-F14	60	305	400	32
LAP-ÖF-250.002-F14	80	305	400	35
LAP-ÖF-300.002-F10	60	355	414	51
LAP-ÖF-300.012-F14	80	355	434	53
LAP-ÖF-D250.012-F14	80	305	504	54
LAP-ÖF-D300.012-F14	80	355	572	74
Actuator function: air-to-open/spring-to-close				
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	60	305	380	42
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.005-F14	80	355	732	99
LAP-SF-D300.345-F14	80	355	732	122

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 20/25	DN 40	DN 50/65	DN 80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	16	9	↓	↓	↓
LAD-AZ-150	35	↑	16	11	↓	↓
LAD-AZ-220	56	↑	↑	16	11	6
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	14	7	↓	↓	↓
LAD-ÖF-150.102	35	16	16	9	↓	↓
LAD-ÖF-220.001	56	↑	↑	16	10	5
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	9	4	↓	↓	↓
LAD-SF-150.002	35	16	13	7	↓	↓
LAD-SF-220.003.7	56	↑	↑	16	8	3
LAD-SF-220.004.7S*	56	↑	↑	↑	12	6

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 20/25	DN 40	DN 50/65	DN 80	DN 100-125
Actuator function: air-to-open/air-to-close						
LAD-AZ-100	20	12	↓	↓	↓	↓
LAD-AZ-150	35	16	16	6	↓	↓
LAD-AZ-220	56	↑	↑	15	6	↓
Actuator function: spring-to-open/air-to-close						
LAD-ÖF-100.014	20	10	↓	↓	↓	↓
LAD-ÖF-150.102	35	16	14	5	↓	↓
LAD-ÖF-220.001	56	↑	16	13	3	↓
Actuator function: air-to-open/spring-to-close						
LAD-SF-100.001.5	20	4	↓	↓	↓	↓
LAD-SF-150.002	35	16	9	3	↓	↓
LAD-SF-220.003.7	56	↑	16	8	↓	↓
LAD-SF-220.004.7S*	56	↑	↑	16	7	4

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 20/25	DN 40	DN 50/65	DN 80	DN 100/125	DN 150/200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	12	7	3	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	10	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	5	↓	↓
LAP-AZ-160-F10	30	↑	↑	16	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	9	5	↓
LAP-AZ-200-F10	30/45	↑	↑	↑	15	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	8	3
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	12	6
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	9
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	12
LAP-AZ-D300-F14	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-OF-80.101-F10	15/30	8	4	2	↓	↓	↓
LAP-OF-125.101-F10	15/30	16	16	8	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	↑	16	8	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	↑	14	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	↑	6	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	16	9	4
LAP-OF-300.002-F10*	60	↑	↑	↑	↑	15	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	7
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	16	10
LAP-OF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	8	↓	↓	↓	↓	↓
LAP-SF-80.001-F10	30	↑	5	2	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	13	6	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	10	4	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	14	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	16	9	↓	↓
LAP-SF-200.003-F10	60/80	↑	↑	↑	↓	4	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	14	↓	↓
LAP-SF-250.004F10/F14	60/80	↑	↑	↑	↓	7	3
LAP-SF-300.034-F10*	60	↑	↑	↑	16	11	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↓	5
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	16	8
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	11

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 20/25	DN 40	DN 50/65	DN 80	DN 100/125	DN 150/200
Actuator function: air-to-open/air-to-close							
LAP-AZ-80-F10	15/30	10	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	5	↓	↓	↓
LAP-AZ-160-F10	30	↑	↑	10	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	3	↓	↓
LAP-AZ-200-F10	30/45	↑	↑	16	9	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↓	3	↓
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	10	↓
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	5
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	10
LAP-AZ-D300-F14*	80	↑	↑	↑	↑	↑	16
Actuator function: spring-to-open/air-to-close							
LAP-ÖF-80.101-F10	15/30	5	↓	↓	↓	↓	↓
LAP-ÖF-125.101-F10	15/30	16	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	30/45	↑	16	8	↓	↓	↓
LAP-ÖF-200.102-F10	30/45	↑	↑	16	↓	↓	↓
LAP-ÖF-200.001-F10	45/60	↑	↑	↑	6	↓	↓
LAP-ÖF-250.002-F10/F14	60/80	↑	↑	↑	12	3	↓
LAP-ÖF-300.002-F10*	60	↑	↑	↑	16	11	↓
LAP-ÖF-300.012-F14	80	↑	↑	↑	↑	↑	2
LAP-ÖF-D250.012-F14	80	↑	↑	↑	↑	16	8
LAP-ÖF-D300.012-F14	80	↑	↑	↑	↑	↑	16
Actuator function: air-to-open/spring-to-close							
LAP-SF-80.001.5-F10	15	4	↓	↓	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	8	3	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	5	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	7	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	9	3	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	16	8	↓	↓
LAP-SF-300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.034-F10*	60	↑	↑	↑	16	12	↓
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	↑	5
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	10

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-10

PN10
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-10



Main applications

- Mining
- Irrigation
- Chemical industry
- Industrial recirculation systems
- Sewage treatment plants
- Air-conditioning systems
- Condensate transport
- Paint shops
- Seawater desalination/reverse osmosis
- Refineries
- Flue gas desulphurisation
- Swimming pools
- Process engineering
- Water treatment
- Water extraction
- Sugar industry

Fluids handled

- Waste water
- Aggressive fluids
- Inorganic fluids
- Brackish water
- Service water

- Distillate
- River, lake and groundwater
- Gas
- Toxic fluids
- Condensate
- Corrosive fluids
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Oil
- Organic fluids
- Cleaning agents
- Lubricants
- Dipping paints
- Wash water
- Other fluids on request.

Operating data

Characteristic	Value
Nominal pressure	PN 10
Nominal size	DN 15-300
Max. permissible pressure	10 bar
Max. permissible temperature ¹⁾	+160 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ²⁾	F14	5,5 - 10
D300 ²⁾	F14	5,5 - 7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (important in the event of frost!).

1) The temperatures indicated are for orientation only; they are not valid for all operating conditions.

2) Double piston

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJL-250	5.1301	-10 °C to +160 °C
EN-GJS-400-18-LT	5.3103	-20 °C to +160 °C

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by supported diaphragm (spiral-supported from DN 65)
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body coated with PA (Rilsan); temperature limit +90 °C³⁾
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C
- Two-piece diaphragm made of PTFE/EPDM; temperature limit +160 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

Diaphragm valve

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Extended service life and pressure limit**
The diaphragm support increases valve life and extends the pressure limit of the diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.

³⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

- **Fluid purity**
Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.
- **Fast checking of valve position**
The valve's position can be easily checked via a clear visual indicator, also visible from a distance.
- **Reliable operation**
The stem and all internal operating elements are **not** in contact with the fluid.

SISTO-LAD diaphragm actuator

- Compact design
- Minimised friction during actuation thanks to actuator diaphragm made of NBR
- Emergency operation of valve possible without compressed air supply

SISTO-LAP piston actuator

- Actuator variants with optimised stroke ensure full valve travel with minimum air consumption
- Smooth, low-friction movement of the piston assembly (up to 250 mm diameter pistons) with double cup seal and vulcanised metal disc

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size

4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	4,7	80	159,0
20	9,8	100	270,0
25	15,0	125	360,0
32	23,0	150	518,0
40	37,0	200	1112,0
50	69,0	250	1166,0
65	109,00	300	1260,0

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures of °C (to EN 1092-2/ EN 1092-1)⁴⁾

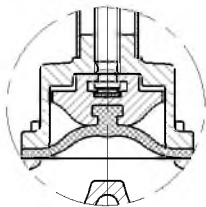
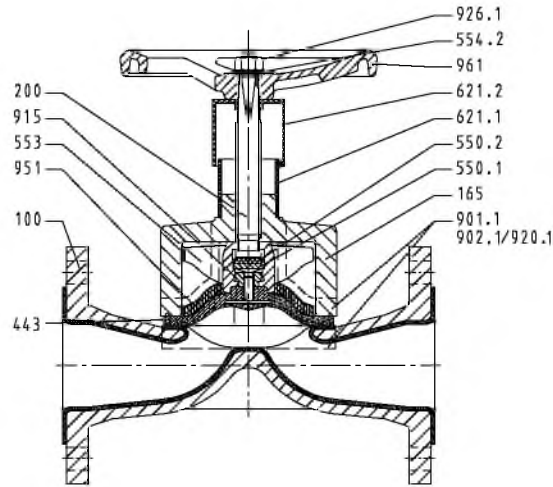
Nominal pressure	Material	-20	RT up to +120 ⁵⁾	+150	+160
10	5.1301	-	10	9,0	8,7
	5.3103	10	10	9,7	9,6

⁴⁾ Intermediate temperatures can be derived by linear interpolation.

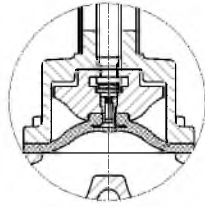
⁵⁾ RT: room temperature +20°C

Materials

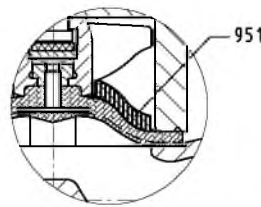
SISTO-10 manually operated valve



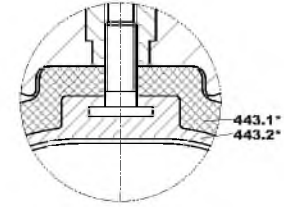
DN 15-20 design



DN 25-50 design



DN 65-300 design



Design with
2-piece diaphragm

Parts list

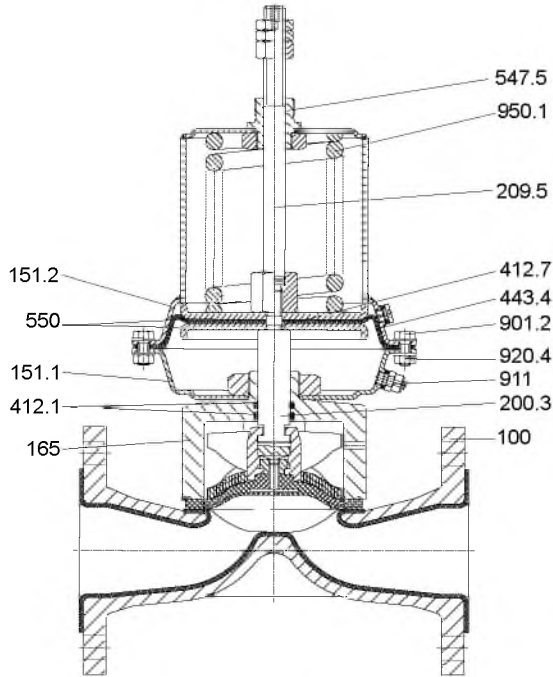
Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	Standard, DN 200-300 = 5.3103 (JS1049)
165	Bonnet	EN-GJL-250	5.1301	Standard
200	Stem	X14CrMoS17	1.4104	
443 ⁶⁾	Diaphragm	EPDM		Standard
443.1 ⁶⁾	Backing diaphragm	EPDM		
443.2 ⁶⁾	Diaphragm	TFM		
550.1	Bearing disc	11SMnPb30	1.0718	For DN 25-300
550.2	PTFE disc	PTFE/graphite		For DN 25-300
553	Compressor	EN-GJL-250	5.1301	GD-ZnAl4Cu1 for DN 15-20
554.2	Washer	StA2E		
621.1	Position indicator, lower part	ASA Luran		
621.2	Position indicator, upper part	ASA Luran		For DN 25-150; DN 200-300: ASA/ABS
901.1	Hexagon head bolt	A2		For DN 15-65
902.1	Stud	A2		For DN 80-300
915	Floating nut	11SMnPb30	1.0718	For DN 25-300
920.1	Nut	A2		For DN 80-300
926.1	Prevailing torque nut	A2-70		For DN 25-300

⁶⁾ Recommended spare parts

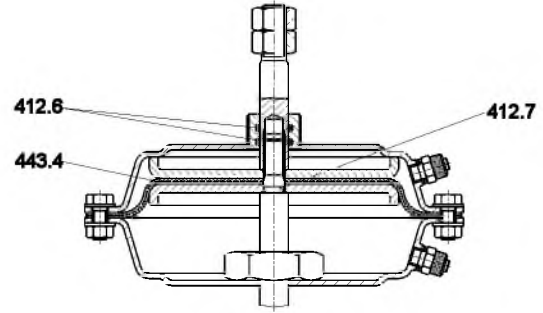
Part No.	Description	Material	Material number	Note
951	Support spiral	St 2K BK		For DN 65-300
961	Handwheel	EN-GJL-200	5.1300	For DN 15-20: PC

Materials

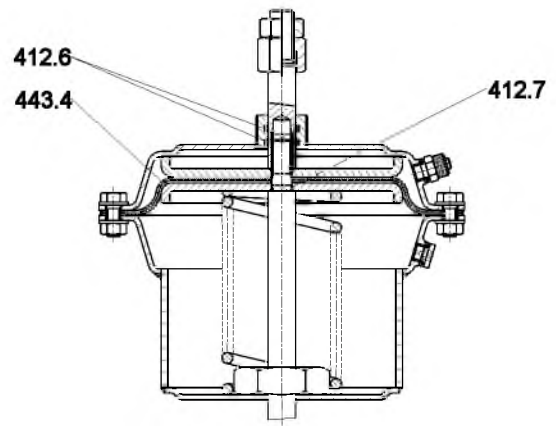
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

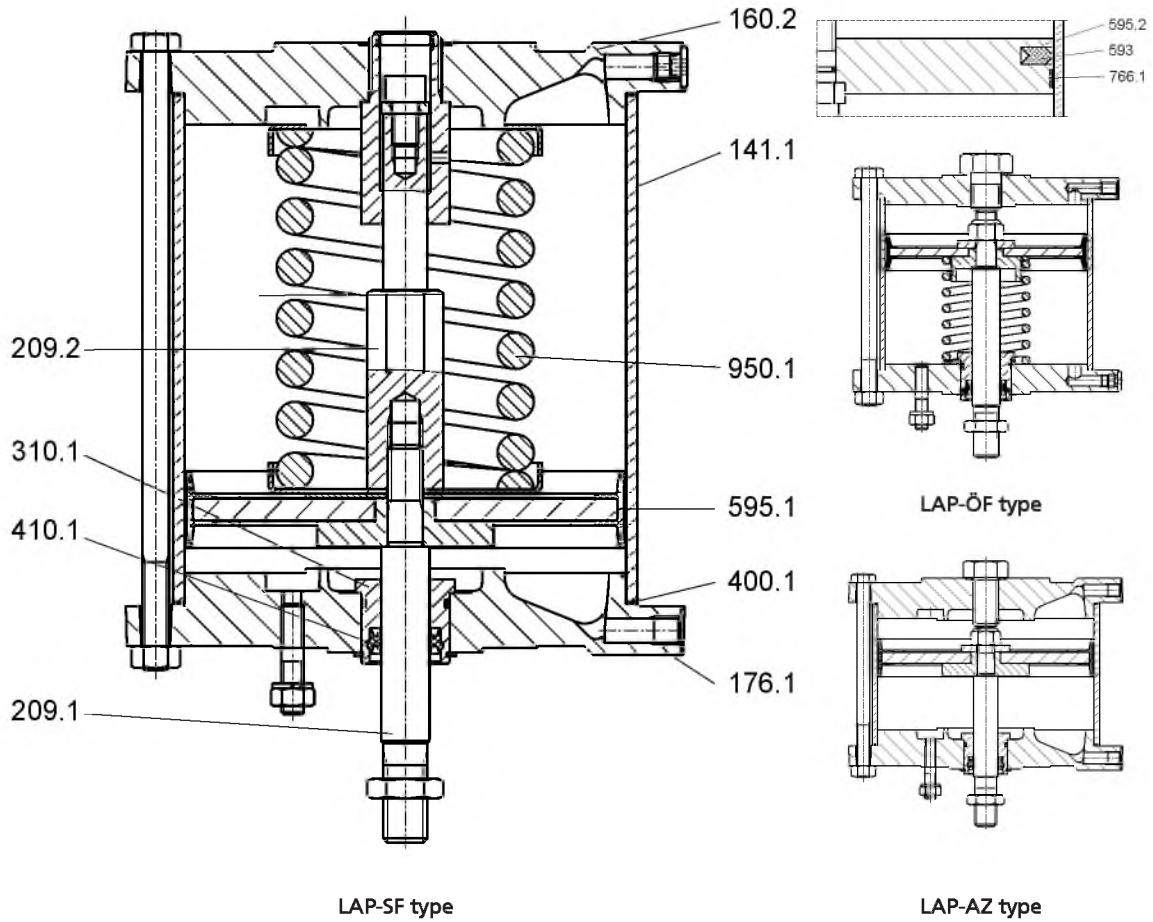
Parts list

Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/RN		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	FPM		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
901.2	Hexagon head bolt	A2-70		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



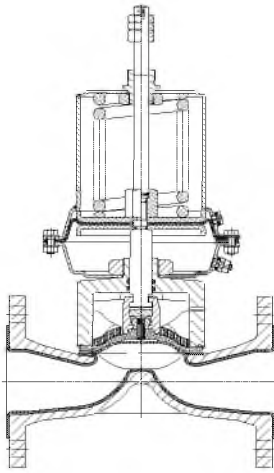
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic – POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic – AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic – L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber – NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber – St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

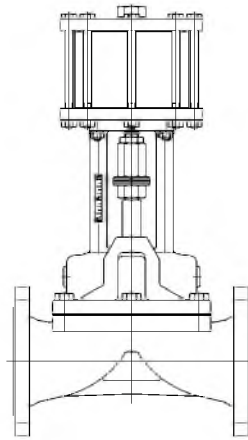
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

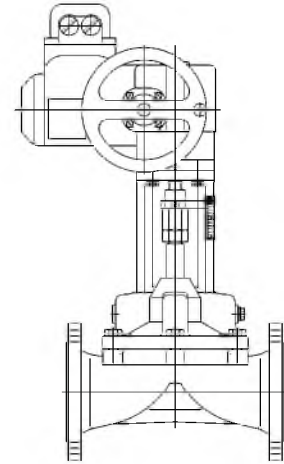
SISTO-10



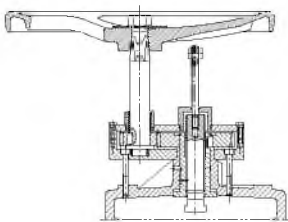
With SISTO-LAD



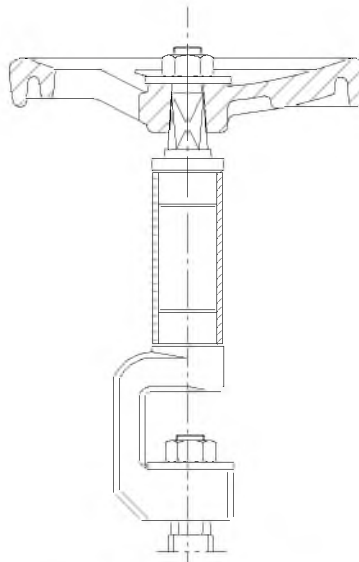
With SISTO-LAP



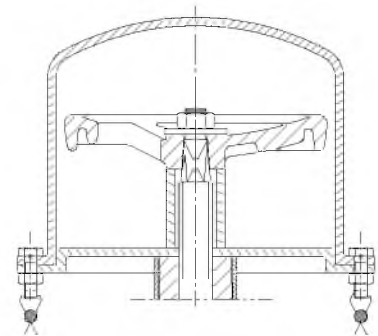
With electric actuator



Gearbox



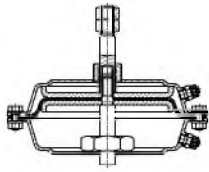
Stem extension



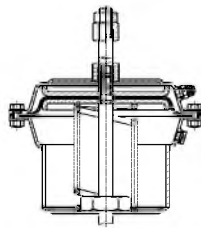
Lead-sealable cap

Variants

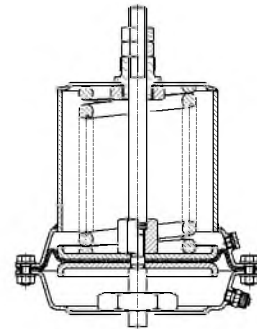
SISTO-LAD diaphragm actuator and accessories



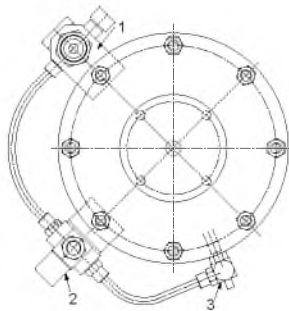
LAD-AZ type



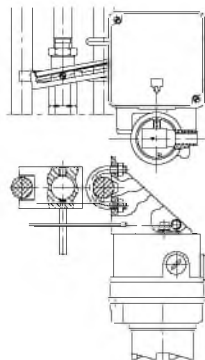
LAD-ÖF type



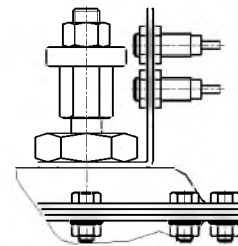
LAD-SF type



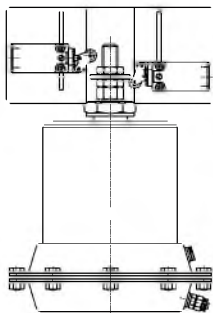
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



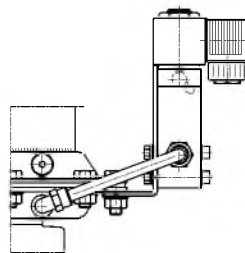
Configuration with positioner



Configuration with proximity sensor



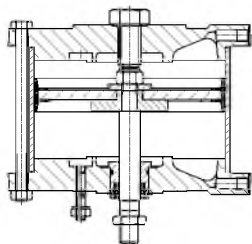
Configuration with mechanical limit switches



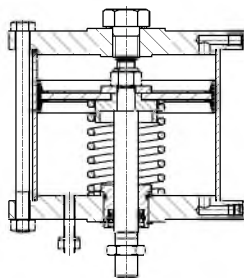
Configuration with solenoid valve

Variants

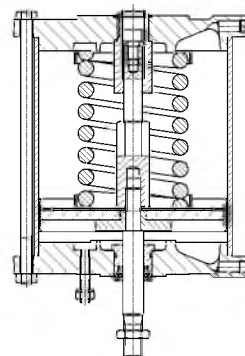
SISTO-LAP piston actuator and accessories



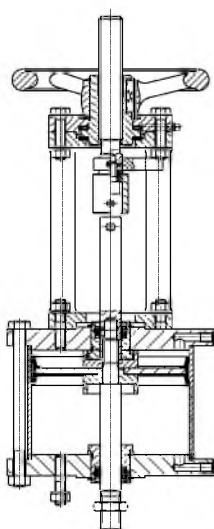
LAP-AZ type



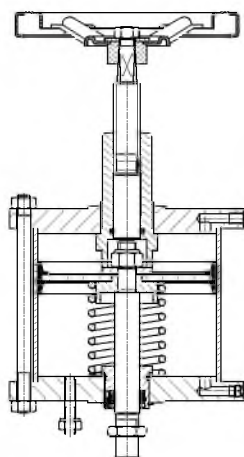
LAP-ÖF type



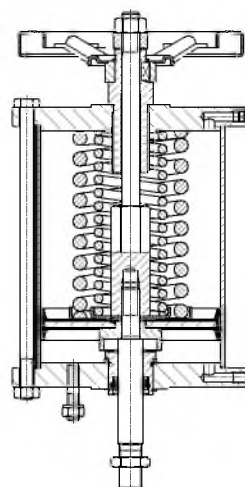
LAP-SF type



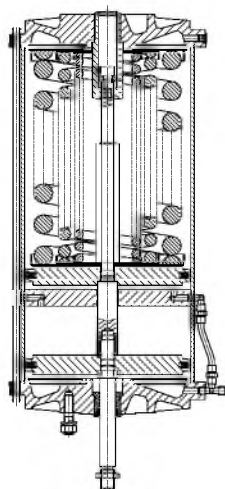
LAP-AZ type
with emergency handwheel



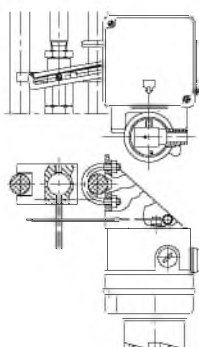
LAP-ÖF type
with emergency handwheel



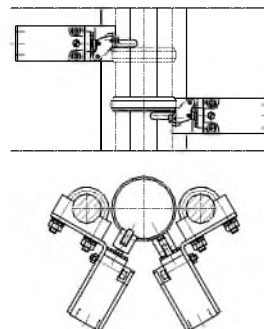
LAP-SF type
with emergency handwheel



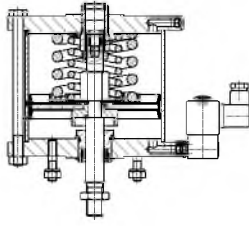
LAP-SF type
Double piston



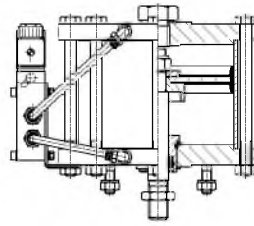
Configuration with
positioner



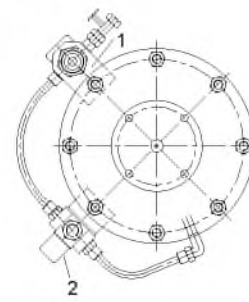
Configuration with position
switches



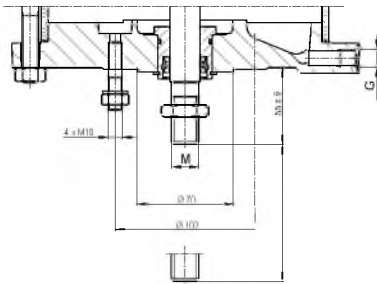
LAP-SF type with 3/2 directional control valve



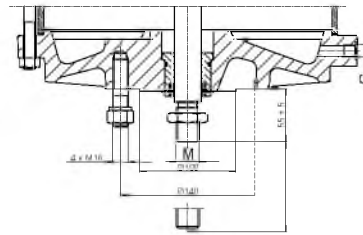
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons DØ 300/F14 (optional)

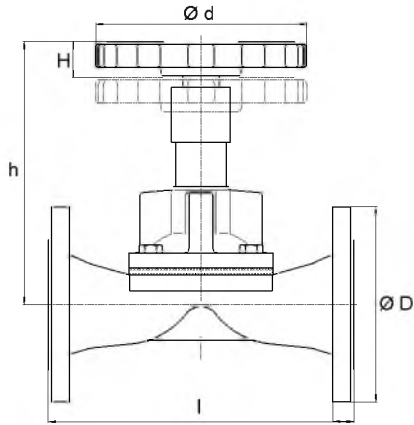
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

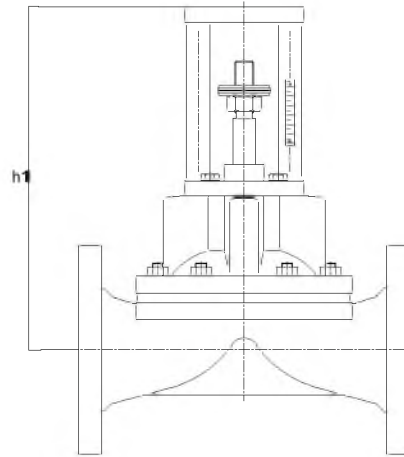
⁹⁾ See "Symbols key" table

Dimensions

SISTO-10 manually operated valve



Manually operated valve



Diaphragm valve prepared for SISTO-LAP
piston actuator
and electric actuator

Dimensions in mm

DN	Diaphragm	l	Ø D	H	Manually operated valve				Prepared for actuator	
					h ¹⁰⁾	Ø d	Handwheel turns approx.	[kg]	Centre-to-top height h1	Top flange
15	58 x 62	130	95	8	108	63	3	2,5	213	F10
20	58 x 62	150	105	8	108	63	3	3,0	213	F10
25	68 x 72	160	115	11	140	100	4	4,0	217	F10
32	90 x 100	180	140	18	165	100	6	5,5	227	F10
40	90 x 100	200	150	18	165	100	6	8,0	227	F10
50	107 x 124	230	165	26	200	125	7	11,5	242	F10
65	132 x 144	290	185	34	245	200	9	19,0	312	F10
80	157 x 187	310	200	40	265	200	10	25,0	320	F10
100	Ø 226	350	220	56	340	200	11	39,0	363	F10
125	Ø 258	400	250	72	405	250	15	53,0	395	F10
150	Ø 303	480	285	81	450	400	14	78,0	485	F10/F14
200	Ø 415	600	340	115	595	400	20	162,0	550	F10/F14
250	Ø 415	730	395	115	645	400	20	190,0	600	F10/F14
300	Ø 415	850	445	115	645	400	20	210,0	600	F10/F14

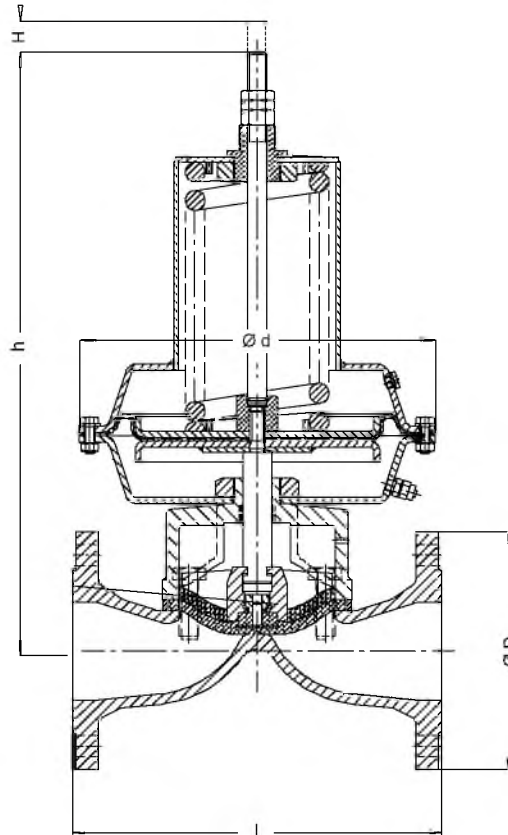
Mating dimensions - Standards

Face-to-face length: EN 558-1 R1
 Flange dimensions: DIN EN 1092-2
 Flange facing: DIN EN 1092-2 type B

¹⁰⁾ Add 5 mm for rubber-lined valves

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

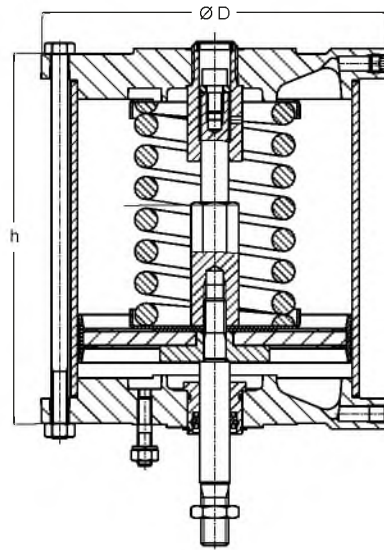
DN	Diaphragm	l	Ø D	H	Ø d			h ¹¹⁾¹²⁾			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	58x62	130	95	8	160	190	250	250	210	220	290	340	-	-	-	-	9,5	11,5	-
20	58x62	150	105	8	160	190	250	250	210	220	290	340	-	-	-	-	10,0	12,0	-
25	68x72	160	115	11	160	210	270	270	210	240	310	360	-	-	530	530	11,0	13,0	-
32	90x100	180	140	18	160	210	270	270	210	240	310	360	-	-	530	530	12,5	14,5	-
40	90x100	200	150	18	160	210	270	270	210	240	310	360	-	-	530	530	15,0	17,0	-
50	107x124	230	165	26	-	-	-	-	210	250	320	370	307	-	540	540	-	20,5	26,5
65	132x144	290	185	34	-	-	-	-	210	290	360	410	307	410	580	580	-	28,0	34,0
80	157x187	310	200	40	-	-	-	-	-	-	-	-	307	430	600	600	-	-	40,0
100	Ø226	350	220	56	-	-	-	-	-	-	-	-	307	510	680	680	-	-	54,0
125	Ø258	400	250	72	-	-	-	-	-	-	-	-	307	-	-	-	-	-	68,0

11) Add 5 mm for rubber-lined valves

12) Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-160-F10	80	210	208	13
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F14	80	355	274	35
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-80.101-F10	30	130	151	6
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.101-F10	30	170	151	8
LAP-ÖF-125.102-F10	30	170	189	9
LAP-ÖF-160.102-F10	45	210	208	13
LAP-ÖF-160.001-F10	45	210	288	13
LAP-ÖF-160.102-F10	60	210	224	14
LAP-ÖF-200.001-F10	60	255	330	23
LAP-ÖF-200.001-F10	80	255	350	25
LAP-ÖF-250.001-F10	60	305	360	37
LAP-ÖF-250.002-F10	60	305	380	32
LAP-ÖF-250.002-F10	80	305	400	35
LAP-ÖF-250.002-F14	80	305	400	39
LAP-ÖF-300.002-F10	60	355	414	51
LAP-ÖF-300.002-F10	80	355	434	52
LAP-ÖF-300.012-F14	80	355	434	52
LAP-ÖF-300.012-F14	80	355	434	53
LAP-ÖF-D250.012-F14	80	305	504	54

Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/spring-to-close				
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F10	80	355	535	70
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.034-F14	80	355	692	89

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125 ¹³⁾
Actuator function: air-to-open/air-to-close									
LAD-AZ-100	20	10	10	8	↓	↓	↓	↓	↓
LAD-AZ-150	35	↑	↑	10	10	10	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	↑	↑	10	10	6
Actuator function: spring-to-open/air-to-close									
LAD-ÖF-100.014	20	10	10	7	↓	↓	↓	↓	↓
LAD-ÖF-150.102	35	↑	↑	10	10	10	↓	↓	↓
LAD-ÖF-220.001	56	↑	↑	↑	↑	↑	10	9	6
Actuator function: air-to-open/spring-to-close									
LAD-SF-100.001.5	20	10	10	5	↓	↓	↓	↓	↓
LAD-SF-150.002	35	↑	↑	10	10	6	↓	↓	↓
LAD-SF-220.003.7	56	↑	↑	↑	↑	10	10	5	3
LAD-SF-220.004.7S*	56	↑	↑	↑	↑	↑	↑	7	5

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125 ¹³⁾
Actuator function: air-to-open/air-to-close									
LAD-AZ-100	20	8	8	↓	↓	↓	↓	↓	↓
LAD-AZ-150	35	10	10	10	8	2	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	10	10	10	4	↓
Actuator function: spring-to-open/air-to-close									
LAD-ÖF-100.014	20	5	5	↓	↓	↓	↓	↓	↓
LAD-ÖF-150.102	35	10	10	10	6	↓	↓	↓	↓
LAD-ÖF-220.001	56	↑	↑	↑	10	10	10	2	↓
Actuator function: air-to-open/spring-to-close									
LAD-SF-100.001.5	20	2	2	↓	↓	↓	↓	↓	↓
LAD-SF-150.002	35	10	10	8	2	↓	↓	↓	↓
LAD-SF-220.003.7	56	↑	↑	↑	10	10	3	↓	↓
LAD-SF-220.004.7S*	56	↑	↑	↑	↑	↑	6	2	↓

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

¹³⁾ Stroke limited to 56 mm

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	10	8	5	2	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	↑	10	10	10	↓	↓	↓	↓
LAP-AZ-125-10	45/60	↑	↑	↑	↑	6	3	↓	↓
LAP-AZ-160-10	45/60	↑	↑	↑	↑	10	6	↓	↓
LAP-AZ-160-10	80	↑	↑	↑	↑	↑	↑	4	2
LAP-AZ-200-10	60/80	↑	↑	↑	↑	↑	10	7	4
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	↑	10	↓
LAP-AZ-250-F14	80	↑	↑	↑	↑	↑	↑	↑	7
LAP-AZ-300-F14	60/80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-80.101-10	15/30	8	5	3	1	↓	↓	↓	↓
LAP-ÖF-125.101-10	15/30	10	10	10	8	↓	↓	↓	↓
LAP-ÖF-160.102-10	45/60	↑	↑	↑	10	10	↓	↓	↓
LAP-ÖF-200.001-10	60/80	↑	↑	↑	↑	↑	9	↓	↓
LAP-ÖF-250.001-F10	60	↑	↑	↑	↑	↑	10	↓	↓
LAP-ÖF-250.002-F10	60/80	↑	↑	↑	↑	↑	↑	7	↓
LAP-ÖF-250.002-F14	80	↑	↑	↑	↑	↑	↑	↓	5
LAP-ÖF-300.002-F10*	60/80	↑	↑	↑	↑	↑	↑	10	7
LAP-ÖF-300.002-F14	80	↑	↑	↑	↑	↑	↑	↑	8
LAP-ÖF-D250.012	80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: air-to-open/spring-to-close									
LAP-SF-80.001.5-10	15	8	↓	↓	↓	↓	↓	↓	↓
LAP-SF-80.001-10	30	↓	5	3	1	↓	↓	↓	↓
LAP-SF-125.002.5-10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-10	30	↑	10	10	6	↓	↓	↓	↓
LAP-SF-160.012-10	30/45	↑	↑	↑	8	↓	↓	↓	↓
LAP-SF-200.003.7-10	45	↑	↑	↑	↑	10	↓	↓	↓
LAP-SF-200.003-10	60/80	↑	↑	↑	↑	↑	6	4	2
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-SF-250.004-F14	80	↑	↑	↑	↑	↑	↑	↓	3
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	↑	↑	9	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	6
LAP-SF-D300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	6

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	6	↓	↓	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	10	10	7	↓	↓	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	10	10	5	↓	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	10	5	3	↓
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	10	10	↓
LAP-AZ-250-F14	80	↑	↑	↑	↑	↑	↑	↑	5
LAP-AZ-300-F14	60/80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-125.101-F10	15/30	10	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.102-F10	30	↑	8	3	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	45/60	↑	10	10	8	2	↓	↓	↓
LAP-ÖF-200.001-F10	60/80	↑	↑	↑	10	10	↓	↓	↓
LAP-ÖF-250.002-F10	60/80	↑	↑	↑	↑	↑	9	6	↓
LAP-ÖF-300.002-F10*	60/80	↑	↑	↑	↑	↑	10	10	↓
LAP-ÖF-300.012-F14	80	↑	↑	↑	↑	↑	↑	↑	7
LAP-ÖF-D250.012	80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: air-to-open/spring-to-close									
LAP-SF-125.002.5-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	7	↓	↓	↓	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	10	7	↓	↓	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	10	6	↓	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	↑	10	5	↓	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	↑	10	↓	↓	↓
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	4	2	↓
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	3

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-10S

PN10
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Legal information/Copyright

Type Series Booklet SISTO-10S

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Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-10S



Main applications

- Mining
- Irrigation
- Chemical industry
- Industrial recirculation systems
- Sewage treatment plants
- Air-conditioning systems
- Condensate transport
- Paint shops
- Seawater desalination/reverse osmosis
- Refineries
- Flue gas desulphurisation
- Swimming pools
- Process engineering
- Water treatment
- Water extraction
- Sugar industry

Fluids handled

- Waste water

- Aggressive fluids
- Inorganic fluids
- Brackish water
- Service water
- Distillate
- River, lake and groundwater
- Gas
- Toxic fluids
- Condensate
- Corrosive fluids
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Oil
- Organic fluids
- Cleaning agents
- Lubricants
- Dipping paints
- Wash water
- Other fluids on request.

Operating data

Characteristic	Value
Nominal pressure	PN 10
Nominal size	DN 15-200
Max. permissible pressure	10 bar
Max. permissible temperature ¹⁾	+160 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ²⁾	F14	5,5 - 10
D300 ²⁾	F14	5,5 - 7

1) The temperatures indicated are for orientation only; they are not valid for all operating conditions.

2) Double piston

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Body materials

Overview of available materials

Material	Material number	Temperature limit ¹⁾
EN-GJL-250	5.1301	-10 °C to +160 °C

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by supported diaphragm (spiral-supported from DN 65)
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body coated with PA (Rilsan); temperature limit +90 °C³⁾
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C
- Two-piece diaphragm made of PTFE/EPDM; temperature limit +160 °C

- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

Diaphragm valve

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Extended service life and pressure limit**
The diaphragm support increases valve life and extends the pressure limit of the diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**

³⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

The thrust bearing minimises the closing torques.

▪ **Optimised long-term operation**

The stem protection integrated in the position indicator prevents ingress of contaminants.

▪ **Fluid purity**

Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.

▪ **Fast checking of valve position**

The valve's position can be easily checked via a clear visual indicator, also visible from a distance.

▪ **Reliable operation**

The stem and all internal operating elements are **not** in contact with the fluid.

SISTO-LAD diaphragm actuator

- Compact design
- Minimised friction during actuation thanks to actuator diaphragm made of NBR
- Emergency operation of valve possible without compressed air supply

SISTO-LAP piston actuator

- Actuator variants with optimised stroke ensure full valve travel with minimum air consumption
- Smooth, low-friction movement of the piston assembly (up to 250 mm diameter pistons) with double cup seal and vulcanised metal disc

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type

2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	4,7	65	109,0
20	9,8	80	159,0
25	15,0	100	270,0
32	23,0	125	360,0
40	37,0	150	518,0
50	69,0	200	1112,0

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures of °C (to EN 1092-2/ EN 1092-1)⁴⁾

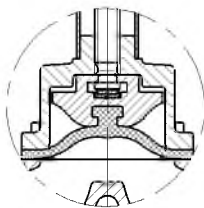
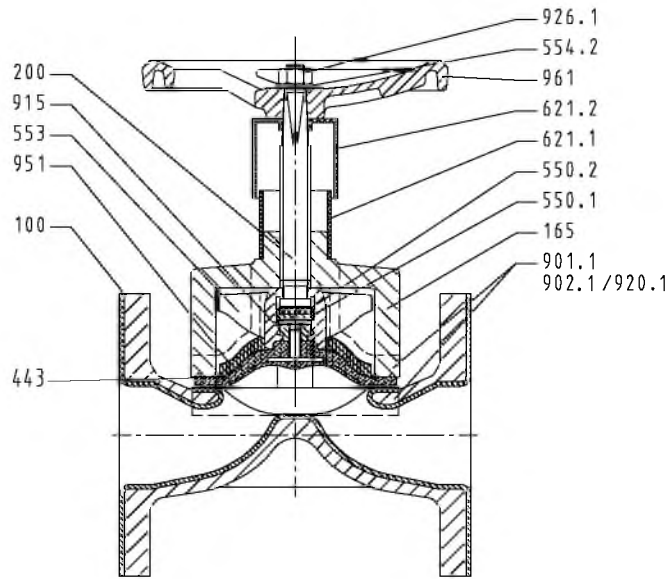
Nominal pressure	Material	-10	RT up to +120 ⁵⁾	+150	+160
10	5.1301	10	10	9,0	8,7

⁴⁾ Intermediate temperatures can be derived by linear interpolation.

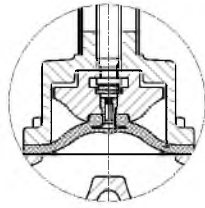
⁵⁾ RT: room temperature +20°C

Materials

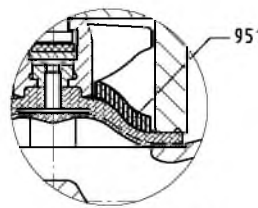
SISTO-10S manually operated valve



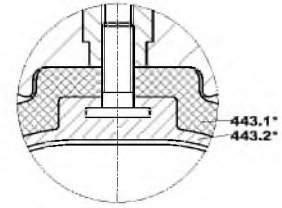
DN 15-20 design



DN 25-50 design



DN 65-200 design



Design with
2-piece diaphragm

Parts list

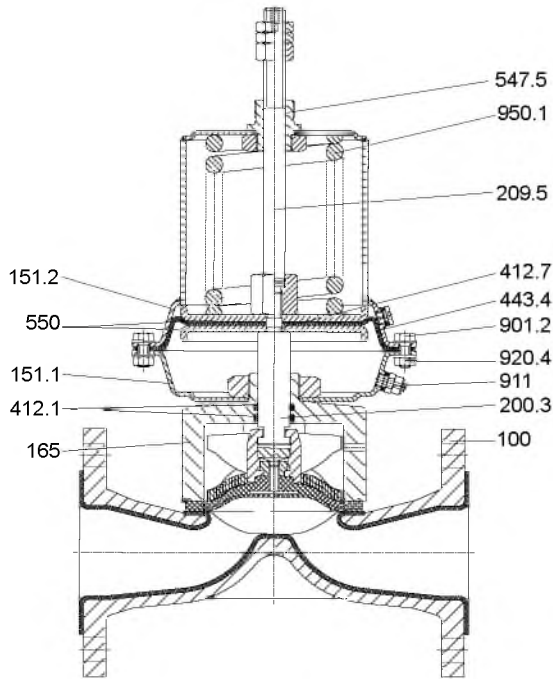
Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	Standard
165	Bonnet	EN-GJL-250	5.1301	Standard
200	Stem	X14CrMoS17	1.4104	
443 ⁶⁾	Diaphragm	EPDM		Standard
443.1 ⁶⁾	Backing diaphragm	EPDM		
443.2 ⁶⁾	Diaphragm	TFM		
550.1	Bearing disc	11SMnPb30	1.0718	For DN 25-200
550.2	PTFE disc	PTFE/graphite		For DN 25-200
553	Compressor	EN-GJL-250	5.1301	GD-ZnAl4Cu1 for DN 15-20
554.2	Washer	StA2E		
621.1	Position indicator, lower part	ASA Luran		
621.2	Position indicator, upper part	ASA Luran		For DN 25-150; DN 200: ASA/ABS
901.1	Hexagon head bolt	A2		For DN 15-80
902.1	Stud	A2		For DN 100-200
915	Floating nut	11SMnPb30	1.0718	For DN 25-200
920.1	Nut	A2		For DN 100-200
926.1	Prevailing torque nut	A2-70		For DN 25-200

⁶⁾ Recommended spare parts

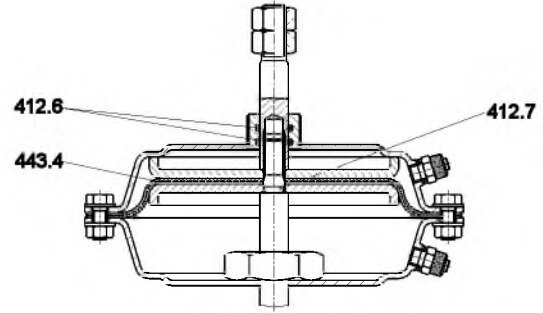
Part No.	Description	Material	Material number	Note
951	Support spiral	St 2K BK		For DN 65-200
961	Handwheel	EN-GJL-200	5.1300	For DN 15-20: PC

Materials

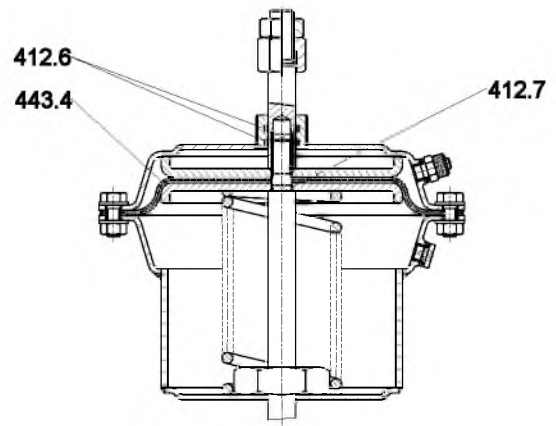
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

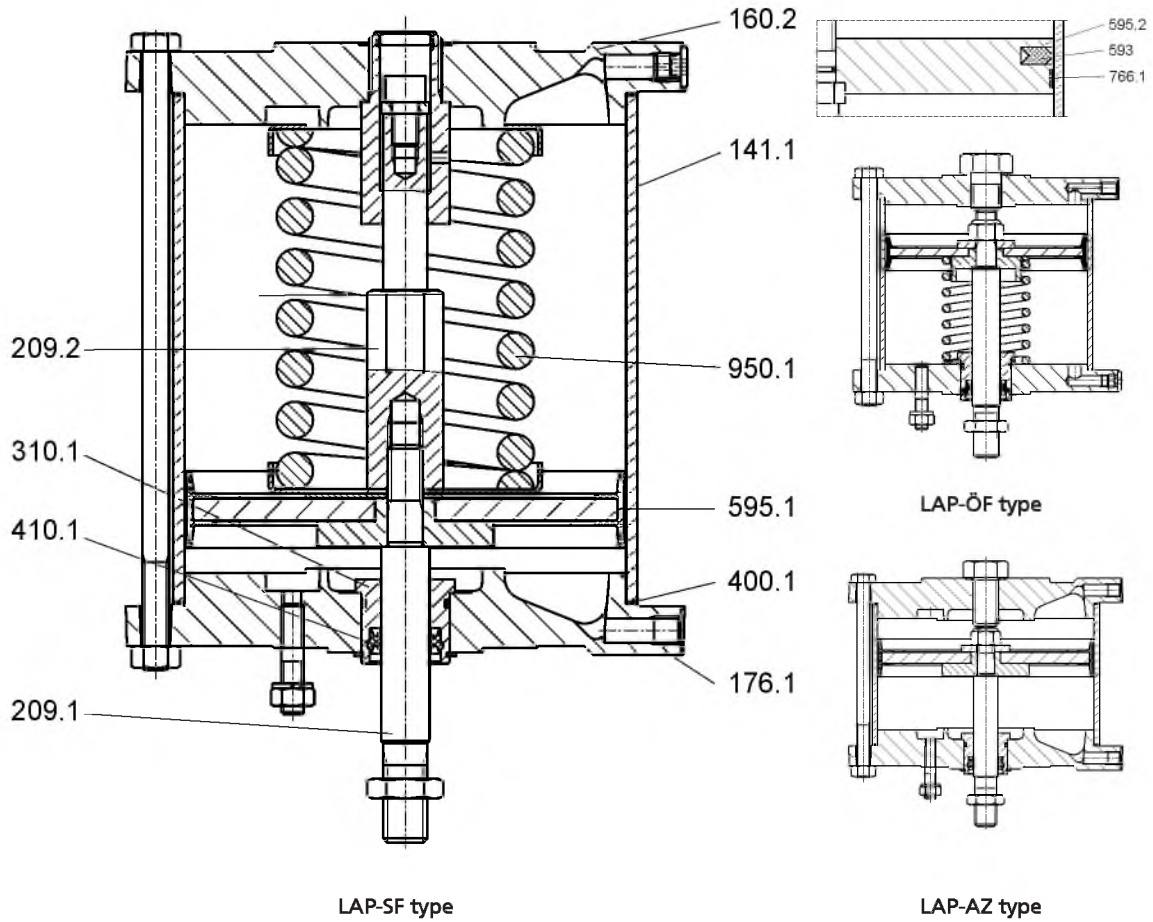
Parts list

Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/RN		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	FPM		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
901.2	Hexagon head bolt	A2-70		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



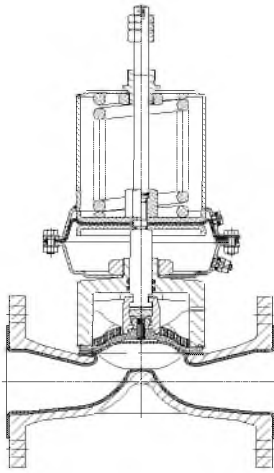
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic – POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic – AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic – L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber – NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber – St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

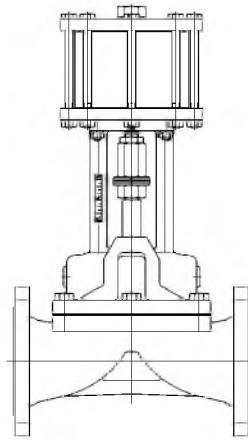
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

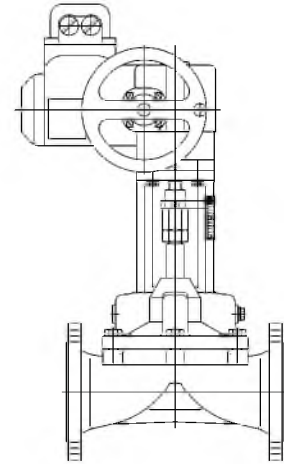
SISTO-10S



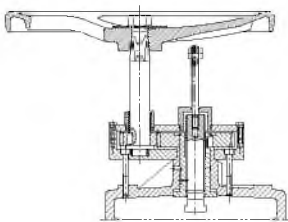
With SISTO-LAD



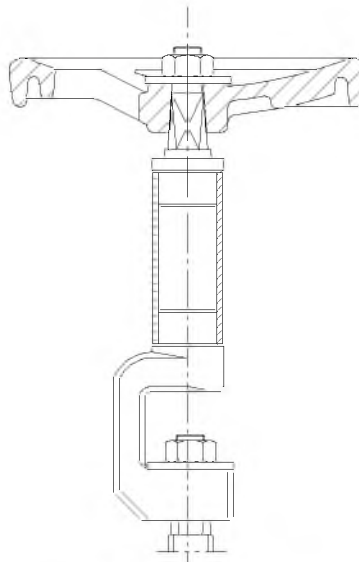
With SISTO-LAP



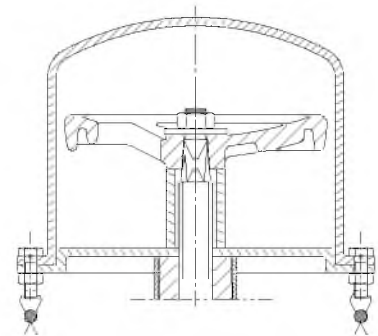
With electric actuator



Gearbox



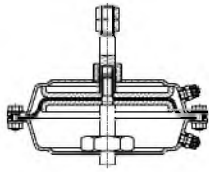
Stem extension



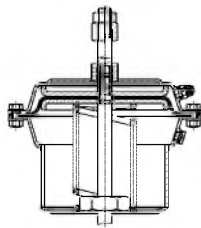
Lead-sealable cap

Variants

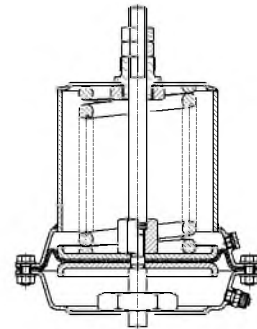
SISTO-LAD diaphragm actuator and accessories



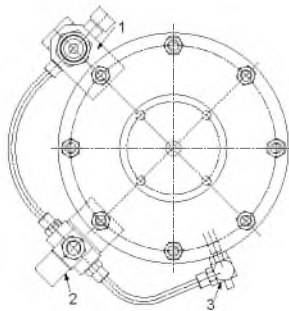
LAD-AZ type



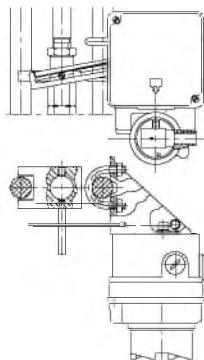
LAD-ÖF type



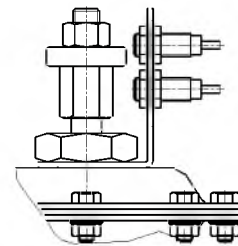
LAD-SF type



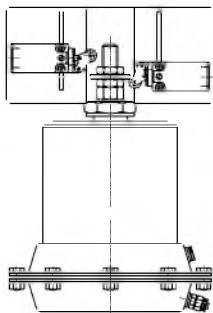
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



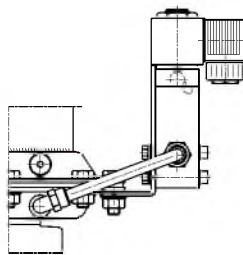
Configuration with positioner



Configuration with proximity sensor



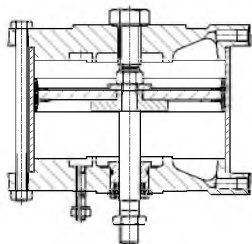
Configuration with mechanical limit switches



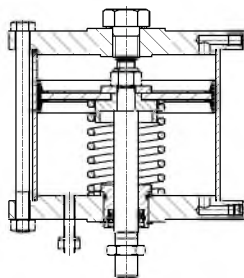
Configuration with solenoid valve

Variants

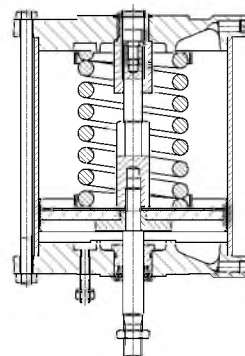
SISTO-LAP piston actuator and accessories



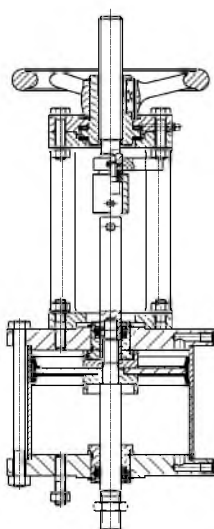
LAP-AZ type



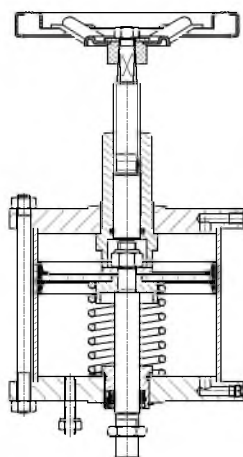
LAP-ÖF type



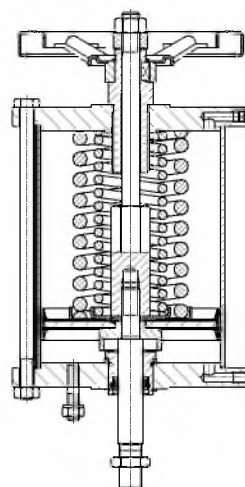
LAP-SF type



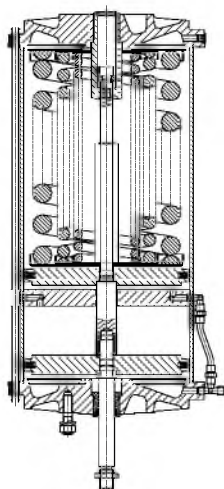
LAP-AZ type
with emergency handwheel



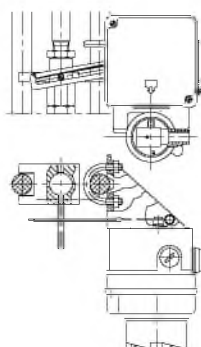
LAP-ÖF type
with emergency handwheel



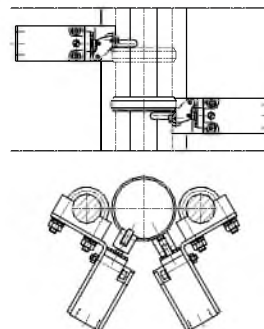
LAP-SF type
with emergency handwheel



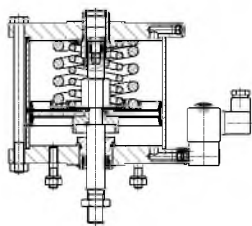
LAP-SF type
Double piston



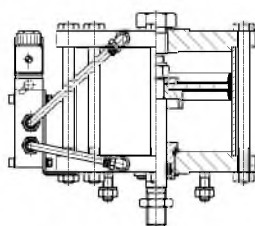
Configuration with
positioner



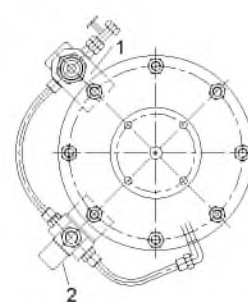
Configuration with position
switches



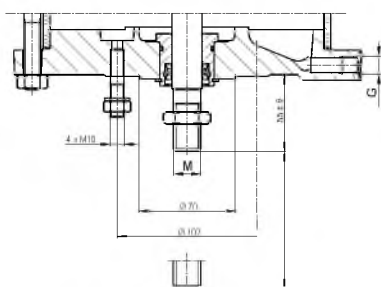
LAP-SF type with 3/2 directional control valve



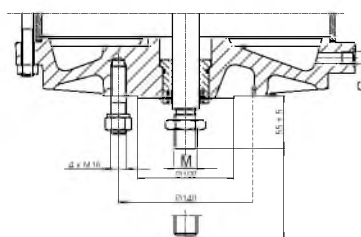
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons DØ 300/F14 (optional)

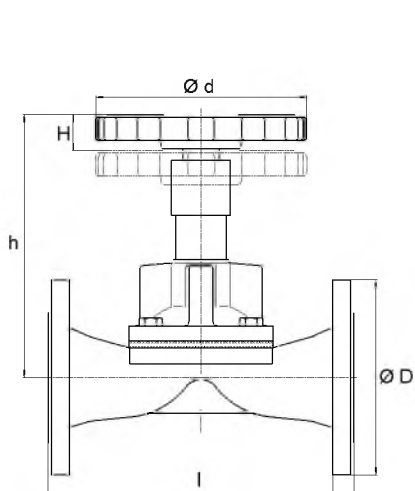
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

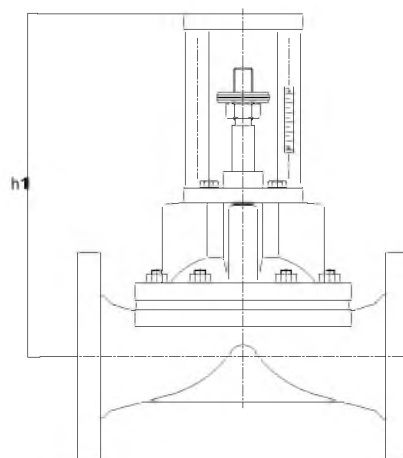
⁹⁾ See "Symbols key" table

Dimensions

SISTO-10S manually operated valve



Manually operated valve



Diaphragm valve prepared for SISTO-LAP
piston actuator
and electric actuator

Dimensions in mm

DN	Diaphragm MD (Ø/AxB)	l ⁽¹⁰⁾	Ø D	H	Manually operated valve				Actuated valve	
					h ⁽¹¹⁾	Ø d	Handwheel turns	[kg]	Centre-to- top height h ⁽¹¹⁾	Top flange
15	58 x 62	108	95	8	108	63	3	2,5	213	F10
20	58 x 62	117	105	8	108	63	3	3,0	213	F10
25	68 x 72	127	115	11	140	100	4	4,0	217	F10
32	90 x 100	146	140	18	165	100	6	5,5	227	F10
40	90 x 100	159	150	18	165	100	6	8,0	227	F10
50	107 x 124	190	165	26	200	125	7	11,5	242	F10
65	132 x 144	216	185	34	245	200	9	19,0	312	F10
80	157 x 187	254	200	40	265	200	10	25,0	320	F10
100	Ø 226	305	220	56	340	200	11	39,0	363	F10
125	Ø 258	356	250	72	405	250	15	53,0	395	F10
150	Ø 303	406	285	81	450	400	14	78,0	485	F10/F14
200	Ø 415	521	340	115	595	400	20	162,0	550	F10/F14

Mating dimensions - Standards

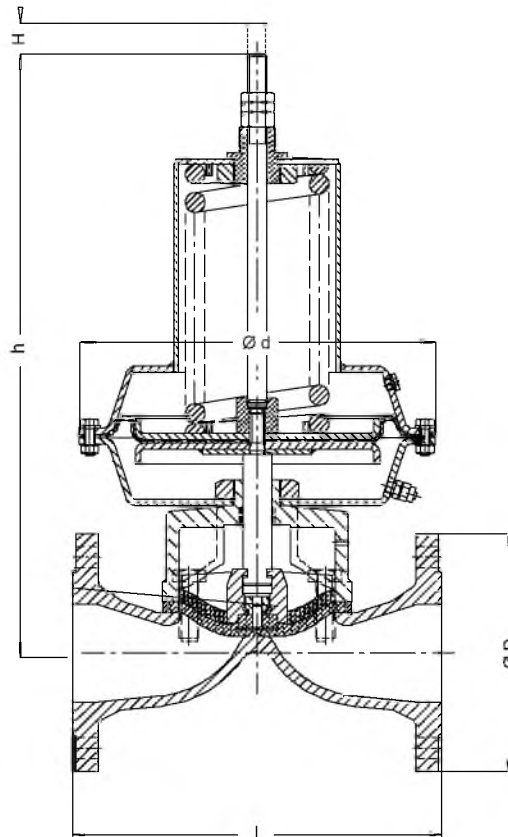
Face-to-face length: EN 558-1 R7
 Flange dimensions: ASME B 16.5 - 2013 Cl. 150
 DIN EN-1092-2
 Flange facing: ASME B 16.5 - 2013 Cl. 150
 DIN EN 1092-2 type B

¹⁰⁾ Add 6 mm for rubber-lined valves

¹¹⁾ Add 5 mm for rubber-lined valves

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

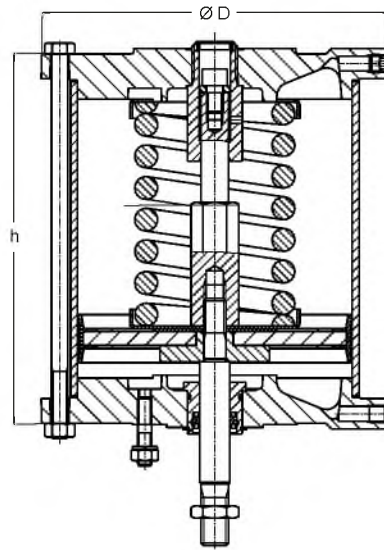
DN	Diaphragm	l	Ø D	H	Ø d			h ¹²⁾¹³⁾			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	58x62	130	95	8	160	190	250	250	210	220	290	340	-	-	-	-	9,5	11,5	-
20	58x62	150	105	8	160	190	250	250	210	220	290	340	-	-	-	-	10,0	12,0	-
25	68x72	160	115	11	160	210	270	270	210	240	310	360	-	-	530	530	11,0	13,0	-
32	90x100	180	140	18	160	210	270	270	210	240	310	360	-	-	530	530	12,5	14,5	-
40	90x100	200	150	18	160	210	270	270	210	240	310	360	-	-	530	530	15,0	17,0	-
50	107x124	230	165	26	-	-	-	-	210	250	320	370	307	-	540	540	-	20,5	26,5
65	132x144	290	185	34	-	-	-	-	210	290	360	410	307	410	580	580	-	28,0	34,0
80	157x187	310	200	40	-	-	-	-	-	-	-	-	307	430	600	600	-	-	40,0
100	Ø226	350	220	56	-	-	-	-	-	-	-	-	307	510	680	680	-	-	54,0
125	Ø258	400	250	72	-	-	-	-	-	-	-	-	307	-	-	-	-	-	68,0

¹²⁾ Add 5 mm for rubber-lined valves

¹³⁾ Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-160-F10	80	210	208	13
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F14	80	355	274	35
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-80.101-F10	30	130	151	6
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.101-F10	30	170	151	8
LAP-ÖF-125.102-F10	30	170	189	9
LAP-ÖF-160.102-F10	45	210	208	13
LAP-ÖF-160.001-F10	45	210	288	13
LAP-ÖF-160.102-F10	60	210	224	14
LAP-ÖF-200.001-F10	60	255	330	23
LAP-ÖF-200.001-F10	80	255	350	25
LAP-ÖF-250.001-F10	60	305	360	37
LAP-ÖF-250.002-F10	60	305	380	32
LAP-ÖF-250.002-F10	80	305	400	35
LAP-ÖF-250.002-F14	80	305	400	39
LAP-ÖF-300.002-F10	60	355	414	51
LAP-ÖF-300.002-F10	80	355	434	52
LAP-ÖF-300.012-F14	80	355	434	52
LAP-ÖF-300.012-F14	80	355	434	53
LAP-ÖF-D250.012-F14	80	305	504	54

Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/spring-to-close				
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F10	80	355	535	70
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.034-F14	80	355	692	89

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125 ¹⁴⁾
Actuator function: air-to-open/air-to-close									
LAD-AZ-100	20	10	10	8	↓	↓	↓	↓	↓
LAD-AZ-150	35	↑	↑	10	10	10	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	↑	↑	10	10	6
Actuator function: spring-to-open/air-to-close									
LAD-ÖF-100.014	20	10	10	7	↓	↓	↓	↓	↓
LAD-ÖF-150.102	35	↑	↑	10	10	10	↓	↓	↓
LAD-ÖF-220.001	56	↑	↑	↑	↑	↑	10	9	6
Actuator function: air-to-open/spring-to-close									
LAD-SF-100.001.5	20	10	10	5	↓	↓	↓	↓	↓
LAD-SF-150.002	35	↑	↑	10	10	6	↓	↓	↓
LAD-SF-220.003.7	56	↑	↑	↑	↑	10	10	5	3
LAD-SF-220.004.7S*	56	↑	↑	↑	↑	↑	↑	7	5

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125 ¹⁴⁾
Actuator function: air-to-open/air-to-close									
LAD-AZ-100	20	8	8	↓	↓	↓	↓	↓	↓
LAD-AZ-150	35	10	10	10	8	2	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	10	10	10	4	↓
Actuator function: spring-to-open/air-to-close									
LAD-ÖF-100.014	20	5	5	↓	↓	↓	↓	↓	↓
LAD-ÖF-150.102	35	10	10	10	6	↓	↓	↓	↓
LAD-ÖF-220.001	56	↑	↑	↑	10	10	10	2	↓
Actuator function: air-to-open/spring-to-close									
LAD-SF-100.001.5	20	2	2	↓	↓	↓	↓	↓	↓
LAD-SF-150.002	35	10	10	8	2	↓	↓	↓	↓
LAD-SF-220.003.7	56	↑	↑	↑	10	10	3	↓	↓
LAD-SF-220.004.7S*	56	↑	↑	↑	↑	↑	6	2	↓

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

¹⁴⁾ Stroke limited to 56 mm

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	10	8	5	2	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	↑	10	10	10	↓	↓	↓	↓
LAP-AZ-125-10	45/60	↑	↑	↑	↑	6	3	↓	↓
LAP-AZ-160-10	45/60	↑	↑	↑	↑	10	6	↓	↓
LAP-AZ-160-10	80	↑	↑	↑	↑	↑	↑	4	2
LAP-AZ-200-10	60/80	↑	↑	↑	↑	↑	10	7	4
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	↑	10	↓
LAP-AZ-250-F14	80	↑	↑	↑	↑	↑	↑	↑	7
LAP-AZ-300-F14	60/80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-80.101-10	15/30	8	5	3	1	↓	↓	↓	↓
LAP-ÖF-125.101-10	15/30	10	10	10	8	↓	↓	↓	↓
LAP-ÖF-160.102-10	45/60	↑	↑	↑	10	10	↓	↓	↓
LAP-ÖF-200.001-10	60/80	↑	↑	↑	↑	↑	9	↓	↓
LAP-ÖF-250.001-F10	60	↑	↑	↑	↑	↑	10	↓	↓
LAP-ÖF-250.002-F10	60/80	↑	↑	↑	↑	↑	↑	7	↓
LAP-ÖF-250.002-F14	80	↑	↑	↑	↑	↑	↑	↓	5
LAP-ÖF-300.002-F10*	60/80	↑	↑	↑	↑	↑	↑	10	7
LAP-ÖF-300.002-F14	80	↑	↑	↑	↑	↑	↑	↑	8
LAP-ÖF-D250.012	80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: air-to-open/spring-to-close									
LAP-SF-80.001.5-10	15	8	↓	↓	↓	↓	↓	↓	↓
LAP-SF-80.001-10	30	↓	5	3	1	↓	↓	↓	↓
LAP-SF-125.002.5-10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-10	30	↑	10	10	6	↓	↓	↓	↓
LAP-SF-160.012-10	30/45	↑	↑	↑	8	↓	↓	↓	↓
LAP-SF-200.003.7-10	45	↑	↑	↑	↑	10	↓	↓	↓
LAP-SF-200.003-10	60/80	↑	↑	↑	↑	↑	6	4	2
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-SF-250.004-F14	80	↑	↑	↑	↑	↑	↑	↓	3
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	↑	↑	9	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	6
LAP-SF-D300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	6

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with PTFE diaphragm

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Actuator size	Stroke	DN 15-25	DN 32-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	6	↓	↓	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	10	10	7	↓	↓	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	10	10	5	↓	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	10	5	3	↓
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	10	10	↓
LAP-AZ-250-F14	80	↑	↑	↑	↑	↑	↑	↑	5
LAP-AZ-300-F14	60/80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-125.101-F10	15/30	10	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.102-F10	30	↑	8	3	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	45/60	↑	10	10	8	2	↓	↓	↓
LAP-ÖF-200.001-F10	60/80	↑	↑	↑	10	10	↓	↓	↓
LAP-ÖF-250.002-F10	60/80	↑	↑	↑	↑	↑	9	6	↓
LAP-ÖF-300.002-F10*	60/80	↑	↑	↑	↑	↑	10	10	↓
LAP-ÖF-300.012-F14	80	↑	↑	↑	↑	↑	↑	↑	7
LAP-ÖF-D250.012	80	↑	↑	↑	↑	↑	↑	↑	10
Actuator function: air-to-open/spring-to-close									
LAP-SF-125.002.5-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	7	↓	↓	↓	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	10	7	↓	↓	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	10	6	↓	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	↑	10	5	↓	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	↑	10	↓	↓	↓
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	4	2	↓
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↑	↑	↑	3

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-KBS

PN10
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-KBS



Main applications

- Mining
- Chemical industry
- Drainage
- Drainage systems
- Descaling units
- Solids transport
- Industrial recirculation systems
- Sewage treatment plants
- Condensate transport
- Paint shops
- Paper and cellulose industry
- Refineries
- Flue gas desulphurisation
- Sludge disposal
- Sludge processing
- Process engineering
- Water treatment
- Sugar industry

Fluids handled

- Abrasive fluids
- Waste water with faeces
- Faecal-free waste water

- Aggressive fluids
- Inorganic fluids
- Activated sludge
- Brackish water
- Service water
- Distillate
- Digested sludge
- Solids-laden fluids
- Solids (ores, sand, gravel, ash)
- River, lake and groundwater
- Toxic fluids
- Corrosive fluids
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Polymerising/crystallising fluids
- Raw sludge
- Lubricants
- Grey water
- Brine
- Dipping paints
- Other fluids on request.

Operating data

Characteristic	Value
Nominal pressure	PN 10
Nominal size	DN 15-200
Max. permissible pressure	10 bar
Max. permissible temperature ¹⁾	+140 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10

¹⁾ The temperatures indicated are for orientation only; they are not valid for all operating conditions.

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure $P_{ctr. perm.}$ bar
D250 ²⁾	F14	5,5 - 10
D300 ²⁾	F14	5,5 - 7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Body materials

Overview of available materials

Material	Material number	Temperature limit ¹⁾
EN-GJL-250	5.1301	-10 °C to +140 °C
EN-GJS-400-18-LT	5.3103	-20 °C to +140 °C

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Shut-off and sealing to atmosphere by diaphragm
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).

Variants

- Actuator (electric or pneumatic)
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Body coated with PA (Rilsan); temperature limit +90 °C³⁾
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of CSM; temperature limit +100 °C
- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C

- Certification to customer specification

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- **Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Low flow resistance coefficient**
Streamlined straight-through type body design
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**

²⁾ Double piston

³⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.

▪ **Fast checking of valve position**

The valve's position can be easily checked via a clear visual indicator, also visible from a distance.

▪ **Reliable operation**

The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	7,2	65	205,0
20	12,2	80	284,0
25	32,0	100	504,0
32	45,0	125	792,0
40	64,0	150	1440,0
50	108,0	200	2210,0

Pressure/temperature ratings

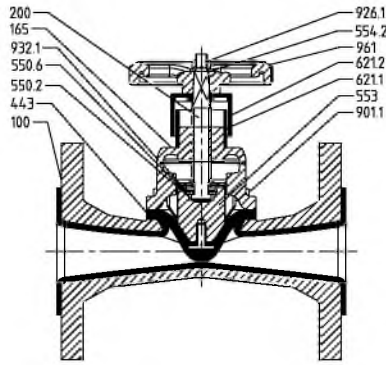
Permissible operating pressures in bar at temperatures in °C (to EN 1092-2)⁴⁾

Nominal pressure	Material	DN	-20	-10 to +100	+140
10	5.1301	15-100	-	10	6
		125-150		6	2
		200		3,5	2
	5.3103	15-100	10	10	6
		125-150	6	6	2
		200	3,5	3,5	2

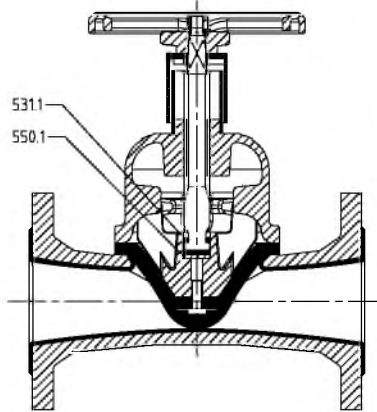
⁴⁾ Intermediate temperatures can be derived by linear interpolation.

Materials

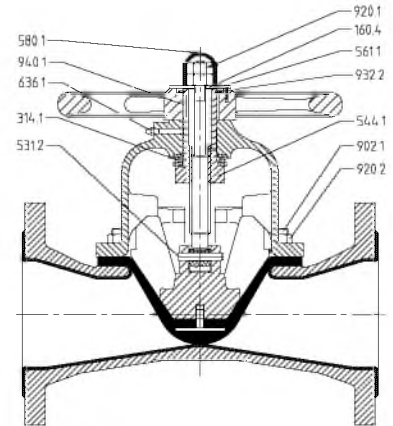
SISTO-KBS manually operated valve



DN 15-40 design



DN 50-100 design



DN 125-200 design

Parts list

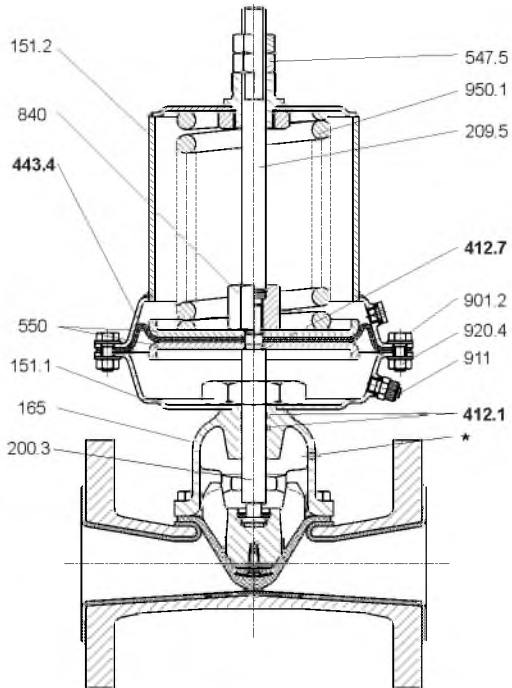
Part No.	Description	Material	Material number	Note
100	Body ⁵⁾	EN-GJL-250	5.1301	
160.4	Handwheel cover	EN-GJL-200	5.1300	For DN 125-200
165	Bonnet	EN-GJL-250	5.1301	
200	Stem	X14CrMoS17	1.4104	
314.1	Thrust bearing	Steel		For DN 125-200
443 ⁶⁾	Diaphragm	EPDM		
531.1	Locking sleeve	Spring steel		For DN 125-200
531.2	Locking sleeve	Spring steel		For DN 50-100
544.1	Threaded bush	EN-GJS-400-16-LT	5.3103	For DN 125-200
550.1	Bearing disc	Steel		For DN 50-100
550.2	PTFE disc	PTFE/graphite		For DN 15-100
550.6	Segmental disc	A2		For DN 15-40
553	Compressor	EN-GJL-250	5.1301	5.3106 for DN 15-20
554.2	Washer	StA2E		For DN 15-100
561.1	Grooved pin	4.6		For DN 125-200
580.1	Cap	PE		For DN 125-200
621.1	Position indicator, lower part	ASA Luran		For DN 25-100
621.2	Position indicator, upper part	ASA Luran		For DN 15-100
636.1	Lubricating nipple	Steel		For DN 125-200
901.1	Hexagon head bolt	A2-70		For DN 15-80
902.1	Stud	A2-70		For DN 100-200
920.1	Nut	A2-70		For DN 100-200
920.2	Nut	A2-70		For DN 100-200
926.1	Prevailing torque nut	A2-70		For DN 15-100
932.1	Circlip	Spring steel		For DN 15-40
932.2	Circlip	Spring steel		For DN 125-200
940.1	Parallel key	St50K		For DN 125-200
961	Handwheel	EN-GJL-200	5.1300	For DN 15-20: PC

⁵⁾ Bodies of some nominal sizes available in 5.3103 only

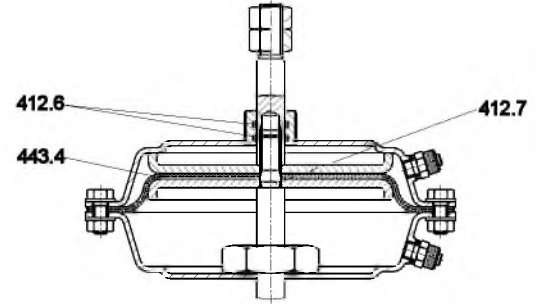
⁶⁾ Recommended spare parts

Materials

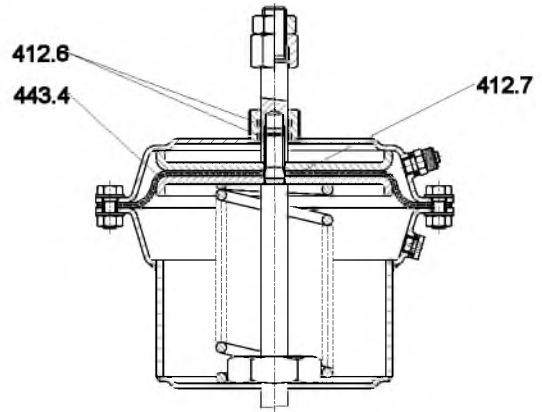
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

Parts list

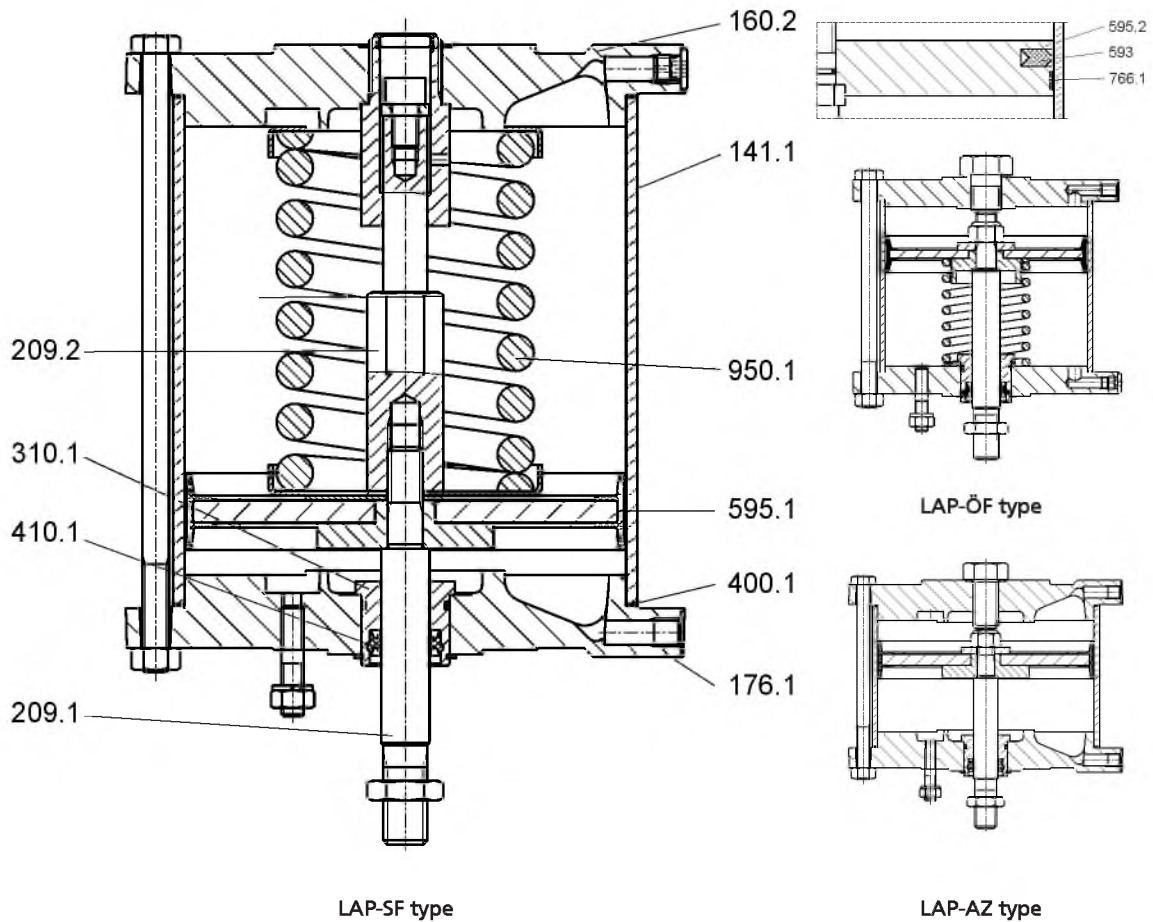
Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/RN		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	NBR		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
840	Coupling	X14CrMoS17	1.4104	
901.2	Hexagon head bolt	8.8 A2E		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

* = shown offset by 90°

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



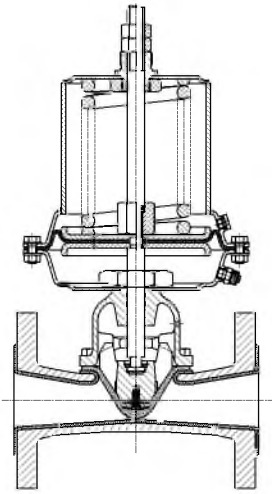
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

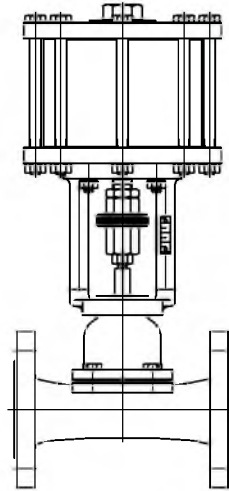
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

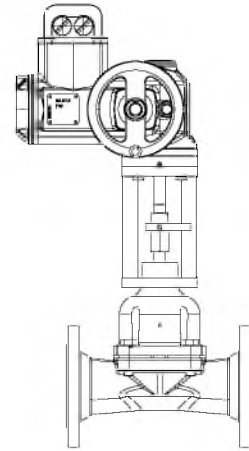
SISTO-KBS



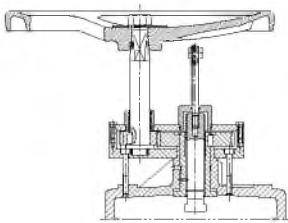
With SISTO-LAD



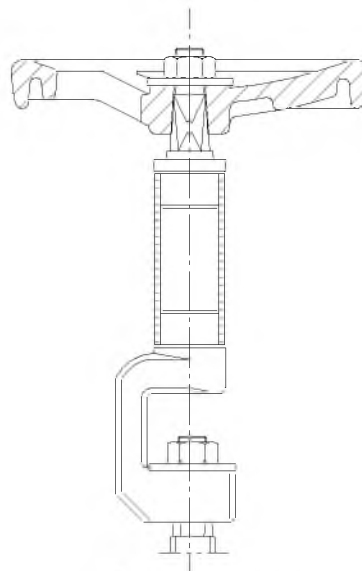
With SISTO-LAP



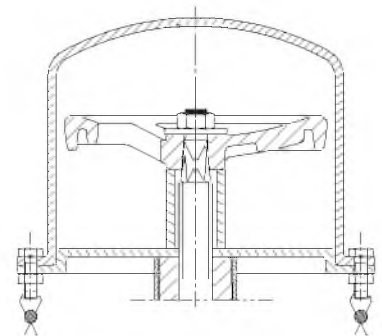
With electric actuator



Gearbox



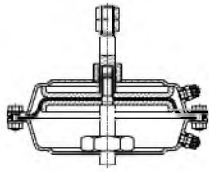
Stem extension



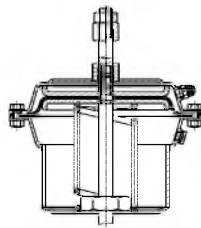
Lead-sealable cap

Variants

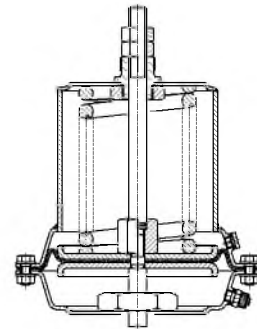
SISTO-LAD diaphragm actuator and accessories



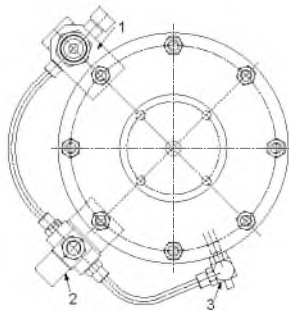
LAD-AZ type



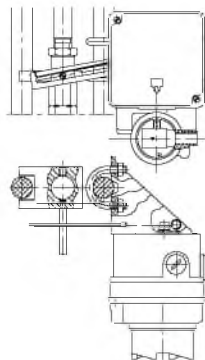
LAD-ÖF type



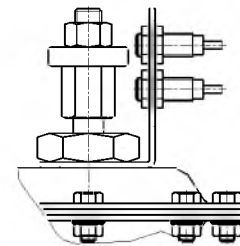
LAD-SF type



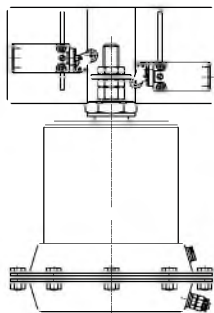
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



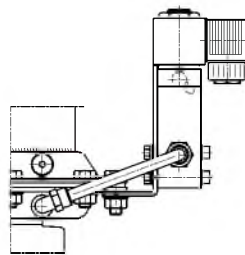
Configuration with positioner



Configuration with proximity sensor



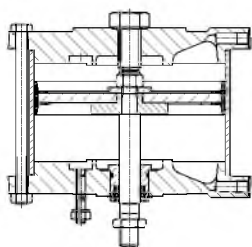
Configuration with mechanical limit switches



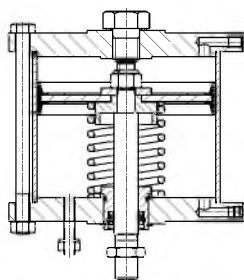
Configuration with solenoid valve

Variants

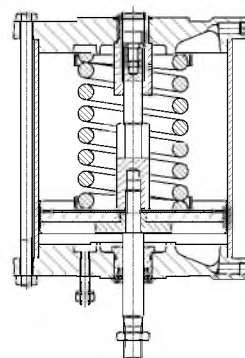
SISTO-LAP piston actuator and accessories



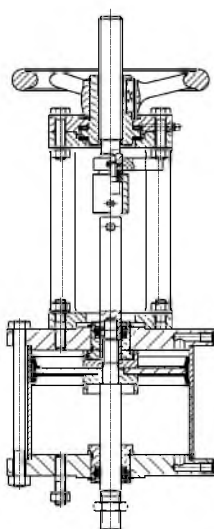
LAP-AZ type



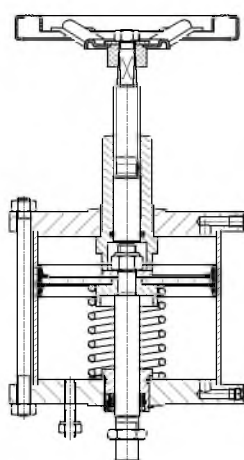
LAP-ÖF type



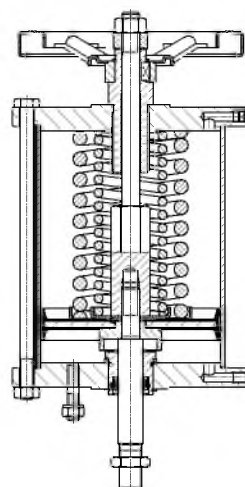
LAP-SF type



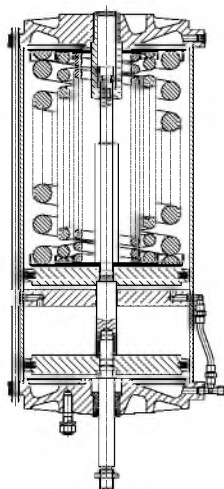
LAP-AZ type
with emergency handwheel



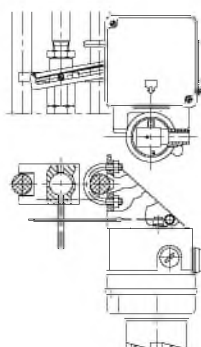
LAP-ÖF type
with emergency handwheel



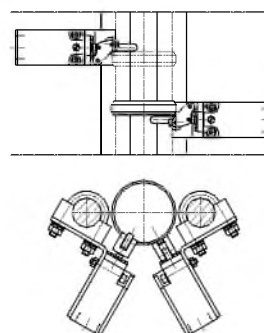
LAP-SF type
with emergency handwheel



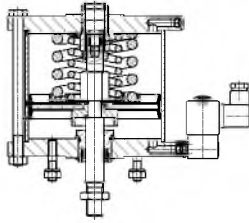
LAP-SF type
Double piston



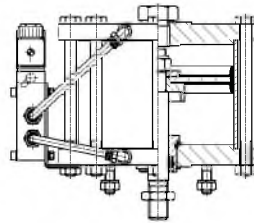
Configuration with
positioner



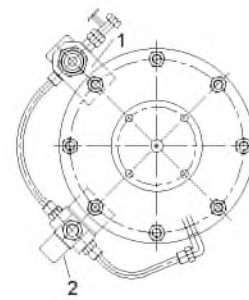
Configuration with position
switches



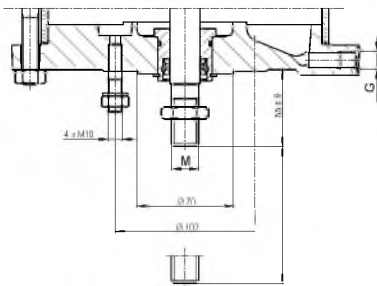
LAP-SF type with 3/2 directional control valve



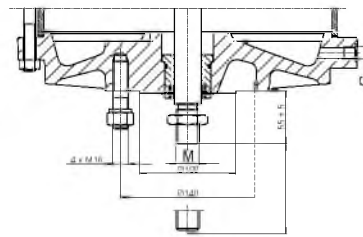
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons Ø 300/F14 (optional)

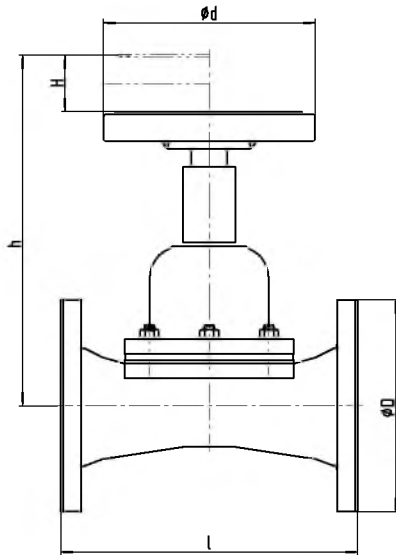
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

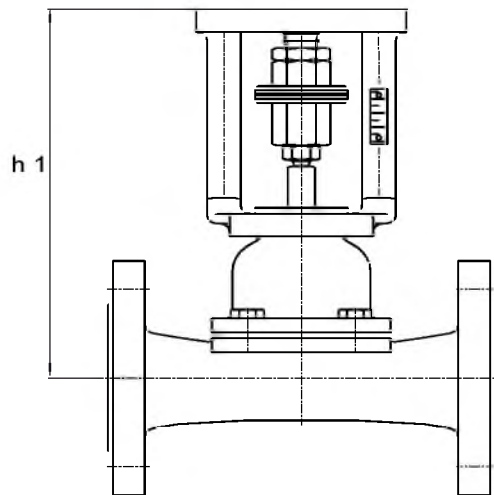
⁹⁾ See "Symbols key" table

Dimensions

SISTO-KBS manually operated valve



Manually operated valve



Diaphragm valve prepared for SISTO-LAP
piston actuator
and electric actuator

Dimensions in mm

DN	Diaphragm	l ¹⁰⁾	Ø D	H	Manually operated valve				Prepared for actuator	
					h ¹¹⁾	Ø d	Handwheel turns	[kg]	Centre-to-top height h ¹¹⁾	Top flange
15	70 x 46	108	95	9	93	63	3	1,9	216	F10
20	70 x 46	117	105	9	93	63	3	2,5	216	F10
25	86 x 67	127	115	21	155	100	7	3,5	235	F10
32	86 x 67	146	140	21	155	100	7	4,9	235	F10
40	86 x 67	159	150	21	155	100	7	5,4	235	F10
50	111 x 86	190	165	33	220	125	8	9,1	300	F10
65	136 x 108	216	185	45	280	200	11	13,5	337	F10
80	169 x 134	254	200	46	320	200	11	19,3	362	F10
100	Ø 198	305	220	59	370	250	11	26,4	382	F10
125	Ø 230	356	250	73	360	320	15	41,7	444	F10
150	Ø 285	406	285	95	440	400	19	58,1	511	F10/F14
200	Ø 337	521	340	114	560	500	23	92,8	623	F10/F14

Mating dimensions - Standards

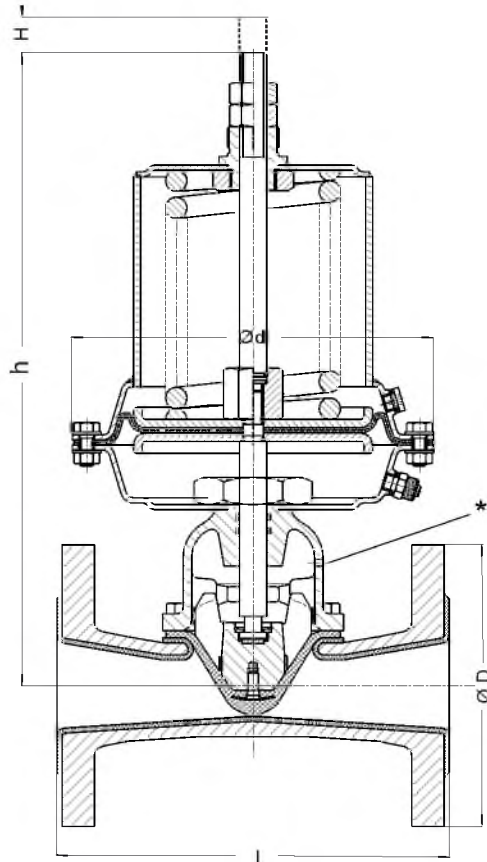
Face-to-face length: EN 558-1 R7
 Flange dimensions: ASME B 16.5-2013 Cl. 150
 DIN EN 1092-2
 Flange facing: ASME B 16.5-2013 Cl. 150-FF
 DIN EN 1092-2 Form B

¹⁰⁾ Add 6 mm for rubber-lined valves

¹¹⁾ Add 5 mm for rubber-lined valves

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

DN	Diaphragm	L ¹²⁾	Ø D	H	Ø d			h			Ø d			h			[kg]			
					100			150			220			LAD-SF type						
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220	
15	70 x 46	108	95	9	160	200	260	260	210	230	300	350	-	-	-	-	-	9,5	11,5	-
20	70x 46	117	105	9	160	200	260	260	210	230	300	350	-	-	-	-	-	10,0	12,0	-
25	86 x 67	127	115	21	160	220	280	280	210	250	320	370	307	370	540	540	11,0	13,0	19,0	
32	86 x 67	146	140	21	160	220	280	280	210	250	320	370	307	370	540	540	12,5	14,5	20,5	
40	86 x 67	159	150	21	160	220	280	280	210	250	320	370	307	370	540	540	15,0	17,0	23,0	
50	111 x 86	190	165	33	-	-	-	-	210	260	330	380	307	380	550	550	-	20,5	26,5	
65	136 x 108	216	185	45	-	-	-	-	-	-	-	-	307	420	590	590	-	-	34,0	
80	169 x 134	254	200	46	-	-	-	-	-	-	-	-	307	445	615	615	-	-	40,0	
100	Ø 198	305	220	59	-	-	-	-	-	-	-	-	307	525	695	695	-	-	54,0	

* = shown offset by 90°

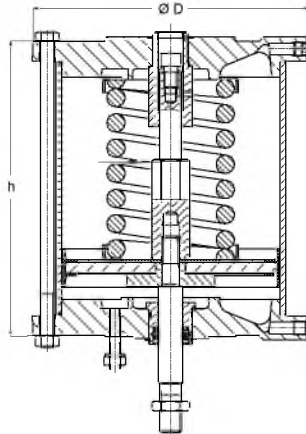
12) Add 6 mm for rubber-lined valves

13) Add 5 mm for rubber-lined valves

14) Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	45	255	190	18
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	31
LAP-AZ-250-F10	80	305	260	32
LAP-AZ-250-F14	100	305	280	34
LAP-AZ-300-F14	100	355	294	44
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.102-F10	30	170	171	6
LAP-ÖF-160.102-F10	30	210	188	11
LAP-ÖF-200.001-F10	45	255	310	21
LAP-ÖF-200.001-F10	60	255	330	22
LAP-ÖF-250.001-F10	45	305	340	35
LAP-ÖF-250.001-F10	60	305	360	36
LAP-ÖF-250.002-F10	80	305	400	35
LAP-ÖF-300.002-F10	80	355	434	52
LAP-ÖF-D250.012-F14	100	305	524	55
Actuator function: air-to-open/spring-to-close				
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F10	80	355	535	70
LAP-SF-D300.035-F14	100	355	812	127

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25-40	DN 50	DN 65	DN 80	DN 100
Actuator function: air-to-open/air-to-close							
LAD-AZ-100	20	4	3	↓	↓	↓	↓
LAD-AZ-150	35	10	10	10	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	10	7	6
Actuator function: spring-to-open/air-to-close							
LAD-ÖF-100.014	20	4	2	↓	↓	↓	↓
LAD-ÖF-150.102	35	10	9	8	↓	↓	↓
LAD-ÖF-220.001	56	↑	10	10	10	7	5
Actuator function: air-to-open/spring-to-close							
LAD-SF-100.001.5	20	3	↓	↓	↓	↓	↓
LAD-SF-150.002	35	10	8	5	↓	↓	↓
LAD-SF-220.003.7	56	↑	10	10	7	4	2
LAD-SF-220.004.7S*	56	↑	↑	↑	10	9	5

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

Elastomer diaphragm

Actuator size	Stroke	DN 15-20	DN 25-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	4	3	↓	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	10	10	10	↓	↓	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	3	↓	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	8	5	3	↓	↓
LAP-AZ-200-F10	45	↑	↑	↑	10	10	↓	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	↑	7	3	↓
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-AZ-250-F14	100	↑	↑	↑	↑	↑	↑	↑	3
LAP-AZ-300-F14	100	↑	↑	↑	↑	↑	↑	↑	6
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-80.101-F10	15	3	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.101-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.102-F10	30	↑	10	6	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	30	↑	↑	10	↓	↓	↓	↓	↓
LAP-ÖF-200.001-F10	45/60	↑	↑	↑	10	8	5	↓	↓
LAP-ÖF-250.001-F10	45/60	↑	↑	↑	↑	10	10	↓	↓
LAP-ÖF-250.002-F10	80	↑	↑	↑	↑	↑	↑	5	↓
LAP-ÖF-300.002-F10*	80	↑	↑	↑	↑	↑	↑	6	↓
LAP-ÖF-D250.012-F14	100	↑	↑	↑	↑	↑	↑	↑	6
Actuator function: air-to-open/spring-to-close									
LAP-SF-125.002.5-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	7	3	↓	↓	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	10	10	2	↓	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	↑	7	5	↓	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	10	9	↓	↓	↓
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	6	↓	↓
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	10	10	6	↓
LAP-SF-D300.035-F14	100	↑	↑	↑	↑	↑	↑	↑	6

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Diaphragm Valve

SISTO-KB

PN10
Maintenance-free
With or without Lining
Flanged Ends
With Handwheel or Actuator

Type Series Booklet



SISTO

Diaphragm Valves

Soft-seated Glandless Diaphragm Valves

SISTO-KB



Main applications

- Mining
- Chemical industry
- Drainage
- Drainage systems
- Descaling units
- Solids transport
- Industrial recirculation systems
- Sewage treatment plants
- Condensate transport
- Paint shops
- Paper and cellulose industry
- Refineries
- Flue gas desulphurisation
- Sludge disposal
- Sludge processing
- Process engineering
- Water treatment
- Sugar industry

Fluids handled

- Abrasive fluids
- Waste water with faeces
- Faecal-free waste water

- Aggressive fluids
- Inorganic fluids
- Activated sludge
- Brackish water
- Service water
- Distillate
- Digested sludge
- Solids-laden fluids
- Solids (ores, sand, gravel, ash)
- River, lake and groundwater
- Toxic fluids
- Corrosive fluids
- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Polymerising/crystallising fluids
- Raw sludge
- Lubricants
- Grey water
- Brine
- Dipping paints
- Other fluids on request.

Operating data

Characteristic	Value
Nominal pressure	PN 10
Nominal size	DN 15-200
Max. permissible pressure	10 bar
Max. permissible temperature ¹⁾	+140 °C

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10

¹⁾ The temperatures indicated are for orientation only; they are not valid for all operating conditions.

Piston diameter mm	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure $P_{ctr. perm.}$ bar
D250 ²⁾	F14	5,5 - 10
D300 ²⁾	F14	5,5 - 7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJL-250	5.1301	-10 °C to +140 °C
EN-GJS-400-18-LT	5.3103	-20 °C to +140 °C
GX5CrNiMo 19-11-2	1.4408 ³⁾	-20 °C to +140 °C

Design details

Diaphragm valve design

- Soft-seated shut-off valve in straight-way pattern
- Shut-off and sealing to atmosphere by diaphragm
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- Valves without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Components such as electric actuators, position switches, block terminals, solenoid valves etc. may in certain circumstances be covered by Article 1 of the EC Directive 94/9/EC. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC declaration of conformity or manufacturer's declaration).

Variants

- Actuator (electric or pneumatic)
- Body lined with IIR (Butyl); temperature limit: +120 °C
- Body lined with NRH (hard rubber); temperature limit: +100 °C
- Body coated with ECTFE (Halar); temperature limit +90 °C
- Body coated with PA (Rilsan); temperature limit +90 °C⁴⁾
- Diaphragm made of EPDM; temperature limit +140 °C
- Diaphragm made of CSM; temperature limit +100 °C

²⁾ Double piston

³⁾ DN 50, DN 80, DN 100 only

⁴⁾ Temperatures of +90 °C for periods of up to one hour resulting from one-off incorrect system operation will not impair the valve's functioning.

- Diaphragm made of IIR; temperature limit +120 °C
- Diaphragm made of NBR; temperature limit +90 °C
- Certification to customer specification

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stop in the actuator for closed and open positions
- Manual override available as standard for spring-to-close design
- LAD-AZ actuator type: air-to-open/air-to-close
- LAD-ÖF actuator type: spring-to-open/air-to-close
- LAD-SF actuator type: air-to-open/spring-to-close

SISTO-LAP piston actuator

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- Reliable sealing to atmosphere and absolutely tight shut-off**
The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- Low flow resistance coefficient**
Streamlined straight-through type body design
- Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- Smooth actuation**
The thrust bearing minimises the closing torques.
- Optimised long-term operation**

The stem protection integrated in the position indicator prevents ingress of contaminants.

▪ **Fluid purity**

Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.

▪ **Fast checking of valve position**

The valve's position can be easily checked via a clear visual indicator, also visible from a distance.

▪ **Reliable operation**

The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

- Operating manual 0570.821
- Type series booklet SISTO-LAP (pneumatic actuators) 9210.1

On all enquiries/orders please specify

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet

11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

Flow characteristics

Flow coefficients for unlined valves

DN	Kvs value [m³/h]	DN	Kvs value [m³/h]
15	7,2	65	205,0
20	12,2	80	284,0
25	32,0	100	504,0
32	45,0	125	792,0
40	64,0	150	1440,0
50	108,0	200	2210,0

Pressure/temperature ratings

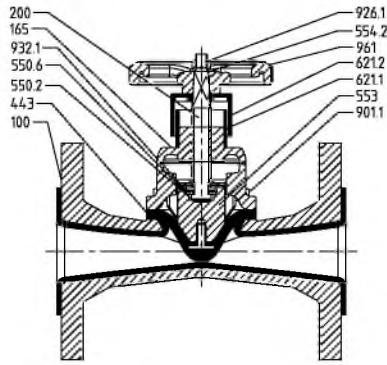
Permissible operating pressures in bar at temperatures of °C (to EN 1092-2/ EN 1092-1)⁵⁾

Nominal pressure	Material	DN	-20	-10 to +100	+140
10	5.1301	15-100	-	10	6
		125-150		6	2
		200		3,5	2
	5.3103	15-100	10	10	6
		125-150	6	6	2
		200	3,5	3,5	2
	1.4408	50-100	10	10	-

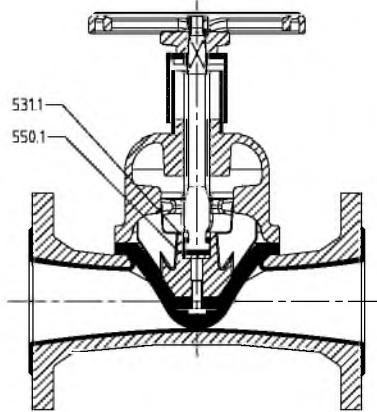
⁵⁾ Intermediate temperatures can be derived by linear interpolation.

Materials

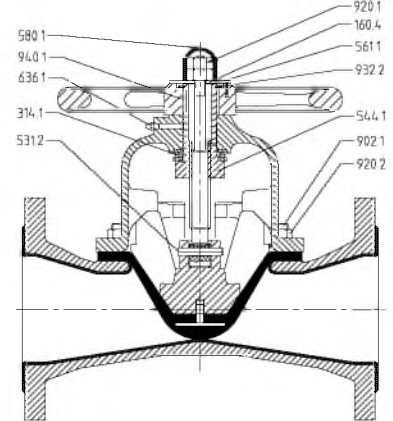
SISTO-KB manually operated valve



DN 15-40 design



DN 50-100 design



DN 125-200 design

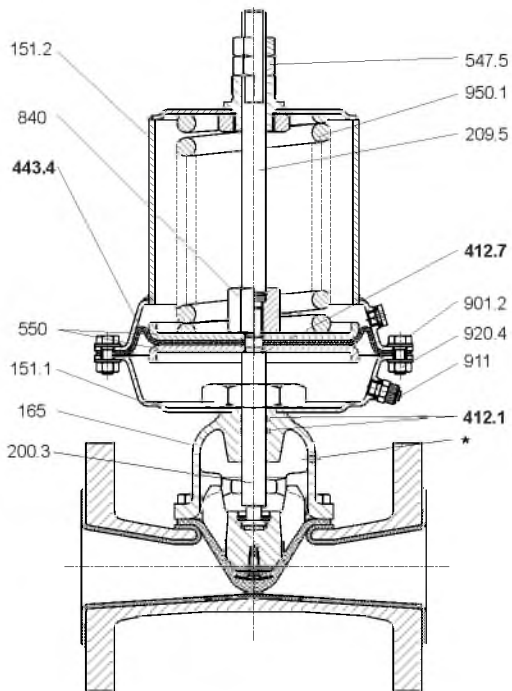
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	
160.4	Handwheel cover	EN-GJL-200	5.1300	For DN 125-200
165	Bonnet	EN-GJL-250	5.1301	
200	Stem	X14CrMoS17	1.4104	
314.1	Thrust bearing	Steel		For DN 125-200
443 ⁶⁾	Diaphragm	EPDM		
531.1	Locking sleeve	Spring steel		For DN 125-200
531.2	Locking sleeve	Spring steel		For DN 50-100
544.1	Threaded bush	EN-GJS-400-18-LT	5.3103	For DN 125-200
550.1	Bearing disc	Steel		For DN 50-100
550.2	PTFE disc	PTFE/graphite		For DN 15-100
550.6	Segmental disc	A2		For DN 15-40
553	Compressor	EN-GJL-250	5.1301	5.3106 for DN 15-20
554.2	Washer	StA2E		For DN 15-100
561.1	Grooved pin	4.6		For DN 125-200
580.1	Cap	PE		For DN 125-200
621.1	Position indicator, lower part	ASA Luran		For DN 25-100
621.2	Position indicator, upper part	ASA Luran		For DN 15-100
636.1	Lubricating nipple	Steel		For DN 125-200
901.1	Hexagon head bolt	A2-70		For DN 15-80
902.1	Stud	A2-70		For DN 100-200
920.1	Nut	A2-70		For DN 100-200
920.2	Nut	A2-70		For DN 100-200
926.1	Prevailing torque nut	A2-70		For DN 15-100
932.1	Circlip	Spring steel		For DN 15-40
932.2	Circlip	Spring steel		For DN 125-200
940.1	Parallel key	St50K		For DN 125-200
961	Handwheel	EN-GJL-200	5.1300	For DN 15-20: PC

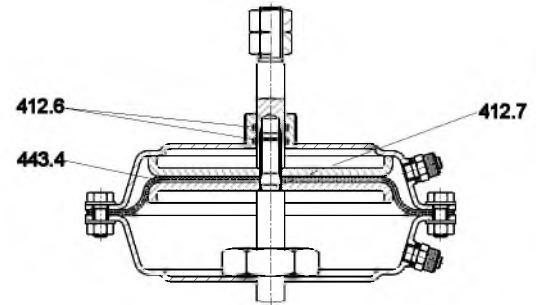
⁶⁾ Recommended spare parts

Materials

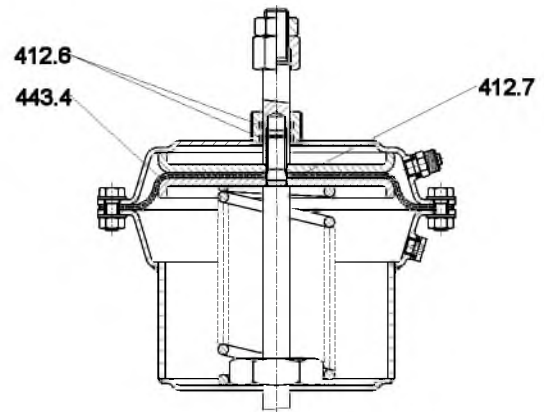
SISTO-LAD diaphragm actuator



LAD-SF type



LAD-AZ type



LAD-ÖF type

Parts list

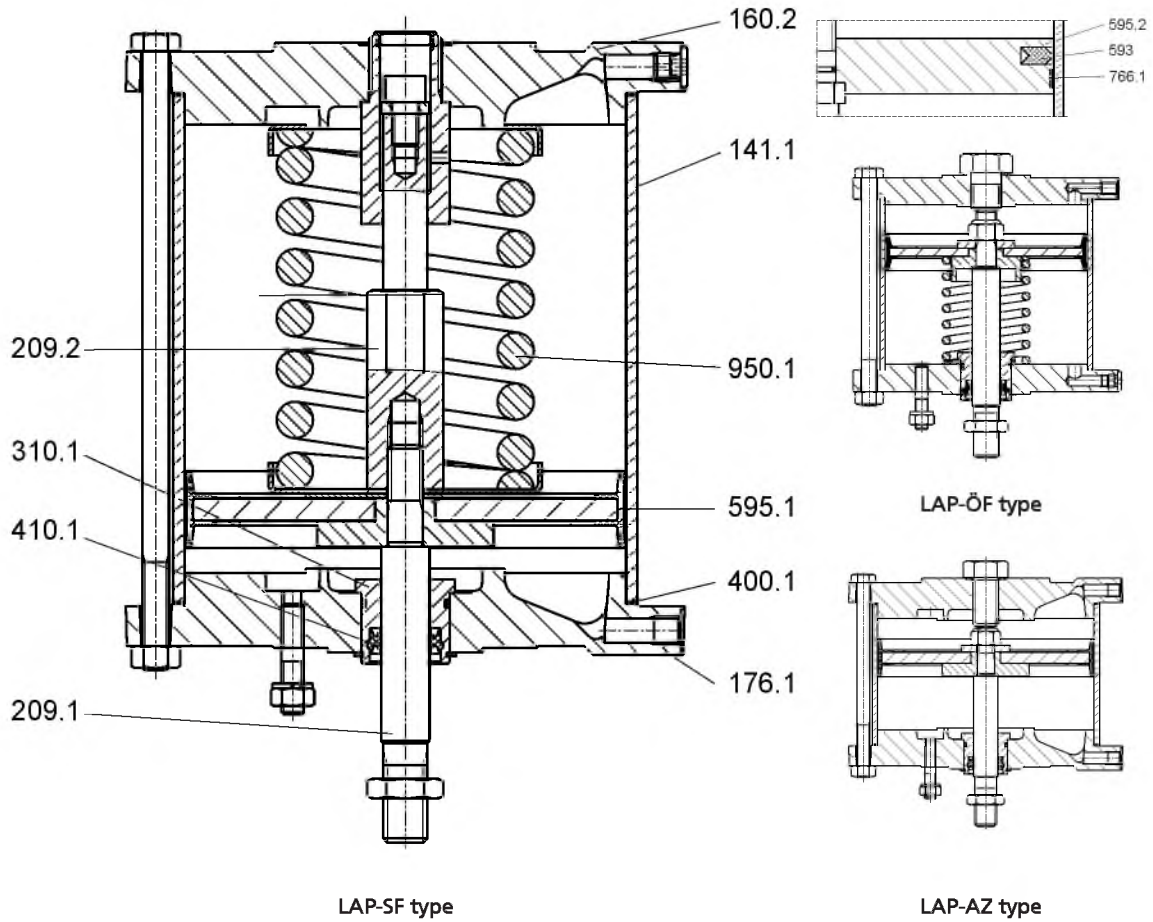
Part No.	Description	Material	Material number	Note
151.1	Lower housing section	St 37/RN		
151.2	Upper housing section	St 37/RN		
165	Bonnet	EN-GJS-400-18-LT	5.3103	
200.3	Stem	X14CrMoS17	1.4104	
209.5	Piston rod	X14CrMoS17	1.4104	
412.1 ⁷⁾	O-ring	NBR		
412.6 ⁷⁾	O-ring	NBR		
412.7 ⁷⁾	O-ring	NBR		
443.4 ⁷⁾	Actuator diaphragm	NBR		
547.5	Guide bush	SoMs59		
550	Diaphragm plate	St 37/galvanised		
840	Coupling	X14CrMoS17	1.4104	
901.2	Hexagon head bolt	8.8 A2E		
911	Compressed air port	Brass		For 8 x 1 PA hose
920.4	Nut	A2-70		
950.1	Spring	Spring steel		

* = shown offset by 90°

⁷⁾ Recommended spare parts

Materials

SISTO-LAP piston actuator



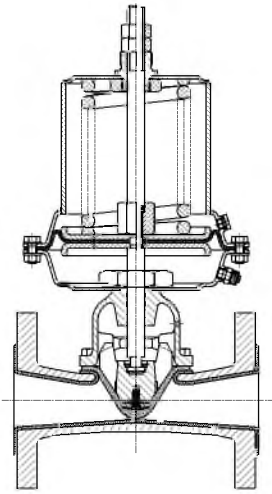
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ⁸⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ⁸⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ⁸⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ⁸⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ⁸⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

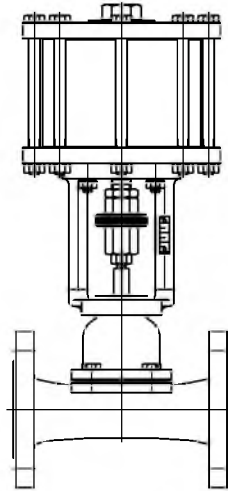
⁸⁾ Recommended spare parts (= complete set of sealing elements)

Variants

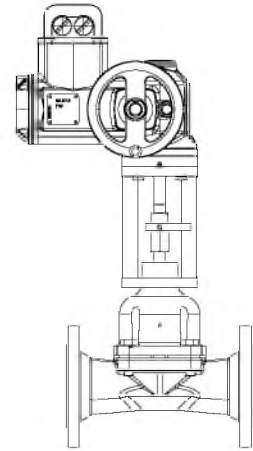
SISTO-10



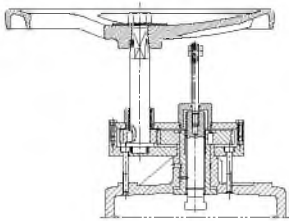
With SISTO-LAD



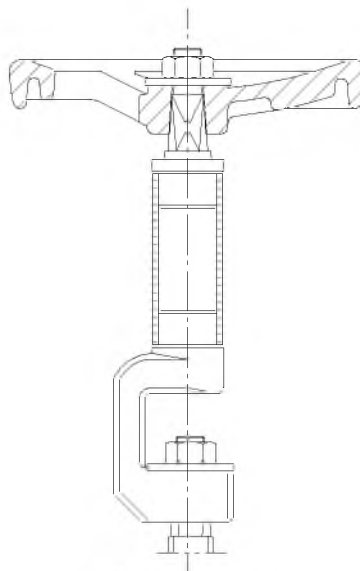
With SISTO-LAP



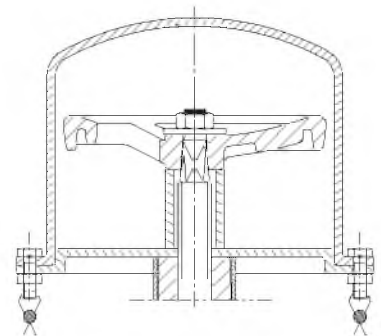
With electric actuator



Gearbox



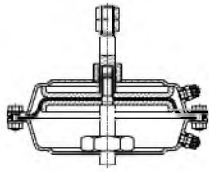
Stem extension



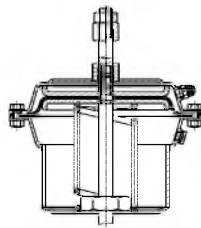
Lead-sealable cap

Variants

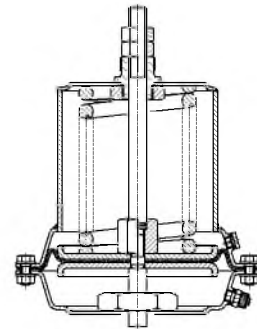
SISTO-LAD diaphragm actuator and accessories



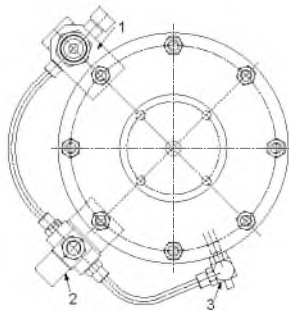
LAD-AZ type



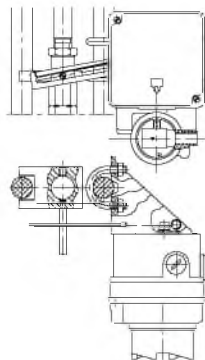
LAD-ÖF type



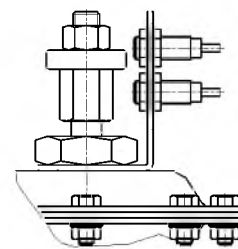
LAD-SF type



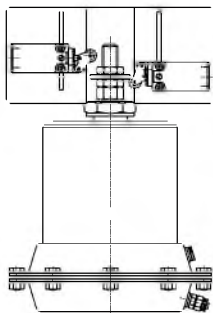
- 1) Filter/pressure reducer
- 2) Solenoid valve
- 3) Throttling valve



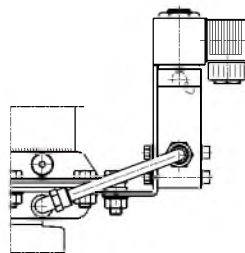
Configuration with positioner



Configuration with proximity sensor



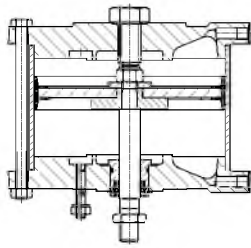
Configuration with mechanical limit switches



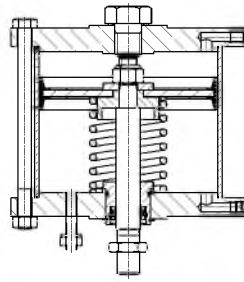
Configuration with solenoid valve

Variants

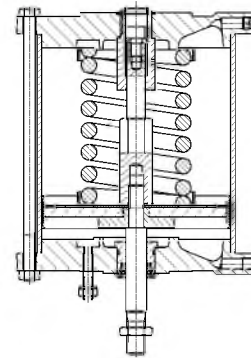
SISTO-LAP piston actuator and accessories



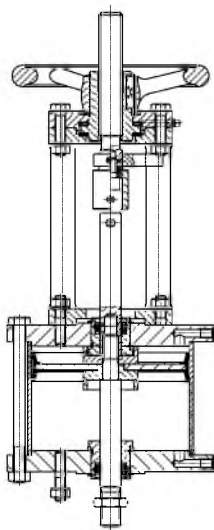
LAP-AZ type



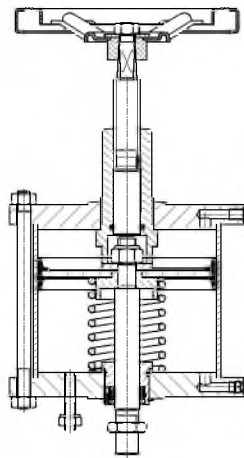
LAP-ÖF type



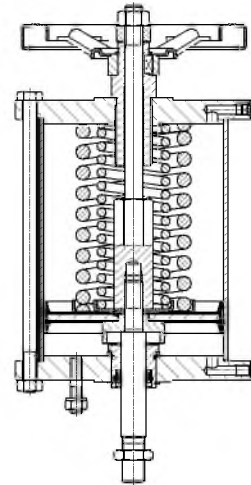
LAP-SF type



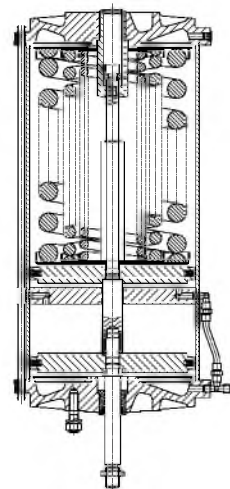
LAP-AZ type
with emergency handwheel



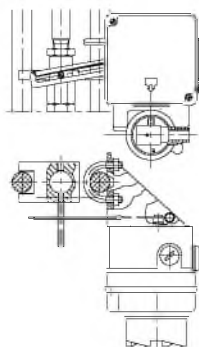
LAP-ÖF type
with emergency handwheel



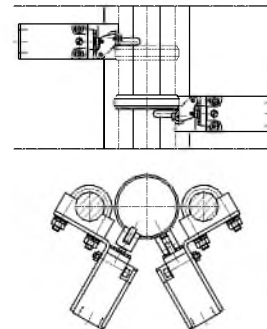
LAP-SF type
with emergency handwheel



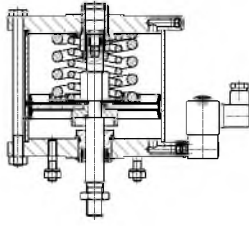
LAP-SF type
Double piston



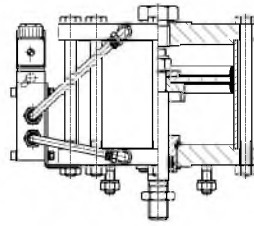
Configuration with
positioner



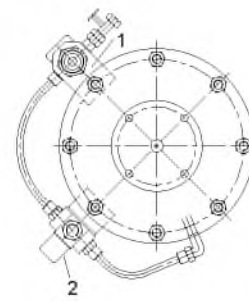
Configuration with position
switches



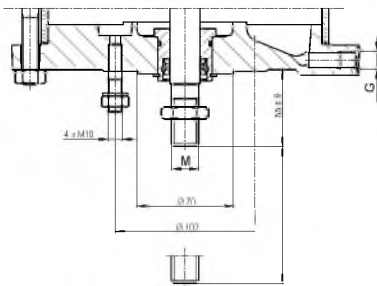
LAP-SF type with 3/2 directional control valve



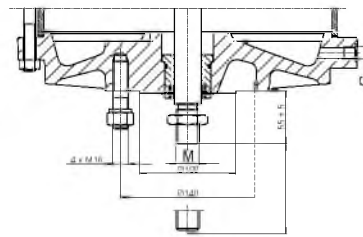
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁹⁾



Flange connection F14⁹⁾

Symbols key

Symbol	Description
G	G1/8" for pistons Ø 80/125/160 G1/4" for pistons Ø 200/250/300
M	M12 for pistons Ø 80/125 M20 for pistons Ø 160 to 300 M24 for pistons DØ 300/F14 (optional)

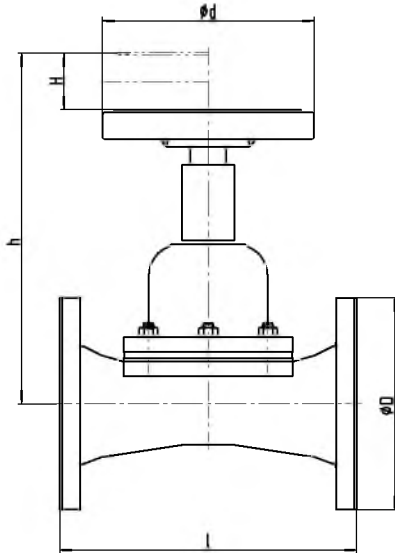
Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228 G1/8" and G1/4"

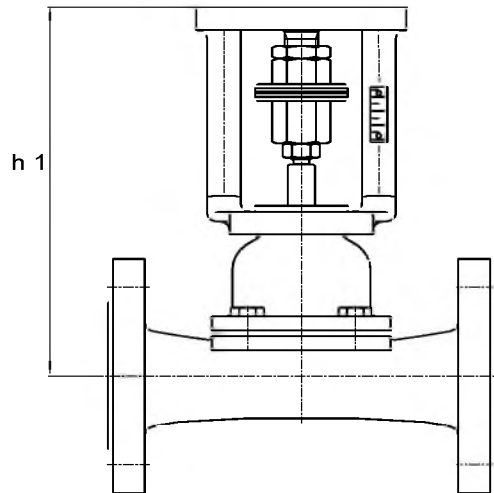
⁹⁾ See "Symbols key" table

Dimensions

SISTO-KB manually operated valve



Manually operated valve



Diaphragm valve prepared for SISTO-LAP
piston actuator
and electric actuator

Dimensions in mm

DN	Diaphragm	l	Ø D	H	Manually operated valve				Prepared for actuator	
					h ¹⁰⁾	Ø d	Handwheel turns	[kg]	Centre-to-top height h ¹⁰⁾	Top flange
15	70 x 46	130	95	9	93	63	3	2,5	216	F10
20	70 x 46	150	105	9	93	63	3	3,1	216	F10
25	86 x 67	160	115	21	155	100	7	4,6	235	F10
32	86 x 67	180	140	21	155	100	7	5,7	235	F10
40	86 x 67	200	150	21	155	100	7	7,3	235	F10
50	111 x 86	230	165	33	220	125	8	10,5	300	F10
65	136 x 108	290	185	45	280	200	11	16,7	337	F10
80	169 x 134	310	200	46	320	200	11	23,0	362	F10
100	Ø 198	350	220	59	370	250	11	30,5	382	F10
125	Ø 230	400	250	73	360	320	15	47,3	444	F10
150	Ø 285	480	285	95	440	400	19	68,4	511	F10/F14
200	Ø 337	600	340	114	560	500	23	102,4	623	F10/F14

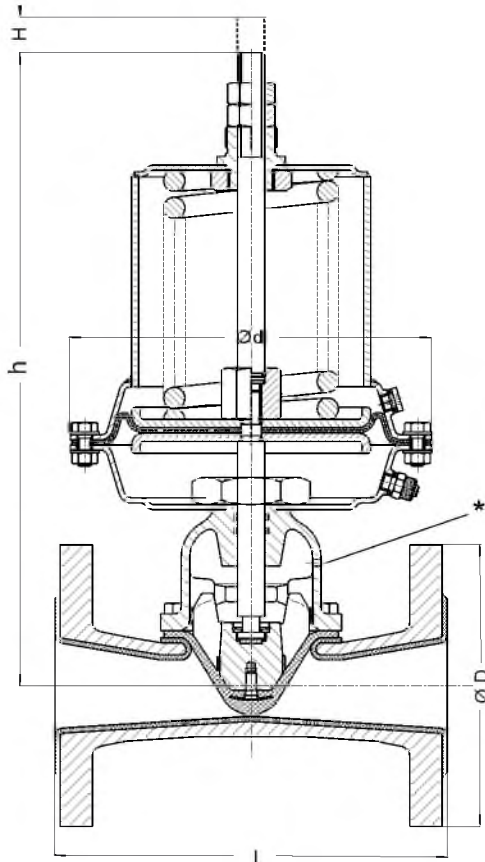
Mating dimensions - Standards

Face-to-face length: EN 558-1 R1
 Flange dimensions: DIN EN 1092-2
 Flange facing: DIN EN 1092-2 type B

¹⁰⁾ Add 5 mm for rubber-lined valves

Dimensions

SISTO-LAD diaphragm actuator



Dimensions in mm

DN	Diaphragm	l	Ø D	H	Ø d			h			Ø d			h			[kg]		
					100			150			220			LAD-SF type					
					AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	AZ/ÖF/SF	AZ	ÖF	SF	100	150	220
15	70 x 46	130	95	9	160	200	260	260	210	230	300	350	-	-	-	9,5	11,5	-	
20	70x 46	150	105	9	160	200	260	260	210	230	300	350	-	-	-	10,0	12,0	-	
25	86 x 67	160	115	21	160	220	280	280	210	250	320	370	307	370	540	540	11,0	13,0	19,0
32	86 x 67	180	140	21	160	220	280	280	210	250	320	370	307	370	540	540	12,5	14,5	20,5
40	86 x 67	200	150	21	160	220	280	280	210	250	320	370	307	370	540	540	15,0	17,0	23,0
50	111 x 86	230	165	33	-	-	-	-	210	260	330	380	307	380	550	550	-	20,5	26,5
65	136 x 108	290	185	45	-	-	-	-	-	-	-	307	420	590	590	-	-	34,0	
80	169 x 134	310	200	46	-	-	-	-	-	-	-	307	445	615	615	-	-	40,0	
100	Ø 198	350	220	59	-	-	-	-	-	-	-	307	525	695	695	-	-	54,0	

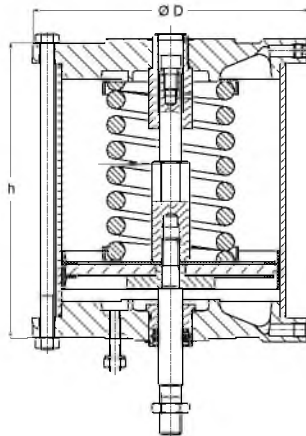
* = shown offset by 90°

11) Add 5 mm for rubber-lined valves

12) Add 50 mm for limit switch configuration

Dimensions

SISTO-LAP piston actuator



Type	Stroke	Ø D	h	[kg]
Actuator function: air-to-open/air-to-close				
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	45	255	190	18
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	31
LAP-AZ-250-F10	80	305	260	32
LAP-AZ-250-F14	100	305	280	34
LAP-AZ-300-F14	100	355	294	44
Actuator function: spring-to-open/air-to-close				
LAP-ÖF-80.101-F10	15	130	151	5
LAP-ÖF-125.101-F10	15	170	151	7
LAP-ÖF-125.102-F10	30	170	171	6
LAP-ÖF-160.102-F10	30	210	188	11
LAP-ÖF-200.001-F10	45	255	310	21
LAP-ÖF-200.001-F10	60	255	330	22
LAP-ÖF-250.001-F10	45	305	340	35
LAP-ÖF-250.001-F10	60	305	360	36
LAP-ÖF-250.002-F10	80	305	400	35
LAP-ÖF-300.002-F10	80	355	434	52
LAP-ÖF-D250.012-F14	100	305	524	55
Actuator function: air-to-open/spring-to-close				
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F10	80	355	535	70
LAP-SF-D300.035-F14	100	355	812	127

Technical data

Actuator size

SISTO-LAD diaphragm actuator

Selection table for max. permissible operating pressure in bar for SISTO valve with elastomer diaphragm

Min. required control pressure: 4 bar/max. permissible control pressure: 6 bar (* min. 5 bar)

Actuator size	Stroke	DN 15-20	DN 25-40	DN 50	DN 65	DN 80	DN 100
Actuator function: air-to-open/air-to-close							
LAD-AZ-100	20	4	3	↓	↓	↓	↓
LAD-AZ-150	35	10	10	10	↓	↓	↓
LAD-AZ-220	56	↑	↑	↑	10	7	6
Actuator function: spring-to-open/air-to-close							
LAD-ÖF-100.014	20	4	2	↓	↓	↓	↓
LAD-ÖF-150.102	35	10	9	8	↓	↓	↓
LAD-ÖF-220.001	56	↑	10	10	10	7	5
Actuator function: air-to-open/spring-to-close							
LAD-SF-100.001.5	20	3	↓	↓	↓	↓	↓
LAD-SF-150.002	35	10	8	5	↓	↓	↓
LAD-SF-220.003.7	56	↑	10	10	7	4	2
LAD-SF-220.004.7S*	56	↑	↑	↑	10	9	5

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request

Actuator size

SISTO-LAP piston actuator

Selection table for max. permissible operating pressure in bar

Min. required control pressure: 5.5 bar / max. permissible control pressure: 10 bar (* max. 7 bar)

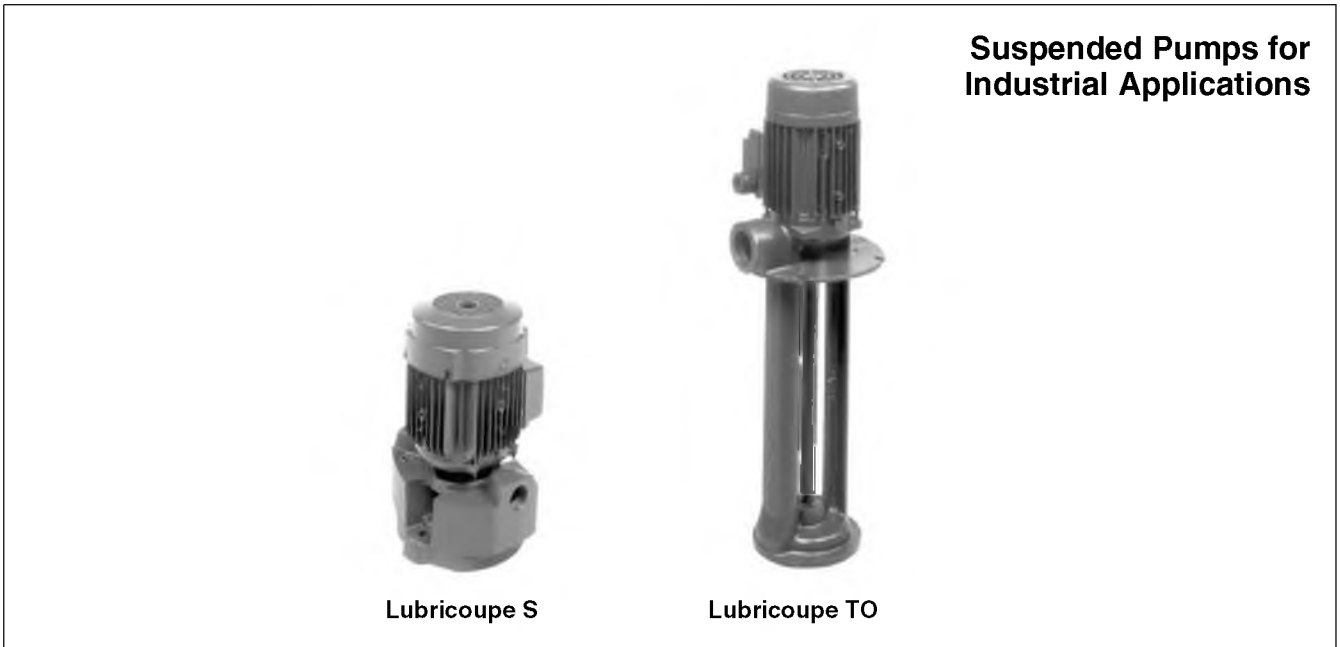
Elastomer diaphragm

Actuator size	Stroke	DN 15-20	DN 25-40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Actuator function: air-to-open/air-to-close									
LAP-AZ-80-F10	15/30	4	3	↓	↓	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	10	10	10	↓	↓	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	3	↓	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	8	5	3	↓	↓
LAP-AZ-200-F10	45	↑	↑	↑	10	10	↓	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	↑	7	3	↓
LAP-AZ-250-F10	60/80	↑	↑	↑	↑	↑	10	6	↓
LAP-AZ-250-F14	100	↑	↑	↑	↑	↑	↑	↑	3
LAP-AZ-300-F14	100	↑	↑	↑	↑	↑	↑	↑	6
Actuator function: spring-to-open/air-to-close									
LAP-ÖF-80.101-F10	15	3	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.101-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-ÖF-125.102-F10	30	↑	10	6	↓	↓	↓	↓	↓
LAP-ÖF-160.102-F10	30	↑	↑	10	↓	↓	↓	↓	↓
LAP-ÖF-200.001-F10	45/60	↑	↑	↑	10	8	5	↓	↓
LAP-ÖF-250.001-F10	45/60	↑	↑	↑	↑	10	10	↓	↓
LAP-ÖF-250.002-F10	80	↑	↑	↑	↑	↑	↑	5	↓
LAP-ÖF-300.002-F10*	80	↑	↑	↑	↑	↑	↑	6	↓
LAP-ÖF-D250.012-F14	100	↑	↑	↑	↑	↑	↑	↑	6
Actuator function: air-to-open/spring-to-close									
LAP-SF-125.002.5-F10	15	10	↓	↓	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	7	3	↓	↓	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	10	10	2	↓	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	↑	7	5	↓	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	10	9	↓	↓	↓
LAP-SF-250.004-F10	60/80	↑	↑	↑	↑	↑	6	↓	↓
LAP-SF-300.034-F10*	60/80	↑	↑	↑	↑	10	10	6	↓
LAP-SF-D300.035-F14	100	↑	↑	↑	↑	↑	↑	↑	6

Symbols key

Symbol	Description
↑	Select smaller actuator
↓	Select larger actuator

Other selection options on request



Fields of Application

Lubricoupe units are used to pump oil, cooling lubricants, solvents, degreasing agents, wash water in spray-paint and cooling systems, machine tools and welding machines.

Shaft Seal

Mechanical seal

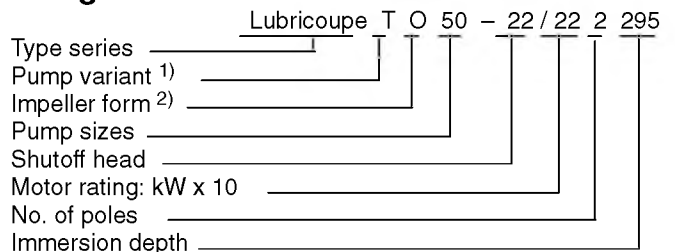
Lubricoupe S 20-.../S10-... : BV₂ PGG
S 25-... : BF PGG

Lubricoupe T: none

Operating Data

		Lubricoupe S	Lubricoupe TO
Q	up to	2,2 m ³ /h (36 l/min)	30 m ³ /h (500 l/min)
H	up to	50 m	23
H _s	up to	8 m	-
t	up to	+60 °C	+60 °C

Designation



- 1) T = submersible pump, S = self-priming pump
 2) O = open impeller.

Design/Variants

Lubricoupe S: vertical, self-priming, single-stage centrifugal pump with star impeller.

The pump and the surface-cooled, three-phase squirrel cage motor, make KSB, 220-255V / 380-440V, design IM V1, 50/60 Hz, type of protection IP 44, have a common shaft and are flanged to form a close-coupled unit.

Lubricoupe T: vertical, single-stage centrifugal pump with open impeller.

The pump and the surface-cooled, three-phase squirrel cage motor, make KSB, 220-240/380-420 V up to 2.2 kW.

Bearings

Lubricoupe S: grease-lubricated deep-groove ball bearings sealed for life.

Lubricoupe TO: grease-lubricated deep-groove ball bearings sealed for life.

Materials

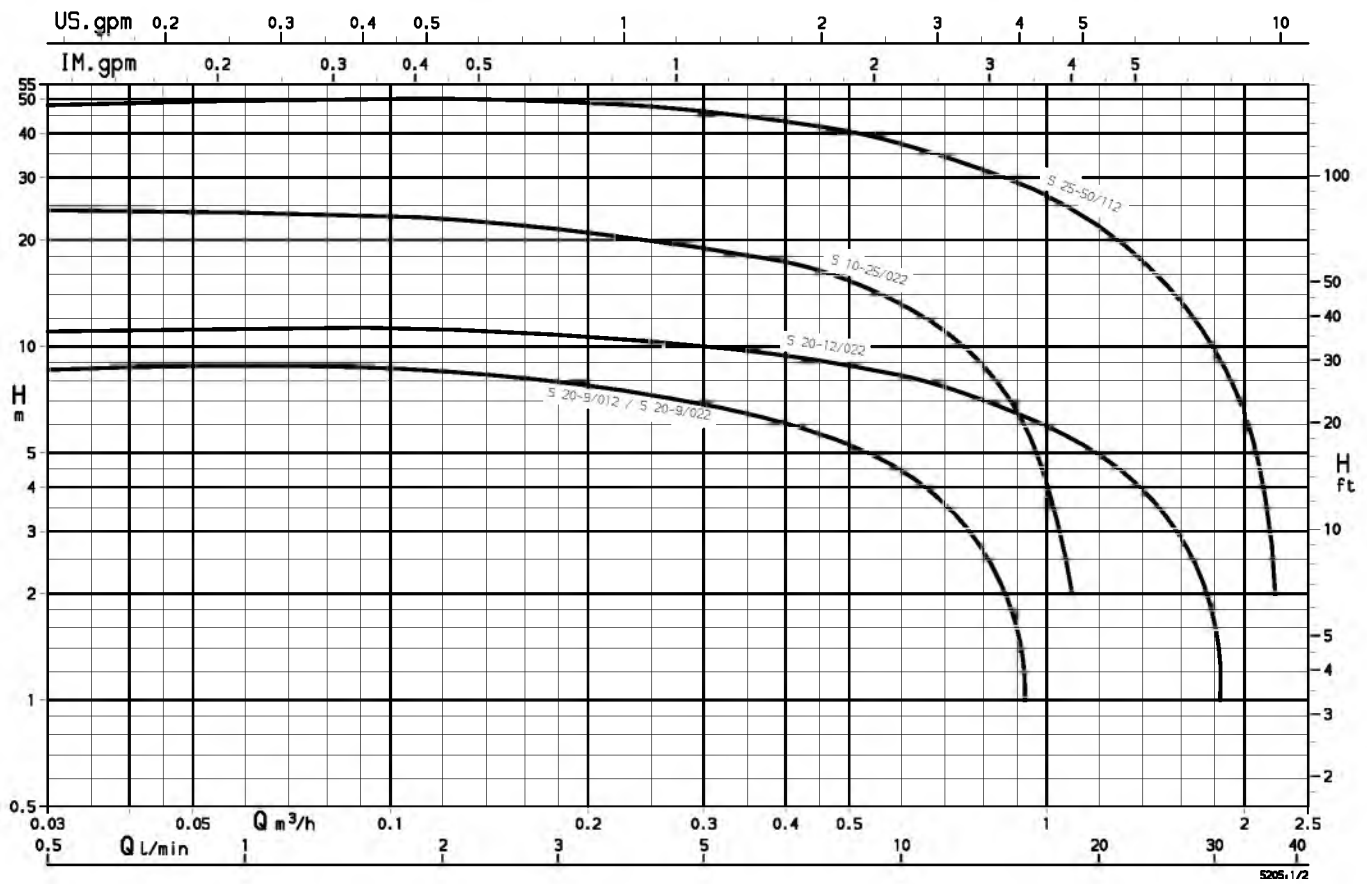
	Self-priming Pump Lubricoupe S	Submersible Pump Lubricoupe TO
Pump casing	Cast iron GG-20	Cast iron GG-20
Volute casing	-	-
Casing cover	Cast iron GG-20	Steel
Impeller	Brass CuZn40Pb2	Nylon ¹⁾
Shaft	Steel	Steel
Suction strainer	-	Steel
Motor stool	-	-

- 1) TO 32-11, TO 32-15 = Cast iron GG-20; TO 50-22 = bronze
 2) pump size 40 only, pump size 50 = Cast iron GG-25

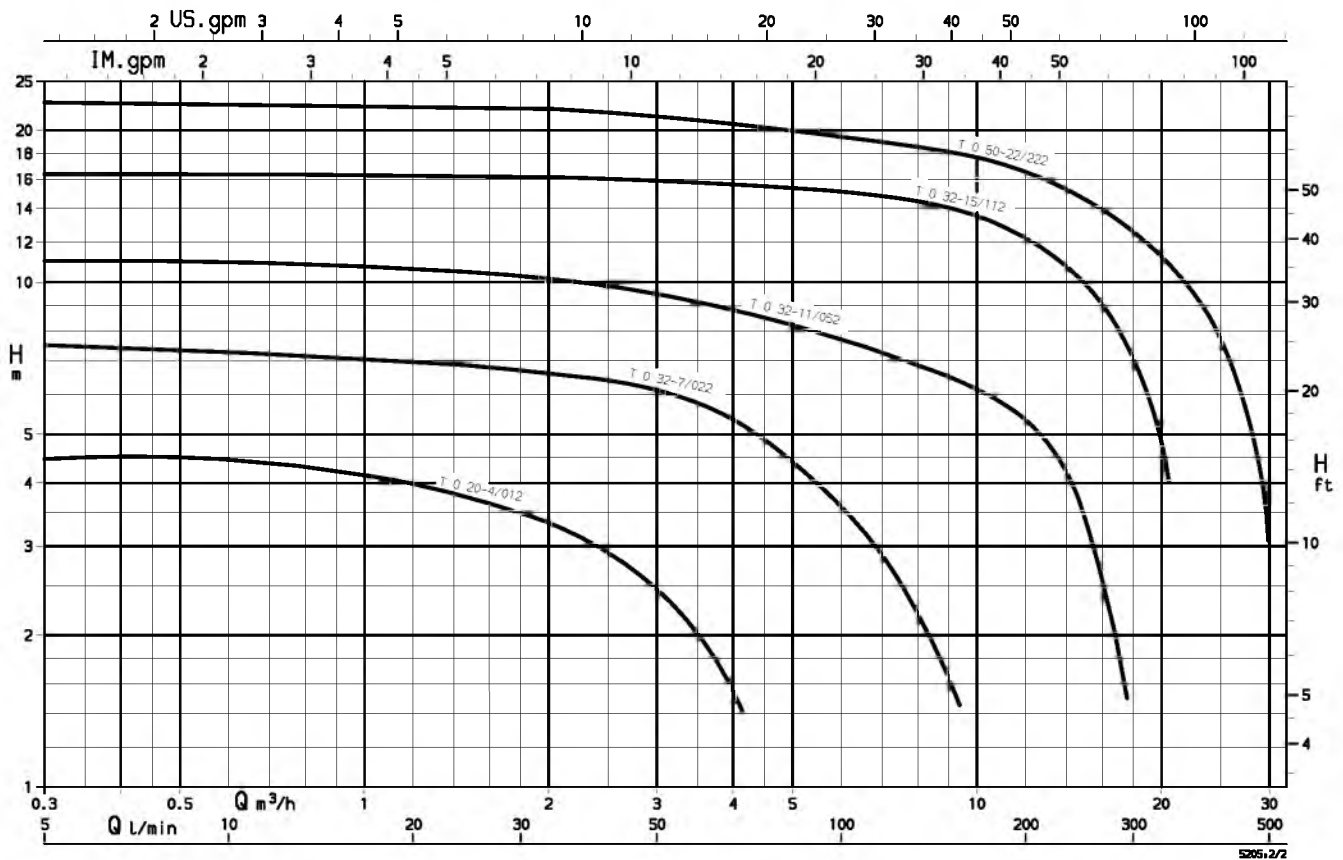
Selection Charts

n = 2900 1/min

Lubricoupe S

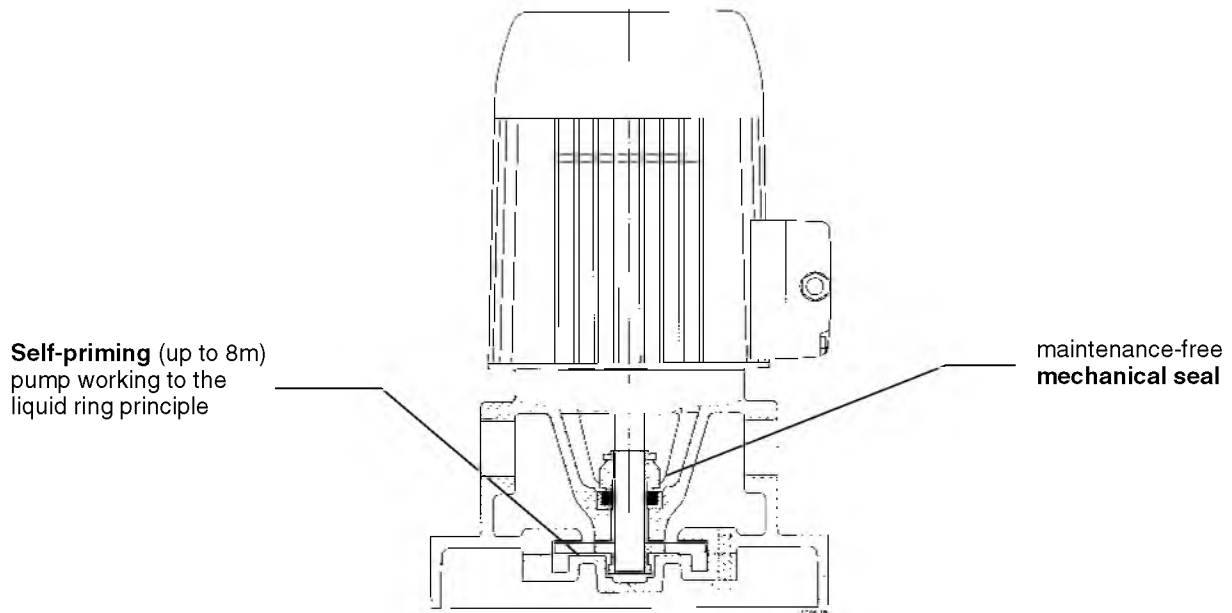


Lubricoupe TO

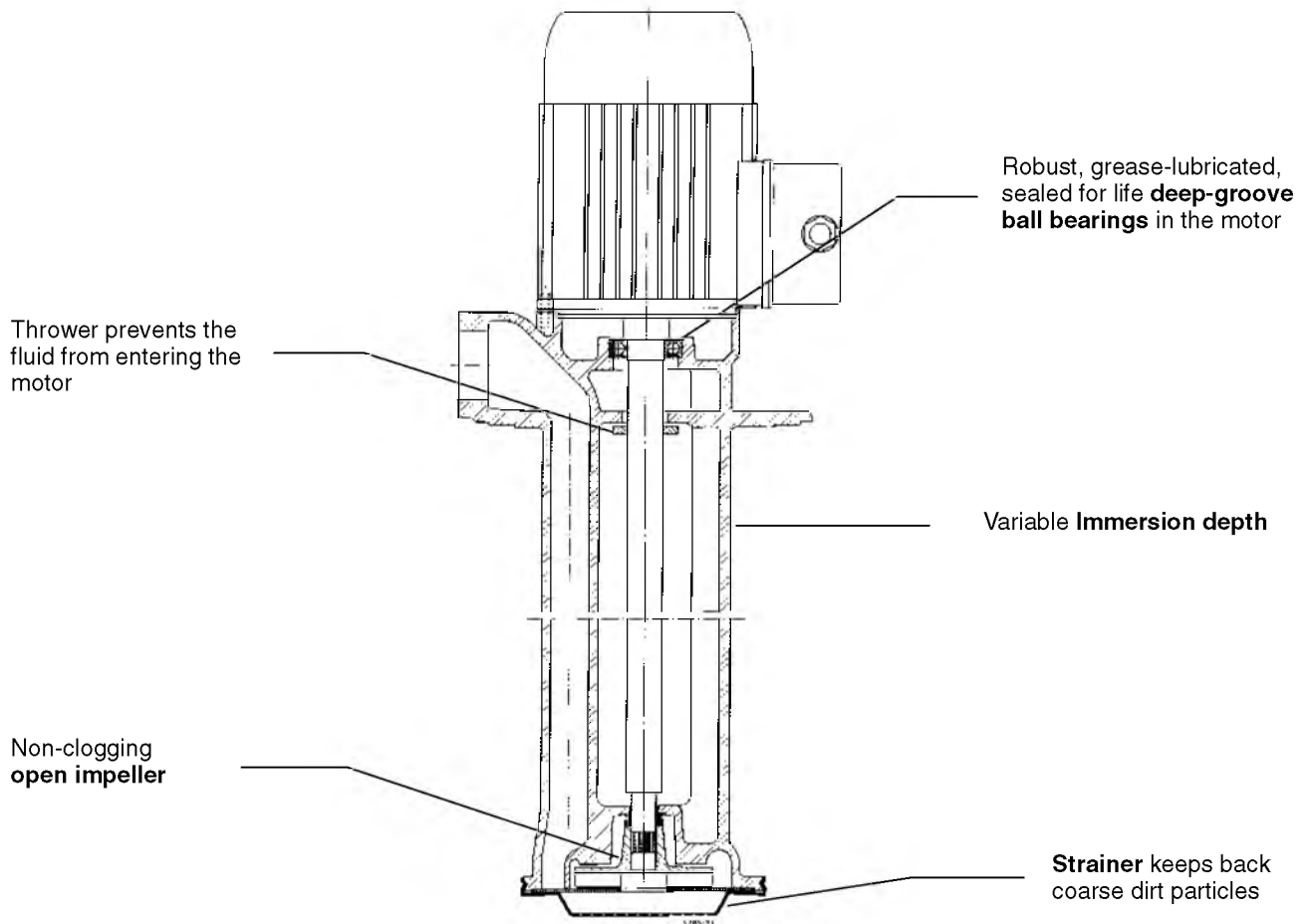


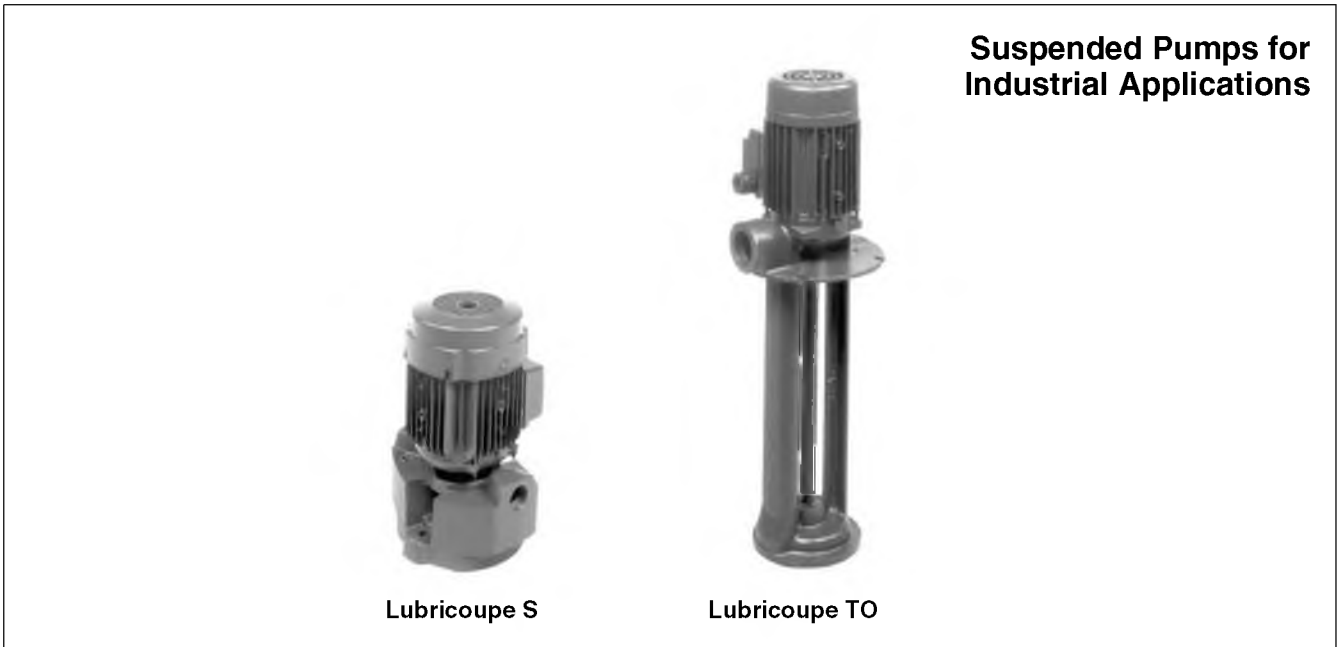
Benefits at a Glance

Lubricoupe S



Lubricoupe TO





Fields of Application

Lubricoupe units are used to pump oil, cooling lubricants, solvents, degreasing agents, wash water in spray-paint and cooling systems, machine tools and welding machines.

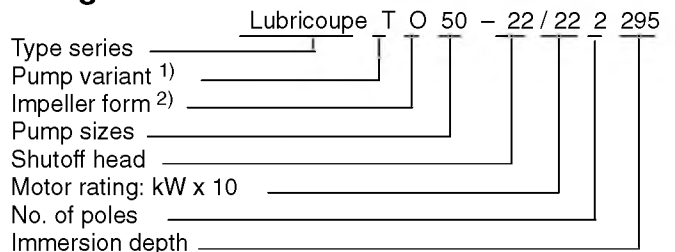
Shaft Seal

Mechanical seal
Lubricoupe S 20-.../S10-... : BV₂ PGG
S 25-... : BF PGG
Lubricoupe T: none

Operating Data

		Lubricoupe S	Lubricoupe TO
Q	up to	2,2 m ³ /h (36 l/min)	30 m ³ /h (500 l/min)
H	up to	50 m	23
H _s	up to	8 m	-
t	up to	+60 °C	+60 °C

Designation



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 2) O = open impeller.

Design/Variants

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Lubricoupe S: grease-lubricated deep-groove ball bearings sealed for life.

Lubricoupe TO: grease-lubricated deep-groove ball bearings sealed for life.

Materials

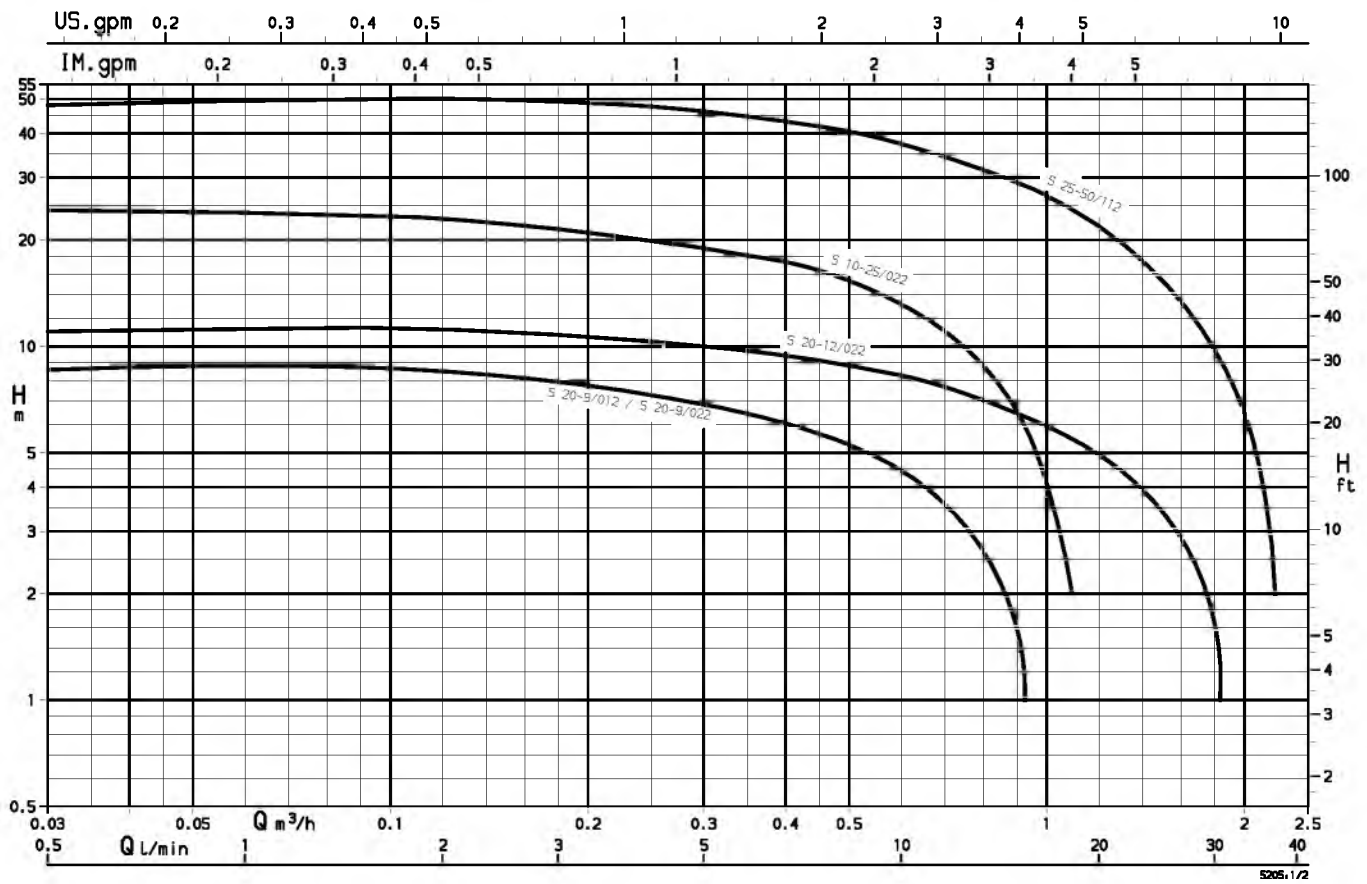
	Self-priming Pump Lubricoupe S	Submersible Pump Lubricoupe TO
Pump casing	Cast iron GG-20	Cast iron GG-20
Volute casing	-	-
Casing cover	Cast iron GG-20	Steel
Impeller	Brass CuZn40Pb2	Nylon ¹⁾
Shaft	Steel	Steel
Suction strainer	-	Steel
Motor stool	-	-

- 1) TO 32-11, TO 32-15 = Cast iron GG-20; TO 50-22 = bronze
 2) pump size 40 only, pump size 50 = Cast iron GG-25

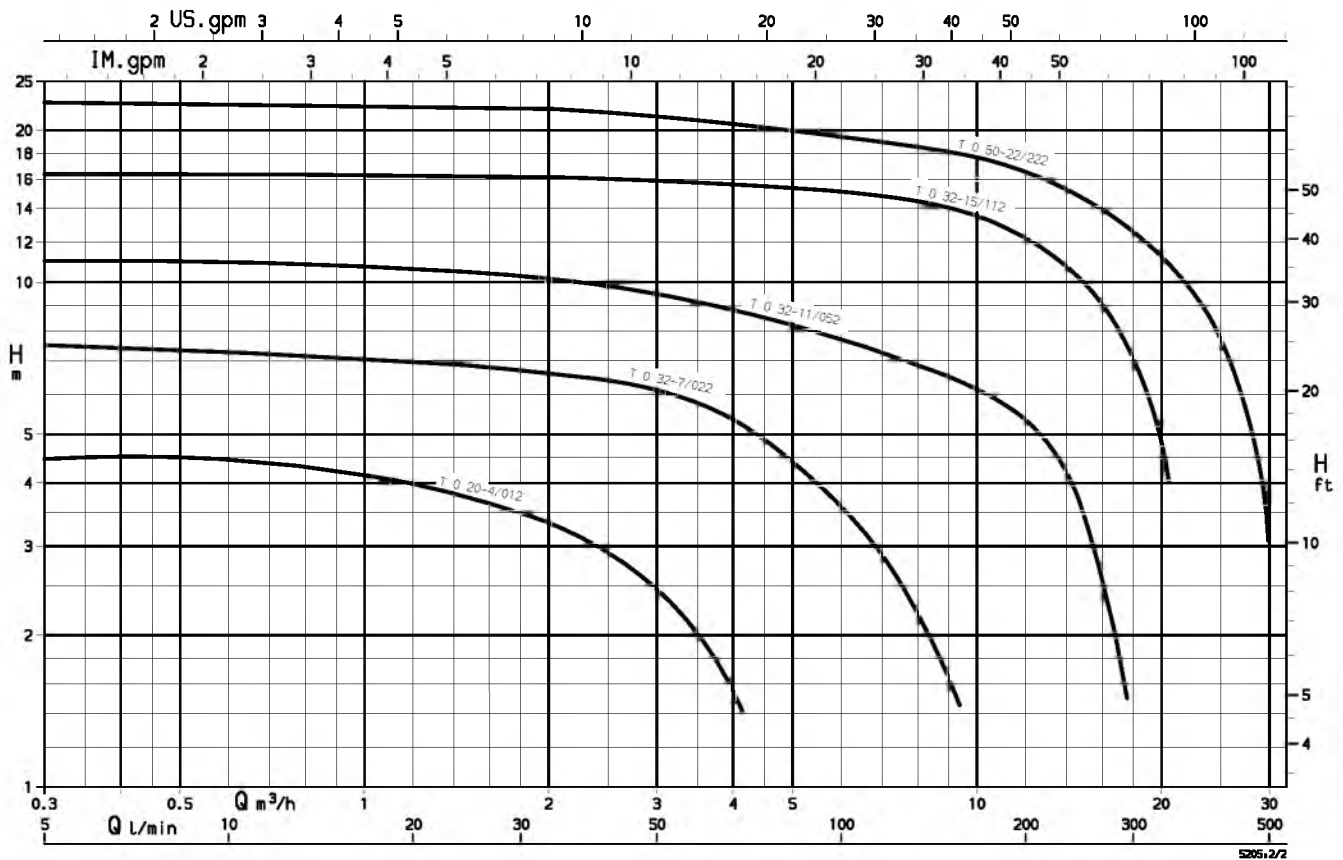
Selection Charts

n = 2900 1/min

Lubricoupe S

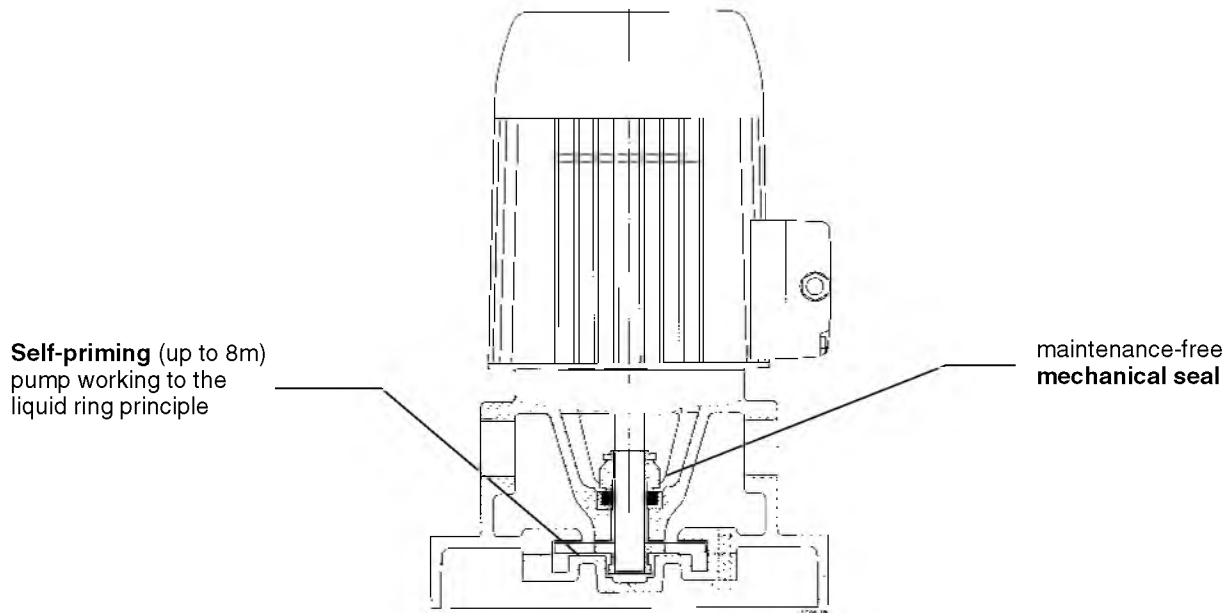


Lubricoupe TO

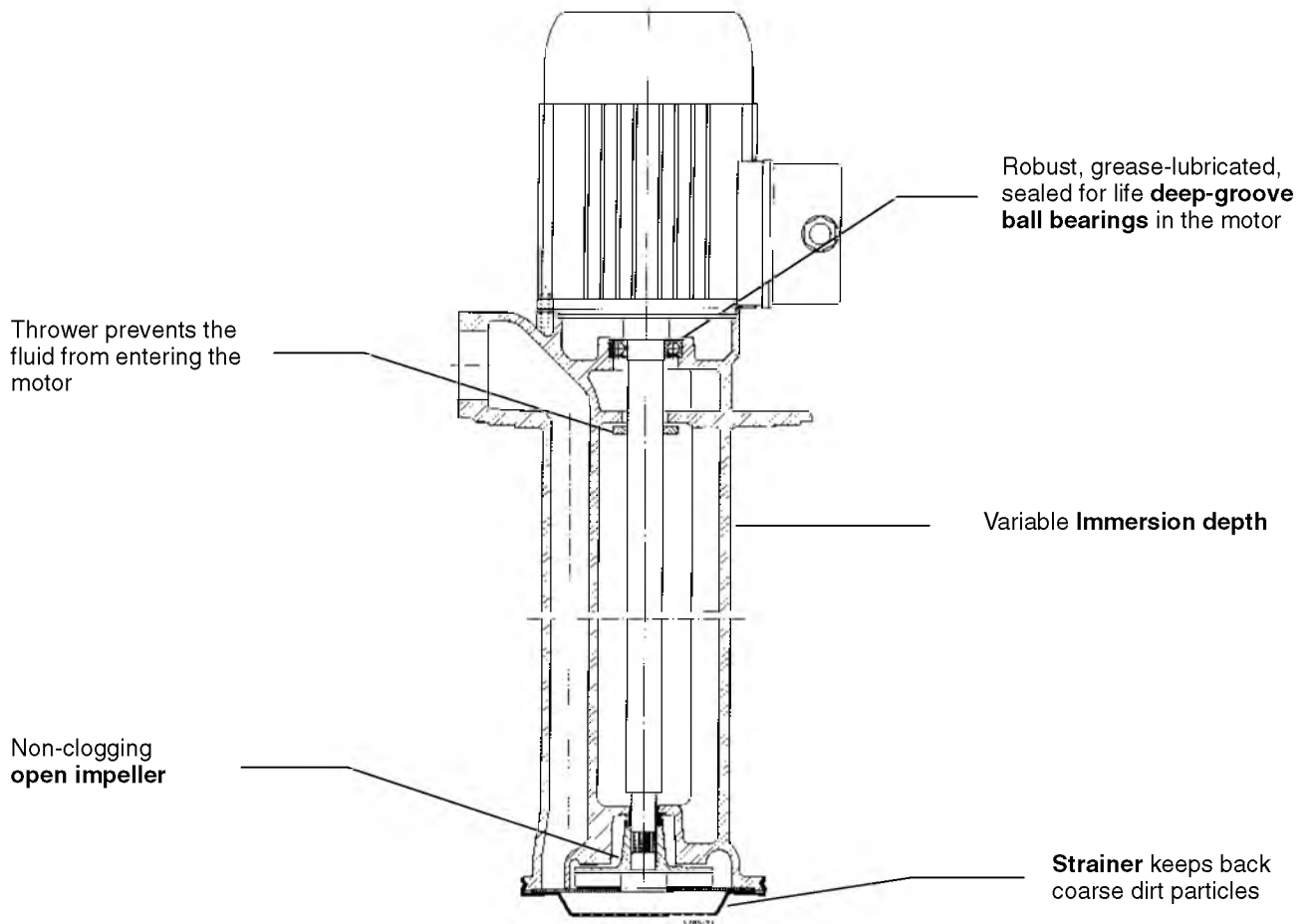


Benefits at a Glance

Lubricoupe S



Lubricoupe TO





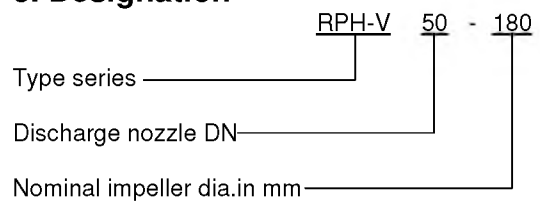
1. Application

RPH-V pumps are mainly used in refineries as well as in chemical and petrochemical plants.

2. Design

Vertical, radially split volute casing pumps to API 610 11th edition, and ISO 13709 (heavy duty), with radial impeller, single-flow, single-stage.

3. Designation

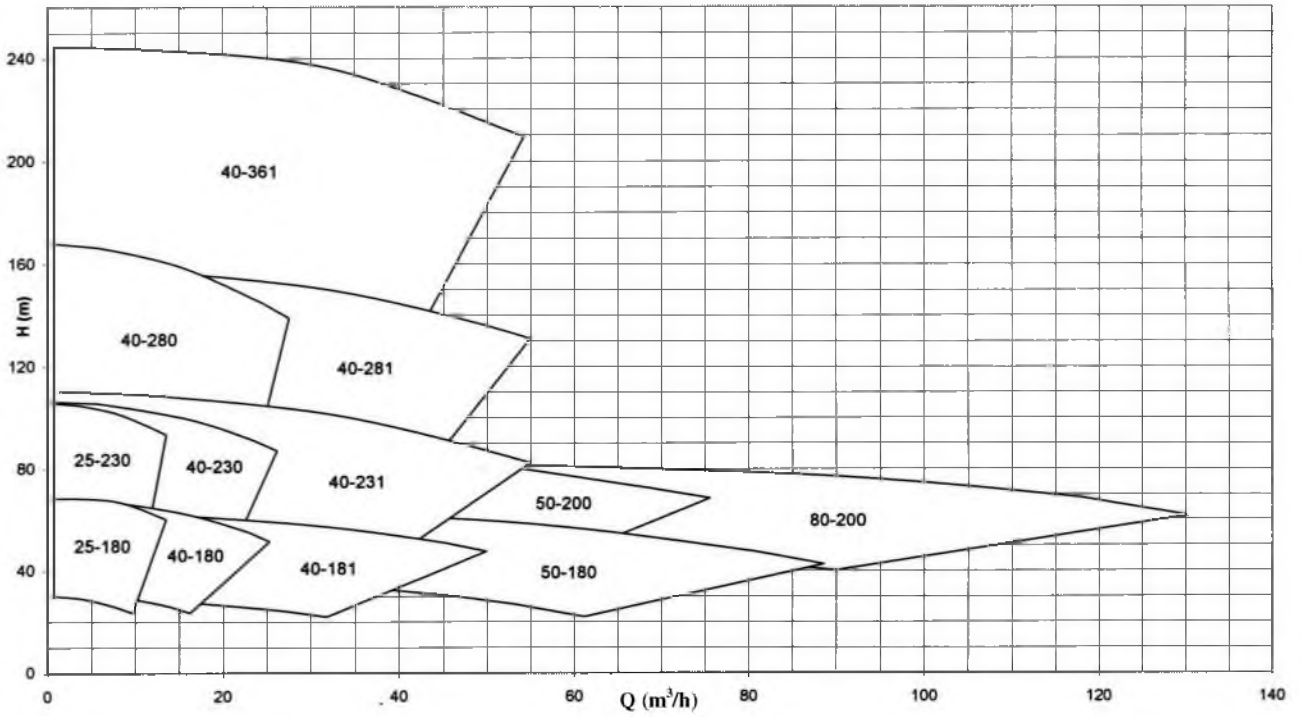


4. Operating Data

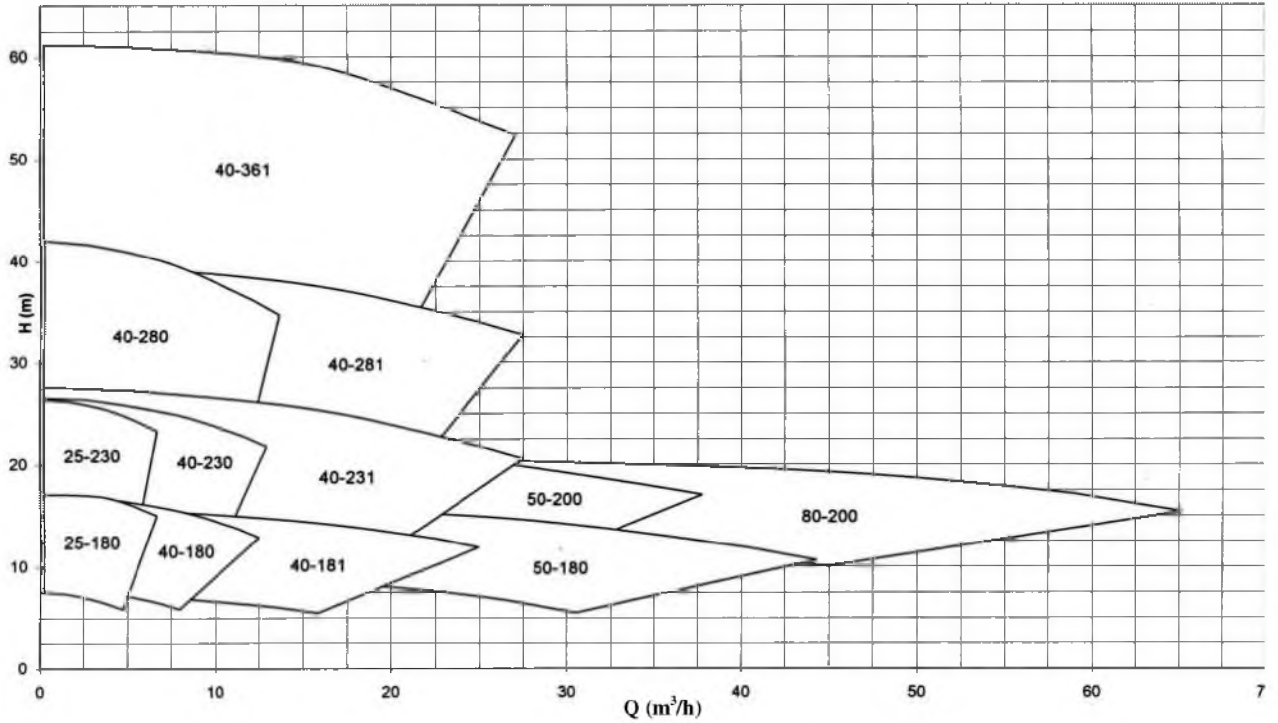
Pump sizes	DN	40 to 150
Capacities	Q	up to 80 m ³ /h
Heads	H	up to 240 m
Operating pressures	p	up to 35 bar for piping in material ASTM A106
Operating temperatures	t	-30 to +230°C
Standard installation depth	ET	from 630 to 3985 mm (rectangular soleplate); from 590 to 3935 mm (circular soleplate)

Other operating data on request.

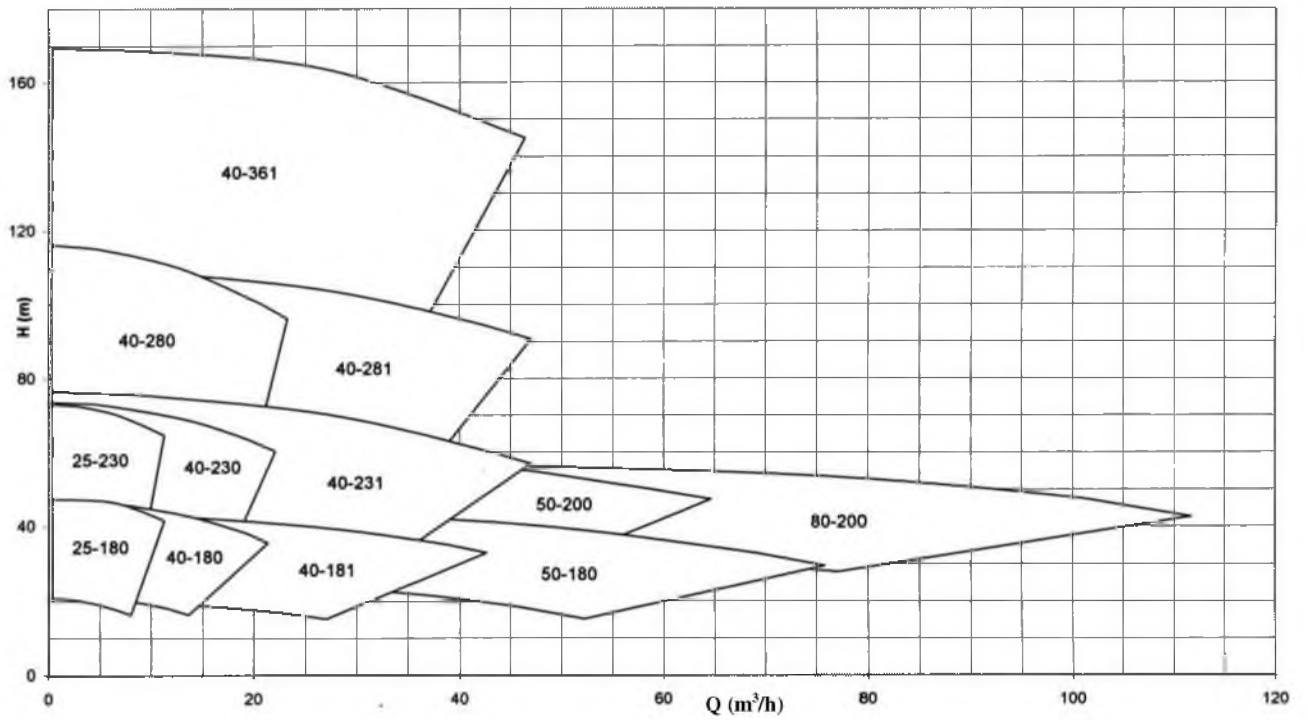
5.1 Selection chart 3.500 1/min



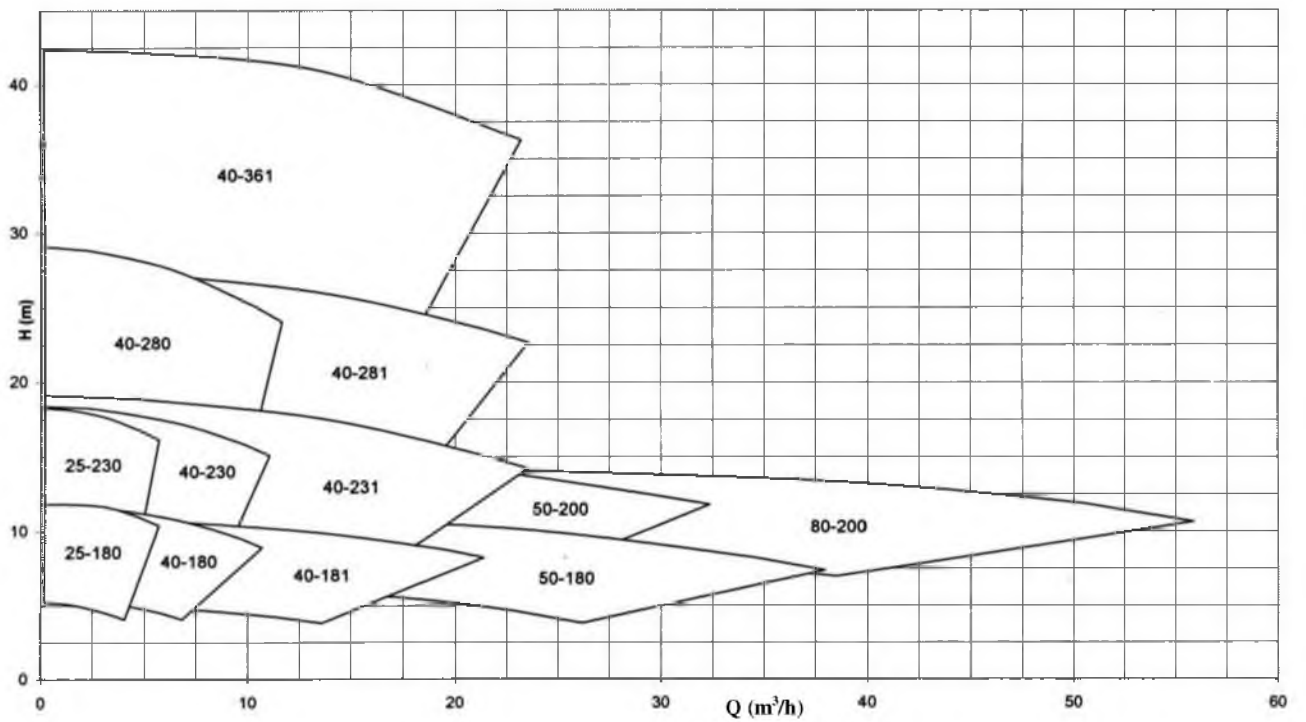
5.2 Selection chart 1.750 1/min



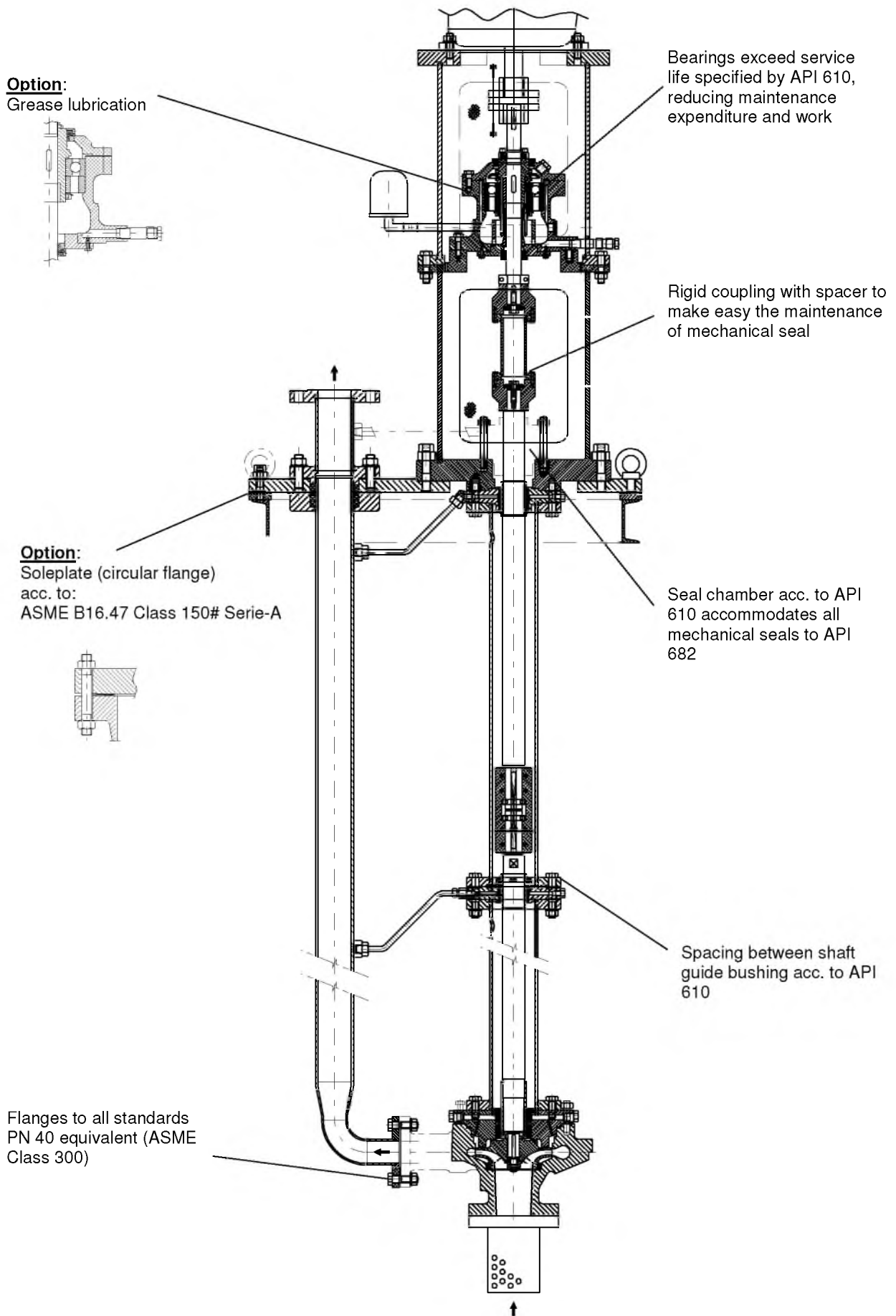
5.3 Selection chart 2.900 1/min



5.4 Selection chart 1.450 1/min



6. Product features / Benefits



7. Technical data

Pump Size		Unity	25-180	25-230	40-180	40-230	50-200	80-200	40-181	40-231	40-280	40-281	40-361	50-180
Volute type		--	Simple											
Impeller	- Outlet width	mm	6	6	6	6,2	10,5	14	7,8	7,7	7,5	7,7	7,9	10,9
	- Inlet diameter		48	48	58	57	88	105	75	75	61	71	69	88
	- maximum diam.		179	224	180	224	205	207	180	230	278	278	343	180
	- minimum diam.		120	180	130	180	164	166	130	180	220	230	280	140
Sealing chamber size (Acc.to API 682 Table 1)		--	4											
Bearing type / Lubrication			6313C3 / oil											
Shaft diameter	- in the sealing chamber (D)	mm	50											
	- in the bearing		65											
	- in the coupling		32											
	- in the impeller		24						27					
Shaft deflection			As per API 610 11 th edition											
Pressure limits	Max.operating pressure	bar	35 ²⁾											
	Max.test pressure	bar	1,5 times the operating pressure or as per API 610 11 th edition											
Flanges		--	ASME B16.5 Class 300 RF											
Temp.limit	Max.fluid temp.	°C	230 ³⁾											
Driver	Maximum Value P/n ¹⁾	kW / rpm	0,019						0,032					
Motor	n = 1450 rpm	kW	28						47					
	n = 1750 rpm		33						56					
	n = 2900 rpm		55						93					
	n = 3500 rpm		67						112					

¹⁾ Values indicated refer to shaft in material A434 4140CL.BB and impeller in A216WCB & temperature < 100°C.

²⁾ Pressure limit refers to piping in material A106.

³⁾ Temperature limit refers to bearing bushes in material Peek.

For other condition, please consult KSB.

8. Materials table

(reference for main parts)

Part No.	Description	Variant S5	Variant S6	Variant A8
102	Volute casing	A 216 Grade WCB	A 216 Grade WCB	A 351 Grade CF8M
161	Casing cover	A 216 Grade WCB / A 516 Grade 65	A 216 Grade WCB / A 516 Grade 65	A 351 Grade CF8M
210	Shaft	A 434/4140CL.BB	A 434/4140CL.BB	A276 Type 316
230	Impeller	A 216 Grade WCB	A 743 Grade CA6NM	A 743 Grade CF8M
350	Bearing housing	A 216 Grade WCB	A 216 Grade WCB	A 216 Grade WCB
411.10	Joint ring	Spiral SS316 -Graphite	Spiral SS316 -Graphite	Spiral SS316 -Graphite
502 / 503	Wear ring	AISI 420 Hard	AISI 420 Hard	AISI 316 Hard Faced
711	Rising	A106 Grade B	A106 Grade B	AISI 316
902.01 / 920.01	Casing bolts / hex.nut	A193 Grade B7 / A194 Grade 2H	A193 Grade B7 / A194 Grade 2H	A193 Grade B7 / A194 Grade 2H

Other materials acc. to API 610 are available on request.

9. Design details

9.1 Pump casing

Radially split, consisting of volute casing and casing cover. Volute casing with casing wear rings. Casing cover with casing wear rings, depending on axial thrust balancing.

9.2 Impeller

Closed radial impeller, impeller wear ring on the suction side. Discharge side wear ring only on hydraulically balanced impellers.

9.3 Balancing

Balancing of axial thrust by sealing gap and balancing holes (if required).

9.4 Minimum flow

Unless specified otherwise in the individual characteristic curves, the following applies:

$Q_{min} = 0,1 \cdot Q_{opt}$ for short operation

$Q_{min} = 0,3 \cdot Q_{opt}$ for continuous operation

9.5 Bearing lubrication

Bearing bracket – oil fill in 0,5 l.

Lubricating oil types C 46 DIN 51 517 or SAE 20 W/20 HD shall be used.

On the standard pump design, the bearing bracket is uncooled.

NPT threads are provided for constant-level oiler, oil drain and vent plug.

The bearings are designed for at least 25,000 operating hours as per API 610/11th edition.

During pump standstill the oil level can be checked against the center of the oil level sight glass.

9.6 Shaft

Depending on installation following shafts are necessary: pump shaft, intermediate shaft and drive shaft.

The shafts are coupled by split coupling.

9.7 Shaft sealing

The pump is fitted with mechanical seals or gland packing (special variant). The mechanical seal chamber is designed in acc. to API 610, 11th edition. Mechanical seals are provided in cartridge design only (API 682)!

Sealing plans with an external source (plans 32,52,53,54) to lubricate mechanical seal faces in order to avoid dry run during start-up.

For other sealing plans and gland packing applications consult KSB.

9.8 Direction of rotation

Clockwise, viewed from the drive end.

9.9 Bearing guides

Sliding type in Peek material with shaft protecting sleeve.

9.10 Bearing guide lubrication

The following possibilities are available:

a) Pumped liquid:

When the product have lubricant characteristics, with a maximum of 20 p.p.m. of impurity and particle with 10 µm. Each bearing receives injection through a piping connected to the rising pipe.

b) Clean water of external source (optional):

Water injection is done in all bearings through an external connection located above the mounting plate.

9.11 Soleplate sealing

Flexible graphite packing rings with wire reinforcement to control fugitive emissions - Teadit Style 2000IC:

- Temperature: -240 ~ 450 °C

- Pressure: up to 400 bar

- pH: 0 ~14

9.12 Surface Coating

Type A1 – Standard surface coating for material variants S5 e S6 up to 90°C.

Preparatory treatment	Grease-free / steel shot blasting ISO 8501-1 SA 2 ½.	
Primer	1 coat - 100 µm thick (dry) – Zinc phosphate epoxy.	
Finish coat	Internal surfaces:	External surfaces: Acrylic aliphatic polyurethane RAL 5002 blue
	Without	1 coat - 70 µm thick (dry).

Type A2 – Standard surface coating for material variants S5 e S6 from 90°C up to 230°C.

Preparatory treatment	Grease-free / steel shot blasting ISO 8501-1 SA 2 ½.	
Primer	1 coat - 50 µm thick (dry) - Zinc inorganic silicate.	
Finish coat	Internal surfaces:	External surfaces: Monocomponent modified silicate Aluminum 800
	Without	1 coat - 35 µm thick (dry).

Notes:

- Material combinations C6, A8 and D1 do not have coating.

- Special surface coating available on request.

10. Pump selection

RPH-V pumps use the same published curves as horizontal version RPH, however items 10.1 until 10.4 should be considered for the correct pump selection.

10.1 Pump head

The reference line to define the pump head and capacity is the pump discharge flange (DN2).

The performance curve does not consider pressure losses in the suction strainer, discharge curve, column bearings, rising piping and internal circulation for bearing lubrication.

The pump total head is the sum of following items:

- Installation head,
- loss in the straight discharge column.
- loss in the discharge curve (elbow) , and
- loss in the strainer.

10.2 Pressure losses

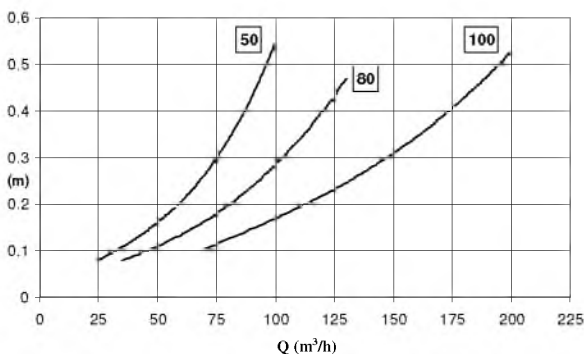
Piping losses – Head losses in straight pipes in 100 m of pipe (in m)

Nominal flow m ³ /h	Nominal diameter				
	40	50	80	100	150
1	0,22	0,08			
1,5	0,50	0,17			
2	0,80	0,28			
3	1,80	0,60	0,05		
4	3,00	1,05	0,10		
5	4,70	1,60	0,15	0,05	
6	6,60	2,20	0,20	0,07	
8	11,50	3,90	0,35	0,13	
10	17,00	5,70	0,50	0,20	
12,5	26,00	8,50	0,80	0,28	
15	37,00	12,50	1,10	0,40	0,05
17,5	47,00	16,00	1,40	0,50	0,06
20	63,00	21,50	2,00	0,70	0,09
25	95,00	33,00	3,00	1,10	0,13
30		45,00	4,20	1,50	0,20
35		61,00	5,70	2,00	0,24
40		78,00	7,00	2,50	0,30
45		100,00	9,00	3,10	0,40
50			11,00	3,80	0,50
60			16,00	5,50	0,70
70			21,00	7,20	0,90
80			26,50	9,20	1,20
90			34,00	12,00	1,40
100			40,00	14,00	1,80
120			58,00	20,00	2,50
140			80,00	27,00	3,30
160				35,00	4,25
180				43,00	5,30
200				50,00	6,50

Piping losses – Head losses at 90° elbow (in m)

Nominal flow m ³ /h	Nominal diameter at pump discharge nozzle			
	25	40	50	80
3	0,02			
4	0,04			
5	0,07	0,01		
6	0,10	0,02		
8	0,18	0,03	0,01	
10	0,28	0,04	0,02	
12,5	0,43	0,07	0,03	
15	0,62	0,10	0,04	
17,5	0,85	0,13	0,05	
20	1,11	0,17	0,07	0,01
25	1,73	0,26	0,11	0,02
30	2,50	0,38	0,16	0,02
35		0,52	0,21	0,03
40		0,68	0,28	0,04
45		0,86	0,35	0,05
50		1,06	0,43	0,07
60		1,52	0,62	0,10
70		2,08	0,85	0,13
80			1,11	0,17
90			1,41	0,21
100			1,73	0,26
120			2,50	0,38
140				0,52
160				0,68
180				0,86
200				1,06
250				1,65
300				2,38

Strainer losses (in m) – curves refer to suction nozzle nominal diameter DN1.



10.3 NPSH

The NPSH values indicated in the individual performance curves were measured on impellers without hydraulic balancing. They correspond to a 3 % drop of the pump head.

Generally a value of $NPSH_{available} - NPSH_{pump} \geq 0,5 \text{ m}$ is desirable (for hot water applications please contact KSB).

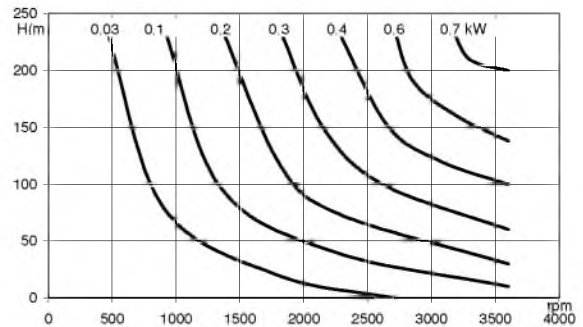
10.4 Efficiency

The efficiencies specified in the performance curves refer only to the hydraulic pump without losses. Axial thrust balancing of the impeller, fluid viscosity, a larger impeller clearance gap, the shaft seal type, drive shaft and thrust bearing losses reduce the pump's overall efficiency.

Efficiency was measured using a clearance gap to AN 1501, group 2 and an inlet pressure of 2 to 3 bar.

The efficiency is stated in the individual performance curves of horizontal version (RPH).

10.4.1 Power consumption per guide bearing



Note:

Power consumption of mechanical seal should also be considered.

10.5 Drive

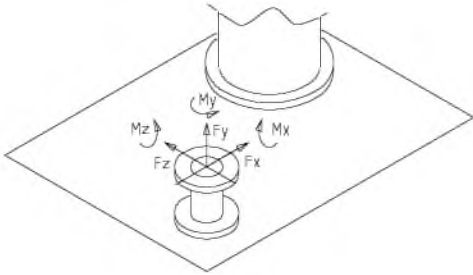
Direct or indirect by electric motor, engine or turbine, if an internal combustion engine has been specified, special care shall be taken when selecting the type of coupling to be used.

10.6 Motor selection

When determining the motor size, consideration shall be given to the efficiency determined and the power margins as per API 610.

Motor rating	Power margin
up to 22 kW	25 %
22 to 55 kW	15 %
above 55 kW	10 %

10.7 External nozzle forces and moments

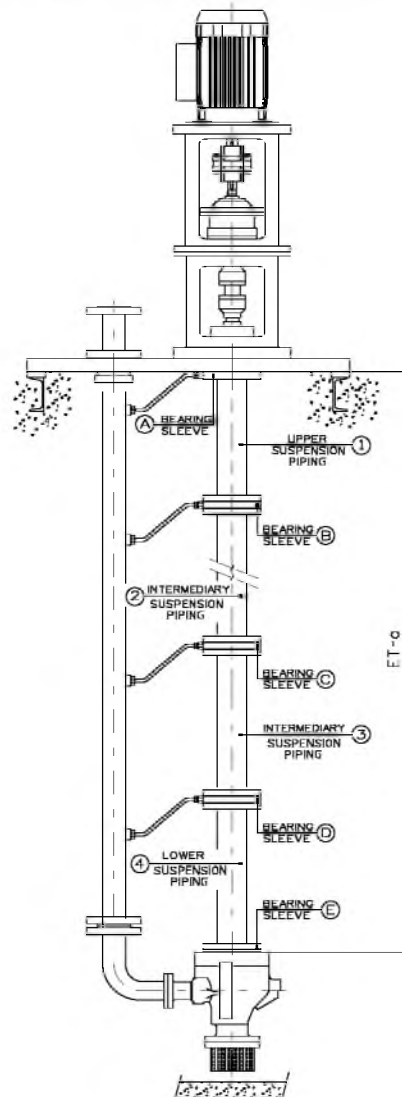


Pump sizes	Discharge nozzle							
	Forces (in N)				Moments (in Nm)			
	F_x	F_y	F_z	F_{res}	M_x	M_y	M_z	M_{res}
25-180	710	580	890	1280	460	230	350	620
25-230								
40-180	1070	890	1330	1930	950	470	720	1280
40-230								
40-280								
40-181	1070	890	1330	1930	950	470	720	1280
40-231								
40-281								
40-361								
50-180	1070	890	1330	1930	950	470	720	1280
50-200								
80-200	2490	2050	3110	4480	2300	1180	1760	3130

11. Installation depths

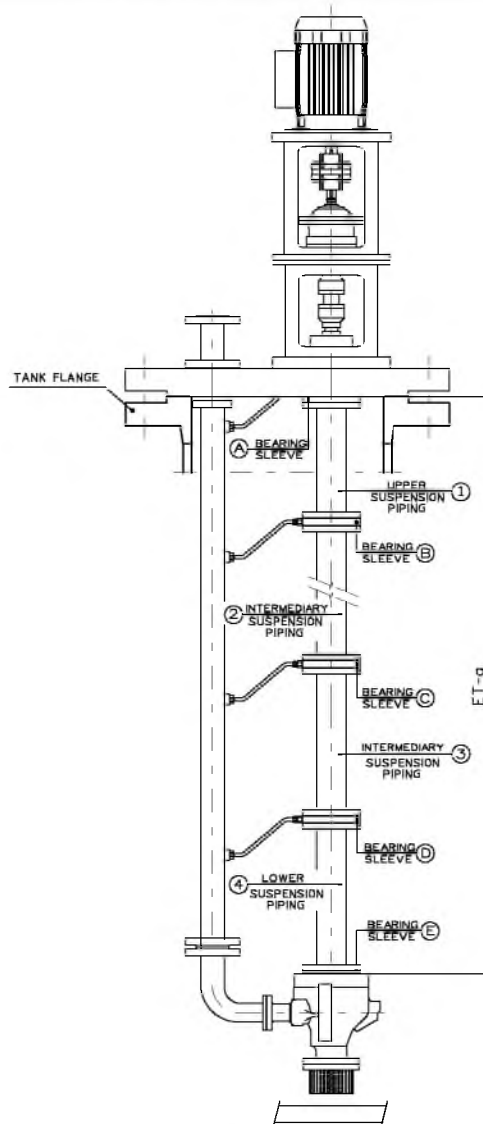
11.1 – Rectangular Soleplate (see item 14.1)

Suspension piping length (mm)				Bearing sleeve					Size												
Upper	intermediary	Intermediary	Lower	Upper	Intermediary	Intermediary	Intermediary	Lower	25-180	25-230	40-180	40-181	50-180	50-200	40-230	40-231	40-280	40-281	80-200	40-361	
1	2	3	4	A	B	C	D	E	ET-a (mm)												
400	----	----	----	X	N.A	N.A	N.A	X													425
500	----	----	----	X	N.A	N.A	N.A	X													525
600	----	----	----	X	N.A	N.A	N.A	X													625
800	----	----	----	X	N.A	N.A	N.A	X													825
900	----	----	----	X	N.A	N.A	N.A	X													925
500	500	----	----	X	X	N.A	N.A	X													1055
600	500	----	----	X	X	N.A	N.A	X													1155
600	600	----	----	X	X	N.A	N.A	X													1255
900	400	----	----	X	X	N.A	N.A	X													1355
900	500	----	----	X	X	N.A	N.A	X													1455
900	600	----	----	X	X	N.A	N.A	X													1555
800	800	----	----	X	X	N.A	N.A	X													1655
900	800	----	----	X	X	N.A	N.A	X													1755
900	900	----	----	X	X	N.A	N.A	X													1855
900	600	400	----	X	X	X	N.A	X													1985
900	600	500	----	X	X	X	N.A	X													2085
900	600	600	----	X	X	X	N.A	X													2185
900	900	400	----	X	X	X	N.A	X													2285
900	900	500	----	X	X	X	N.A	X													2385
900	900	600	----	X	X	X	N.A	X													2485
900	800	800	----	X	X	X	N.A	X													2585
900	900	800	----	X	X	X	N.A	X													2685
900	900	900	----	X	X	X	N.A	X													2785
900	900	600	500	X	X	X	X	X													2915
900	900	600	500	X	X	X	X	X													3015
900	900	800	400	X	X	X	X	X													3115
900	900	900	400	X	X	X	X	X													3215
900	900	900	500	X	X	X	X	X													3315
900	900	900	600	X	X	X	X	X													3415
900	900	800	800	X	X	X	X	X													3515
900	900	900	800	X	X	X	X	X													3615
900	900	900	900	X	X	X	X	X													3715

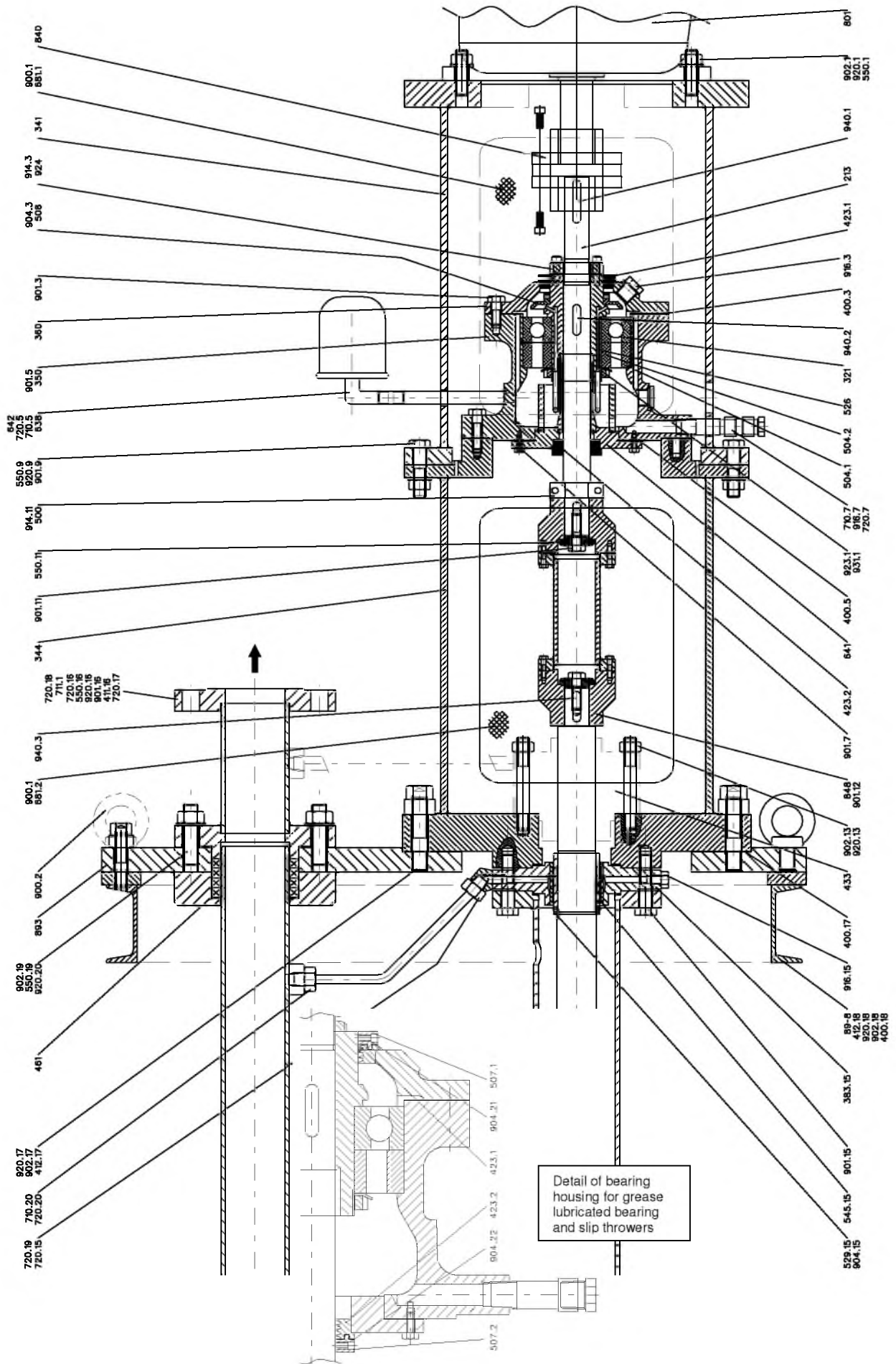


11.2 – Circular soleplate (see item 14.2)

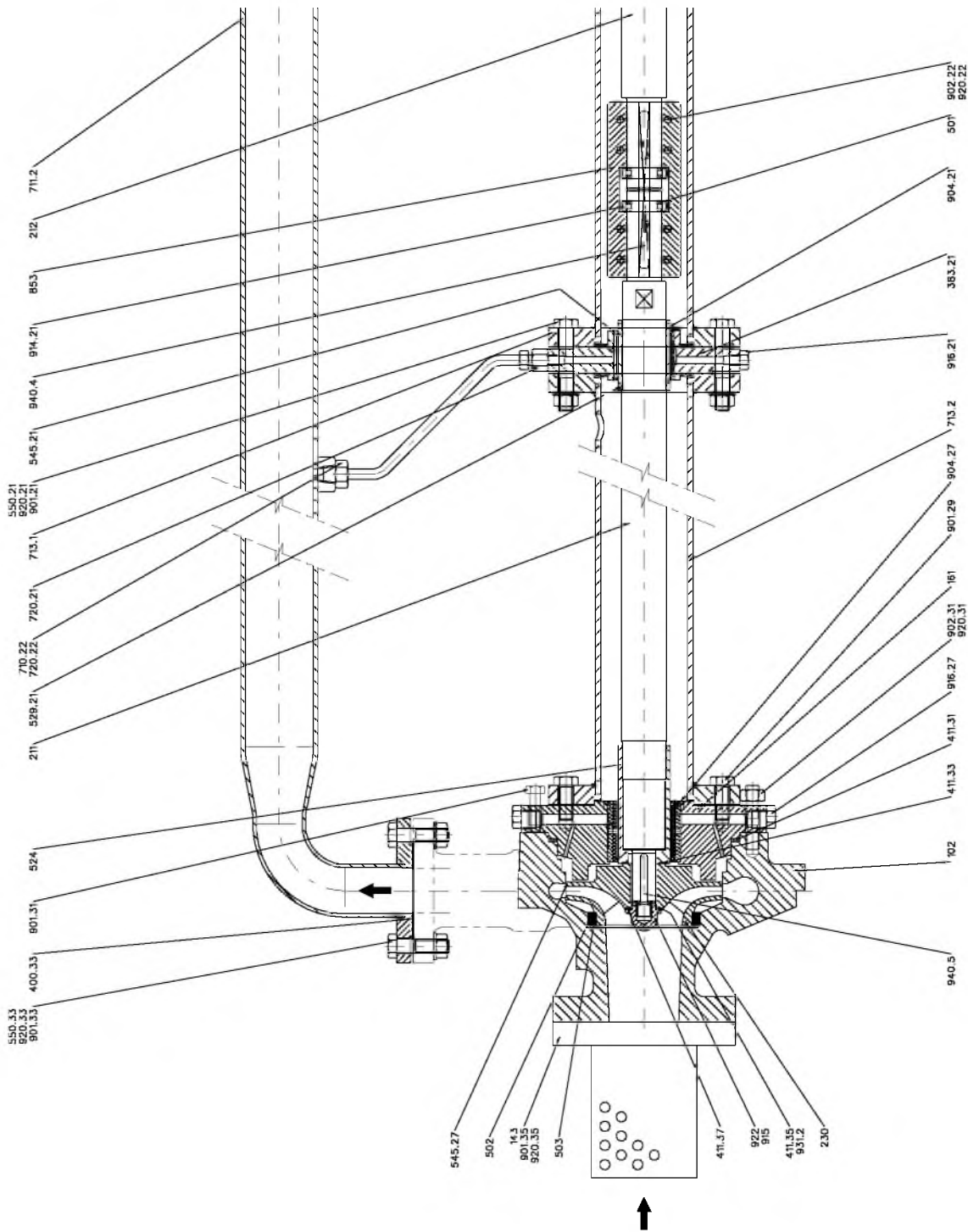
Suspension piping length (mm)				Bearing sleeve					Size												
Upper	Intermediary	Intermediary	Lower	Upper	Intermediary	Intermediary	Intermediary	Lower	25-180	25-230	40-180	40-181	50-180	50-200	40-230	40-231	40-280	40-281	80-200	40-361	
1	2	3	4	A	B	C	D	E	ET-a (mm)												
400	-----	-----	-----	X	N.A	N.A	N.A	X													
500	-----	-----	-----	X	N.A	N.A	N.A	X													
600	-----	-----	-----	X	N.A	N.A	N.A	X													
800	-----	-----	-----	X	N.A	N.A	N.A	X													
900	-----	-----	-----	X	N.A	N.A	N.A	X													
500	500	-----	-----	X	X	N.A	N.A	X													
600	500	-----	-----	X	X	N.A	N.A	X													
600	600	-----	-----	X	X	N.A	N.A	X													
900	400	-----	-----	X	X	N.A	N.A	X													
900	500	-----	-----	X	X	N.A	N.A	X													
900	600	-----	-----	X	X	N.A	N.A	X													
800	800	-----	-----	X	X	N.A	N.A	X													
900	800	-----	-----	X	X	N.A	N.A	X													
900	900	-----	-----	X	X	N.A	N.A	X													
900	600	400	-----	X	X	X	N.A	X													
900	600	500	-----	X	X	X	N.A	X													
900	600	600	-----	X	X	X	N.A	X													
900	900	400	-----	X	X	X	N.A	X													
900	900	500	-----	X	X	X	N.A	X													
900	900	600	-----	X	X	X	N.A	X													
900	800	800	-----	X	X	X	N.A	X													
900	900	800	-----	X	X	X	N.A	X													
900	900	900	-----	X	X	X	N.A	X													
900	800	600	500	X	X	X	X	X													
900	900	600	500	X	X	X	X	X													
900	900	800	400	X	X	X	X	X													
900	900	900	400	X	X	X	X	X													
900	900	900	500	X	X	X	X	X													
900	900	900	600	X	X	X	X	X													
900	900	800	800	X	X	X	X	X													
900	900	900	800	X	X	X	X	X													
900	900	900	900	X	X	X	X	X													



12. Sectional drawing (part 1/2) – reference only



Sectional drawing (part 2/2)

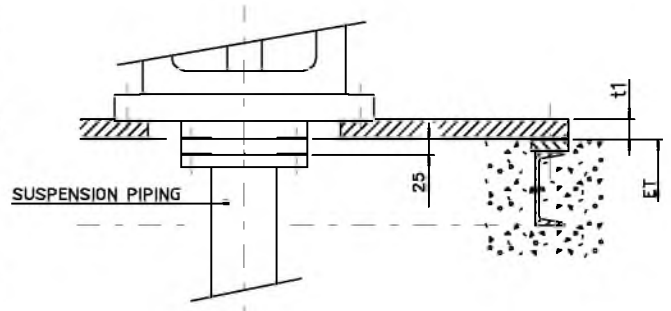
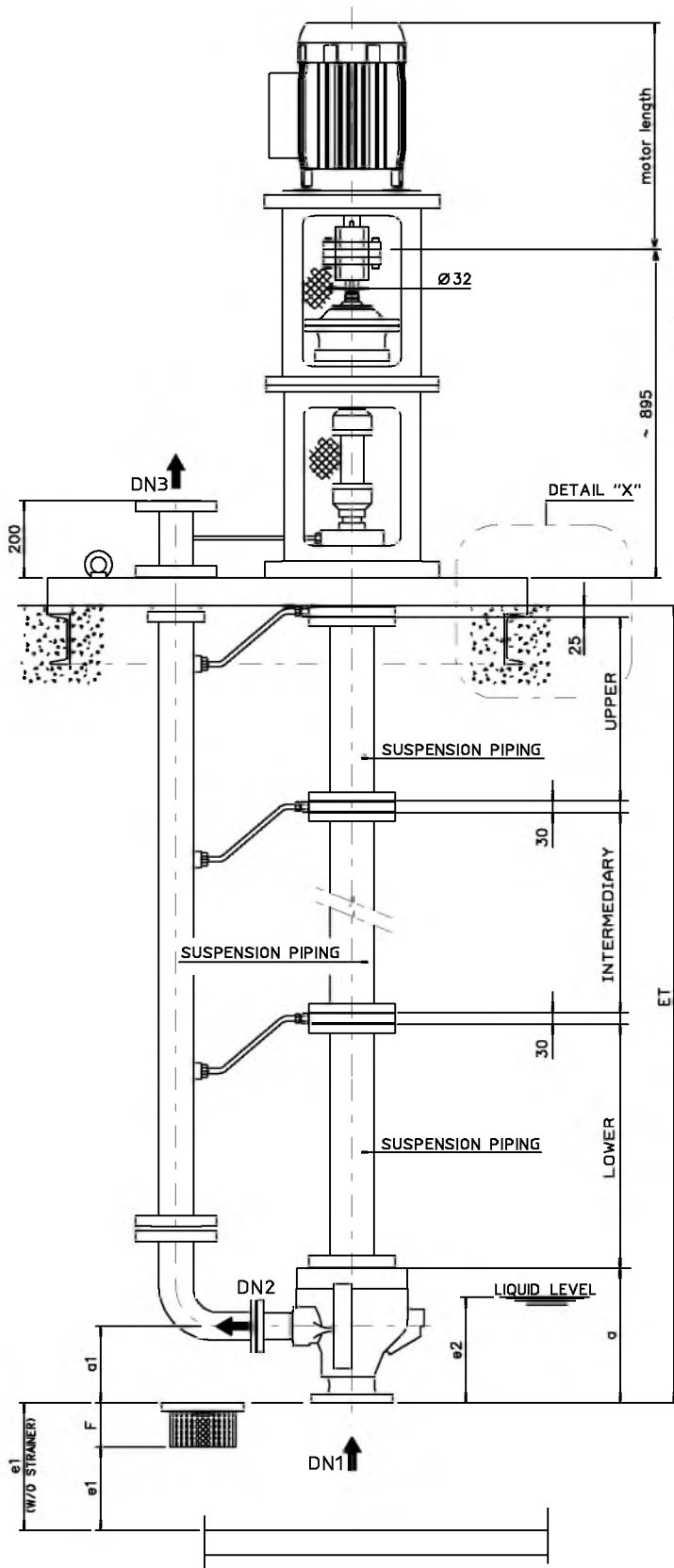


13. Main parts list

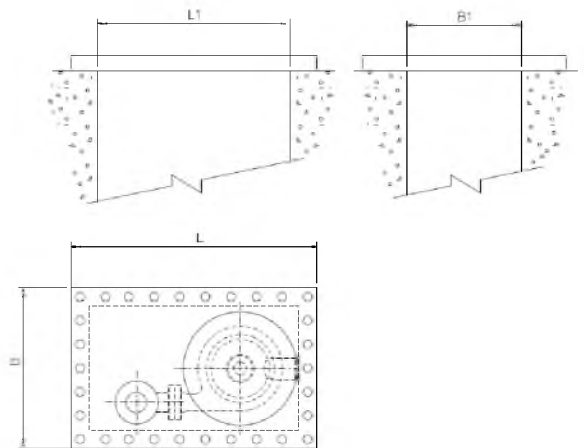
Description	Part n°	Description	Part n°	Description	Part n°
Volute casing	102	Bearing cover	360	Bearing sleeve	529.15
Strainer (optional)	143	Spider	383.15	Bearing sleeve	529.21
Casing cover	161	Spider	383.21	Constant level oiler	638
Pump shaft	211	Spiral wound	411.31	Rising	711.1
Intermediary shaft	212	Mechanical seal	433	Rising	711.2
Drive shaft	213	Lantern ring	458	Suspension piping	713.1
Impeller	230	Packing	461	Suspension piping	713.2
Bearing	321	Wear ring	502	Soleplate	893
Drive lantern	341	Impeller wear ring	503	Impeller nut	922
Bearing bracket lantern	344	Shaft prot.sleeve	524	Bearing nut	923
Bearing casing	350	Center sleeve	526		

14. Pump dimensions – General arrangement drawing

14.1 - Rectangular soleplate

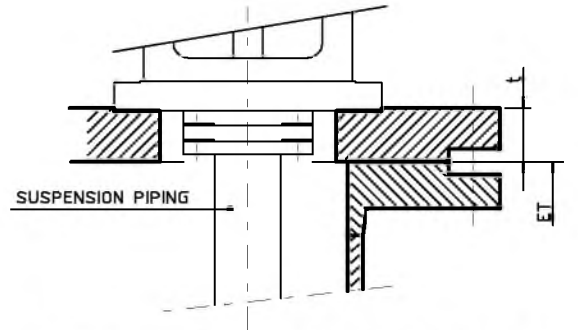
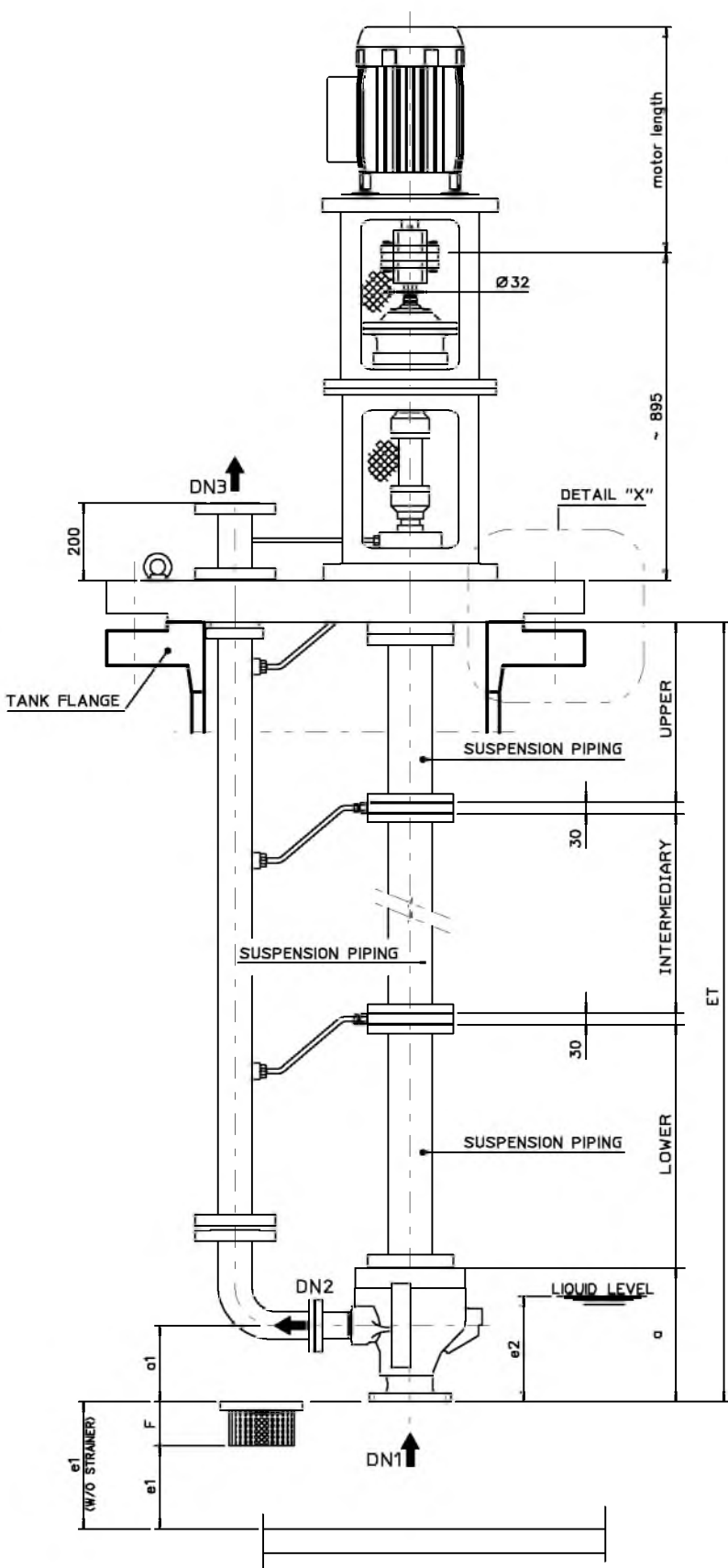


DETAIL "X" FOR RECTANGULAR SOLEPLATE

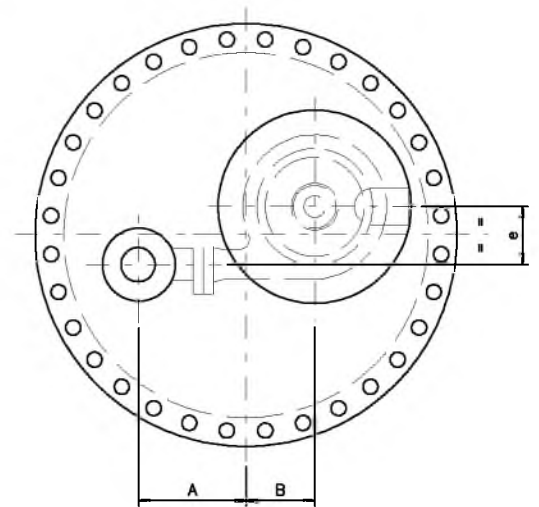
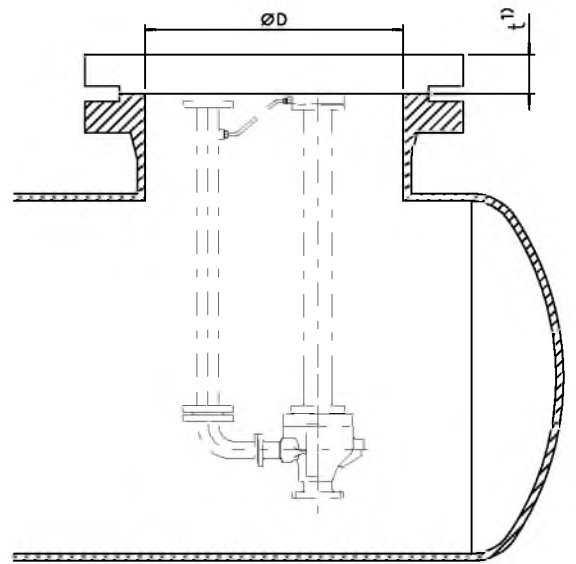


RECTANGULAR SOLEPLATE

14.2 – Circular Flange



DETAIL "X" FOR CIRCULAR SOLEPLATE



CIRCULAR SOLEPLATE

15. Pump dimensions ¹⁾

15.1 Table 1

PUMP SIZE	PUMP								
	NOZZLES			a	a1	e	e1 (min)	e2 (min)	F
	DN1	DN2	DN3						
25-180	40	25	40	214	120	105	65	240	140
25-230	40	25	40	206	120	125	65	240	140
40-180	50	40	80	224	130	105	80	260	160
40-181	50	40	80	228	130	110	80	260	160
40-230	50	40	80	216	130	130	80	260	160
40-231	50	40	80	230	140	135	80	280	160
40-280	50	40	80	234	140	160	80	280	160
40-281	50	40	80	235	140	160	80	280	160
40-361	50	40	80	242	150	195	80	300	160
50-180	80	50	80	248	150	120	100	300	160
50-200	80	50	80	236	150	125	100	300	160
80-200	100	80	150	271	185	130	125	370	200

15.2 Table 2

PUMP SIZE	SOLEPLATE									
	CIRCULAR FLANGE ²⁾					RECTANGULAR				
	Nominal pipe size	A	B	D (min.) ³⁾	t	TANK		SOLEPLATE		
						L1	B1	L	B	t1
25-180	26"	247	125	610	66,7	690	470	782	562	31,7
25-230	28"	247	150	660	69,9	720	470	812	562	31,7
40-180	28"	252	160	660	69,9	760	470	852	562	31,7
40-181	28"	252	160	660	69,9	760	470	852	562	31,7
40-230	30"	272	155	711	73,1	770	480	862	572	31,7
40-231	30"	272	155	711	73,1	770	480	862	572	31,7
40-280	32"	297	155	762	79,4	800	550	892	642	31,7
40-281	32"	297	155	762	79,4	800	550	892	642	31,7
40-361	36"	337	130	864	88,9	830	630	922	722	31,7
50-180	28"	257	165	660	69,9	770	470	862	562	31,7
50-200	26"	227	130	610	66,7	700	470	792	562	31,7
80-200	30"	235	170	711	73,1	800	530	892	622	31,7

¹⁾ Dimensions in mm, except where noted.

²⁾ Dimensions according to ASME B16.47 Class 150# RF Serie A.
Standard materials for a maximum working pressure of 13,5 bar at 200°C:
- Casted: A216 WCB (CS) and A351CF8M (SS).
- Forged: A105 (CS) and A182 Gr. F316 (SS).

Others materials, rating class or different flange thickness upon request.

³⁾ D is the minimum pipe inside diameter.

Grey Water and Condensate Pump

Rotex

Type Series Booklet



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Drainage / Waste Water

Grey Water and Condensate Pump

Rotex



Main applications

- Disposal
- Heating systems
- Drainage systems
- Drainage

Fluids handled

- Grey water
- Heating water
- Condensate
- River, lake and groundwater

Operating data

Operating properties

Characteristic		Value	
		Rotex 10, 20	Rotex 70
Flow rate	Q [m ³ /h]	≤ 24	
	Q [l/s]	≤ 6,67	
Head	H [m]	≤ 14	
Fluid temperature	T [°C]	≤ 90	≤ 70

Designation

Example: Rotex 10 / 100 D

Designation key

Code	Description	
Rotex	Type series	
10	Size	
	10	<ul style="list-style-type: none"> ▪ Heavy-duty design Rp 1 1/4, Rp 2 ▪ Two-channel impeller ▪ Level control with displacement weight
	20	<ul style="list-style-type: none"> ▪ Heavy-duty design Rp 2 ▪ Three-channel impeller ▪ Level control with displacement weight
70 ¹⁾	<ul style="list-style-type: none"> ▪ Light-duty design Rp 1 1/4, Rp 2 ▪ Open radial impeller ▪ Level control with float switch 	
100	Installation depth [cm]	
	100, 170 ²⁾	
D	Drive	
	D	Three-phase motor
	E	Single-phase AC motor

Design details

Design

- Centrifugal pump
- Single-stage
- To EN 12050-2
- Pump foot designed as inlet strainer
- Discharge to the top, parallel to the pump shaft
- Pump and motor rigidly connected via a support column
- Ready to be plugged in
- 1.5 m power cable

Installation type

- Vertical installation

Drive

- Surface-cooled three-phase motor, IP55
- Single-phase AC motor, IP54

Impeller type

Rotex 10:

- Two-channel impeller
- Free passage = 13 mm

Rotex 20:

- Three-channel impeller
- Free passage = 18 mm

Rotex 70:

- Open radial impeller
- Free passage = 10 mm

Bearings

- Product-lubricated plain bearing

1) Rotex size 70 cannot be used for condensate.

2) Rotex size 70 is only available up to an installation depth of 100 cm.

- Grease-packed deep groove ball bearings sealed for life
- Automation**
- Level control
 - Pump operation is automatic, depending on the fluid level

- Rotex 10, 20:
- Displacement weight with cable pull float switch control
- Rotex 70:
- Float switch

Materials

Overview of available materials

Description	Material	
	Rotex 10, 20	Rotex 70
Discharge casing	Grey cast iron	-
Volute casing	-	Grey cast iron
Pump shaft for installation depth 100 cm	Steel	Steel
Pump shaft for installation depth 170 cm	Chrome steel	-
Pump foot	-	Grey cast iron
Impeller	Grey cast iron	Polyamide
Bearing housing	Grey cast iron	-
Bearing bush	Sinter bronze, steel PTFE/CuSn	
Pipe	Steel	
Flange	-	Grey cast iron
Casing wear ring	Bronze	-

Product benefits

- Ready-to-connect, easy installation and commissioning
- Automatic operation by level control with displacement weight or float switch
- Easy to install thanks to low weight, compact design and ready-to-connect system
- Maintenance-free thanks to grease-packed deep groove ball bearings sealed for life and product-lubricated plain bearings

Certifications

Overview

Label	Effective in:	Note
	Europe	All pump sizes

Technical data

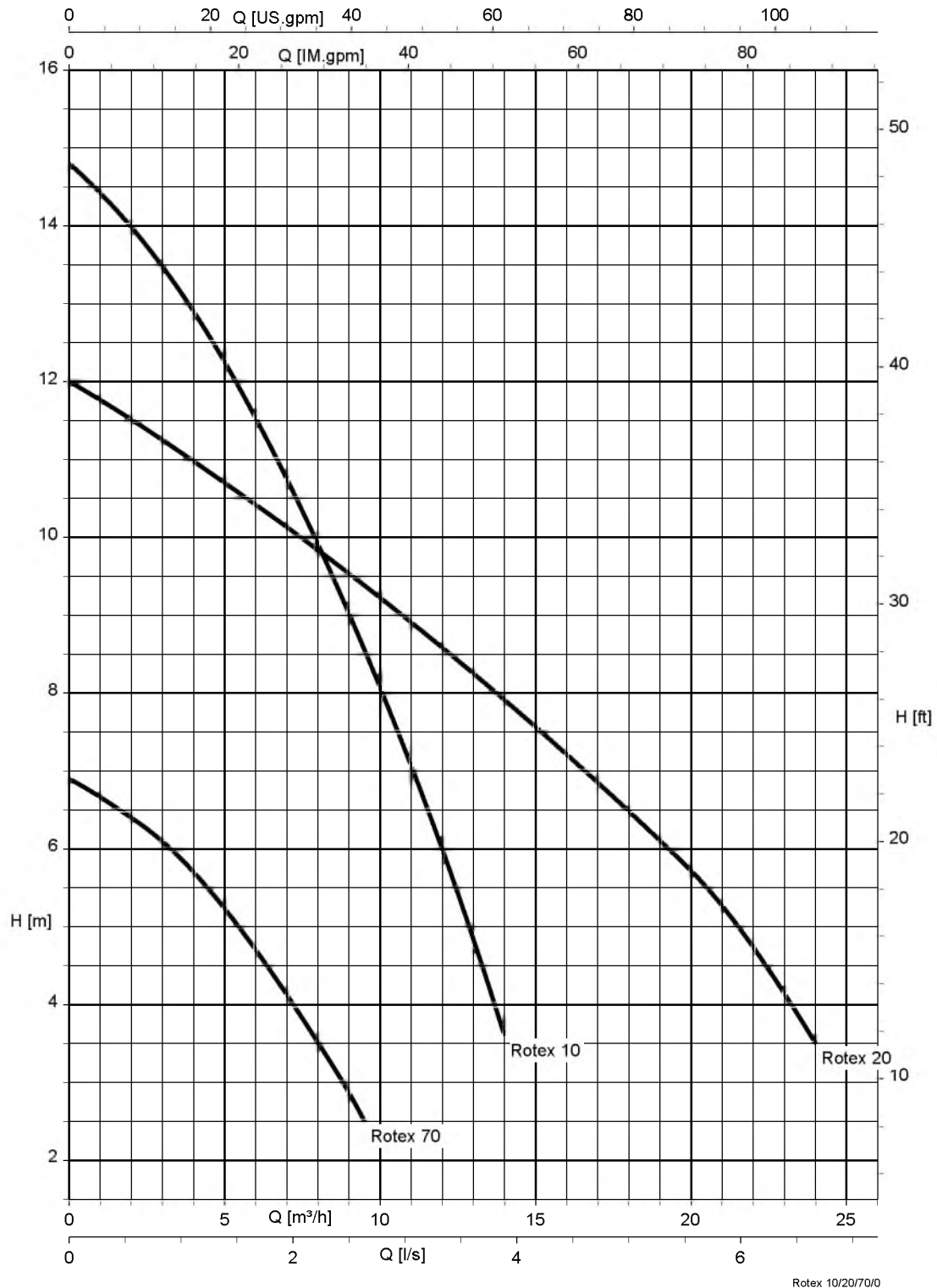
Rotex 10, 20, 70

Technical data

Size	Installation depth [cm]	Connection	P ₂ [kW]	I _N [A]		Mat. No.	[kg]
				1 ~ 230 V	3 ~ 400 V		
10/100 D	100	Rp 1¼	0,55	-	1,35	00529119	25
10/100 E	100	Rp 1¼	0,55	3,6	-	00529129	26
10/170 D	170	Rp 1¼	0,55	-	1,35	00529118	34
10/170 E	170	Rp 1¼	0,55	3,6	-	00529128	35
20/100 D	100	Rp 2	0,55	-	1,35	00529124	26
20/170 D	170	Rp 2	0,55	-	1,35	00529123	35
70 D	100	Rp 1¼	0,37	-	1,0	29101099	16
70 E	100	Rp 1¼	0,37	2,8	-	29101100	17

Characteristic curves

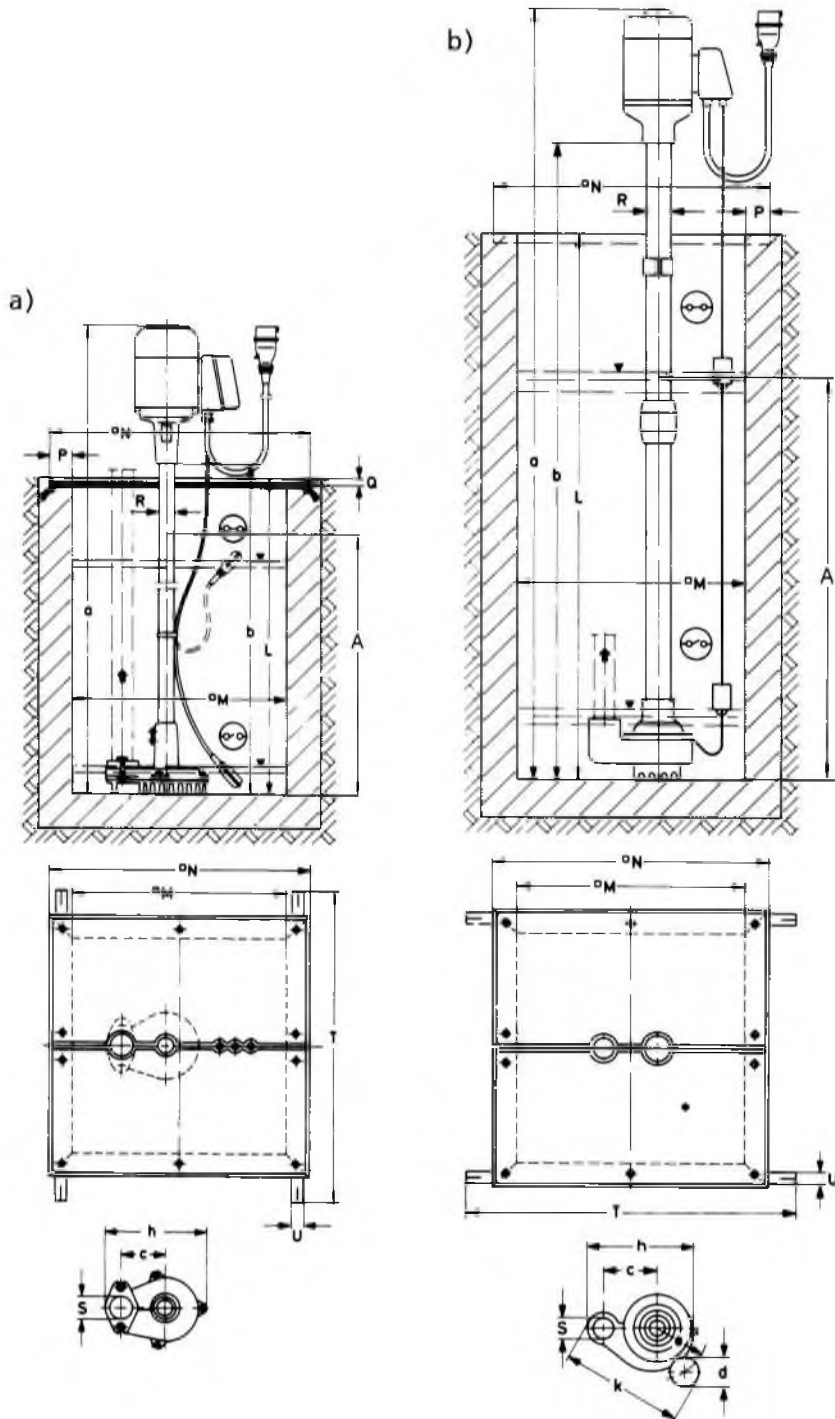
Rotex 10, 20, 70; n = 2900 rpm



Free passage: Rotex 10 = 10 mm; Rotex 20 = 13 mm; Rotex 70 = 18 mm

Dimensions

Rotex 10, 20, 70




Dimensions a) Rotex 70 b) Rotex 10, 20

Minimum water level (stop level)	Rotex 10, 20: 150 mm ³⁾ Rotex 70: 100 mm
Maximum water level (start-up level)	Rotex .../170: ≥ 1000 mm

³⁾ If handling condensate: 400 mm




Dimensions [mm]

Rotex		a	b	c	d	e	h	k	A	L	M	N	P	Q	R	T	U
10/100	Rp 1 1/4	1363	1069	106	60	110	220	242	180	1000	500	560	30	20	60	660	20
10/170	Rp 1 1/4	2085	1791	106	60	110	220	242	1050	1700	500	560	30	20	60	660	20
20/100	Rp 2	1370	1076	117	60	110	240	270	180	1000	500	560	30	20	60	660	20
20/170	Rp 2	2092	1798	117	60	110	240	270	1050	1700	500	560	30	20	60	660	20
70	Rp 1 1/4	1342	1046	97	-	-	215	-	590	1000	500	560	30	20	33,8	660	20

Accessories



Pump accessories




Pump accessories

	Item	Description	Connection	Rotex			Mat. No.	[kg]
				10	20	70		
	P10	RK swing check valve	Rp 1 1/4	X	-	X	01009771	0.1
		Plastic, EN 12 050-4, with internal thread ISO 7/1, full port and drain plug; cannot be used for pumped drainage	Rp 2	-	X	-	01009773	0.5
			Swing check valve	Rp 2	-	X	-	00430260	2.5
	P11	Socket gate valve CuZn PN 10-12 DIN 3352 With internal thread / internal thread and full port	Rp 1 1/4	X	-	X	01014219	0.627
			Rp 2	-	X	-	00411503	1.287
	P18	Cover plate, steel Tread-proof, split, with profile joints and angle iron mounting frame (type A 560) for 500 x 500 mm pits (Dual-pump stations with P13 Y-pipe are equipped with 2 cover plates next to each other.)	Rp 1 1/4	-	-	X	18075627	13

Alarm switchgears for pumps without ATEX





AS 0/AS 1/AS 2/AS 4/AS 5

	Item	Description	Mat. No.	[kg]
	E50	Alarm switchgear AS 0 With circuit breaker, acoustic signal transmitter with 85 dB(A), green equipment-on lamp Plastic housing IP20, 140 x 80 x 57 mm. Use float switch, F1 moisture sensor (item E64), M1 alarm contactor or signal relay of control unit as contactor.	29128401	0.5
	E51	Alarm switchgear AS 2 With circuit breaker, acoustic signal with 85 dB(A), green equipment-on lamp, volt-free contact for hook-up to a control station Plastic housing IP 20, 140 x 80 x 57 mm. Use float switch, F1 moisture sensor (item E 64) or signal relay of control unit as contactor.	29128422	0.5


	Item	Description	Mat. No.	[kg]
	E52	Alarm switchgear AS 4 With circuit breaker, acoustic signal transmitter with 85 dB(A), green equipment-on lamp, volt-free contact for hook-up to a control station, self-charging power supply unit for 5 hours of operation in the event of a power failure Plastic housing IP20, 140 x 80 x 57 mm. Use float switch (E60), F1 moisture sensor (item E64) or signal relay of control unit as contactor.	29128442	0.5
	E53	Alarm switchgear AS 5 Mains-independent, with self-charging power supply unit for 10 hours of operation in the event of a power failure, mains pilot LED, fault indicator light, horn-off push button, volt-free contact for hook-up to a control station, ready for connection with 1.8 m connection cable and plug. ISO housing IP41, 190 x 165 x 75 mm. Use float switch (E60) or signal relay of control unit as contactor.	00530561	1.7
	E55	Alarm switchgear AS 1 In IP30 ISO plug housing, mains-independent, with self-charging power supply unit for 5 hours of operation in the event of a power failure, acoustic signal transmitter 70 dB(A) with circuit breaker and integrated signal transmitter with 3-metre connection cable, max. 60 °C, not suitable for steam and condensate. 1. High water alert by suspending the moisture sensor in a (pump) sump above the pump start-up point. 2. Water alarm signal at a water level of only 1 mm (!), by placing the contactor on the floor of rooms at risk of flooding, e.g. the cellar or next to the washing machine in the kitchen or bathroom.	00533740	0.9

Control unit/switchgear accessories

Alarm equipment for alarm switchgear AS 5

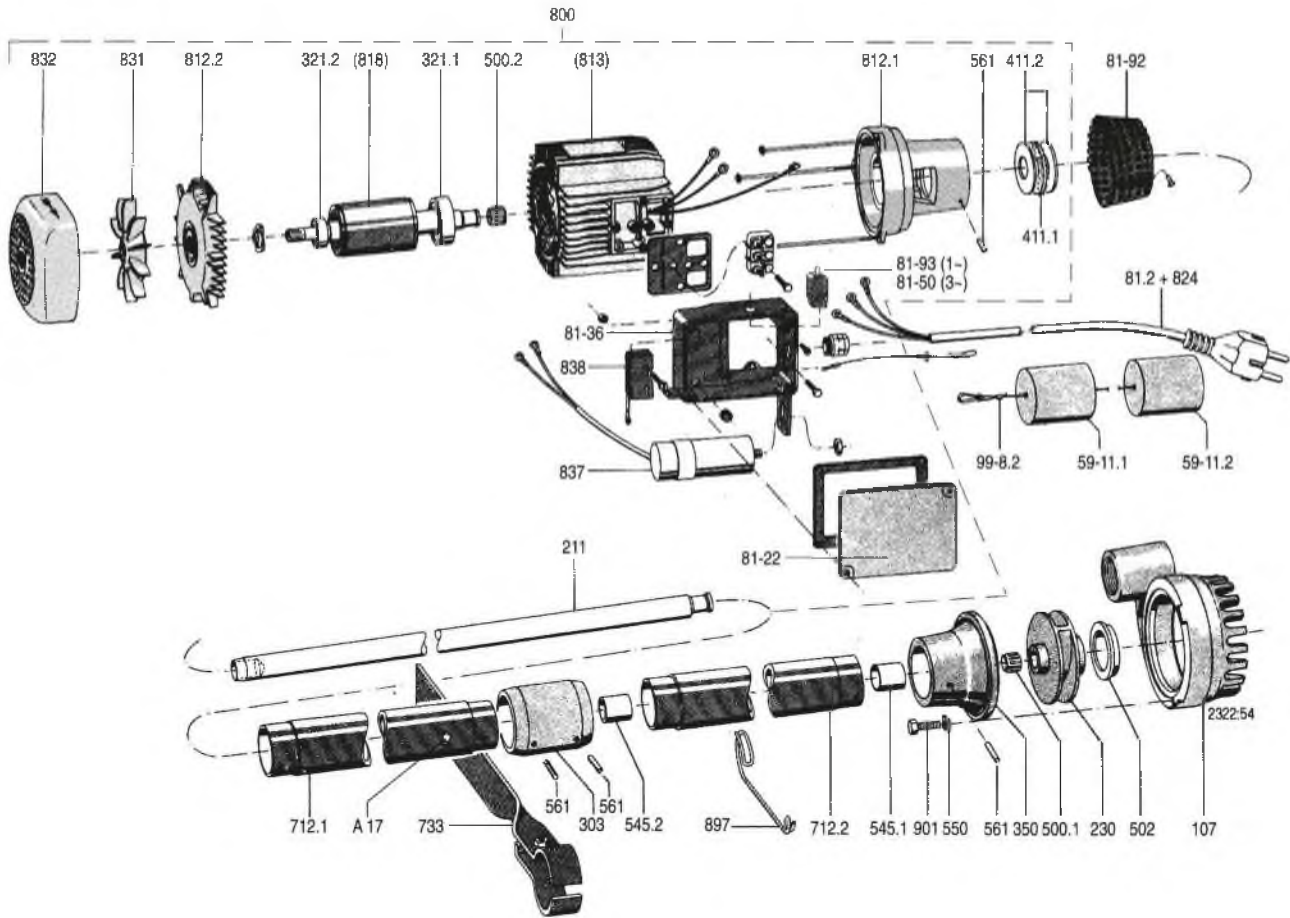
	Description	Mat. No.	[kg]
	Yellow alarm strobe light, 12 V DC, 195 mA, IP65	01056355	0.3
	Plastic housing, (W) 82 ×(H) 55 ×(D) 106.5 [mm], IP65, for easier installation of alarm strobe light, for wall-mounting	01061067	0.2
	Horn, 12 V DC, 105 dB, 150 mA, IP54, with 0.45 m connection cable	01086547	0.1
	Alarm combination (yellow alarm strobe light and piezo buzzer 92 dB), 12 V DC, 120 mA, IP65	01139930	0.1

Control unit/switchgear accessories -  for Rotex 70 only!

	Item	Description	Type	Mat. No.	[kg]
	E60	Float switch with free cable end (NO contact) Switch housing made of polypropylene (max. fluid temperature 70 °C), circuit closed in upper float position, power cable (H07RN-F 3G1)	5	11037743	0.8
			10 m	11037744	1.3
			20 m	11037746	2.4

Exploded views with lists of components

Rotex 10, 20



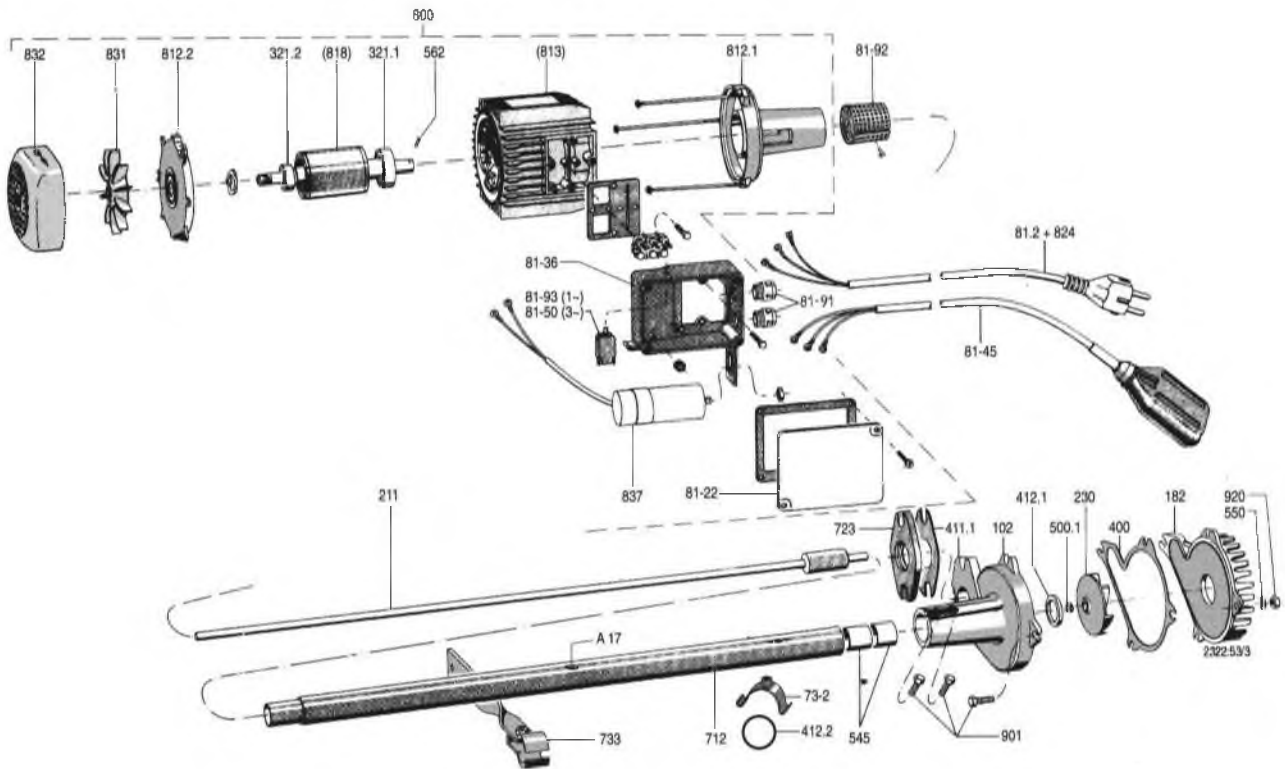
Exploded view - Rotex 10, 20 () = Not available as a separate spare part

List of components

Part No.	Description	Part No.	Description
107	Discharge casing	81-22	Terminal box cover
211	Pump shaft	81-36	Terminal box base
230	Impeller	81-50	Contactar
303 ⁴⁾	Thrust and radial bearing	81-92	Cover plate
321.1/2	Radial ball bearing	81-93	Protective switch
350	Bearing housing	812.1/2	Motor housing cover
411.1/2	Joint ring	813	Stator core pack
500.1/2	Ring	818	Rotor
502	Casing wear ring	824	Cable
545.1/2 ⁴⁾	Bearing bush	831	Fan impeller
550	Disc	832	Fan hood
561	Grooved pin	837	Capacitor
59-11.1/2	Weight	838	Switch
712.1/2 ⁴⁾	Support column	897	Guide piece
733	Pipe clamp	901	Hexagon head bolt
800	Motor	99-8.2	Thread
81-2	Plug	A 17	Overflow hole

⁴⁾ Only included for installation depth 170 cm.

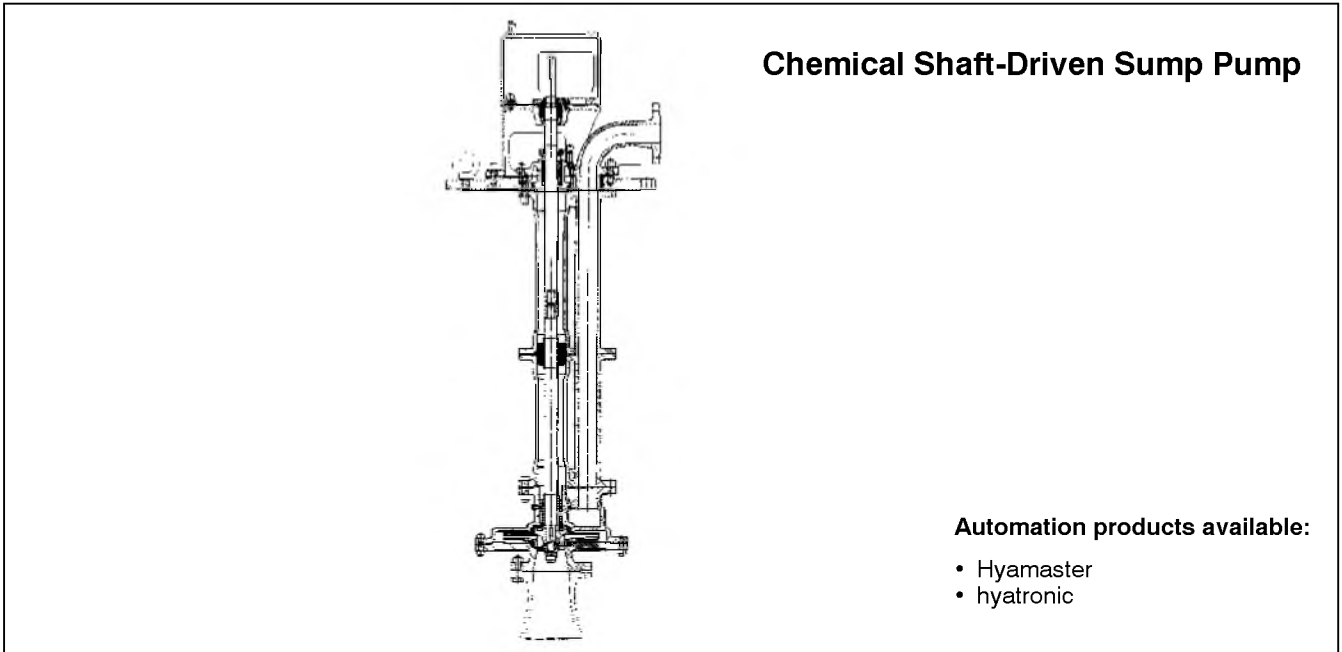
Rotex 70



Exploded view - Rotex 70 () = Not available as a separate spare part

List of components

Part No.	Description	Part No.	Description
102	Volute casing	81-22	Terminal box cover
182	Foot	81-36	Terminal box base
211	Pump shaft	81-45	Float switch
230	Impeller	81-50	Contactator
321.1/2	Radial ball bearing	81-91	Cable gland
400	Gasket	81-92	Cover plate
411.1	Joint ring	81-93	Protective switch
412.1/2	O-ring	812.1/2	Motor housing cover
500.1	Ring	813	Stator core pack
545	Bearing bush	818	Rotor
550	Disc	824	Cable
562	Parallel pin	831	Fan impeller
712	Support column	832	Fan hood
723	Flange	837	Capacitor
73-2	Hose connection	901	Hexagon head bolt
733	Pipe clamp	920	Nut
800	Motor	A 17	Overflow hole
81-2	Plug		



Chemical Shaft-Driven Sump Pump

Automation products available:

- Hyamaster
- hyatronic

Fields of Application

CTN

For handling chemically aggressive liquids, also slightly contaminated or with a low solids content.

CTN pumps can be used in the chemical and petrochemical industry.

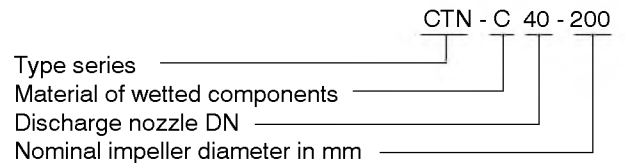
CTN-H

For handling liquids which can only be pumped when warm or hot.

Design

Vertical, radially split shaft-driven sump pump with double volute casing, in wet or dry installation; radial impeller, single-flow, single- and double-stage. The shaft seal is not in contact with the pumped product.

Designation



Operating Data

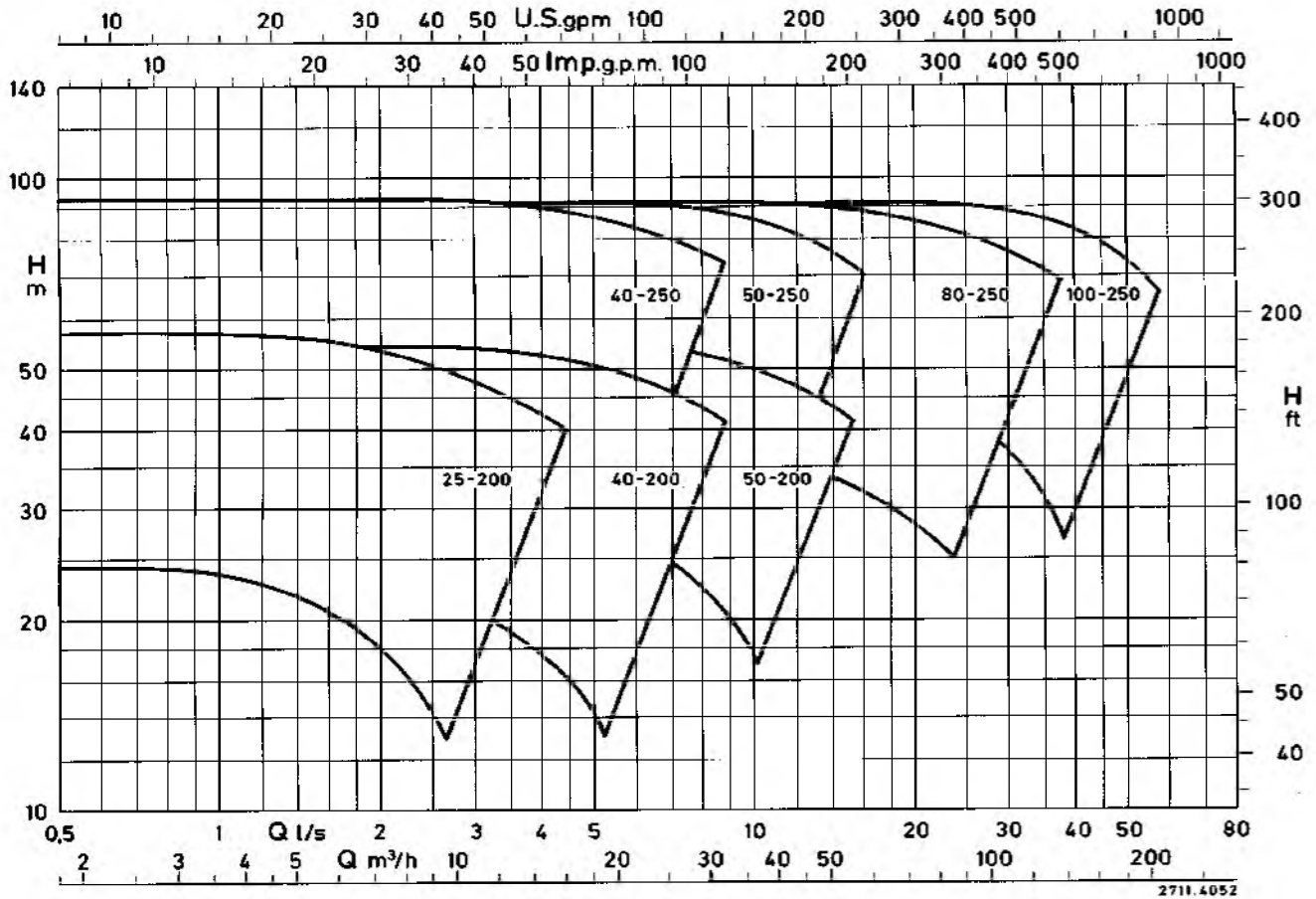
Capacities	Q	up to 220 l/s (800 m ³ /h)
Heads	H	up to 93 m
Pump sizes	DN	25 to 250
Operating pressures	p ₂	up to 16 bar
Operating temperatures	t	-70 °C to +300 °C

Certification

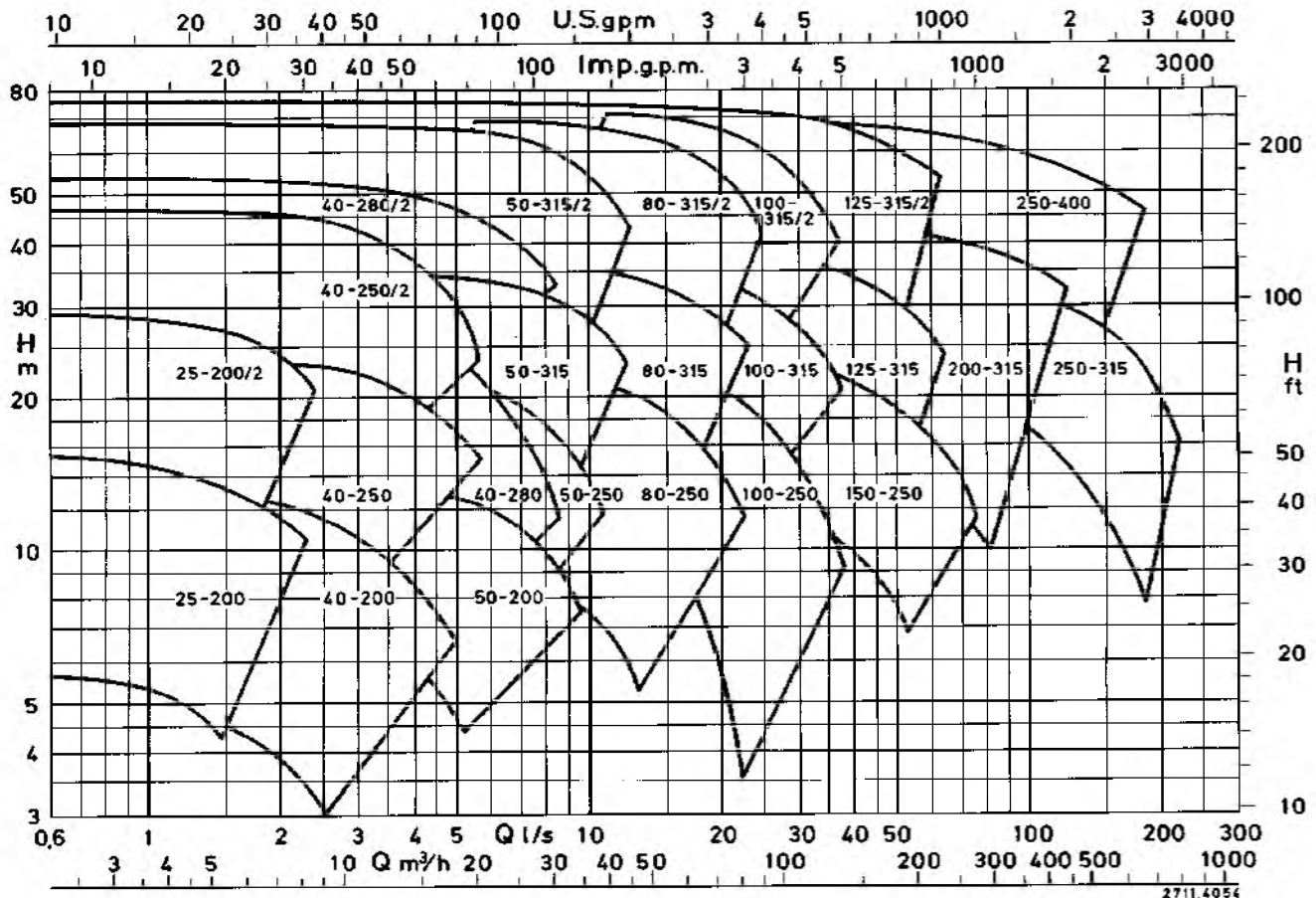
Certified quality management ISO 9001.

Selection Charts

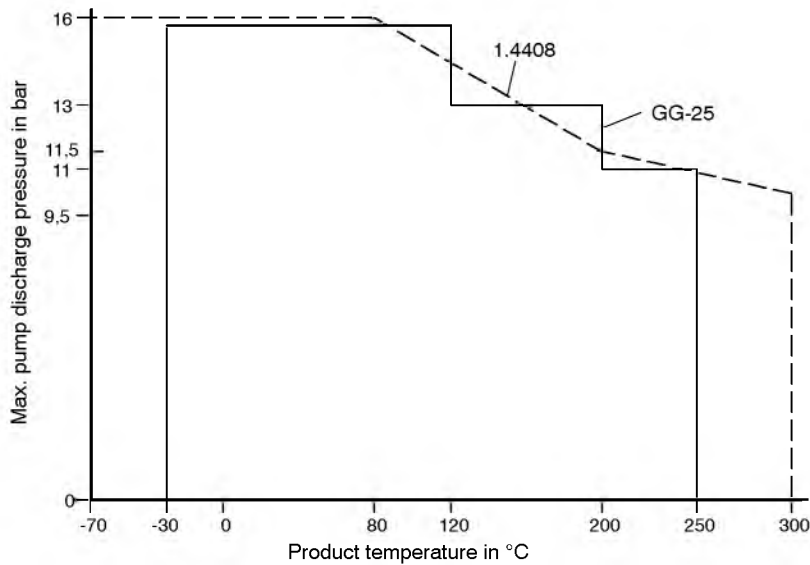
n = 2900 1/min



n = 1450 1/min



Pressure and Temperature Limits



Materials

Part No.	Description	CTN/CTN-H	
		Material G	Material C
102	Volute casing	JL1040 ⁵⁾	1.4408
108	Stage casing	JL1040 ⁵⁾	1.4408
153	Suction nozzle	JL1040 ⁵⁾	1.4408
162	Suction cover	JL1040 ⁵⁾	1.4408
210	Shaft	C45SH+S	1.4571SH
230	Impeller	JL1040 ⁵⁾	1.4408
341	Motor stool	JL1040 ⁵⁾	JL1040 ⁵⁾
344	Bearing bracket lantern	JL1040 ⁵⁾	JL1040 ⁵⁾
350.04	Guide bearing housing ³⁾	JL1040 ⁵⁾	1.4408
452.02	Gland cover	C22+N	1.4571
454.02	Stuffing box ring	1.4571	1.4571
458.02	Lantern ring	1.4571	1.4571
502.01 bis .04	Casing wear ring	JL1040 ⁵⁾	-
529.01/.03	Bearing sleeve	1.4122+QT750	1.4571
545.01/.03	Bearing bush	Carbon ⁴⁾	Carbon ⁴⁾
71-9.01/.02	Pipe assembly	JL1040 ^{2) 5)}	1.4571/1.4408
72-1	Flanged elbow	JL1040 ^{2) 5)}	1.4408 ²⁾
852	Threaded coupling	1.4021+QT750	1.4571
893.02	Soleplate	JL1040 ⁵⁾	JL1040 ⁵⁾
	Nuts and bolts	5.6	A4

1) if only one shaft is fitted: for larger installation depths the shaft assembly consists of pump shaft and drive shaft or of pump shaft, intermediate shaft(s) and drive shaft

2) on CTN-H: material variant G = St35; C = 1.4571

3) not applicable to CTN-H

4) standard version: other materials possible, depending on pumped liquid

5) to EN 1561

Benefits at a Glance

Thrust bearing

little axial movement of the rotor; held in position by the shaft nut. Rotor adjustable on mounted pump

Shaft seal

not in contact with the pumped product, gland packing or mechanical seal possible

Plain bearings

adapted to operating conditions, product-lubricated

Double volute

reduces load on the plain bearings

Pressure-retaining components

selected in well-proven calculation procedure, manufactured as quality casting with corrosion allowance

Discharge pipe

raised above the soleplate, easy and quick installation without draining the tank

Soleplate

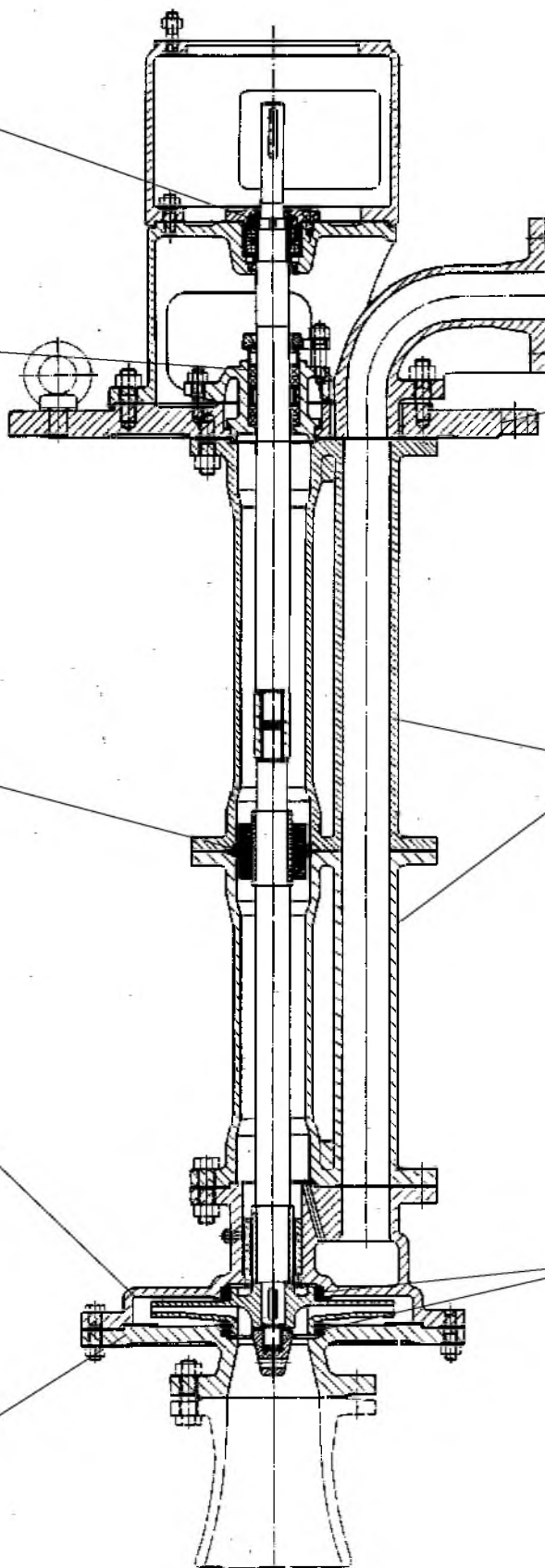
round, interchangeable among certain pump sizes, odour- and gasproof soleplate design possible

Installation depth

variable by combining different quantities of pipe assemblies (modular design system)

Casing wear rings

replaceable (in material variant GG)



Applications

Installations

- Inlet tanks
- Shafts
- Pump sumps
- Tanks
- Wells
- Water extraction from rivers

Utilisation

- General industrial applications
- Water supply
- Fire-fighting systems
- Pressure boosting
- Irrigation
- Drinking water

Fluid handled

Water without solids content

Operating data

Flow rate	Up to 1800 m ³ /h covered by 17 sizes of the hydraulic system Up to 2500 m ³ /h on request
Head	Up to 250 m
Fluid temperature	Up to 60°C
Installation depth	20 m as a standard, larger installation depths on request
Well diameter	6" to 22"
Nominal pressure	16 bar or 25 bar

Designation

	W	8	- 65/	T9 -	C01
Type series	_____	_____	_____	_____	_____
Well diameter	_____	_____	_____	_____	_____
Flow rate at best efficiency point	_____	_____	_____	_____	_____
Number of stages	_____	_____	_____	_____	_____
Material variant	_____	_____	_____	_____	_____

Design

Multi-stage deep-well turbine pump with mixed flow impellers

- Suction casing with foot valve and suction strainer
- Motor stool with reinforced thrust bearing and reverse rotation lock
- Flanged column pipe and product-lubricated radial bearings
- Discharge elbow with flange connection on the discharge side
- Discharge nozzle above sole plate
Variant: discharge nozzle below sole plate
- Variant for dry installation

Materials: cast iron or bronze

- Other material variants on request

Drive

- 50/60 Hz electric motor with flexible coupling
- Combustion engine with angular gear
- Motor with hollow shaft

Vertical Deep-well Turbine Pumps



Compliant with Machinery Directive 2006/42/EC

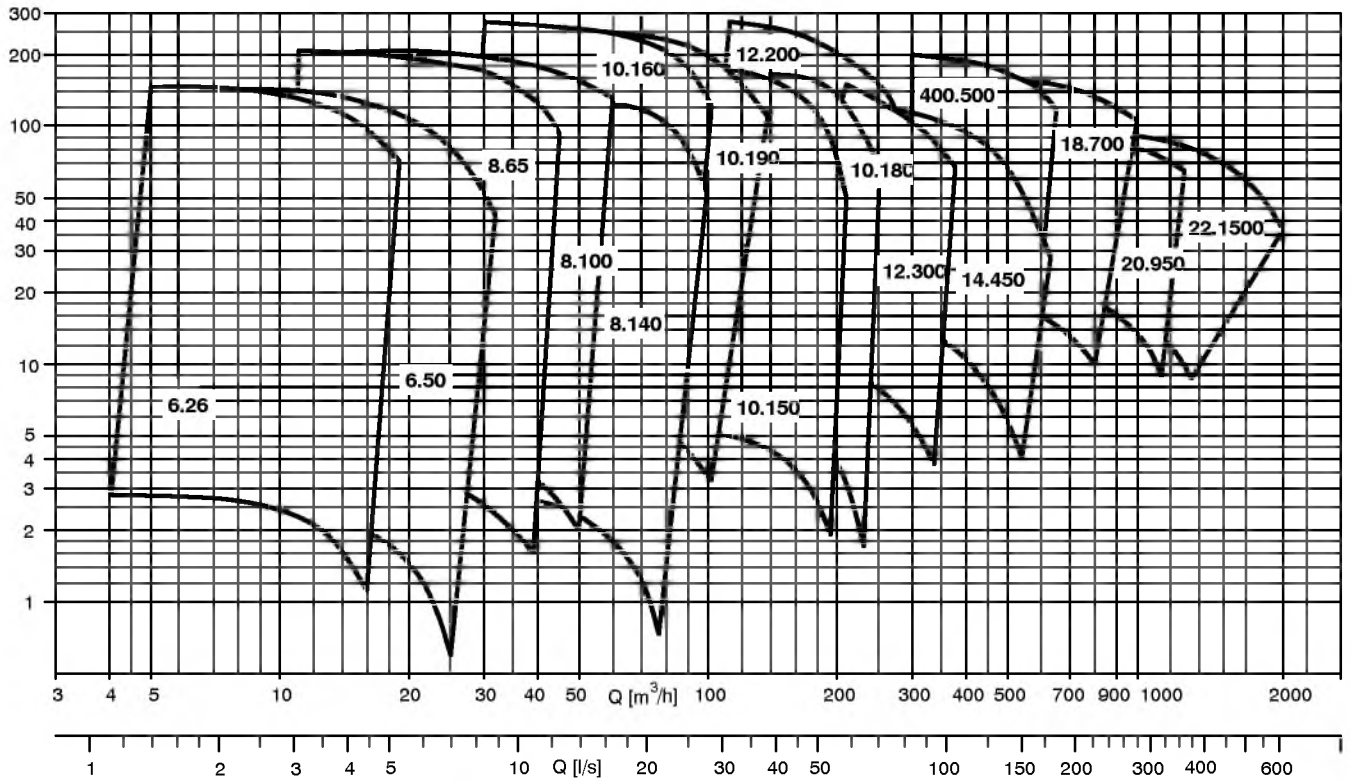


DIN ISO 9001 / EN 29001



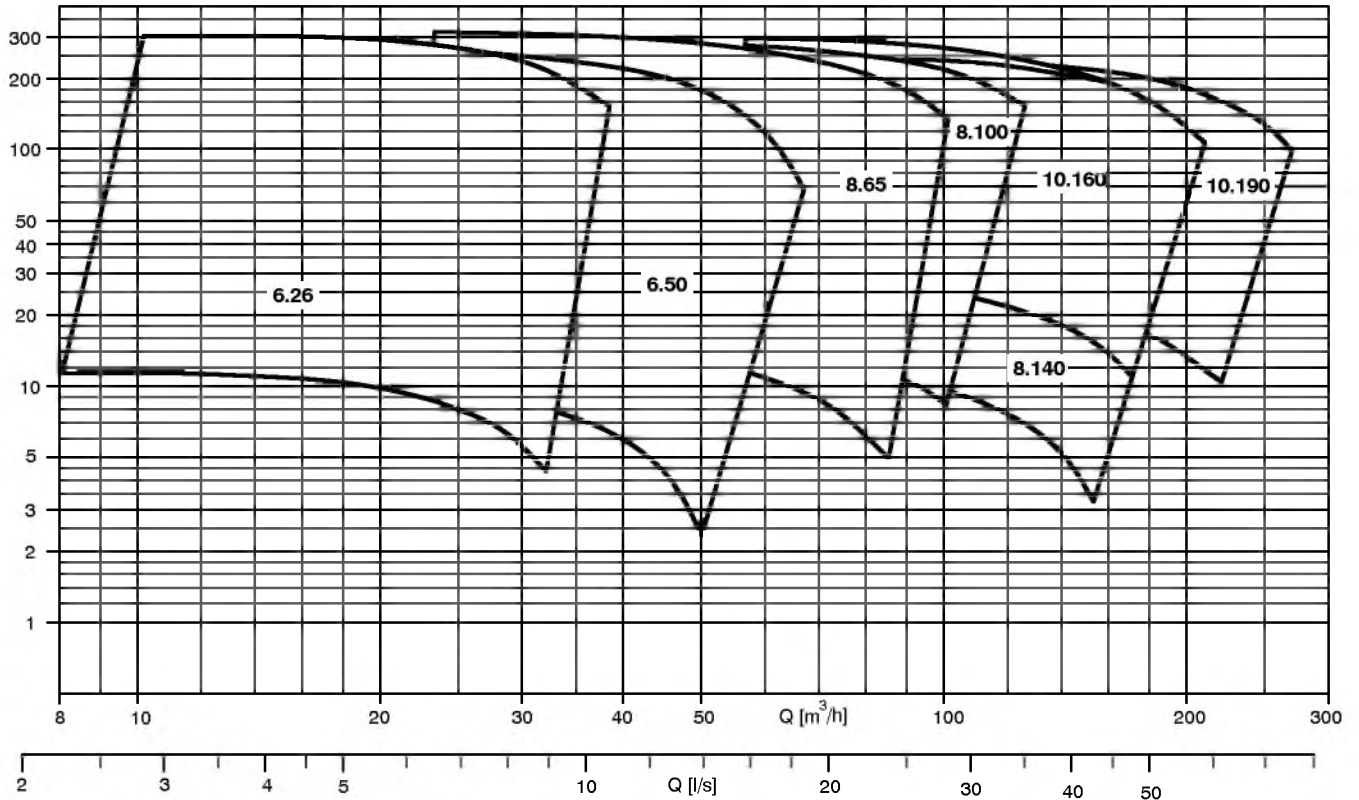
Performance chart - 1450 rpm, 50 Hz

H [m]



Performance chart - 2900 rpm, 50 Hz

H [m]



Materials

Part description	Variant C00	Variant C01
Motor stool	JL1040 (1) / GJL-250	JL1040 (1) / GJL-250
Discharge elbow	JL1040 (1) / GJL-250	JL1040 (1) / GJL-250
Column pipe	Steel S235 JRG2	Steel S235 JRG2
Drive shaft, transmission shaft, pump shaft	1.4021	1.4021
Coupling sleeve with gears	1.0718+C / 11SMnPb30	1.0718+C / 11SMnPb30
Shaft protecting sleeve	1.4404	1.4404
Bearing bush	Althan (NBR)	Althan (NBR)
Pump bowl, suction and discharge casing, drive bearing, valve parts	JL1040 (1) / GJL-250	JL1040 (1) / GJL-250
Impeller	JL1040 (1) / GJL-250	Bronze CuSn10
Tapered locking sleeve	C35E	C35E
Casing wear ring	Bronze CuSn8	Bronze CuSn8
Suction strainer	Galvanised steel	Galvanised steel
Nuts and bolts above discharge elbow	Stainless steel A4	Stainless steel A4
Nuts and bolts at discharge elbow, column pipe and casing	Stainless steel A4	Stainless steel A4

1) - To EN 1561

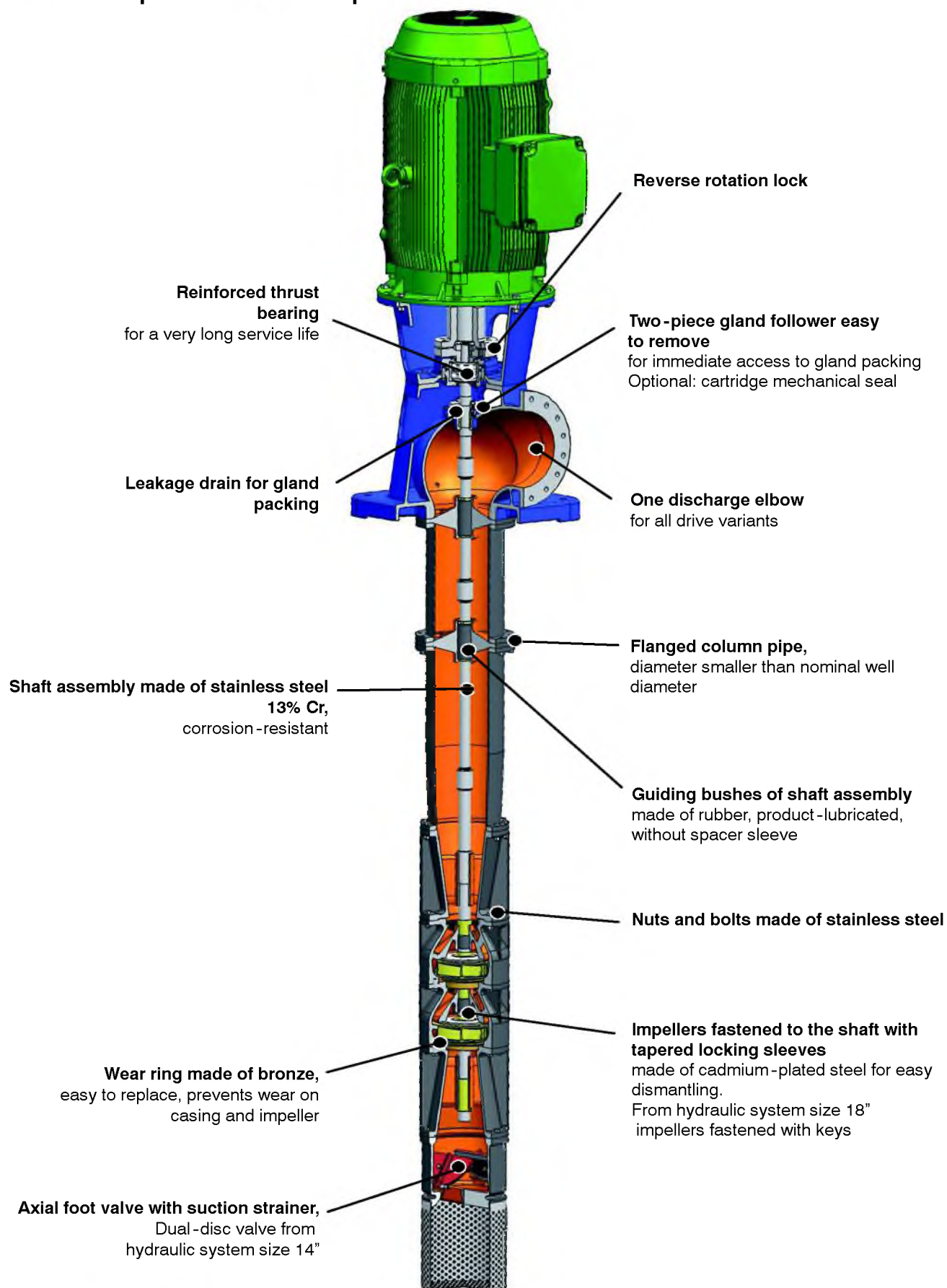
Special variants:

- ATEX version ExII2G T1 - T5
- Variant with cartridge mechanical seal on request
- Column pipe shafts with sleeves
- Bearing bushes made of bronze or PTFE
- For fluids other than water, or fluids with a solids content exceeding 50 g/m³, other material variants may be offered.
- ACS approval (French drinking water regulations)
- Discharge elbow below the sole plate
- Speed control on request
- Bearing with external lubrication
- Thrust bearing with temperature sensor

Paint coat

- Above the sole plate: acrylic blue RAL 5002
- Below the sole plate and inside the elbow: bituminous anti-corrosive coating, black RAL 9005
- Special variant: coating for marine applications

Vertical Deep-well Turbine Pumps



Subject to technical modification without prior notice.

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02/2011

5901-5/4-10

Electromagnetic Piston Pump



Fields of Application

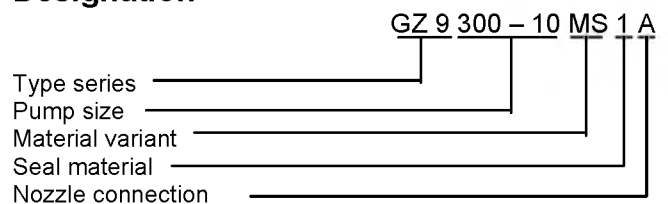
GZ pumps are suitable for clean liquids not liable to crystallize with a maximum viscosity of up to 12mm²/s, which neither corrode nor abrade the pump materials. For applications requiring condensation water or splash protection, pump type GZ 10 (drive coated with four-component resin) can be supplied upon request.

- Welding
- Industrial ironing machines
- Coffee machines
- Sealing pressure systems for mechanical seals
- Lubricating oil systems
- Air humidifiers
- Disinfectors
- Washing plants
- Drink dispensers
- Solar technology
- Medical applications (inhalator)
- Drinking bowls
- Humidifiers systems
- Dosing duties
- Fixative baths
- Plasma technology
- Laser technology
- Studio and stage engineering

Design

Ready-to-connect, self priming, electromagnetic piston pump, splash-proof, (IP41), with 1.05m connection cable 3 x 0.75 mm² H 03 VVF

Designation



With:

Material variant

MS = brass
C = stainless steel

Seal material

1 = buna N
2 = EPDM
3 = Viton

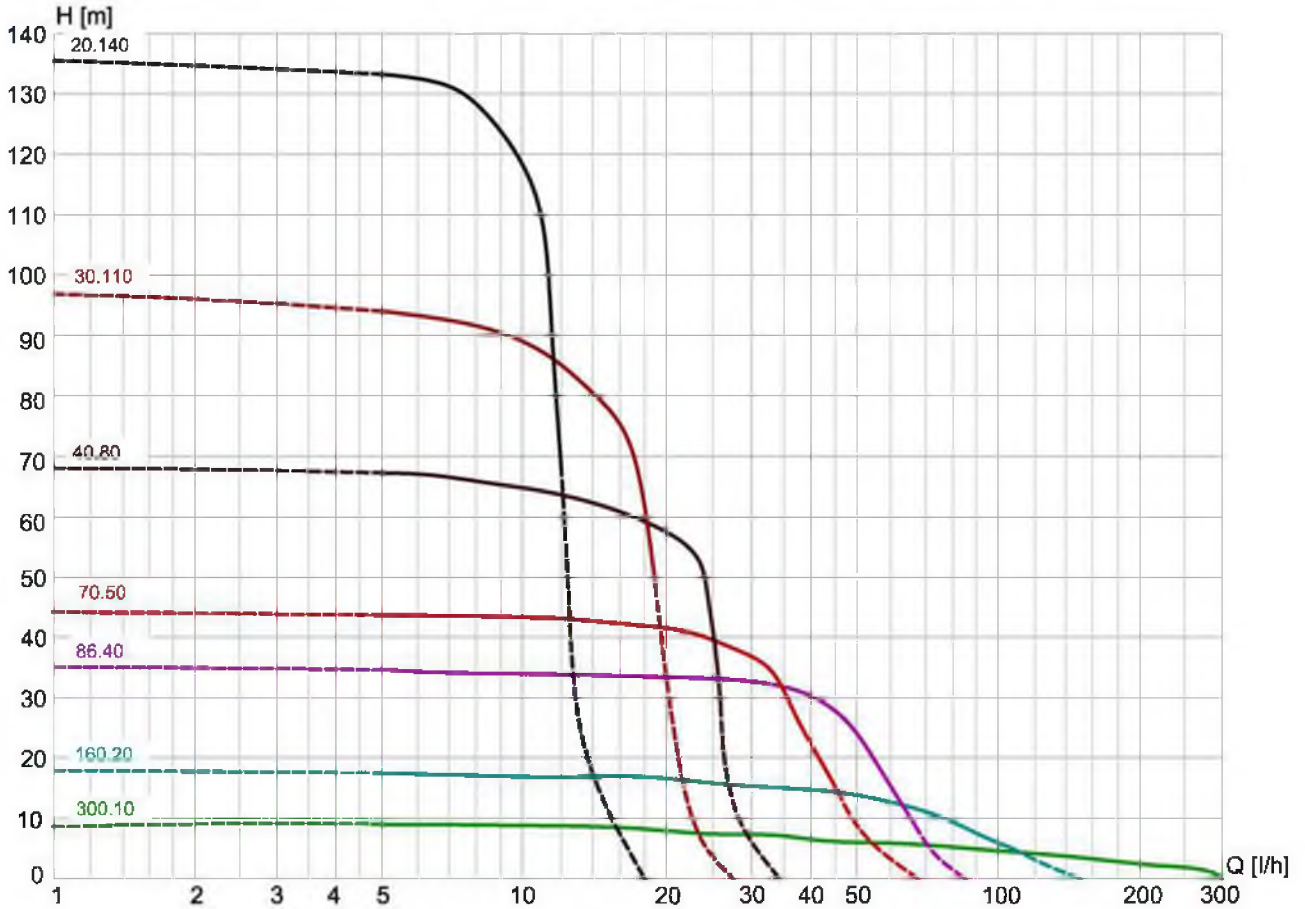
Nozzle connection

A = hose connection on suction and discharge side
B = threaded connection on suction and discharge side
AB = hose connection on suction side threaded connection on discharge side
BA = threaded connection on suction side
Hose connection on discharge side

Operating Data

Capacity	Q	up to 300l/h
Operating pressure	P _d	up to 13 bar
Suction lift	P _s	up to 0,5m (300-10 : 0,3m)
Inlet pressure	P _z	up to 1 bar
		If above, please inquire
Operating temp.	T	up to 60°C Up to 100°C for oil
Drive rating	P	60 W
Pump weight		approx 600g

Selection Chart



Electrical Connection

1 ~ 230 V (207 – 253 V) pour 50 Hz

Special variants:

- Direct current voltage :
 - 12V
 - 24V

- Alternating voltage:

50 Hz <ul style="list-style-type: none"> ○ 24V (22 – 26V) ○ 42V (40 – 44V) ○ 110V (100 – 120V) ○ 127V (114 – 140V) ○ 230V (207 – 253V) ○ 380V (370 – 390V) 	60 Hz <ul style="list-style-type: none"> ○ 12V (11 – 14V) ○ 42V (40 – 44V) ○ 110V (100 – 120V) ○ 200V (190 – 210V) ○ 220V (210 – 230V) ○ 240V (230 – 250V) ○ 380V (370 – 390V)
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- Special variants on inquiry

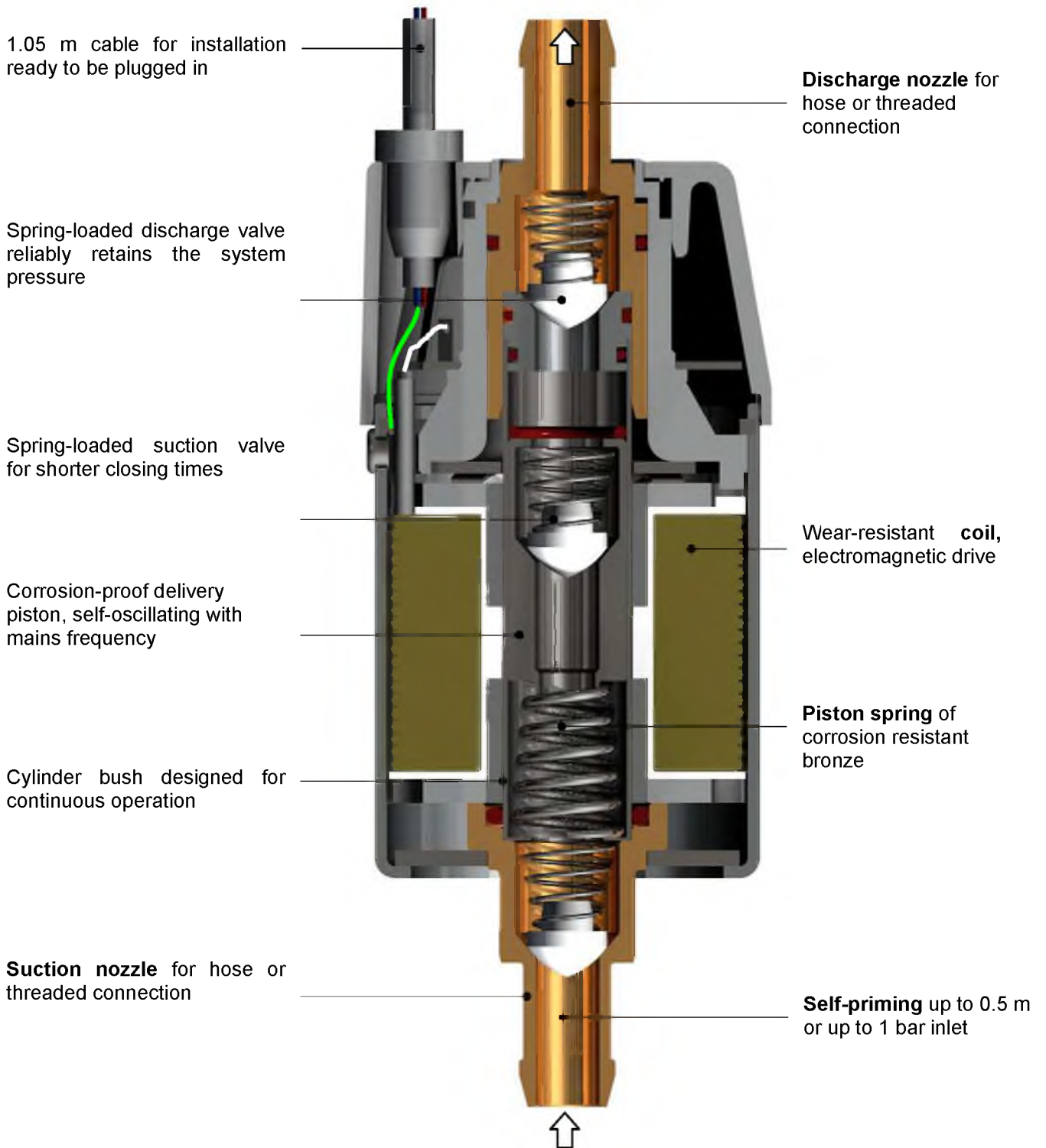
Materials

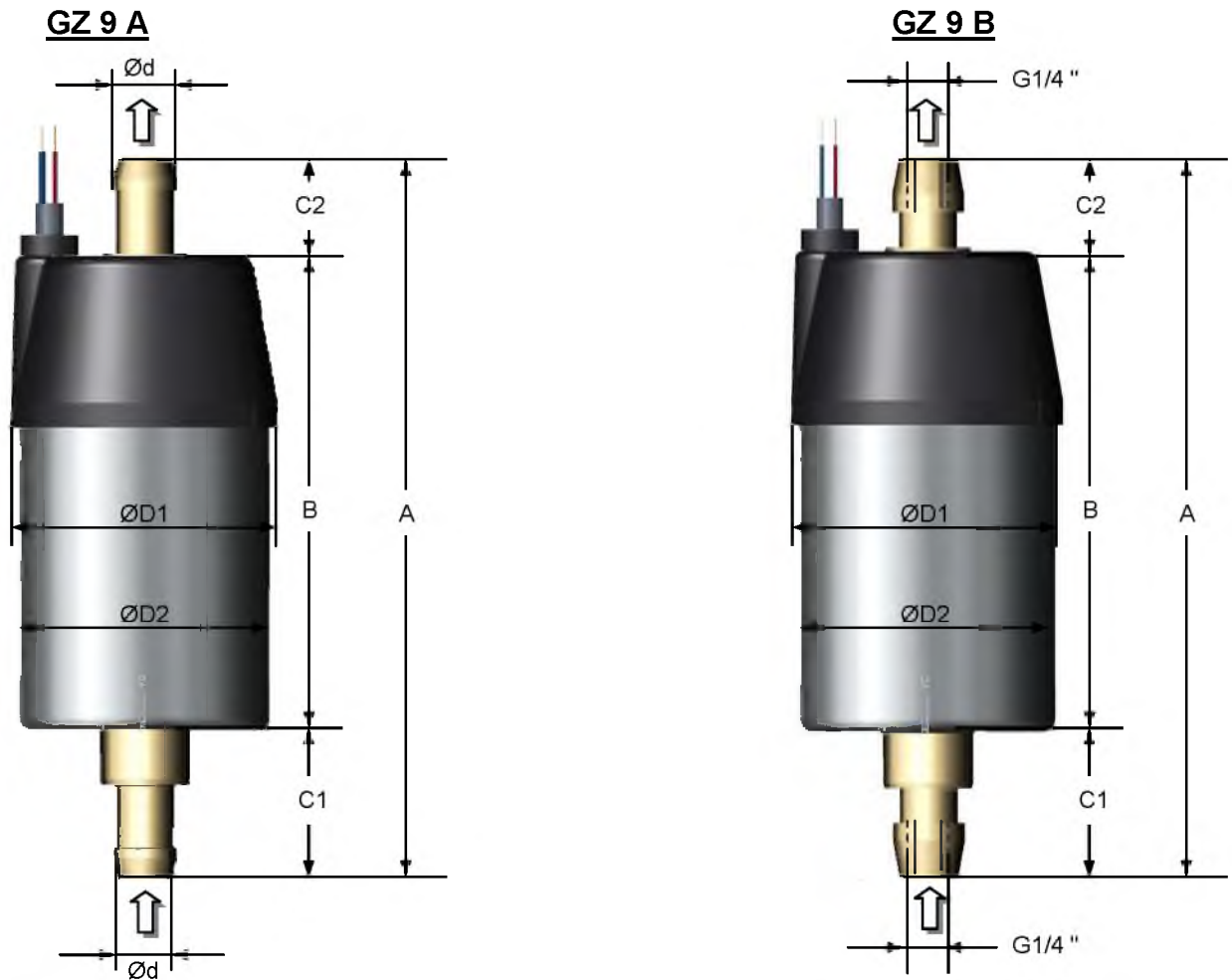
	Standard design Ms	Variant C
Suction nozzle	CuZn40Pb2	1.4301
Discharge nozzle	CuZn40Pb2	1.4301
Pump casing	Galvanized sheet steel	
Delivery piston	1.4016	
Cylinder bush	CuZn40Pb2	1.4301
Piston spring	Bronze de Beryllium	1.4301
Suction/discharge valve	Polyurethane	
Valve springs	1.4301	

Pump Media List

<i>Medium pumped</i>	Pump material variants		Seal materials		
	GZ 9 MS	GZ 9 C	Buna N	EPDM	Viton
			(standard)	Only 300-10, 160-20, 70- 50, 86-40)	(not for 20- 140)
			Code 1	Code 2	Code 3
Clean water	X		X	X	X
Condensate	X	X		X	X
Cooling water	X		X	X	X
Drinking water	X				X
Partly demineralised water	X				X
Demineralised water		X		X	
Water/glycol mixture	X		X	X	
Diesel oil, heating oil	X				X
Gasoline, kerosene	X				X
Oil	X				X
Fixative bath, acidic	X				X
Aggressive liquids (not crystallizing)	Please consult us; depends on medium pumped				
Fruit juice, coffee	X		X		X
Alkaline cleaning detergent	X			X	
Lees for bottle rinsing	X			X	
Lees for metal cleaning	X				X
Halogenated hydrocarbons (water-free)	X				X

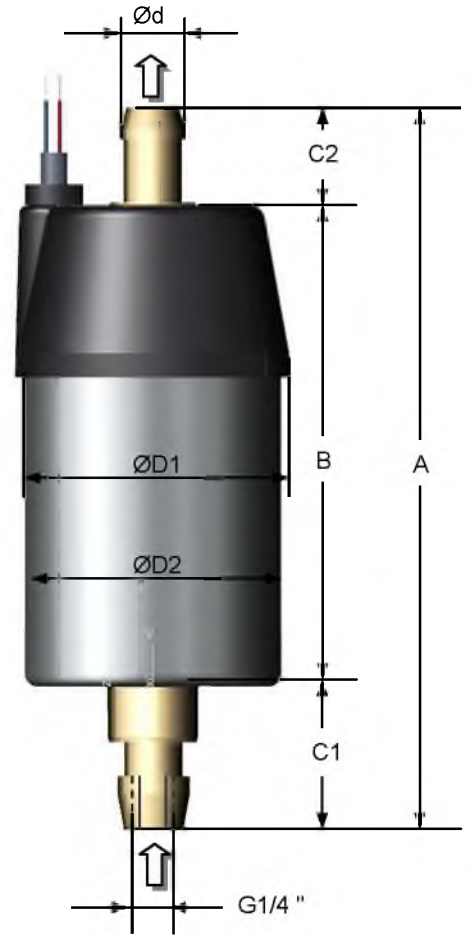
Design Features



Dimension Table
Nozzle connection


Pump size	Nozzle connection	A	B	C1	C2	D1	D2	d
20-140	A	133	90	19	24	51	48	8
30-110	A	133	90	19	24	51	48	8
40-80	A	133	90	19	24	51	48	8
70-50	A	133	90	19	24	51	48	8
86-40	A	133	90	19	24	51	48	8
160-20	A	137	90	29	18	51	48	12
300-10	A	137	90	29	18	51	48	12
20-140	B	140	90	26	24	51	48	
30-110	B	140	90	26	24	51	48	
40-80	B	140	90	26	24	51	48	
70-50	B	140	90	26	24	51	48	
86-40	B	140	90	26	24	51	48	
160-20	B	148	90	34	24	51	48	
300-10	B	148	90	34	24	51	48	

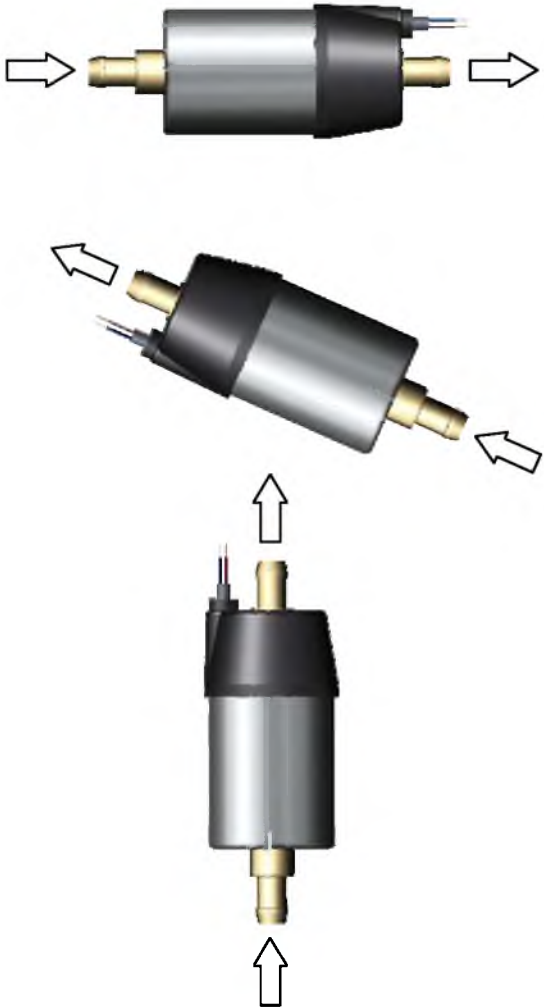
Nozzle connections
GZ 9 AB

GZ 9 BA


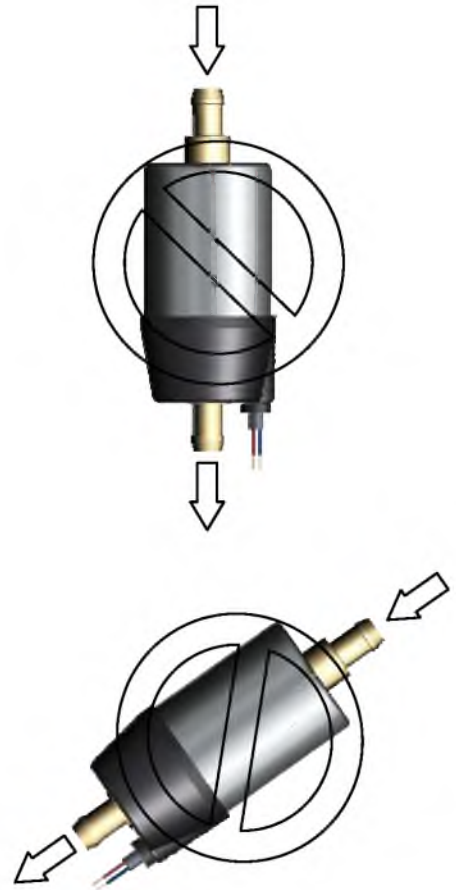
Pump size	Nozzle connection	A	B	C1	C2	D1	D2	d
20-140	AB	133	90	19	24	51	48	8
30-110	AB	133	90	19	24	51	48	8
40-80	AB	133	90	19	24	51	48	8
70-50	AB	133	90	19	24	51	48	8
86-40	AB	133	90	19	24	51	48	8
160-20	AB	143	90	29	24	51	48	12
300-10	AB	143	90	29	24	51	48	12
20-140	BA	140	90	26	24	51	48	8
30-110	BA	140	90	26	24	51	48	8
40-80	BA	140	90	26	24	51	48	8
70-50	BA	140	90	26	24	51	48	8
86-40	BA	140	90	26	24	51	48	8
160-20	BA	142	90	34	18	51	48	12
300-10	BA	142	90	34	18	51	48	12

Installation position

Right



Wrong



Pump Accessories

Holding equipment available for all pump sizes and variants, consisting of a holder with rubber buffers and a pipe bracket.



Exécution standard / standardausführung / Standard design

 Combinaison de matériaux / Materialvariante / Kombination of material : **MS**

Moteur / Motor : 1~, 230 V (207 - 253 V), 50 Hz

 |Matériau d'étanchéité / Dichtungswerkstoff / Material for sealing : **Perbunan (Code 1)**

Type de pompe Baugrösse Pump size	Raccord des tubulures / Stutzenanschluss / Branch connection		
	A code / Ident-Nr.	B code / Ident Nr-	Poids / Gewicht / weight (kg)
GZ9 20-140	48 830 955	48 830 956	0,6
GZ9 30-110	48 830 957	48 830 958	0,6
GZ9 40-80	48 830 959	48 830 960	0,6
GZ9 70-50	48 830 961	48 830 962	0,6
GZ9 86-40	48 830 963	48 930 964	0,6
GZ9 160-20	48 830 965	48 830 966	0,6
GZ9 300-10	48 830 967	48 830 968	0,6

* AB et BA sur demande 1 AB und BA auf Anfrage 1 AB and BA on request

Variante admise Moteur / Motor : 1~, 230 V (207 - 253 V), 50 Hz : Zugelassene Variante EPDM (Code 2) Admissible variant			
Type de pompe Baugrösse Pump size	Raccord des tubulures / Stutzenanschluss / Branch connection		
	A code / Ident-Nr.	B code / Ident Nr-	Poids / Gewicht / weight (kg)
GZ9 70-50	42 111 792	42 111 793	0,6
GZ9 86-40	42 111 802	42 111 803	0,6
GZ9 160-20	42 111 812	42 111 813	0,6
GZ9 300-10	42 111 822	42 111 823	0,6

* AB et BA sur demande 1 AB und BA auf Anfrage 1 AB and BA on request

Variante admise Moteur / Motor : 1~, 230 V (207 - 253 V), 50 Hz : Zugelassene Variante VITON (Code 3) Admissible variant			
Type de pompe Baugrösse Pump size	Raccord des tubulures / Stutzenanschluss / Branch connection		
	A code / Ident-Nr.	B code / Ident Nr-	Poids / Gewicht / weight (kg)
GZ9 30-110	42 111 780	42 111 781	0,6
GZ9 40-80	42 111 786	42 111 787	0,6
GZ9 70-50	42 111 794	42 111 795	0,6
GZ9 86-40	42 111 804	42 111 805	0,6
GZ9 160-20	42 111 814	42 111 815	0,6
GZ9 300-10	42 111 824	42 111 825	0,6

* AB et BA sur demande 1 AB und BA auf Anfrage 1 AB and BA on request

Variante admise Zugelassene Variante Admissible variant	Combinaison de matériaux / Materialvariante / Combinaison of material : MS Materiu d'étanchéité / Dichtungswerkstoff / Material for sealing : Perbunan (code 1)		
	Raccord des tubulures / Stutzenanschluss / Branch connection		
Type de pompe Baugrösse Pump size	A code / Ident-Nr. 12CC	B code / Ident-Nr. 12CC	Poids / Gewicht / weight (kg)
GZ9 20-140	42 111 704	42 111 705	0,6
GZ9 30-110	42 111 710	42 111 711	0,6
GZ9 40-80	42 111 716	42 111 717	0,6
GZ9 70-50	42 111 727	42 111 728	0,6
GZ9 86-40	42 111 743	42 111 744	0,6
GZ9 160-20	42 111 754	42 111 755	0,6
GZ9 300-10	42 111 765	42 111 766	0,6
	Raccord des tubulures / Stutzenanschluss / Branch connection		
Type de pompe Baugrösse Pump size	A code / Ident-Nr. 24CC	B code / Ident-Nr. 24CC	Poids / Gewicht / weight (kg)
GZ9 20-140	42 111 706	42 111 707	0,6
GZ9 30-110	42 111 712	42 111 713	0,6
GZ9 40-80	42 111 718	42 111 719	0,6
GZ9 70-50	42 111 729	42 111 730	0,6
GZ9 86-40	42 111 745	42 111 746	0,6
GZ9 160-20	42 111 756	42 111 757	0,6
GZ9 300-10	42 111 767	42 111 768	0,6
	Raccord des tubulures / Stutzenanschluss / Branch connection		
Type de pompe Baugrösse Pump size	A code / Ident-Nr. 24V	B code / Ident-Nr. 24V	Poids / Gewicht / weight (kg)
GZ9 20-140	42 111 702	42 111 703	0,6
GZ9 30-110	42 111 708	42 111 709	0,6
GZ9 40-80	42 111 714	42 111 715	0,6
GZ9 70-50	42 111 725	42 111 726	0,6
GZ9 86-40	42 111 741	42 111 742	0,6
GZ9 160-20	42 111 752	42 111 753	0,6
GZ9 300-10	42 111 763	42 111 764	0,6

Swing Check Valve

SISTO-RSK/RSKS

PN 16 / DN 25-300

Maintenance-free
Soft-seated
With or without Lining
Flanged Ends

Type Series Booklet



SISTO

Check Valves and Strainers

Swing Check Valves to DIN/EN

SISTO-RSK/RSKS



Main applications

- Mining
- General irrigation systems
- Chemical industry
- Disposal
- Fire-fighting systems
- Domestic water supply
- Nuclear power stations
- Sewage treatment plants
- Fossil-fuelled power stations
- Seawater desalination/reverse osmosis
- Process engineering
- Water treatment
- Water supply systems

Fluids handled

- Abrasive fluids
- Faecal-free waste water
- Aggressive fluids
- Inorganic fluids
- Brackish water
- Service water
- Solids-laden fluids
- River, lake and groundwater
- Fluids posing a health hazard

- Toxic fluids
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Cooling water
- Fire-fighting water
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Radioactive fluids
- Cleaning agents
- Grey water
- Brine
- Drinking water
- Wash water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 15-300
Permissible pressure	1-16 bar
Max. permissible temperature ¹⁾	-20 °C to +140 °C

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	-20 °C to +140 °C

Design details

Design

- Soft-seated swing check valve in straight-way pattern with straight-line flow path
- Soft rubber encapsulated disc with slanted seat
- Internal hinge pin
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

¹⁾ The temperatures indicated are for orientation only; they are not valid for all operating conditions.

Variants

- Body and cover lined with IIR (butyl); temperature limit: +120 °C
- Body and cover lined with NRH (hard rubber); temperature limit +100 °C
- Body and cover coated with ECTFE (Halar); temperature limit +90 °C
- Body and cover coated with PA (Rilsan)²⁾; temperature limit +90 °C
- IIR-encapsulated disc; temperature limit +120 °C
- CSM-encapsulated disc; temperature limit +100 °C
- EPDM-encapsulated disc; temperature limit +140 °C
- NBR-encapsulated disc; temperature limit +90 °C
- Certification to customer specification

Product benefits

- Streamlined body design provides low flow resistance coefficient.
- The valve hydraulics without dead volume offer optimum conditions for high-purity fluids.
- Valve disc slightly pre-loaded to prevent pressure surges
- Maintenance-free due to internal hinge pin
- Soft rubber encapsulated valve disc ensures reliable shut-off.

Related documents

- Operating manual 0570.821

On all enquiries/orders please specify

1. Type
2. Nominal pressure
3. Nominal size

4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Flow characteristics

Flow coefficients for unlined valves

DN	RSK Kvs value [m³/h]	DN	RSKS Kvs value [m³/h]
25	16,0	25	16,0
40	40,0	40	-
50	63,0	50	63,0
65	-	65	97,0
80	160,0	80	160,0
100	230,0	100	230,0
125	391,0	125	391,0
150	532,0	150	532,0
200	-	200	1002,0
250	-	250	1384,0
300	-	300	2254,0

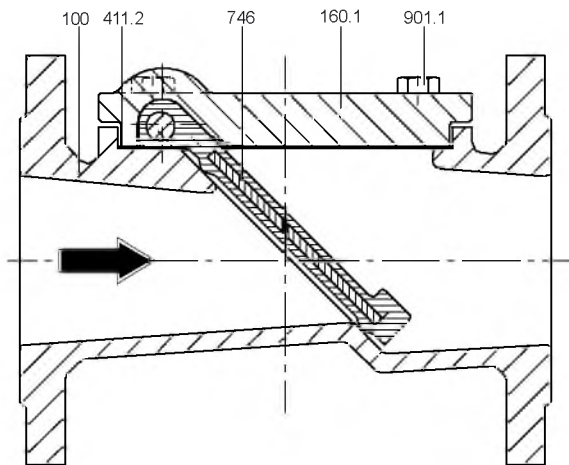
Pressure/temperature ratings

Permissible operating pressures in bar at temperatures of °C (to EN 1092-2/EN 1092-1)

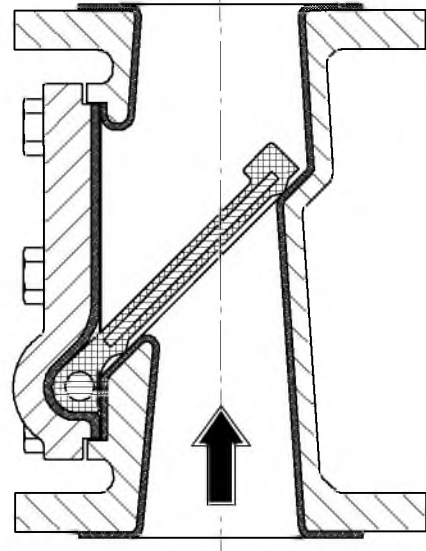
Nominal pressure	Material	DN	-20 to +100	+120	+140
16	5.3103	25-300	16	12	8

²⁾ In compliance with KTW recommendations for the use of elastomers in drinking water issued by the German Federal Office of Health.

Materials



Horizontal installation position
(Shown: variant without lining)



Vertical installation position ³⁾
(Shown: variant with lining)

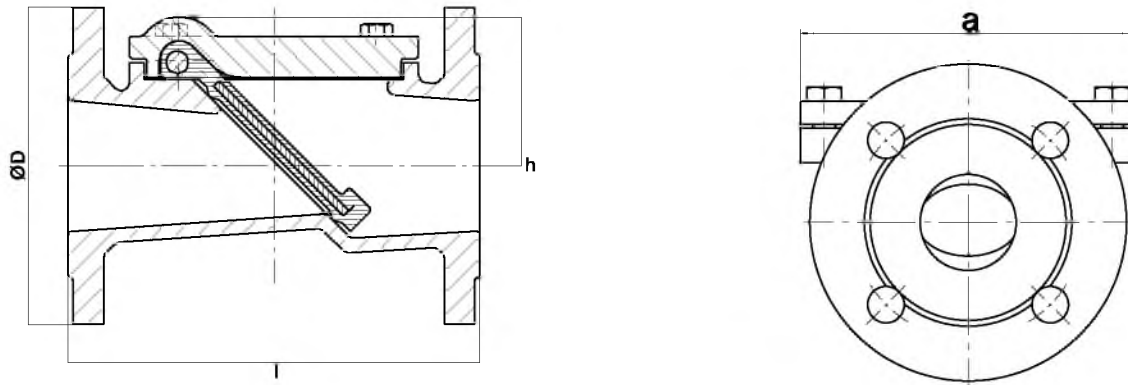
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJS-400-18-LT/NRH	5.3103	Standard
160.1	Cover	EN-GJS-400-18-LT/NRH	5.3103	Standard
411.2 ⁴⁾	Joint ring	EPDM		
746 ⁴⁾	Valve disc	S355/IIR		Standard
901.1	Hexagon head bolt	A2-70		

³⁾ Vertical installation is only permitted if the fluid does not contain any solids.

⁴⁾ Recommended spare parts

Dimensions



Dimensions in mm

DN	l		a		h	ØD	[kg]	
	RSK	RSKS	RSK	RSKS			RSK	RSKS
25	160	-	84	84	43	115	4	4
40	200	180 ⁵⁾	164	164	78	150	11	11
50	230	200	175	164	78	165	11	12
65	-	240	-	164	78	185	-	15
80	310	260	224	232	100	200	25	28
100	350	300	224	232	100	220	31	33
125	400	350	290	290	130	250	50	48
150	480	400	290	290	130	285	60	62
200	-	500	-	390	190	340	-	108
250	-	600	-	390	190	405	-	139
300	-	700	-	550	260	460	-	247

Mating dimensions – Standards

RSK face-to-face length: EN 558-1 R1
 RSKS face-to-face length: EN 558-1 R48
 Flange connection: DIN EN 1092-2
 Flange facing: DIN EN 1092-2 type B

Vertical installation is only permitted if the fluid does not contain any solids.

If the valve is installed in vertical position, flow must be upwards.

The flow direction must correspond to the arrow indicated on the valve body.

Installation instructions

Swing check valves can be installed horizontally and vertically.

⁵⁾ PN10 only

Swing Check Valve

SISTO-RSK/RSKS

PN 16 / DN 25-300

Maintenance-free
Soft-seated
With or without Lining
Flanged Ends

Type Series Booklet



SISTO

Check Valves and Strainers

Swing Check Valves to DIN/EN

SISTO-RSK/RSKS



Main applications

- Mining
- General irrigation systems
- Chemical industry
- Disposal
- Fire-fighting systems
- Domestic water supply
- Nuclear power stations
- Sewage treatment plants
- Fossil-fuelled power stations
- Seawater desalination/reverse osmosis
- Process engineering
- Water treatment
- Water supply systems

Fluids handled

- Abrasive fluids
- Faecal-free waste water
- Aggressive fluids
- Inorganic fluids
- Brackish water
- Service water
- Solids-laden fluids
- River, lake and groundwater
- Fluids posing a health hazard

- Toxic fluids
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Valuable fluids
- Cooling water
- Fire-fighting water
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Radioactive fluids
- Cleaning agents
- Grey water
- Brine
- Drinking water
- Wash water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 15-300
Permissible pressure	1-16 bar
Max. permissible temperature ¹⁾	-20 °C to +140 °C

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	-20 °C to +140 °C

Design details

Design

- Soft-seated swing check valve in straight-way pattern with straight-line flow path
- Soft rubber encapsulated disc with slanted seat
- Internal hinge pin
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

¹⁾ The temperatures indicated are for orientation only; they are not valid for all operating conditions.

Variants

- Body and cover lined with IIR (butyl); temperature limit: +120 °C
- Body and cover lined with NRH (hard rubber); temperature limit +100 °C
- Body and cover coated with ECTFE (Halar); temperature limit +90 °C
- Body and cover coated with PA (Rilsan)²⁾; temperature limit +90 °C
- IIR-encapsulated disc; temperature limit +120 °C
- CSM-encapsulated disc; temperature limit +100 °C
- EPDM-encapsulated disc; temperature limit +140 °C
- NBR-encapsulated disc; temperature limit +90 °C
- Certification to customer specification

Product benefits

- Streamlined body design provides low flow resistance coefficient.
- The valve hydraulics without dead volume offer optimum conditions for high-purity fluids.
- Valve disc slightly pre-loaded to prevent pressure surges
- Maintenance-free due to internal hinge pin
- Soft rubber encapsulated valve disc ensures reliable shut-off.

Related documents

- Operating manual 0570.821

On all enquiries/orders please specify

1. Type
2. Nominal pressure
3. Nominal size

4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Flow characteristics

Flow coefficients for unlined valves

DN	RSK Kvs value [m³/h]	DN	RSKS Kvs value [m³/h]
25	16,0	25	16,0
40	40,0	40	-
50	63,0	50	63,0
65	-	65	97,0
80	160,0	80	160,0
100	230,0	100	230,0
125	391,0	125	391,0
150	532,0	150	532,0
200	-	200	1002,0
250	-	250	1384,0
300	-	300	2254,0

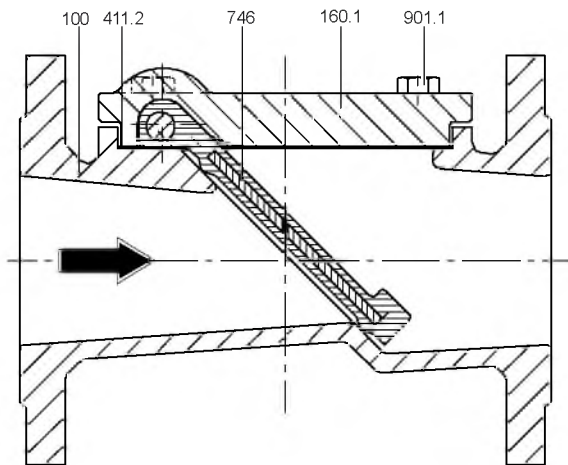
Pressure/temperature ratings

Permissible operating pressures in bar at temperatures of °C (to EN 1092-2/EN 1092-1)

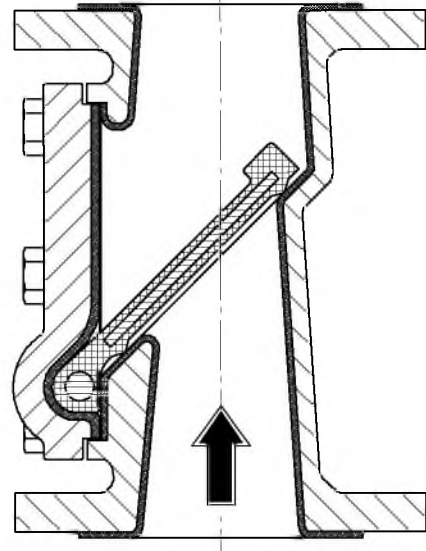
Nominal pressure	Material	DN	-20 to +100	+120	+140
16	5.3103	25-300	16	12	8

²⁾ In compliance with KTW recommendations for the use of elastomers in drinking water issued by the German Federal Office of Health.

Materials



Horizontal installation position
(Shown: variant without lining)



Vertical installation position ³⁾
(Shown: variant with lining)

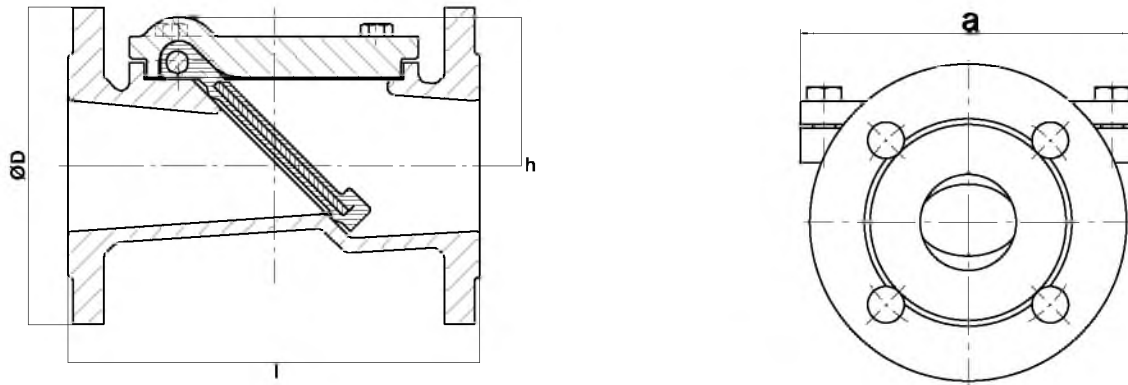
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJS-400-18-LT/NRH	5.3103	Standard
160.1	Cover	EN-GJS-400-18-LT/NRH	5.3103	Standard
411.2 ⁴⁾	Joint ring	EPDM		
746 ⁴⁾	Valve disc	S355/IIR		Standard
901.1	Hexagon head bolt	A2-70		

³⁾ Vertical installation is only permitted if the fluid does not contain any solids.

⁴⁾ Recommended spare parts

Dimensions



Dimensions in mm

DN	l		a		h	ØD	[kg]	
	RSK	RSKS	RSK	RSKS			RSK	RSKS
25	160	-	84	84	43	115	4	4
40	200	180 ⁵⁾	164	164	78	150	11	11
50	230	200	175	164	78	165	11	12
65	-	240	-	164	78	185	-	15
80	310	260	224	232	100	200	25	28
100	350	300	224	232	100	220	31	33
125	400	350	290	290	130	250	50	48
150	480	400	290	290	130	285	60	62
200	-	500	-	390	190	340	-	108
250	-	600	-	390	190	405	-	139
300	-	700	-	550	260	460	-	247

Mating dimensions – Standards

RSK face-to-face length: EN 558-1 R1
 RSKS face-to-face length: EN 558-1 R48
 Flange connection: DIN EN 1092-2
 Flange facing: DIN EN 1092-2 type B

Vertical installation is only permitted if the fluid does not contain any solids.

If the valve is installed in vertical position, flow must be upwards.

The flow direction must correspond to the arrow indicated on the valve body.

Installation instructions

Swing check valves can be installed horizontally and vertically.

⁵⁾ PN10 only

LIFT & SWING CHECK VALVE Flanged, socket welded and Butt-Welded



**Class 150
NPS 1/2" to 18"**

Applications

- LNG process / All liquefied gases

Working conditions

- Temperature : from -196°C to +100°C
- Rating : ASME B16.34

Materials

- Casting ASTM A351 CF8 , ASTM A31 CF8M
ASTM A351 CF3M

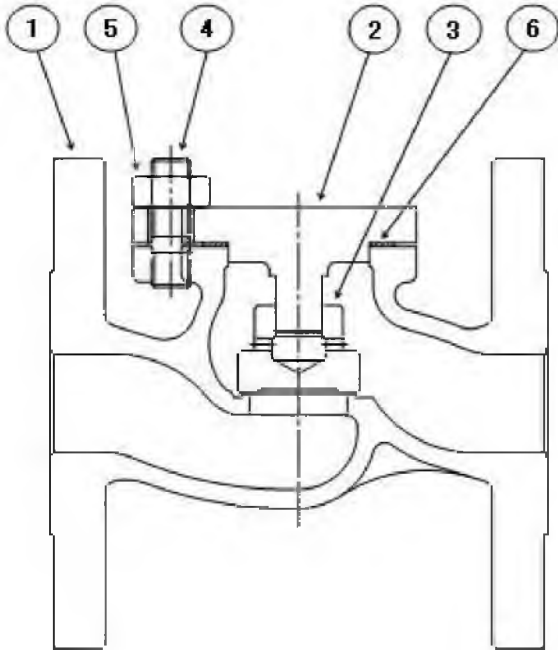
Design

- Bolted cover
- Flanged , socked welding , or butt welding connection
- Rating : ASME B16.34
- End to end dimension per ASME B16.10 for flanged and butt-welded valves
- Dash pot
- Dimension per ASME B16.25 for butt-welded ends
- Gasket :Pure Graphite or SS+ Graphite
- Type approval by LR/ABS/BV/DNV
- End to end dimension manufacture standard for socket welding valves
- Other variants

Variant on request

On all inquiries / orders please specify

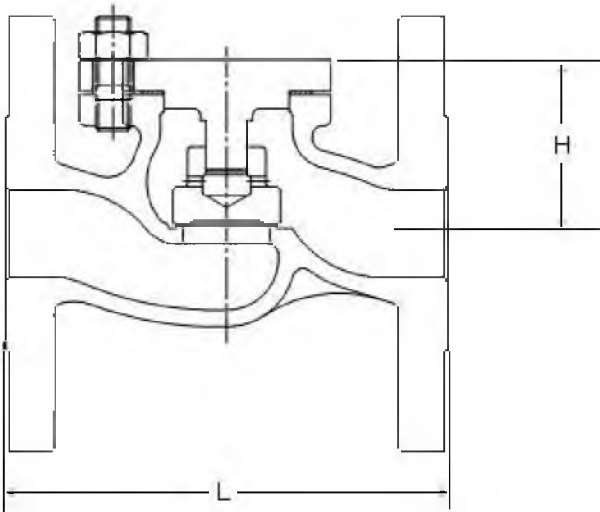
- 1 Valve type
- 2 Pressure class
- 3 Size
- 4 Design pressure
- 5 Design temperature
- 6 Differential pressure-shut off
- 7 Flow media
- 8 Material of construction
- 9 Trim material
- 10 Type of end connection
- 11 Pipe schedule(for butt-weld)
- 12 Operation Method
- 13 Variants
- 14 Valve data sheet if applicable

LIFT Check Valve - Class 150 – NPS 1/2” to 2”
Materials


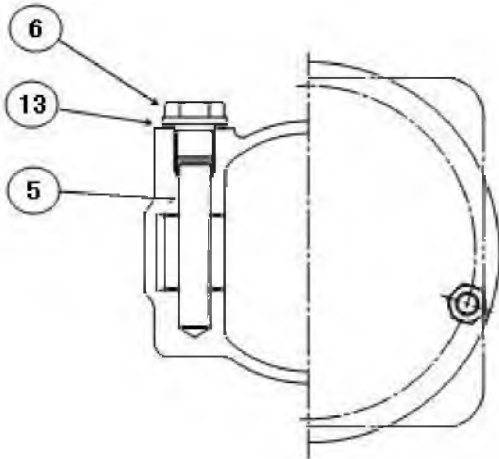
Part No.	Part Name	Material
1	BODY	SCS 14A ASTM A351 CF8M
2	COVER	SCS 14A ASTM A351 CF8M
3	DISC	SUS 316 316 SS
4	COVER BOLT	SUS 316 ASTM A193-B8
5	COVER BOLT NUT	SUS 316 ASTM A194-8
6	GASKET	GRAPHITE

Design Specifications

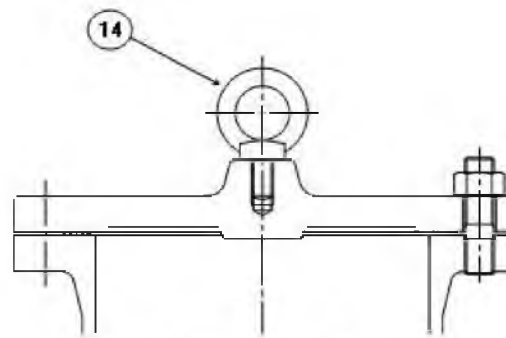
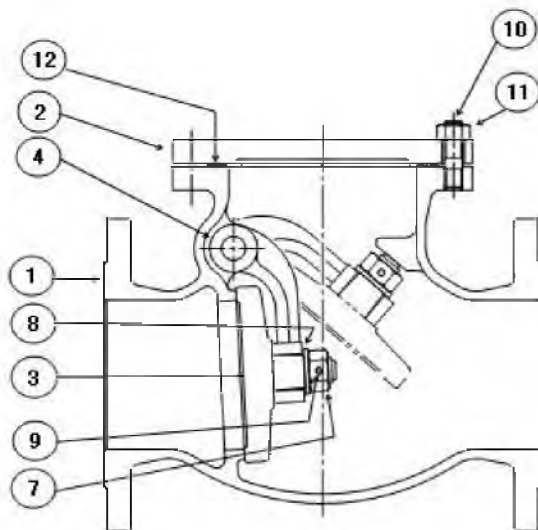
Pressure/Temperature Rating: ASME B16.34
 Flange Dimensions(NPS 1/2" to 2"): ASME B16.5
 Butt-weld Ends : ASME B16.25
 End-to-End: ASME B16.10


Dimensions

CLASS 150		1/2"	3/4"	1"	1"1/4	1"1/2	2"
L	inch	4	5	5	6	6	8
	mm	108	117	127	140	165	203
H	inch	2	2	2.5	3	3	3.5
	mm	52	58	62	71	75	90

SWING Check Valve - Class 150 – NPS 1”½ to 18”

Materials

Part No.	Part Name	Material
1	BODY	SCS 14A ASTM A351 CF8M
2	COVER	SCS 14A CF-8M
3	DISC	SCS 13A ASTM A351 CF8
4	ARM	SCS 13A ASTM A351 CF8
5	HINGE PIN	SUS 316 316 SS
6	PLUG	SUS 316 316 SS
7	NUT	SUS 316 ASTM A194-8M
8	WASHER	SUS 316 316 SS
9	SPLIT PIN	SUS 316 316 SS
10	COVER BOLT	SUS 316 ASTM A193-B8
11	COVER BOLT NUT	SUS 304 ASTM A194-8
12	GASKET	GRAPHITE + SUS316
13	GASKET	COPPER
14	EYEBOLT	SUS304 STAINLESS STEEL

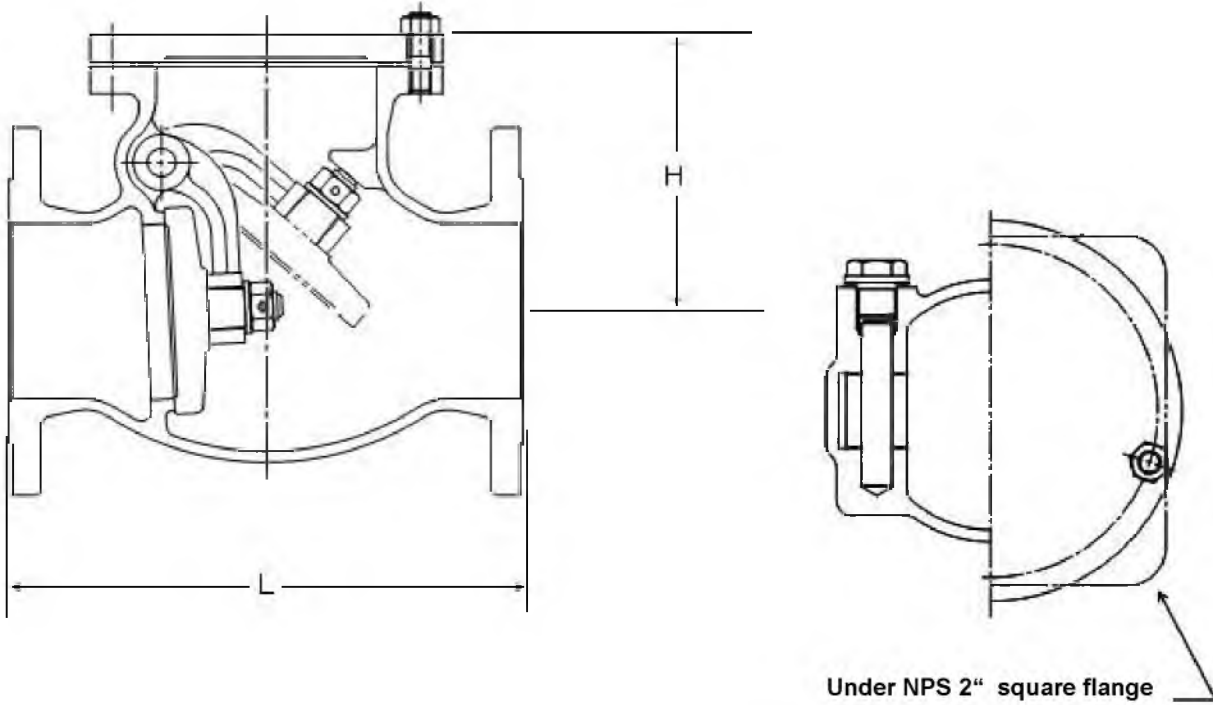


Only over NPS 4"

SWING Check Valve - Class 150 – NPS 1”½ to 18”

Design Specifications

Pressure/Temperature Rating: ASME B16.34
 Flange Dimensions(NPS 1” 1/2 to 12”): ASME B16.5
 Butt-weld Ends : ASME B16.25
 End-to-End: ASME B16.10



Dimensions

CLASS 150		1"	1"½	2"	2"½	3"	4"
L	inch	5	6	8	9	9	11
	mm	127	165	203	216	241	292
H	inch	3	4	4.5	5	6	6.5
	mm	77	95	113	132	145	160

CLASS 150		5"	6"	8"	10"	12"	14"	16"	18"
L	inch	13	14	19	24	27	31.5	37	39
	mm	330	356	495	622	698	787	914	978
H	inch	7.5	8.5	10	12.5	14.5	17	20	22
	mm	191	215	255	310	365	427	488	547

Product Code
- WADA Cryogenic Swing Check Valve Class 150

WSC	150	DN15	RF	b1	c1	d1	t21
①	②	③	④	⑤	⑥	⑦	⑧

- | | |
|--|--|
| <p>① Valve designation
WSC : WADA Swing Check Valve</p> <p>② Pressure Class
150 : ASME B16.34 #150</p> <p>③ Nominal Diameter
DN25/50/65/80/100/125/150/200/250/300/350/400/450</p> <p>④ Connection
RF : Flanged
BW : Butt Welding</p> <p>⑤ Body Material
b1 : ASTM A351 CF8M (RF)
b2 : ASTM A351 CF3M (BW)</p> | <p>⑥ Bonnet Material
c1 : ASTM A351 CF8
for DN100/125/150/200/250/300/350/400/450
c2 : 316SS for DN25/50/65/80</p> <p>⑦ Disc Material
d1 : ASTM A351 CF8M</p> <p>⑧ Seat Material
t21 : Stellite 21</p> |
|--|--|

- WADA Cryogenic Lift Check Valve Class 150

WLC	150	DN15	RF	b1	c1	d1	t6
①	②	③	④	⑤	⑥	⑦	⑧

- | | |
|--|--|
| <p>① Valve designation
WSC : WADA Swing Check Valve</p> <p>② Pressure Class
150 : ASME B16.34 #150</p> <p>③ Nominal Diameter
DN15/20/25/32/40/50</p> <p>④ Connection
RF : Flanged
BW : Butt Welding
SW : Socket Welding (DN15/20/25)</p> <p>⑤ Body Material
b1 : ASTM A351 CF8M (RF)
b2 : ASTM A351 CF3M (BW/SW)</p> | <p>⑥ Bonnet Material
c2 : 316SS</p> <p>⑦ Disc Material
d2 : 316SS</p> <p>⑧ Seat Material
T6 : Stellite 6</p> |
|--|--|

Lift Check Valve

BOA-RPL/RPL F-F

PN 10/16
DN 25-400
Flanged or Threaded Ends

Type Series Booklet



Check Valves and Strainers

Lift Check Valves

BOA-RPL/RPL F-F



Main applications

- Irrigation systems
- Domestic water supply
- Sewage treatment plants
- Air-conditioning systems
- Cooling circuits
- Water treatment
- Water supply systems
- Food and beverages industry

Fluids handled

- Cooling water
- Drinking water
- River, lake and groundwater
- Service water
- Waste water

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16
Nominal size	DN 25-400
Max. permissible pressure	16 bar (DN 25 - 200) 10 bar (DN 250 - 400)
Max. permissible temperature	70 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Material number	Temperature limit
BOA-RPL F-F		
EN-GJL-250	EN-JL1040	+70 °C
BOA-RPL		
EN-GJS-400-15	EN-JS1030	+70 °C

Design details

Design

- Ball check valve to EN 1074-3
- Tested to EN 12266-1
- BOA-RPL made of nodular cast iron
- BOA-RPL F-F with threaded ends to ISO 7/1
- Bolted cover
- Drain plug
- Unblocking device
- Valve certified for drinking water applications to D.M. 174/2004
- DN 50 to DN 150: PN 10/16 flanges
- DN 200: PN 16 flanges
- DN 250 to DN 400: PN 10 flanges
- Suitable for horizontal and vertical installation

Variants

- Other material variants
- Larger nominal sizes

Product benefits

- Valve easy to inspect and drain via standard drain plug.
- Unblocking device as standard, no special tools required for unblocking the ball.
- Approved for drinking water applications due to epoxy coating

Related documents

- Operating manual V 979011/1.10

On all enquiries / orders please specify

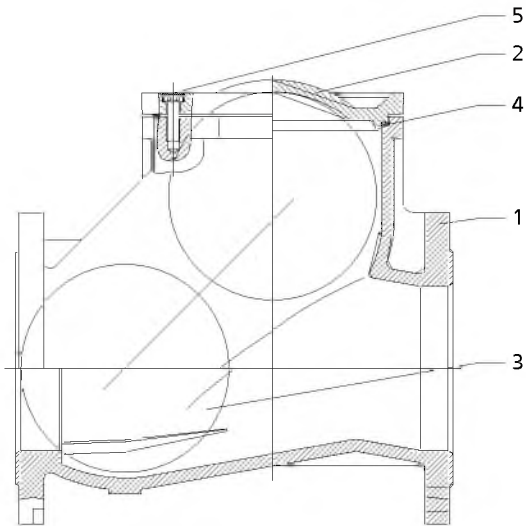
1. Type
2. Nominal pressure
3. Nominal size
4. Variants
5. Number of type series booklet

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C

Nominal pressure	Nominal size	Permissible operating pressures ¹⁾
PN	DN	Up to +70 °C
10	50-400	10,0
16	25-200	16,0

Materials



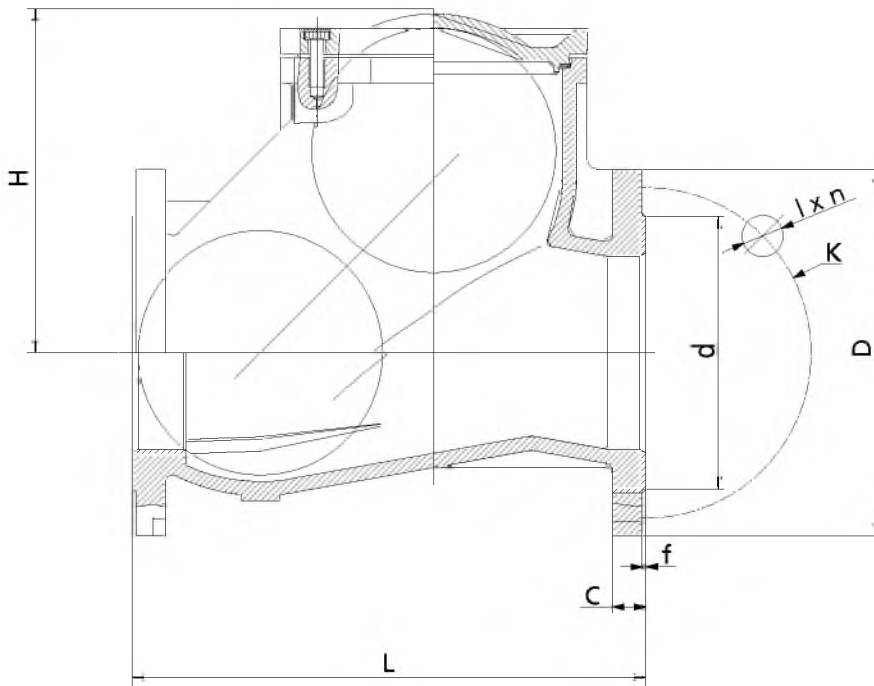
Overview of available materials

Part No.	Description	Material	Material number	Note
1	Body	EN-GJL-250	EN-JL1040	Epoxy-coated
		EN-GJS-400-15	EN-JS1030	Epoxy-coated
2	Cover	EN-GJL-250	EN-JL1040	
		EN-GJS-400-15	EN-JS1030	
3	Ball	Aluminium		NBR-coated
4	Cover gasket	NBR		
5	Screw	Galvanised steel	Fe/Zn5	

¹⁾ Static load

Dimensions

Dimensions of BOA-RPL



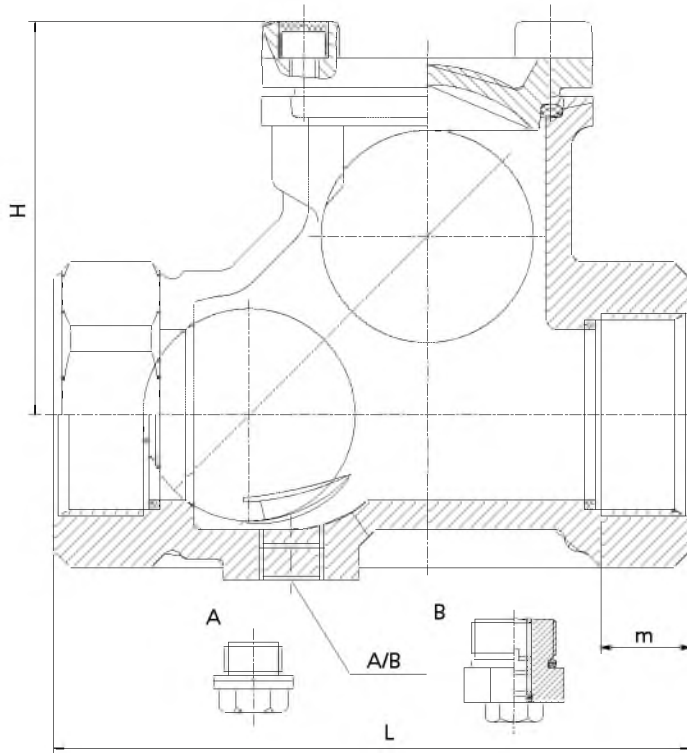
Dimensions in mm

PN	DN	L	H	d	D	K	l	n	C	f	[kg]
10/16	50	200	113	102	165	125	18	4	20	3	8,3
	65	240	126	122	185	145	18	4	20	3	12,3
	80	260	162	138	200	160	18	8	22	3	16,8
	100	300	194	158	220	180	18	8	24	3	23,1
	125	350	214	188	250	210	18	8	22	3	37,2
	150	400	260	212	285	240	22	8	26	3	53,1
16	200	500	320	268	340	295	22	12	22	3	98,8
10	250	600	365	320	405	350	22	12	30	3	135,7
	300	700	427	378	460	400	22	12	30	4	220,0
	350	800	427	429	520	460	23	16	32	4	260
	400	900	537	480	580	515	28	16	32	4	410

Mating dimensions - Standards

Face-to-face EN 558-1/48
lengths:
Flanges: DIN EN 1092-2

Dimensions of BOA-RPL F-F



Dimensions in mm

PN	DN	L	m	H	[kg]
16	25	120	18	75	1,8
	32	140	18	75	2,3
	40	150	20	89	3,1
	50	220	35	113	4,6

Mating dimensions - Standards

Face-to-face lengths: see table
Threaded ends: ISO 7/1

Notes on installation

Suitable for horizontal and vertical installation

Knife Gate Valve

HERA-BD

PN 10
DN 50-1200

Type Series Booklet



Legal information/Copyright

Type Series Booklet HERA-BD

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Knife Gate Valves

Bi-directional Knife Gate Valve

HERA-BD



Main applications

- Waste water treatment plants
- Biogas plants
- Solids transport
- Water treatment
- Pulp and paper industry
- Drainage systems
- Drainage
- Washing plants
- Sludge disposal
- Sludge processing
- Food industry and beverages industry

Fluids handled

- Waste water with/without faeces
- Activated sludge
- Service water
- Digested sludge
- Solids-laden fluids
- River water, lake water and groundwater
- Raw sludge
- Grey water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10
Nominal size	DN 50 - 1200
Max. permissible pressure [bar]	10
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+120

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 120 °C

Design details

Design

- Wafer-type design: suitable for clamping between pipe flanges or dead-end service at full operating pressure
- Single-piece (≤ DN 500) or two-piece (> DN 500) body with integrated flange seal
- Short face-to-face length to EN 558-1/20
- Non-rising stem
- Non-rising handwheel
- Blade made of 1.4571 as standard (≤ DN 400)
- Confined U-shaped seal made of EPDM
- Transverse seal with gland packing
- Robust yoke for actuator mounting as standard
- All steel parts and grey cast iron parts epoxy-coated (200 µm) to protect against corrosion, colour: RAL 5015, blue
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.
- The valves can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Blade made of 1.4571 / AISI 316 Ti (≥ DN 450)
- Stem made of 1.4571 / AISI 316 Ti
- Nuts and bolts made of A4
- Sealing material made of NBR or Viton (U-shaped seal and O-rings)
- Gland packing made of stainless steel braiding, with scraper effect
- Chain wheel ≤ DN 600
- Quick-action lever ≤ DN 150
- Gearbox ≥ DN 400
- Double-acting pneumatic actuators ≤ DN 800
- Electric actuators ≤ DN 1200 (with rising stem)
- Limit switch(es)
- Solenoid valves to Namur
- 3.1 certificate
- Larger nominal sizes and other variants on request

Product benefits

- All grey cast iron and steel components are protected against corrosion by high-quality epoxy coating.
- Robust and compact steel mounting yoke for straightforward mounting of pneumatic and electric actuators and limit switches. A hard anodised aluminium NAMUR adapter plate attached to the actuator allows proximity switches or solenoid valves to be quickly installed (plug & run).
- Reliable and service-friendly stem seal: The gland packing is made of PTFE impregnated fibre and can be re-adjusted during operation. There is no need to remove the valve from the piping to replace the packing.
- High functional reliability and tight shut-off in both flow directions.
 - The stainless steel blade is polished on both sides and guided by a confined U-shaped seal during the entire valve travel. This prevents "chattering" of the blade and minimises the risk of deposits.
 - Flushing corners in the body ensure the seat is flushed clean when the valve closes.
- Suitable for universal use. Flange connection via tapped blind holes and throughbolts enables the wafer-type gate valve to be clamped between pipe flanges or used as dead-end valve at full operating pressure.
- Economical
 - The valve is available in a single-piece (up to DN 500) or two-piece body design with full bore providing unrestricted flow passage. The body is fully machined inside, resulting in a tight fit of all components, very low pressure losses and high flow coefficients.

- As a standard feature, O-rings are integrated into the body and serve as flange seals. This helps to save extra costs for providing and fitting external flange seals.

Related documents

Other applicable documentation

Document	Reference number
Technical data sheet	7328.22
Operating manual	7328.8

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Operating temperature
6. Fluid handled
7. Variants
8. Reference number

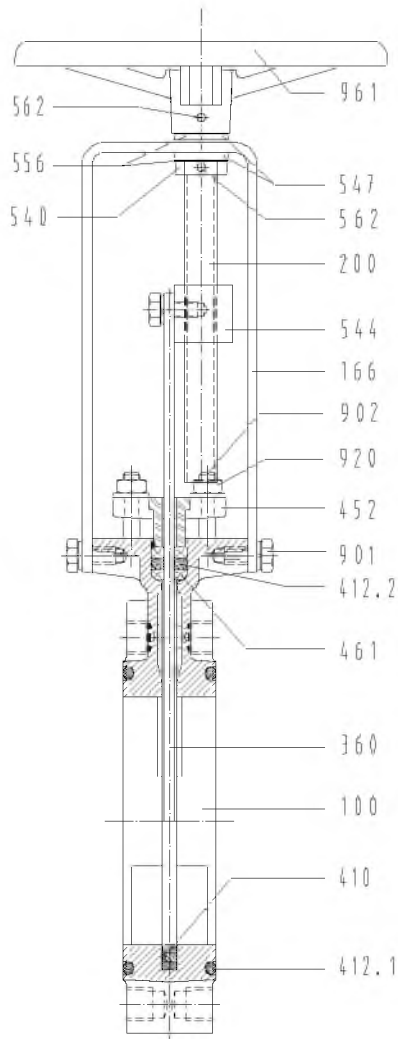
Pressure/temperature ratings

Test pressure and operating pressure

PN	DN	Shell test	Leak test (seat)	Permissible operating pressure
		With water		
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12 to DIN EN 12266-1 ¹⁾ [bar]	-10 to +120 °C [bar]
10	50-250	15	11	10
6	300-400	9	6,6	6
5	450	7,5	5,5	5
4	500-600	6	4,4	4
2	700-1200	3	2,2	2

1) DN 50-600: leakage rate A, DN 700-1200: leakage rate B

Materials

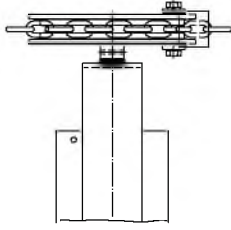


HERA-BD

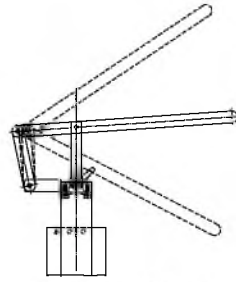
Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	DN 50 - 500: epoxy-coated, single-piece
		EN-GJS-400-15	5.3106	DN 600: epoxy-coated, two-piece
166	Yoke	Steel	1.0044 / S275JR	Epoxy-coated
200	Stem	Stainless steel	1.4016 / AISI 430	Non-rising
360	Blade	Stainless steel	1.4571 / AISI 316 Ti	DN 50-400
		Stainless steel	1.4301 / AISI 304	≥ DN 450
410	U-shaped seal	EPDM with steel core	-	-
412.1	O-ring	EPDM	-	Integrated flange seal
412.2	O-ring	EPDM	-	-
452	Gland follower	EN-GJS-400-15	5.3106	Epoxy-coated
461	Gland packing	PTFE-impregnated synthetic fibres	-	-
540	Bush	Stainless steel	1.4301 / AISI 304	-
544	Threaded bush	Brass	-	-
547	Guide bush	Manganese bronze	C86300 / CB762S	-
556	Anti-friction disc	PET + solid lubricant	-	-
562	Spring-type straight pin	Steel	DIN 7346	-
901	Hexagon head bolt	A2	-	-
902	Stud	A2	-	-
920	Hexagon nut	A2	-	-
961	Handwheel	Steel	-	DN 50-300: epoxy-coated
		EN-GJL-250	5.1301	≥ DN 350: epoxy-coated

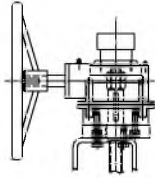
Variants



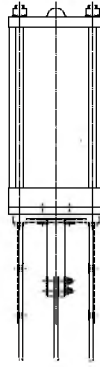
Chain wheel (non-rising stem)



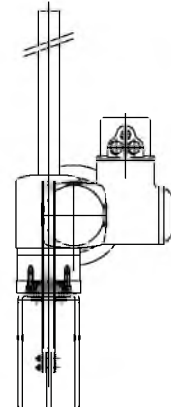
Quick-action lever



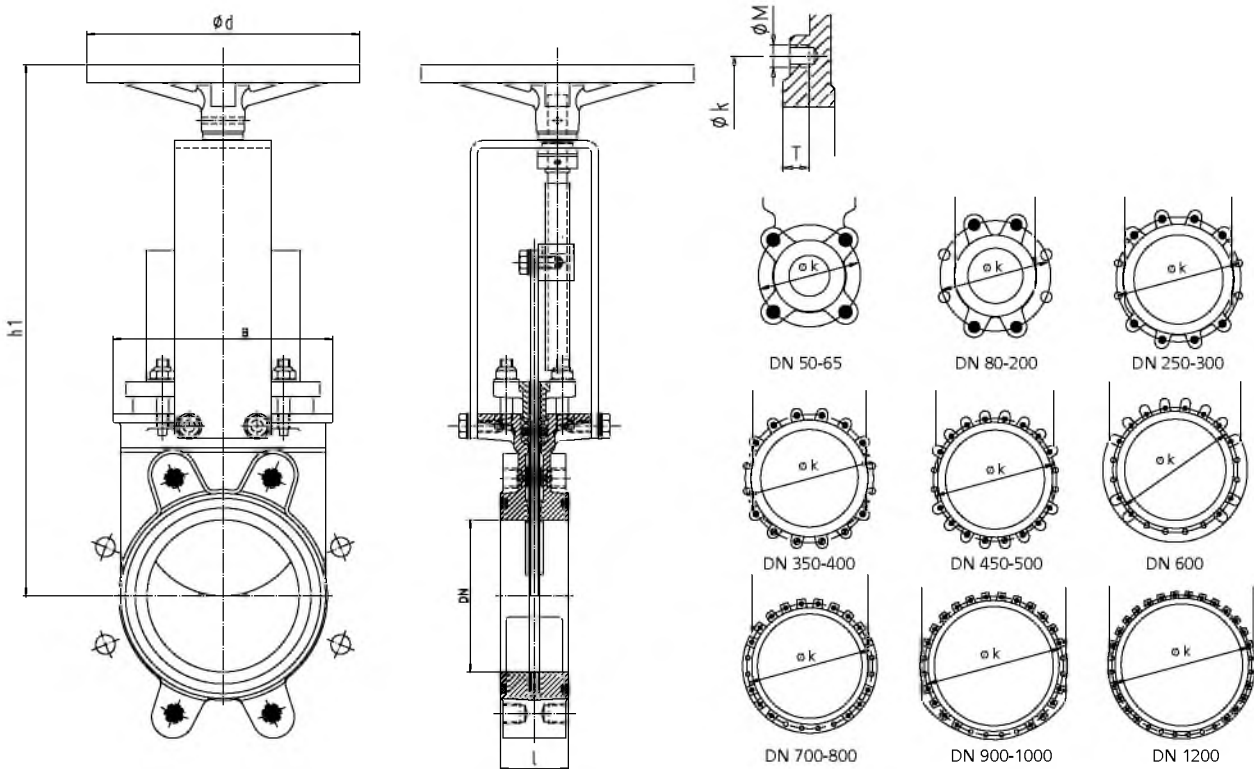
Gearbox (non-rising stem)



Pneumatic actuators
(double-acting)



Electric actuators
(rising stem)

Dimensions and weights

Fig. 1: HERA-BD
Dimensions [mm] and weights [kg]

PN	DN	l	h_1	B	ϕd	[kg]
10	50	43	311	113	225	8
	65	46	338	128	225	9
	80	46	363	143	225	10
	100	52	404	162	225	12
	125	56	438	181	225	15
	150	56	489	209	225	17
	200	60	594	263	310	30
6	250	68	694	315	310	42
	300	78	784	370	310	60
	350	78	932	420	410	90
5	400	102	1017	478	410	150
4	450	114	1119	532	550	185
4	500	127	1219	584	550	224
	600	110	1379	762	550	230
2	700	110	1736	890	800	380
	800	110	1923	1012	800	550
	900	110	2047	1112	800	680
	1000	110	2487	1240	800	800

Dimensions [mm]

PN	DN	ϕk	Number of bolt holes z	Bolt size ϕM	Blind hole depth T	Number of tapped blind holes n_1	Number of clearance holes ²⁾ n_2	Number of tapped holes ³⁾ n_3
10	50	125	4	M16	10	4	0	0
	65	145	4	M16	10	4	0	0
	80	160	8	M16	12	4	4	0
	100	180	8	M16	12	4	4	0
	125	210	8	M16	14	4	4	0
	150	240	8	M20	14	4	4	0
	200	295	8	M20	14	4	4	0
6	250	350	12	M20	18	8	4	0
	300	400	12	M20	21	8	4	0
	350	460	16	M20	21	8	4	4

- 2) Bolts passing along the side of the body
 3) Tapped from both ends, not through-tapped

PN	DN	ø k	Number of bolt holes z	Bolt size ø M	Blind hole depth T	Number of tapped blind holes n ₁	Number of clearance holes ²⁾ n ₂	Number of tapped holes ³⁾ n ₃
6	400	515	16	M24	28	8	4	4
5	450	565	20	M24	30	12	4	4
4	500	620	20	M24	40	12	4	4
	600	725	20	M27	26	12	8	0
2	700	840	24	M27	20	16	8	0
	800	950	24	M30	20	16	8	0
	900	1050	28	M30	20	20	8	0
	1000	1160	28	M33	20	20	10	0

Mating dimensions as per standard

Face-to-face lengths: EN 558-1/20 up to DN 500
≥ DN 600: see table

Flanges: DIN EN 1092-2

Other flange designs

- Other flange designs on request

Installation instructions

HERA BD is bi-directional, i.e. flow may pass the valve in either direction. Installation as dead-end valve at full operating pressure without counterflange is permissible. Observe the maximum operating pressures for the respective nominal sizes. Due to the O-rings integrated into the flange faces no further flange seals are required.

Knife Gate Valve

HERA-SH

PN 10/16, Class 150
DN 50-1000
Uni-directional
Full-lug Body

Type Series Booklet



Knife Gate Valves

Knife Gate Valve with Uni-directional Seal

HERA-SH



Main applications

- Paper and cellulose industry
- Sewage treatment plants
- Chemical industry
- Water treatment
- Food and beverages industry

Fluids handled

- Pulp
- Waste water
- Corrosive fluids
- Syrup
- Service water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16, Class 150
Nominal size	DN 50-1000
Max. permissible pressure	10,3 bar
Max. permissible temperature	180 °C

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 425 °C
ASTM A 351 CF8	Up to 538 °C
ASTM A 351 CF8M	Up to 538 °C

Other materials on request.

Design details

Design

- Designed and tested to MSS SP-81
- Pressure/temperature ratings to MSS SP-81
- Single-piece body
- Full-lug body
- Stem sealed by gland packing
- Rising stem
- Outside screw
- Non-rising handwheel
- Uni-directional
- Pillar yoke
- Suitable for mounting electric actuators and gearboxes to DIN ISO 5210
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Group 2.
- The valves can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 94/9/EC.

Variants

- Body made of nodular cast iron (wafer-type body only)
- Wafer-type body
- Non-rising stem
- Graphite gland packing for high temperatures
- Mounting of electric and pneumatic actuators
- Mounting of gearboxes
- Other material variants
- Larger nominal sizes and other variants on request

Product benefits

- In-situ valve maintenance
 - Externally accessible gland packing, so packing rings can be replaced without removing the valve from the piping.
- Long service life
 - Blade bottom edge curved for high cutting force. Smooth blade surface due to precision grinding and hard chromium plating, for increased abrasion resistance and long service life
 - O-ring-supported self-adjusting flexible seat with high abrasion resistance and long service life.
- Reliable sealing
 - Retaining ring can be adjusted during maintenance work to restore tightness

- Easy actuation
 - Stem nut supported by needle bearing for lower actuating torque and ease of actuation

Related documents

- Knife gate valve, type HERA-BD, see type series booklet 7328.1
- Knife gate valve, type HERA-BDS, see type series booklet 7332.1
- Knife gate valve, type HERA-BHT, see type series booklet 7330.1
- Operating manual 7329.8

On all enquiries/orders please specify

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Operating temperature
6. Fluid handled
7. Variants
8. Number of type series booklet

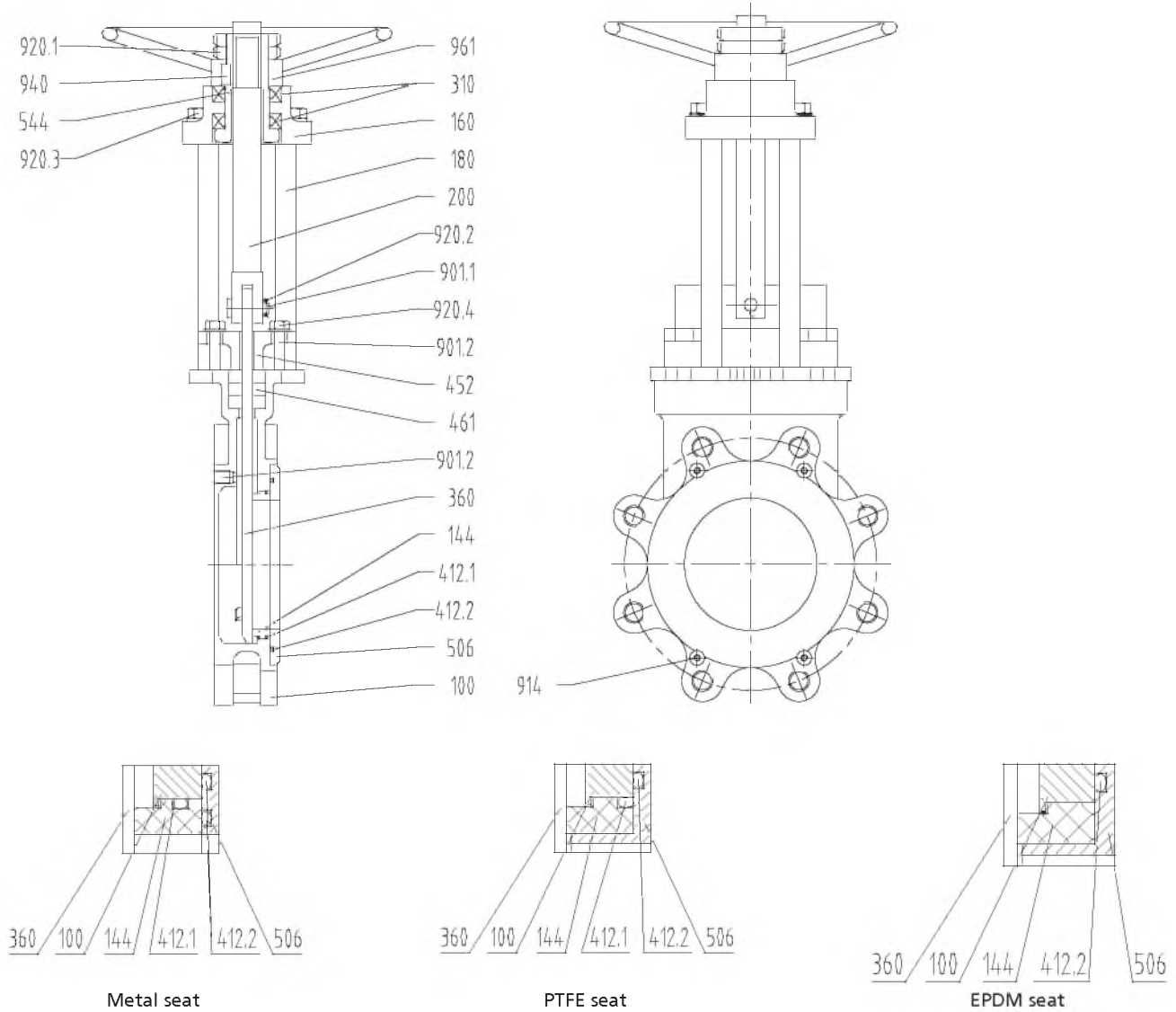
Pressure/temperature ratings

Test and operating pressures

Nominal pressure	Nominal size	Shell test ¹⁾	Leak test (seat) ¹⁾	Permissible operating pressures
		with water		
PN	DN	[bar]	[bar]	[bar]
10	50-600	15	2,8	10,3
	700-1000	15	2,8	6,9
16	50-600	24	2,8	10,3
	700-1000	24	2,8	6,9
Class 150	50-600	30	2,8	10,3
	700-1000	30	2,8	6,9

¹⁾ Test procedure to MSS SP-81

Materials

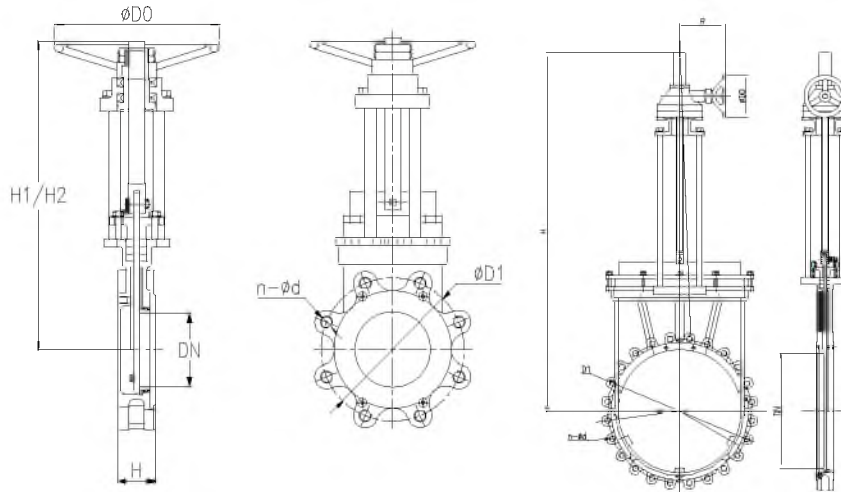


Overview of available materials

Part No.	Description	Material	Note
100	Body	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
144	Seat	ASTM A 182 F304	Hard chromium plated for metal-seated design
		ASTM A 182 F316	Hard chromium plated for metal-seated design
		EPDM	-20 °C to +120 °C
		PTFE	-20 °C to +150 °C
160	Cover	Aluminium alloy	
180	Pillar	ASTM A 182 F304	Body made of A 351 CF8(M)
		C45 + Cr	Body made of A 216 WCB
200	Stem	ASTM A 182 F304	
310	Plain bearing	GCr6	
360	Blade	ASTM A 182 F304	Hard chromium plated for metal-seated design
		ASTM A 182 F316	Hard chromium plated for metal-seated design
		ASTM A 276 410	Hard chromium plated

Part No.	Description	Material	Note
412.1	O-ring	NBR	Standard: -20 °C to +100 °C
		Viton	Variant: -20 °C to +180 °C
412.2	O-ring	NBR	Standard: -20 °C to +100 °C
		Viton	Variant: -20 °C to +180 °C
452	Gland follower	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
461	Gland packing	PTFE	
		Graphite	Variant, for temp. from 150 °C
506	Retaining ring	ASTM A 216 WCB	
		ASTM A 182 F304	
		ASTM A 182 F316	
544	Threaded bush	H59	
901.1	Bolt	ASTM A 276 304	
901.2	Bolt	ASTM A 182 F304	
914	Hexagon socket head cap screw	ASTM A 182 F304	
920.1	Nut	ASTM A 182 F304	
920.2	Split pin	ASTM A 182 F304	
920.3	Nut	ASTM A 182 F304	
920.4	Nut	ASTM A 182 F304	
940	Key	C45	
961	Handwheel	D-2	

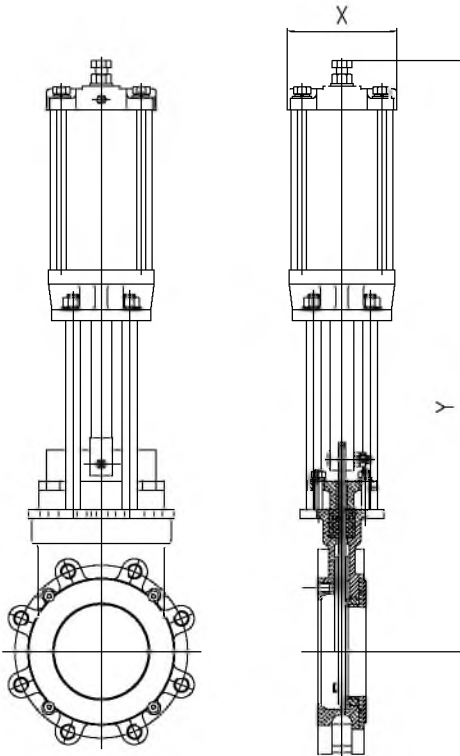
Dimensions



Dimensions in mm

PN	DN	L	H1	H2	H	D0	R	D1	Inside bolt hole diameter d	Number of through-holes n	Bolt size	[kg]
10	50	48	330	390	-	200	-	125	18	4	M16	10
	65	48	360	435	-	200	-	145	18	4	M16	11
	80	51	390	485	-	220	-	160	18	8	M16	13,5
	100	51	430	545	-	220	-	180	18	8	M16	15,5
	125	57	475	615	-	250	-	210	18	8	M16	23,5
	150	57	510	675	-	280	-	240	22	8	M20	29
	200	70	620	835	-	315	-	295	22	8	M20	43
	250	70	765	1015	-	355	-	350	22	12	M20	67,5
	300	76	850	1170	-	400	-	400	22	12	M20	100,5
	350	76	970	1320	-	450	-	460	22	16	M20	126
	400	89	1060	1469	-	500	-	515	26	16	M24	176,2
	450	89	-	-	1780	460	340	565	26	20	M24	195
	500	114	-	-	1920	460	340	620	26	20	M24	236
	600	114	-	-	2175	460	340	725	30	20	M27	380
700	117	-	-	2535	460	340	840	30	24	M27	540	
800	117	-	-	2845	530	420	950	33	24	M30	685	
900	130	-	-	3270	530	420	1050	33	28	M30	967	
1000	156	-	-	3600	530	420	1160	33	28	M30	1200	
16	50	48	330	390	-	200	-	125	18	4	M16	10
	65	48	360	435	-	200	-	145	18	4	M16	11
	80	51	390	485	-	220	-	160	18	8	M16	13,5
	100	51	430	545	-	220	-	180	18	8	M16	15,5
	125	57	475	615	-	250	-	210	18	8	M16	23,5
	150	57	510	675	-	280	-	240	22	8	M20	29
	200	70	620	835	-	315	-	295	22	12	M20	43,5
	250	70	765	1015	-	355	-	355	26	12	M24	68
	300	76	850	1170	-	400	-	410	26	12	M24	101
	350	76	970	1320	-	450	-	470	26	16	M24	127
	400	89	1060	1469	-	500	-	525	30	16	M27	177
	450	89	-	-	1780	460	340	585	30	20	M27	195
	500	114	-	-	1920	460	340	650	33	20	M30	236
	600	114	-	-	2175	460	340	770	36	20	M33	380
700	117	-	-	2535	460	340	840	36	24	M33	540	
800	117	-	-	2845	530	420	950	39	24	M36	685	
900	130	-	-	3270	530	420	1050	39	28	M36	967	
1000	156	-	-	3600	530	420	1170	42	28	M39	1200	
Class 150	2"	48	330	390	-	200	-	120,5	19	4	5/8"-11UNC	10
	2,5"	48	360	435	-	200	-	139,5	19	4	5/8"-11UNC	11
	3"	51	390	485	-	220	-	152,5	19	4	5/8"-11UNC	13,5
	4"	51	430	545	-	220	-	190,5	19	8	5/8"-11UNC	15,5
	5"	57	475	615	-	250	-	216	22,4	8	3/4"-10UNC	23,5
	6"	57	510	675	-	280	-	241,5	22,4	8	3/4"-10UNC	29
	8"	70	620	835	-	315	-	298,5	22,4	8	3/4"-10UNC	43,5
	10"	70	765	1015	-	355	-	362	25,4	12	7/8"-9UNC	68
	12"	76	850	1170	-	400	-	432	25,4	12	7/8"-9UNC	101
	14"	76	970	1320	-	450	-	476	28,4	12	1"-8UNC	127
	16"	89	1060	1460	-	500	-	540	28,4	16	1"-8UNC	177
18"	89	-	-	1780	460	340	578	31,8	16	1 1/8"-7UNC	195	

PN	DN	L	H1	H2	H	D0	R	D1	Inside bolt hole diameter d	Number of through-holes n	Bolt size	[kg]
	20"	114	-	-	1920	460	340	635	31,8	20	1 1/8"-7UNC	236
	24"	114	-	-	2175	460	340	749	35	20	1 1/4"-7UNC	380
	28"	117	-	-	2535	460	340	864	35	28	1 1/4"-7UNC	540
	32"	117	-	-	2845	530	420	978	41,2	28	1 1/2"-6UNC	685
	36"	130	-	-	3270	530	420	1086	41,2	32	1 1/2"-6UNC	967
	40"	156	-	-	3600	530	420	1200	41,2	36	1 1/2"-6UNC	1200



Dimensions in mm

PN	DN	Pneumatic actuator type (double-acting)	X	Y	[kg]
10	50	KZSL-100	120	490	14
16	65	KZSL-100	120	520	16,5
Class 150	80	KZSL-100	120	590	19,5
	100	KZSL-100	120	650	22
	125	KZSL-125	145	715	32
	150	KZSL-125	145	790	38,5
	200	KZSL-160	180	1040	65
	250	KZSL-200	240	1225	95,5
	300	KZSL-250	290	1390	152
	350	KZSL-300	350	1650	240
	400	KZSL-300	350	1820	282
	450	KZSL-350	400	2015	398
	500	KZSL-350	400	2185	470
	600	KZSL-400	450	2380	698
	700	KZSL-500	550	2770	884
	800	KZSL-600	650	3040	1180
900	KZSL-600	680	3500	1500	
1000	KZSL-600	680	3900	1750	

Face-to-face MSS SP-81

lengths:

Flanges: DIN 2501 (PN 10/16)
ASME B16.5 (Class 150)

Knife Gate Valve

HERA-BHT

PN 10/16, Class 150
DN 80-600

Type Series Booklet



Legal information/Copyright

Type Series Booklet HERA-BHT

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Knife Gate Valves

Bi-directional Knife Gate Valve

HERA-BHT



Main applications

- Pulp and paper industry
- Solids separation
- Hydraulic repulping
- Transport of mining slurry
- Drainage systems
- Sludge disposal
- Sludge processing
- Transport of residues
- Waste water treatment plants

Fluids handled

- Slurry
- High-density fluids
- Solids-laden fertiliser fluids
- Pulp
- Digested sludge
- Raw sludge
- Activated sludge
- Waste water
- Service water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16,
Nominal pressure	Class 150
Nominal size	DN 80 - 600
Max. permissible pressure [bar]	10,3
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+100

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	≤ 425 °C
ASTM A 351 CF8	≤ 538 °C
ASTM A 351 CF8M	≤ 538 °C

Other materials on request.

Design details

Design

- Design to ASME B16.34 and MSS SP-81
- Semi-lug body
- Two-piece body with integrated flange seal
- Rising stem
- Non-rising handwheel
- Welded steel plate construction (DN 450-600)
- Bi-directional and soft-seated
- Through-going blade with excellent flow characteristic
- Robust yoke for actuator mounting as standard
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.
- The valves can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Double-acting pneumatic actuators
- Electric actuators
- Locking device
- Stem extension
- Stem protecting tube
- Position indicator
- Chain wheel
- Mechanical limit switch
- Larger nominal sizes and other variants on request

Product benefits

- Cast steel body withstands elevated fluid pressures.
- Yoke replaceable to accommodate different actuators quickly and easily.
- Gate valve bore is identical with nominal pipe diameter, resulting in a low flow resistance and process cost savings.

- Two-piece body without dead volumes: no downtime and maintenance costs caused by the removal of solids deposits.
- Reliable sealing: O-ring-supported self-adjusting flexible seat with high abrasion resistance and long service life.
- Suitable for universal use. Metal-seated and soft-seated (PTFE and EPDM) designs available to suit a variety of processes.

Related documents

Information/documents

Document	Reference number
Type series booklet HERA-BD (knife gate valve, bi-directional)	7328.1
Type series booklet HERA-BDS (knife gate valve, bi-directional)	7332.1
Type series booklet HERA-SH (knife gate valve, uni-directional)	7329.1
Operating manual	7330.8

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Operating temperature
6. Fluid handled
7. Variants
8. Reference number

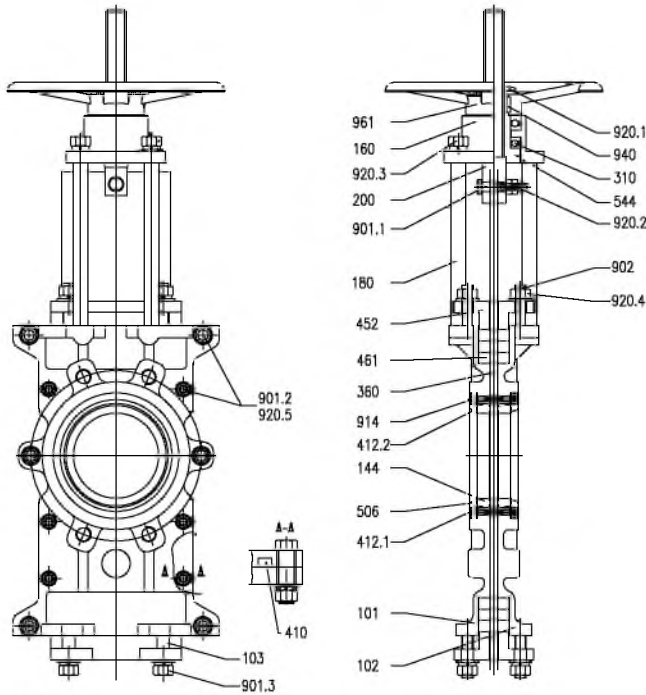
Pressure/temperature ratings

Test pressure and operating pressure

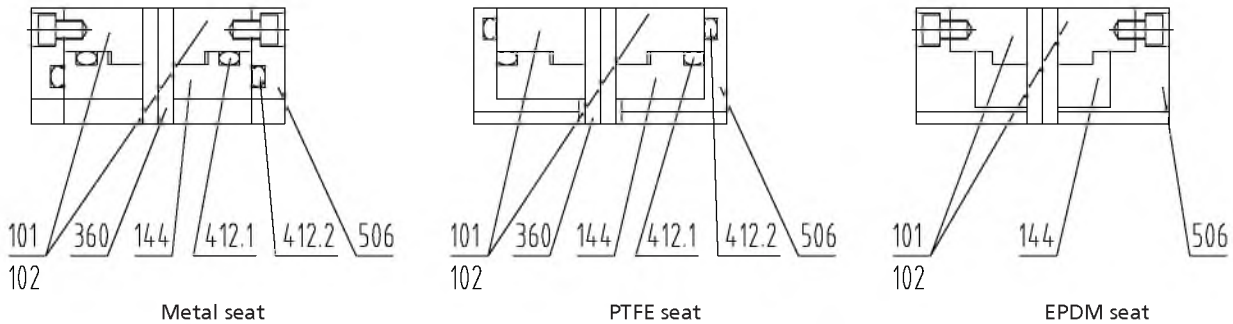
PN	DN	Shell test ¹⁾	Leak test (seat) ¹⁾	Permissible operating pressure
		With water		
		[bar]	[bar]	[bar]
10	80-600	15	2,8	10,3
16	80-600	24	2,8	10,3
Class 150	80-600	30	2,8	10,3

1) Test procedure to MSS SP-81

Materials



HERA-BHT

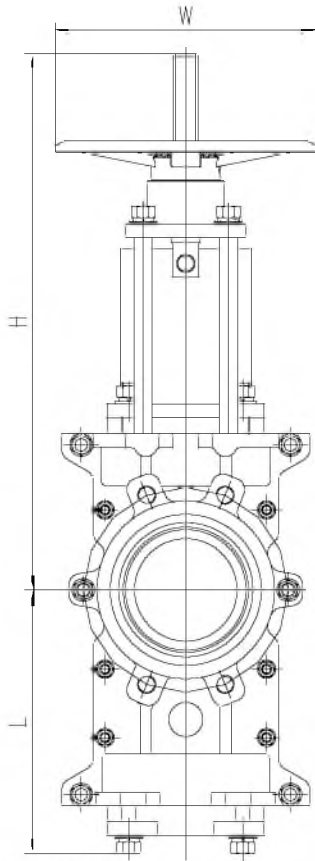


Parts list

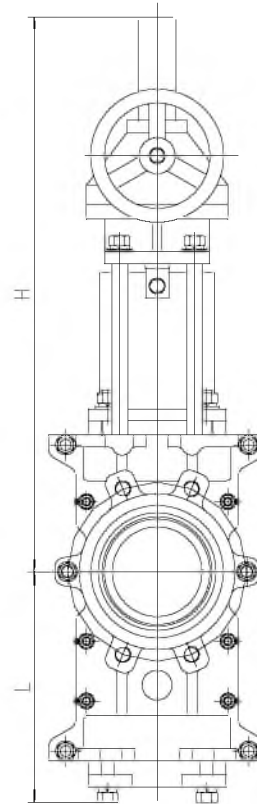
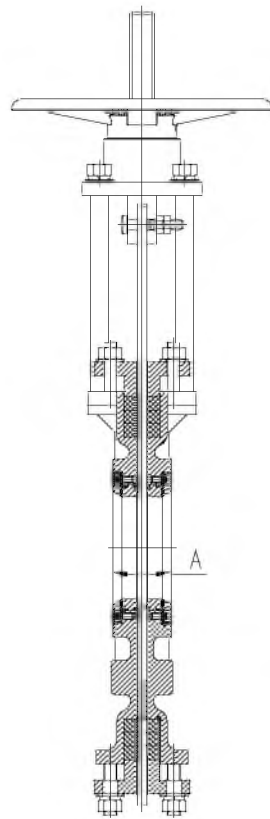
Part No.	Description	Material	Note
101	Lower body section	ASTM A 216 WCB	-
		ASTM A 351 CF8	-
		ASTM A 351 CF8M	-
102	Upper body section	ASTM A 216 WCB	-
		ASTM A 351 CF8	-
		ASTM A 351 CF8M	-
103	Bottom plate	ASTM A 216 WCB	-
		ASTM A 351 CF8	-
		ASTM A 351 CF8M	-
144	Seat	ASTM A 182 F304 + HCr	For metal-seated design
		ASTM A 182 F316 + HCr	For metal-seated design
		EPDM	-20 °C to +120 °C
		PTFE	-20 °C to +150 °C
160	Cover	Aluminium alloy	-
180	Pillar	ASTM A 182 F304	For body made of A 351 CF8(M)
		C45 + Cr	For body made of A 216 WCB
200	Stem	ASTM A 182 F304	-
310	Plain bearing	GCr6	-
360	Blade	ASTM A 182 F304	For soft-seated design
		ASTM A 182 F304 + HCr	For metal-seated design
		ASTM A 182 F316	For soft-seated design
		ASTM A 182 F316 + HCr	For metal-seated design
		ASTM A 276 410 + HCr	For soft-seated and metal-seated designs

Part No.	Description	Material	Note
410	Sealing element	NBR	-20 °C to +100 °C
412.1	O-ring	NBR	-20 °C to +100 °C
		Viton	-20 °C to +180 °C
412.2	O-ring	NBR	-20 °C to +100 °C
		Viton	-20 °C to +180 °C
452	Gland follower	ASTM A 216 WCB	-
		ASTM A 351 CF8	-
		ASTM A 351 CF8M	-
461	Gland packing	NBR or Viton	-
506	Retaining ring	ASTM A 216 WCB	-
		ASTM A 351 CF8	-
		ASTM A 351 CF8M	-
544	Threaded bush	H59	-
901.1	Bolt	ASTM A 182 F304	-
901.2	Bolt	ASTM A 182 F304	-
901.3	Bolt	ASTM A 182 F304	-
914	Hexagon socket head cap screw	ASTM A 182 F304	-
920.1	Nut	ASTM A 182 F304	-
920.2	Nut	ASTM A 182 F304	-
920.3	Nut	ASTM A 182 F304	-
940	Key	C45	-
961	Handwheel	D-2	-

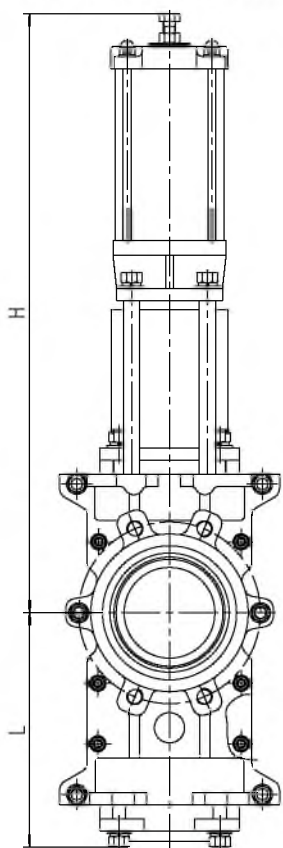
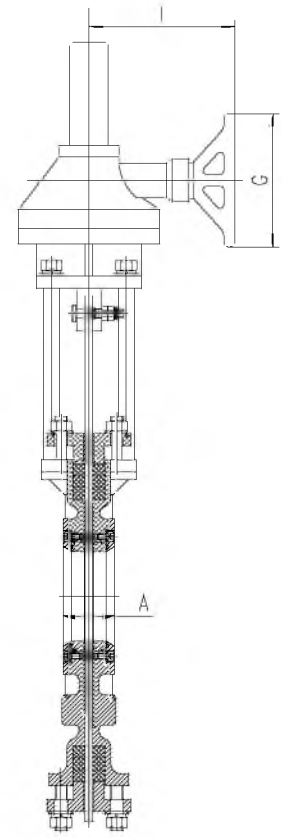
Dimensions and weights



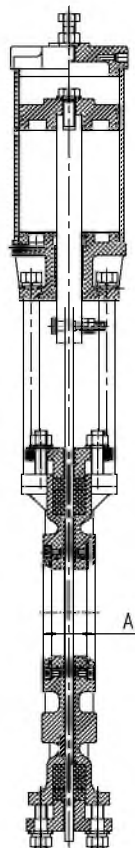
HERA-BHT with handwheel



HERA-BHT with gearbox



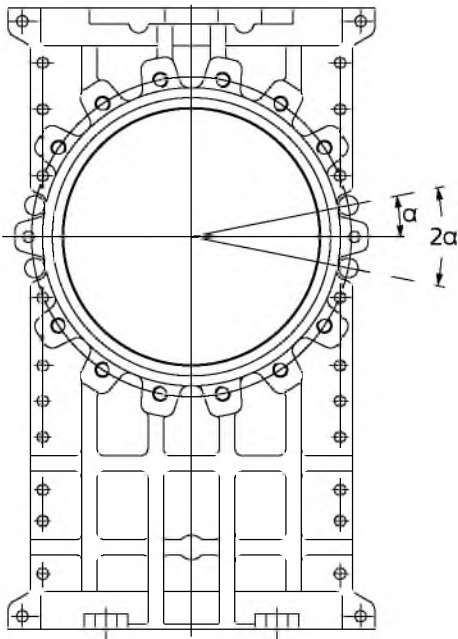
HERA-BHT with pneumatic actuator



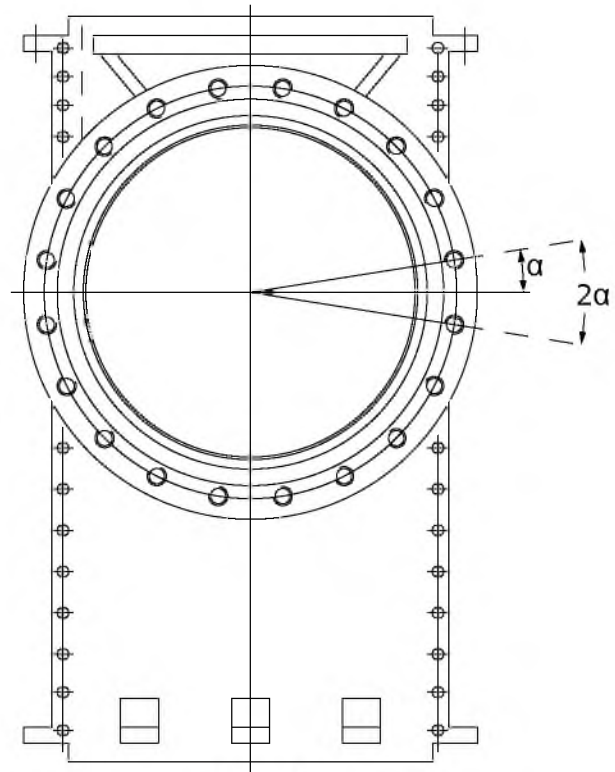
- 2) Fully open
- 3) Welded design

Dimensions [mm] and weights [kg]

PN	DN	A	L	H ²⁾	W	G	I	H1	With handwheel	With gearbox	With pneumatic actuator
									[kg]	[kg]	[kg]
10/16 Class 150	80	51	250	480	220	-	-	610	15,0	-	22,0
	100	51	350	530	220	-	-	620	17,0	-	24,5
	125	57	410	615	250	-	-	755	24,5	-	36,0
	150	57	450	695	280	-	-	800	31,0	-	44,3
	200	70	570	820	315	-	-	1000	53,5	-	72,4
	250	70	630	990	355	-	-	1170	74,0	-	107,8
	300	76	710	1140	400	-	-	1350	120,0	-	173,8
	350	76	810	1300	450	-	-	1570	185,0	-	315,0
	400	89	910	1570	-	310	260	1700	291,0	-	406,0
	450 ³⁾	110	1000	1810	-	460	340	1940	-	422,0	625,0
500 ³⁾	114	1110	1910	-	460	340	2050	-	480,0	714,0	
600 ³⁾	134	1280	2190	-	460	340	2350	-	915,0	1195,0	



DN 80-400 (semi-lug type)



DN 450-600 (full-lug type)

Dimensions [mm]

PN	DN	Flange OD	Bolt circle diameter	Number of clearance holes	Number of tapped holes
10	80	200	160	4	4
	100	220	180	4	4
	125	250	210	4	4
	150	285	240	4	4
	200	340	295	4	4
	250	395	350	4	8
	300	445	400	4	8
	350	505	460	4	12
	400	565	515	4	12
	450	615	565	0	20
16	80	200	160	4	4
	100	220	180	4	4
	125	250	210	4	4
	150	285	240	4	4
	200	340	295	4	8
	250	405	355	4	8

PN	DN	Flange OD	Bolt circle diameter	Number of clearance holes	Number of tapped holes
16	300	460	410	4	8
	350	520	470	4	12
	400	580	525	4	12
	450	640	585	0	20
	500	715	650	0	20
	600	840	770	0	20

Dimensions [mm]

PN	DN	Depth of tapped holes	Bolt size	Bolt hole ID	Angle α
10	80	14	M16	18	22,50°
	100	14	M16	18	22,50°
	125	16	M16	18	22,50°
	150	16	M20	22	22,50°
	200	16	M20	22	22,50°
	250	16	M20	22	15,00°
	300	18	M20	22	15,00°
	350	20	M20	22	11,25°
	400	20	M24	26	11,25°
	450	24	M24	26	9,00°
	500	24	M24	26	9,00°
16	80	14	M16	18	22,50°
	100	14	M16	18	22,50°
	125	16	M16	18	22,50°
	150	16	M20	22	22,50°
	200	16	M20	22	15,00°
	250	16	M24	26	15,00°
	300	18	M24	26	15,00°
	350	20	M24	26	11,25°
	400	20	M27	30	11,25°
	450	24	M27	30	9,00°
	500	24	M30	33	9,00°
600	30	M33	36	9,00°	

Dimensions [mm]

Class	DN	Flange OD	Bolt circle diameter	Number of clearance holes	Number of tapped holes
150	3"	190	152,5	0	4
	4"	230	190,5	4	4
	5"	255	216,0	4	4
	6"	280	241,5	4	4
	8"	345	298,5	4	4
	10"	405	362,0	4	8
	12"	485	432,0	4	8
	14"	535	476,0	4	8
	16"	600	540,0	4	12
	18"	635	578,0	0	16
	20"	700	635,0	0	20
	24"	815	749,5	0	20

Dimensions [mm]

Class	DN	Depth of tapped holes	Bolt size	Bolt hole ID	Angle α
150	3"	14	$\frac{5}{8}$ " - 11 UNC	18,0	45,00°
	4"	14	$\frac{5}{8}$ " - 11 UNC	18,0	22,50°
	5"	16	$\frac{3}{4}$ " - 10 UNC	22,0	22,50°
	6"	16	$\frac{3}{4}$ " - 10 UNC	22,0	22,50°
	8"	16	$\frac{3}{4}$ " - 10 UNC	22,0	22,50°
	10"	16	$\frac{7}{8}$ " - 9 UNC	26,0	15,00°
	12"	18	$\frac{7}{8}$ " - 9 UNC	26,0	15,00°
	14"	20	1" - 8 UNC	29,5	15,00°
	16"	20	1" - 8 UNC	29,5	11,25°
	18"	24	1 $\frac{1}{8}$ " - 7 UNC	32,5	11,25°
	20"	24	1 $\frac{1}{8}$ " - 7 UNC	32,5	9,00°

Class	DN	Depth of tapped holes	Bolt size	Bolt hole ID	Angle α
150	24"	30	1 1/4" - 7 UNC	35,5	9,00°

Mating dimensions as per standard

Face-to-face lengths: MSS SP-81
 Flanges: Mating dimensions to
 EN 1092-1 (PN 10/16)
 ASME B16.5 (Class 150)

Knife Gate Valve

HERA-BDS

PN 10/16, Class 150
DN 50-600
Bi-directional
Full-lug Body

Type Series Booklet



Knife Gate Valves

Bi-directional knife gate valve

HERA-BDS



Main applications

- Mining
- Sewage treatment plants
- Paper and cellulose industry
- Cement plants
- Chemical industry

Fluids handled

- Slurry
- Abrasive fluids
- Pulp
- Waste water
- Service water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16, Class 150
Nominal size	DN 50-600
Max. permissible pressure	10 bar
Max. permissible temperature	120 °C

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 425 °C
ASTM A 351 CF8	Up to 538 °C
ASTM A 351 CF8M	Up to 538 °C

Other materials on request.

Design details

Design

- Design to ASME B16.34 and MSS SP-81
- Pressure/temperature ratings to MSS SP-81
- Full-lug body
- Wafer-type body
- Bi-directional seal
- Rising stem
- Non-rising handwheel
- Resilient lining
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Group 2.

Variants

- Non-rising stem
- Graphite gland packing for high temperatures
- Locking device
- Protection plate
- Mounting of electric and pneumatic actuators
- Mounting of gearboxes
- Other material variants
- Larger nominal sizes up to DN 900

Product benefits

- Blade bottom edge curved for high cutting force. Smooth blade surface due to precision grinding and hard chromium plating, for increased abrasion resistance and long service life.
- Internal gland packing with improved sealing performance
- Two-piece body designed without dead volumes to prevent pulp deposits inside the body and jamming of the blade, particularly in the case of solids-laden fluids.
- Long service life due to resilient, abrasion-resistant die-cast rubber seat with metal backing ring Replaceable seats, easy to remove and install
- Drain facility at the bottom of the valve body. Body bottom dismantles easily for regular cleaning. Flushing system can be fitted by customer.

Related documents

- Operating manual 7332.8

On all enquiries/orders please specify

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Type 2. Nominal pressure 3. Nominal size 4. Operating pressure 5. Operating temperature 6. Line connection | <ol style="list-style-type: none"> 7. Material 8. Fluid handled 9. Variants 10. Number of type series booklet <p>Always indicate the original serial number and the year of construction when ordering spare parts.</p> |
|--|---|

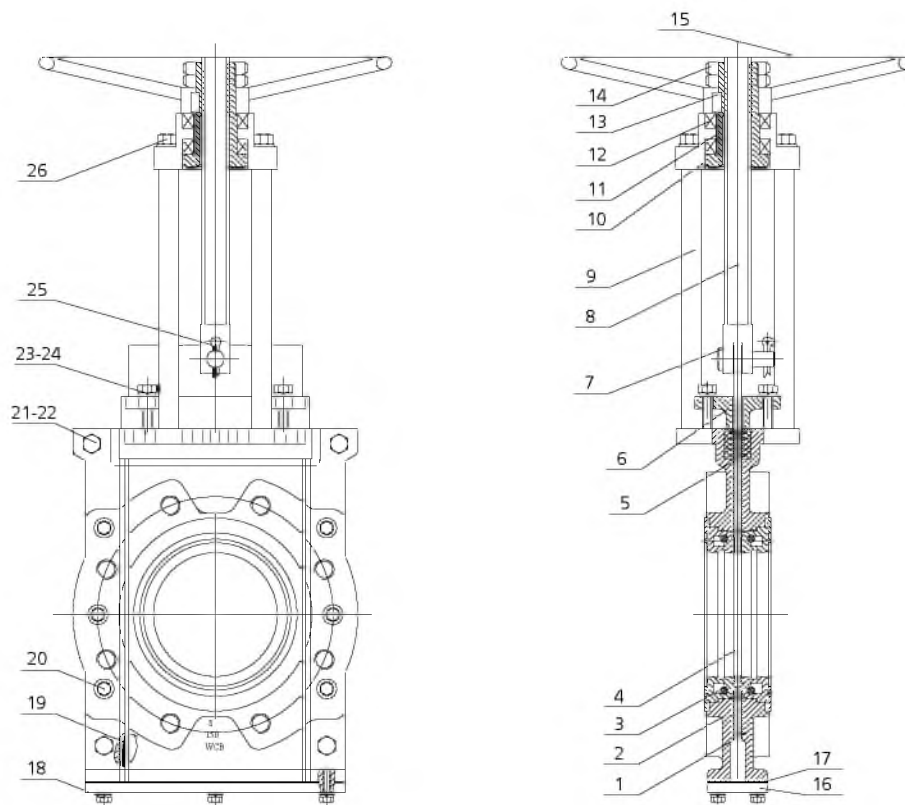
Pressure/temperature ratings

Test and operating pressures

Nominal pressure	Nominal size	Shell test ¹⁾²⁾	Leak test (seat) ¹⁾	Permissible operating pressures
		with water		
PN	DN	[bar]	[bar]	[bar]
10	50-600	15	2,8	10,3
16	50-600	24	2,8	10,3
Class 150	50-600	30	2,8	10,3

Materials

HERA-BDS with handwheel



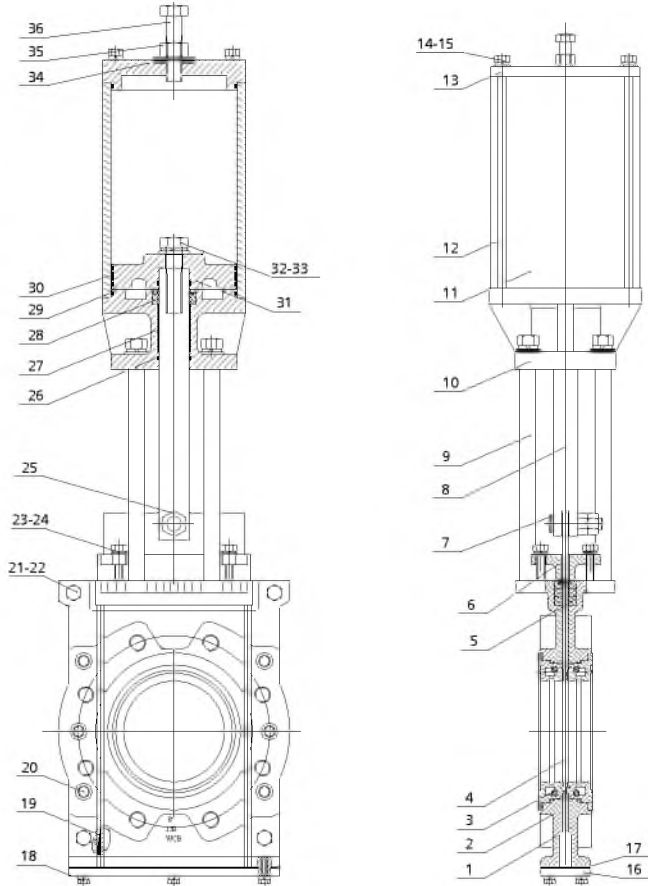
Overview of available materials

Part No.	Description	Material	Note
1	Upper body section	ASTM A 216 WCB	
		ASTM A 351 CF8	

1) Test procedure to MSS SP-81
2) Test medium at 0 °C to 66 °C

Part No.	Description	Material	Note
2	Lower body section	ASTM A 351 CF8M	
		ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
3	Seat	EPDM	
		NBR	
		Rubber	
4	Blade	ASTM A 182 F304	Hard chromium plated
		ASTM A 182 F316	Hard chromium plated
		ASTM A 276 410	Material available for model with metal (hard chromium plated) seat only
5	Packing ring	PTFE	
6	Gland follower	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
7	Pin	ASTM A 182 F304	
8	Stem	ASTM A 182 F304	
9	Pillar	ASTM A 182 F304	Body made of A 351 CF8(M)
		C45 + Cr	Body made of A 216 WCB
10	Cover	ASTM A 216 WCB	
		ZL102	
11	Nut	H59	
12	Plain bearing	GCr6	
13	Key	45#	
14	Slotted round nut	45#	Electroless nickel-plated
15	Handwheel	Nodular cast iron	
16	Bottom	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
17	Gasket	NBR	
18	Hexagon head bolt	ASTM A 182 F304	
19	Sealing cord	NBR	
20	Hexagon socket head cap screw	ASTM A 182 F304	
21	Hexagon head bolt	ASTM A 182 F304	
22	Hexagon nut	ASTM A 182 F304	
23	Stud	ASTM A 182 F304	
24	Hexagon nut	ASTM A 182 F304	
25	Split pin	Stainless steel	
26	Hexagon nut	ASTM A 182 F304	

HERA-BDS with pneumatic actuator

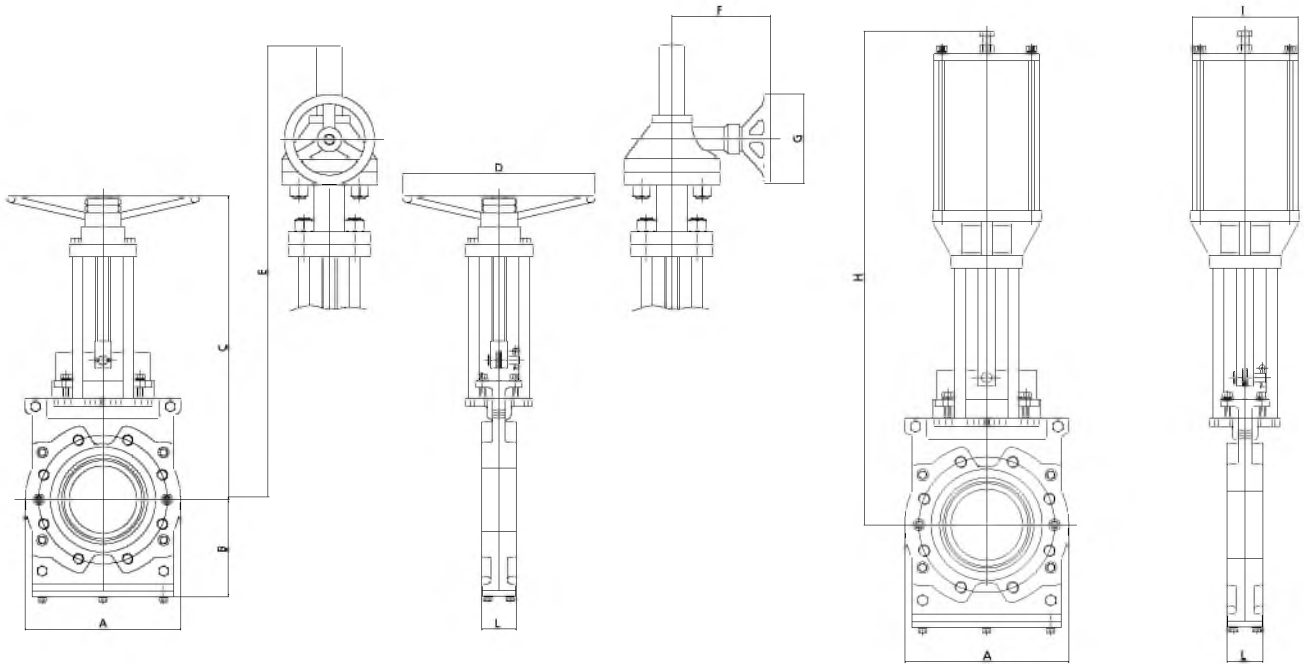


Overview of available materials

Part No.	Description	Material	Note
1	Upper body section	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
2	Lower body section	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
3	Seat	EPDM	
		NBR	
		Rubber	
4	Blade	ASTM A 182 F304	Hard chromium plated
		ASTM A 182 F316	Hard chromium plated
		ASTM A 276 410	Material available for model with metal (hard chromium plated) seat only
5	Packing ring	PTFE	
6	Gland follower	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
7	Pin	ASTM A 182 F304	
8	Cylinder rod	45#	Hard chromium plated
9	Pillar	ASTM A 182 F304	Body made of A 351 CF8(M)
		C45 + Cr	Body made of A 216 WCB
10	Bottom end cap	Q 235	
		ZL102	
11	Cylinder	Q 235	Aluminium alloy
12	Tie bolt	Q 235	Galvanised

Part No.	Description	Material	Note
13	Top end cap	Q 235	
		ZL102	
14	Hexagon nut	ASTM A 182 F304	
15	Spring washer	65Mn	
16	Bottom	ASTM A 216 WCB	
		ASTM A 351 CF8	
		ASTM A 351 CF8M	
17	Gasket	NBR	
18	Hexagon head bolt	ASTM A 182 F304	
19	Sealing cord	NBR	
20	Hexagon socket head cap screw	ASTM A 182 F304	
21	Hexagon head bolt	ASTM A 182 F304	
22	Hexagon nut	ASTM A 182 F304	
23	Stud	ASTM A 182 F304	
24	Hexagon nut	ASTM A 182 F304	
25	Hexagon nut	ASTM A 182 F304	
26	O-ring	NBR	
27	Boundary-lubricated bearing	Composite	
28	Y-ring	Polyurethane	
29	O-ring	NBR	
30	Guide ring	PTFE	
31	Piston	ZL102	
		Q 235	
32	Hexagon head bolt	45#	
33	Spring washer	65Mn	
34	Gasket	PTFE	
35	Hexagon nut	ASTM A 182 F304	
36	Adjusting screw	ASTM A 182 F304	

Dimensions



Dimensions in mm

DN	L	A	B	C ³⁾	E ³⁾	D	F	G	H	I	With handwheel	With gearbox	With pneumatic actuator
											[kg]	[kg]	[kg]
50	48	165	120	450/360	-	220	-	-	550	120	20	-	26
65	48	190	130	475/390	-	220	-	-	600	120	22	-	30
80	51	200	145	535/415	-	220	-	-	640	120	26	-	35
100	51	230	150	600/450	-	250	-	-	700	145	35	-	42
125	57	230	180	690/510	-	250	-	-	840	190	38	-	50
150	57	285	200	740/550	-	282	-	-	910	190	42	-	66
200	70	345	220	885/660	-	355	-	-	1100	225	65	-	87
250	70	405	275	1060/780	-	355	-	-	1280	225	85	-	140
300	76	485	330	-	1450/1105	-	260	310	1440	282	-	162	225
350	76	535	350	-	1570/1160	-	260	310	1700	330	-	190	298
400	89	600	380	-	1670/1220	-	260	310	1855	410	-	230	335
450	89	635	400	-	1800/1230	-	340	460	2000	500	-	290	395
500	114	705	450	-	1950/1790	-	340	460	2180	550	-	360	470
600	114	820	510	-	1890/2490	-	340	460	2400	650	-	440	570

Mating dimensions – Standards

Face-to-face MSS SP-81

lengths:

Flanges: Mating dimensions Class 150: ANSI B 16.5
Mating dimensions PN 10, PN 16: DIN 2501

³⁾ (Fully open/closed)



**Spring return
pneumatic actuators**

**DYNACTAIR 1.5, 3, 6, 12 and 25 :
rack and pinion kinematics**

**DYNACTAIR 50 and 100 :
scotch-yoke kinematics**

**DYNACTAIR 200, 400 and 800 :
yoke AMRI patented kinematics**

Output torques up to 8800 Nm

General features

Designed for the automation of ¼ turn valves (butterfly valves, ball valves), the DYNACTAIR series of spring return pneumatic actuators and their AMTROBOX/AMTRONIC/SMARTRONIC box are involved in all the functions of control and supervision encountered in all modern processes, and more particularly in communication by fieldbus.

3 kinematics are used for the actuators operation:

- rack and pinion kinematics for DYNACTAIR 1.5, DYNACTAIR 3, DYNACTAIR 6, DYNACTAIR 12 and DYNACTAIR 25,
- scotch-yoke kinematics for DYNACTAIR 50 and DYNACTAIR 100,
- yoke AMRI patented kinematics for DYNACTAIR 200, DYNACTAIR 400 and DYNACTAIR 800.

The mounting interface is in accordance with ISO 5211 standard.

Equipped with an interchangeable insert, they can be easily fitted on different valve shaft (square end, flat end, key).

In standard version, the DYNACTAIR actuators are equipped with a visual pointer and adjustable mechanical travel stops:

- on closed **or** on open position for DYNACTAIR 1.5 to 100 (see pages 6 and 7),
- on closed **and** on open position for DYNACTAIR 200 to 800.

The actuator is mounted directly or by means of an adaptor on ¼ turn valve plate.

Protection:

They are hose and fine dust proof (protection degree equivalent to IP 65).

External coating:

DYNACTAIR 1.5 to 100: housing with 50 µm thickness hard anodization and cylinder head with black cataphoresis coating 30 µm.

DYNACTAIR 200 to 800: polyurethane paint, thickness 80 µm, colour dark grey RAL 7016.

Working temperature :

From -20° C up to +80° C: standard version,

Alternative construction for DYNACTAIR 1.5 to 100:

- 40° to +80°C: dynamic O-rings in special Nitrile,
- 20° to +120°C: dynamic O-rings in Viton (available with corrosive motive medium).

Other working temperature range for DYNACTAIR 200 to 800: Please consult us.

Standard variant:

ATEX version in accordance with 94/9/EC directive.

This spring return actuator range is completed by the ACTAIR series of double acting pneumatic actuators. Please consult type series booklet ACTAIR 1.5 to 1600 pneumatic actuators, ref. 8515.1.

Production range

DYNACTAIR Type	ISO 5211 mounting plate *	Maximum allowable dimensions for the shaft			
		Height	Driving by square	Diameter Driving by flat	Driving by key
1.5	F04 or F05+F04 (45°)*	24	11	11	Please, consult us
3	F05 – F07	30	16	14	
6	F05 – F07	32	19	17	
12	F07 – F10	40	22	22	
25	F10 – F12	45	27	27	
50	F10 – F12	55	36	36	
100	F14	65	50	46	
200	F16	80	60	55	
400	F16	80	60	55	
800	F16 – F25	95	70	75	

* Direct adaptation onto identical mounting plate.

Adaptation by intermediate flange onto different plate (different size or shape).

Control fluid supply

Air or any neutral gas, filtered, dry or lubricated:

- filtration: 50 µm,
- drying: dew point at max. working pressure $\leq 4^{\circ}\text{C}$ and min. temperature -5°C

If a lubrication is required - the lubrication increases the actuator life - the use of a non detergent oil without aggressive additive is recommended:

- viscosity 2 to 3° ENGLER at 50° C
- aniline point 90° C to 105° C
- flow 1 to 3 drop for 500 NL/mn.

Operating times

The table below defines the minimum operating times under 5 bar control air pressure and the operation rates per minute for DYNACTAIR actuators on/off function.

DYNACTAIR type	Minimum operating time			Operation rates per minute
	DYNACTAIR + AMTRONIC	On/off function		
		DYNACTAIR with distributor ISO-1 or NAMUR fitted onto the housing	DYNACTAIR direct connection	
1.5	2 seconds	2 seconds		30 maxi
3	2 seconds	2 seconds		30 maxi
6	2 seconds	2 seconds		30 maxi
12	4 seconds	2 seconds		15 maxi
25	6 seconds	3,5 seconds		10 maxi
50	10 seconds	5 seconds		6 maxi
100	15 seconds	8 seconds		4 maxi
200	45 seconds	30 seconds	15 seconds	2 maxi
400	90 seconds	45 seconds	30 seconds	1 maxi
800	180 seconds	90 seconds	40 seconds	0,5 maxi

On request, adjust construction for :

- other operation times,
- high operation rates.

Please consult us.

Capacity

DYNACTAIR type	Capacity in cm ³
1.5	240
3	570
6	1180
12	2400
25	4700
50	5280
100	9800
200	25000
400	50000
800	92000

Safety function

In standard version, the DYNACTAIR actuators are designed to ensure valve closure in case of lack of control fluid pressure.

On request, valve opening by lack of control fluid is available.

The opening function by lack of control fluid differentiates itself from the closing function by a different mounting of the kinematics (refer to pages 6 to 9) and by a more or less powerful construction of the energy accumulator (refer to pages 4 and 5).

Due to these differences of construction, the use of a closing function actuator instead of an opening function actuator (and vice versa) can cause some hazards during operation such as the impossibility to operate the valve or operation in the wrong direction. For these reasons, it is strongly inadvisable to try to change from one type of actuator to the other.

Output torque (Nm) relating to the control fluid pressure and the safety function

To ensure the safety function (closing or opening) in case of lack of control fluid, the DYNACTAIR spring return pneumatic actuators are equipped with an energy accumulator.

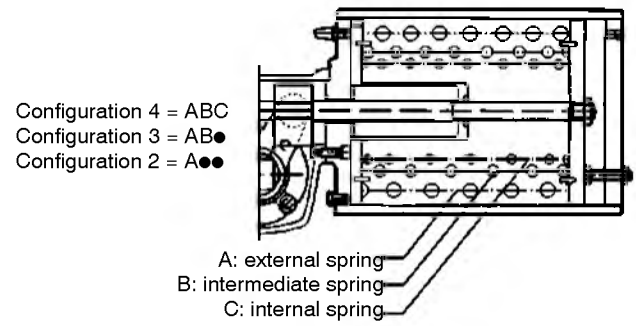
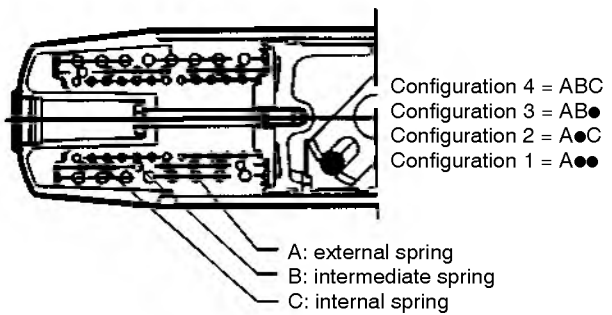
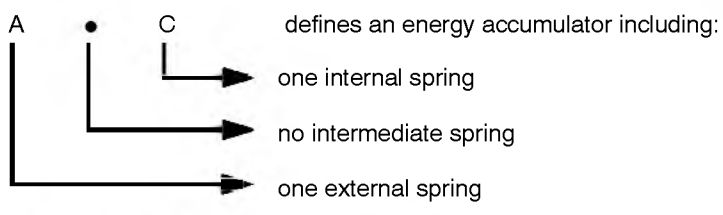
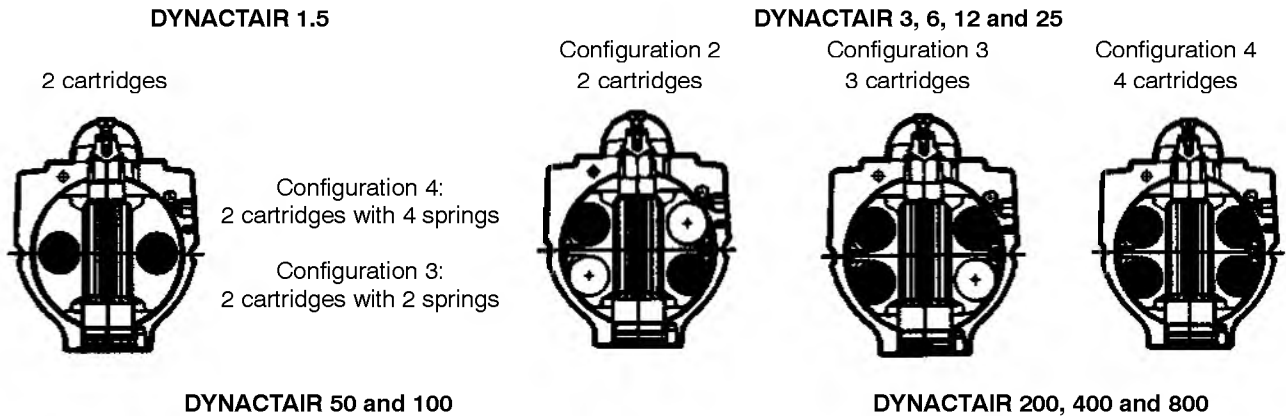
This energy accumulator consists in:

- for DYNACTAIR 1.5 to 25 actuators: 2, 3 or 4 precompressed spring cartridges fitted between the pistons, each cartridge including four helicoidal springs,
- for DYNACTAIR 50 to 800 actuators: a precompressed spring cartridge fitted at each housing end, each cartridge including one, two or three helicoidal springs depending on the requested output torque.

The table below shows the different output torques relating to the control fluid pressure and the quantity of spring cartridges (case of DYNACTAIR 1.5 to 25) or of the quantity of springs and their position (case of DYNACTAIR 50 to 800).

DYNACTAIR	Energy accumulator configuration (cartridge/spring)	Output torque restored by the energy accumulator (cartridge/spring)		Output torque during the setting of the energy accumulator relating to the control fluid pressure											
		Springs start	Springs end	3 bar Air		4 bar Air		5 bar Air		6 bar Air		7 bar Air		8 bar Air	
Rack and pinion kinematics (refer to page 6 for curves and operation)															
1.5	3 (2 cart./ 2 springs)	16	9	16	5	24	13	32	20						
	4 (2 cart./ 4 spring)	30	15					25	5	32	13				
3	2 (2 cartridges)	28	16	27	14	41	28	55	43						
	3 (3 cartridges)	42	24			33	14	47	29	61	43				
	4 (4 cartridges)	57	32					39	14	53	29	68	43	82 57	
6	2 (2 cartridges)	51	32	55	28	82	55	108	81						
	3 (3 cartridges)	77	48			58	29	85	56	111	82				
	4 (4 cartridges)	103	64					69	30	96	57	122	83	148 109	
12	2 (2 cartridges)	108	64	94	50	147	103	200	156						
	3 (3 cartridges)	161	96			115	50	168	103	220	155				
	4 (4 cartridges)	215	128					136	48	188	101	241	154	294 207	
25	2 (2 cartridges)	220	131	186	97	292	203	398	308						
	3 (3 cartridges)	330	196			226	94	332	199	437	305				
	4 (4 cartridges)	440	262					267	89	372	194	478	299	583 405	
Scotch-yoke kinematics (refer to page 7 for curves and operation)															
50	1 (1 spring A ●●)	360	229	401	270	611	481								
	2 (2 springs A ● C)	550	336	295	81	505	291	716	502						
	3 (2 springs A B ●)	622	404			437	218	647	429	857	639				
	4 (3 springs A B C)	810	520			317	60	528	278	738	488	949	698	1116 909	
100	1 (1 spring A ●●)	728	447	789	508	1202	921								
	2 (2 ressorts A ● C)	970	585	652	267	1065	680	1478	1093						
	3 (2 ressorts A B ●)	1350	800			843	293	1256	706	1669	1119				
	4 (3 ressorts A B C)	1600	1010			657	120	1070	533	1482	946	1895	1358	2300 1771	
Yoke AMRI patented kinematics (refer to pages 8 and 8 for curves and operation)															
Closing by lack of control fluid	200	2 (1 spring A ●●)	800	1000	1880	700									
		3 (2 springs A B ●)	1000	1700			2100	600							
		4 (3 springs A B C)	1000	2150			1700	300	2600	1000	2600	1000			
	400	2 (1 spring A ●●)	1000	2000	3700	1000									
		3 (2 springs A B ●)	1000	3400			4200	1000							
		4 (3 springs A B C)	1000	4300			3400	600	4400	1000	4400	1000			
800	2 (1 spring A ●●)	2000	3000	7000	2000										
	3 (2 springs A B ●)	2000	5400	4400	700	7800	2000								
	4 (3 springs A B C)	2000	8000					8800	2000	8800	2000				
Opening by lack of control fluid	200	2 (1 spring A ●●)	1500	500	1000	1300	1000	2100							
		3 (2 springs A B ●)	2500	1000			1000	1050	1000	2000	1000	2900			
	400	2 (1 spring A ●●)	3000	1000	1000	2600	1000	4200							
		3 (2 springs A B ●)	4400	1000			1000	2100	1000	4000	1000	4400			
	800	2 (1 spring A ●●)	4600	1800	2000	5420	2000	8800							
		3 (2 springs A B ●)	8800	2000	2000	1200	2000	4500	2000	7900	2000	8800			

Configuration of the energy accumulator



Actuator selection

Relating to the ¼ turn valve to be operated and its operating torque, the available control fluid pressure and the requested safety function, it is necessary to take into consideration the following criteria for the actuator selection (type and configuration):

Butterfly valves

Closing function = springs end and air start,
Opening function = springs start and air end.

Ball valves

Whatever the safety function may be, the four criteria must be taken into consideration:
Springs end and air start,
Springs start and air end.

Choose the values for springs and air the nearest possible one another and immediately higher than the operating torque of the valve to be actuated (consult the manufacturer instructions).

This selection is already defined in the technical leaflets for KSB-AMRI valves: definition of the DYNACTAIR configuration relating to its safety function and control fluid pressure.

DYNACTAIR	Configuration	Closing by lack of control fluid				Opening by lack of control fluid			
		3 bar	4 bar	5 bar	6 bar	3 bar	4 bar	5 bar	6 bar
1.5		3	3	4	4	2	3	3	3
3 – 6 – 12 – 25		2	3	4	4	2	2	3	3
50 – 100		2	3	4	4	1	1	2	3
200 – 400 – 800		2	3	4	4	2	2	3	3

Operation

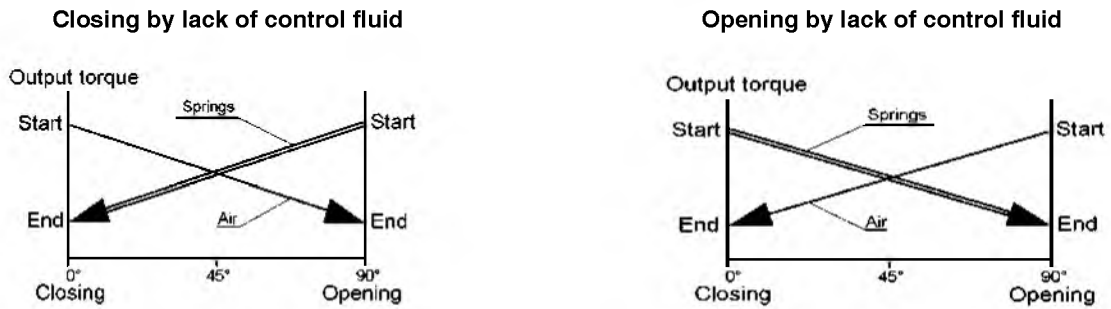
DYNACTAIR 1.5 to 25: rack and pinion kinematics

The rack and pinion kinematics develop a linear output torque.

The movement of the rack/pistons secured by the control fluid pressure causes a ¼ turn rotation of the pinion integral with the valve shaft: the pressure ensures at once the valve operation and the compression of the spring cartridges.

The spring cartridges reset the valve in safety position when the pressure is cut-off.

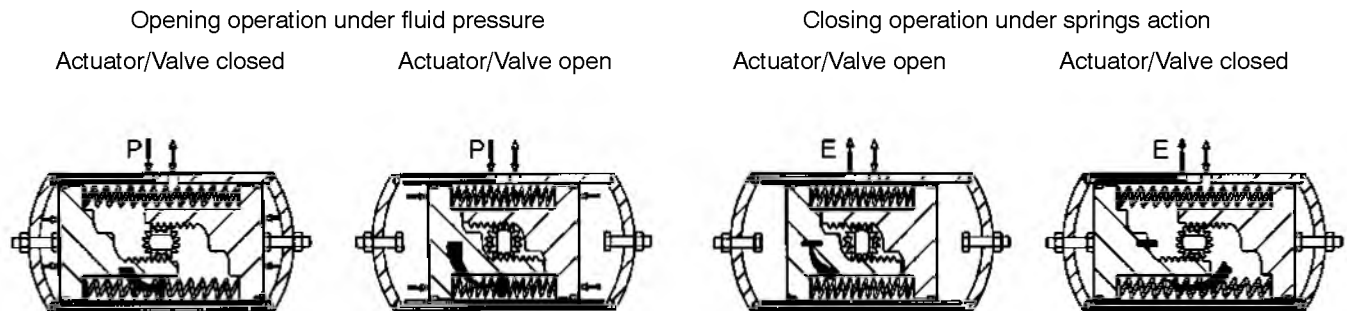
Curve of the rack and pinion kinematics



Closure function by lack of control fluid - Adjustable mechanical travel stop on closing position

Adjustment range ($\pm 2,5^\circ$) for the end-stop

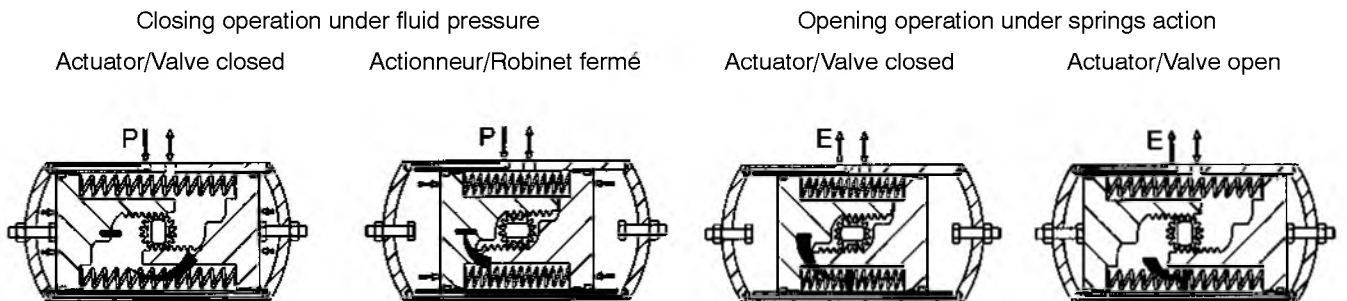
The DYNACTAIR with closure function by lack of control fluid can be equipped with only an adjustable end-stop on closing position



Opening function by lack of control fluid - Adjustable mechanical travel stop on opening position

Adjustment range ($\pm 2,5^\circ$) for the end-stop

The DYNACTAIR with opening function by lack of control fluid can be equipped with only an adjustable end-stop on opening position



During the operation under control fluid pressure, the holding in position is only achieved by the pressure in the chambers.

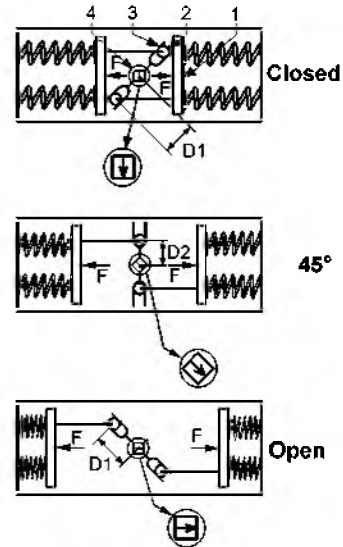
DYNACTAIR 50 and 100: scotch-yoke kinematics

The scotch-yoke kinematics develop a variable output torque well suited to the operation of 1/4 turn valves.

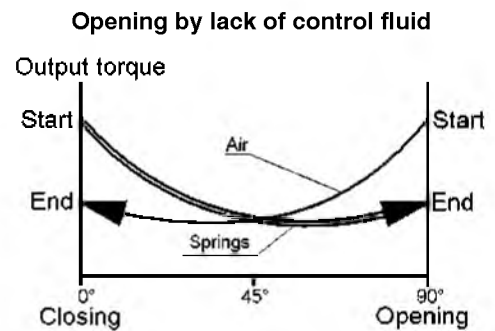
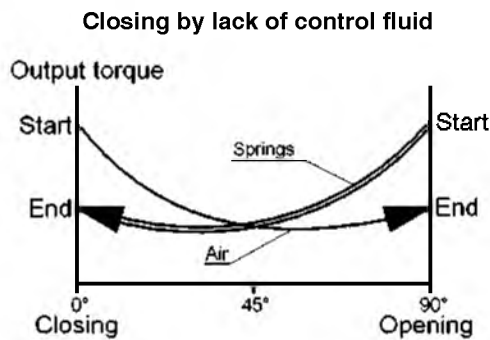
The movement transmission is achieved by means of the piston system ①, rollers ②, scotch-yoke ③ and shaft ④.
 The movement of the pistons ① secured by the pressure causes the sliding of the rollers ② in the grooves of the yoke ③.
 The yoke ③ allows the rotation of the shaft ④ integral with the valve shaft.

The control fluid pressure ensures at once the valve operation and the compression of the springs.

The springs reset the valve in safety position when the pressure is cut-off.



Curve of the scotch-yoke kinematics



Closure function by lack of control fluid - Adjustable mechanical travel stop on closing position

Adjustment range ($\pm 2,5^\circ$) for the end-stop

The DYNACTAIR with closure function by lack of control fluid can be equipped with only an adjustable end-stop on closing position

Opening operation under fluid pressure

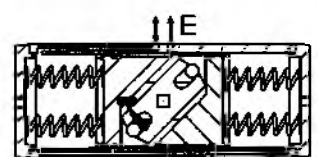
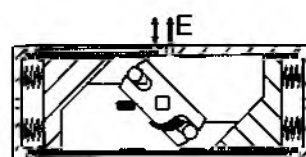
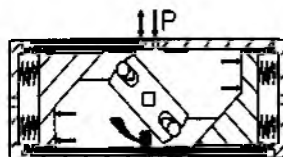
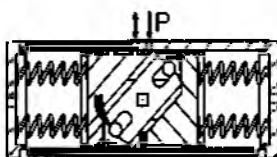
Actuator/Valve closed

Actuator/Valve open

Closing operation under springs action

Actuator/Valve open

Actuator/Valve closed



Opening function by lack of control fluid - Adjustable mechanical travel stop on opening position

Adjustment range ($\pm 2,5^\circ$) for the end-stop

The DYNACTAIR with opening function by lack of control fluid can be equipped with only an adjustable end-stop on opening position

Closing operation under fluid pressure

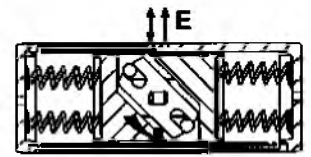
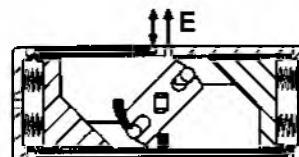
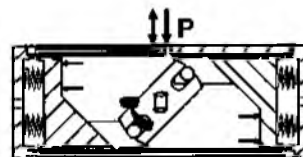
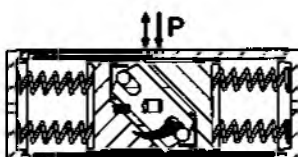
Actuator/Valve open

Actuator/Valve closed

Opening operation under springs action

Actuator/Valve closed

Actuator/Valve open



During the operation under control fluid pressure, the holding in position is only achieved by the pressure in the chambers.

DYNACTAIR 200 to 800: yoke AMRI patented kinematics

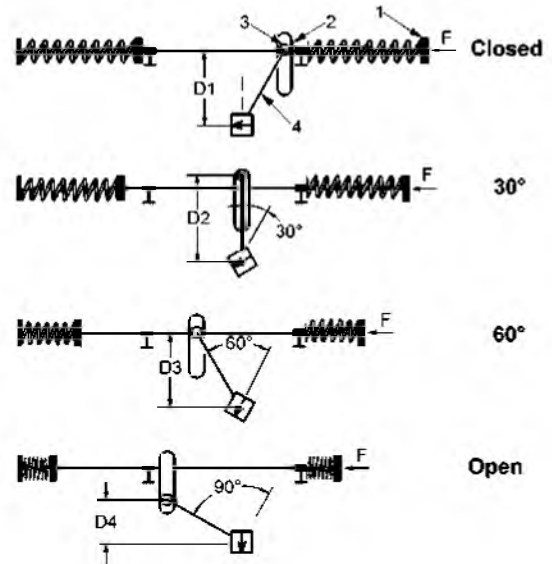
The yoke AMRI patented kinematics develop a variable output torque very well suited to the operation of ¼ turn valves with hydrodynamic torque.

The movement transmission is achieved by means of the piston system ①, the slide operating nut ②, the rolling pad ③ and the yoke ④.

The movement of the piston ① secured by pressure in the actuator cylinder causes the linear travel of the operating nut ②. This movement drives the sliding of the pads ③ in the 2 slides of the operating nut, and allows the rotation of the yoke ④ integral with the valve shaft.

The control fluid pressure ensures at once the valve operation and the compression of the springs.

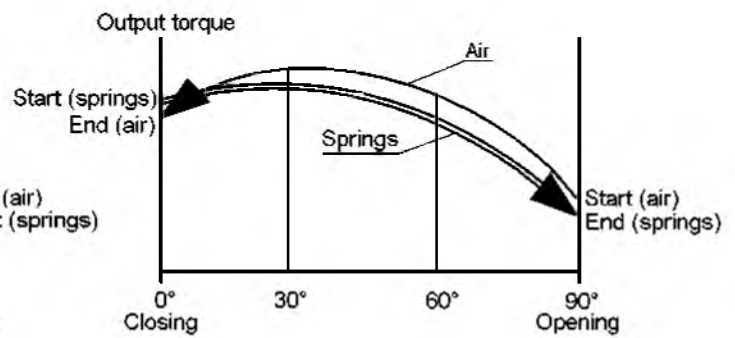
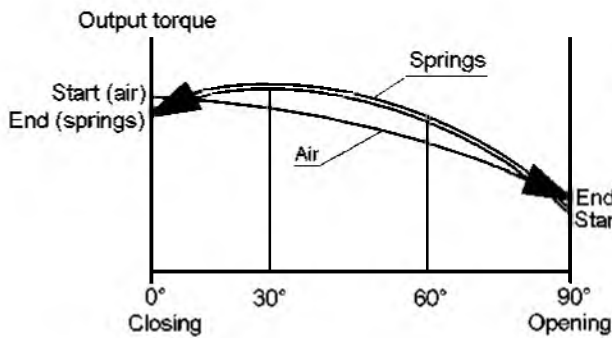
The springs reset the valve in safety position when the pressure is cut-off



Curve of the yoke AMRI patented kinematics

Closing by lack of control fluid

Opening by lack of control fluid



During the operation under control fluid pressure, the holding in position is only achieved by the pressure in the chambers.

DYNACTAIR 200

Closure function by lack of control fluid

Opening operation under fluid pressure

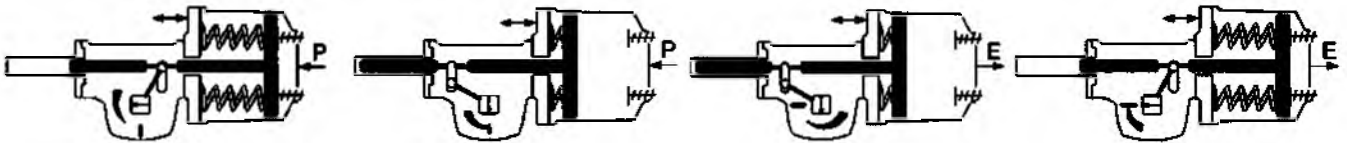
Actuator/Valve closed

Actuator/Valve open

Closing operation under springs action

Actuator/Valve open

Actuator/Valve closed



Opening function by lack of control fluid

Closing operation under fluid pressure

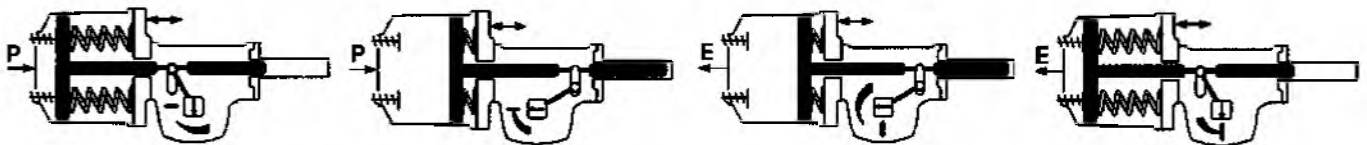
Actuator/Valve open

Actuator/Valve closed

Opening operation under springs action

Actuator/Valve closed

Actuator/Valve open



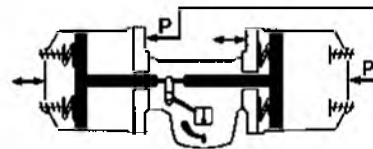
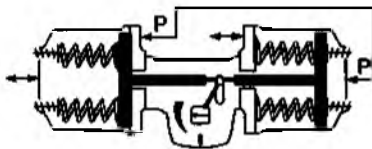
DYNACTAIR 400 and 800

Closure function by lack of control fluid

Opening operation under fluid pressure

Actuator/Valve closed

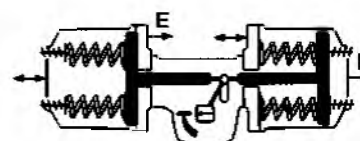
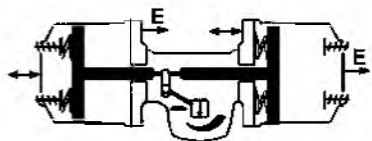
Actuator/Valve open



Closing operation under springs action

Actuator/Valve open

Actuator/Valve closed

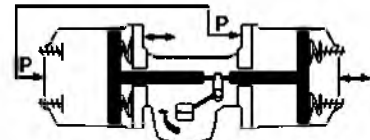
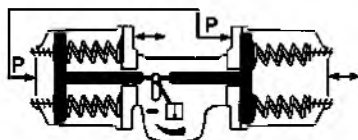


Opening function by lack of control fluid

Closing operation under fluid pressure

Actuator/Valve open

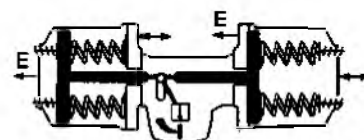
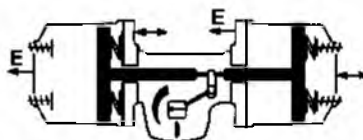
Actuator/Valve closed



Opening operation under springs action

Actuator/Valve closed

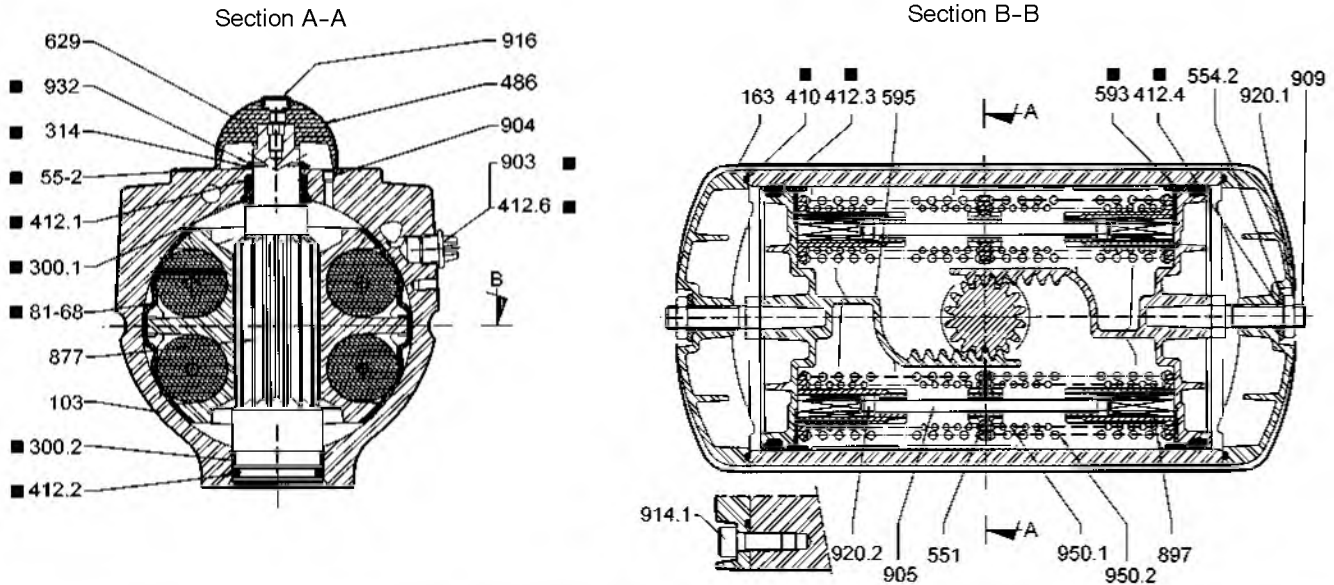
Actuator/Valve open



DYNACTAIR 1,5 to 25

Construction

Direct pneumatic connection 1/4" Gas.



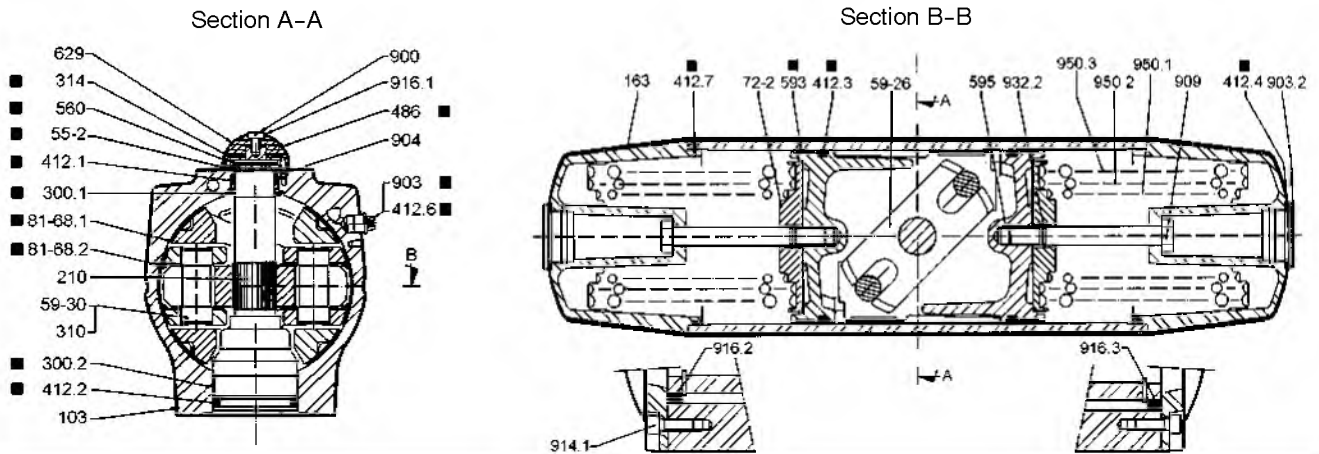
Item	Designation	Materials
103	Housing	Light alloy with 50 µm hard anodization
163	Cylinder head	Light alloy with 30 µm cataphoresis coating
300.1	Upper bearing	Acetal
300.2	Lower bearing	Acetal
314	Thrust washer	Stainless steel type 316
410	Cylinder head gasket	Nitrile
412.1	O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.2	O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.3	Piston O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.4	O-Ring	Nitrile
412.6	O-Ring	Nitrile
486	Ball	Stainless steel
554.2	Washer	Stainless steel A4-70
55-2	Friction washer	Acetal
593	Piston bearing	Acetal
595	Piston	Light alloy
629	Pointer	Polyamide 6-6 + treatment against U.V. rays
81-68	Piston guide	Acetal
877	Pinion	Zinc coated steel
903	Plug	Polyamide 6-6
904	Socket screw	Stainless steel with cladding
909	Adjusting screw	Stainless steel A4-70
914.1	Hexagon socket head screw	Stainless steel A4-70
916	Plug	Polyethylene
920.1	Hexagonal nut	Stainless steel A4-70
932	Spring retaining ring	Stainless steel
Precompressed spring cartridge including:		
551	Space washer	Acetal + fibreglass
897	Spring guide	Acetal + fibreglass
905	Tie-rod	Zinc coated steel
920.2	Hexagonal nut	Zinc coated steel
950.1	Internal spring	Steel with cataphoresis coating
950.2	External spring	Steel with cataphoresis coating

■ Parts included in the spare parts kit

* Alternative: Special Nitrile (-40° to +80° C) or Viton (-20° to +120° C)

DYNACTAIR 50 and 100
Construction

Direct pneumatic connection 1/4" Gas



Item	Designation	Materials
103	Housing	Light alloy with 50 µm hard anodization
210	Shaft	Zinc coated treated steel
300.1 ■	Upper bearing	Acetal
300.2 ■	Lower bearing	Stainless steel + PTFE
310	Self lubricating bearing	PTFE filled
314 ■	Thrust washer	Zinc coated treated steel
412.1 ■	O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.2 ■	O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.3 ■	Piston O-Ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.6 ■	O-Ring	Nitrile
486 ■	Ball	Stainless steel
55-2 ■	Friction washer	Acetal
560 ■	Pin	Stainless steel
593 ■	Piston bearing	Acetal
595	Piston	Ductile iron JS 1030
59-26	Scotch-yoke	Treated steel
59-30	Roller	Treated steel
629	Pointer	Polyamide 6-6 + treatment against U.V. rays
81-68.1 ■	Piston guide	Acetal
81-68.2 ■	Piston guide	Acetal
900	Cheese head screw	Stainless steel A4-70
903 ■	Plug	Polyamide 6-6
904	Socket screw	Stainless steel
914.1	Hexagon socket screw	Stainless steel A4-70
916.1	Plug	Polyethylene
916.2	Cylindrical plug	Nitrile
916.3	Triangular plug	Nitrile
Pre-mounted spring pack including:		
163	Cylinder head	Light alloy with 30 µm cathaphoresis coating
412.4 ■	O-Ring	Nitrile
412.7 ■	O-Ring	Nitrile
72-2	Centring plate	Light alloy
903.2	Threaded plug	Stainless steel
909	Adjusting screw	Zinc coated steel
932.2	Spring retaining ring	Stainless steel type 316
950.1	Internal spring	Steel with cathaphoresis coating
950.2	Intermediate spring	Steel with cathaphoresis coating
950.3	External spring	Steel with cathaphoresis coating

■ Parts included in the spare parts list.

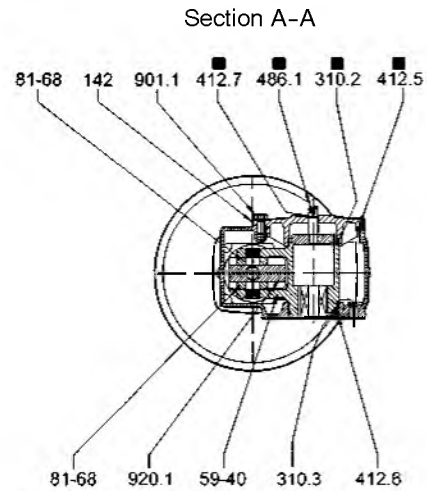
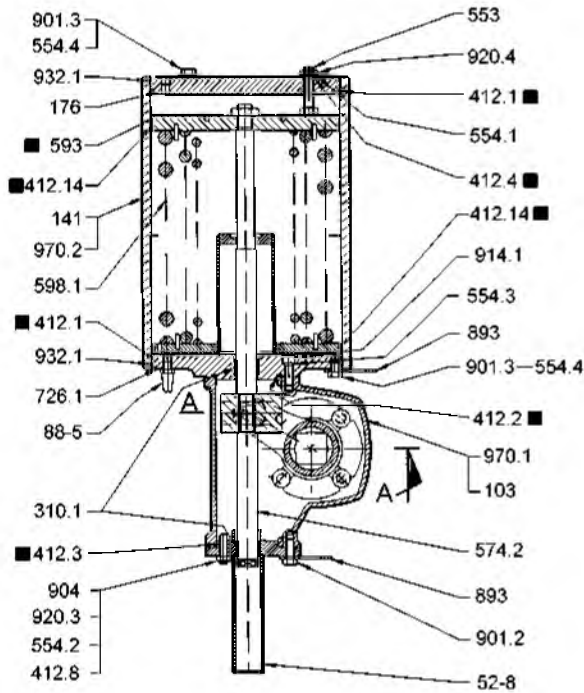
* Alternative: Special Nitrile (-40° to +80° C) or Viton (-20° to +120° C)

DYNACTAIR 200 to 800

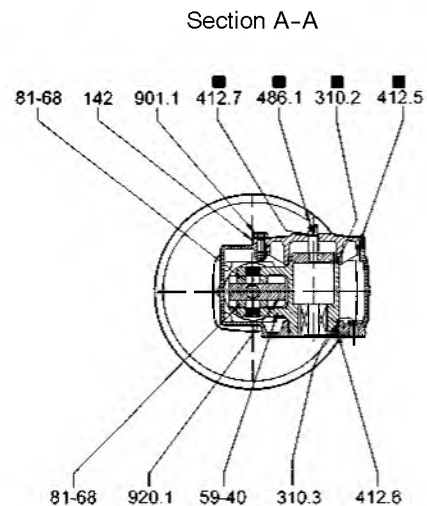
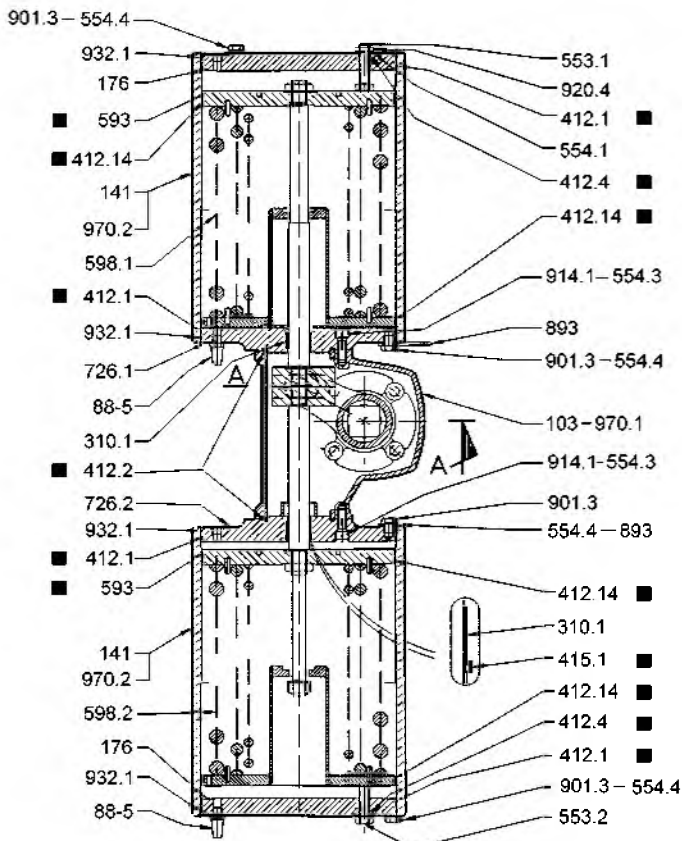
Construction

Direct pneumatic connection: 1/2" Gas for DYNACTAIR 200 and 400
3/4" Gas for DYNACTAIR 800

DYNACTAIR 200 - Closure function by lack of control fluid



DYNACTAIR 400 and 800 - Closure function by lack of control fluid



■ Parts included in the spare parts kit

DYNACTAIR 200 to 800

Standard construction

Direct pneumatic connection: 1/2" Gas for DYNACTAIR 200 and 400
3/4" Gas for DYNACTAIR 800

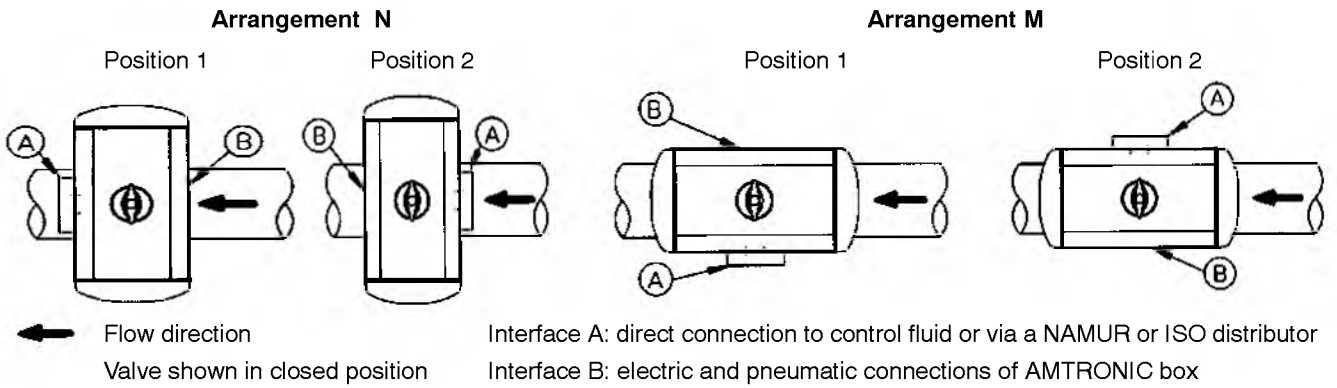
Item	Designation	Materials
103	Housing	Ductile iron JS 1030
141	Cylinder	Steel
142	Cover	Ductile iron JS 1030
176	Cylinder head	Steel with cataphoresis coating
310.1	Self-lubricating bearing	PTFE filled on steel casing
310.2 ■	Self-lubricating bearing	PTFE filled on steel casing
310.3	Self-lubricating bearing	PTFE filled on steel casing
412.1 ■	O-Ring	Nitrile
412.2 ■	O-Ring	Nitrile
412.3 ■	O-Ring	Nitrile
412.4 ■	O-Ring	Nitrile
412.5 ■	O-Ring	Nitrile
412.6	O-Ring	Nitrile
412.7 ■	O-Ring	Nitrile
412.8	O-Ring	Nitrile
412.14 ■	O-Ring	Nitrile
415.1 ■	Lip seal ring	Nitrile
486.1 ■	Ball	Stainless steel
52-8	Protection sleeve	Treated steel
553.1	Thrust insert	Stainless steel A4-70
553.2	Thrust insert	Stainless steel A4-70
554.1	Washer	Stainless steel A4-70
554.2	Washer	Stainless steel A4-70
554.3	Washer	Nylon
554.4	Washer	Stainless steel
574.2	Rod	Steel
593 ■	Guiding strip	PTFE + bronze
598.1	Sub assembly springs cartridge	Treated steel + springs in steel
598.2	Sub assembly springs cartridge	Treated steel + springs in steel
59-40	Chuck	Ductile iron JS 1030*+ signalisation shaft in stainless steel
726.1	Guiding flange	Steel with cataphoresis coating
726.2	Centring washer	Steel with cataphoresis coating
81-68	Pressure pad	Nitrured steel
88-5	Silencer	-----
893	Support plate	Steel with cataphoresis coating
901.1	Hexagon head screw	Stainless steel A4-70
901.2	Hexagon head screw	Stainless steel A4-70
901.3	Hexagon head screw	Stainless steel A4-70
904	Travel stop	Stainless steel A4-70
914.1	Hexagon socket head screw	Stainless steel A4-70
920.1	Operating nut	Ductile iron JS 1060
920.2	Hexagon nut	Stainless steel A4-70
920.4	Hexagon nut	Stainless steel A4-70
932.1	Spring retaining ring	Treated steel
970.1	Identity plate	Stainless steel
970.2	Safety instructions plate	Stainless steel

■ Parts included in the spare parts kit

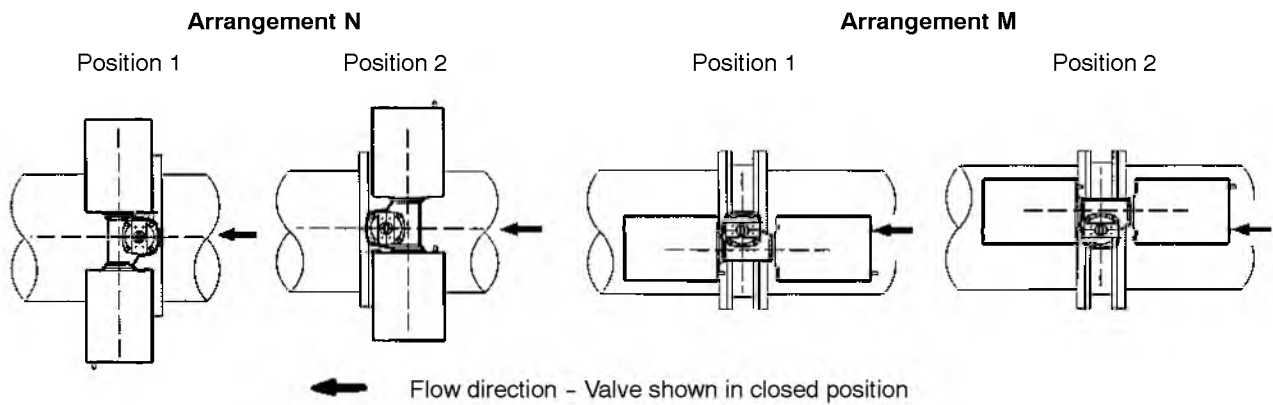
Mounting on valve

The actuator can be positioned in four position, at intervals of 90°. Unless otherwise stated, the actuator is mounted according to the arrangement N position 1.

DYNACTAIR 1.5 to 100



DYNACTAIR 200 to 800



These actuators are equipped with interchangeable inserts machined to the size and the shape of various valve shafts to be operated.

DYNACTAIR 1.5 to 25

DYNACTAIR 50 to 800

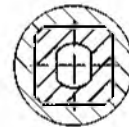
Pinion with star drawing allowing mounting at intervals of 45°

Shaft or yoke with driving square and insert

Flat end



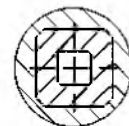
Flat end



Key end



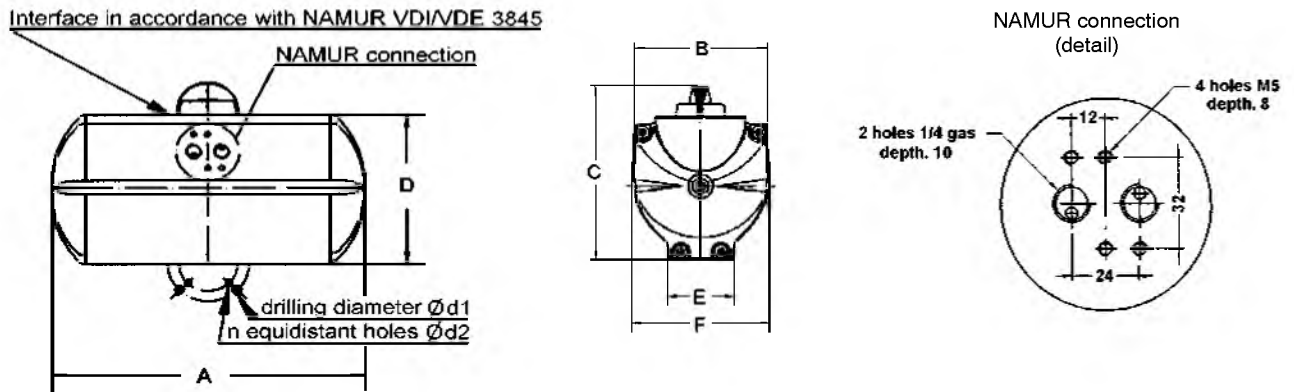
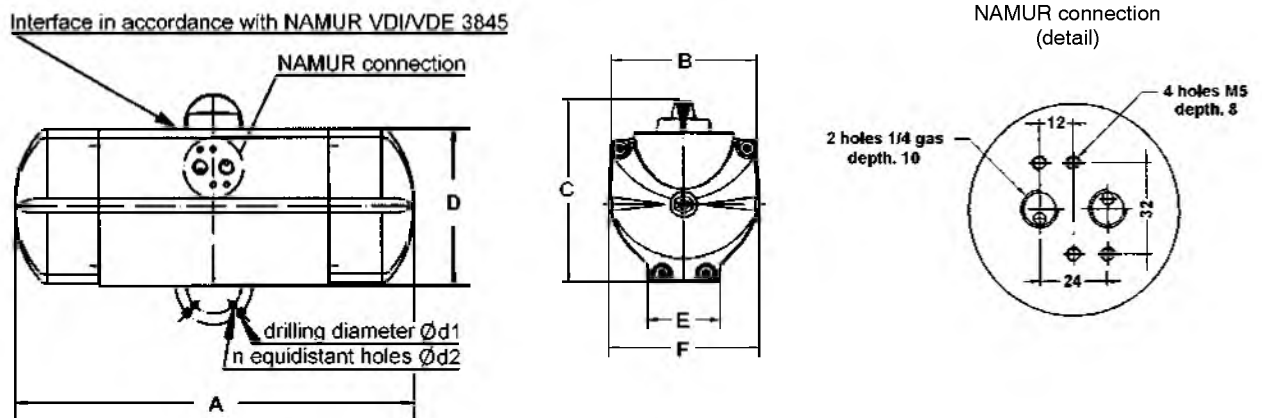
Square end



Square end



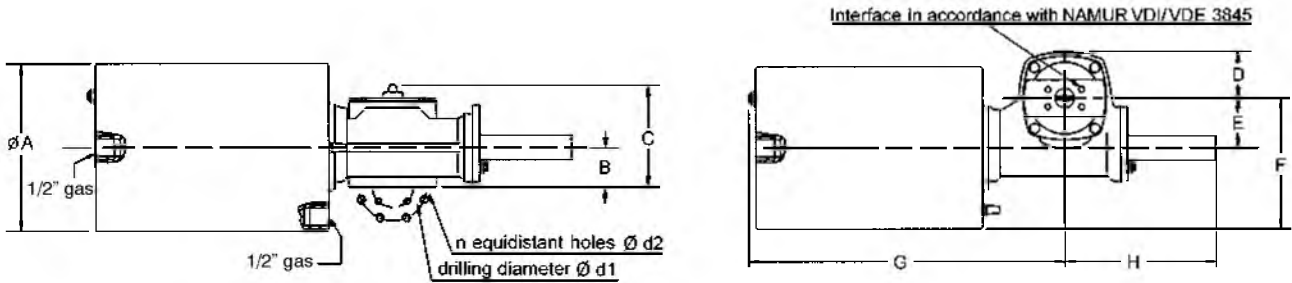
The actuators can be delivered with or without the coupling parts.

Overall dimensions (mm) and weights (kg)
DYNACTAIR 1.5 to 25

DYNACTAIR 50 and 100


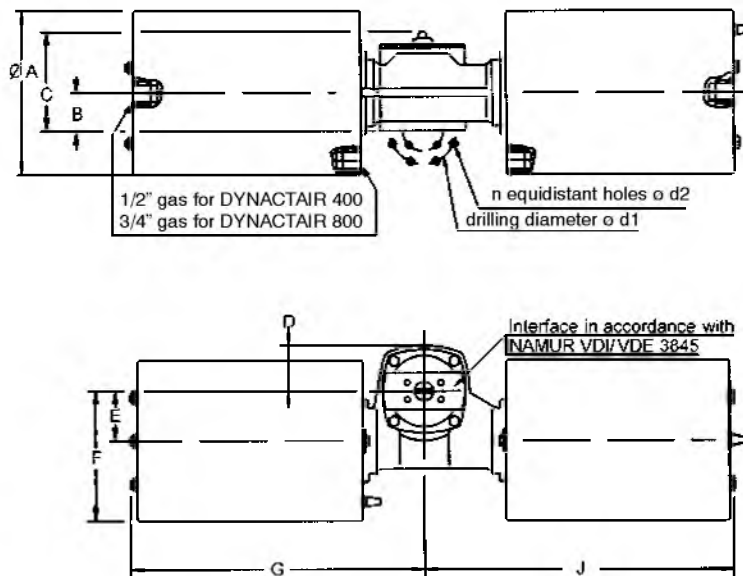
DYNACTAIR Type	Dimensions (mm)						ISO 5211 mounting plate				Weight kg
	A	B	C	D	E	F	ref	$\varnothing d1$	$\varnothing d2$	n	
1.5	194	100	119	98	55	100	F04 (45°)	42	M5	4	3,2
							F05	50	M6	4	
3	218	114	137	116	65	118	F05	50	M6	4	4,5
							F07	70	M8	4	
6	272	132	163	142	65	138	F05	50	M6	4	7,3
							F07	70	M8	4	
12	344	156	197	176	90	166	F07	70	M8	4	13,6
							F10	102	M10	4	
25	424	174	238	217	125	200	F10	102	M10	4	24
							F12	125	M12	4	
50	705	157	216	195	122	170	F10	102	M10	4	46
							F12	125	M12	4	
100	812	174	258	237	144	210	F14	140	M16	4	75

Overall dimensions (mm) and weights (kg)

DYNACTAIR 200 (Standard version - Direct connection)



DYNACTAIR 400 and 800 (Standard version - Direct connection)



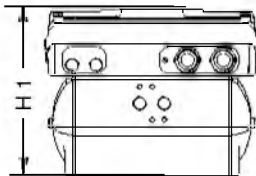
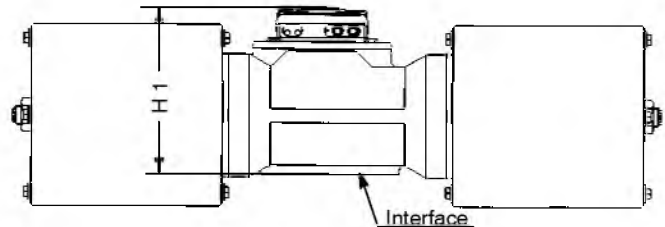
DYNACTAIR Type	Overall dimensions (mm)									ISO 5211 mounting plate			Weight kg	
	A	B	C	D	E	F	G	H	J	ref	ød1	ød2		n
200	406	95	246	115	125	328	740	474		F16	165	M20	4	270
400	406	95	246	115	125	328	740		790	F16	165	M20	4	410
800	508	109	280	155	140	394	905		950	F16 F25	165 254	M20 M16	4 8	880

Indication function

Limit switch indication by AMTROBOX (IP67)

The function provided by AMTROBOX is as follow:

- Position detection:
- On/off position detection by means of microswitches or inductive proximity detectors (1/O, 1/C, 1 on intermediate position on request).

DYNACTAIR 1.5 100

DYNACTAIR 200 to 800


Consult type series booklet AMTROBOX ref. 8525.1

Control and supervision functions

Piloting-servo control by AMTRONIC / SMARTRONIC box

The functions provided are as follows :

AMTRONIC :

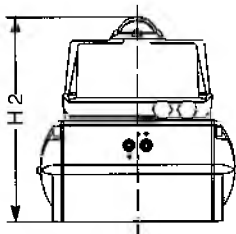
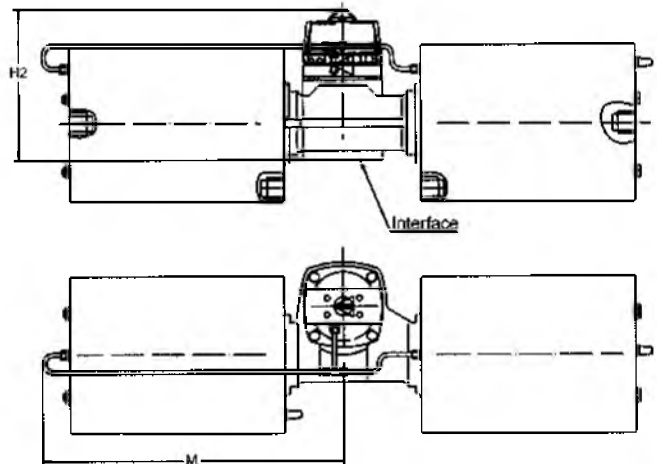
- On/off pneumatic distribution: 4/2 or 4/3 configuration, spring return or double acting, A.C. or D.C. supply.
- Operating time adjustment.

SMARTRONIC :

- Proportional distribution for autocalibration setting, 4-20 mA pilot.
- Operating time adjustment

Options :

- On/off position detection (2 microswitches or inductive proximity detectors),
- Proportional position detection (4-20 mA).
- Field bus: AS-i, Profibus DP, Device Net.

DYNACTAIR 1.5 to 100

DYNACTAIR 200 to 800


Consult type series booklet AMTRONIC ref. 8512.1 and SMARTRONIC MA 8527.1

DYNACTAIR Type	H1	H2	M	Weight kg
1.5	168	235		4,5
3	185	252		5,5
6	211	278		8
12	245	312		13
25	286	353		20
50	264	331		32
100	306	373		50
200	293	390	790	280
400	293	390	790	425
800	328	425	955	900

Options

Visual position indicator type “BEACON”

DYNACTAIR 1.5 to 800

Instead of the standard pointer.



Direct NPT air connection

DYNACTAIR 1.5 to 200

1/4" NPT connection plate made of anodised Aluminium, fitted onto the Namur interface of the standard actuator.



DYNACTAIR 200 to 800

NPT air connection directly threaded on the cylinder:
 - 1/2" NPT on DYNACTAIR 200 and 400,
 - 3/4" NPT on DYNACTAIR 800

DYNACTAIR actuators can be equipped with different accessories instead of AMTROBOX, AMTRONIC and SMARTRONIC instrumentation box.

Limit switch box
DYNACTAIR 1.5 to 800



The switch box is fitted onto the top of the actuator housing by means of a yoke with interface in accordance with VDI/VDE 3845 NAMUR specification. Please consult us.

Positioner
DYNACTAIR 1.5 to 800



A positioner with a 3-15 PSI pneumatic piloting signal or a 4-20 mA electric signal (standard or with intrinsically safety) can be mounted onto the top of actuator housing by means of a yoke with VDI/VDE 3845 interface. Please consult us.

NAMUR distributor
DYNACTAIR 1.5 to 100



A distributor with electric or pneumatic piloting with NAMUR interface can be fitted directly onto the side of the actuator housing. Please consult us.

ISO size 1 distributor
DYNACTAIR 1.5 to 800
ISO size 2 distributor
DYNACTAIR 200 to 800

A distributor with an ISO 5599 size 1 or size 2 interface can also be fitted to the actuator by means of a distributor plate.

Options

Manual emergency control

Protection:

Hose and fine dust proof (protection degree equivalent to IP 65).

External coating:

Polyurethane paint thickness 80 µm, colour dark grey ref. RAL 7016.

Working temperature:

From -20° C up to +80° C.

DYNACTAIR 1.5 to 100: declutchable manual override

A manual override using a declutchable gear box may be fitted between the valve mounting plate and the actuator.

This manual control will override with the pneumatic actuator and can be set in clutched or declutched positions.

Construction:

- housing, cover and extension in JL 1040 cast iron,
- handwheel in welded steel,
- screw in treated steel,
- worm in JS 1030 ductile iron,
- drive shaft, clutch lever, locking pointer, adjustable mechanical travel stops ($\pm 5^\circ$) and external bolting in 13% chromium stainless steel.

For more information, please refer to Manual Override technical leaflet ref 5350.1.

Instructions for override operation

The manual override should only be used under the following recommendations:

- *absence of air pressure in the actuator,*
- *the actuator chambers must be to the open air.*

Check the actuator is not under air pressure before use the manual override.

Override clutch

- 1 – Unlock the unit by pulling the locking pointer ,
- 2 – Keep the pointer in pulled position and turn the clutch lever to the clutched position,
- 3 – Release the pointer, it must bolt itself in low position.

Manual emergency control use

- 4 – Operate the valve by turning the handwheel.

Turns number for a complete operation

DYNACTAIR 1.5 , 3 , 6 and 12: 10 turns

DYNACTAIR 25 and 50 : 12 turns

DYNACTAIR 100 : 13 turns

- 5 – Bring the emergency control back to its initial position by turning the handwheel in the opposite direction.

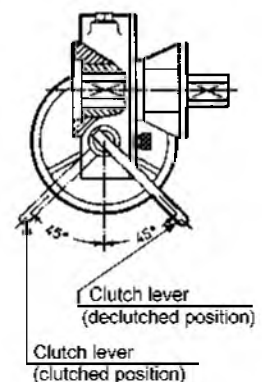
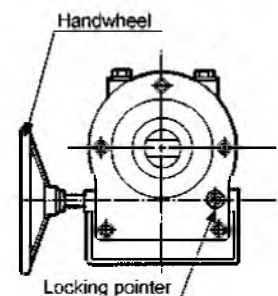
Override declutch

- 6 – Repeat the clutch operations in the opposite way.

Caution : the clutch lever operation is not allowed when the springs are compressed, that causes damages to the override. The declutch operation can be done only with the actuator in safety position, i.e. springs decompressed.

The operation no. 5 must be imperatively done before system declutch.

The actuator can be now pressurized.



Options

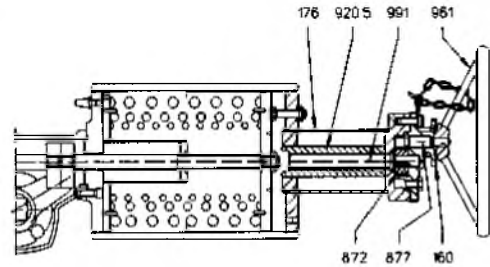
Manual emergency control

DYNACTAIR 200 to 800: emergency control to be pushed

A manual emergency control to be pushed can be fitted on the cylinder head. Operation by handwheel dia.500 mm with reduction gear unit. This control can be locked in any position by means of a chain.

Construction

- sub-assembly sleeve 176 in treated steel with cataphoresis coating,
- nut 920.5 in bronze,
- operating screw 991, toothed wheel 872 and pinion 877 in treated steel,
- cover 160 in JS 1030 ductile iron,
- handwheel 961 in welded steel.



Instructions for emergency control operation

The manual emergency control should only be used under the following recommendations:

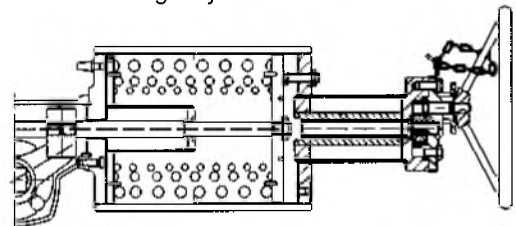
- *absence of air pressure in the actuator,*
- *the actuator chambers must be to the open air.*

Check the actuator is not under air pressure before emergency control use.

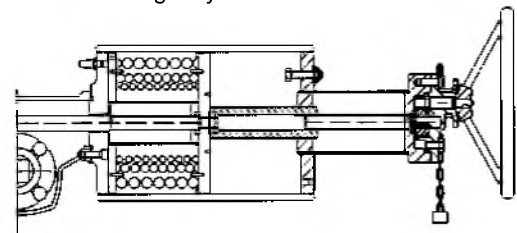
Bringing into service

- Unlock the handwheel,
- Turn the handwheel:
 - clockwise for valve closure,
 - anticlockwise for valve opening.
- Handwheel turns number for a complete operation:
 - DYNACTAIR 200 and 400: 123 turns,
 - DYNACTAIR 800: 231 turns.

Emergency control out of use



Emergency control into use



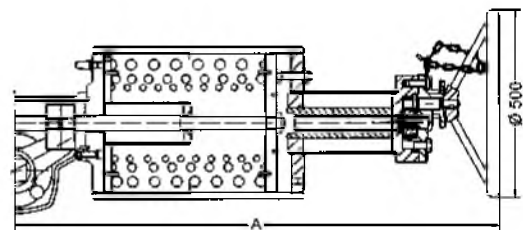
Before normal use of the actuator, imperatively bring out of use the emergency control.

- Bring back the control to its initial position,
- Lock the handwheel.

Now, the pressurization of the actuator is possible.

Overall Dimensions

DYNACTAIR	A (mm)
200	1245
400	
800	1456



Stroke limiter

DYNACTAIR 1.5 to 100

Stroke limiter adjustable between 0 and 90° in only one direction. The device is fitted instead of the standard adjustment end-stop. Available on open or close direction. Consult us.

DYNACTAIR 1.5 to 6

Stroke limiter adjustable in both directions (open and close). The device is fitted between the valve top flange and the actuator. Consult us.

This leaflet is not contractual and may be amended without notice.

11.07.05

8511.1/6-10

Pneumatic Actuator

SISTO-LAP

Piston Actuator
Maintenance-free
LAP-SF type
LAP-ÖF type
LAP-AZ type

Type Series Booklet



SISTO

Pneumatic Actuators

Piston Actuators

SISTO-LAP



SISTO-LAP product description

Pneumatic piston actuator designed for valves with a linear stem movement (globe, diaphragm and gate valves).

Suitable for building services, industrial plants, power stations, the food and beverages industries and the chemical industry.

The pneumatic actuators can also be used in potentially explosive atmospheres.

Product benefits

- Actuator variants with optimised stroke ensure full valve travel with minimum air consumption
- Smooth, low-friction movement of the piston assembly with double cup seal or low-friction piston seal

Operating data

- Max. permissible control medium temperature: 80 °C
- Permissible ambient temperature: -10 °C to +80 °C

Permissible control pressure

Piston diameter mm	Top flange DIN ISO 5210/ DIN 3358	Permissible control pressure P _{ctr. perm.} bar
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ¹⁾	F14	5,5 - 7
D300 ¹⁾	F14	5,5 - 7

¹⁾ Double piston

Piston diameter mm	Top flange DIN ISO 5210/ DIN 3358	Permissible control pressure P _{ctr. perm.} bar
500	F25	4-10
D500 ¹⁾	F25	4-7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (Important in the event of frost!).

Design details

Design

- Double-acting piston, with piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stop in the actuator for closed and open positions
- Flanges to DIN ISO 5210/DIN 3358
- Pistons Ø 80 to Ø 300 = F10
- Pistons Ø 250 to Ø 300 = F14
- Piston Ø 500 = F25
- Installation kit and mating dimensions see technical data sheet of the valve type series

Actuator function

- LAP-AZ actuator type: air-to-open/air-to-close
- LAP-ÖF actuator type: spring-to-open/air-to-close
- LAP-SF actuator type: air-to-open/spring-to-close

Accessory variants

- Exhaust regulator
- Double piston
- Throttling valve
- Piston rods protruding from both cylinder end caps (stroke limited in closing direction)
- Filter/pressure reducer
- Emergency handwheel
- Solenoid valves, 3/2-way; 5/2-way
- Position switch(es)
- Silencer
- Positioner

On all enquiries/orders please specify

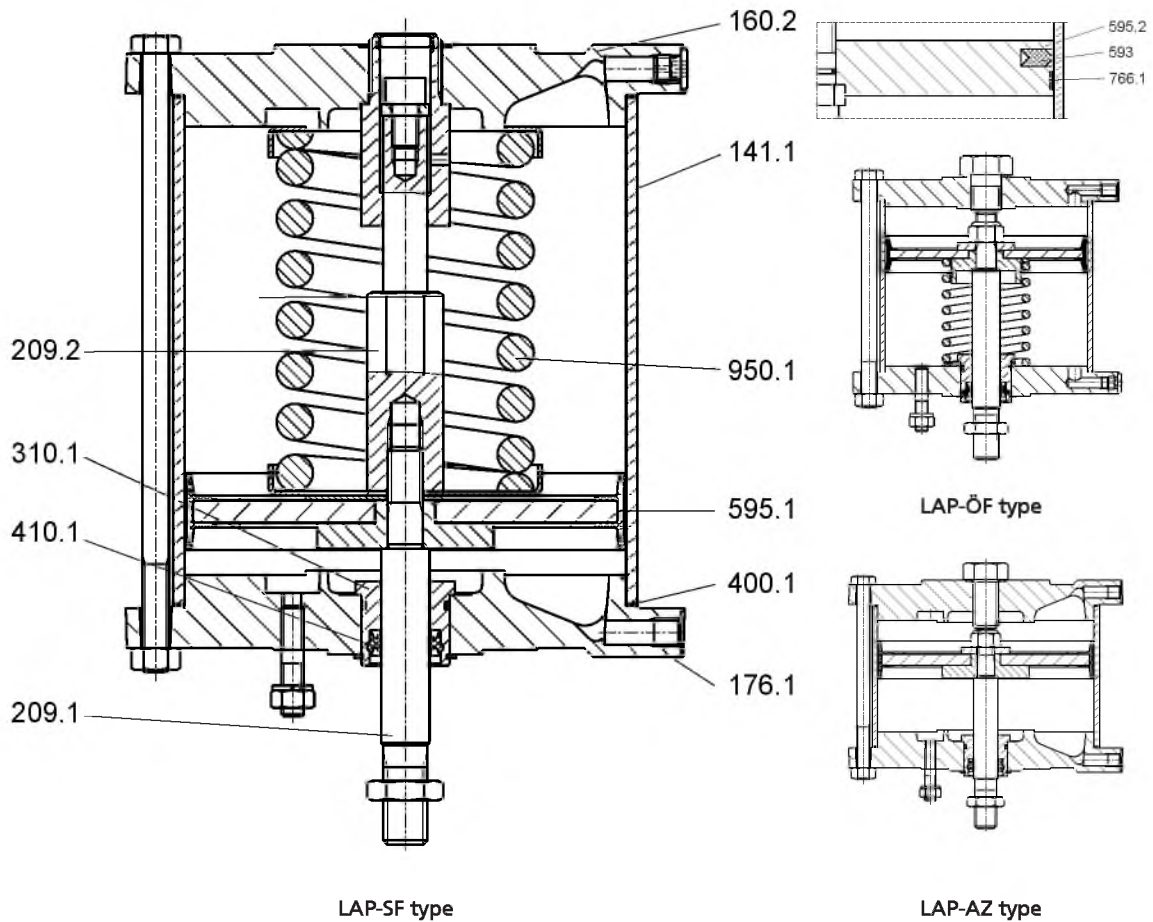
Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories
4. Number of type series booklet
5. Valve travel

6. Break-to-open force
7. Break-to-close force
8. End-to-open force
9. End-to-close force

Materials

SISTO-LAP piston actuator



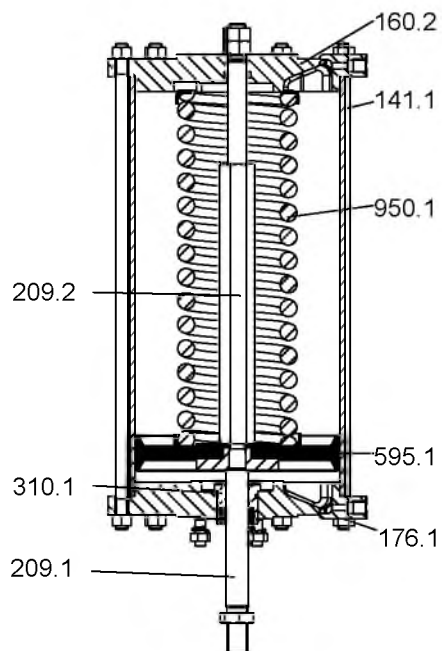
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi	2.0321 3.3206	Ø 80 Ø 125 - Ø 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0,3	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	Ø 80 - Ø 300
310.1 ²⁾	Plain bearing	Plastic - POM		Ø 80 - Ø 300
400.1 ²⁾	Gasket	Plastic - AFM 30		Ø 80 - Ø 300
410.1 ²⁾	Seal/wiper set	Plastic - L96-SFR/NBR		Ø 80 - Ø 300
593 ²⁾	Piston seal	Acrylonitrile butadiene rubber - NBR		Ø 300
595.1 ²⁾	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg0.3	3.2371	Ø 300
766.1	Guide band	PTFE		Ø 300
950.1	Spring	Spring steel		Ø 80 - Ø 300

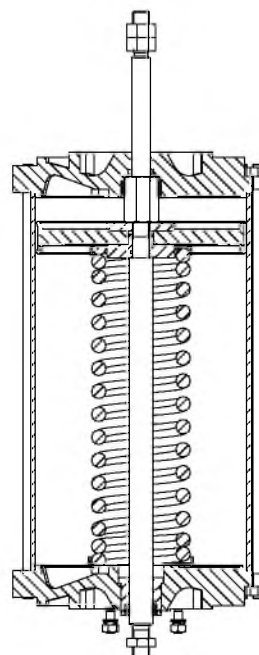
²⁾ Recommended spare parts (= complete set of sealing elements)

Materials

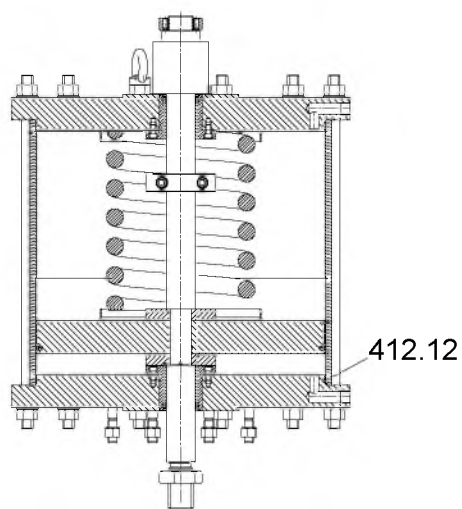
SISTO-LAP piston actuator
(with piston rods protruding from both cylinder end caps)



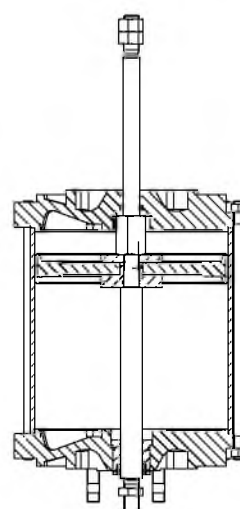
LAP-SF...DK



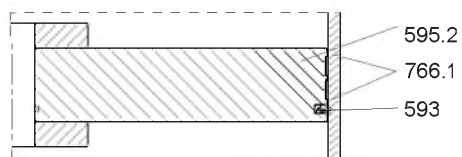
LAP-ÖF...DK



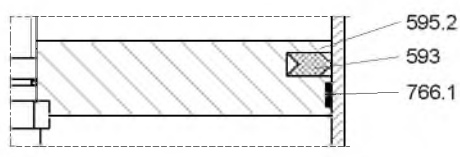
LAP-SF 500...DK



LAP-AZ...DK



Piston 500



Piston 300

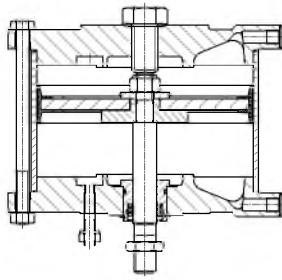
Parts list

Part No.	Description	Material	Material number	Piston Ø dK
141.1	Cylinder	CuZn37 AlMgSi0,5F22 St E355	2.0121 3.3206 1.0580	Ø 80 Ø 125 - Ø 300 Ø 500
160.2	Top end cap	AlCuMgPb AlSiMg AW2017A	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300 Ø 500
176.1	Bottom end cap	AlCuMgPb AlSiMg AW2017A	3.1645 3.2371	Ø 80 - Ø 160 Ø 200 - Ø 300 Ø 500
209.1	Lower piston rod	Stainless steel – X12CrMoS17	1.4104	Ø 80 - Ø 500
209.2	Upper piston rod	Stainless steel – X12CrMoS17	1.4104	Ø 80 - Ø 500
310.1 ³⁾	Plain bearing	Plastic - POM CWR710R	2.0540	Ø 80 - Ø 300 Ø 500
412.12	O-Ring	NBR		Ø 500
593 ²⁾	Piston seal	Acrylonitrile butadiene rubber – NBR		Ø 300
595.1 ²⁾	Piston assembly	Steel/acrylonitrile butadiene rubber – St/NBR		Ø 80 - Ø 250
595.2	Piston	Cast aluminium alloy - G-AlSi7Mg AW2017A	3.2371	Ø 300 Ø 500
766.1	Guide band	PTFE		Ø 500
950.1	Spring	Spring steel		Ø 80 - Ø 300

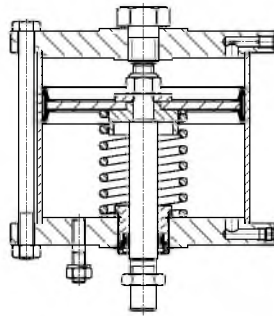
³⁾ Recommended spare parts (= complete set of sealing elements)

Variants

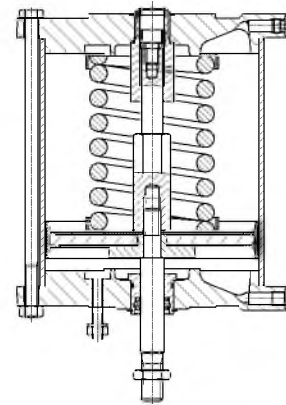
SISTO-LAP piston actuator and accessories



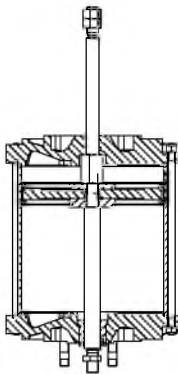
LAP-AZ type



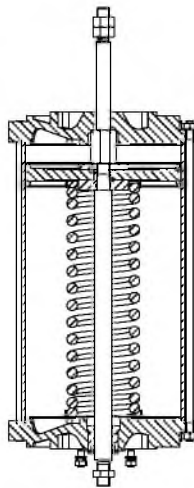
LAP-ÖF type



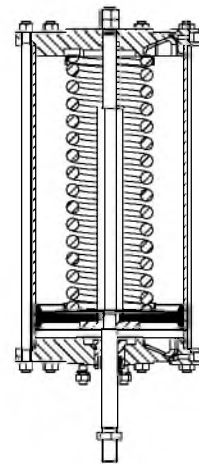
LAP-SF type



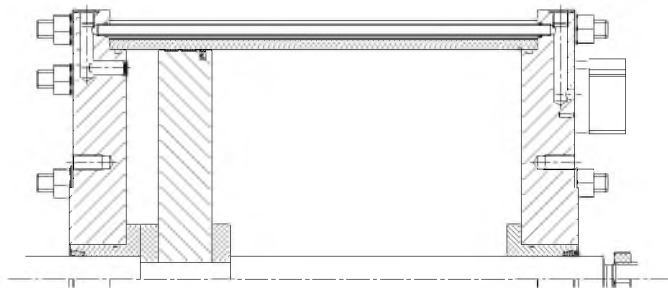
LAP-AZ...DK type



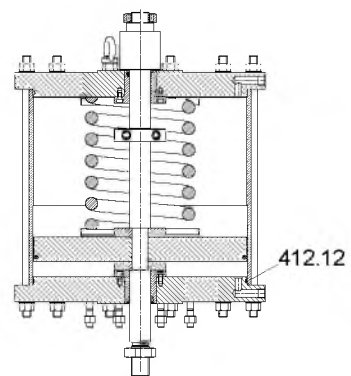
LAP-AZ...DK type



LAP-SF...DK type

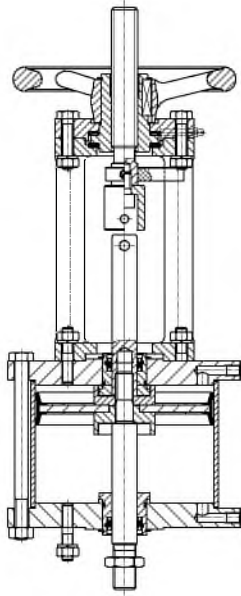


Internal air routing, example: LAP-AZ-500
(only available for LAP-500 design)

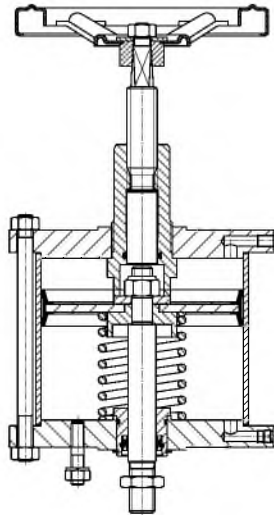


LAP-SF-500...DK type
(design with piston rods protruding from both cylinder end caps only)

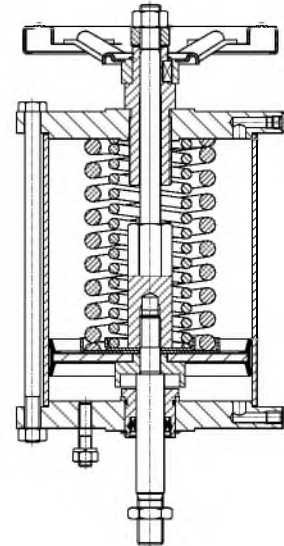
412.12



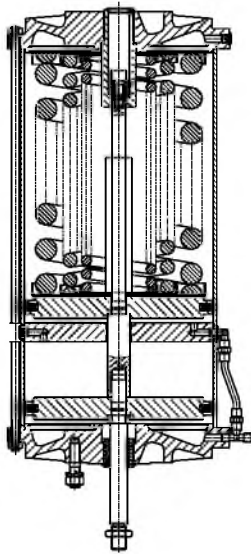
LAP-AZ type with emergency handwheel



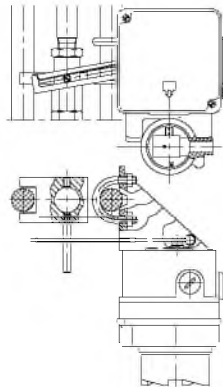
LAP-ÖF type with emergency handwheel



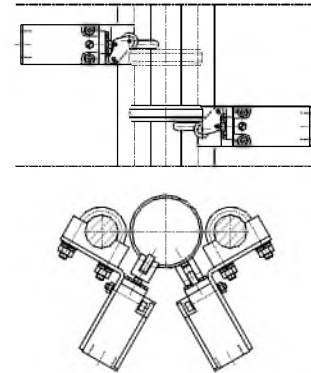
LAP-SF type with emergency handwheel



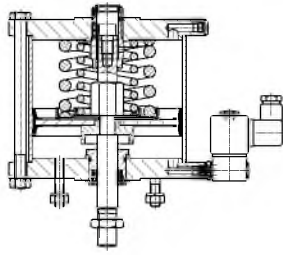
LAP-SF type with double piston



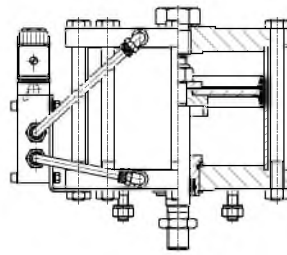
Configuration with positioner



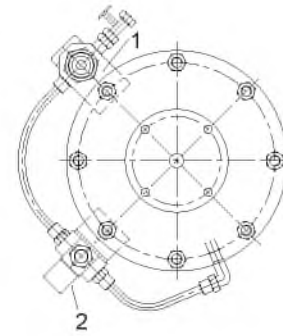
Configuration with position switches



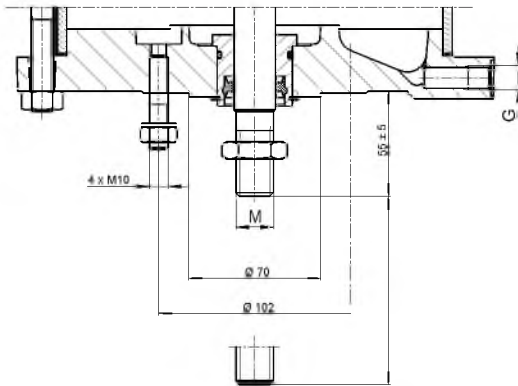
LAP-SF type with 3/2 directional control valve



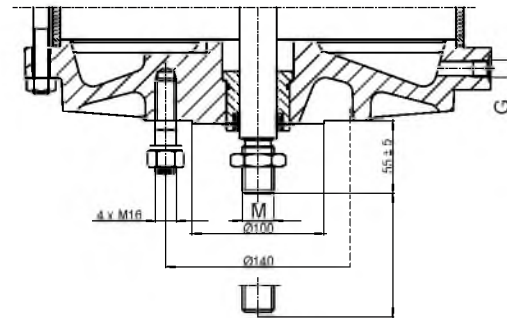
LAP-AZ type with 5/2 directional control valve



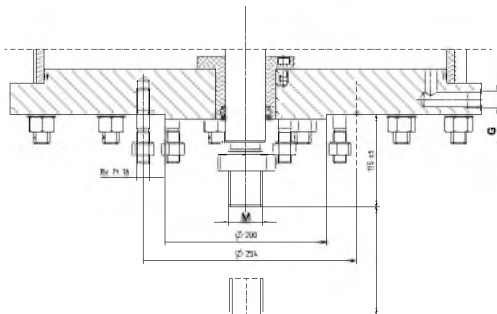
1) Filter/pressure reducer
2) Solenoid valve



Flange connection F10⁴⁾



Flange connection F14⁴⁾



Flange connection F25⁴⁾

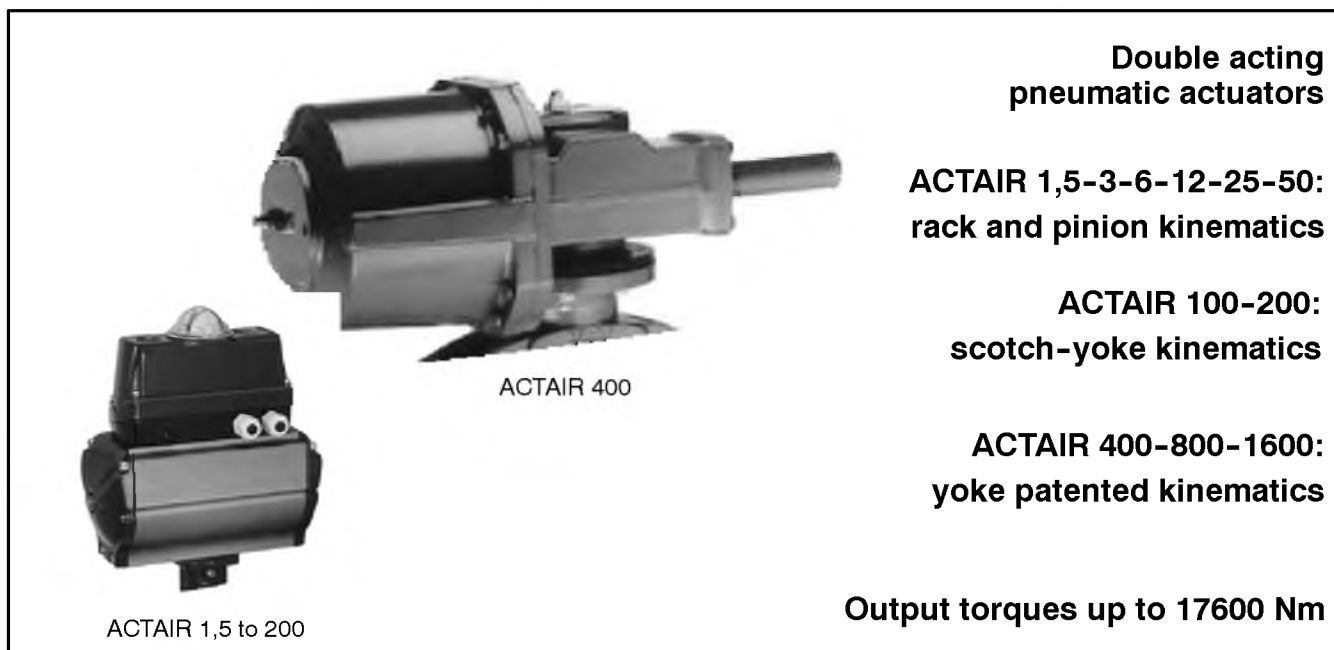
Symbols key

Symbol	Description
G	G 1/8" for piston Ø 80/125/160 G 1/4" for piston Ø 200/250/300 G 1/2" for piston Ø 500
M	M12 for piston Ø 80/125 M20 for piston Ø 160 to 300 M24 for piston Ø 300/F14 (optional) M42x3 for piston Ø 500

Mating dimensions - Standards

Flange connection: DIN ISO 5210 / DIN 3358
Pipe connection: DIN ISO 228

⁴⁾ See "Symbols key" table



Applications

- All sectors of Water, Industry and Energy.

General features

- Designed for the automation of ¼ turn valves (butterfly valves, ball valves), the ACTAIR series of double acting pneumatic actuators and their AMTROBOX/AMTRONIC/SMARTRONIC boxes are involved in all functions of control and supervision encountered in all modern processes, and more particularly in communication by fieldbus.
- The mounting plate is in accordance with ISO 5211 standard.
- The actuator is mounted directly or by means of an adaptor on ¼ turn valve plate.
- Equipped with an interchangeable insert, they can be easily fitted on different valve shaft (square end, flat end, key...).
- The ACTAIR series actuators are equipped, in standard version, with a visual pointer and adjustable mechanical travel stops.
- Air or any neutral gas, filtered, dry or lubricated and compressed to a pressure 3 to 8 bar:
 - filtration: 50 µm
 - drying: dew point at max. working pressure $\leq 4^{\circ}\text{C}$ and min. temperature -5°C

Protection

- They are hose and fine dust proof and are protected against accidental immersion effects (protection degree: IP 67).

External coating

- ACTAIR 1,5 to 200: Housing with hard anodization 50 µm thickness and cylinder head with black cataphoresis coating 30 µm.
- ACTAIR 400 to 1600: Polyurethane paint (colour dark grey RAL 7016, 80 µm thickness).

Working temperature range

- En standard:
 - de -20°C to $+80^{\circ}\text{C}$
- En variante for ACTAIR 1.5 to 200:
 - de -40°C to $+80^{\circ}\text{C}$: dynamic O-rings in special Nitrile,
 - de -20°C to $+120^{\circ}\text{C}$: dynamic O-rings in Viton (available with corrosive motive medium).

Standard variante

- ATEX version in accordance with 94/9/EC directive.
- DYNACTAIR series spring return actuator range which is based on the double acting actuators. Please consult the type series booklet DYNACTAIR 1,5 to 800 no. 8511.1.

Options

- Declutchable manual override RMD
- Adjustable stroke

Kinematic

3 kinematics are used for the actuators operation:

- rack and pinion kinematics for ACTAIR 1,5-3, ACTAIR 6, ACTAIR 12, ACTAIR 25 and ACTAIR 50,
- scotch-yoke kinematics for ACTAIR 100 and ACTAIR 200,
- yoke patented kinematics for ACTAIR 400, ACTAIR 800 and 1600.

Mounting plate according to ISO 5211 standard.

Production range

ACTAIR Type	ISO 5211 Mounting plate*	Maximum allowable dimensions for the shaft			
		Height	Driving by square	Driving by flat	Driving by key
1,5	F04	24	11	11	Please, consult us
3	F04 or F05+F04 (45°)*	24	11	11	
6	F05 – F07	30	16	14	
12	F05 – F07	32	19	17	
25	F07 – F10	40	22	22	
50	F10 – F12	45	27	27	
100	F10 – F12	55	36	36	
200	F14	65	50	46	
400	F16	80	60	55	
800	F16 – F25	95	70	75	
1600	F25 – F30	110	90	85	

* Direct adaptation onto identical mounting plate.

Adaptation by intermediate flange onto different plate (different size or shape).

Output torques (Nm) relating to control fluid pressure

The output torque of the actuator depends on the pressure of the control fluid.

The table below shows different output torques as a function of control fluid pressure.

Type	Maximum allowable output torque (Nm)	Control fluid pressure in bar															
		3			4			5			6			8			
Rack and pinion kinematics																	
1.5	20	9			12			15			18			20			
3	55	25			33			40			50			55			
6	105	48			64			80			96			105			
12	170	89			115			140			155			170			
25	385	178			237			290			350			385			
50	640	357			475			520			580			640			
Scotch-yoke kinematics																	
		0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	0°	45°	90°	
100	1320	600	360	600	800	480	800	1000	600	1000	1200	720	1200	1320	792	1320	
200	2640	1200	720	1200	1600	960	1600	2000	1200	2000	2400	1440	2400	2640	1584	2640	
Yoke patented kinematics																	
		0°	30°	60°	90°	0°	30°	60°	90°	0°	30°	60°	90°	0°	30°	60°	90°
400	4400	2700	2970	2700	700	3200	3520	3200	800	4000	4400	4000	1000	4400	4840	4400	1100
800	8800	5160	5676	5160	1300	6800	7480	6800	1700	8600	9460	8600	2150	8800	9680	8800	2200
1600	17600	9500	10450	9500	2500	12500	13750	12500	3150	15500	17050	15500	3900	17600	19360	17600	4400

Control fluid pressure

Air or any neutral gas, filtered, dry or lubricated and compressed to a pressure 3 to 8 bar:

- filtration: 50 µm,
- drying: dew point at max. working pressure $\leq 4^{\circ}\text{C}$ and min. temperature -5°C

If a lubrication is required - the lubrication increases the actuator life and particularly recommended in throttling applications - the use of a non detergent oil without aggressive additive is recommended:

- viscosity 2 to 3° ENGLER at 50° C
- aniline point 90° C to 105° C
- flow 1 to 3 drop for 500 NL/mn.

For throttling applications with dry air, please consult us.

Operating time

The table below defines the minimum operation times under control air pressure 5 bar and the operation rates per minute of the ACTAIR on/off function.

ACTAIR Type	Mini operation time On/off function			Operation rates per minute
	ACTAIR + AMTRONIC	ACTAIR with distributor ISO-1 or NAMUR onto the housing	ACTAIR direct connexion	
1.5			0,5 second	60 max.
3	1 second		0,5 second	60 max.
6	1 second		0,5 second	60 max.
12	2 seconds		1 second	30 max.
25	4 seconds		1,5 seconds	20 max.
50	5 seconds		2 seconds	15 max.
100	6 seconds		3 seconds	10 max.
200	9 seconds		4 seconds	7 max.
400	25 seconds	12 seconds	8 seconds	4 max.
800	50 seconds	25 seconds	15 seconds	2 max.
1600	90 seconds	45 seconds	20 seconds	1 max.

Adjust construction on request for:

- other operation times,
- high operation rates.

Consult us.

Capacity

ACTAIR Type	Capacity in cm ³	
	For opening	For closing
1,5	72	100
3	240	305
6	570	660
12	1 180	1 265
25	2 400	2 508
50	4 700	4 680

ACTAIR Type	Capacity in cm ³	
	For opening	For closing
100	5 280	4 380
200	9 800	8 500
400	15 960	15 720
800	35 300	35 300
1600	62 500	62 500

Construction

In the standard version, ACTAIR actuators are designed to ensure clockwise valve closure. On request, anticlockwise arrangement is available.

In standard version, these actuators are equipped with adjustable end-stops:

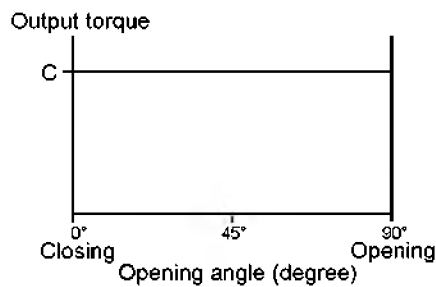
- ACTAIR 1,5:
 - on close position **and** on open position
 - adjustable on 2 positions: adjustment range $\pm 2^\circ$.
 - these adjustable end-stop are fixed on the side of the housing
- ACTAIR 3 to 200 :
 - on close position **o** on open position (see pages 6 and 7)
 - adjustable on only one position: adjustment range $\pm 2,5^\circ$.
 - In standard, adjustable end-stop on close position.
 - In option, adjustable end-stop on open position.
- ACTAIR 400-800-1600:
 - on close position **and** on open position
 - adjustable on 2 positions: adjustment range $\pm 2^\circ$.

ACTAIR 1,5 to 50: Rack and pinion kinematics

The rack and pinion kinematics develop a constant output torque. The movement of the rack/pistons secured by the pressure causes a $\frac{1}{4}$ turn clockwise rotation of the pinion integral with the valve shaft.

Curve of the rack and pinion kinematics

Constant output torque

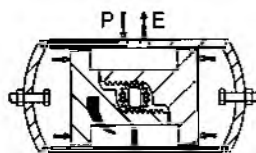
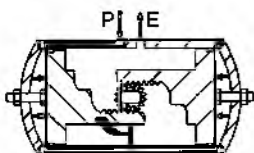


ACTAIR 3 to 50: Clockwise closure version – Adjustable mechanical travel stop at the closed position

Opening operation

Actuator/Valve closed

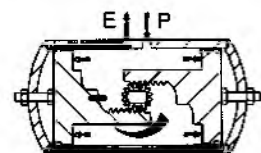
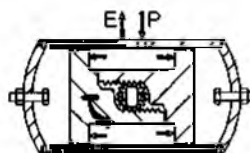
Actuator/Valve open



Closure operation

Actuator/Valve open

Actuator/Valve closed

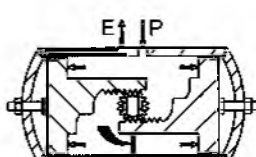
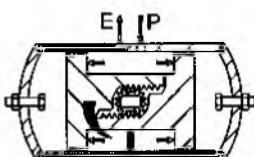


Clockwise closure version – Adjustable mechanical travel stop at the open position

Opening operation

Actuator/Valve closed

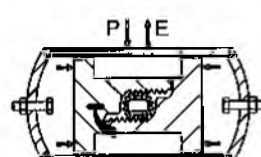
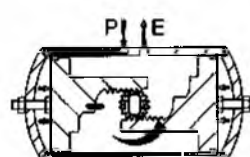
Actuator/Valve open



Closure operation

Actuator/Valve open

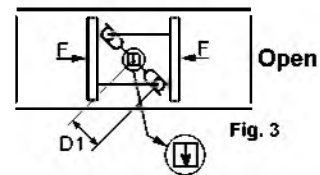
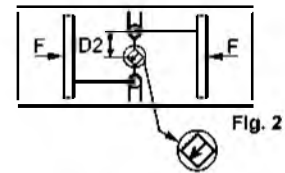
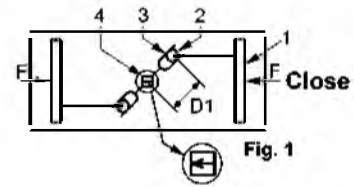
Actuator/Valve closed



ACTAIR 100 and 200: Scotch-yoke kinematics

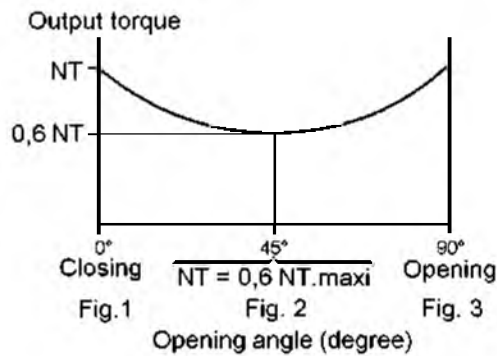
The scotch-yoke kinematics develop a variable output torque very well suited to the operation of 1/4 turn valves.

The movement transmission is achieved by means of the piston system ①, rollers ②, scotch-yoke ③ and shaft ④.
 The movement of the pistons ① secured by the pressure causes the sliding of the rollers ② in the grooves of the yoke ③. The yoke ③ allows the rotation of the shaft ④ integral with the valve shaft.



Curve of the Scotch yoke kinematics

Output torque for F constant $C = F \times D$



Clockwise closure version – Adjustable mechanical travel stop at the closed position

Opening operation

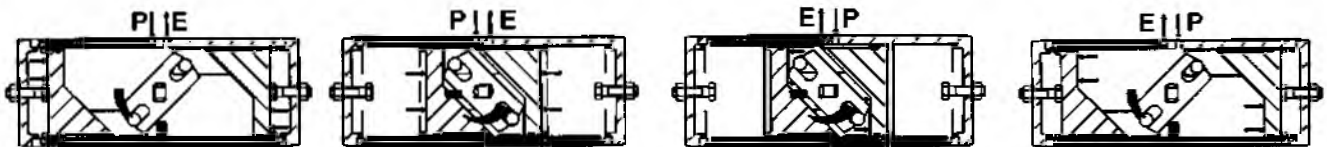
Actuator/Valve closed

Actuator/Valve open

Closure operation

Actuator/Valve open

Actuator/Valve closed



Clockwise closure version – Adjustable mechanical travel stop at the open position

Opening operation

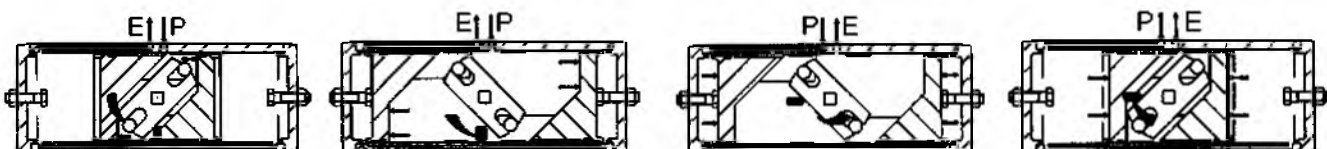
Actuator/Valve closed

Actuator/Valve open

Closure operation

Actuator/Valve open

Actuator/Valve closed



ACTAIR 400 to 1600: Yoke AMRI patented kinematics

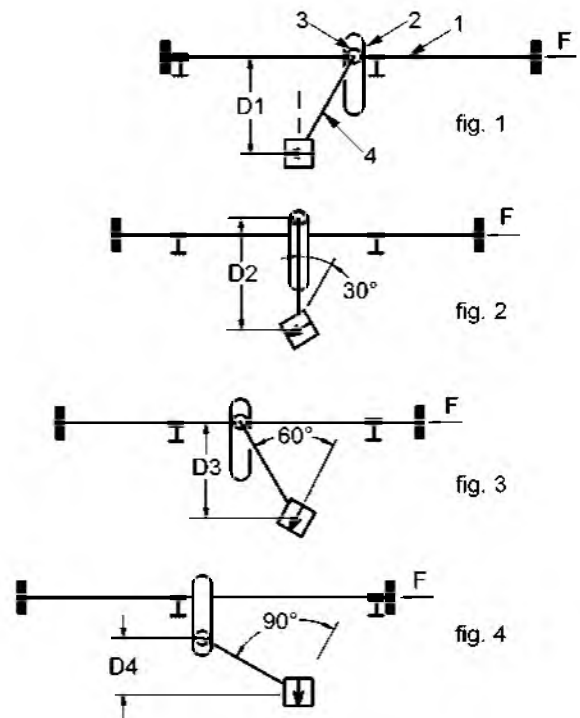
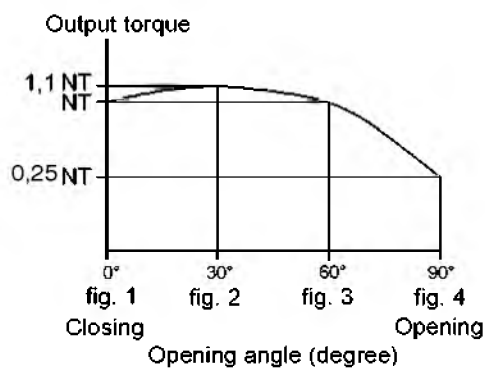
The yoke AMRI patented kinematics develop a variable output torque very well suited to the operation of ¼ turn valves with hydrodynamic torque.

The movement transmission is achieved by means of the piston system ①, the slide operating nut ②, the rolling pad ③ and the yoke ④.

The movement of the piston ① secured by the pressure in the actuator cylinder causes the linear travel of the operating nut ②. This movement drives the sliding of the pads ③ in the 2 slides of the operating nut ② and allows the rotation of the yoke ④ integral with the valve shaft.

Curve of the yoke AMRI patented kinematics

Output torque for F constant $C = F \times D$

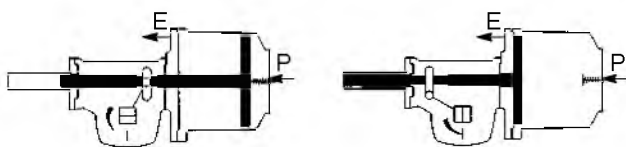


ACTAIR 400

Opening operation

Actuator/Valve closed

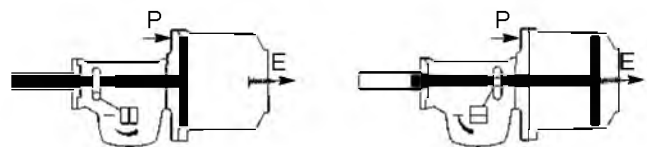
Actuator/Valve open



Closure operation

Actuator/Valve open

Actuator/Valve closed



ACTAIR 800 and 1600

Opening operation

Actuator/Valve closed

Actuator/Valve open



Closing operation

Actuator/Valve open

Actuator/Valve closed



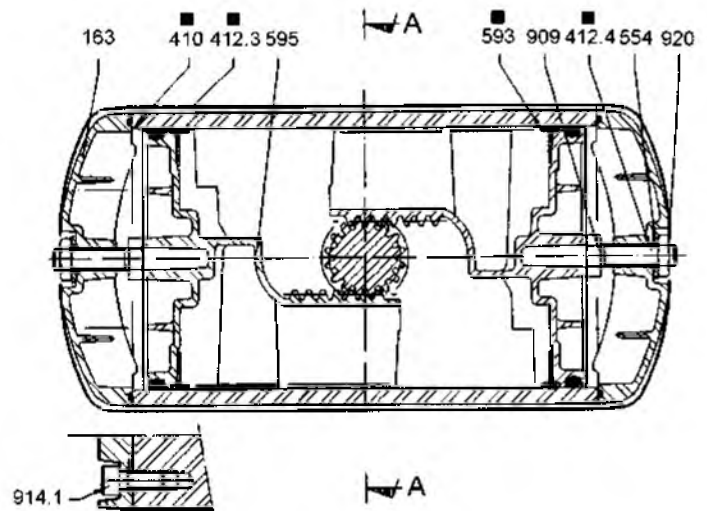
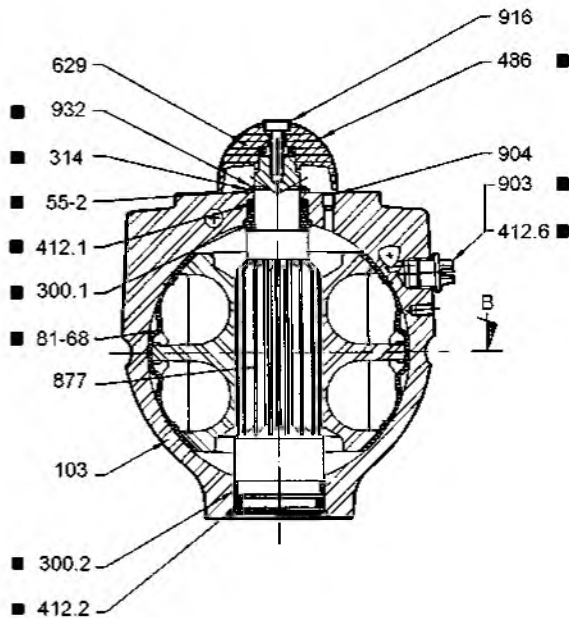
ACTAIR 1,5 to 50

Construction

Direct pneumatic connection 1/4" G.

Section A-A

Section B-B



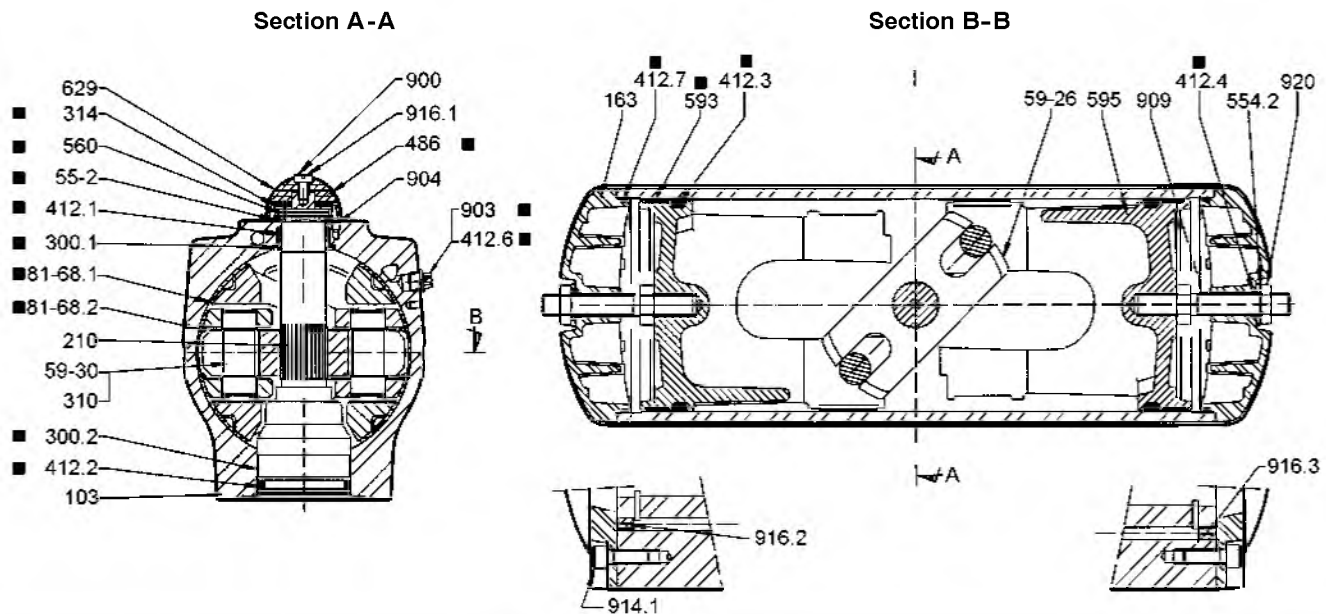
Item	Designation	Materials
103	Housing	Light alloy with 50 µm hard anodization
163	Cylinder head	Light alloy with 30 µm cataphoresis coating
300.1	■ Upper bearing	Acetal
300.2	■ Lower bearing	Acetal
314	■ Thrust washer	Stainless steel type 316
410	■ Cylinder head gasket	Nitrile
412.1	■ O-ring	Nitrile (Working temperature range: from -20° up to +80°C)*
412.2	■ O-ring	Nitrile (Working temperature range: from -20° up to +80°C)*
412.3	■ Piston O-ring	Nitrile (Working temperature range: from -20° up to +80°C)*
412.4	■ O-ring	Nitrile
412.6	■ O-ring	Nitrile
486	■ Ball	Stainless steel
554	Washer	Stainless steel A4-70
55-2	■ Friction washer	Acetal
593	■ Piston bearing	Acetal
595	Piston	Light alloy
629	Pointer	Polyamide 6-6 + treatment against U.V. rays
81-68	■ Piston guide	Acetal
877	Pinion	Zinc coated steel
903	■ Plug	Polyamide 6-6
904	Socket screw	Stainless steel with cladding
909	Adjusting screw	Stainless steel A4-70
914.1	Hexagon socket head screw	Stainless steel A4-70
916	Plug	Polyethylene
920	Hexagonal nut	Stainless steel A4-70
932	■ Spring retaining ring	Stainless steel

■ Parts included in the spare parts kit

* Alternative: Special Nitrile (-40 °C to +80 °C) or Viton (-20 °C to +120 °C)

ACTAIR 100 and 200
Construction

Direct pneumatic connection 1/4" G



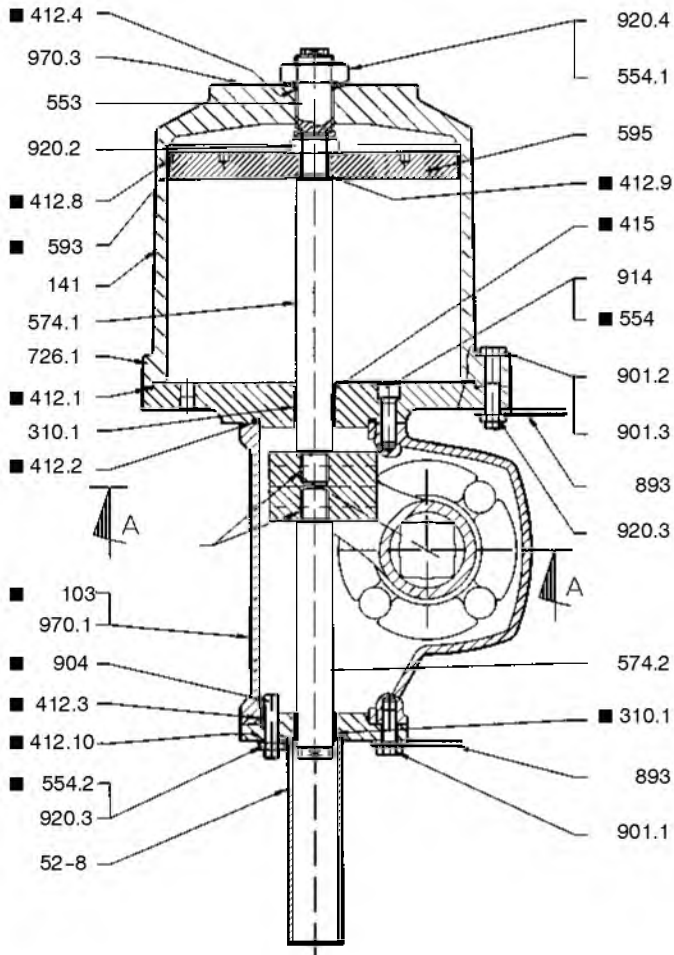
Item	Designation	Materials
103	Housing	Light alloy with 50 µm hard anodization
163	Cylinder shaft	Light alloy with 30 µm cataphoresis coating
210	Shaft	Zinc coated treated steel
300.1	■ Upper bearing	Acetal
300.2	■ Lower bearing	Stainless steel + PTFE
310	Self lubricating bearing	PTFE filled
314	■ Thrust washer	Zinc coated treated steel
412.1	■ O-ring	Nitrile
412.2	■ O-ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.3	■ Piston O-ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.4	■ O-ring	Nitrile (Working temperature range: from -20° up to +80° C)*
412.6	■ O-ring	Nitrile
412.7	■ O-ring	Nitrile
486	■ Ball	Stainless steel
554.2	Washer	Stainless steel A4-70
55-2	■ Friction washer	Acetal
560	■ Pin	Stainless steel
593	■ Piston bearing	Acetal
595	Piston	JS 1030 spheroidal graphite cast iron
59-26	Scotch-yoke	Treated steel
59-30	Roller	Treated steel
629	Pointer	Polyamide 6-6 + treatment against U.V. rays
81-68.1	■ Piston guide	Acetal
81-68.2	■ Piston guide	Acetal
900	Cheese head screw	Stainless steel A4-70
903	■ Plug	Polyamide 6-6
904	Socket screw	Stainless steel
909	Adjusting screw	Stainless steel A4-70
914.1	Hexagon socket head screw	Stainless steel A4-70
916.1	Plug	Polyethylene
916.2	Cylindric plug	Nitrile
916.3	Triangular plug	Nitrile
920	Hexagonal nut	Stainless steel A4-70
932	■ Circlips	Stainless steel

■ Parts included in the spare parts kit

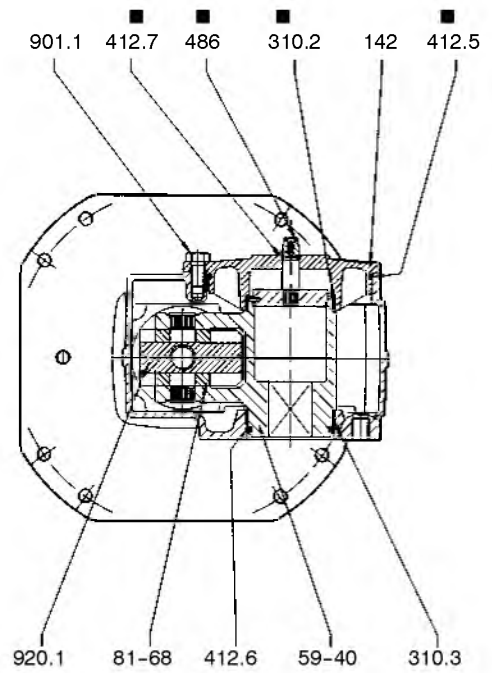
* Alternative: Special Nitrile (-40° C to +80° C) or Viton (-20 ° C to +120 ° C)

ACTAIR 400

Construction



Section A-A



■ Parts included in the spare parts kit

ACTAIR 400
Standard construction

Direct pneumatic connection 1/2" G

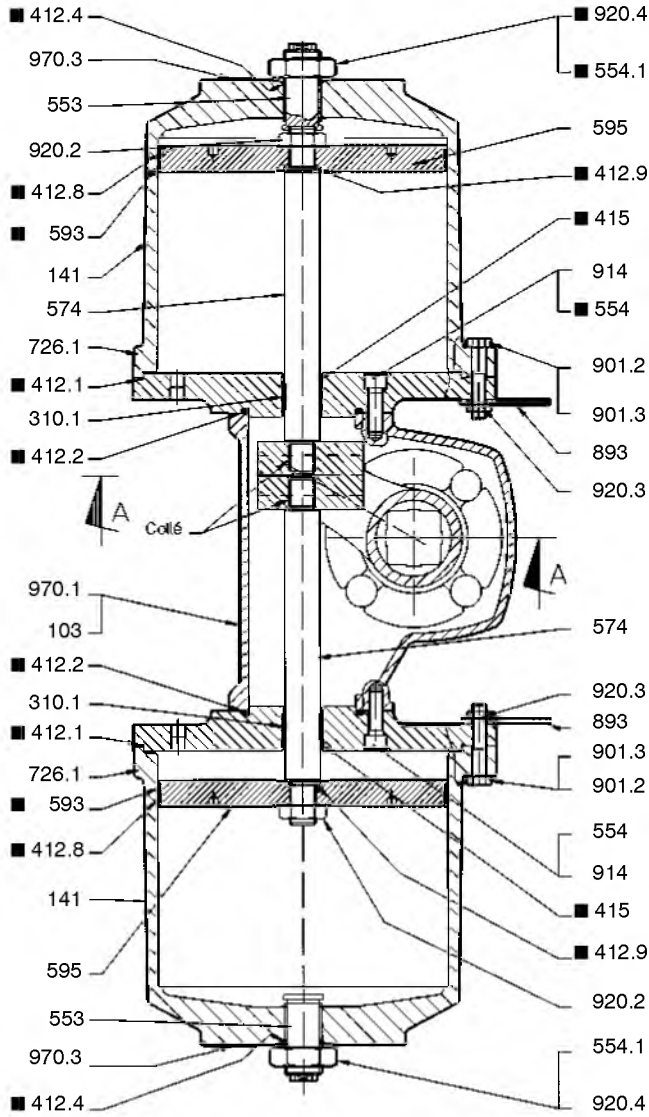
Item	Designation	Materials
103	Housing	JL 1040 grey cast iron or JS 1030 spheroidal graphite cast iron
141	Cylinder	JS 1030 spheroidal graphite cast iron
142	Cover	JL 1040 grey cast iron or JS 1030 spheroidal graphite cast iron
310.1	Self-lubricating bearing	PTFE filled on steel casing
310.2	■ Self-lubricating bearing	PTFE filled on steel casing
310.3	Self-lubricating bearing	PTFE filled on steel casing
412.1	■ O-ring	Nitrile
412.2	■ O-ring	Nitrile
412.3	■ O-ring	Nitrile
412.4	■ O-ring	Nitrile
412.5	■ O-ring	Nitrile
412.6	O-ring	Nitrile
412.7	■ O-ring	Nitrile
412.8	■ O-ring	Nitrile
412.9	■ O-ring	Nitrile
412.10	■ O-ring	Nitrile
415	■ Leap seal ring	Nitrile
486	■ Ball	Stainless steel
52.8	Protection sleeve	Treated steel
553	Thrust insert	Stainless steel 316
554	■ Washer	Nylon
554	Washer	Stainless steel A4-70
554.2	Washer	Stainless steel A4-70
574.1	Piston rod	Chromed steel
574.2	Rod	Chromed steel
593	■ Guiding strip	PTFE + Bronze
595	Piston	Steel
59-40	Chuck	JS 1030 spheroidal graphite cast iron + stainless steel
726.1	Flange	Steel + cataphoresis coating
81-68	Pressure pad	Nitrured steel
893	Soleplate	Steel + cataphoresis coating
901.1	Hexagon head screw	Stainless steel A4-70
901.2	Hexagon head screw	Stainless steel A4-70
901.3	Hexagon head screw	Stainless steel A4-70
904	Grub screw	Stainless steel A4-70
914	Screw	Stainless steel A4-70
920.1	Operating nut	JS 1060 spheroidal graphite cast iron
920.2	Hexagon nut	Stainless steel A4-70
920.3	Hexagon nut	Stainless steel A4-70
920.4	Hexagon nut	Stainless steel A4-70
970.1	Identity plate	Stainless steel
970.3	Stiker for mechanical stop use	Adhesive

■ Parts included in the spare parts kit

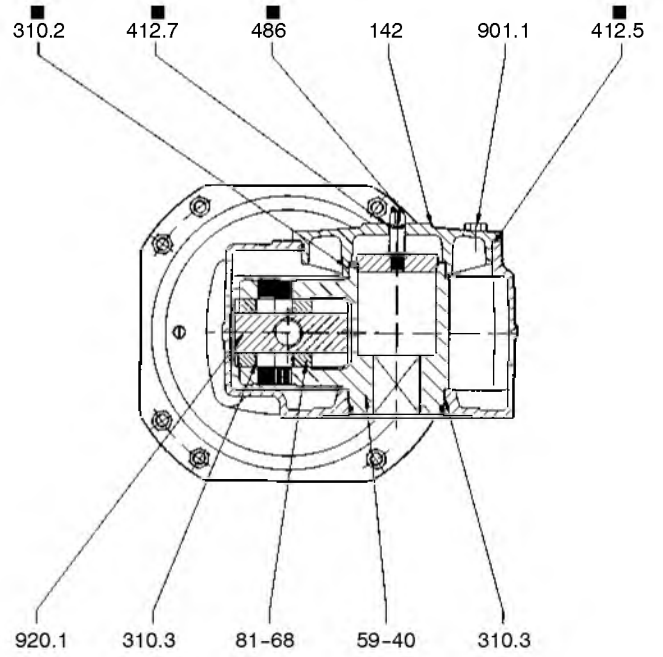
Other working temperature range: Please consult us.

ACTAIR 800

Construction



Section A-A



■ Parts included in the spare parts kit

ACTAIR 800

Standard construction

Direct pneumatic connection 1/2" G

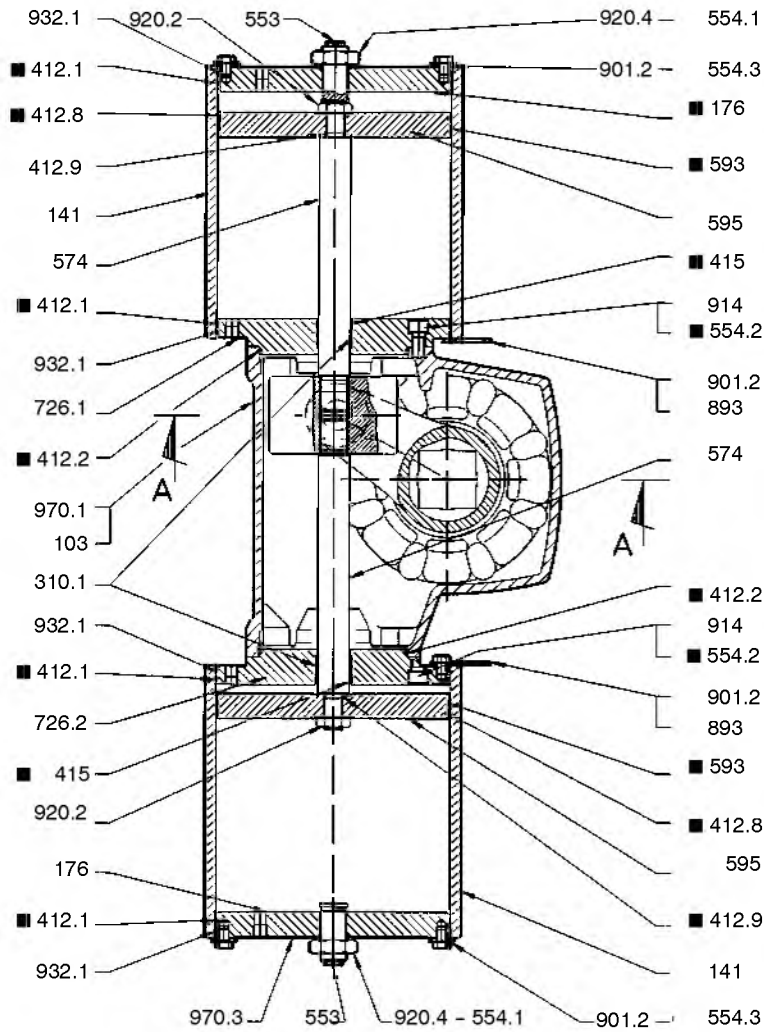
Item	Designation	Materials
103	Housing	JL 1040 grey cast iron or JS 1030 spheroidal graphite cast iron
141	Cylinder	JS 1030 spheroidal graphite cast iron
142	Cover	JL 1040 grey cast iron or JS 1030 spheroidal graphite cast iron
310.1	Self-lubricating bearing	PTFE filled on steel casing
310.2	■ Self-lubricating bearing	PTFE filled on steel casing
310.3	Self-lubricating bearing	PTFE filled on steel casing
412.1	■ O-ring	Nitrile
412.2	■ O-ring	Nitrile
412.4	■ O-ring	Nitrile
412.5	■ O-ring	Nitrile
412.7	■ O-ring	Nitrile
412.8	■ O-ring	Nitrile
412.9	■ O-ring	Nitrile
412.10	■ O-ring	Nitrile
415	■ Leap seal ring	Nitrile
486	■ Ball	Stainless steel
52.8	Protection sleeve	Treated steel
553	Thrust insert	Stainless steel 316
554	■ Washer	Nylon
554.1	Washer	Stainless steel A4-70
574	Rod	Chromed steel
593	■ Guiding strip	PTFE + Bronze
595	Piston	Steel
59-40	Chuck	JS 1030 spheroidal graphite cast iron + stainless steel
726.1	Flange	Steel + cataphoresis coating
81-68	Pressure pad	Nitrured steel
893	Soleplate	Steel + cataphoresis coating
901.1	Hexagon head screw	Stainless steel A4-70
901.2	Hexagon head screw	Stainless steel A4-70
901.3	Hexagon head screw	Stainless steel A4-70
914	Screw	Stainless steel A4-70
920.1	Operating nut	JS 1060 spheroidal graphite cast iron
920.2	Hexagon nut	Stainless steel A4-70
920.3	Hexagon nut	Stainless steel A4-70
920.4	Hexagon nut	Stainless steel A4-70
970.1	Identity plate	Stainless steel
970.3	Stiker for mechanical stop use	Adhesive

■ Parts included in the spare parts kit

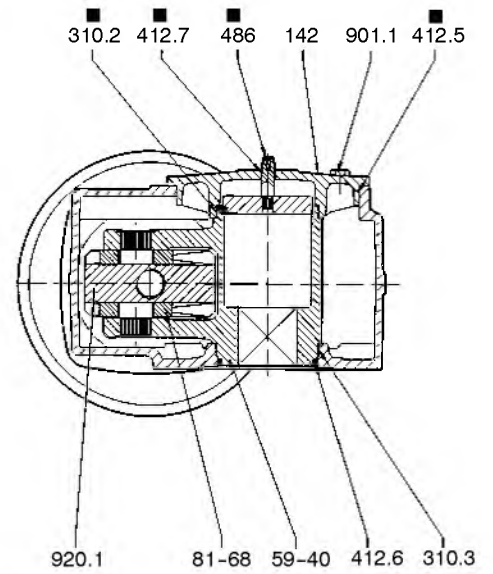
Other working temperature range: Please consult us.

ACTAIR 1600

Construction



Section A-A



■ Parts included in the spare parts kit

ACTAIR 1600

Standard construction

Direct pneumatic connection 3/4" G

Item	Designation	Materials
103	Housing	JS 1030 spheroidal graphite cast iron
141	Cylinder	Steel
142	Cover	JS 1030 spheroidal graphite cast iron
176	■ Cylinder head	Steel + cataphoresis coating
310.1	Self-lubricating bearing	PTFE filled on steel casing
310.2	■ Self-lubricating bearing	PTFE filled on steel casing
310.3	Self-lubricating bearing	PTFE filled on steel casing
412.1	■ O-ring	Nitrile
412.2	■ O-ring	Nitrile
412.5	■ O-ring	Nitrile
412.6	O-ring	Nitrile
412.7	■ O-ring	Nitrile
412.8	■ O-ring	Nitrile
412.9	■ O-ring	Nitrile
415	■ Leap seal ring	Nitrile
486	■ Ball	Stainless steel
553	Thrust insert	Stainless steel 316
554.1	Washer	Stainless steel A4-70
554.2	■ Washer	Stainless steel A4-70
554.3	Washer	Nylon
574	Piston rod	Chromed steel
593	■ Guiding strip	PTFE + Bronze
595	Piston	Steel
59-40	Chuck	JS 1030 spheroidal graphite cast iron + stainless steel
726.1	Flange	Steel + cataphoresis coating
726.2	Flange	Steel + cataphoresis coating
81-68	Pressure pad	Nitrured steel
893	Soleplate	Steel + cataphoresis coating
901.1	Hexagon head screw	Stainless steel A4-70
901.2	Hexagon head screw	Stainless steel A4-70
914	Screw	Stainless steel A4-70
920.1	Operating nut	JS 1060 spheroidal graphite cast iron
920.2	Hexagon nut	Stainless steel A4-70
920.4	Hexagon nut	Stainless steel A4-70
932	Retaining ring	Treated steel
970.1	Identity plate	Stainless steel
970.3	Stiker for mechanical stop use	Adhesive

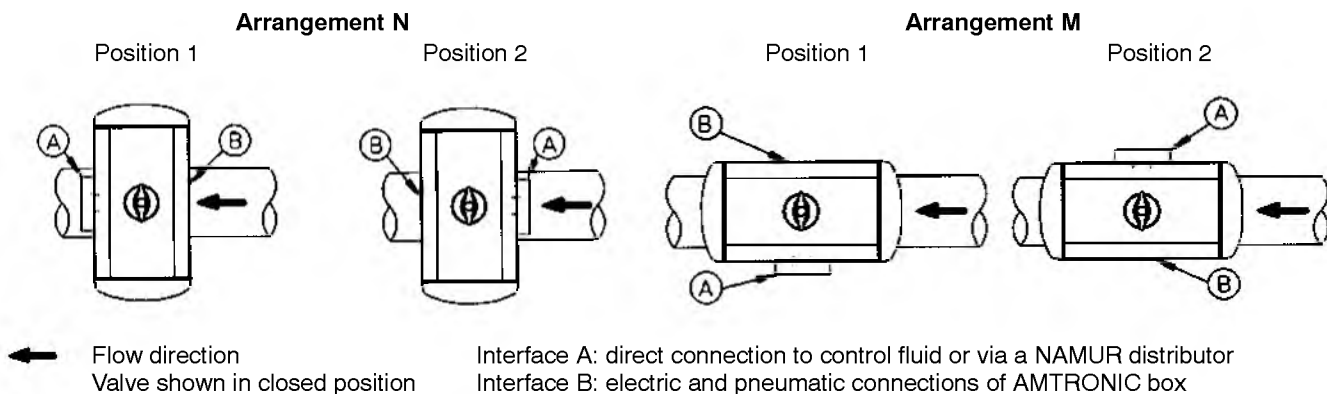
■ Parts included in the spare parts kit

Other working temperature range: Please consult us.

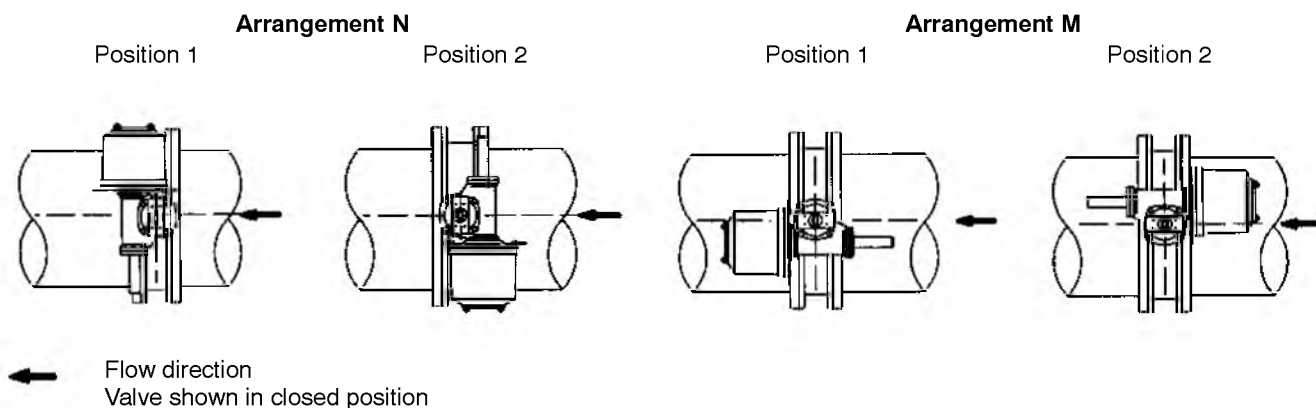
Mounting on valve

The actuator can be positioned in four positions, at intervals of 90°. Unless otherwise stated, the actuator is mounted according to the arrangement N position1.

ACTAIR 1,5 to 200



ACTAIR 400 to 800



These actuators are equipped with interchangeable inserts manufactured to the size and the form of different valve shafts for motorized operation (square end, flat end, key...).

ACTAIR 1,5 to 50

Pinion with star driving allowing mounting of the insert at intervals of 45°

Flat end



Key end



Square end



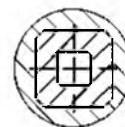
ACTAIR 100 to 1600

Shft or yoke with driving square and insert

Flat end



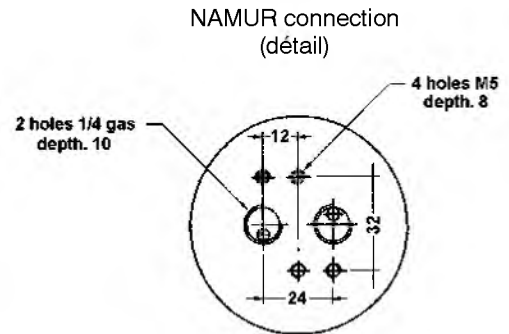
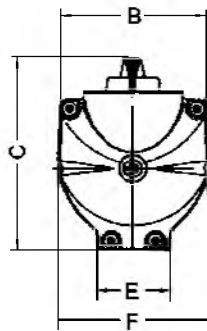
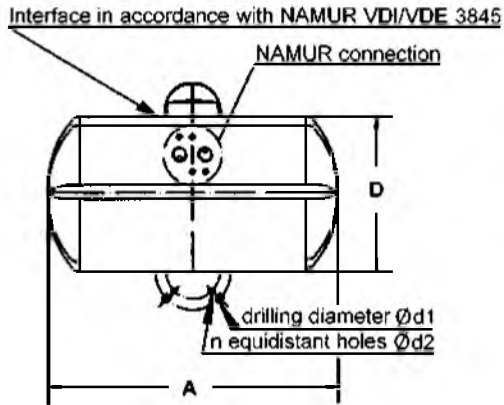
Square end



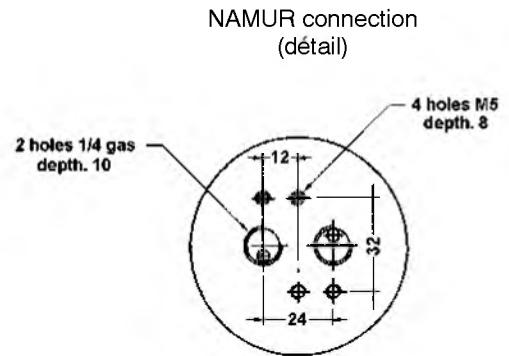
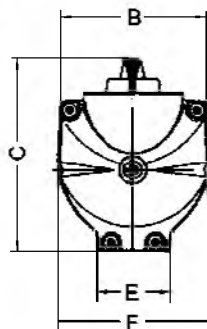
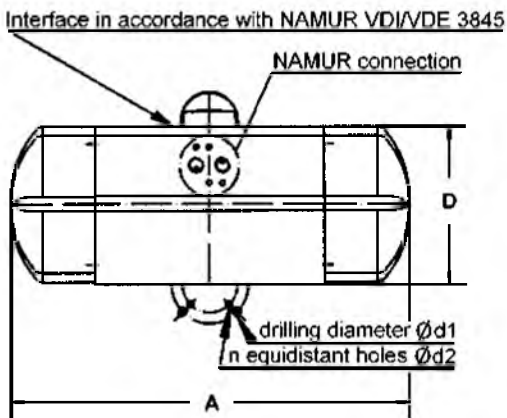
The actuators can be delivered with or without the coupling parts.

Overall dimensions (mm) and weights (kg)

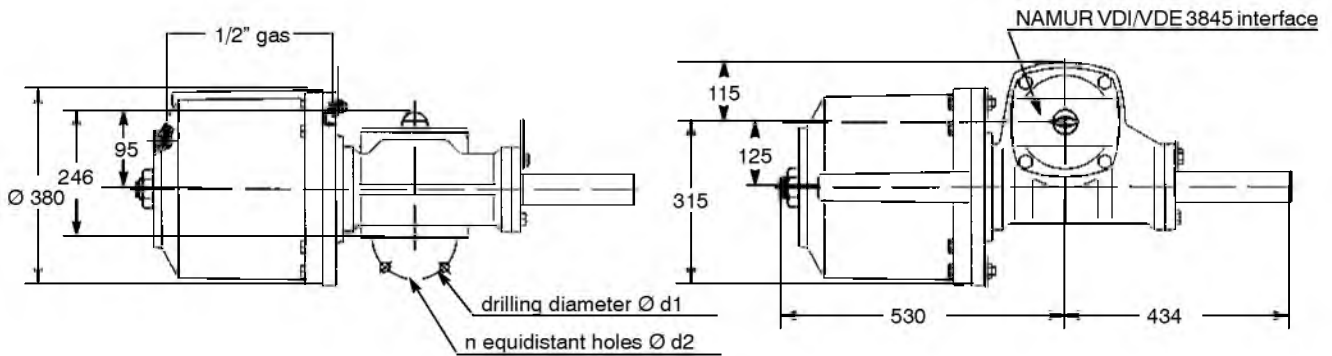
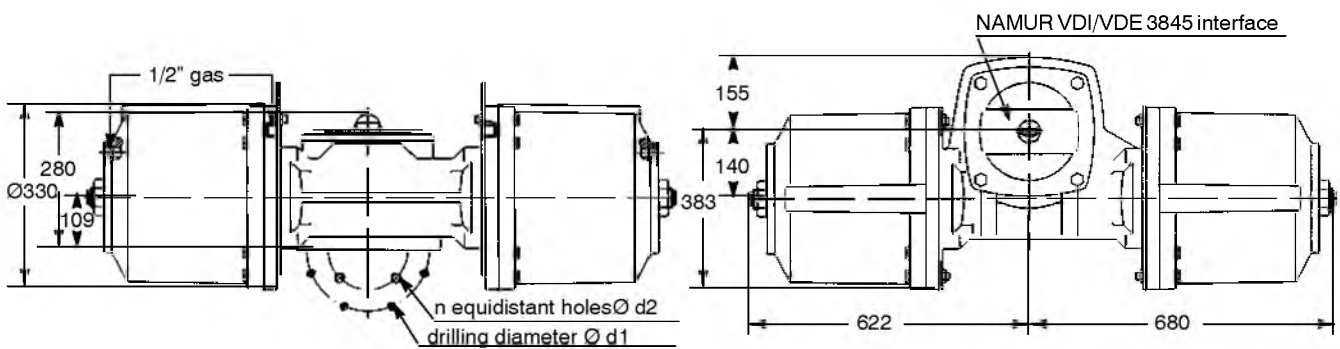
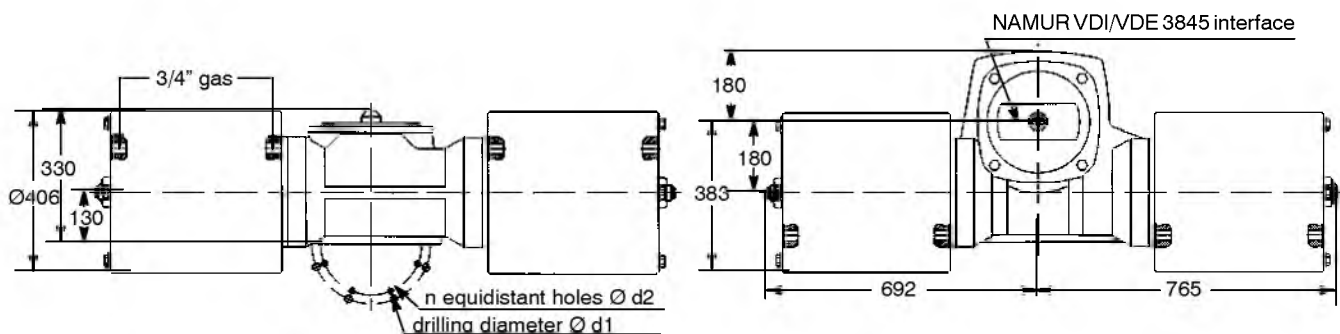
ACTAIR 1,5 to 50



ACTAIR 100 and 200



ACTAIR Type	A	B	C	D	E	F	ISO 5211 mounting plate				Weight kg
							ref	Ød1	Ød2	n	
1.5	143	76	96	66	44	76	F04	42	M5	4	1.2
3	194	100	119	98	55	100	F04 (45°)	42	M5	4	2.8
							F05	50	M6	4	
6	218	114	137	116	65	118	F05	50	M6	4	3.9
							F07	70	M8	4	
12	272	132	163	142	65	138	F05	50	M6	4	6.0
							F07	70	M8	4	
25	344	156	197	176	90	166	F07	70	M8	4	11.0
							F10	102	M10	4	
50	424	174	238	217	125	200	F10	102	M10	4	18.3
							F12	125	M12	4	
100	505	157	216	195	122	170	F10	102	M10	4	30.0
							F12	125	M12	4	
200	592	174	258	237	144	210	F14	140	M16	4	48.0

Overall dimensions (mm) and weights (kg)
ACTAIR 400 (Standard version - Direct connection)

ACTAIR 800 (Standard version - Direct connection)

ACTAIR 1600 (Standard version - Direct connection)


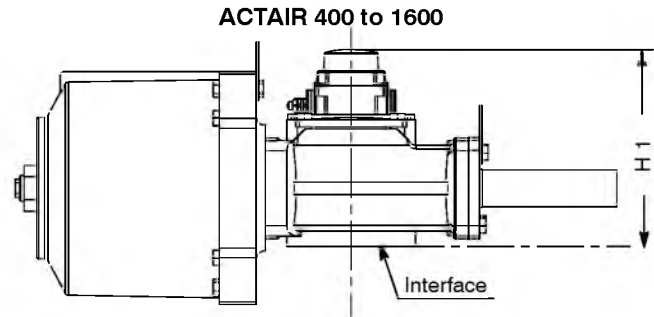
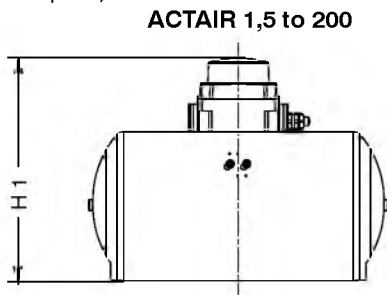
ACTAIR Type	ref	ISO 5211 Mounting plate			Weight kg
		$\varnothing d1$	$\varnothing d2$	n	
400	F16	165	M20	4	160.0
800	F16	165	M20	4	290.0
	F25	254	M16	8	
1600	F25	254	M16	8	504.0
	F30	298	M20	8	

Indication function

Limit switch box IP 67 AMTROBOX C (Type Series Booklet AMTROBOX C ref. 8525.178-10)

The function provided by AMTROBOX C is as follow:

- Position detection:
 - On/off position detection by means of microswitches or inductive proximity detectors (1/O, 1/C, 1 on intermediate position on request).



Control and supervision functions

Piloting-servo control by AMTRONIC/SMARTRONIC

The functions provided are as follows :

AMTRONIC :

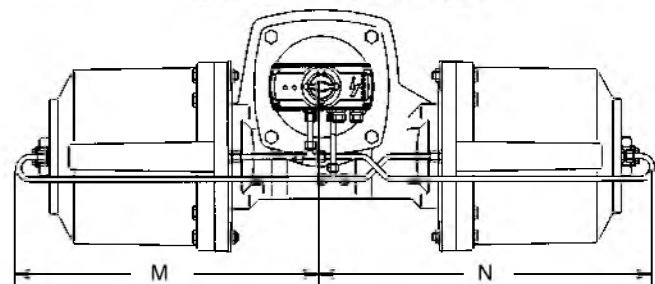
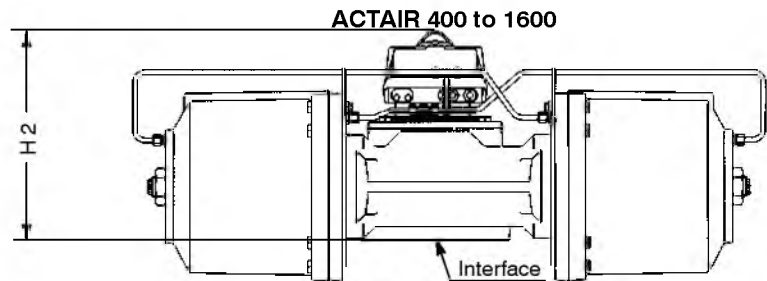
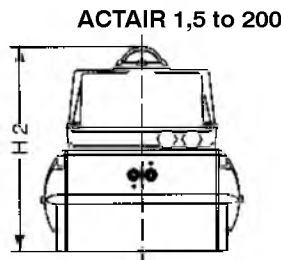
- On/off pneumatic distribution: 4/2 or 4/3 configuration, spring return or double acting, A.C. or D.C. supply.
- Operating time adjustment.

SMARTRONIC :

- Proportional distribution for autocalibration setting, 4-20 mA pilot.
- Operating time adjustment

Options :

- On/off position detection (2 microswitches or inductive proximity detectors),
- Proportional position detection (4-20 mA).
- Field bus : AS-i, Profibus DP.



Consult type series booklets AMTRONIC ref. 8512.1 and SMARTRONIC MA 8527.1

ACTAIR type	H1	H2	M	N	Weight (kg)
1.5	144				2,9
3	168	235			4.5
6	185	252			5.5
12	211	278			8.0
25	245	312			13.0
50	286	353			20.0
100	264	331			32.0
200	306	373			50.0
400	293	390	580	434	170.0
800	328	425	672	730	300.0
1600	378	475	742	815	514.0

Options :
Visual position indicator type “BEACON”

Instead of the standard pointer.

ACTAIR 3 to 1600

Direct NPT air connection

1/4" NPT connection plate made of anodised Aluminium, fitted onto the Namur interface of the standard actuator.

ACTAIR 1.5 to 200

ACTAIR 400 to 1600

NPT air connection directly threaded on the cylinder:
 - 1/2" NPT on ACTAIR 400 and 800,
 - 3/4" NPT on ACTAIR 1600

Declutchable manual override: ACTAIR 3 to 1600

The manual override using a declutchable gear box may be fitted between the valve mounting plate and the actuator. This manual override will override with the pneumatic actuator and can be set in clutched or declutched positions. This device is based on worm wheel and screw kinematics. Please consult us.

Note: *The manual override should only be used under the following recommendations:*

- *absence of air pressure in the actuator,*
- *Leakage to air free of all the cylinders of the actuator.*

The manual override should not be declutched when pressure is in the actuator.

Construction :

- Housing, cover and extension in JL 1040 grey cast iron,
- Handwheel in welded iron,
- Screw in steel,
- Worm in JS 1030 spheroidal graphite cast iron,
- Drive shaft, clutch lever, locking pointer, adjustable mechanical travel stops (+/-5°) and external bolting in 13 % chromium steel.

Protection :

They are hose and fine dust proof (protection degree: IP 65). Construction for protection degree IP 67 on request: please, consult us.

External coating:

Polyurethane paint (colour dark grey RAL 7016, 80 µm thickness).

Working temperature range:

From -20° C to +80° C.



Please refer to the type series booklet manual override ref. no.5350.1.

Options

Stroke limiter

ACTAIR 3 to 200

Stroke limiter adjustable between 0 and 90° in only one direction. The device is fitted instead of the standard adjustment end-stop. Available on open or close direction. Consult us.

ACTAIR 3 to 12

Stroke limiter adjustable in both directions (open and close). The device is fitted between the valve top flange and the actuator. Consult us.

ACTAIR actuators can be equipped with different accessories instead of AMTRONIC instrumentation box.

**Limit switch box
ACTAIR 1,5 to 1600**



This switchbox is fitted onto the top of the actuator housing by means of a yoke with interface in accordance with VDI/VDE 3845 NAMUR specification. Please consult us.

**Positioner
ACTAIR 1,5 to 1600**



A positioner with a 3-15 PSI pneumatic piloting signal or a 4-20 mA electric signal (standard or with intrinsically safety) can be mounted onto the top of actuator housing by means of a yoke with VDI/VDE 3845. Please consult us.

**NAMUR distributor
ACTAIR 1,5 to 200**



A distributor with electric or pneumatic piloting with NAMUR interface can be fitted directly onto the side of the actuator housing. Please consult us.

**ISO size 1 distributor
ACTAIR 3 to 1600
ISO size 2 distributor
ACTAIR 400 to 1600**

A distributor with an ISO 5599 size 1 or size 2 interface can also be fitted to the actuator by means of a distributor plate.

This leaflet is not contractual and may be amended without notice.

13.02.07

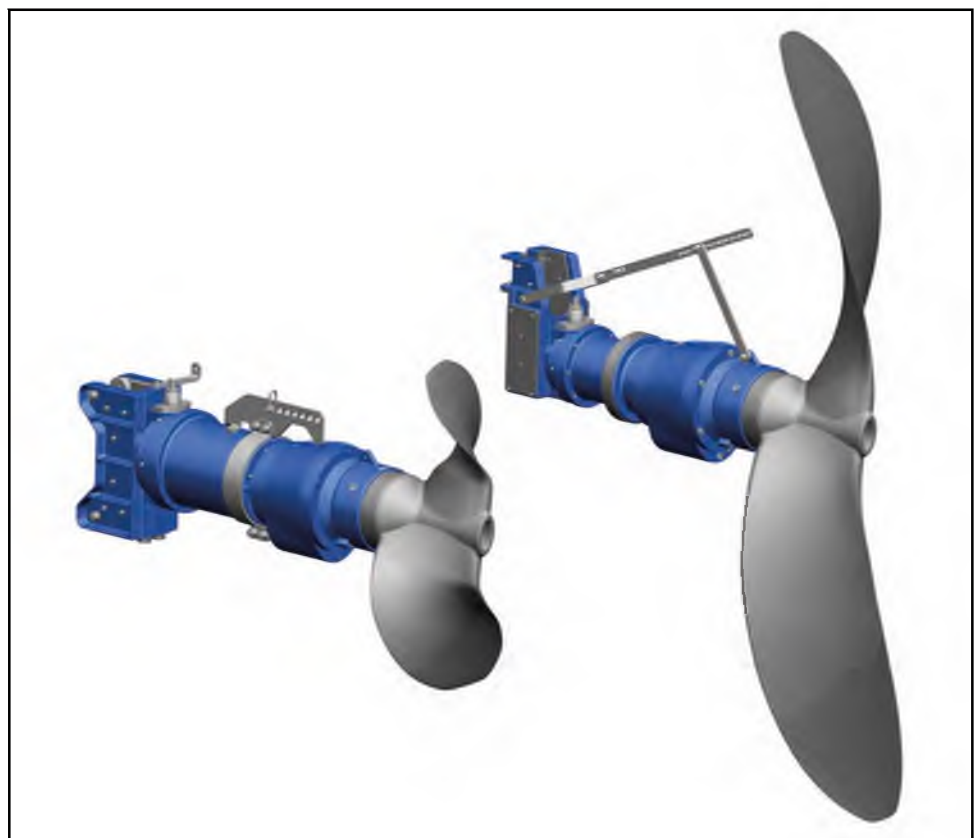
8515.1/8-10

Submersible Mixer

Amaprop

For Biogas Plants
50 Hz

Type Series Booklet



Legal information/Copyright

Type Series Booklet Amaprop

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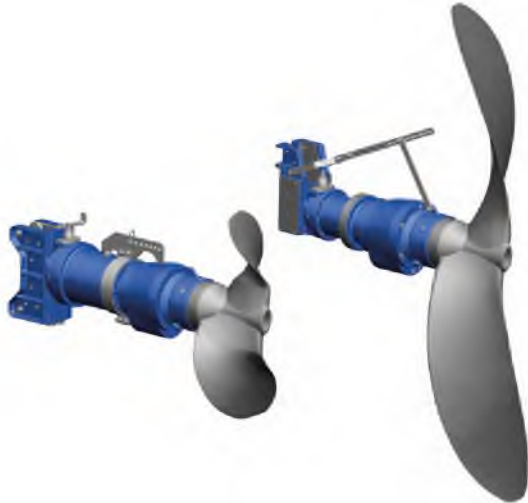
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Biogas

Submersible Mixer

Amaprop



Designation

Example: Amaprop J 184 - 1000 / 16 4 UR G

Designation key

Code	Description
Amaprop	Type series
J	Propeller material
J	Amaprop 1380: nodular cast iron EN-GJS-400-15
J	Amaprop 1000: nodular cast iron EN-GJS-400-15
K	Amaprop 2500: ceramic-coated composite material
184	Nominal propeller speed [rpm]
1000	Size/nominal propeller diameter [mm]:
	1000
	1380
	2500
16	Motor size
	Amaprop 1000: 11, 16, 23
	Amaprop 1380: 6, 11, 16, 23
	Amaprop 2500: 6
4	Number of motor poles
UR	Motor version
UR	Standard
YR	Explosion-proof (T4)
WR	For fluid temperatures up to 60 °C
ZR	Explosion-proof (T3) up to 60 °C
G	Material variant
G	Grey cast iron

Main applications

- For mixing the digestion substrate and homogenising the concentration and temperature in the main digester and post-digester
- To prevent (or destroy and re-homogenise) floating sludge blankets
- For mixing the digestion substrates
 - In mixing tanks
 - In main digesters and post-digesters
 - In final storage tanks (digestate storage tanks)
 - In tanks for semi-liquid manure

Fluids handled

- Fluids with a dry solids content:
 - < 10 % (Amaprop 2500)
 - > 10 % to 15 % (Amaprop 1000 and 1380)

Operating data

Operating properties

Characteristic	Value	Amaprop		
		1000	1380	2500
		Motor rating	P [kW]	10 to 20	6 to 13	6 to 6.5
Installation depth	H [m]	≤ 10 ¹⁾		
Fluid temperature	T [°C]	Motor versions UR/YR: < 45		
		Motor versions WR/ZR: < 60		

1) Larger installation depths on request

Design details

Design

- Fully flooded submersible mixer
- Horizontal installation

Propeller

- Self-cleaning (ECB) propeller

Shaft seal

- Two bi-directional mechanical seals in tandem arrangement, with liquid reservoir
- Additional leakage chamber between the mating ring carrier and the gear unit

Bearings

- Motor-end rolling element bearings, greased for life
- Gear-end rolling element bearings, oil-lubricated

Drive

- Three-phase asynchronous squirrel-cage motor
- Motors integrated in explosion-proof submersible mixers are supplied in Ex d IIB type of protection.

Materials

Overview of available materials

Part No.	Description	Material variant G	
		Amaprop 1000/1380	Amaprop 2500
811	Motor housing	EN-GJL-250	
812	Motor housing cover	EN-GJL-250	
870	Gear housing	EN-GJL-250	
476	Mating ring carrier	EN-GJL-250	
23-9	Propeller	EN-GJS-400-15	Glass fibre reinforced epoxy resin
433.01	Mechanical seal	Drive end	SiC/SiC
433.02		Propeller end	SiC/SiC
732	Guide bracket	EN-GJL-250, plastic-lined	EN-GJS-400-15, plastic-lined
-	Propeller shaft	1.4122	
-	Elastomer seals	FPM/NBR	
-	Screws/bolts	A4 (= 1.4571)	

Grey cast iron EN-GJL-250 (lamellar graphite cast iron):

Lamellar graphite cast iron to EN 1561 is the most widely used cast material for handling municipal sewage, waste water and sludges as well as stormwater and surface water. It is suitable for neutral fluids which are only slightly aggressive and cause little wear. The pH value should be ≥ 6.5 , the sand content ≤ 0.5 g/l.

Nodular cast iron EN-GJS-400-15

Its ductile structure, mechanical properties and wear resistance make this nodular cast iron to EN 1561 a suitable propeller material. Also suitable for handling digestion substrate.

Glass fibre reinforced epoxy resin

The high-performance composite material consists of glass fibre reinforced epoxy resin, a metal hub insert and a protective gel coating which is resistant to abrasion and chemicals.

Coating and preservation

Primer and top coat

Surface treatment:	SA 2 1/2 degree of cleanliness to DIN EN ISO 12944
Primer coat:	2-component epoxy resin zinc phosphate primer, min. film thickness = 35 μ m
Top coat:	2-component high-solid epoxy resin top coat (RAL 5002), min. film thickness = 100 μ m

Special coating

Available from the manufacturer on request (a surcharge and longer delivery time apply).

Product benefits

- Two bi-directional mechanical seals with oil reservoir filled with ecologically acceptable oil provide double safety
- Perfectly protected by absolutely water-tight cable gland protecting the motor against moisture
- Motor monitored by temperature sensors to prevent it from overheating
- Leakage chamber between oil reservoir and gear unit for high reliability
- Easy to install

Amaprop 1000 and 1380:

- Little wear, high break resistance and long service life due to propeller made of nodular cast iron

Amaprop 2500:

- Absolutely break-proof due to propeller blades made of glass fibre reinforced epoxy resin with metal hub insert and ceramic coating.

Acceptance tests / Warranties

- Functional test
Every submersible mixer is subjected to a functional test to KSB standard ZN 56525.
- Quality is assured by means of an audited and certified quality assurance system to DIN EN ISO 9001.
- Special acceptance tests are available on request.

Warranty information

Our warranty is based on and exclusively applies to your specifications as documented in the data sheet of the submersible mixer, and covers the relevant physical properties. Any warranty claims beyond the aforementioned aspects, as well as any claims resulting from an excessive solids content in the plant, the formation of floating blankets as well as failure to produce a specific gas yield, shall be excluded. The correct positioning of the submersible mixers is crucial for the overall function of the equipment. KSB's warranty obligations shall not cover any damage that may occur as a result of incorrect mixer positioning, i. e. installing the mixer in a position not expressly approved by KSB. In addition, low-flow areas (flow separation) resulting from the tank geometry shall not be covered by our warranty. Furthermore, we shall not assume any liability if our submersible mixers are used in patented processes and/or in case of protected rights of third parties.

Unauthorised modifications, the mixer's use for fluids and operating conditions not specified in the purchase order, as well as the use of non-KSB installation parts without KSB's prior consent will result in the forfeiture of any and all claims for damages. The same applies to consequential damage (e.g. resultant process downtime).

Selection information

- Good mixing results and safe and reliable operation of the submersible mixers essentially depend on the position of the mixers in the tank and relative to each other. It is therefore imperative to position the submersible mixers as shown in KSB's general arrangement drawing. KSB shall not be held responsible for any damage resulting from mixer positions not expressly approved by KSB.

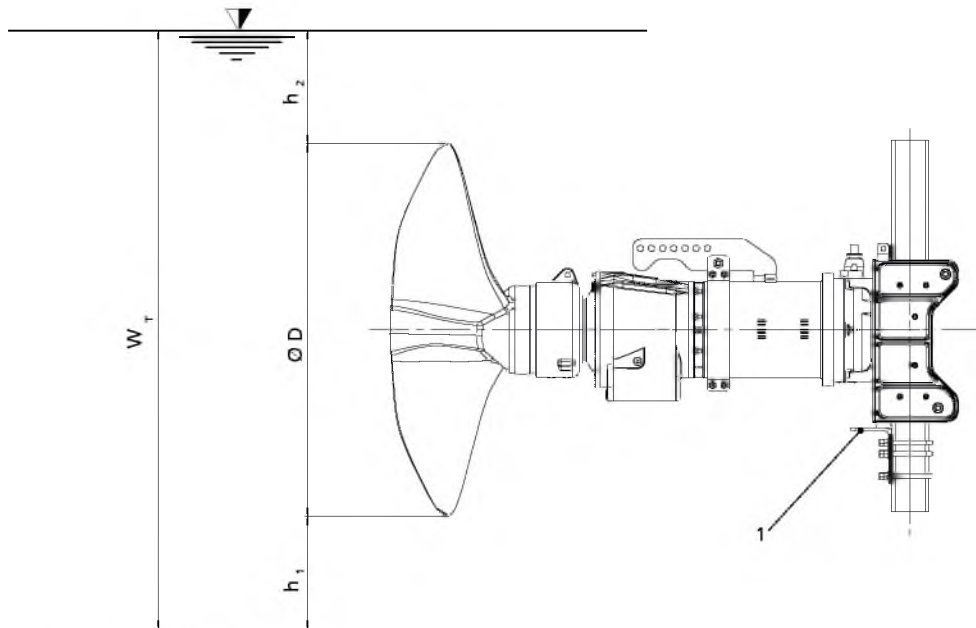
- The minimum and maximum submergence indicated in the data sheet of the submersible mixer must be complied with. The propeller must not be operated outside the fluid. Air-entraining vortices must be avoided. Always use level control equipment which trips the submersible mixer if the fill level drops below the minimum operating level.
- For servicing the submersible mixers, access openings and appropriate means of removal must be provided, so that the mixers can be lifted out of the filled tank at any time. For this purpose, the minimum dimensions for removing the submersible mixers must be observed.
- If the submersible mixer trips due to excessive temperature, check the motor housing for insulating substrate deposits and clean with appropriate equipment (e. g. high-pressure cleaner) as required. Consult KSB, if necessary.
- For higher fill levels, the guide rails of the Amaprop 1000 installation accessories must be secured against vibrations by means of a middle support fitted on site.
- In order to prevent any damage caused by the propeller or layers of floating sludge, if any, cable supports must be used for routing the power cable properly, i.e. without excessive slack.

Information on frequency inverter operation

- All submersible mixers from KSB are suitable for frequency inverter operation.
- The permissible control range is 30 - 50 Hz.
- In addition to any capacity reserves required for hydraulic reasons, a motor power reserve of 5 % must be provided when mixers are operated on frequency inverters.

Minimum level of fluid handled

The submersible mixer is operational when the fluid level is not lower than dimension W_T . This minimum level of the fluid handled must also be ensured during automatic operation.



Minimum level of fluid handled

A submergence h_2 from the top propeller tip to the substrate surface must be ensured to reliably prevent the formation of air-entraining vortices. Air-entraining vortices will cause rough running and damage to submersible mixers and installation parts. The formation of air-entraining vortices can be checked through the sight glasses fitted in the tank wall (⇒ Page 5). The situation can be remedied by increasing the fill level (for Amaprop 2500) or adjusting the installation level of the mixer, if possible. (For Amaprop 1000 and 1380 with accessories set 22: The position of the mixer in relation to the fill level can be adjusted by using the winch. The adjustment can be made by changing the position of the retaining bracket (1) or, in the case of mixers suspended from lifting equipment, via the lifting equipment.)

Minimum level of fluid handled

$\varnothing D$	$h_1^{2)}$	$h_2^{2)}$
[mm]	[m]	[m]
1000	0,3	0,5
1380	0,3	0,5
2500	0,3	0,5

2) Minimum

Overview of product features

Technical data of material variant G

Feature	Amaprop 1000	Amaprop 1380	Amaprop 2500
Explosion protection			
Motor version UR	Not explosion-proof (fluid temperatures < 45 °C)		
Motor version WR	Not explosion-proof (fluid temperatures < 60 °C)		
Motor version YR	Ⓔ II2G Ex dc IIB T4 (fluid temperatures < 45 °C)		
Motor version ZR	Ⓔ II2G Ex dc IIB T3 (fluid temperatures < 60 °C)		
Motor			
Starting method	DOL or star-delta		
Voltage and frequency	400 V ³⁾ 50 Hz, suitable for frequency inverter operation		
Cooling	By surrounding fluid		
Submergence	Up to 10 m ⁴⁾		
Power cable			
Length	10 m ⁵⁾		
Cable entry	Totally watertight		
Type	See table "Overview of power cables"		
Bearings			
Motor	Grease-packed rolling element bearings sealed for life		
Gear unit	Oil-lubricated rolling element bearings		
Gear unit	Spur gear		
Sealing elements			
Elastomer seals	Viton (fluorocarbon rubber FPM)		
Shaft seal	Propeller end	Cartridge mechanical seal with covered spring	
	Drive end	Bellows-type mechanical seal	
Monitoring equipment			
Winding temperature	PTC resistor		
Motor leakage	Leakage sensor in the motor space		
Coating	Two-component epoxy resin coating		
Permissible fluid temperature			
Motor versions UR, YR	45 °C		
Motor versions WR, ZR	60 °C		
Acceptance tests	To ISO 9001 ⁶⁾		
Installation			
Stationary	Installation depth up to 10 m ⁷⁾		

Overview of power cables

Feature	Rubber-sheathed cable	
	S1BN8-F	S07RC4N8-F
Version	Standard	Optional
Rated voltage	1000 V	750 V
EMC screening	-	✓
Insulation material	EPR ⁸⁾	EPR ⁸⁾
Max. continuous temperature of insulation	90 °C	90 °C
For permanent immersion in digestion substrate to DIN VDE 0282-16/HD22.16	✓	✓

- 3) Optional: 500 V, 690 V
 4) Deeper submergence on request
 5) Optional: 15 m, 20 m, > 20 m on request
 6) Optional: with test report 10204-2.2
 7) Larger installation depths on request
 8) EPR = ethylene propylene rubber

Standard and special designs

Standard and special designs

Option	Comments
Power cable > 20 m	Available for all sizes
Analysing device for leakage sensor, thermistor tripping unit for monitoring the winding temperature	Available for all sizes
Special voltages 500 V and 690 V	Available for all sizes
Two-component epoxy resin coating, 250 µm	Available for all sizes
Additional operating manuals	Standard: 1 operating manual per pump set
Customer-specific installation drawing	Available for all sizes
Flow simulation	Available for all sizes
Installation consultancy	Available for all sizes

For any versions not documented in this type series booklet or special versions please always contact KSB for technical details, prices and delivery periods.

Examples:

- Other voltages (except 400 V, 500 V and 690 V)
- Special coatings
- Combinations with special motor/special propeller/special gear unit (e.g. for higher-viscosity fluids)
- Special installation parts
- Special cables
- Tank
- Tank accessories (wall duct for electric cables)
- Access openings and associated covers in tank roof for rapidly removing/re-installing submersible mixers

Technical data

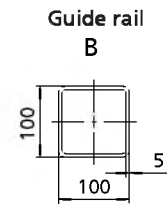
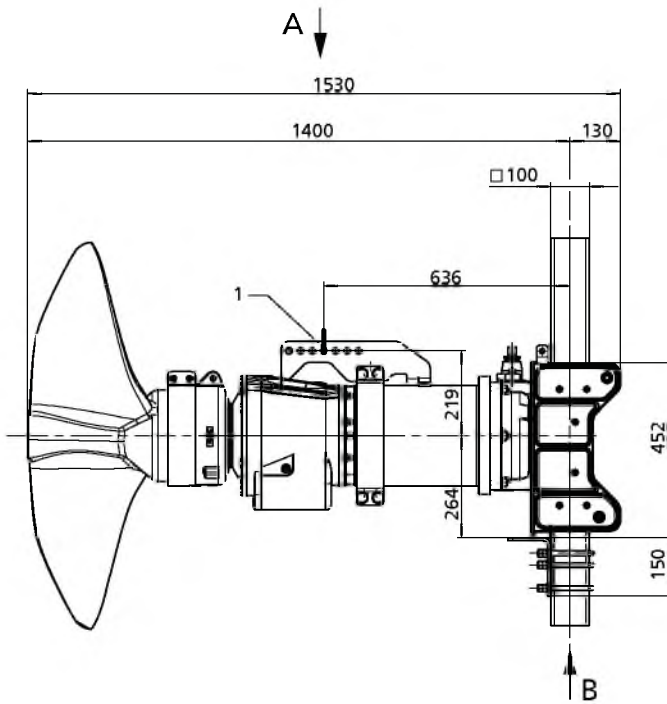
Performance data (400 V, 50 Hz), material variant G

Designation	Propeller speed n_2	Motor rating P_2	Gear unit size	[kg] ⁹⁾
	[rpm]	[kW]		
Amaprop J 1000 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)				
166-1000/11 4 URG / YRG	166	10	SP 190	327
175-1000/16 4 URG / YRG	175	15	SP 190	340
184-1000/16 4 URG / YRG	184	15	SP 190	340
192-1000/16 4 URG / YRG	192	15	SP 190	340
185-1000/23 4 URG / YRG	185	20	SP 190	351
208-1000/23 4 URG / YRG	208	20	SP 190	351
Amaprop J 1000 (motor version WR/ZR, applications with fluid temperatures from 45 °C to 60 °C)				
166-1000/16 4 WRG / ZRG	166	11,8	SP 190	340
174-1000/16 4 WRG / ZRG	174	11,8	SP 190	340
181-1000/23 4 WRG / ZRG	181	16	SP 190	351
184-1000/23 4 WRG / ZRG	184	16	SP 190	351
189-1000/23 4 WRG / ZRG	189	16	SP 190	351
Amaprop J 1380 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)				
88-1380/6 4 URG / YRG	88	6,5	SP 190	322
99-1380/11 4 URG / YRG	99	10,0	SP 190	322
105-1380/11 4 URG / YRG	105	10,0	SP 190	322
114-1380/16 4 URG / YRG	114	13,0	SP 190	335
Amaprop J 1380 (motor version UR/YR, applications with fluid temperatures from 45 °C to 60 °C)				
88-1380/6 4 WRG / ZRG	88	6,0	SP 190	322
99-1380/16 4 WRG / ZRG	99	10,0	SP 190	335
105-1380/16 4 WRG / ZRG	105	11,8	SP 190	335
114-1380/23 4 WRG / ZRG	114	13,0	SP 190	346
Amaprop K 2500 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)				
38-2500/6 4 URG / YRG	38	6,5	SP 190	276
42-2500/6 4 URG / YRG	42	6,5	SP 190	276
Amaprop K 2500 (motor version WR/ZR, applications with fluid temperatures from 45 °C to 60 °C)				
38-2500/6 4 WRG / ZRG	38	6	SP 190	276
42-2500/6 4 WRG / ZRG	42	6	SP 190	276

⁹⁾ Weight incl. guide bracket

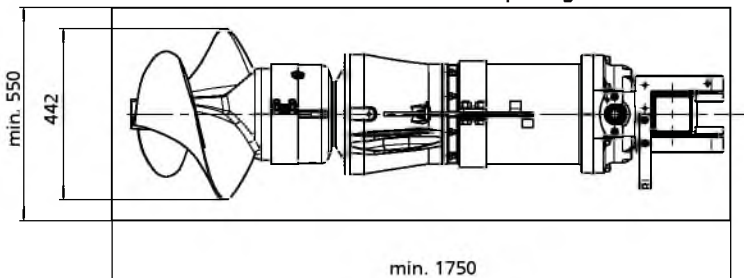
Dimensions

Amaprop 1000
Dimensions [mm]



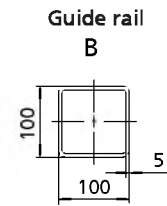
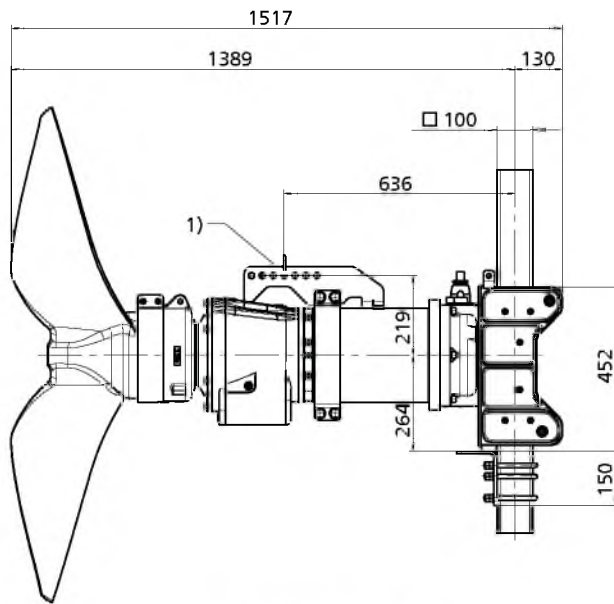
1 = attachment point

Minimum dimensions of access opening



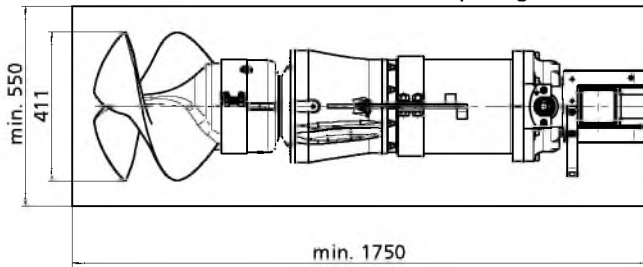
Amaprop 1380

Dimensions [mm]

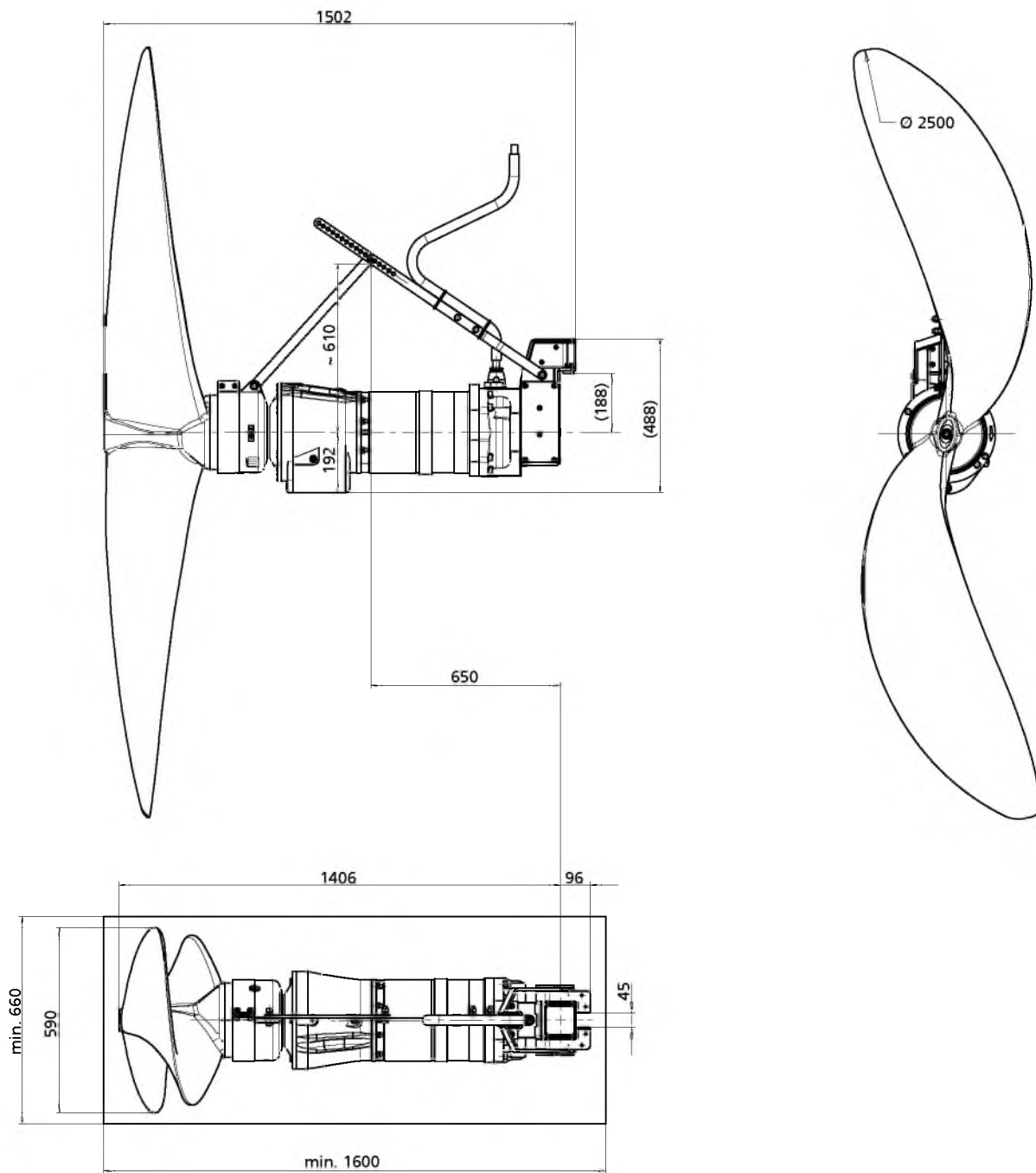


1 = attachment point

Minimum dimensions of access opening



Amaprop 2500
Dimensions [mm]

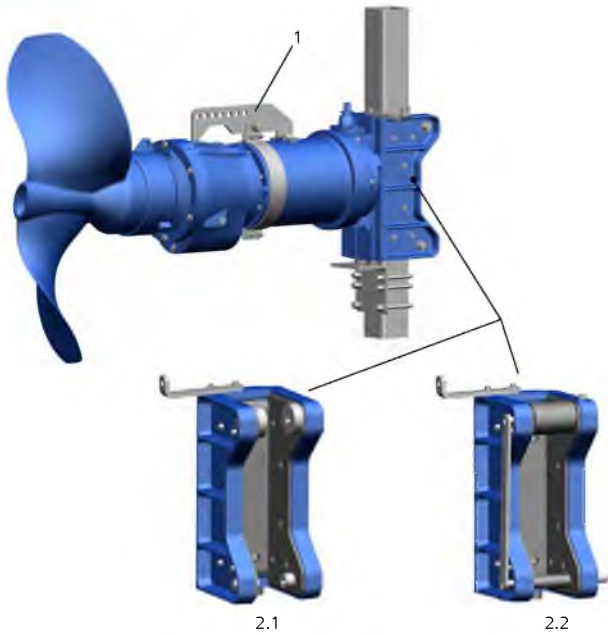


Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Submersible mixer, complete with lifting bail or supporting strap and power cable
- Guide bracket
- Gearboxes
- Two shackles (for lifting tackle and cable support)
- Cable support for properly routing the power cables
- Separate name plate

Amaprop 1000 and 1380:



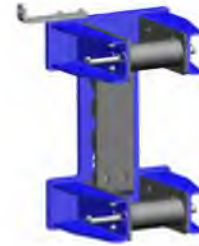
Amaprop 1000 with accessories set 22 and with accessories of other makes for gas-tight tanks

1	Supporting strap
2.1	Guide bracket with individual rollers (for accessories set 22 and for operation with mixer suspended from lifting equipment, with guide rail narrowing upwards. The guide bracket is mounted to the guide rail from the top; the rollers do not need to be removed/reassembled.)
2.2	Guide bracket (for operation with mixer suspended from lifting equipment. The guide bracket can be mounted to the guide rail from the side; the rollers need to be removed/reassembled.)

For Amaprop 1000 and 1380 guide brackets for guide rails of 100 x ≈150 mm and 150 x ≈150 mm are available as an option (surcharge, delivery time and dimensions on request). Selection of the guide bracket is based on the existing installation parts.

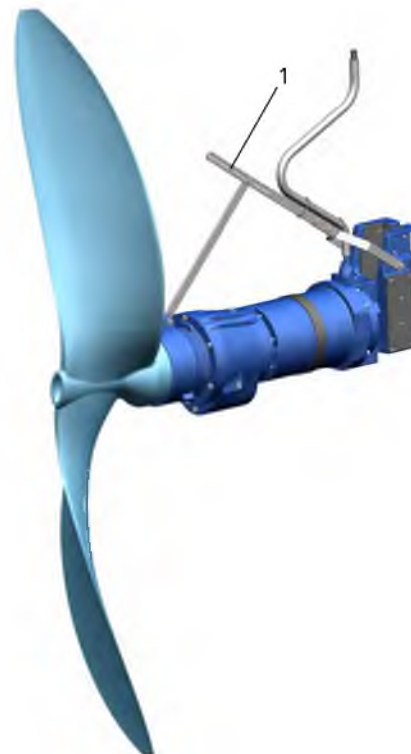


Guide bracket for guide rail 100 x ≈150 mm



Guide bracket for guide rail 150 x ≈150 mm

Amaprop 2500:



Amaprop 2500

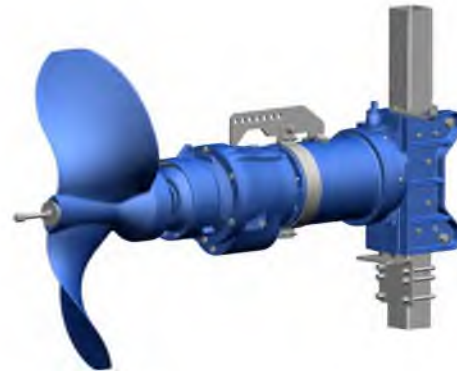
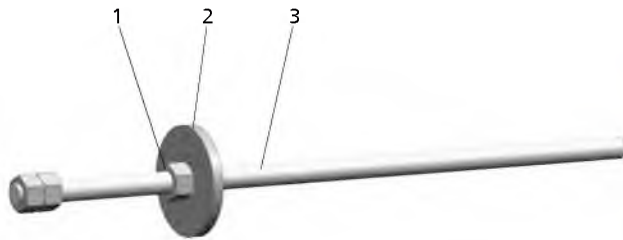
1	Lifting bail
---	--------------

Accessories

- Submersible mixer stand
- Forcing screw
- Propeller fitting tool
- Other accessories on request

Accessories

Propeller fitting tool



Propeller fitting tool

Propeller with propeller fitting tool

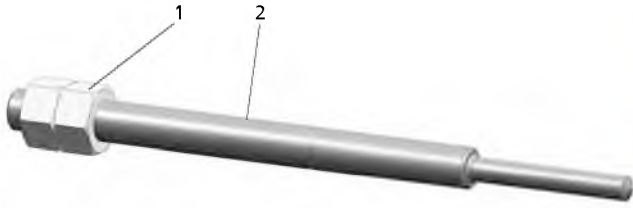
1	Nut
2	Disc
3	Fully threaded stud

The propeller fitting tool facilitates fitting the propeller on the submersible mixer shaft. The fully threaded stud (3) is screwed into the shaft, and the propeller and the disc (2) are placed on the shaft. The nut (1) is tightened up to the stop, pulling the propeller onto the shaft.

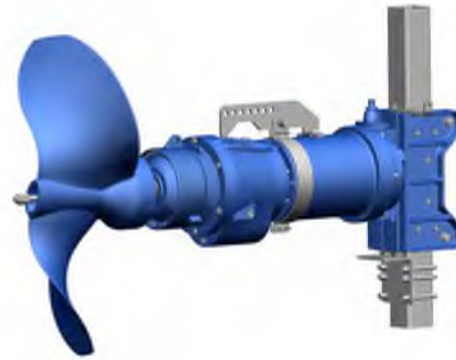
Accessory: propeller fitting tool

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Propeller fitting tool	X	X	X	A4-70	01428379	1.22

Forcing screw



Forcing screw



Propeller with forcing screw

1	Nut
2	Fully threaded stud

The forcing screw facilitates dismantling and pulling the propeller off the submersible mixer shaft. The hexagon socket head cap screw with washer is removed and the fully threaded stud (2) is screwed into the propeller's forcing thread up to the stop using the nut (1), pulling the propeller smoothly off the shaft.

Accessory: propeller forcing screw

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Forcing screw	-	X	-	A4-70	11306648	0.77
Forcing screw	X	-	X	A4-70	11306649	1.05

Cable support/carabine hook/strain relief device

Cable support

The cable support is used for supporting the power cable at the lifting rope or tank edge (one included in standard scope of supply; additional or spare cable supports available).

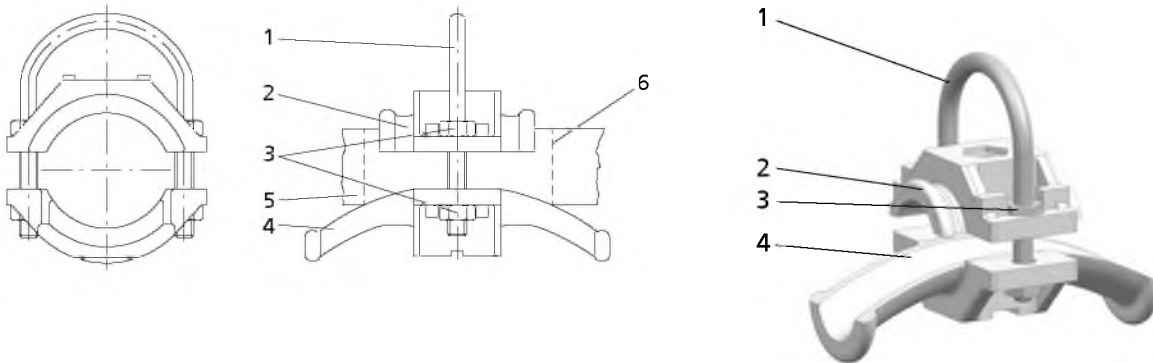
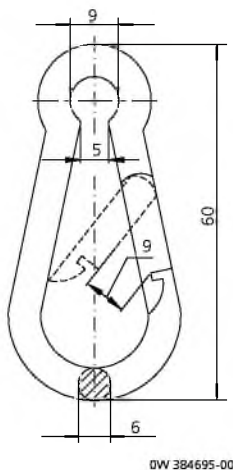


Illustration of cable support

1	U-bolt
2	Moulded part made of polypropylene
3	Hexagon nut made of A4
4	Moulded part made of polypropylene
5	Power cable with defined diameter ¹⁰⁾
6	Rubber pad

i For power cable diameters ≤ 17 mm a rubber pad is inserted to make sure the cable is clamped properly.

Carabine hook



DW 384695-00

Dimensions of carabine hook [mm]

Load-carrying capacity = 150 kg

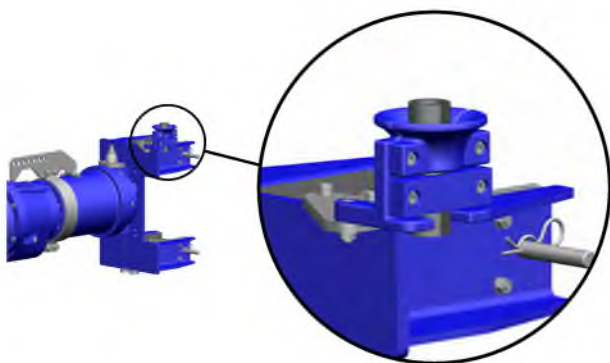
¹⁰⁾ Refer to the power cable data given in the motor catalogue.

Overview of cable supports/carabine hooks

Description	Amaprop			Suitable for motor				Material	Mat. No.	[kg]
	1000	1380	2500	6 4	11 4	16 4	23 4			
Cable support, incl. carabine hooks	✗	-	-	✗ ¹⁾	-	-	-	Cable support: plastic / A4, carabine hook: A4	19555523	0.09
Cable support, incl. carabine hooks	-	✗	-	✗ ¹⁾	✗ ¹⁾	✗ ¹⁾	✗ ¹⁾	Cable support: plastic / A4, carabine hook: A4	19555523	0.09
Cable support, incl. carabine hooks	-	-	✗	-	✗ ¹⁾	✗ ¹⁾	✗ ¹⁾	Cable support: plastic / A4, carabine hook: A4	19555523	0.09

Strain relief device

To relieve the strain of the power cable on Amaprop 1000 and 1380 a customer-specific strain relief device can be fitted as an option. Depending on the system, various strain relief devices are offered for the power cable. As an option, a KSB strain relief device can be fitted to the fastening points of the spacer.



Amaprop 1000 with guide bracket for guide rail 150 x 450 mm and fitted strain relief device for the power cable

Accessory: strain relief device for the power cable

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Strain relief device	✗	✗	-	EN-GJL-250	01608408	3.6

Lifting equipment

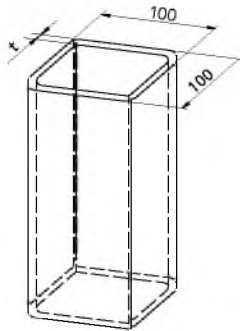
- See type series booklet "KSB Lifting Equipment" 1596.5

1) Diameter of power cable: Ø = 17-25 mm

Guide rails

The guide rail length required depends on the fluid level. Guide rails are supplied in standard lengths of 3 m or 6 m. Free guide rail ends should not protrude more than 0.5 m above the fluid surface. If the guide rail is to be fastened to the roofing structure, the guide rail length must be selected accordingly. If necessary, shorten the guide rails at the site.

For larger installation depths, the guide rails must be extended by adding guide rail extensions (3 m or 6 m). Welding and subsequent treatment must be performed at the site in accordance with the relevant regulations. To allow smooth lifting and lowering of the submersible mixers, the weld seam at the outside of the guide rail must be ground down to a max. projection of 0.5 mm.



UG 1145303

t = 5 mm

Square guide rail to DIN EN 10219-2

Amaprop 1000 and 1380

Overview of guide rails for Amaprop 1000/1380¹²⁾

Description	Length	Material	Mat. No.	[kg]
	[m]			
Guide rail 100 x 100 x 5 mm	3,0	1.4301	11304598	43.2
Guide rail 100 x 100 x 5 mm	3,0	1.4571	11304599	43.2
Guide rail 100 x 100 x 5 mm	6,0	1.4301	11304600	86.4
Guide rail 100 x 100 x 5 mm	6,0	1.4571	11304601	86.4

Amaprop 2500

Overview of guide rails and installation types for Amaprop 2500

Guide rail		Free-standing	With upper holder
Length	Cross-section		
[m]			
< 7	100 x 100 x 5	X	X ¹³⁾
< 9	100 x 100 x 5	-	X
> 9	100 x 100 x 5	-	X

¹²⁾ In biogas digester: 1.4571 as standard; in mixing tank and digestate storage tank: 1.4301 as standard / 1.4571 on option

¹³⁾ Only if guide rail is not fastened to roofing structure

Overview of guide rails, high and low position, for Amaprop 2500

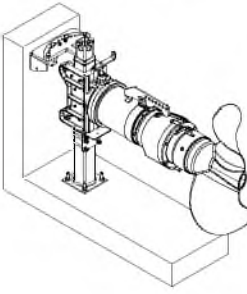
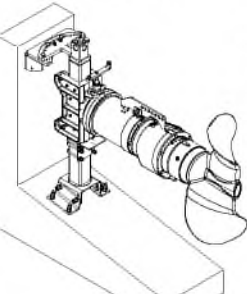
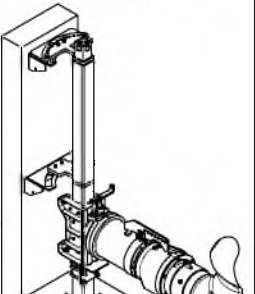
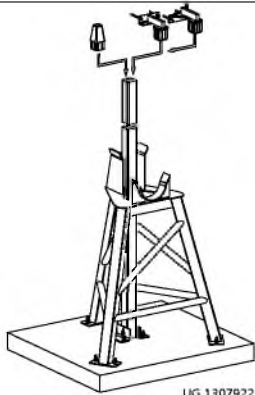
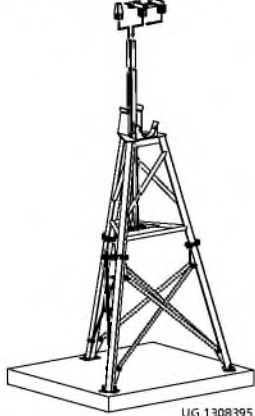
Description	Length	Material	Mat. No.	[kg]
	[m]			
Guide rail 100 x 100 x 5 mm ¹⁴⁾	3,0	1.4571	11304599	43.2
Guide rail 100 x 100 x 5 mm ¹⁴⁾	3,0	1.4571	11304601	86.4

¹⁴⁾ If guide rail cannot be fastened to roofing structure: always combined with insert sleeve

Installation accessories

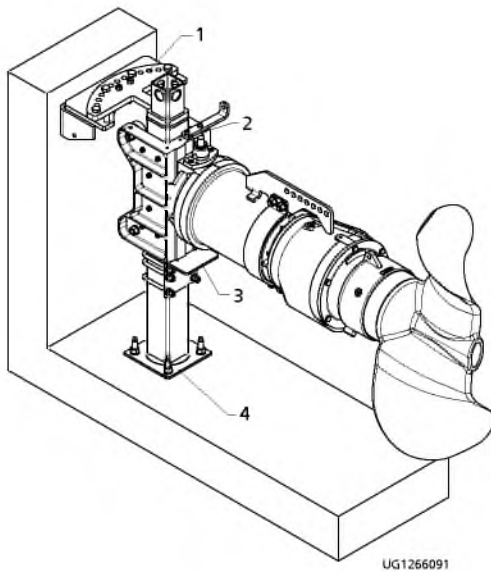
Overview of installation accessories

Overview of installation accessories for Amaprop 1000/1380 and Amaprop 2500

Accessories	Installation example		
<p>Amaprop 1000 and 1380 Accessories set 22</p>	<p>Mounting on tank wall and horizontal tank floor (0 - 0.5°) (⇒ Page 22)</p> 	<p>Mounting on tank wall and sloping tank floor (0.5° - 10°) (⇒ Page 24)</p> 	<p>Middle support for guide rail 100 x 100 x 5, for large installation depths (⇒ Page 26)</p> 
<p>Amaprop 2500 Low-position submersible mixer stand</p>	 <p>UG 1307922</p> <p>Free-standing installation on horizontal tank floor in biogas digesters (near-floor position) (⇒ Page 28)</p>		
<p>High-position submersible mixer stand</p>	 <p>UG 1308395</p> <p>Free-standing installation on horizontal tank floor in biogas digesters (near-surface position) (⇒ Page 28)</p>		

Accessories set 22 - Amaprop 1000 and 1380

For mounting at the top of the tank wall and on a horizontal tank floor (0° - 0.5°), level-adjustable and with horizontal swivelling option.



Installation example: Amaprop 1000 and 1380 mounted on tank wall and horizontal tank floor

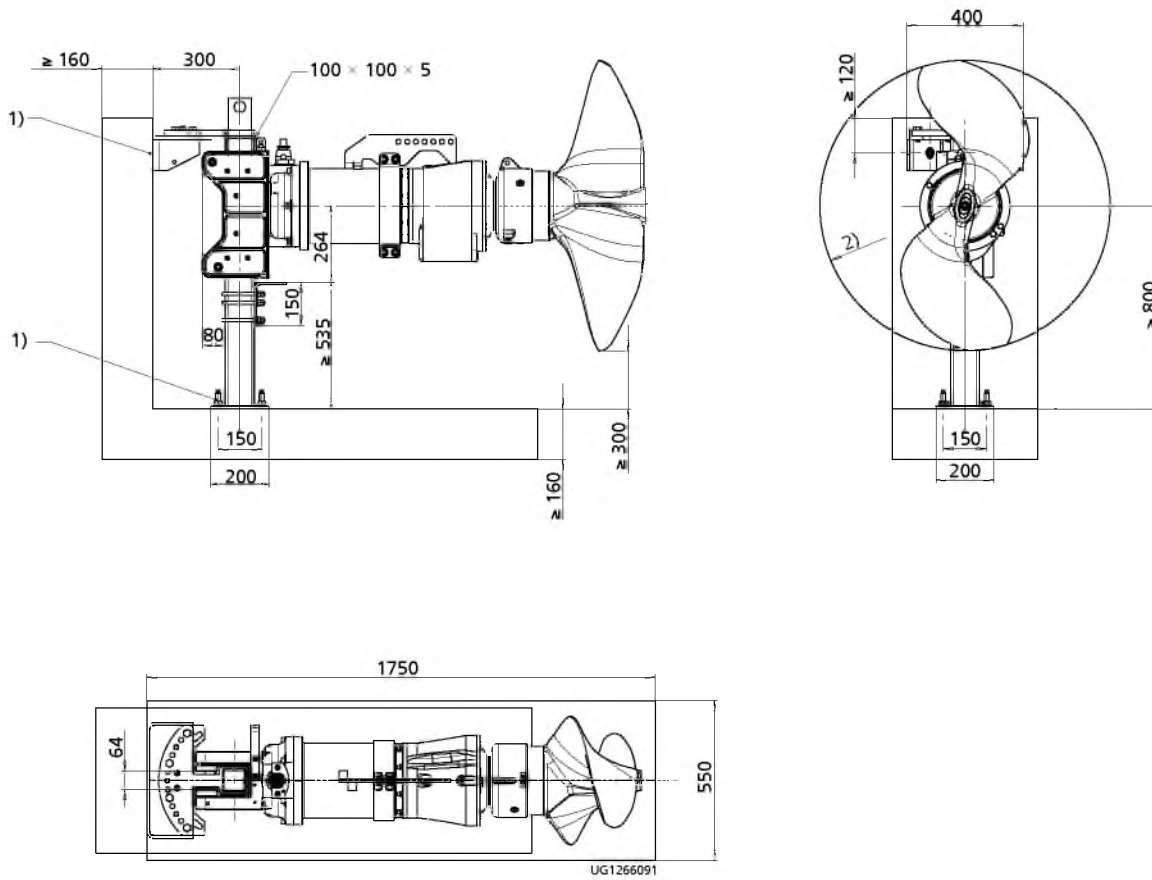
1	Upper holder
2	Guide rail
3	Retaining bracket
4	Lower holder

Accessories set 22 - Mounting on tank wall and horizontal tank floor

Description	Material	Mat. No.	[kg]
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313459	23.23
Guide rail	(⇒ Page 19)		
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4571	19202370	3.5
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4301	01118892	5.68
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4571	01118903	5.68

General arrangement drawing of accessories set 22 -
Amaprop 1000 and 1380

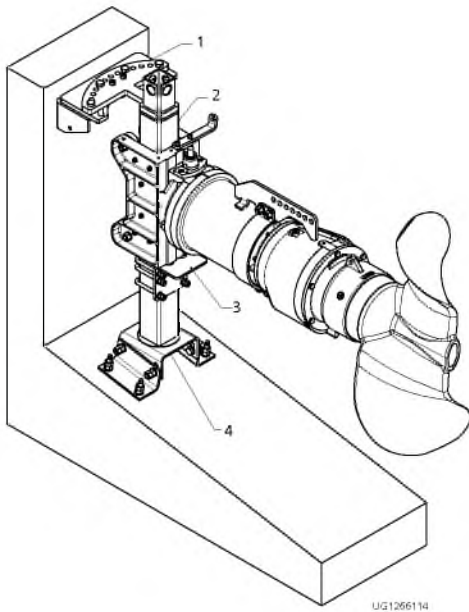
For mounting at the top of the tank wall and on a horizontal
tank floor (0° - 0.5°), level-adjustable and with horizontal
swivelling option.



Installation of accessories set 22 - Amaprop 1000 and 1380

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: $\varnothing = 1000$ mm, Amaprop 1380: $\varnothing = 1380$ mm

For mounting on tank wall and sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option



UG1266114

Installation example: Amaprop 1000 and 1380 mounted on sloping tank floor

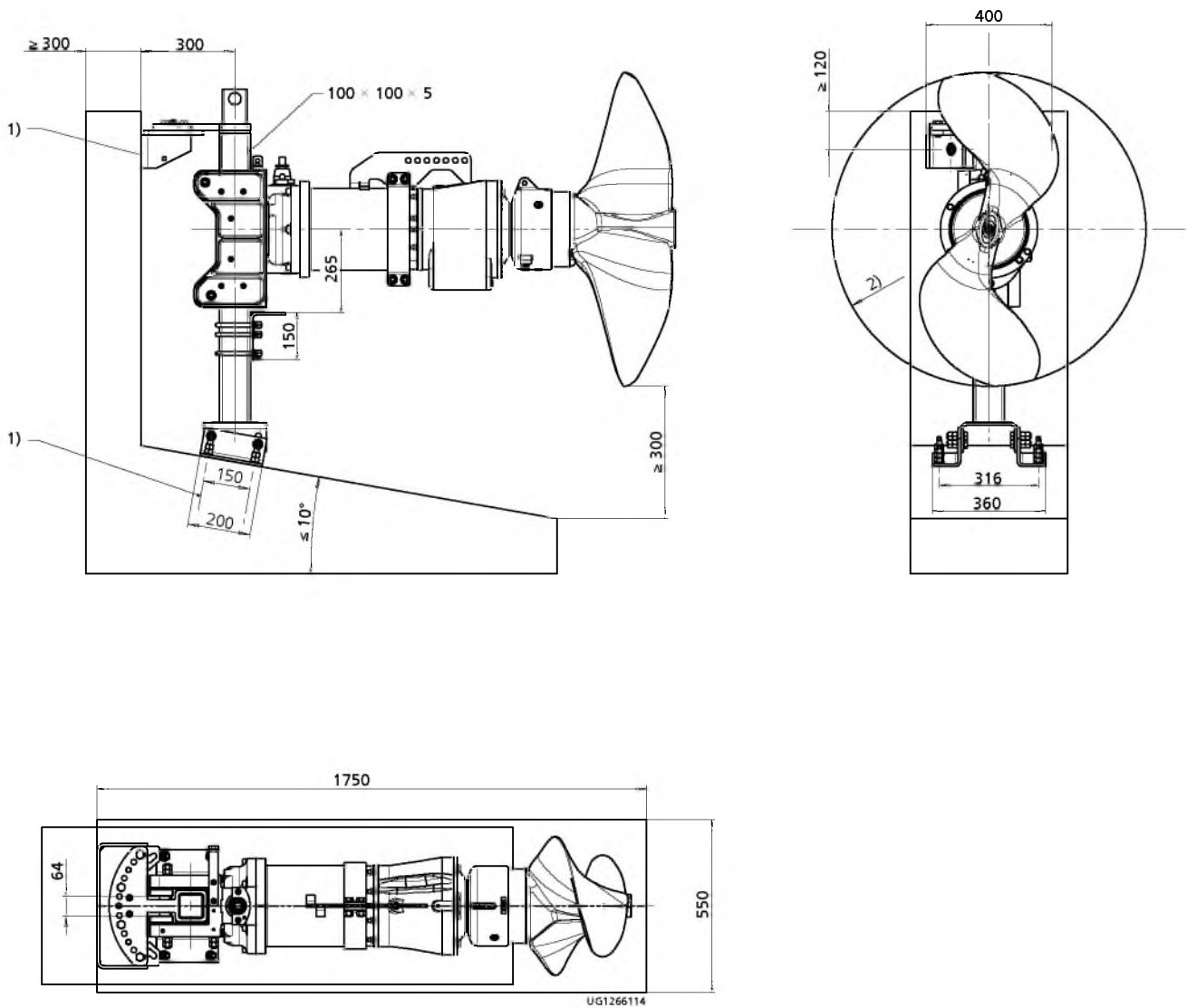
1	Upper holder
2	Guide rail
3	Retaining bracket
4	Lower holder

Accessories set 22 - Mounting on tank wall and sloping tank floor

Description	Material	Mat. No.	[kg]
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313459	23.23
Guide rail	(→ Page 19)		
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4571	19202370	3.5
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4301	01118906	11.92
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4571	01118907	11.92

General arrangement drawing of accessories set 22 -
Amaprop 1000 and 1380

For mounting at the top of the tank wall and on a sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option.

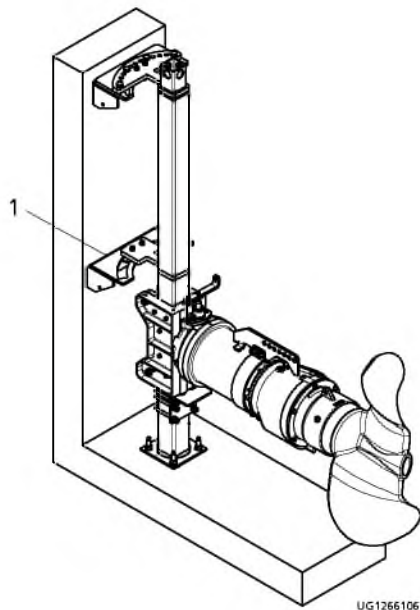


Installation of accessories set 22 - Amaprop 1000 and 1380

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: Ø 1000 mm, Amaprop 1380: Ø 1380 mm

Middle support

Middle support for guide rail 100 x 100 x 5 mm, for large installation depths



Installation example: Amaprop 1000 and 1380 mounted on tank edge and horizontal tank floor

1	Middle support
---	----------------

Amaprop 1000, required middle support; guide rail length 6 m

Size	T	Middle support required
	[°C]	
J 166-1000/114URG/YRG	45	-
J 175-1000/164URG/YRG	45	-
J 184-1000/164URG/YRG	45	-
J 192-1000/164URG/YRG	45	-
J 185-1000/164URG/YRG	45	-
J 208-1000/234URG/YRG	45	X
J 166-1000/164WRG/ZRG	60	-
J 174-1000/164WRG/ZRG	60	-
J 181-1000/234WRG/ZRG	60	-
J 184-1000/234WRG/ZRG	60	-
J 189-1000/234WRG/ZRG	60	-

Amaprop 1000, required middle support; guide rail length 8 m

Size	T	Middle support required
	[°C]	
J 166-1000/114URG/YRG	45	-
J 175-1000/164URG/YRG	45	-
J 184-1000/164URG/YRG	45	X
J 192-1000/164URG/YRG	45	X
J 185-1000/164URG/YRG	45	X
J 208-1000/234URG/YRG	45	X
J 166-1000/164WRG/ZRG	60	-
J 174-1000/164WRG/ZRG	60	-
J 181-1000/234WRG/ZRG	60	X
J 184-1000/234WRG/ZRG	60	X
J 189-1000/234WRG/ZRG	60	X

Amaprop 1380, required middle support; guide rail length 6 m

Size	T	Middle support required
	[°C]	
J 88-1380/64URG/YRG	45	-
J 99-1380/114URG/YRG	45	-
J 105-1380/114URG/YRG	45	-

Size	T	Middle support required
	[°C]	
J 114-1380/164URG/YRG	45	-
J 88-1380/64WRG/ZRG	60	-
J 99-1380/164WRG/ZRG	60	-
J 105-1380/164WRG/ZRG	60	-
J 114-1380/234WRG/ZRG	60	-

Amaprop 1380, required middle support; guide rail length 8 m

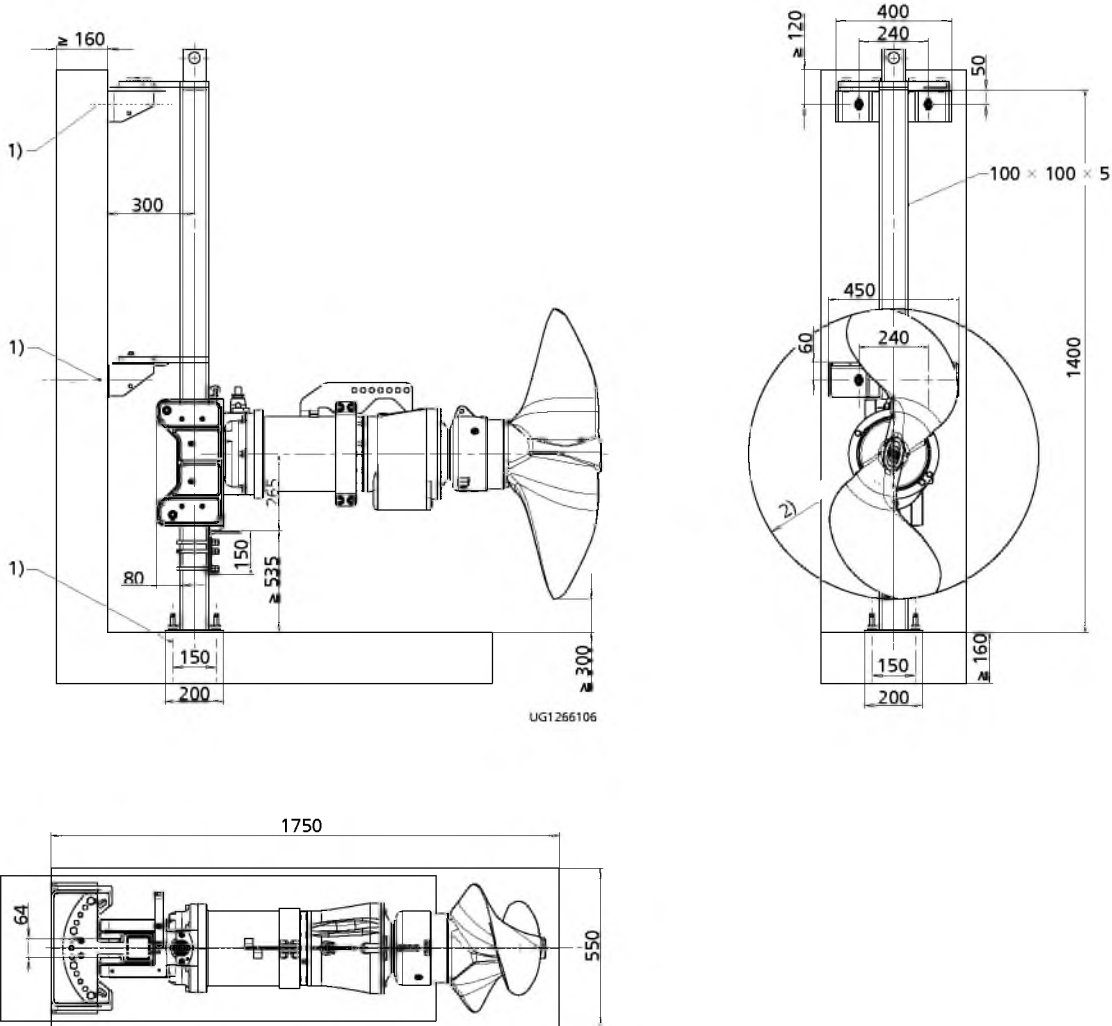
Size	T	Middle support required
	[°C]	
J 88-1380/64URG/YRG	45	-
J 99-1380/114URG/YRG	45	-
J 105-1380/114URG/YRG	45	X
J 114-1380/164URG/YRG	45	X
J 88-1380/64WRG/ZRG	60	-
J 99-1380/164WRG/ZRG	60	-
J 105-1380/164WRG/ZRG	60	X
J 114-1380/234WRG/ZRG	60	X

Standard accessories set 22 - Middle support for guide rail 100 x 100 x 5 mm, for large installation depths

Description	Material	Mat. No.	[kg]
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313462	19.26
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313463	19.26

General arrangement drawing of accessories set 22 - Amaprop 1000 and 1380

For mounting at the top of the tank wall and on a horizontal tank floor (0° - 0.5°), level-adjustable and with horizontal swivelling option.



Installation of accessories set 22 - Amaprop 1000 and 1380

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: Ø = 1000 mm, Amaprop 1380: Ø = 1380 mm

Standard accessories - low-position and high-position biogas stands

Design details

Design

- Stand (tripod)
- Square guide rail
- Retaining bracket

Optional:

- 3 leg extensions (for high position only)
- 6 diagonal struts (for high position only)
- Square guide rail extension

Fastening

- The submersible mixer stand is fastened on the tank floor with chemical anchors.

Guide rail

- Cross-section: 100 x 100 mm
- Wall thickness: 3 or 5 mm (depending on guide rail length and fastening of upper guide rail end)
- Material 1.4571

Installation types

- Free-standing, without upper holder
- With upper holder mounted on the tank wall or roofing structure



Submersible mixer stand
Low position

Free-standing,
with insert sleeve

Installation
with upper holder

Submersible mixer stand
High position

Free-standing,
with insert sleeve

Installation
with upper holder

Scope of supply

Depending on the model, the following items are included in the scope of supply:

Submersible mixer stand - Low position

- Stand (tripod)



- Square guide rail/Square guide rail extension, if necessary



- Retaining bracket for square guide rail (2 pcs.)



- Insert sleeve or upper holder (fixed or with swivelling option)



- Chemical anchor (6 pcs.)



- Installation accessories



- Installation accessories



Submersible mixer stand - High position

- Stand (tripod)



- Square guide rail/Square guide rail extension, if necessary



- Retaining bracket for square guide rail (2 pcs.)



- Leg extensions (3 pcs.)



- Diagonal strut (6 pcs.)



- Insert sleeve or upper holder (fixed or with swivelling option)



- Chemical anchor (10 pcs.)

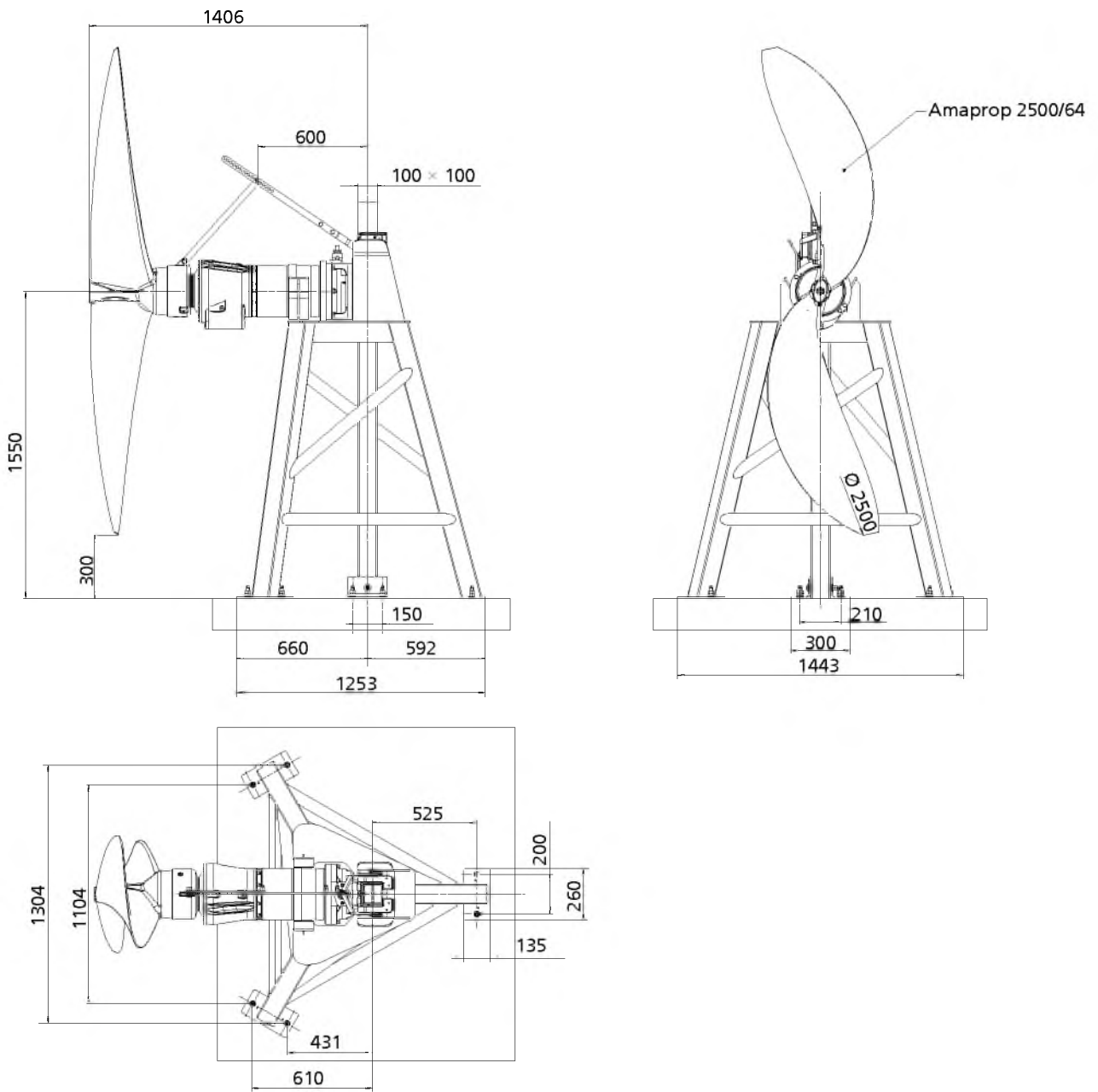
Standard accessories: submersible mixer stand for Amaprop 2500

Standard accessories: submersible mixer stand for Amaprop 2500

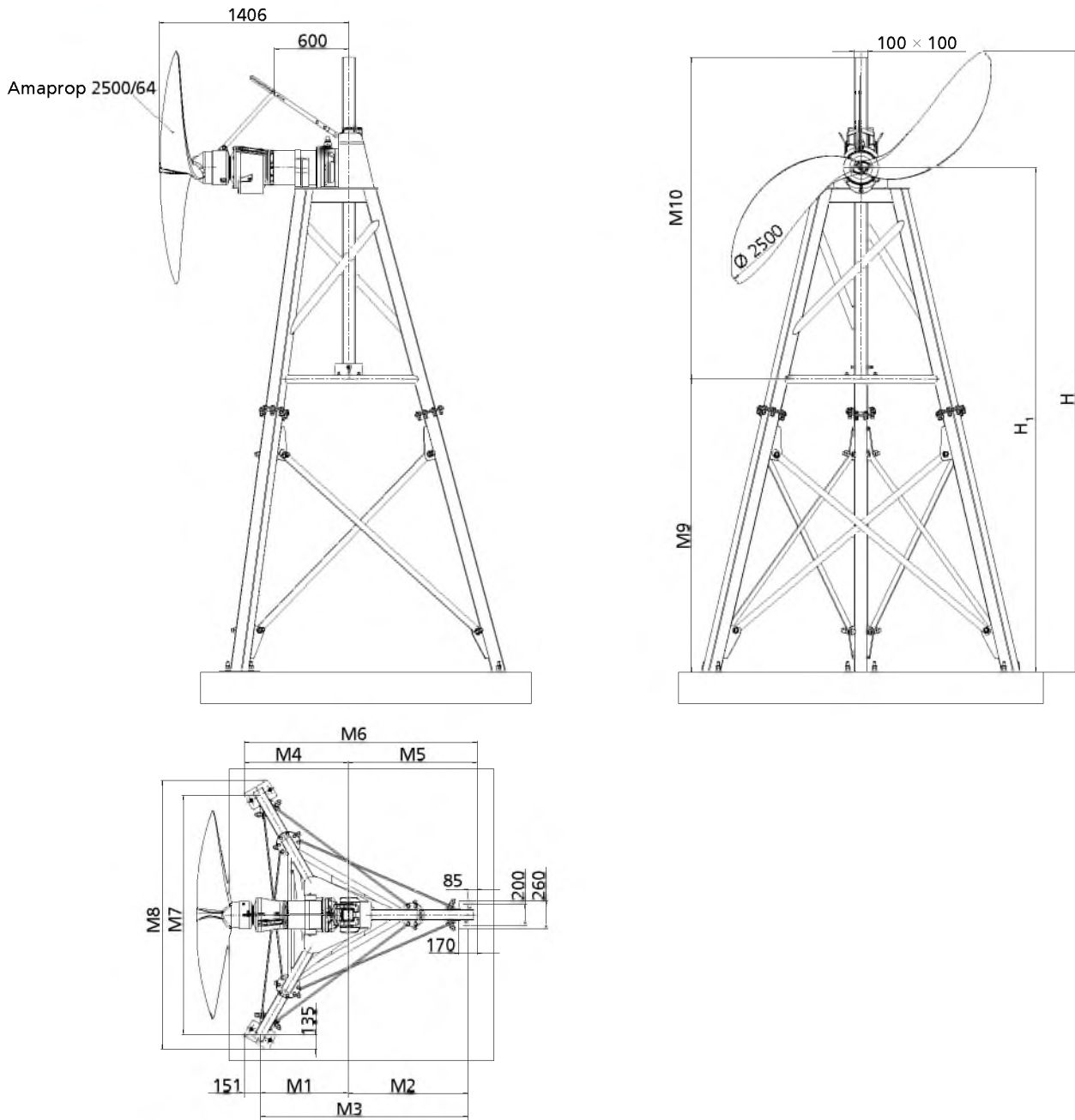
Description	Mat. No.	Material	[kg]
Submersible mixer stand for low-position installation			
Submersible mixer stand (incl. installation accessories), mixer shaft centreline height: 1550 mm above tank floor	01205324	1.4301	177
Submersible mixer stand for high-position installation			
Tripod (incl. installation accessories), upper part of submersible mixer stand, identical for all shaft centreline heights	01213034	1.4301	217
Leg extensions (3 pcs.), shaft centreline height: 3.0 m to 4.5 m	01213223	1.4301	18.9 to 32.9
Leg extensions (3 pcs.), shaft centreline height: 4.5 m	01200190	1.4301	48,7
Leg extensions (3 pcs.), shaft centreline height: 8.0 m	01200190	1.4301	101,4
Diagonal struts (6 pcs.), shaft centreline height up to 3 m ¹⁵⁾	01201525	1.4301	6.4
Diagonal struts (6 pcs.), shaft centreline height: 3.01 m to 3.50 m	01201526	1.4301	7.8
Diagonal struts (6 pcs.), shaft centreline height: 3.51 m to 4.00 m	01200192	1.4301	9.75
Diagonal struts (6 pcs.), shaft centreline height: 4.01 m to 4.50 m	01201543	1.4301	11.7
Diagonal struts (6 pcs.), shaft centreline height: 4.51 m to 5.00 m	01201544	1.4301	15.6
Diagonal struts (6 pcs.), shaft centreline height: 5.01 m to 5.50 m	01201546	1.4301	17.55
Diagonal struts (6 pcs.), shaft centreline height: 5.51 m to 6.00 m	01201557	1.4301	19.5
Diagonal struts (6 pcs.), shaft centreline height: 6.01 m to 6.50 m	01201558	1.4301	21.45
Diagonal struts (6 pcs.), shaft centreline height: 6.51 m to 7.00 m	01201559	1.4301	23.4
Upper holder			
Upper holder 90°, additional holder for supporting the top end of the guide rail 100 x 100 x 3 mm, incl. 2 chemical anchors	01189497	1.4571	7.35
Upper holder 45°/60°/75°, additional holder for supporting the top end of the guide rail 100 x 100 x 3 mm, incl. 2 chemical anchors	01189499	1.4571	8.15
Upper holder 90°, additional holder for supporting the top end of the guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	01108430	1.4571	7.35
Upper holder 45°/60°/75°, additional holder for supporting the top end of the guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	01108432	1.4571	8.15
Insert sleeve			
Insert sleeve for guide rail 100 x 100 x 5 mm	11306485	PP	0.8

¹⁵⁾ No diagonal struts required for shaft centreline heights of 2.2 m and 2.5 m

General arrangement drawing



Amaprop biogas mixer stand - Low position



Amaprop biogas mixer stand - High position

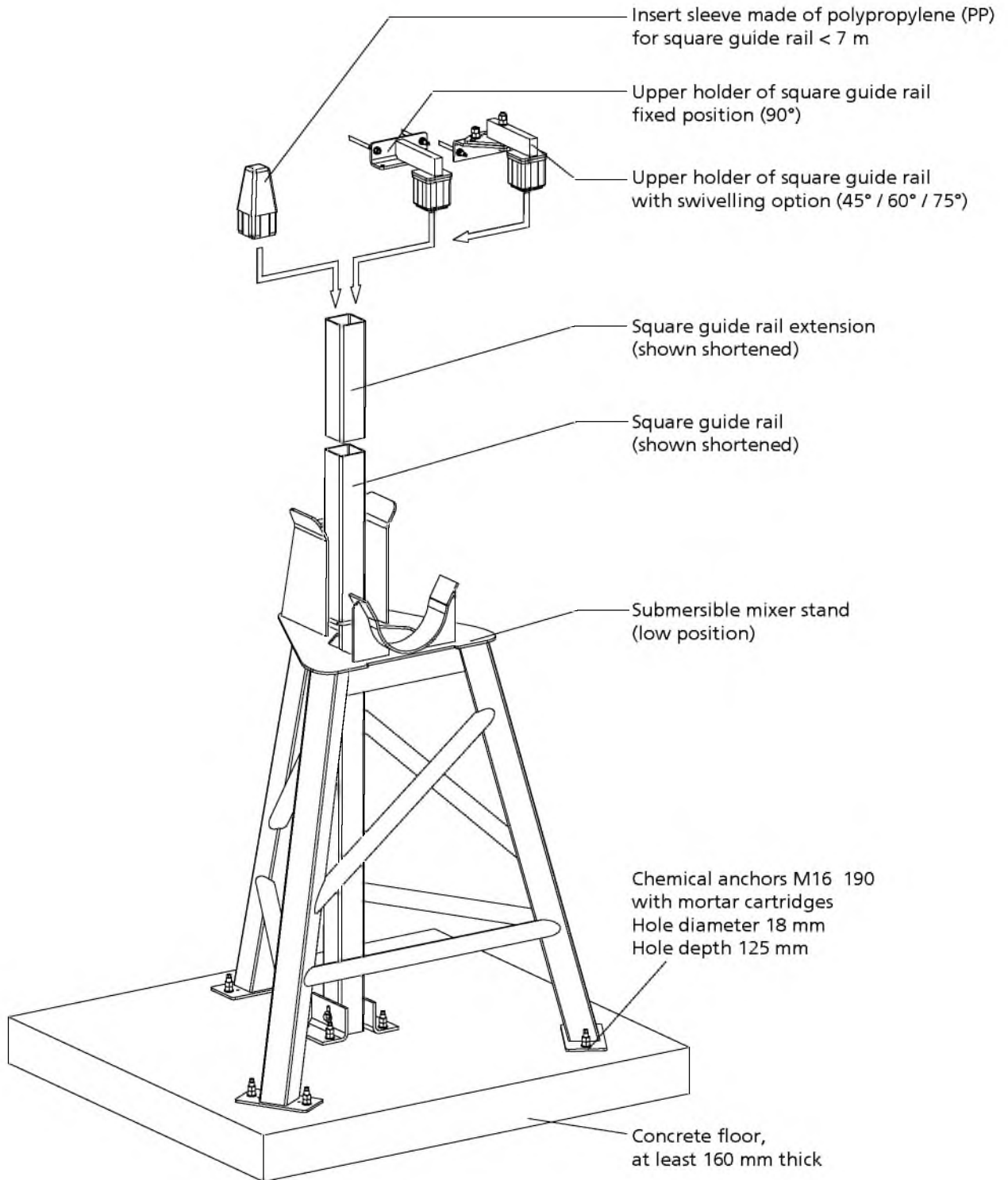
Amaprop biogas mixer stand - High position

H	H ₁	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3450	2200	604	696	1300	755	781	1536	1500	1770	635	3615
3750	2500	644	777	1420	795	862	1656	1640	1910	935	3615
4250	3000	711	911	1621	862	996	1857	1872	2142	1435	3615
4350	3100	724	937	1662	875	1022	1898	1918	2188	1535	3615
4450	3200	738	964	1702	889	1049	1938	1965	2235	1635	3615
4550	3300	751	991	1742	902	1076	1978	2011	2281	1735	3615
4650	3400	764	1018	1782	915	1103	2018	2057	2327	1835	3615
4750	3500	778	1045	1822	929	1130	2058	2104	2374	1935	3615
4850	3600	791	1071	1863	942	1156	2099	2150	2420	2035	3615
4950	3700	805	1098	1903	956	1183	2139	2197	2467	2135	3615

H	H ₁	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
5000	3750	811	1112	1923	962	1197	2159	2220	2490	2185	3615
5050	3800	818	1125	1943	969	1210	2179	2243	2513	2235	3615
5150	3900	831	1152	1983	982	1237	2219	2289	2559	2335	3615
5250	4000	845	1179	2023	996	1264	2259	2336	2606	2435	3615
5350	4100	858	1205	2064	1009	1290	2300	2382	2652	2535	3615
5450	4200	872	1232	2104	1023	1317	2340	2429	2699	2635	3615
5550	4300	885	1259	2144	1036	1344	2380	2475	2745	2735	3615
5650	4400	898	1286	2184	1049	1371	2420	2521	2791	2835	3615
5750	4500	912	1313	2224	1063	1398	2460	2568	2838	2935	3615
5850	4600	925	1339	2265	1076	1424	2501	2614	2884	3035	3615
5950	4700	939	1366	2305	1090	1451	2541	2661	2931	3135	3615
6050	4800	952	1393	2345	1103	1478	2581	2707	2977	3235	3615
6150	4900	965	1420	2385	1116	1505	2621	2753	3023	3335	3615
6250	5000	979	1447	2425	1130	1532	2661	2800	3070	3435	3615
6350	5100	992	1473	2465	1143	1558	2701	2846	3116	3535	3615
6450	5200	1006	1500	2506	1157	1585	2742	2893	3163	3635	3615
6550	5300	1019	1527	2546	1170	1612	2782	2939	3209	3735	3615
6650	5400	1032	1554	2586	1183	1639	2822	2986	3256	3835	3615
6750	5500	1046	1580	2626	1197	1665	2862	3032	3302	3935	3615
6850	5600	1059	1607	2666	1210	1692	2902	3078	3348	4035	3615
6950	5700	1073	1634	2707	1224	1719	2943	3125	3395	4135	3615
7050	5800	1086	1661	2747	1237	1746	2983	3171	3441	4235	3615
7150	5900	1099	1688	2787	1250	1773	3023	3218	3488	4335	3615
7250	6000	1113	1714	2827	1264	1799	3063	3264	3534	4435	3615
7350	6100	1126	1741	2867	1277	1826	3103	3310	3580	4535	3615
7450	6200	1140	1768	2908	1291	1853	3144	3357	3627	4635	3615
7550	6300	1153	1795	2948	1304	1880	3184	3403	3673	4735	3615
7650	6400	1166	1822	2988	1317	1907	3224	3450	3720	4835	3615
7750	6500	1180	1848	3028	1331	1933	3264	3496	3766	4935	3615
7850	6600	1193	1875	3068	1344	1960	3304	3542	3812	5035	3615
7950	6700	1207	1902	3109	1358	1987	3345	3589	3859	5135	3615
8050	6800	1220	1929	3149	1371	2014	3385	3635	3905	5235	3615
8150	6900	1233	1956	3189	1384	2041	3425	3682	3952	5335	3615
8250	7000	1247	1982	3229	1398	2067	3465	3728	3998	5435	3615

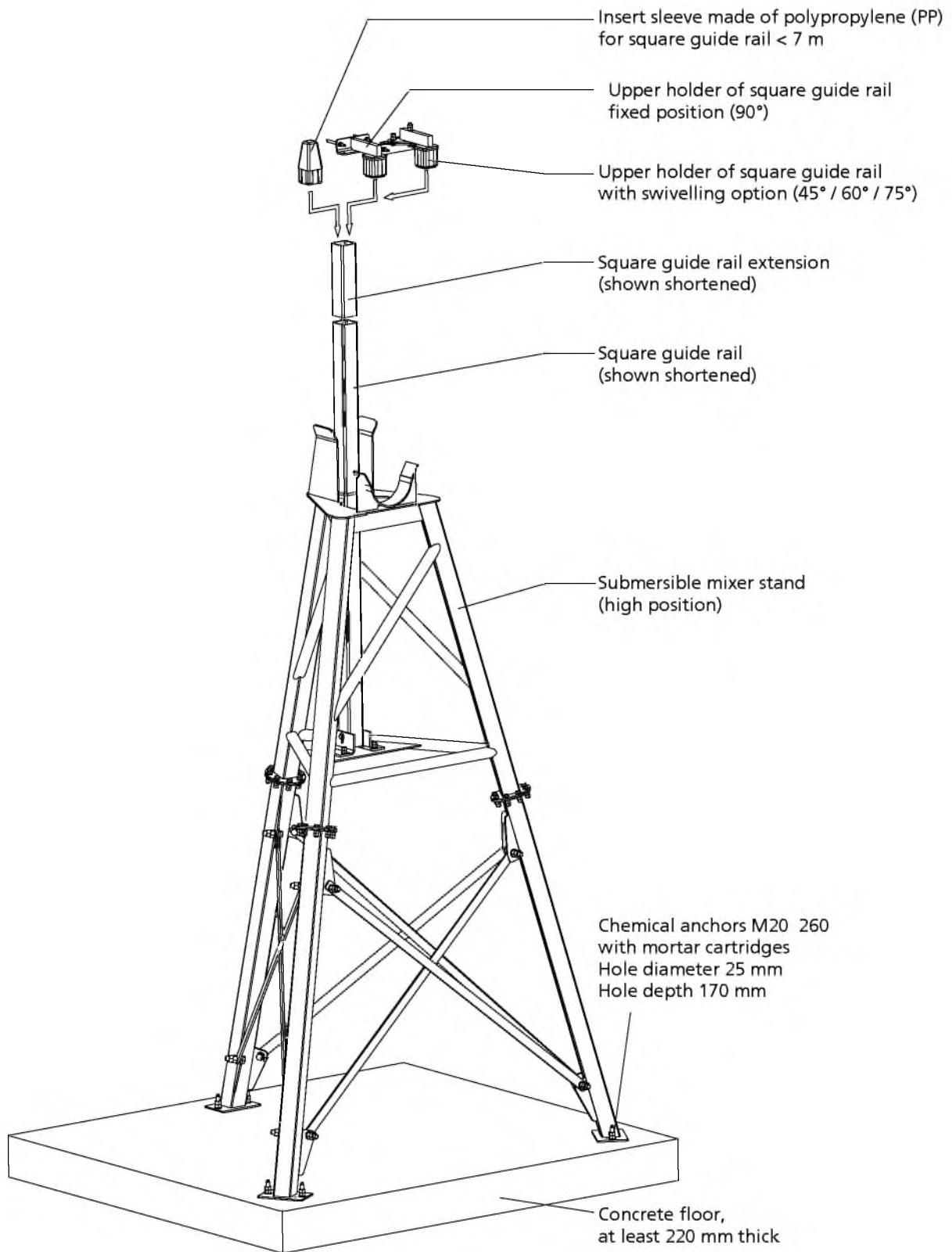
General assembly drawing showing individual components

Biogas mixer stand - Low position



Biogas mixer stand - Low position

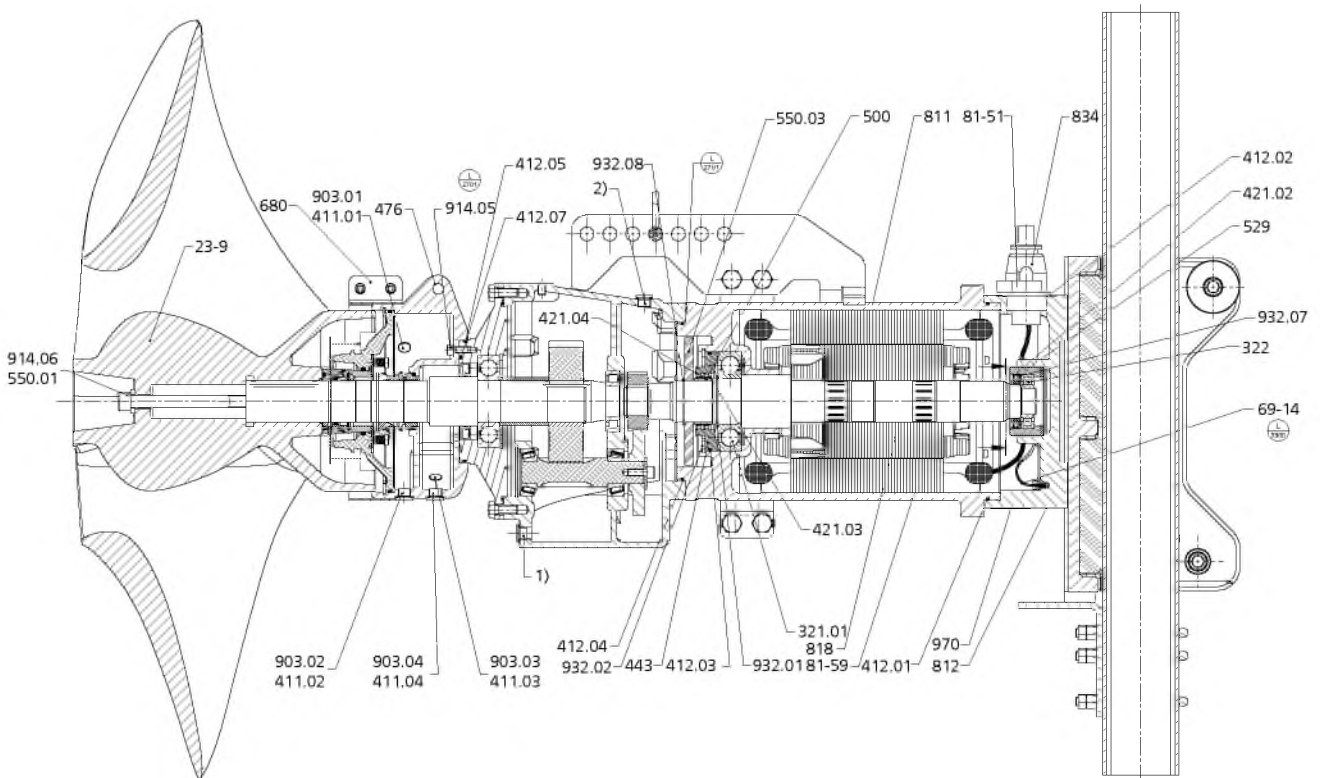
Biogas mixer stand - High position



Biogas mixer stand - High position

General assembly drawings with list of components

Amaprop J 1000



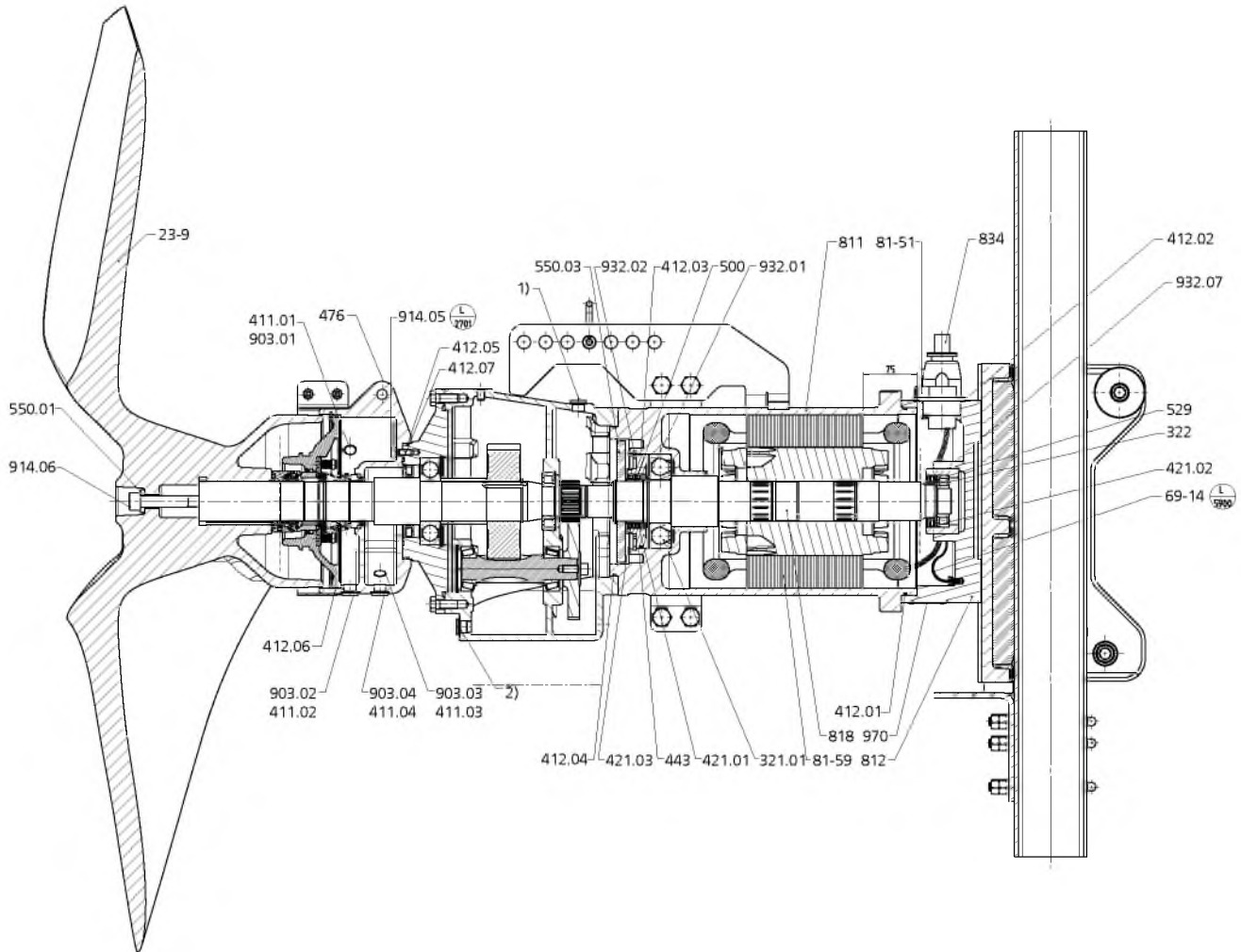
General assembly drawing of Amaprop J 1000

1)	Oil drain plug
2)	Oil filler plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	680	Guard
321.01	Radial ball bearing	81-51	Shim
322	Radial roller bearing	81-59	Stator
411.01/02/03/04	Joint ring	811	Motor housing
412.01/03/04/05/07	O-ring	812	Motor housing cover
421.01/02/03/04	Lip seal	818	Rotor
443	Seal insert	834	Cable gland
476	Mating ring carrier	903.01/02/03/04	Screw plug
500	Ring	914.05/06	Hexagon socket head cap screw
529	Bearing sleeve	932.01/02/07/08	Circlip
550.01/03	Disc	970	Label/plate
69-14	Leakage monitor		

Amaprop J 1380



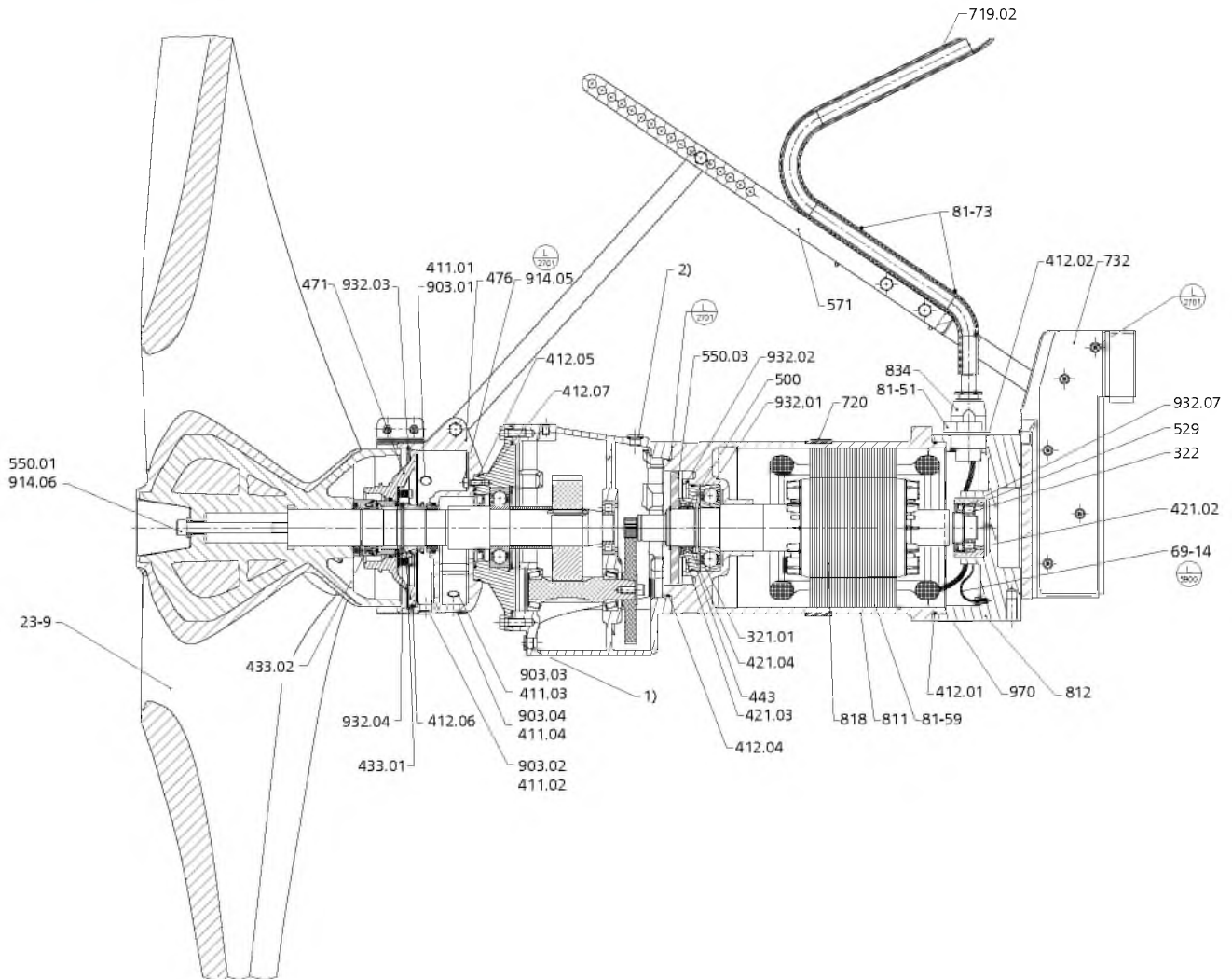
General assembly drawing of Amaprop J 1380

1)	Oil filler plug
2)	Oil drain plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	69-14	Leakage monitor
321.01	Radial ball bearing	81-51	Clamping element
322	Radial roller bearing	81-59	Stator
411.01/.02/.03/.04	Joint ring	811	Motor housing
412.01/.02/.03/.04/.05/.06/.07	O-ring	812	Motor housing cover
421.02/.03/.04	Lip seal	818	Rotor
443	Seal insert	834	Cable gland
476	Mating ring carrier	903.01/.02/.03/.04	Screw plug
500	Ring	932.01/.02/.07	Circlip
529	Bearing sleeve	914.06	Hexagon socket head cap screw
550.01/.03	Disc	970	Label/plate

Amaprop K 2500



General assembly drawing of Amaprop K 2500

1)	Oil drain plug
2)	Oil filler plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	69-14	Leakage monitor
321.01	Radial ball bearing	719.02	Sheathing
322	Radial roller bearing	720	Fitting
411.01/02/03/04	Joint ring	732	Guide bracket
412.01/02/04/05/06/07	O-ring	81-51	Shim
421.02/03/04	Lip seal	81-59	Stator
433.01	Mechanical seal (gear side)	81-73	Cable support
433.02	Mechanical seal (propeller side)	811	Motor housing
443	Seal insert	812	Motor housing cover
471	Seal cover	818	Rotor
476	Mating ring carrier	834	Cable gland
500	Ring	903.01/02/03/04	Screw plug
529	Bearing sleeve	914.05/06	Hexagon socket head cap screw
550.01/03	Disc	932.01/02/03/04/07	Circlip
571	Lifting bail	970	Label/plate
680	Guard		

Enquiry sheet

To:
KSB Aktiengesellschaft
Turmstraße 92
06110 Halle/Saale (Germany)
Tel.: +49 345 4826-4648/4929
Fax: +49 345 4826-5107

From:

Company name	
Contact person	
Street/number	
Post/zip code, city	
Country	
Telephone number	
Fax number	
E-mail	

Project name

Mains frequency:

- 50 Hz
 60 Hz

Mains voltage:

U [V]	
-------	--

Digestion process

Type of digestion process

- Mesophilic/thermophilic
 Substrate preparation
 Wet digestion
 Dry digestion
 External hydrolysis stage
 Other:

Tank (round)

Tank type:

- Main digester
 Post-digester
 Mixing tank (open/closed)
 Digestate storage tank (open/closed)

Material:

- Concrete
 Steel
 Stainless steel
 Steel, enamelled

Coating:

Explosion protection:

- Yes
 No

Inside diameter:

D [ft]	
D [m]	

Tank height:

D [ft]	
H [m]	

Fill level:

H [ft]	
H [m]	

Fill volume:

V [ft ³]	
V [m ³]	

Expected dry solids content:

[%]	
-----	--

Temperature:

T [°F]	
T [°C]	

Fluctuating fill levels (from/to):

[ft]	
[m]	

Tank roof design:

- Concrete
 Membrane

Fluid

Type of substrate input:

- Wet input
- Dry input

Type of fluid:

<input type="checkbox"/> Maize/corn silage	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Grass silage	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Rye (whole plant silage)	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Semi-liquid cattle manure	[ft ³ /d]	
	[m ³ /h]	
<input type="checkbox"/> Dry chicken manure	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Semi-liquid pig manure	[ft ³ /d]	
	[m ³ /h]	
<input type="checkbox"/> Centrate	[ft ³ /d]	
	[m ³ /h]	
<input type="checkbox"/> Other:	[cwt/d]	
	[t/d]	
	[ft ³ /d]	
	[m ³ /h]	

Total dry solids content of substrates:

[%]	
-----	--

Other:

Submersible Mixer

Amamix

Type Series Booklet



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Type Series Booklet Amamix

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Waste Water

Submersible Mixer

Amamix



Main applications

- Mixing
- Homogenisation
- Sludge thickening
- Sludge holding tanks
- Primary sedimentation tanks
- Secondary sedimentation tanks
- Heat transfer optimisation
- Maintaining clean pump sumps
- Preventing the formation of deposits at tank walls and floors
- Breaking up and transporting floating sludge

Fluids handled

- Industrial waste water
- Waste water with faeces
- Faecal-free waste water
- Activated sludge
- Digested sludge
- Raw sludge

Operating data

Operating properties

Characteristic		Value
Propeller diameter	D [mm]	225 - 630
Power range	P [kW]	≤ 10
Fluid temperature	T [°C]	≤ 40
Installation depth	ET [m]	≤ 30

Designation

Example: Amamix C 57 3 5 R / 10 12 YD G

Designation key

Code	Description	
Amamix	Type series	
C	Propeller material	
	C	Stainless steel
G	Grey cast iron	
57	Nominal propeller diameter, e.g. 570 mm	
3	Number of blades	
	2, 3	
5	Code for incidence angle of propeller	
	1, 5, 6, 8	
R	1)	Version without jet ring
	R	Version with jet ring
10	Motor size	
	0, 2, 3, 4, 6, 8, 10	
12	Number of motor poles	
	4, 6, 8, 12	
YD	Motor variant	
	UD/UM	Standard design
	YD/YM	Explosion protection to ATEX
C	Casing material	
	C	Stainless steel
	G	Grey cast iron

Design details

Design

- Fully flooded submersible mixer
- Horizontal installation (with pitch adjustment)

Propeller

- Self-cleaning (ECB) propeller

Shaft seal

- Two bi-directional mechanical seals in tandem arrangement, with liquid reservoir

Bearings

- Grease-packed rolling element bearings sealed for life

Drive

- Three-phase asynchronous squirrel-cage motor
- Motors integrated in explosion-proof submersible mixers are supplied in Ex d IIB type of protection.

1) Blank

Materials

Overview of available materials

Component		Material variant	
		G	C
Motor housing		EN-GJL-250	1.4581
Motor housing cover		EN-GJL-250	1.4517
Casing cover		EN-GJL-250	1.4571
Propeller		PU ²⁾³⁾	1.4571
Mechanical seal	Propeller end	SiC/SiC	
	Drive end	SiC/SiC	
Shaft		1.4571 ⁴⁾	
Elastomer seals		Viton (FPM)	
Screws/bolts		A4 (corresponds to 1.4571)	
Guide bracket		EN-GJL-250	1.4571
Supporting clamp		1.4571	
Jet ring (optional)		1.4571	

prior consent will result in the forfeiture of any and all claims for damages. The same applies to consequential damage (e.g. resultant process downtime).

Product benefits

- High operating reliability due to dry, pressure-tight and encapsulated squirrel-cage motor, thermal class F
- Increased reliability due to bi-directional mechanical seal
- Temperature sensors prevent overheating of the motor
- Marked reduction of energy costs due to optimised propeller design
- Environmentally friendly oil fill
- Ease of service with bolts made of stainless steel which are easy to undo even after years of operation
- Absolutely watertight cable entry

Acceptance tests / Warranties

- Functional test
Every submersible mixer is subjected to a functional test to KSB standard ZN 56525.
- Quality is assured by means of an audited and certified quality assurance system to DIN EN ISO 9001.
- Special acceptance tests are available on request.

Warranty information

Our warranty is based on and exclusively applies to your specifications as documented in the data sheet of the submersible mixer, and covers the relevant physical properties. Any warranty claims beyond the aforementioned aspects, as well as any claims resulting from an excessive solids content in the plant, the formation of floating blankets as well as failure to produce a specific gas yield, shall be excluded. The correct positioning of the submersible mixers is crucial for the overall function of the equipment. KSB's warranty obligations shall not cover any damage that may occur as a result of incorrect mixer positioning, i. e. installing the mixer in a position not expressly approved by KSB. In addition, low-flow areas (flow separation) resulting from the tank geometry shall not be covered by our warranty. Furthermore, we shall not assume any liability if our submersible mixers are used in patented processes and/or in case of protected rights of third parties.

Unauthorised modifications, the mixer's use for fluids and operating conditions not specified in the purchase order, as well as the use of non-KSB installation parts without KSB's

2) Polyurethane

3) Optional: 1.4571

4) Amamix 600 G in 1.4021

Standard and special designs

Standard and special designs

Option	Comments
Analysing device for leakage sensor	Available for all sizes
Propeller in 1.4571 instead of polyurethane	Amamix 200 in material variant G, for fluids containing coarse solids
Propeller C2227 instead of V2227	
Propeller C2223 instead of V2230	
Propeller C2233 instead of V2235	
Bail	All sizes
Wear-resistant adapter	Amamix 300/400/600, (→ Page 64)
Additional operating manuals	Standard: 1 operating manual per pump set
Flow simulation	Available for all sizes

For any versions not documented in this type series booklet or special versions please always contact KSB for technical details, prices and delivery periods.

Examples:

- Other voltages
- Special coatings
- Combinations with special motor/special propeller (e.g. for higher-viscosity fluids)
- Special installation parts
- Versions for higher application temperatures
- Other mechanical seal and elastomer materials

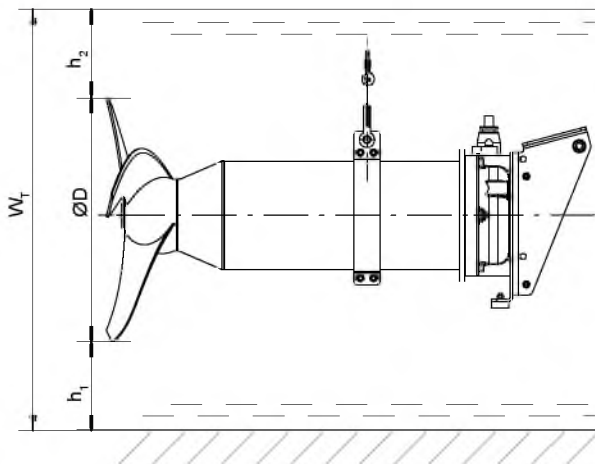
A minimum distance h_1 should also be kept from any vertical walls. If more than one submersible mixer is installed, the mixers should be spaced at a distance $\varnothing D$. Reflections of the water jet and flow turbulence must be taken into account.

With accessories set 6 for shallow tanks and racetracks, the floor clearance h_1 can be reduced to approx. 50 mm. Condition: solid floor (concrete/steel/plastics)

Selection information

Minimum level of fluid handled

The submersible mixer is operational when the fluid level is not lower than dimension W_T . This minimum level of the fluid handled must also be ensured during automatic operation.



Minimum level of fluid handled

Minimum level of fluid handled

$\varnothing D$	$h_{1 \min}$	$h_{2 \min}$	$W_{T \min}$
[mm]	[m]	[m]	[m]
200	0,12	0,50	0,82
300	0,15	0,80	1,25
400	0,20	0,85	1,45
600	0,30	1,00	1,90

Programme overview / selection tables
Overview of range

Overview of range (material variants G, C)

Feature	Amamix 200		Amamix 300		Amamix 400		Amamix 600	
	G	C	G	C	G	C	G	C
Number of motor poles								
4	1 4 UD/YD 2 4 UD/YD		-		-		-	
6	-		0 6 UD/YD 2 6 UD/YD		-		-	
8	-		-		3 8 UD/YD 4 8 UD/YD		-	
12	-		-		-		6 12 UDG/YDG 10 12 UDG/YDG	
Power range	Up to 2.5 kW		Up to 3.2 kW		Up to 4 kW		Up to 10 kW	
Explosion protection								
Version UD/UM	-							
Version YD/YM	II2G Ex dc IIB T4							
Motor								
Starting method	DOL				DOL or star-delta			
Voltage and frequency	400 V ⁵⁾ 50 Hz, suitable for operation on a frequency inverter							
Cooling	Cooled by surrounding fluid							
Immersion depth	Up to 30 m							
Power cable								
Length	10 m ⁶⁾							
Cable entry	Absolutely watertight							
Type	See table "Overview of power cables"							
Bearings	Grease-packed rolling element bearings sealed for life							
Sealing elements								
Elastomer seals	Viton (fluorocarbon rubber FPM)							
Shaft seal	Bellows-type mechanical seal ⁷⁾							
Monitoring								
Winding temperature	PTC							
Motor leakage	Leakage sensor in the motor space							
Mechanical seal leakage	Optional: leakage sensor in the oil reservoir (UD/UM version and material variant C only)							
Coating								
Material variant G	Two-component epoxy resin coating							
Material variant C	-							
Permissible fluid temperature	40 °C							
Acceptance tests	To ISO 9001 ⁸⁾							
Installation								
Stationary	Installation depth up to 30 m							

Overview of power cables

Feature	S1BN8-F rubber-sheathed cable	S07RC4N8-F rubber-sheathed cable	TEHSITE Tefzel cable
Design	Standard	Optional	Optional
Rated voltage	1000 V	750 V	750 V
EMC screening	-	✓	-
Insulation material	EPR ⁹⁾	EPR ⁹⁾	ETFE ¹⁰⁾
Max. continuous temperature of insulation	90 °C	90 °C	135 °C
For permanent immersion in waste water to DIN VDE 0282-16/HD22.16	✓	✓	✓

⁵⁾ Optional: 500 V and 690 V on request

⁶⁾ Optional: 15 m, 20 m, > 20 m on request

⁷⁾ Optional: mechanical seal with covered spring

⁸⁾ Optional: with test report EN 10204-2.2

⁹⁾ EPR = ethylene propylene rubber

¹⁰⁾ ETFE = ethylene tetrafluoroethylene

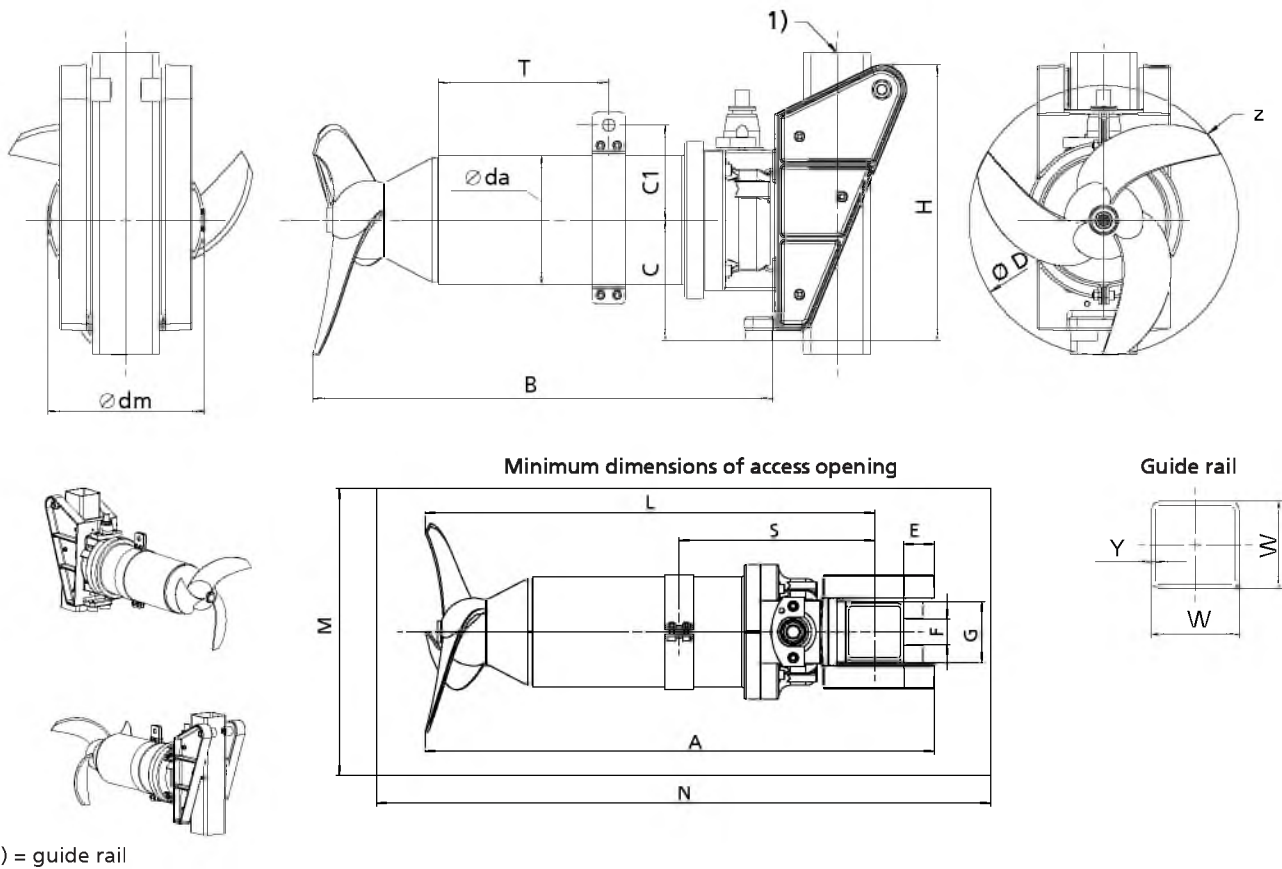
Submersible mixer / motor combinations

Overview of submersible mixer / motor combinations

Size	Motors									
	1 4	2 4	0 6	2 6	3 8	4 8	4 12	6 12	8 12	10 12
Motor housing material grey cast iron										
200 G	X	X	-	-	-	-	-	-	-	-
300 G	-	-	X	X	-	-	-	-	-	-
400 G	-	-	-	-	X	X	-	-	-	-
600 G	-	-	-	-	-	-	-	X	-	X
Motor housing material stainless steel										
200 C	X	X	-	-	-	-	-	-	-	-
300 C	-	-	X	X	-	-	-	-	-	-
400 C	-	-	-	-	X	X	-	-	-	-
600 C	-	-	-	-	-	-	X	-	X	-

Dimensions

Amamix 200, 400 V, 50 Hz, n = 1400 rpm, material variant G - version without jet ring



Technical data

Size	P ₂ [kW]	[kg] ¹¹⁾	z ¹²⁾	Guide rail	
				W [mm]	Y [mm]
V 2227 / 1 4 UDG / YDG	1,25	35	2	60	3
V 2227 / 2 4 UDG / YDG	2,5	37,7	2	60	3
V 2230 / 2 4 UDG / YDG	2,5	37,7	3	60	3
V 2235 / 2 4 UDG / YDG	2,5	37,7	3	60	3
C 2227 / 1 4 UDG / YDG	2,5	37,7	2	60	3
C 2227 / 2 4 UDG / YDG	2,5	37,7	2	60	3
C 2223 / 2 4 UDG / YDG	2,5	37,7	2	60	3
C 2233 / 2 4 UDG / YDG	2,5	37,7	3	60	3

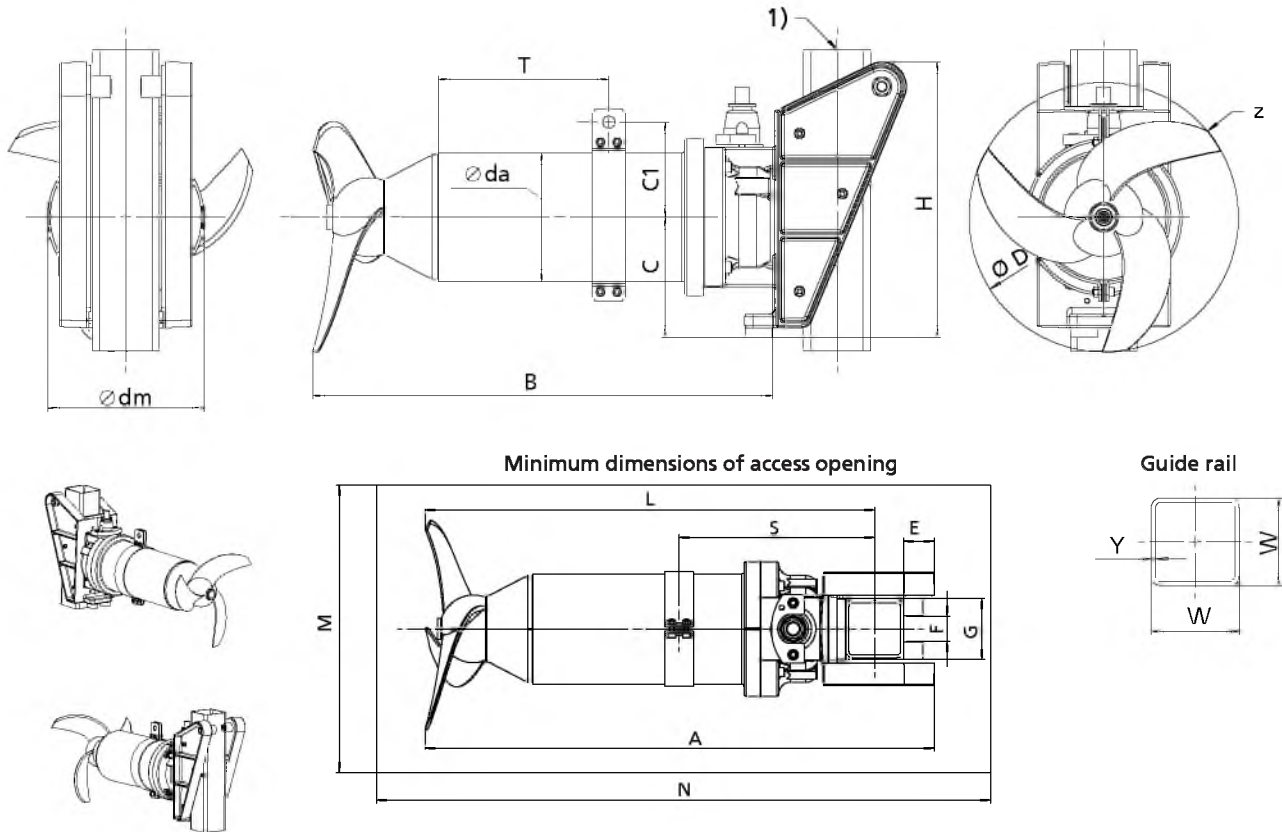
Dimensions [mm]

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
V 2227 / 1 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	225	780	210	240
V 2227 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	225	780	215	235
V 2230 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	275	780	215	235
V 2235 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	275	780	215	235
C 2227 / 1 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	225	780	215	235
C 2227 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	225	780	215	235
C 2223 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	225	780	215	235
C 2233 / 2 4 UDG / YDG	596	459	150	124	~225	156	187	42	36	66	287	524	275	780	215	235

11) Incl. 10-metre power cable and guide bracket

12) z = number of blades

Amamix 200, 400 V, 50 Hz, n = 1400 rpm, material variant C - version without jet ring



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ¹³⁾	z ¹⁴⁾	Guide rail	
				W [mm]	Y [mm]
C 2227 / 1 4 UDC / YDC	1,25	34	2	60	3
C 2227 / 2 4 UDC / YDC	2,5	36,5	2	60	3
C 2223 / 2 4 UDC / YDC	2,5	36,5	2	60	3
C 2233 / 2 4 UDC / YDC	2,5	36,5	3	60	3

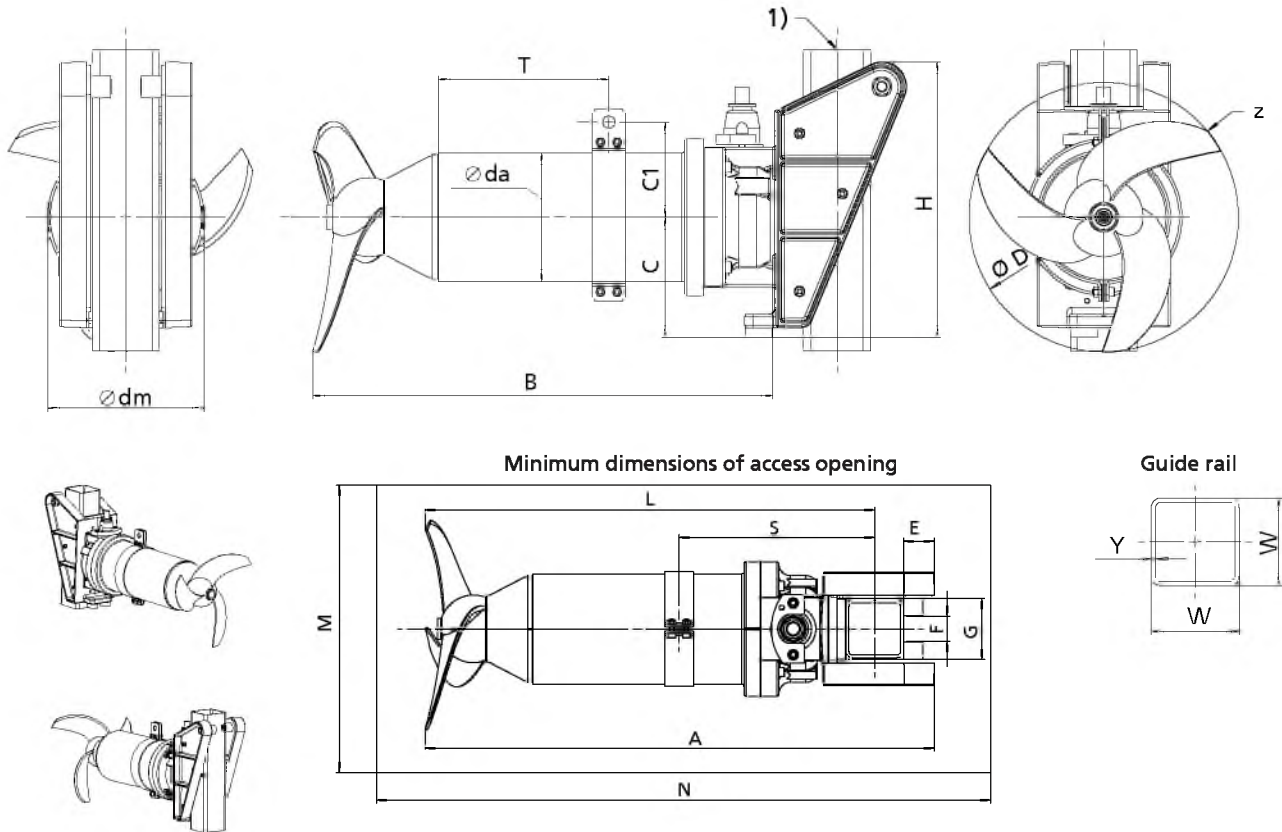
Dimensions [mm]

Size	A	B	C	C1	$\varnothing D$	$\varnothing da$	$\varnothing dm$	E	F	G	H	L	M	N	S	T
C 2227 / 1 4 UDC / YDC	592	459	150	120	~225	148	187	42	36	66	287	520	225	780	220	200
C 2227 / 2 4 UDC / YDC	592	459	150	120	~225	148	187	42	36	66	287	520	225	780	225	195
C 2223 / 2 4 UDC / YDC	592	459	150	120	~225	148	187	42	36	66	287	520	225	780	225	195
C 2233 / 2 4 UDC / YDC	592	459	150	120	~225	148	187	42	36	66	287	520	275	780	225	195

¹³⁾ Incl. 10-metre power cable and guide bracket

¹⁴⁾ z = number of blades

Amamix 300, 400 V, 50 Hz, n = 920 rpm, material variant G - version without jet ring



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ¹⁵⁾	z ¹⁶⁾	Guide rail	
				W [mm]	Y [mm]
C 2925 / 0 6 UDG / YDG	1,8	53,5	2	60	3
C 2928 / 0 6 UDG / YDG	1,8	53,5	2	60	3
C 3225 / 0 6 UDG / YDG	1,8	53,5	2	60	3
C 3228 / 0 6 UDG / YDG	1,8	53,5	2	60	3
C 2936 / 0 6 UDG / YDG	1,8	53,5	3	60	3
C 2938 / 0 6 UDG / YDG	1,8	53,5	3	60	3
C 2925 / 2 6 UDG / YDG	3,2	53,5	2	60	3
C 2928 / 2 6 UDG / YDG	3,2	53,5	2	60	3
C 3225 / 2 6 UDG / YDG	3,2	53,5	2	60	3
C 3228 / 2 6 UDG / YDG	3,2	53,5	2	60	3
C 2936 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 2938 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 3236 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 3238 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 2931 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 2935 / 2 6 UDG / YDG	3,2	53,5	3	60	3
C 3231 / 2 6 UDG / YDG	3,2	53,5	3	60	3

Dimensions [mm]

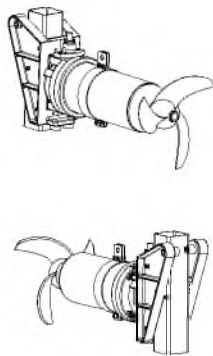
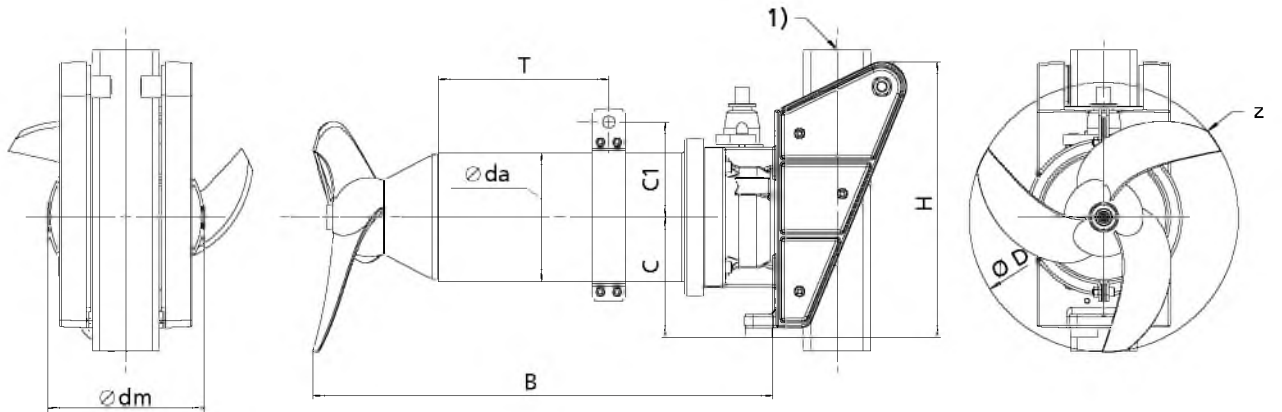
Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 2925 / 0 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	275	910	268	230
C 2928 / 0 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	275	910	268	230
C 3225 / 0 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	275	910	268	230

¹⁵⁾ Incl. 10-metre power cable and guide bracket

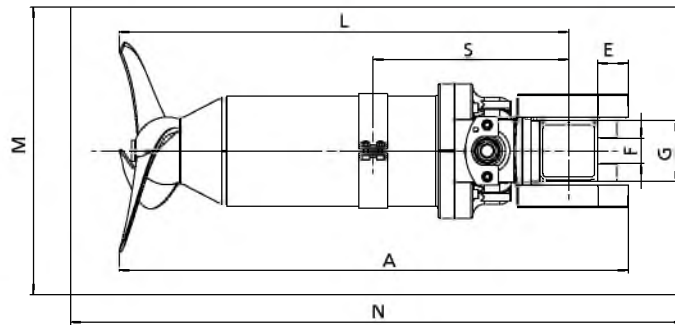
¹⁶⁾ z = number of blades

Size	A	B	C	C1	∅ D	∅ da	∅ dm	E	F	G	H	L	M	N	S	T
C 3228 / 0 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	275	910	268	230
C 2936 / 0 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 2938 / 0 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 2925 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	275	910	268	230
C 2928 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	275	910	268	230
C 3225 / 2 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	275	910	268	230
C 3228 / 2 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	275	910	268	230
C 2936 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 2938 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 3236 / 2 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	375	910	268	230
C 3238 / 2 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	375	910	268	230
C 2931 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 2935 / 2 6 UDG / YDG	731	594	150	124	294	156	187	42	36	66	287	659	375	910	268	230
C 3231 / 2 6 UDG / YDG	731	594	150	124	325	156	187	42	36	66	287	659	375	910	268	230

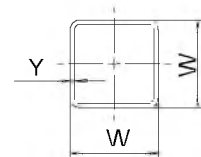
Amamix 300, 400 V, 50 Hz, n = 920 rpm, material variant C - version without jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ¹⁷⁾	z ¹⁸⁾	Guide rail	
				W [mm]	Y [mm]
C 2925 / 0 6 UDC / YDC	1,8	47	2	60	3
C 2928 / 0 6 UDC / YDC	1,8	47	2	60	3
C 3225 / 0 6 UDC / YDC	1,8	47	2	60	3
C 3228 / 0 6 UDC / YDC	1,8	47	2	60	3
C 2936 / 0 6 UDC / YDG	1,8	47	3	60	3
C 2938 / 0 6 UDC / YDC	1,8	47	3	60	3
C 2925 / 2 6 UDC / YDC	3,2	47	2	60	3
C 2928 / 2 6 UDC / YDC	3,2	47	2	60	3
C 3225 / 2 6 UDC / YDC	3,2	47	2	60	3
C 3228 / 2 6 UDC / YDC	3,2	47	2	60	3
C 2936 / 2 6 UDC / YDC	3,2	47	3	60	3
C 2938 / 2 6 UDC / YDC	3,2	47	3	60	3
C 3236 / 2 6 UDC / YDC	3,2	47	3	60	3
C 3238 / 2 6 UDC / YDC	3,2	47	3	60	3
C 2931 / 2 6 UDC / YDC	3,2	47	3	60	3
C 2935 / 2 6 UDC / YDC	3,2	47	3	60	3
C 3231 / 2 6 UDC / YDC	3,2	47	3	60	3

Dimensions [mm]

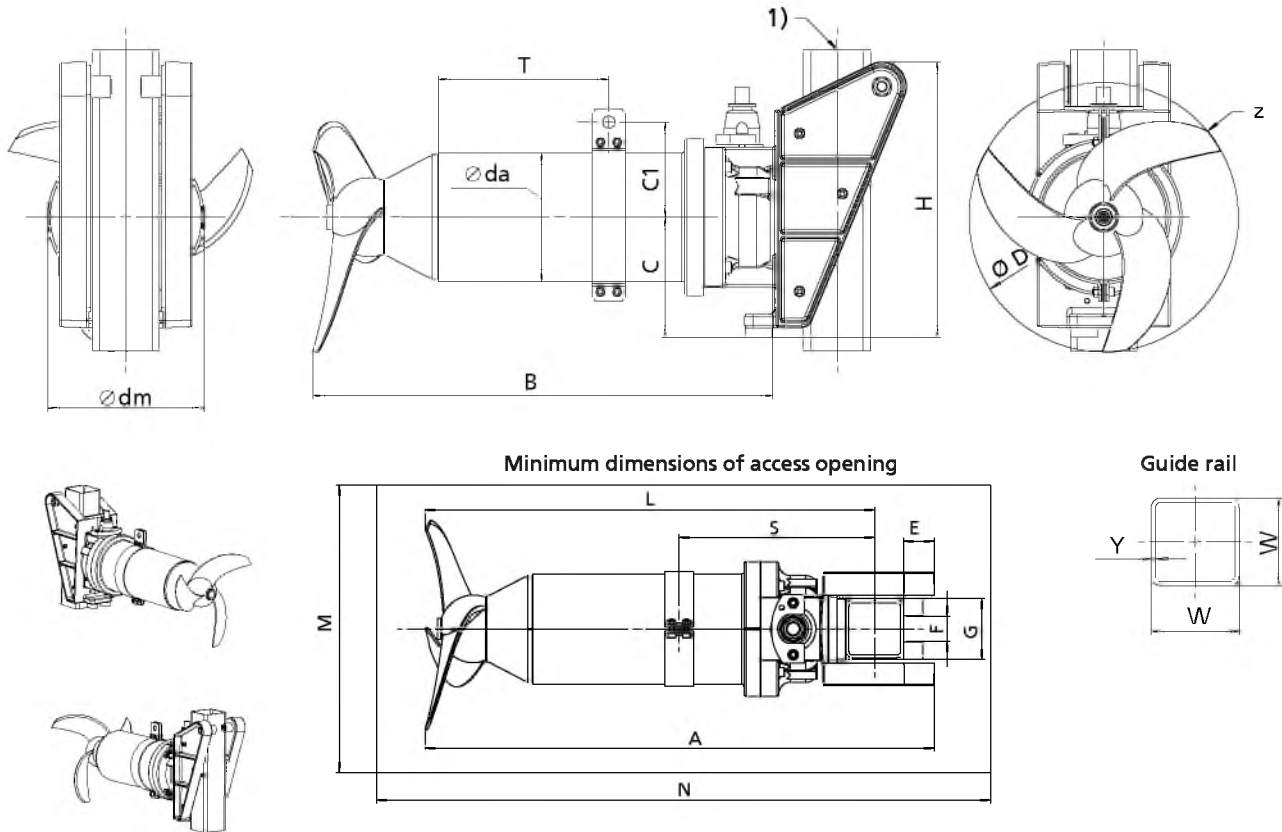
Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 2925 / 0 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	275	910	264	230
C 2928 / 0 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	275	910	264	230
C 3225 / 0 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	275	910	264	230

¹⁷⁾ Incl. 10-metre power cable and guide bracket

¹⁸⁾ z = number of blades

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 3228 / 0 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	275	910	264	230
C 2936 / 0 6 UDC / YDG	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 2938 / 0 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 2925 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	275	910	264	230
C 2928 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	275	910	264	230
C 3225 / 2 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	275	910	264	230
C 3228 / 2 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	275	910	264	230
C 2936 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 2938 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 3236 / 2 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	375	910	264	230
C 3238 / 2 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	375	910	264	230
C 2931 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 2935 / 2 6 UDC / YDC	727	594	150	120	294	148	187	42	36	66	287	655	375	910	264	230
C 3231 / 2 6 UDC / YDC	727	594	150	120	325	148	187	42	36	66	287	655	375	910	264	230

Amamix 400, 400 V, 50 Hz, n = 700 rpm, material variant G - version without jet ring



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ¹⁹⁾	z ²⁰⁾	Guide rail	
				W [mm]	Y [mm]
C 3725 / 3 8 UDG / YDG	2,5	83	2	60	3
C 3728 / 3 8 UDG / YDG	2,5	83	2	60	3
C 4125 / 3 8 UDG / YDG	2,5	83	2	60	3
C 4128 / 3 8 UDG / YDG	2,5	83	2	60	3
C 3738 / 3 8 UDG / YDG	2,5	83	3	60	3
C 4138 / 3 8 UDG / YDG	2,5	83	3	60	3
C 3725 / 4 8 UDG / YDG	4	83	2	60	3
C 3728 / 4 8 UDG / YDG	4	83	2	60	3
C 4125 / 4 8 UDG / YDG	4	83	2	60	3
C 4128 / 4 8 UDG / YDG	4	83	2	60	3
C 3738 / 4 8 UDG / YDG	4	83	3	60	3
C 4138 / 4 8 UDG / YDG	4	83	3	60	3
C 3731 / 4 8 UDG / YDG	4	83	3	60	3
C 3735 / 4 8 UDG / YDG	4	83	3	60	3
C 4131 / 4 8 UDG / YDG	4	83	3	60	3
C 4135 / 4 8 UDG / YDG	4	91	3	100	5

Dimensions [mm]

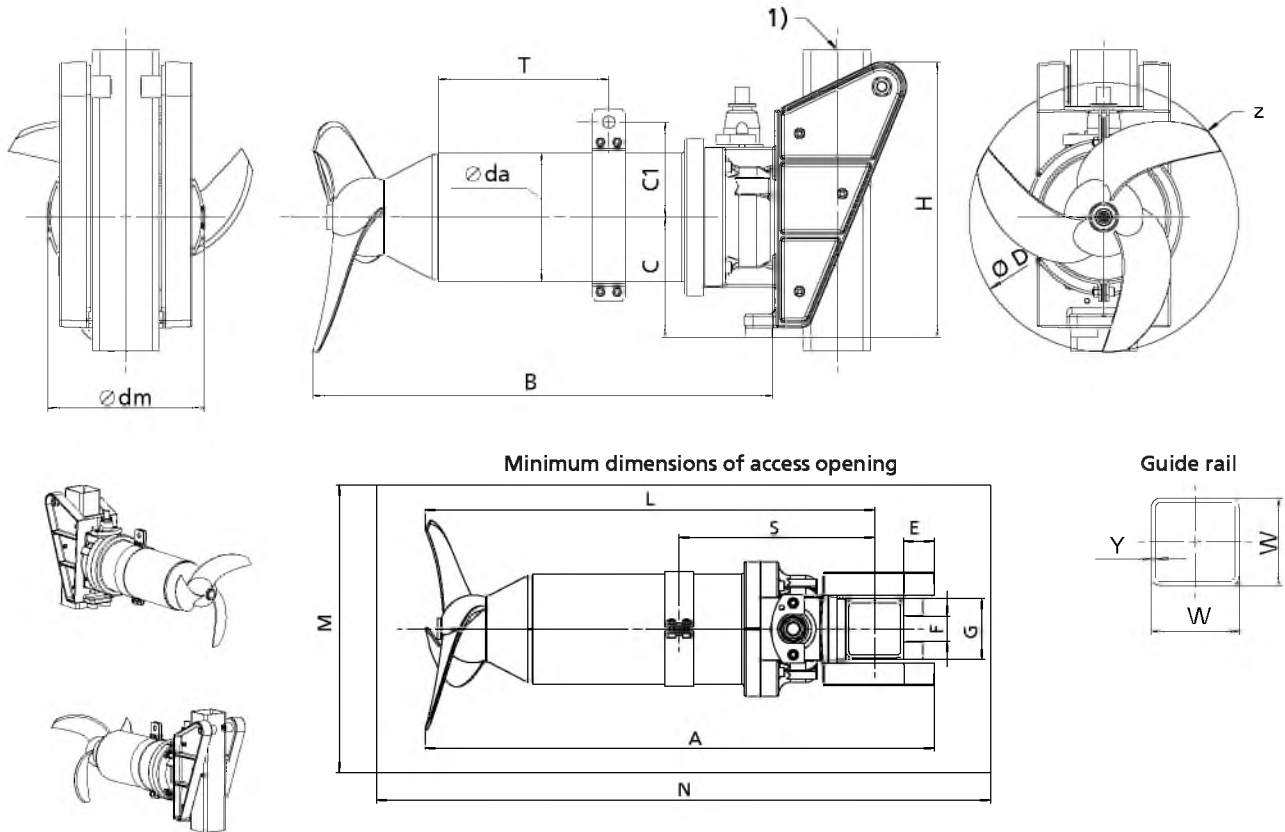
Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 3725 / 3 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	285	1050	321	275
C 3728 / 3 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	285	1050	321	275
C 4125 / 3 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	285	1050	321	275
C 4128 / 3 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	285	1050	321	275

¹⁹⁾ Incl. 10-metre power cable and guide bracket

²⁰⁾ z = number of blades

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 3738 / 3 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	460	1050	321	275
C 4138 / 3 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	460	1050	321	275
C 3725 / 4 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	285	1050	321	275
C 3728 / 4 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	285	1050	321	275
C 4125 / 4 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	285	1050	321	275
C 4128 / 4 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	285	1050	321	275
C 3738 / 4 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	460	1050	321	275
C 4138 / 4 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	460	1050	321	275
C 3731 / 4 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	460	1050	321	275
C 3735 / 4 8 UDG / YDG	844	687	100	142	373	192	234	42	36	66	287	772	460	1050	321	275
C 4131 / 4 8 UDG / YDG	844	687	100	142	410	192	234	42	36	66	287	772	460	1050	321	275
C 4135 / 4 8 UDG / YDG	876	687	180	142	410	192	234	43	44	106	412	783	460	1150	321	275

Amamix 400, 400 V, 50 Hz, n = 700 rpm, material variant C - version without jet ring



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ²¹⁾	z ²²⁾	Guide rail	
				W [mm]	Y [mm]
C 3725 / 3 8 UDC / YDC	2,5	82,5	2	60	3
C 3728 / 3 8 UDC / YDC	2,5	82,5	2	60	3
C 4125 / 3 8 UDC / YDC	2,5	82,5	2	60	3
C 4128 / 3 8 UDC / YDC	2,5	82,5	2	60	3
C 3738 / 3 8 UDC / YDC	2,5	82,5	3	60	3
C 4138 / 3 8 UDC / YDC	2,5	82,5	3	60	3
C 3725 / 4 8 UDC / YDC	4	82,5	2	60	3
C 3728 / 4 8 UDC / YDC	4	82,5	2	60	3
C 4125 / 4 8 UDC / YDC	4	82,5	2	60	3
C 4128 / 4 8 UDC / YDC	4	82,5	2	60	3
C 3738 / 4 8 UDC / YDC	4	82,5	3	60	3
C 4138 / 4 8 UDC / YDC	4	82,5	3	60	3
C 3731 / 4 8 UDC / YDC	4	82,5	3	60	3
C 3735 / 4 8 UDC / YDC	4	82,5	3	60	3
C 4131 / 4 8 UDC / YDC	4	82,5	3	60	3
C 4135 / 4 8 UDC / YDC	4	84	3	100	5

Dimensions [mm]

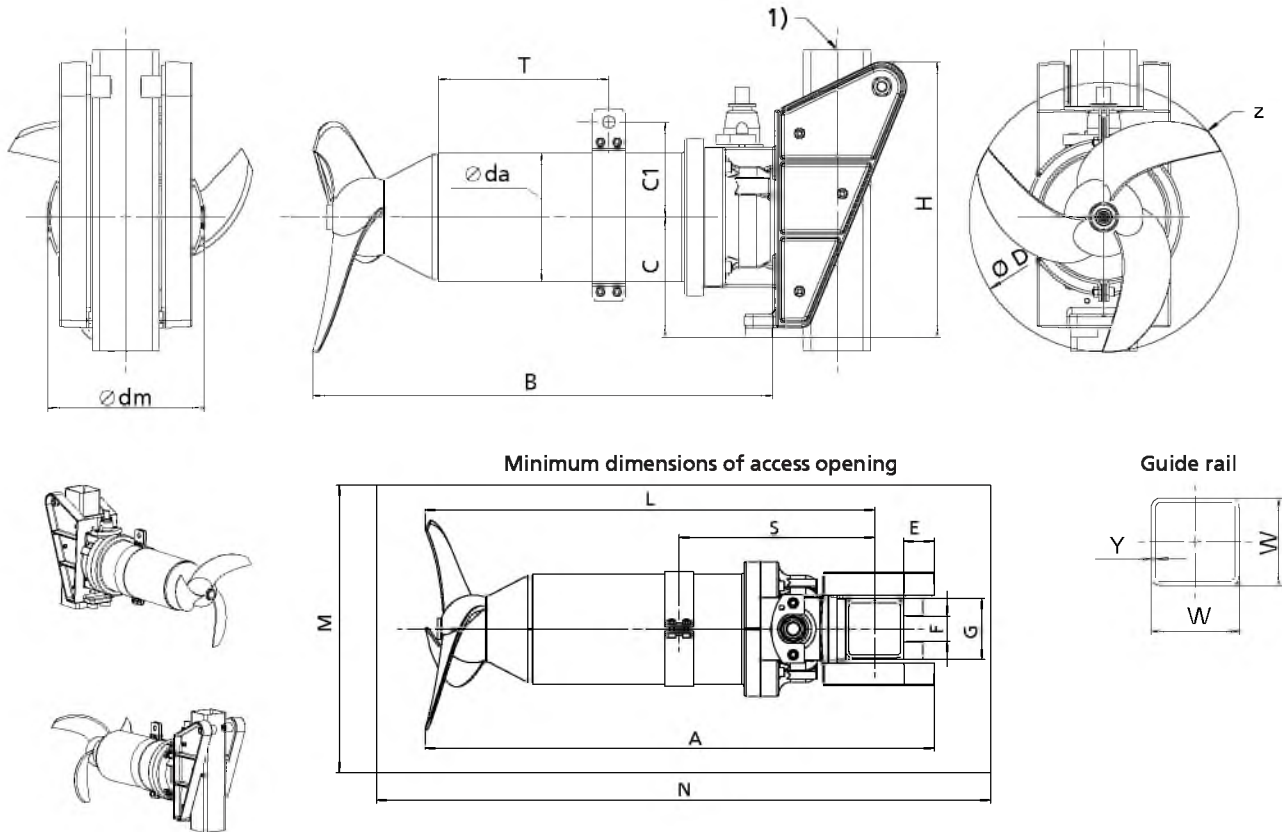
Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 3725 / 3 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	285	1050	318	275
C 3728 / 3 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	285	1050	318	275
C 4125 / 3 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	285	1050	318	275
C 4128 / 3 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	285	1050	318	275

21) Incl. 10-metre power cable and guide bracket

22) z = number of blades

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 3738 / 3 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	460	1050	318	275
C 4138 / 3 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	460	1050	318	275
C 3725 / 4 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	285	1050	318	275
C 3728 / 4 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	285	1050	318	275
C 4125 / 4 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	285	1050	318	275
C 4128 / 4 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	285	1050	318	275
C 3738 / 4 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	460	1050	318	275
C 4138 / 4 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	460	1050	318	275
C 3731 / 4 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	460	1050	318	275
C 3735 / 4 8 UDC / YDC	844	687	150	139	373	186	234	42	36	66	287	772	460	1050	318	275
C 4131 / 4 8 UDC / YDC	844	687	150	139	410	186	234	42	36	66	287	772	460	1050	318	275
C 4135 / 4 8 UDC / YDC	873	687	180	139	410	186	234	43	44	106	420	780	460	1150	318	275

Amamix 600, 400 V, 50 Hz, n = 475 rpm, material variant G - version without jet ring



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ²³⁾	z ²⁴⁾	Guide rail	
				W [mm]	Y [mm]
C 5725 / 6 12 UDG / YDG	5	221	2	100	5
C 5728 / 6 12 UDG / YDG	5	221	2	100	5
C 6325 / 6 12 UDG / YDG	5	221	2	100	5
C 6328 / 6 12 UDG / YDG	5	221	2	100	5
C 5725 / 10 12 UDG / YDG	10	235	2	100	5
C 5728 / 10 12 UDG / YDG	10	235	2	100	5
C 6325 / 10 12 UDG / YDG	10	235	2	100	5
C 6328 / 10 12 UDG / YDG	10	235	2	100	5
C 5738 / 10 12 UDG / YDG	10	235	3	100	5
C 6338 / 10 12 UDG / YDG	10	235	3	100	5
C 5731 / 10 12 UDG / YDG	10	235	3	100	5
C 5735 / 10 12 UDG / YDG	10	235	3	100	5
C 6331 / 10 12 UDG / YDG	10	235	3	100	5
C 6335 / 10 12 UDG / YDG	10	235	3	100	5

Dimensions [mm]

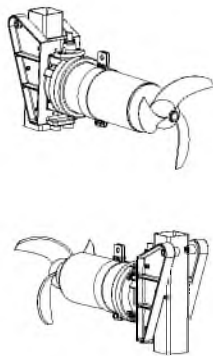
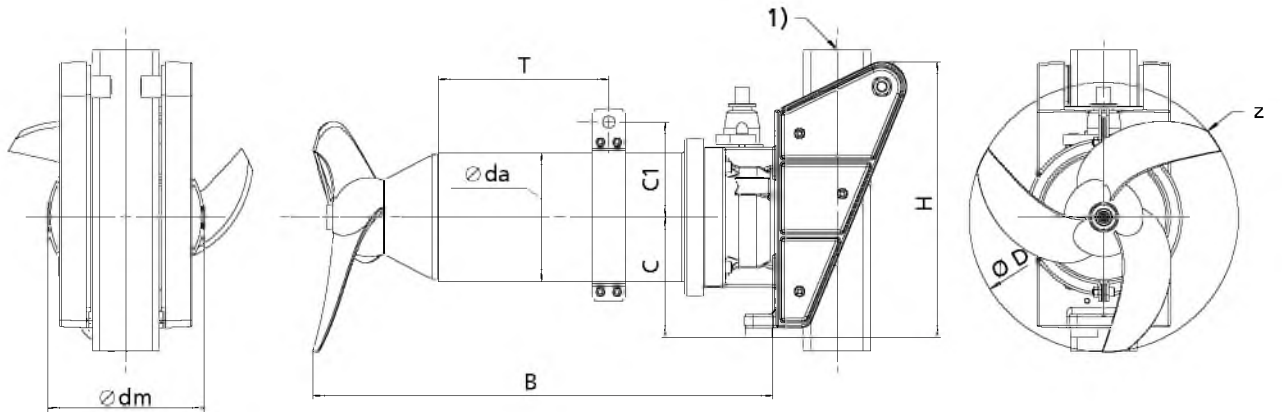
Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 5725 / 6 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	450	1310	393	280
C 5728 / 6 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	450	1310	393	280
C 6325 / 6 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	450	1310	393	280
C 6328 / 6 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	450	1310	393	280
C 5725 / 10 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	450	1310	393	280
C 5728 / 10 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	450	1310	393	280

²³⁾ Incl. 10-metre power cable and guide bracket

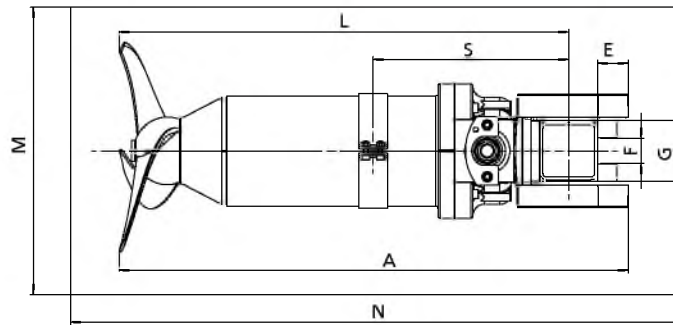
²⁴⁾ z = number of blades

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 6325 / 10 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	450	1310	393	280
C 6328 / 10 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	450	1310	393	280
C 5738 / 10 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	700	1310	393	280
C 6338 / 10 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	700	1310	393	280
C 5731 / 10 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	700	1310	393	280
C 5735 / 10 12 UDG / YDG	1042	848	230	197	570	294	380	43	44	106	508	949	700	1310	393	280
C 6331 / 10 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	700	1310	393	280
C 6335 / 10 12 UDG / YDG	1042	848	230	197	630	294	380	43	44	106	508	949	700	1310	393	280

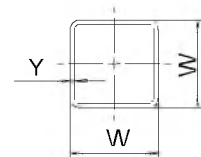
Amamix 600, 400 V, 50 Hz, n = 475 rpm, material variant C - version without jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ²⁵⁾	z ²⁶⁾	Guide rail	
				W [mm]	Y [mm]
C 5725 / 4 12 UMC / YMC	5	146	2	100	5
C 5728 / 4 12 UMC / YMC	5	146	2	100	5
C 6325 / 4 12 UMC / YMC	5	146	2	100	5
C 6328 / 4 12 UMC / YMC	5	146	2	100	5
C 5725 / 8 12 UMC / YMC	10	198	2	100	5
C 5728 / 8 12 UMC / YMC	10	198	2	100	5
C 6325 / 8 12 UMC / YMC	10	198	2	100	5
C 6328 / 8 12 UMC / YMC	10	198	2	100	5
C 5738 / 8 12 UMC / YMC	10	198	3	100	5
C 6338 / 8 12 UMC / YMC	10	198	3	100	5
C 5731 / 8 12 UMC / YMC	10	198	3	100	5
C 5735 / 8 12 UMC / YMC	10	198	3	100	5
C 6331 / 8 12 UMC / YMC	10	198	3	100	5
C 6335 / 8 12 UMC / YMC	10	198	3	100	5

Dimensions [mm]

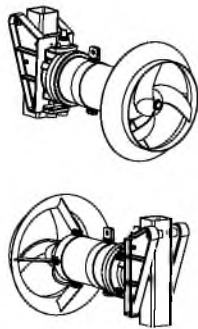
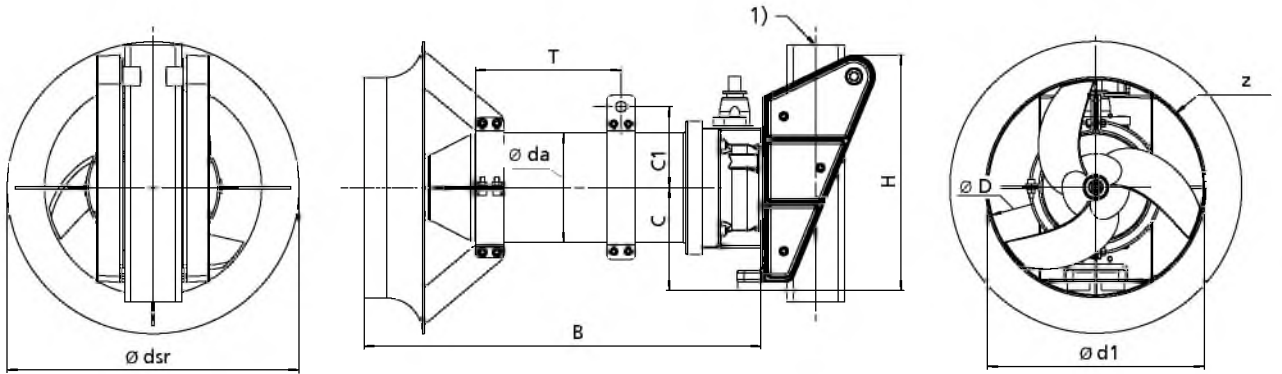
Size	A	B	C	C1	∅ D	∅ da	∅ dm	E	F	G	H	L	M	N	S	T
C 5725 / 4 12 UMC / YMC	1002	816	215	175	570	251	304	43	44	106	420	909	450	1270	360	275
C 5728 / 4 12 UMC / YMC	1002	816	215	175	570	251	304	43	44	106	420	909	450	1270	360	275
C 6325 / 4 12 UMC / YMC	1002	816	215	175	630	251	304	43	44	106	420	909	450	1270	360	275
C 6328 / 4 12 UMC / YMC	1002	816	215	175	630	251	304	43	44	106	420	909	450	1270	360	275
C 5725 / 8 12 UMC / YMC	1122	936	215	175	570	251	304	43	44	106	420	1029	450	1390	425	330
C 5728 / 8 12 UMC / YMC	1122	936	215	175	570	251	304	43	44	106	420	1029	450	1390	425	330

²⁵⁾ Incl. 10-metre power cable and guide bracket

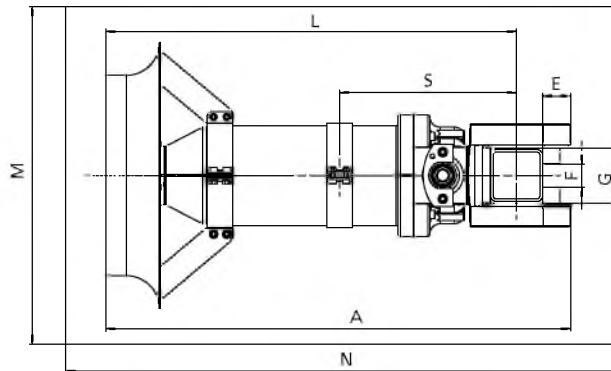
²⁶⁾ z = number of blades

Size	A	B	C	C1	Ø D	Ø da	Ø dm	E	F	G	H	L	M	N	S	T
C 6325 / 8 12 UMC / YMC	1122	936	215	175	630	251	304	43	44	106	420	1029	450	1390	425	330
C 6328 / 8 12 UMC / YMC	1122	936	215	175	630	251	304	43	44	106	420	1029	450	1390	425	330
C 5738 / 8 12 UMC / YMC	1122	936	215	175	570	251	304	43	44	106	420	1029	700	1390	425	330
C 6338 / 8 12 UMC / YMC	1122	936	215	175	630	251	304	43	44	106	420	1029	700	1390	425	330
C 5731 / 8 12 UMC / YMC	1122	936	215	175	570	251	304	43	44	106	420	1029	700	1390	425	330
C 5735 / 8 12 UMC / YMC	1122	936	215	175	570	251	304	43	44	106	420	1029	700	1390	425	330
C 6331 / 8 12 UMC / YMC	1122	936	215	175	630	251	304	43	44	106	420	1029	700	1390	425	330
C 6335 / 8 12 UMC / YMC	1122	936	215	175	630	251	304	43	44	106	420	1029	700	1390	425	330

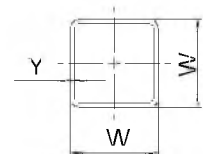
Amamix 300, 400 V, 50 Hz, n = 920 rpm, material variant G - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ²⁷⁾	z ²⁸⁾	Guide rail	
				W [mm]	Y [mm]
C 2925 R / 0 6 UDG / YDG	1,8	58,2	2	60	3
C 2928 R / 0 6 UDG / YDG	1,8	58,2	2	60	3
C 2936 R / 0 6 UDG / YDG	1,8	58,2	3	60	3
C 2938 R / 0 6 UDG / YDG	1,8	58,2	3	60	3
C 2925 R / 2 6 UDG / YDG	3,2	58,2	2	60	3
C 2928 R / 2 6 UDG / YDG	3,2	58,2	2	60	3
C 2936 R / 2 6 UDG / YDG	3,2	58,2	3	60	3
C 2938 R / 2 6 UDG / YDG	3,2	58,2	3	60	3
C 2931 R / 2 6 UDG / YDG	3,2	58,2	3	60	3
C 2935 R / 2 6 UDG / YDG	3,2	58,2	3	60	3

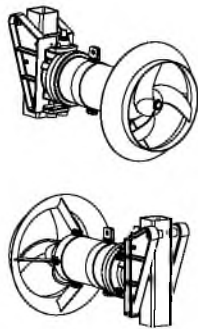
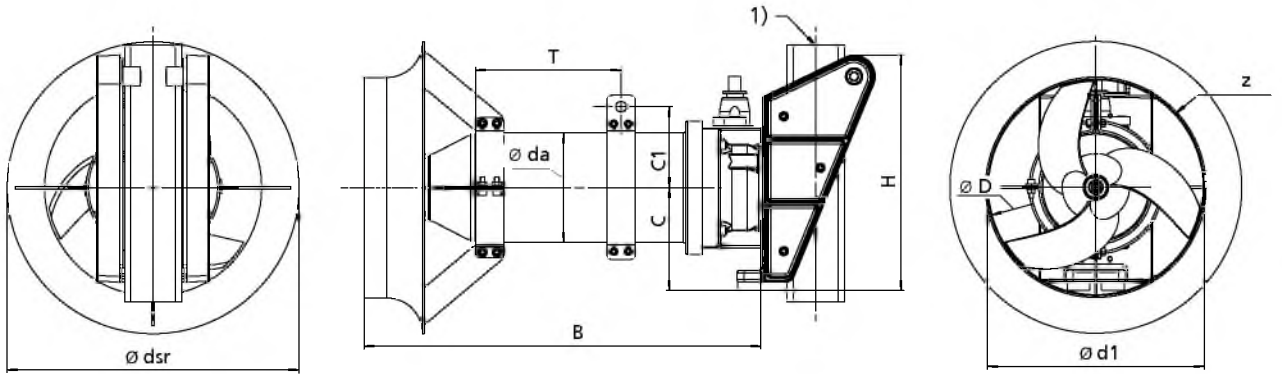
Dimensions [mm]

Size	A	B	C	C1	∅ D	∅ da	∅ d1	∅ dsr	E	F	G	H	L	M	N	S	T
C 2925 R / 0 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2928 R / 0 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2936 R / 0 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2938 R / 0 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2925 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2928 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2936 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2938 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2931 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220
C 2935 R / 2 6 UDG / YDG	735	598	150	124	294	156	300	400	42	36	66	287	663	500	945	278	220

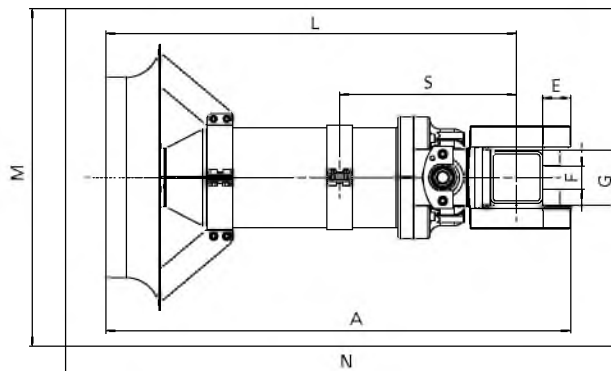
²⁷⁾ Incl. 10-metre power cable and guide bracket

²⁸⁾ z = number of blades

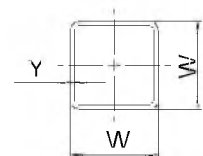
Amamix 300, 400 V, 50 Hz, n = 920 rpm, material variant C - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ²⁹⁾	z ³⁰⁾	Guide rail	
				W [mm]	Y [mm]
C 2925 R / 0 6 UDC / YDC	1,8	51,7	2	60	3
C 2928 R / 0 6 UDC / YDC	1,8	51,7	2	60	3
C 2936 R / 0 6 UDC / YDC	1,8	51,7	3	60	3
C 2938 R / 0 6 UDC / YDC	1,8	51,7	3	60	3
C 2925 R / 2 6 UDC / YDC	3,2	51,7	2	60	3
C 2928 R / 2 6 UDC / YDC	3,2	51,7	2	60	3
C 2936 R / 2 6 UDC / YDC	3,2	51,7	3	60	3
C 2938 R / 2 6 UDC / YDC	3,2	51,7	3	60	3
C 2931 R / 2 6 UDC / YDC	3,2	51,7	3	60	3
C 2935 R / 2 6 UDC / YDC	3,2	51,7	3	60	3

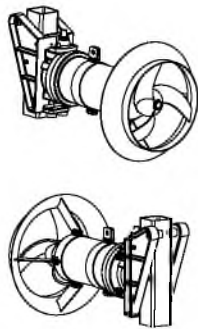
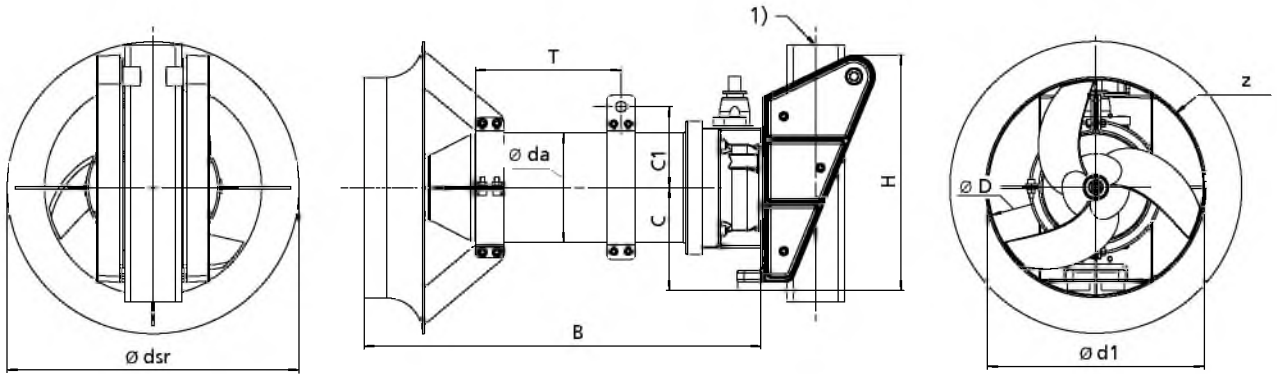
Dimensions [mm]

Size	A	B	C	C1	∅ D	∅ da	∅ d1	∅ dsr	E	F	G	H	L	M	N	S	T
C 2925 R / 0 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2928 R / 0 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2936 R / 0 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2938 R / 0 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2925 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2928 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2936 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2938 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2931 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220
C 2935 R / 2 6 UDC / YDC	731	598	150	120	294	148	300	400	42	36	66	287	659	500	945	274	220

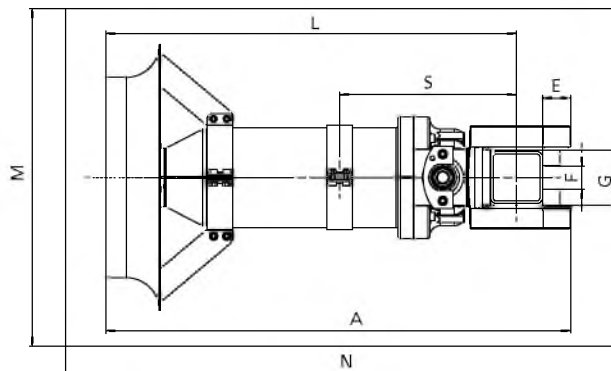
²⁹⁾ Incl. 10-metre power cable and guide bracket

³⁰⁾ z = number of blades

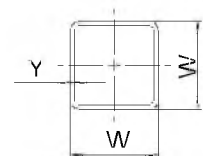
Amamix 400, 400 V, 50 Hz, n = 700 rpm, material variant G - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ³¹⁾	z ³²⁾	Guide rail	
				W [mm]	Y [mm]
C 3725 R / 3 8 UDG / YDG	2,5	89,8	2	60	3
C 3728 R / 3 8 UDG / YDG	2,5	89,8	2	60	3
C 3731 R / 3 8 UDG / YDG	2,5	89,8	3	60	3
C 3738 R / 3 8 UDG / YDG	2,5	89,8	3	60	3
C 3725 R / 4 8 UDG / YDG	4	89,8	2	60	3
C 3728 R / 4 8 UDG / YDG	4	89,8	2	60	3
C 3738 R / 4 8 UDG / YDG	4	89,8	3	60	3
C 3731 R / 4 8 UDG / YDG	4	89,8	3	60	3
C 3735 R / 4 8 UDG / YDG	4	89,8	3	60	3

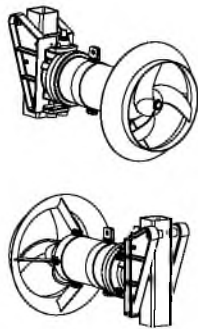
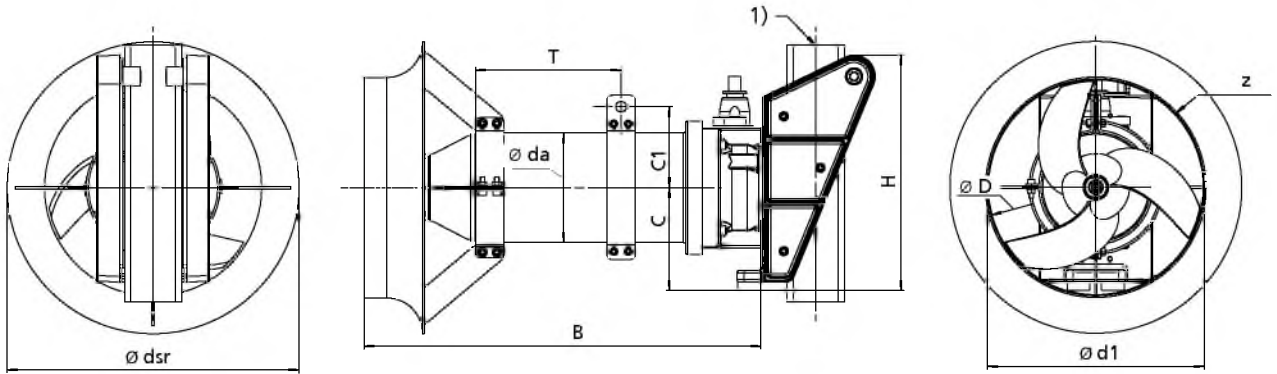
Dimensions [mm]

Size	A	B	C	C1	$\varnothing D$	$\varnothing da$	$\varnothing d1$	$\varnothing dsr$	E	F	G	H	L	M	N	S	T
C 3725 R / 3 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3728 R / 3 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3731 R / 3 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3738 R / 3 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3725 R / 4 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3728 R / 4 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3738 R / 4 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3731 R / 4 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255
C 3735 R / 4 8 UDG / YDG	855	695	150	142	373	192	380	511	42	36	66	287	783	610	1050	341	255

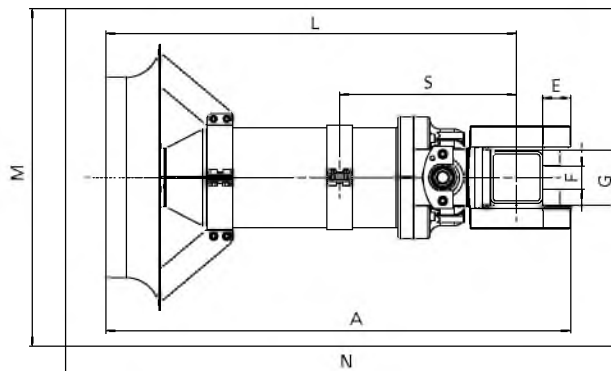
31) Incl. 10-metre power cable and guide bracket

32) z = number of blades

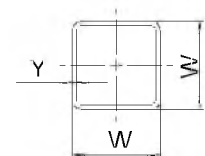
Amamix 400, 400 V, 50 Hz, n = 700 rpm, material variant C - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ³³⁾	z ³⁴⁾	Guide rail	
				W [mm]	Y [mm]
C 3725 R / 3 8 UDC / YDC	2,5	89,3	2	60	3
C 3728 R / 3 8 UDC / YDC	2,5	89,3	2	60	3
C 3731 R / 3 8 UDC / YDC	2,5	89,3	3	60	3
C 3738 R / 3 8 UDC / YDC	2,5	89,3	3	60	3
C 3725 R / 4 8 UDC / YDC	4	89,3	2	60	3
C 3728 R / 4 8 UDC / YDC	4	89,3	2	60	3
C 3738 R / 4 8 UDC / YDC	4	89,3	3	60	3
C 3731 R / 4 8 UDC / YDC	4	89,3	3	60	3
C 3735 R / 4 8 UDC / YDC	4	89,3	3	60	3

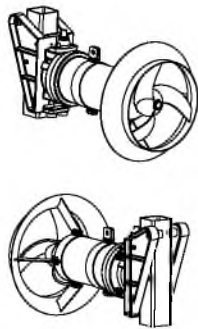
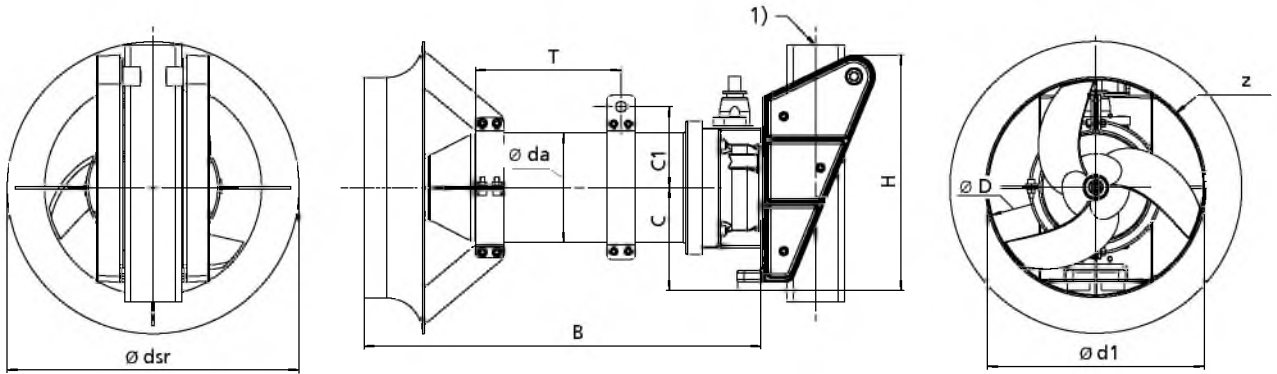
Dimensions [mm]

Size	A	B	C	C1	$\varnothing D$	$\varnothing da$	$\varnothing d1$	$\varnothing dsr$	E	F	G	H	L	M	N	S	T
C 3725 R / 3 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3728 R / 3 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3731 R / 3 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3738 R / 3 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3725 R / 4 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3728 R / 4 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3738 R / 4 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3731 R / 4 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255
C 3735 R / 4 8 UDC / YDC	855	695	150	139	373	186	380	511	42	36	66	287	783	610	1050	338	255

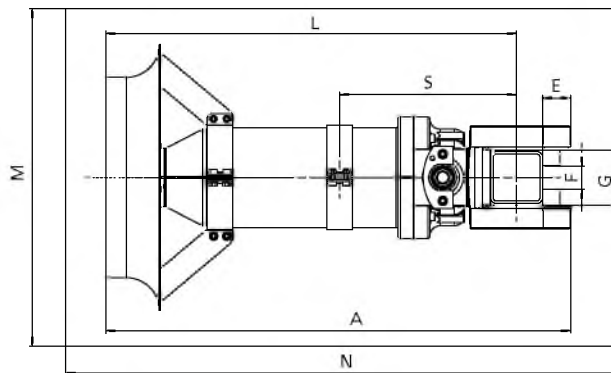
33) Incl. 10-metre power cable and guide bracket

34) z = number of blades

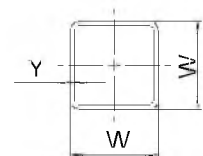
Amamix 600, 400 V, 50 Hz, n = 475 rpm, material variant G - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P ₂ [kW]	[kg] ³⁵⁾	z ³⁶⁾	Guide rail	
				W [mm]	Y [mm]
C 5725 R / 6 12 UDG / YDG	5	240,5	2	100	5
C 5728 R / 6 12 UDG / YDG	5	240,5	2	100	5
C 5731 R / 6 12 UDG / YDG	5	240,5	3	100	5
C 5738 R / 6 12 UDG / YDG	5	240,5	3	100	5
C 5725 R / 10 12 UDG / YDG	10	254,5	2	100	5
C 5728 R / 10 12 UDG / YDG	10	254,5	2	100	5
C 5738 R / 10 12 UDG / YDG	10	254,5	3	100	5
C 5731 R / 10 12 UDG / YDG	10	254,5	3	100	5
C 5735 R / 10 12 UDG / YDG	10	254,5	3	100	5

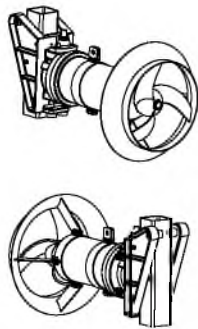
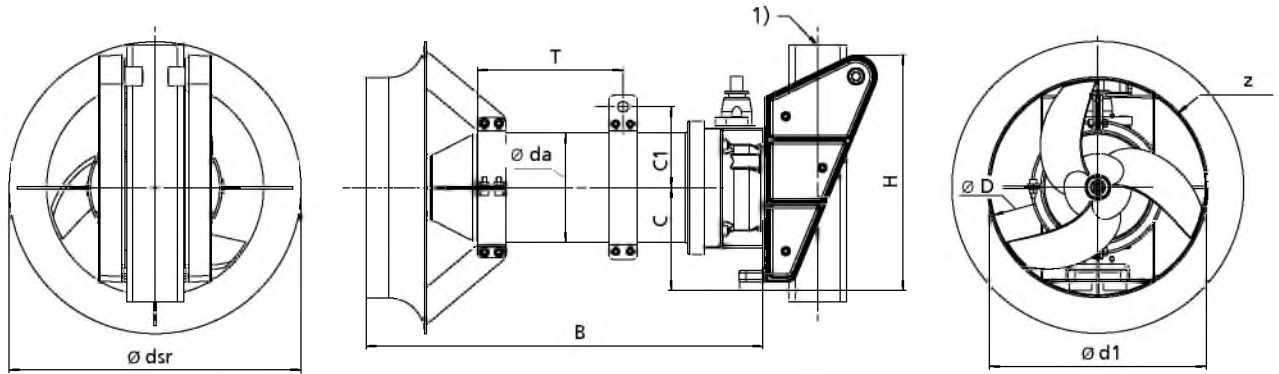
Dimensions [mm]

Size	A	B	C	C1	∅ D	∅ da	∅ d1	∅ dsr	E	F	G	H	L	M	N	S	T
C 5725 R / 6 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5728 R / 6 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5731 R / 6 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5738 R / 6 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5725 R / 10 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5728 R / 10 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5738 R / 10 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5731 R / 10 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270
C 5735 R / 10 12 UDG / YDG	1048	854	230	197	570	294	580	773	54	44	106	507	953	875	1335	403	270

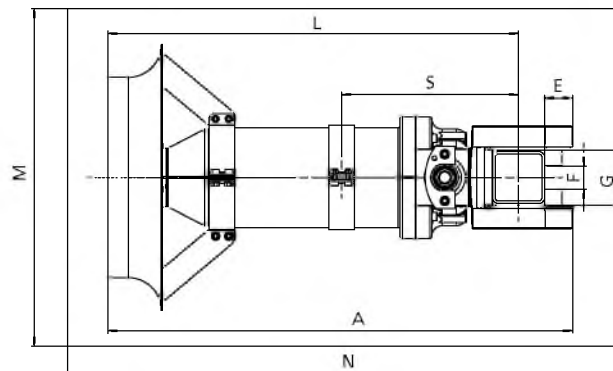
³⁵⁾ Incl. 10-metre power cable and guide bracket

³⁶⁾ z = number of blades

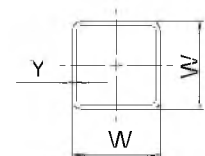
Amamix 600, 400 V, 50 Hz, n = 475 rpm, material variant C - version with jet ring



Minimum dimensions of access opening



Guide rail



1) = guide rail

Technical data

Size	P_2 [kW]	[kg] ³⁷⁾	z ³⁸⁾	Guide rail	
				W [mm]	Y [mm]
C 5725 R / 4 12 UMC / YMC	5	165,5	2	100	5
C 5728 R / 4 12 UMC / YMC	5	165,5	2	100	5
C 5731 R / 4 12 UMC / YMC	5	165,5	3	100	5
C 5738 R / 4 12 UMC / YMC	5	165,5	3	100	5
C 5725 R / 8 12 UMC / YMC	10	217,5	2	100	5
C 5728 R / 8 12 UMC / YMC	10	217,5	2	100	5
C 5738 R / 8 12 UMC / YMC	10	217,5	3	100	5
C 5731 R / 8 12 UMC / YMC	10	217,5	3	100	5
C 5735 R / 8 12 UMC / YMC	10	217,5	3	100	5

Dimensions [mm]

Size	A	B	C	C1	$\varnothing D$	$\varnothing da$	$\varnothing d1$	$\varnothing dsr$	E	F	G	H	L	M	N	S	T
C 5725 R / 4 12 UMC / YMC	1016	830	215	176	570	251	580	773	43	44	106	420	908	890	1290	380	250
C 5728 R / 4 12 UMC / YMC	1016	830	215	176	570	251	580	773	43	44	106	420	908	890	1290	380	250
C 5731 R / 4 12 UMC / YMC	1016	830	215	176	570	251	580	773	43	44	106	420	908	890	1290	380	250
C 5738 R / 4 12 UMC / YMC	1016	830	215	176	570	251	580	773	43	44	106	420	908	890	1290	380	250
C 5725 R / 8 12 UMC / YMC	1137	950	215	176	570	251	580	773	43	44	106	420	1028	890	1410	445	310
C 5728 R / 8 12 UMC / YMC	1137	950	215	176	570	251	580	773	43	44	106	420	1028	890	1410	445	310
C 5738 R / 8 12 UMC / YMC	1137	950	215	176	570	251	580	773	43	44	106	420	1028	890	1410	445	310
C 5731 R / 8 12 UMC / YMC	1137	950	215	176	570	251	580	773	43	44	106	420	1028	890	1410	445	310
C 5735 R / 8 12 UMC / YMC	1137	950	215	176	570	251	580	773	43	44	106	420	1028	890	1410	445	310

³⁷⁾ Incl. 10-metre power cable and guide bracket

³⁸⁾ z = number of blades

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Submersible mixer with supporting clamp
- Cable support for properly routing the power cable
- Two shackles (for lifting tackle and cable support)
- Separate name plate

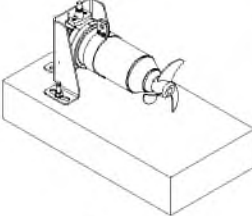
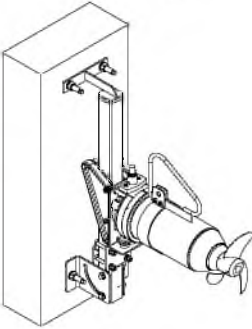
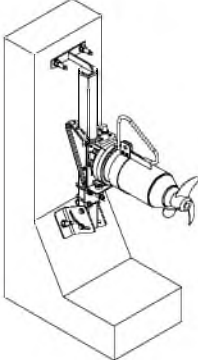
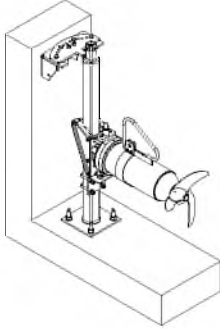
Accessories

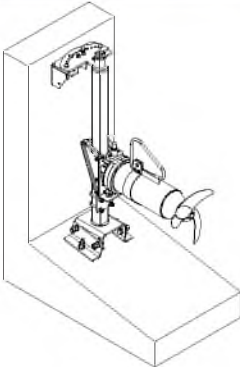
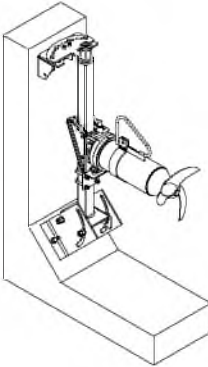
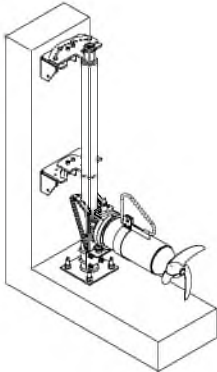
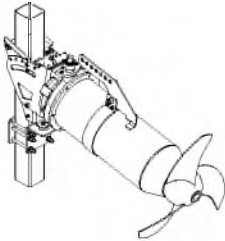
- Submersible mixer stand
- Pitch adapter
- Bail
- Hook
- Lifting rope
- Cable support for properly routing the power cables
- Forcing screw
- Other accessories on request

Accessories

Overview of accessories

Overview of accessories

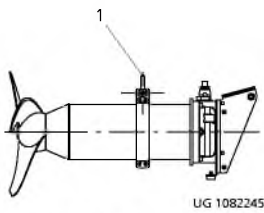
Accessories	Amamix				Illustration	Description
	200	300	400	600		
Accessories set 4 (⇒Page 33)	X	X	X	X		<ul style="list-style-type: none"> Lifting devices and lifting tackle
Accessories set 6 Floor mounting (⇒Page 35)	X	X	-	-		<ul style="list-style-type: none"> With horizontal swivelling option Fixed vertical installation height Condition: Place of installation is accessible (e.g. stormwater relief structures)
Accessories set 7 Mounting on sump/tank wall (⇒Page 37)	X	X	-	-		<ul style="list-style-type: none"> Continuously adjustable installation depth with fixed jet direction. The submersible mixer can be lifted out of the tank or sump for maintenance and inspection work.
Accessories set 7 Mounting on benching and sump/tank wall (⇒Page 37)	X	X	-	-		<ul style="list-style-type: none"> Special feature: continuously adjustable installation depth and adjustable jet direction. The submersible mixer can be lifted out of the tank or sump for maintenance and inspection work.
Accessories set 22 Mounting on the sump/tank wall and horizontal tank floor (inclined by 0 - 0.5°) (⇒Page 42)	X	X	X	X		<ul style="list-style-type: none"> Special feature: continuously adjustable installation depth and adjustable jet direction. The submersible mixer can be lifted out of the tank or sump for maintenance and inspection work.

Accessories	Amamix				Illustration	Description
	200	300	400	600		
Accessories set 22 Mounting on the sump/tank floor and sloping tank floor (inclined by 0.5 - 10°) (⇒Page 45)	X	X	X	X		<ul style="list-style-type: none"> Special feature: continuously adjustable installation depth and adjustable jet direction. The submersible mixer can be lifted out of the tank or sump for maintenance and inspection work.
Accessories set 22 Mounting on the sump/tank wall and on the inclined tank floor or on the sump/tank wall (inclined by 10 - 90°) (⇒Page 49)	X	X	X	X		<ul style="list-style-type: none"> Special feature: continuously adjustable installation depth and adjustable jet direction. The submersible mixer can be lifted out of the tank or sump for maintenance and inspection work.
Accessories set 22 Accessories set 22 - options with middle support for guide rail (⇒Page 53)	X	X	X	X		<ul style="list-style-type: none"> For installation depths > 6 m
Accessories set 22 Accessories set 22 - options Pitch adapter (⇒Page 56)	X	X	X	X		<ul style="list-style-type: none"> For upward or downward pitch adjustment in increments of 10° from 40° upwards to 40° downwards (Amamix 600 G: 15° or 30° upward or downward pitch)
Forcing screws (⇒Page 63)	X	X	X	X		
Guide rails for accessories sets 7 and 22 (⇒Page 64)	X	X	X	X		
Wear-resistant adapter (⇒Page 64)	-	X	X	X		
Other accessories (⇒Page 65)	X	X	X	X		
Lifting equipment	X	X	X	X		<ul style="list-style-type: none"> See type series booklet "KSB Lifting Equipment" 1596.5

Accessories set 4

Overview of range

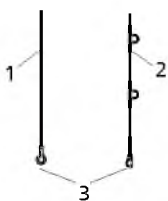
Lifting tackle



Lifting tackle

1	Attachment point (centre-of-gravity position) ³⁹⁾
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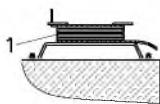
Lifting ropes



Lifting rope

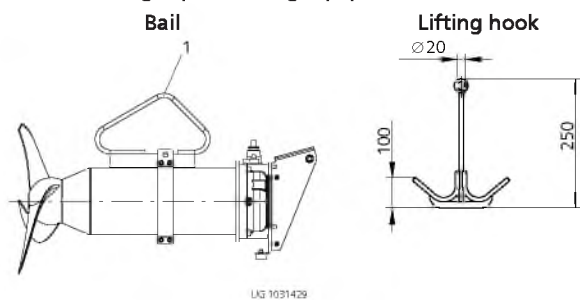
1	Lifting rope made of 1.4401 or
2	Lifting rope made of PP
3	Attachment point on submersible mixer

Rope winder/bollard



1	Rope winder
---	-------------

Alternative combination: bail on submersible mixer / lifting hook on lifting rope of lifting equipment



1 Bail

Overview of accessories set 4: lifting devices and lifting tackle

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Lifting rope for Haacon cranes ⁴⁰⁾	∅ = 5 mm, L = 12 m								1.4401	11304621	1.95
	∅ = 5 mm, L = 18 m								1.4401	11306713	2.7

³⁹⁾ Shackle included in scope of supply

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
∅ = 5 mm, L = 22 m	X	X	X	X	X	X	X	X	1.4401	11306712	3.2
Lifting rope, max. load-carrying capacity 200 kg, 5 m; material: polypropylene ⁴¹⁾	Select in acc. with mixer weight								PP	11185207	2
Lifting rope, max. load-carrying capacity 450 kg, 5 m; material: polypropylene ⁴¹⁾									PP	11190024	5
Rope winder/bollard for Haacon cranes for securing the lifting ropes at the tank edge or railing									1.4571	19554260	1.5
Lifting hook, max. load-carrying capacity 500 kg	X	X	X	X	X	X	X	X	1.4301	19219613	2.44
Bail for fitting to the lifting lug	X	X	-	-	-	-	-	-	1.4571	19219830	1.6
	-	-	X	X	X	X	-	-	1.4571	19219831	2.1
	-	-	-	-	-	-	X	X	1.4571	19219832	2.6

More information

- See type series booklet "KSB Lifting Equipment" 1596.5

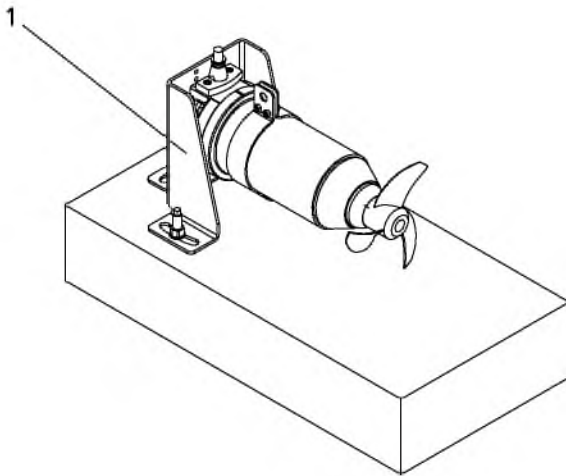
⁴⁰⁾ The lifting rope must be attached to the attachment point on the submersible mixer and can be fastened on the winch of the cranes indicated. When transportable cranes are used, the upper end of the rope is removed from the winch and tied securely around the rope winder. The lower end remains attached to the submersible mixer.

⁴¹⁾ Use several 5-metre ropes connected via spliced loops for large installation depths.

Accessories set 6

Overview of range

For permanent mounting of the submersible mixer on the tank floor.



Installation using accessories set 6: permanent mounting of submersible mixer on tank floor

1	Submersible mixer stand
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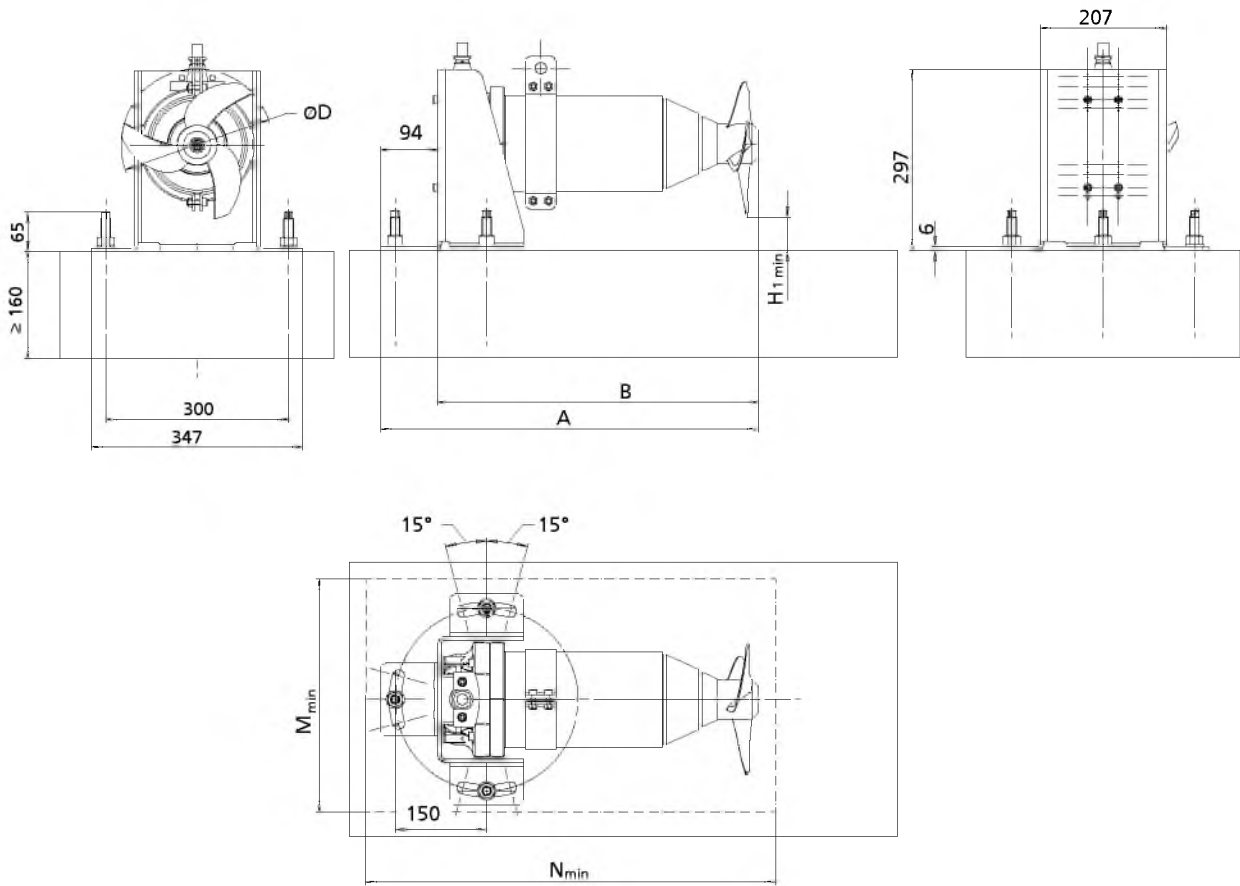
Overview of accessories set 6

Description	Amamix				Material	Mat. No.	[kg]
	200	300	400	600			
Submersible mixer stand (for use in tanks which can be drained to provide access to the submersible mixer, e.g. for maintenance and inspection purposes, e.g. stormwater relief structures) incl. 3 chemical anchors for mounting the submersible mixer stand on the tank floor, min. concrete quality C25/30	X	X	42)	42)	1.4301	01109062	8
					1.4571	19556921	8

42) On request

Installation of accessories set 6 - Amamix 200 / 300

For permanent mounting on the tank floor
(sizes 400 and 600 on request)



Installation with accessories set 6 - Amamix 200 / 300

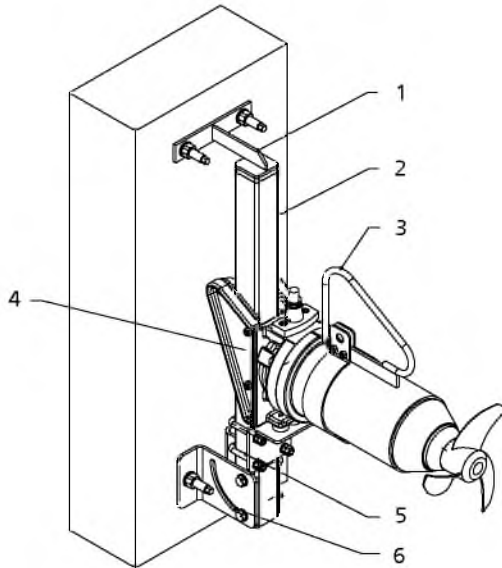
Dimensions [mm]

$\varnothing D$	$H_{1\min}$	A	B	M_{\min}	N_{\min}
200	48,5	560	466	400	610
300	50	694	600	400	750

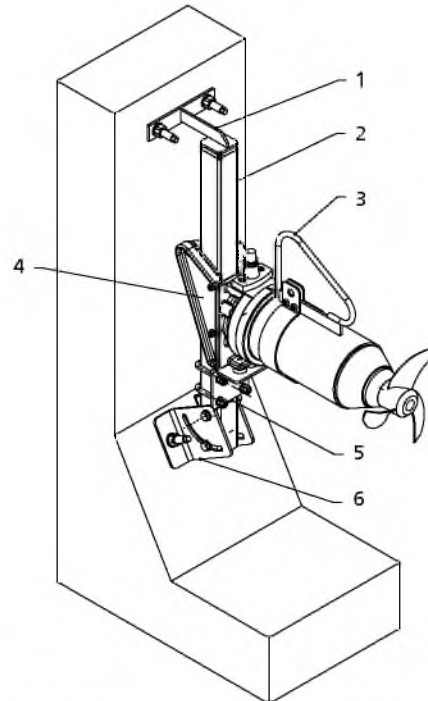
Accessories set 7

Overview of range

For mounting at the top of the tank wall and at the bottom of the tank wall/benching, level-adjustable.



Installation example: mounted on the tank wall



Installation example: mounted on the benching

1	Upper holder	4	Guide bracket for guide rail
2	Guide rail ⁴³⁾	5	Retaining bracket for guide rail
3	Bail (optional)	6	Lower holder

Overview of accessories set 7: mounting at the tank wall or on the benching

Description	Amamix				Material	Mat. No.	[kg]
	200		300				
	G	C	G	C			
Upper holder for guide rail 60 x 60 x 3 mm	X	X	X	X	1.4301	01109095	1.5
Upper holder for guide rail 60 x 60 x 3 mm	X	X	X	X	1.4571	01103807	1.5
Guide rail	(âPage 64)						
Guide bracket for guide rail 60 x 60 x 3 mm ⁴⁴⁾	X	-	X	-	EN-GJL-250	19203139	6.83
Guide bracket for guide rail 60 x 60 x 3 mm	-	X	-	X	1.4571	19202241	3.4
Retaining bracket for guide rail 60 x 60 x 3 mm ⁴⁵⁾	X	X	X	X	1.4571	19202369	1.5
Retaining bracket for guide rail 60 x 60 x 3 mm ⁴⁵⁾	X	X	X	X	1.4301	01109104	1.5
Lower holder for guide rail 60 x 60 x 3 mm	X	X	X	X	1.4301	01109097	2.8
Lower holder for guide rail 60 x 60 x 3 mm	X	X	X	X	1.4571	01103809	2.8

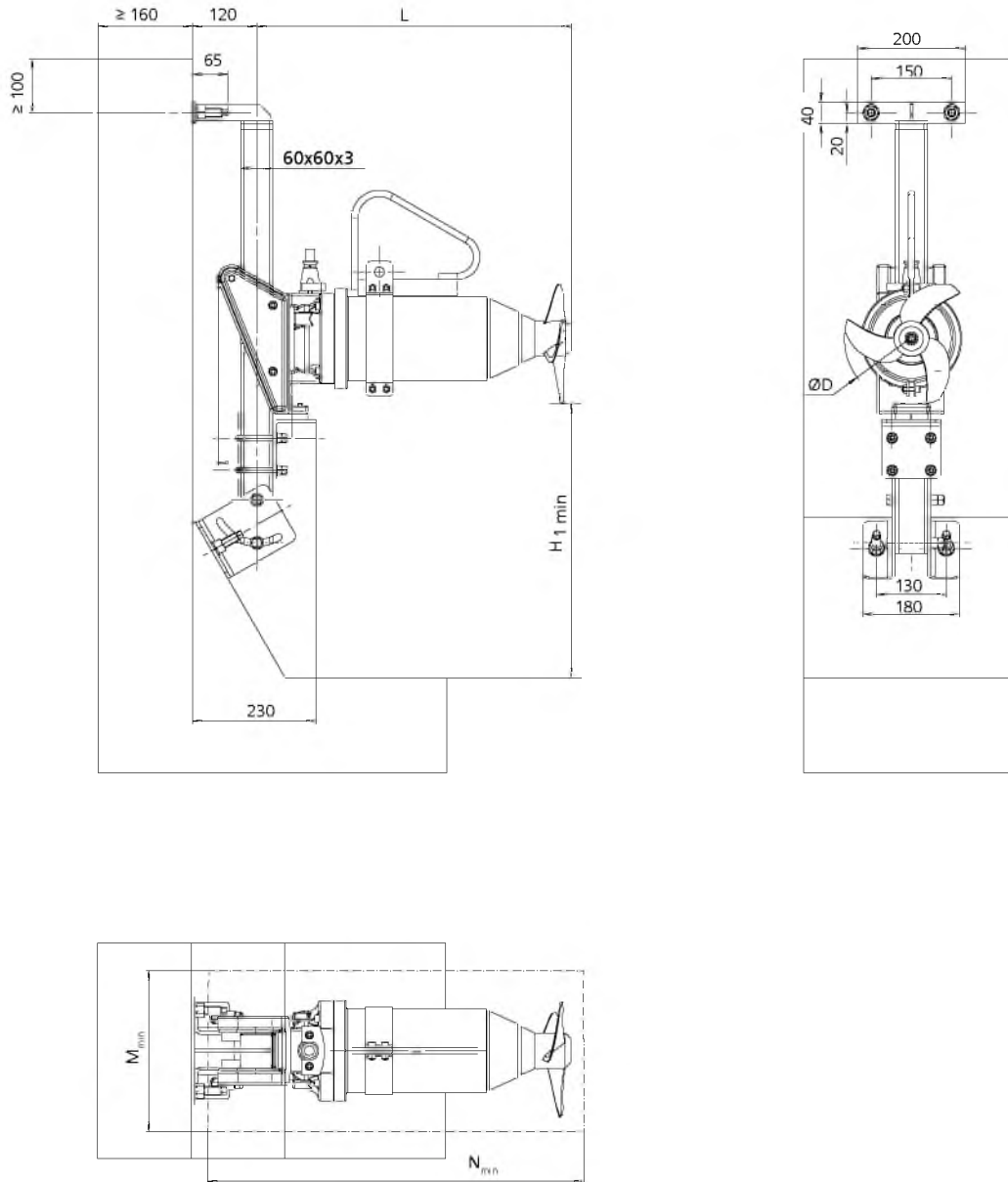
⁴³⁾ Not included in KSB's general scope of supply

⁴⁴⁾ Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (19202241)

⁴⁵⁾ The materials of the retaining bracket and of the guide rail are usually identical.

Installation of accessories set 7 - Amamix 200 / 300

For mounting at the top of the tank wall and on the benching, level-adjustable.



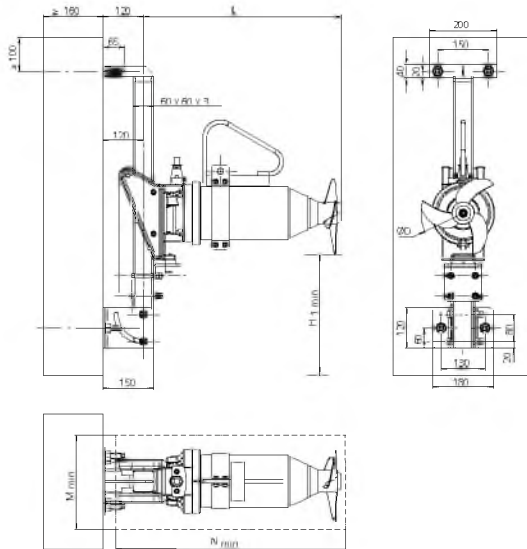
Installation with accessories set 7 - Amamix 200 / 300

Dimensions [mm]

Ø D	Motor housing material	H ₁	L	M _{min}	N _{min}
200	G	120	524	275	700
200	C	120	520	275	700
300	G	150	659	375	830
300	C	150	655	375	830

Installation of accessories set 7 - Amamix 200 / 300

For mounting at the top and bottom of the tank wall, level-adjustable.



Installation of accessories set 7 - Amamix 200 / 300

Dimensions [mm]

$\varnothing D$	Motor housing material	H_1	L	M_{min}	N_{min}
200	G	120	524	275	700
200	C	120	520	275	700
300	G	150	659	375	830
300	C	150	655	375	830

Accessories set 22

Accessories set 22 comprises the upper guide rail holder, the guide rail, the retaining bracket and the lower guide rail holder.

Guide rails

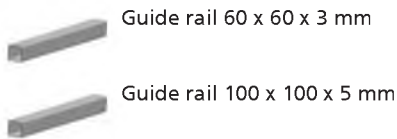
The cross-section of the guide rail depends on the mixer size:

Overview of guide rails

Amamix	Guide rail cross-section	
	60 x 60 x 3 mm	100 x 100 x 5 mm
200	X	-
300	X	-
400	X	X
600	-	X

The guide rail can be supplied either by KSB or the customer/operator.

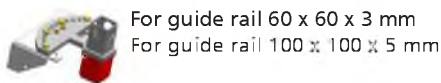
Overview of guide rails



Upper holder

The upper holder is identical for all installation variants (installation on horizontal, sloping or inclined floor). Two designs are available:

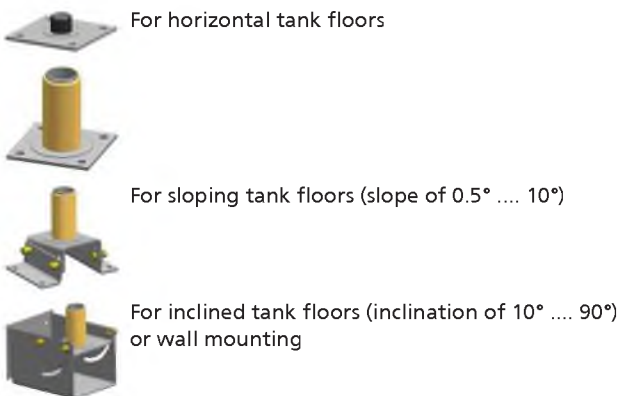
Overview of upper holders



Lower holder

Different types of lower holders are available to match individual tank floor designs.

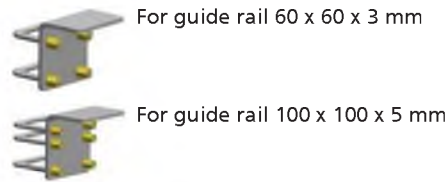
Overview of lower holders



Retaining bracket

The retaining bracket is mounted on the guide rail and serves as a bottom stop for the submersible mixer. Retaining brackets are available for guide rails 60 x 60 x 3 mm and 100 x 100 x 5 mm.

Overview of retaining brackets



Guide bracket for guide rail

The guide bracket is bolted to the motor housing cover of the submersible mixer and serves to guide the submersible mixer along the guide rail. Any forces generated by the submersible mixer, such as the reactive force to the propeller's axial thrust, the motor torque and any lateral forces are transferred into the guide rail via the guide bracket and thus safely dissipated into the foundation (tank wall and floor). The upper holder provides a mixer swivelling option around the guide rail axis of up to 45° towards both sides.

Overview of guide brackets for the guide rail



Pitch adapter

The pitch adapter is fitted between the motor housing cover of the submersible mixer and the guide bracket. By fitting a pitch adapter, the jet pitch can be adjusted either upwards or downwards from the standard horizontal installation position.

Overview of pitch adapters



For all sizes except Amamix 600 G⁴⁶⁾



15°-pitch adapter for Amamix 600 G⁴⁷⁾



30°-pitch adapter for Amamix 600 G⁴⁸⁾

Middle support

For installation depths > 6 m a middle support is required for the guide rail; this may also be useful for lower installation depths depending on tank design and flow conditions.

Overview of middle supports



For guide rail 60 x 60 x 3 mm



For guide rail 100 x 100 x 5 mm

⁴⁶⁾ Pitch can be adjusted through a range of +/- 40°, depending on the mixer size.

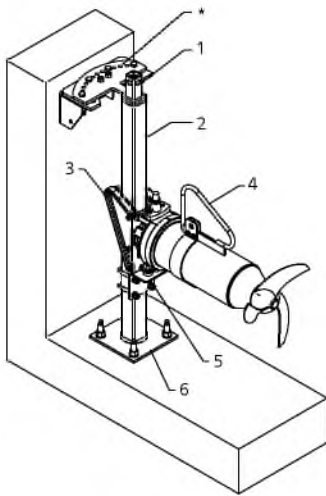
⁴⁷⁾ Allows only fixed angles of 15°, jet direction (upward or downward) must be specified in the purchase order.

⁴⁸⁾ Allows only fixed angles of 30°, jet direction (upward or downward) must be specified in the purchase order.

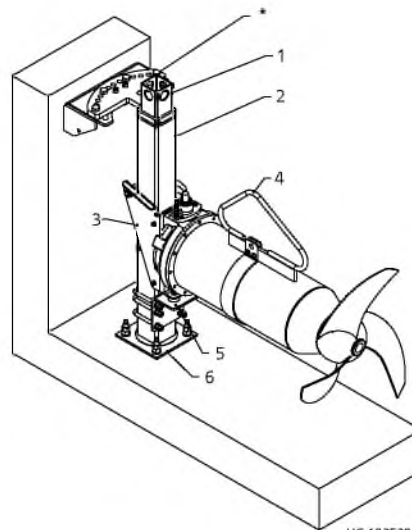
For mounting on the tank wall and horizontal tank floor

Overview of range

Installation using accessories set 22: mounting on the tank wall and horizontal tank floor



Amamix 200, 300, 400



Amamix 400, 600

*	Swivelling option through 45° to the left and right around the guide rail axis (in increments of 7.5°)	4	Bail (optional)
1	Upper holder	5	Retaining bracket for guide rail
2	Guide rail ⁴⁹⁾	6	Lower holder
3	Guide bracket for guide rail		

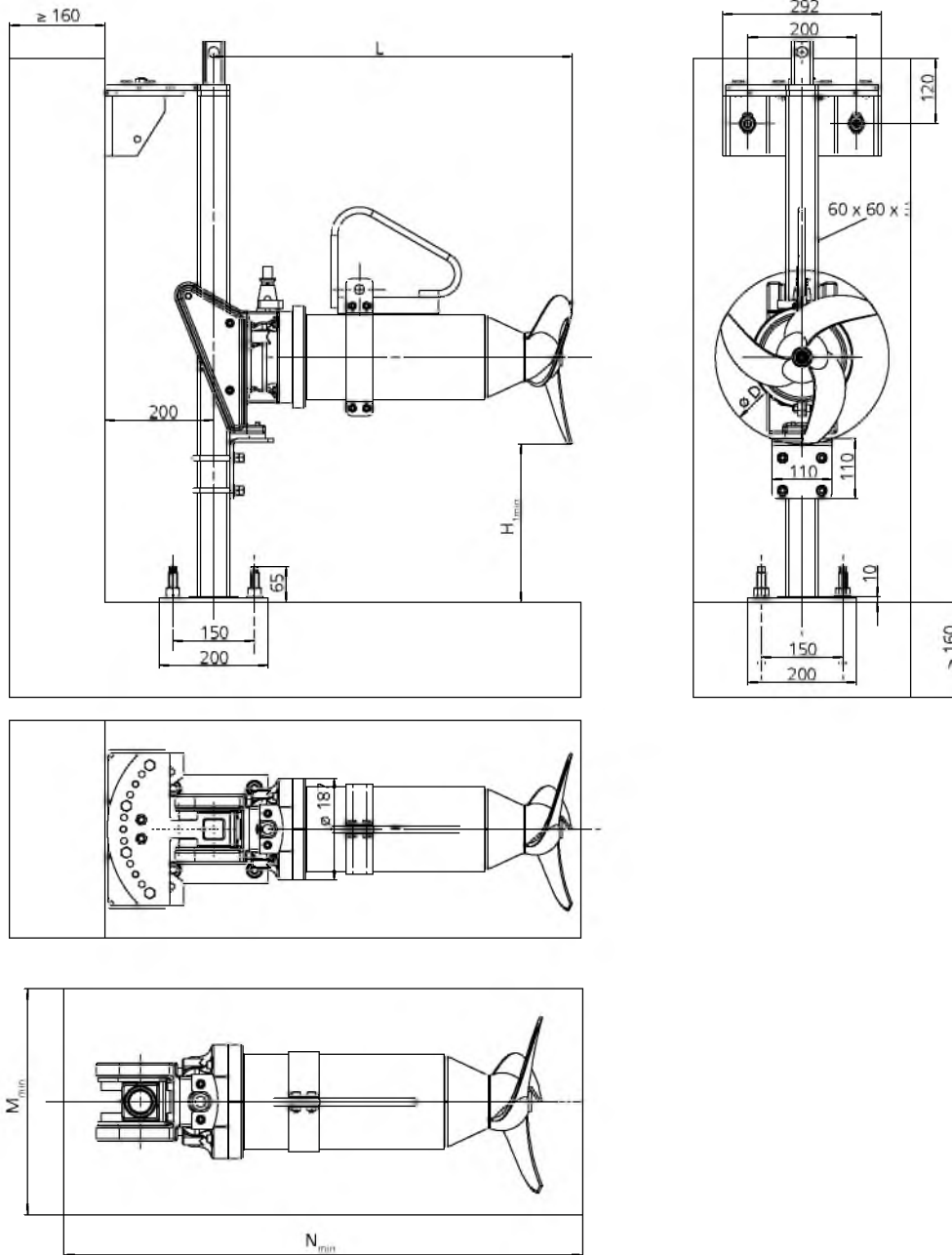
Overview of standard accessories set 22: mounting on the tank wall and horizontal tank floor

Description	Amamix				Material	Mat. No.	[kg]		
	200		300						
	G	C	G	C					
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	-	-	1.4301	01306260	8.9
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	X	X	1.4571	01306261	8.9
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	X	X	X	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	X	X	X	1.4571	01313459	23.23
Guide rail	(⇒ Page 64)								
Guide bracket for guide rail 60 x 60 x 3 mm ⁵⁰⁾	X	-	X	-	-	-	EN-GJL-250	19203139	6.83
Guide bracket for guide rail 60 x 60 x 3 mm ⁵¹⁾	-	-	-	X	-	-	EN-GJL-250	01307155	10.5
Guide bracket for guide rail 60 x 60 x 3 mm	-	X	-	X	-	-	1.4571	19202241	3.4
Guide bracket for guide rail 60 x 60 x 3 mm	-	-	-	-	X	-	1.4571	01307156	7
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	-	X	EN-GJL-250	19556700	17
Guide bracket for guide rail 100 x 100 x 5 mm ⁵²⁾	-	-	-	X	-	-	EN-GJL-250	19556701	13
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	-	1.4571	19202242	8.79
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	-	1.4301	01109104	1.5
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	-	1.4571	19202369	1.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	X	X	X	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	X	X	X	1.4571	19202370	3.5
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	-	1.4301	01129858	4.24
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	-	1.4571	01129859	4.24
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	X	X	X	1.4301	01118892	5.68
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	X	X	X	1.4571	01118903	5.68

49) Not included in KSB's general scope of supply
 50) Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (19202241)
 51) Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (01307156)
 52) Optional: guide bracket for guide rail 100 x 100 x 5 mm made of 1.4571 (19202242)

Installation of accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

For mounting at the top of the tank wall and on the tank floor, level-adjustable and with horizontal swivelling option.



UG 1312313

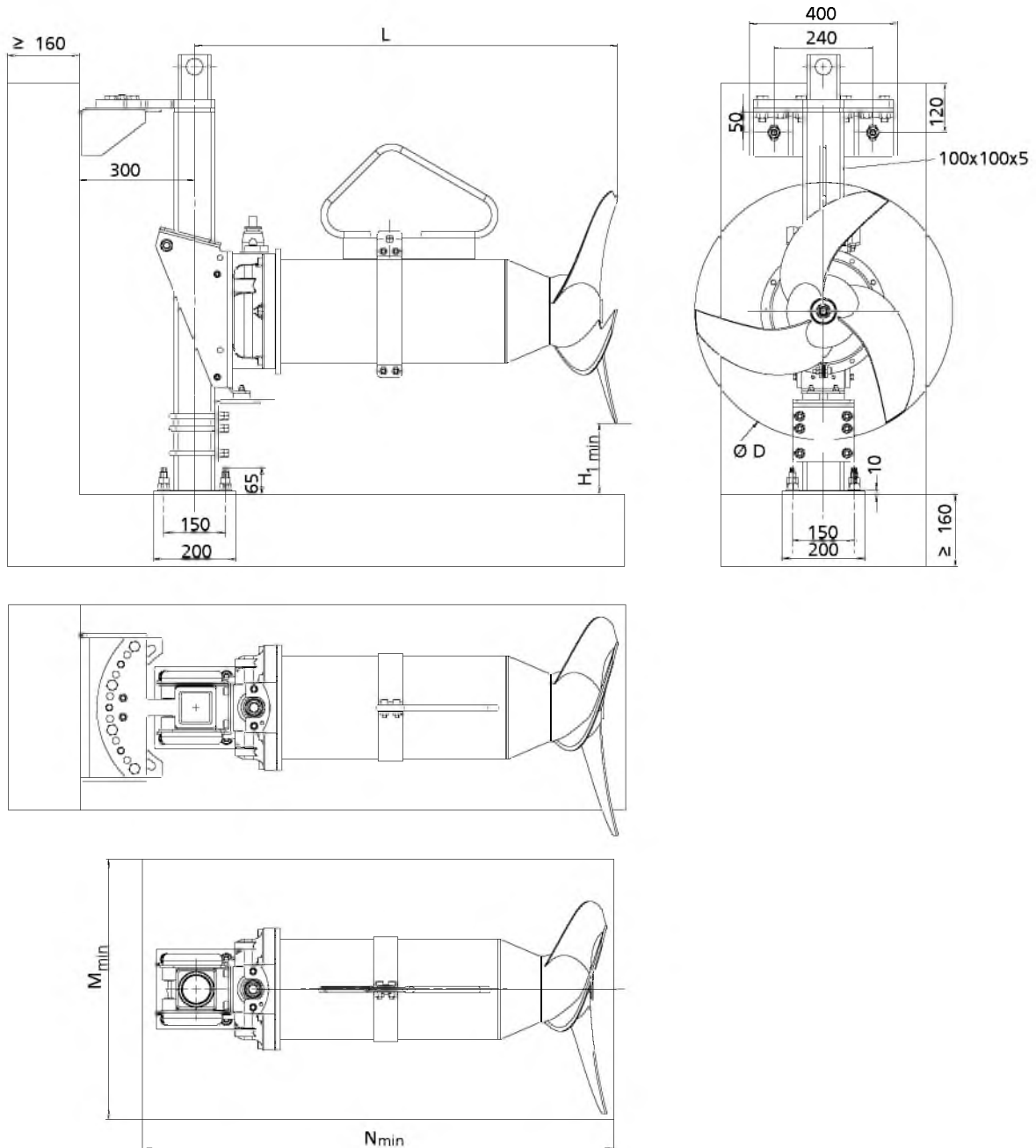
Installation with accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

Dimensions [mm]

$\varnothing D$	Motor housing material	$H_{1\min}$	L	M_{\min}	N_{\min}
200	G	120	524	275	780
200	C	120	520	275	780
300	G	150	659	375	910
300	C	150	655	375	910
400	G	200	844	460	1050
400	C	200	844	460	1050

Installation of accessories set 22 - Amamix 400 (size 4135 only) / 600

For mounting at the top of the tank wall and on a horizontal tank floor, level-adjustable and with horizontal swivelling option.



Installation with accessories set 22 - Amamix 400 (size 4135 only) / 600

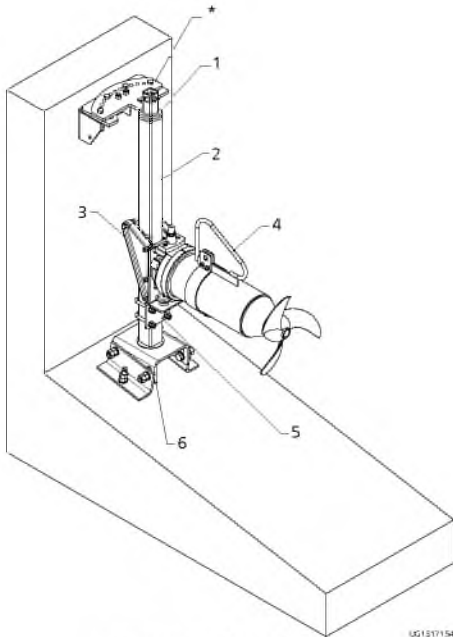
Dimensions [mm]

Ø D	Motor housing material	H _{1 min}	L _{max}	M _{min}	N _{min}
400	G	205	783	460	1150
400	C	205	780	460	1150
600	G	315	949	700	1310
600	C	315	949	700	1390

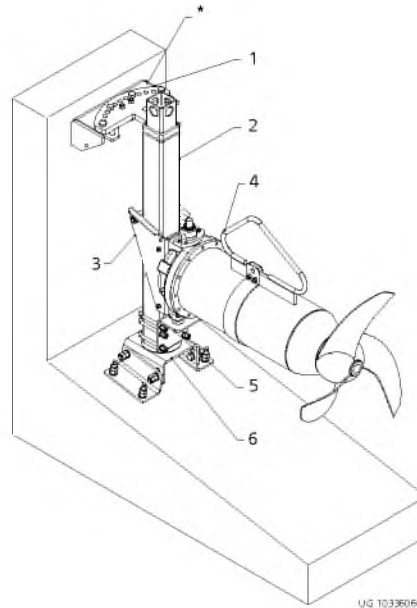
For mounting on the tank wall and on a sloping tank floor (0.5° - 10°)

Overview of range

Installation using accessories set 22: mounting on the tank wall and on a sloping tank floor (0.5° ... 10°)



Amamix 200, 300, 400



Amamix 400, 600

*	Swivelling option through 45° to the left and right around the guide rail axis (in increments of 7.5°)	4	Bail (optional)
1	Upper holder	5	Retaining bracket for guide rail
2	Guide rail ⁵³⁾	6	Lower holder
3	Guide bracket for guide rail		

Overview of standard accessories set 22: mounting on the tank wall and on a sloping tank floor (0.5° ... 10°)

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	X	X	-	-	1.4301	01306260	8.9
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	X	X	-	-	1.4571	01306261	8.9
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	-	X	X	X	X	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	-	X	X	X	X	1.4571	01313459	23.23
Guide rail	(⇒ Page 64)										
Guide bracket for guide rail 60 x 60 x 3 mm ⁵⁴⁾	X	-	X	-	-	-	-	-	EN-GJL-250	19203139	6.83
Guide bracket for guide rail 60 x 60 x 3 mm ⁵⁵⁾	-	-	-	X	-	-	-	-	EN-GJL-250	01307155	10.5
Guide bracket for guide rail 60 x 60 x 3 mm	-	X	-	X	-	-	-	-	1.4571	19202241	3.4
Guide bracket for guide rail 60 x 60 x 3 mm	-	-	-	-	X	-	-	-	1.4571	01307156	7
Guide bracket for guide rail 100 x 100 x 5 mm ⁵⁶⁾	-	-	-	-	-	X	-	-	EN-GJL-250	19556700	17
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	-	-	-	EN-GJL-250	19556701	13
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	-	X	-	-	1.4571	19202242	8.79
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	X	-	-	1.4301	01109104	1.5
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	X	-	-	1.4571	19202369	1.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	X	X	X	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	X	X	X	1.4571	19202370	3.5

⁵³⁾ Not included in KSB's general scope of supply

⁵⁴⁾ Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (19202241)

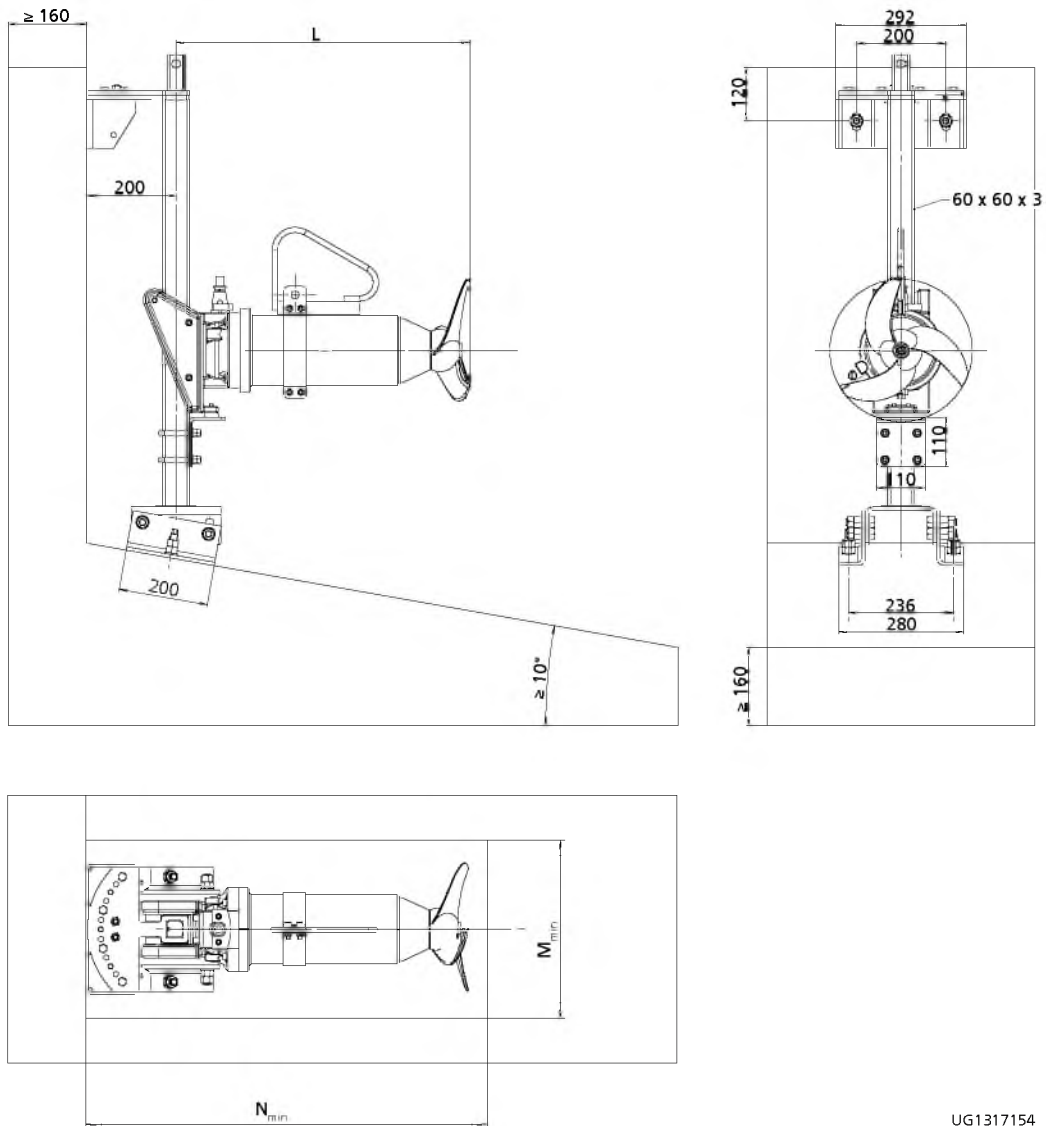
⁵⁵⁾ Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (01307156)

⁵⁶⁾ Optional: guide bracket for guide rail 100 x 100 x 5 mm made of 1.4571 (19202242)

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	X	-	-	1.4301	01129860	9.4
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	X	-	-	1.4571	01129861	9.4
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	-	X	X	X	X	1.4301	01118906	11.92
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	-	X	X	X	X	1.4571	01118907	11.92

Installation with accessories set 22 - Amamix 200 / 300 / 400

For mounting at the top of the tank wall and on a sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option.



UG1317154

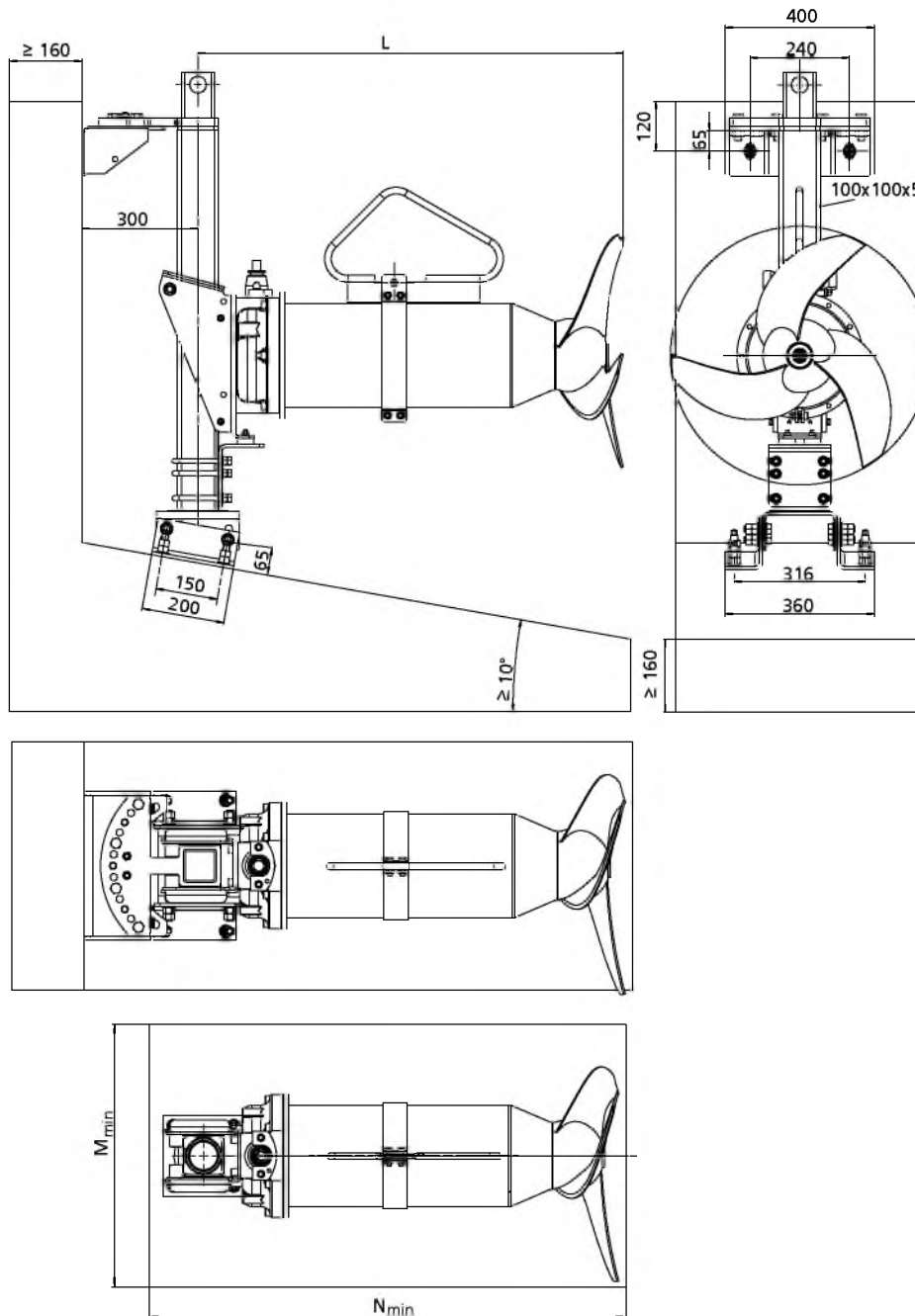
Installation with accessories set 22 - Amamix 200, 300, 400

Dimensions [mm]

Ø D	Motor housing material	L	M _{min}	N _{min}
200	G	524	275	780
200	C	520	275	780
300	G	659	375	910
300	C	655	375	910
400	G	844	460	1050
400	C	844	460	1050

Installation of accessories set 22 - Amamix 400 (size 4135 only) / 600

For mounting at the top of the tank wall and on a sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option.



Installation with accessories set 22 - Amamix 400 (size 4135 only) / 600

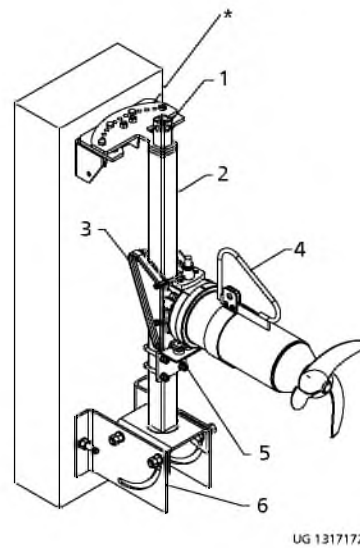
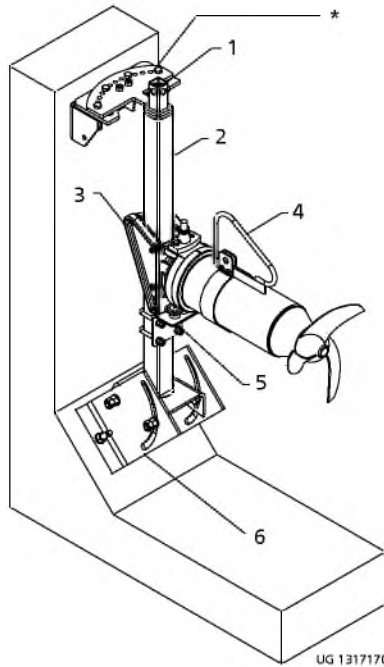
Dimensions [mm]

Ø D	Motor housing material	L	M _{min}	N _{min}
400	G	783	460	1150
400	C	780	460	1150
600	G	949	700	1310
600	C	949	700	1390

For mounting at the top of the tank wall and at the bottom of the tank wall or on an inclined floor (10° - 90°), level-adjustable and with horizontal swivelling option

Overview of range

Installation with accessories set 22: mounted at the top of the tank wall and at the bottom of the tank wall or on an inclined floor (10° - 90°)



Installation example: mounted on an inclined tank floor (10° - 90°)

Installation example: mounted on the tank wall

*	Swivelling option through 45° to the left and right around the guide rail axis (in increments of 7.5°)	4	Bail (optional)
1	Upper holder	5	Retaining bracket for guide rail
2	Guide rail ⁵⁷⁾	6	Lower holder
3	Guide bracket for guide rail		

Overview of standard accessories set 22: mounted at the top of the tank wall and at the bottom of the tank wall or on an inclined floor (10° - 90°)

Description	Amamix				Material	Mat. No.	[kg]		
	200	300	400	600					
	G	C	G	C					
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	-	-	1.4301	01306260	8.9
Upper holder for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	-	-	1.4571	01306261	8.9
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	X	X	X	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	X	X	X	1.4571	01313459	23.23
Guide rail	(⇒ Page 64)								
Guide bracket for guide rail 60 x 60 x 3 mm ⁵⁸⁾	X	-	X	-	-	-	EN-GJL-250	19203139	6.83
Guide bracket for guide rail 60 x 60 x 3 mm ⁵⁹⁾	-	-	-	X	-	-	EN-GJL-250	01307155	10.5
Guide bracket for guide rail 60 x 60 x 3 mm	-	X	-	X	-	-	1.4571	19202241	3.4
Guide bracket for guide rail 60 x 60 x 3 mm	-	-	-	-	X	-	1.4571	01307156	7
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	-	X	EN-GJL-250	19556700	17
Guide bracket for guide rail 100 x 100 x 5 mm ⁶⁰⁾	-	-	-	X	-	-	EN-GJL-250	19556701	13
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	-	1.4571	19202242	8.79

⁵⁷⁾ Guide rail 60 x 60 x 3 mm for Amamix 200/300/400 (not included in KSB's general scope of supply)

⁵⁸⁾ Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (19202241)

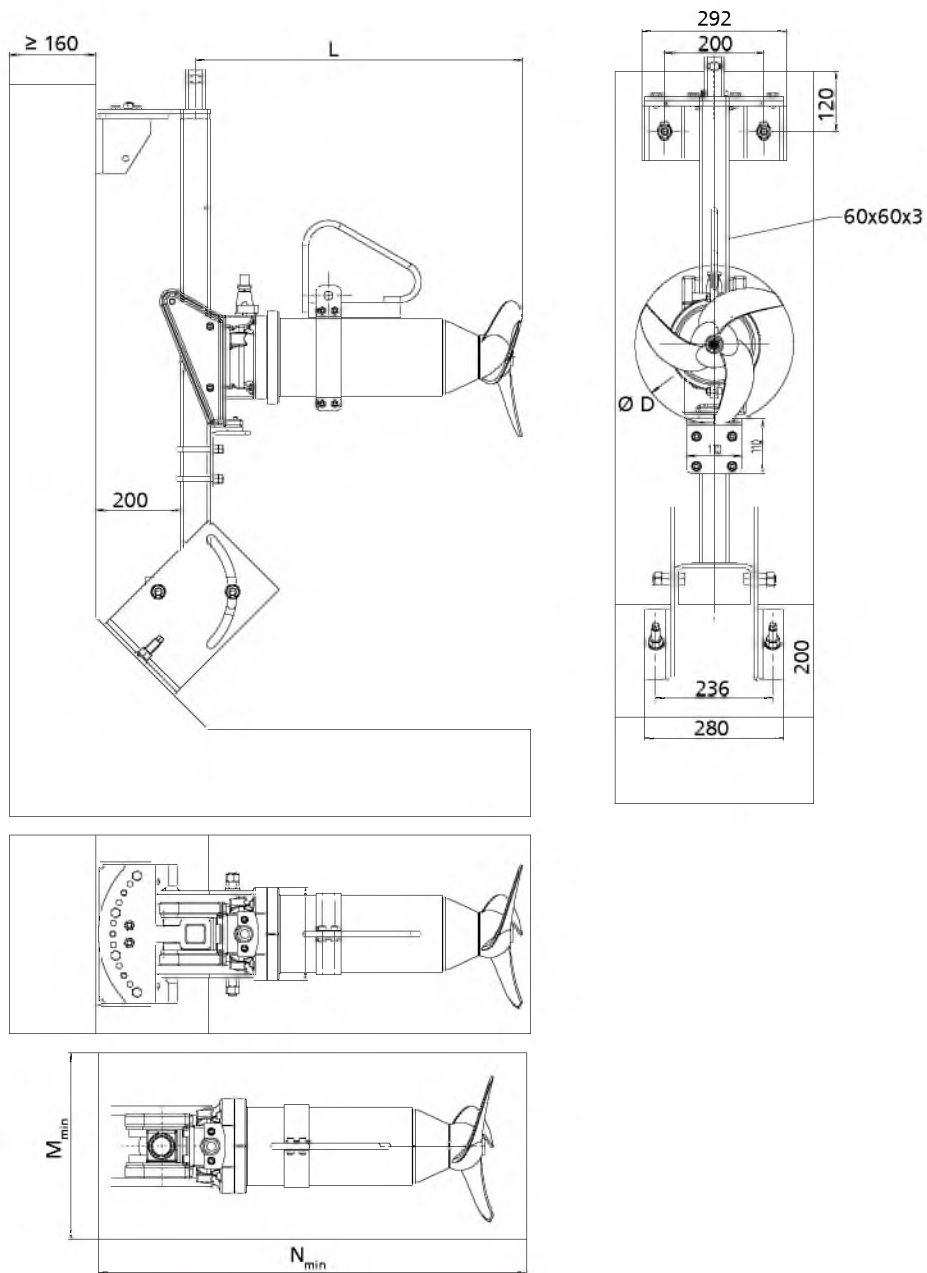
⁵⁹⁾ Optional: guide bracket for guide rail 60 x 60 x 3 mm made of 1.4571 (01307156)

⁶⁰⁾ Optional: guide bracket for guide rail 100 x 100 x 5 mm made of 1.4571 (19202242)

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	X	-	-	1.4301	01109104	1.5
Retaining bracket for guide rail 60 x 60 x 3 mm	X	X	X	X	X	X	-	-	1.4571	19202369	1.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	X	X	X	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	X	X	X	X	1.4571	19202370	3.5
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	X	-	-	1.4301	01129731	13.27
Lower holder for guide rail 60 x 60 x 3 mm, incl. 4 chemical anchors	X	X	X	X	X	X	-	-	1.4571	01129732	13.27
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	-	X	X	X	X	1.4301	01314360	26.52
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	-	-	-	-	X	X	X	X	1.4571	01314362	26.52

Installation of accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

For mounting at the top of the tank wall and at the bottom of the tank wall or on an inclined floor (10° - 90°), level-adjustable and with horizontal swivelling option.



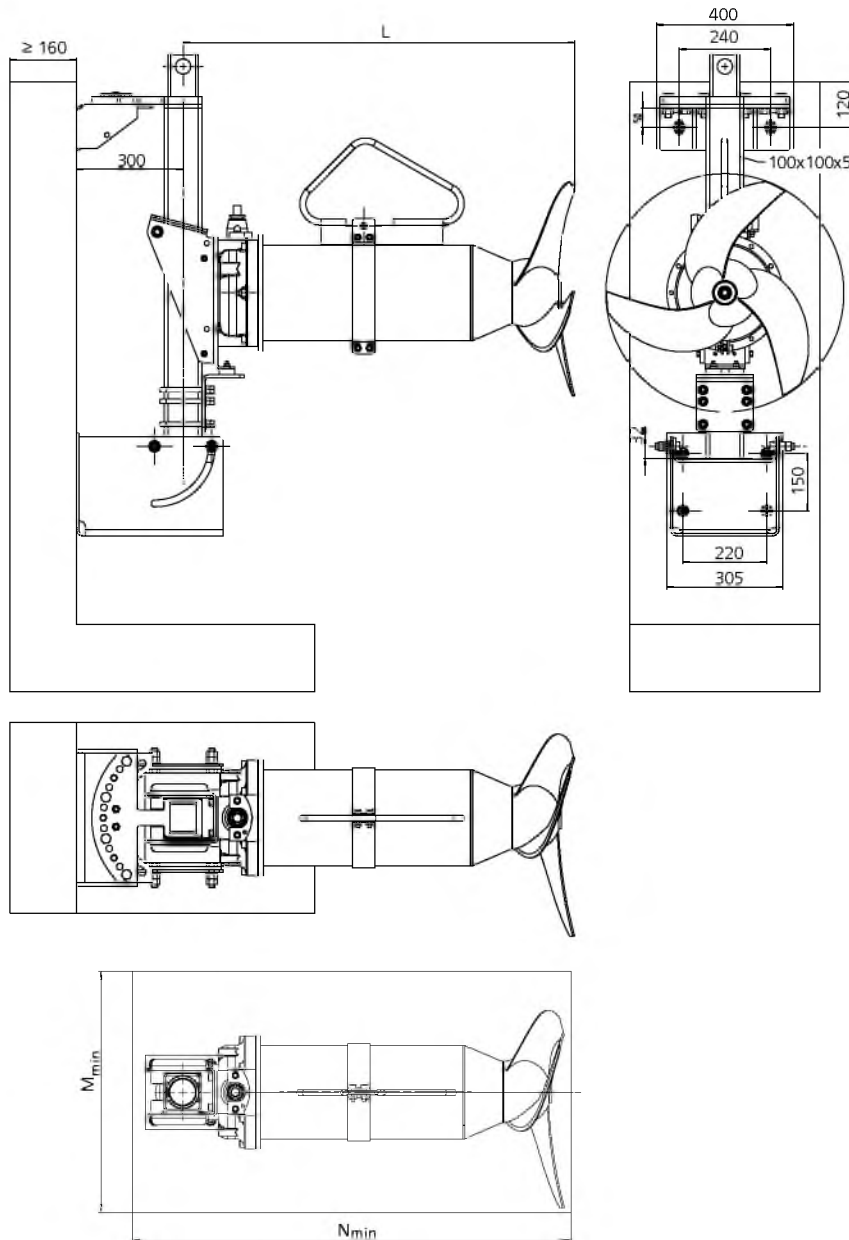
Installation with accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

Dimensions [mm]

$\varnothing D$	Motor housing material	L	M_{min}	N_{min}
200	G	524	275	780
200	C	520	275	780
300	G	659	375	910
300	C	655	375	910
400	G	844	460	1050
400	C	844	460	1050

Installation of accessories set 22 - Amamix 400 (size 4135 only) / 600

For mounting at the top of the tank wall and at the bottom of the tank wall or on an inclined floor (10° - 90°), level-adjustable and with horizontal swivelling option.



Installation with accessories set 22 - Amamix 400 (size 4135 only) / 600

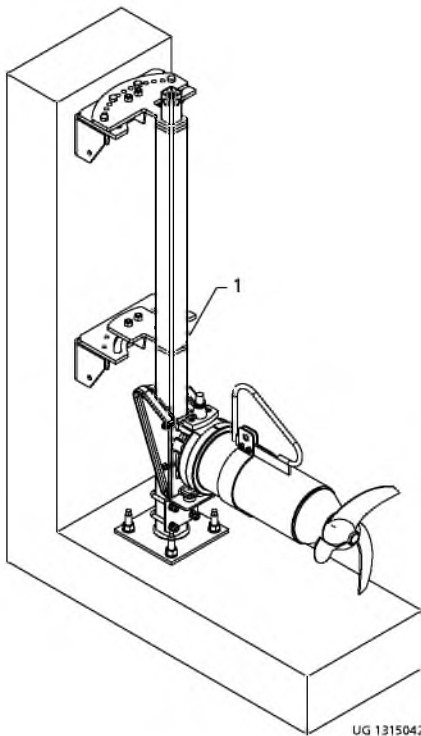
Dimensions [mm]

Ø D	Motor housing material	L	M _{min}	N _{min}
400	G	783	460	1150
400	C	780	460	1150
600	G	949	700	1310
600	C	949	700	1390

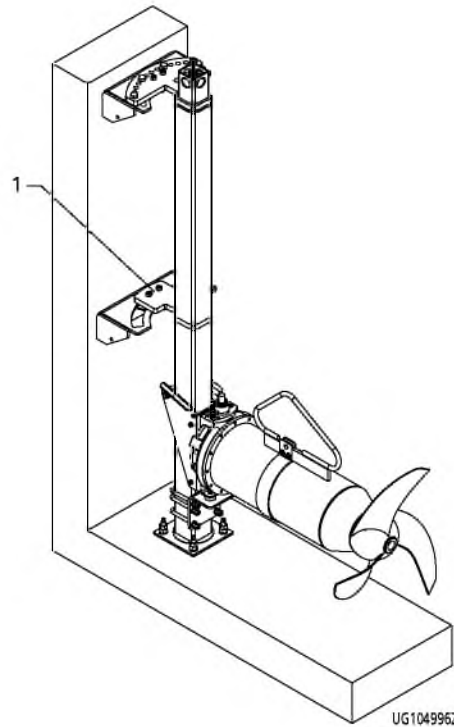
Middle support for 60 x 60 x 3 mm or 100 x 100 x 5 mm guide rail for large installation depths

Overview of range

Installation with accessories set 22: mounted middle support for guide rail



Amamix 200, 300, 400 with guide rail 60 x 60 x 3 mm



Amamix 400, 600 with guide rail 100 x 100 x 5 mm

1 | Middle support

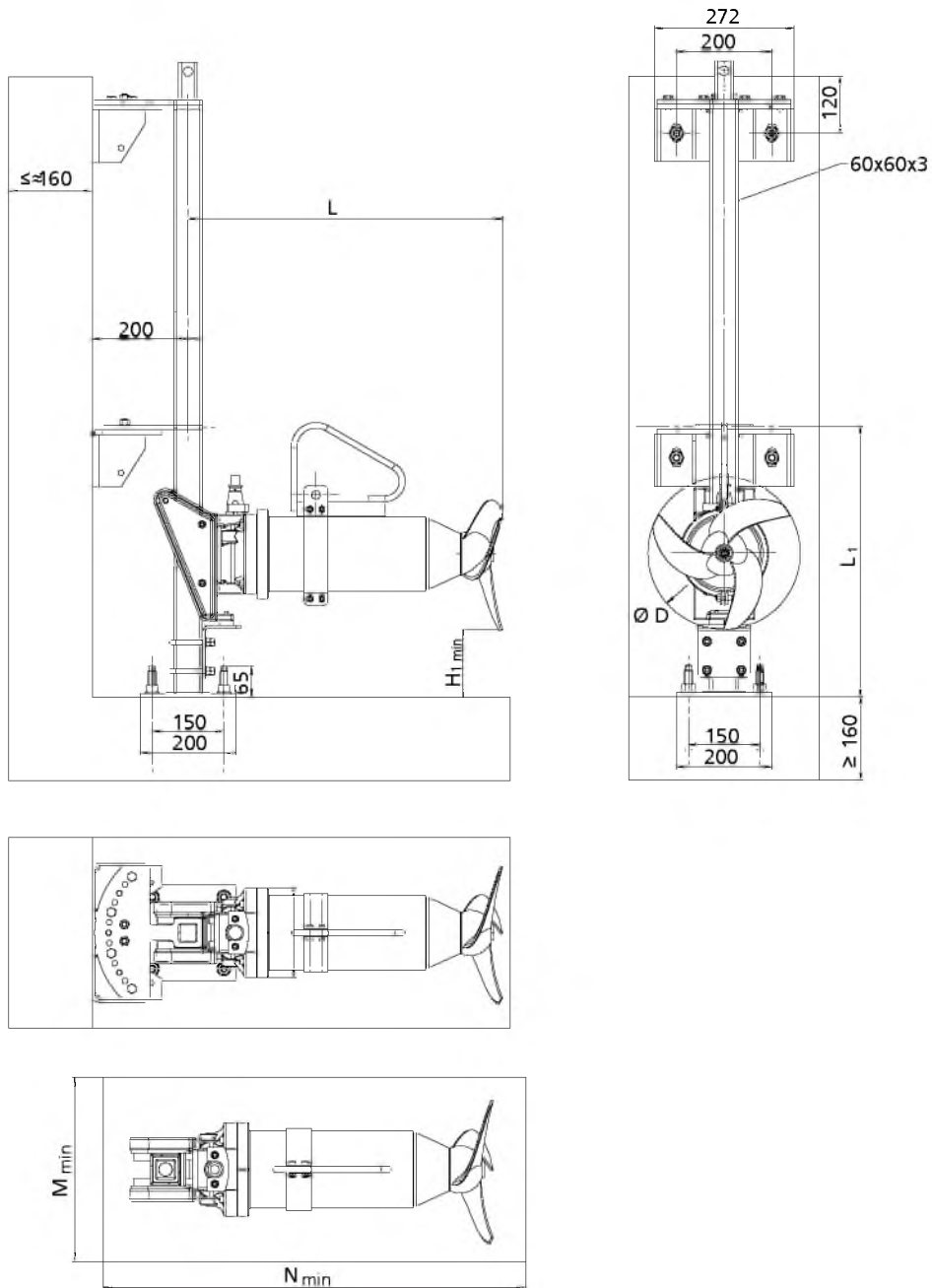
For installation depths > 6 m a middle support for the guide rail must be fitted on the tank wall. Middle supports are not required for installation depths of up to 6 m. However, if the set jet direction and tank wall reflections result in increased forces acting on the guide rail and upper and lower holders, a middle support must be fitted.

Overview of standard accessories set 22: middle support

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Middle support for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	X	X	-	-	1.4301	01306324	7.7
Middle support for guide rail 60 x 60 x 3 mm, incl. 2 chemical anchors	X	X	X	X	X	X	-	-	1.4571	01306325	7.7
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	-	X	X	X	X	1.4301	01313462	19.26
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	-	-	-	-	X	X	X	X	1.4571	01313463	19.26

Installation of accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

Middle support for guide rail 60 x 60 x 3, for large installation depths.



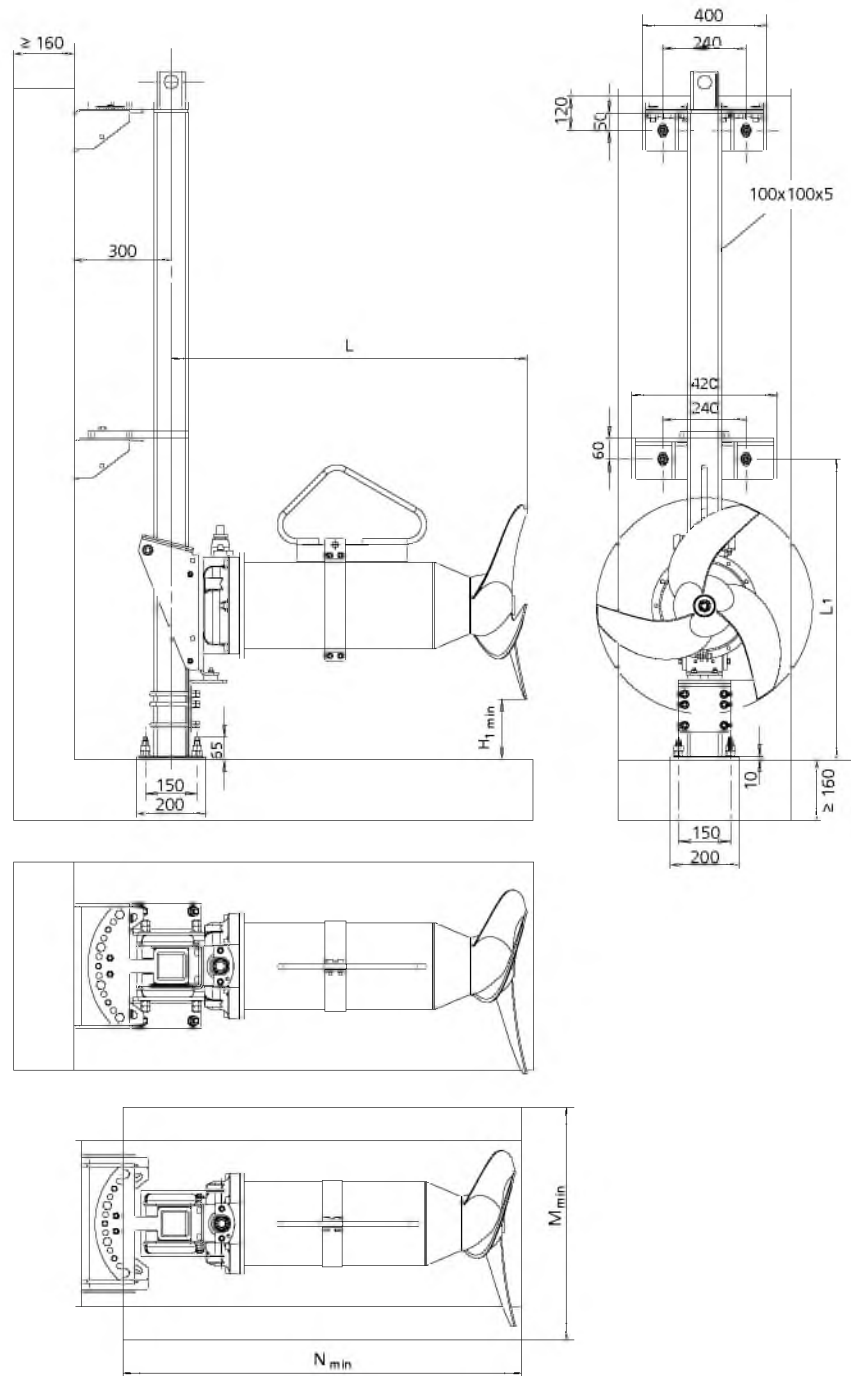
Installation with accessories set 22 - Amamix 200 / 300 / 400 (except size 4135)

Dimensions [mm]

Ø D	Motor housing material	H _{1 min}	L	M _{min}	N _{min}
200	G	120	524	275	780
200	C	120	520	275	780
300	G	150	659	375	910
300	C	150	655	375	910
400	G	200	844	460	1050
400	C	200	844	460	1050

Installation of accessories set 22 - Amamix 400 (size 4135 only) / 600

Middle support for guide rail 100 x 100 x 5, for large installation depths



Installation with accessories set 22 - Amamix 400 (size 4135 only) / 600

Dimensions [mm]

Ø D	Motor housing material	H _{1 min}	L _{max}	M _{min}	N _{min}
400	G	205	783	460	1150
400	C	205	780	460	1150
600	G	315	949	700	1310
600	C	315	949	700	1390

Pitch adapter

General information

The guide bracket for the guide rail does not allow an inclined mixer position relative to the guide rail axis.

For duties requiring an upward or downward inclination of the submersible mixer a pitch adapter is required. The pitch adapter is fitted between the motor housing cover and the guide bracket. It enables the requisite inclination of the submersible mixer axis in increments of 10°, from 40° upwards to 40° downwards.

Exception:

Amamix 200 C/G - max. downward pitch of 10°⁶¹⁾

Amamix 600 C - max. upward or downward pitch of 30°

Amamix 600 G - max. upward or downward pitch of 15° or 30°⁶²⁾

Amamix 200 only allows a downward pitch of up to 10°.

For variants with motor housing material stainless steel, the pitch adapter can be mounted on the guide bracket (in material 1.4571) without any problems. For variants with motor housing material grey cast iron, the pitch adapter cannot be mounted on the guide bracket (in EN-GJL-250) of Amamix 200/300/400. The following guide brackets (in material 1.4571) must be used in this case:

Description	Amamix						Material	Mat. No.	[kg]
	200		300		400 ⁶³⁾				
	G	C	G	C	G	C			
Guide bracket for guide rail 60 x 60 x 3 mm	X	-	X	-	-	-	1.4571	19202241	3.4
Guide bracket for guide rail 60 x 60 x 3 mm	-	-	-	-	X	-	1.4571	01307156	7
Guide bracket for guide rail 100 x 100 x 5 mm	-	-	-	-	-	X	1.4571	19202242	8.79

When the submersible mixer is pitched downwards it may not be possible to shift the supporting clamp towards the motor housing cover far enough to still allow smooth lifting and lowering of the mixer (approx. 5° inclination of the guide bracket relative to the guide rail). In such cases, the supporting strap shown must be used (included in the pitch adapter assembly), which provides the user with a suitable attachment point. The attachment point is determined by the specified hole.

Selecting the attachment hole in the supporting strap required for downward pitch

1. Example: submersible mixer V222. / 1 4 UDG
2. V2... / 1 4 ...: see "Pitch 20°" column
3. See column "Tu": 2. L*

A supporting strap is required. Lifting tackle must be attached to the second hole from the left.

The power cable is protected against damage (chafing) by the supplied cable sleeve and cable ties.

⁶¹⁾ With Amamix 200, the maximum pitch is 10°, as the motor housing is relatively short and does not allow an optimum position of the supporting strap. A pitch angle of 20°/30°/40° can be achieved with a specially designed supporting clamp (on request).

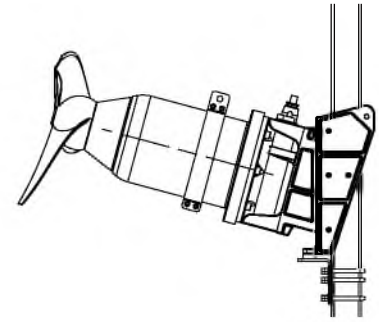
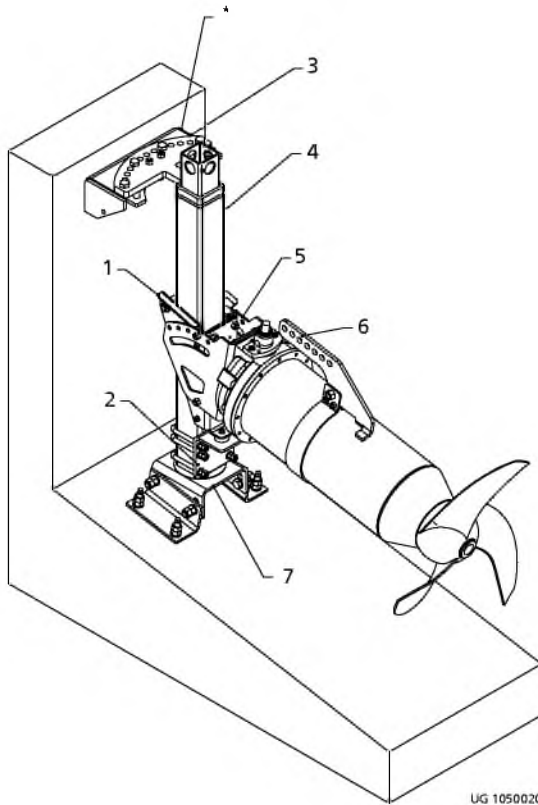
⁶²⁾ The pitch direction (upward or downward) must always be specified in the purchase order.

⁶³⁾ Except size 4135

Overview of range

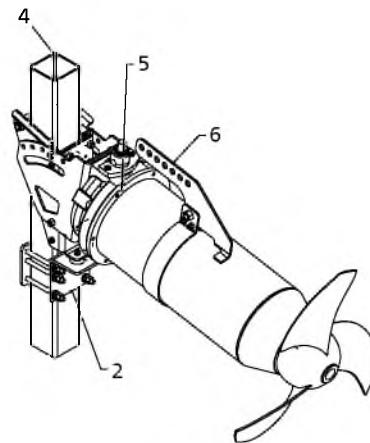
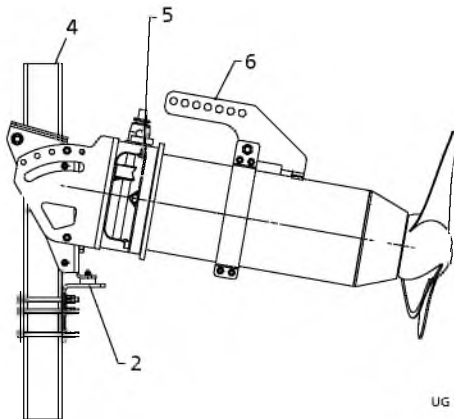
Amamix 200, 300, 400 (motor housing material grey cast iron, stainless steel)
Amamix 600 (motor housing material stainless steel)

Amamix 600 (motor housing material grey cast iron)



Installation example: 15° upward pitch

Mounted on sloping tank floor (0.5° - 10°) with pitch adapter fitted between guide bracket and motor housing cover (downward pitch)



Side view/isometric view

*	Swivelling option through 45° to the left and right around the guide rail axis (in increments of 7.5°)	4	Guide rail
1	Guide bracket	5	Pitch adapter
2	Retaining bracket	6	Supporting strap ⁶⁴⁾
3	Upper holder	7	Lower guide rail holder

⁶⁴⁾ The supporting strap is required for downward pitch only.

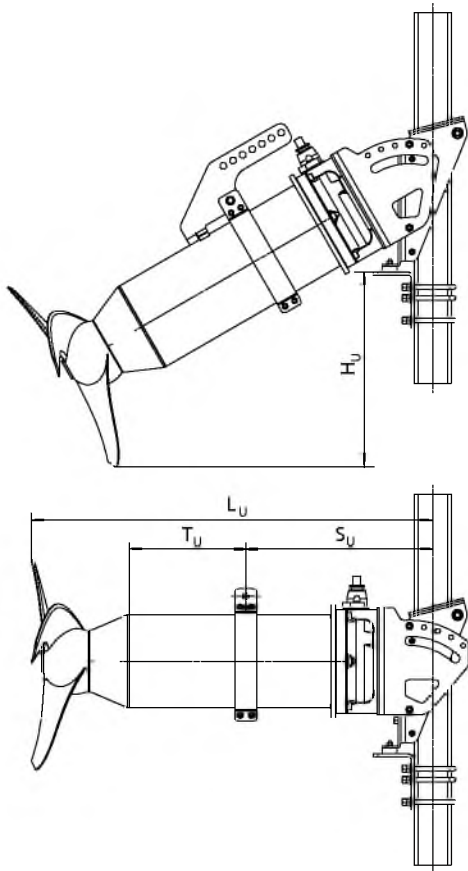
Overview of pitch adapters

Description	Amamix								Material	Mat. No.	[kg]
	200		300		400		600				
	G	C	G	C	G	C	G	C			
Pitch adapter	X	X	X	X	X	X	-	-	1.4571	19554654	4
	-	-	-	-	X ⁶⁵⁾	X ⁶⁵⁾	-	X ⁶⁶⁾	1.4571	19554656	9
	-	-	-	-	-	-	-	X ⁶⁷⁾	1.4571	19554655	9
	-	-	-	-	-	-	X ⁶⁸⁾	-	EN-GJL-250	01137874	12.64
	-	-	-	-	-	-	X ⁶⁹⁾	-	EN-GJL-250	01137876	20.35

-
- 65) Propeller 4135 only
 - 66) With motor 4 12 only
 - 67) With motor 8 12 only
 - 68) 15°
 - 69) 30°

Installation with downward pitch

For accessories set 22 - Amamix 200 - 600



Downward pitch adjustment

Downward pitch adjustment by 0°, 10°, 20°, 30°, 40°

Size	Pitch = 0°				Pitch = 10°				Pitch = 20°				Pitch = 30°				Pitch = 40°				
	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	
	[mm]																				
V2... / 1 4...	< 0	560	225	265	30	585	240	1.L	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)
V2... / 2 4...	< 0	560	230	260	30	585	585	1.L	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)
C2... / 1 4...	< 0	560	230	230	40	585	250	245	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)
C2... / 2 4...	< 0	560	235	225	40	585	250	245	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)	70)
C29... / 0 6...	13	709	275	255	150	744	285	280	245	759	285	305	335	754	285	2.L	415	729	270	4.L	70)
C32... / 2 6...	13	709	275	255	150	744	285	280	245	759	285	305	335	754	285	2.L	415	729	270	4.L	70)
C37... / 3 8...	25	858	340	310	165	898	345	340	275	918	355	1.L	380	913	340	3.L	470	883	330	5.L	70)
C41... / 4 8...	25	858	340	310	165	898	345	340	275	918	355	1.L	380	913	340	3.L	470	883	330	5.L	70)
C57... / 4 12...	100	1004	400	290	305	1074	415	325	430	1114	420	360	540	1129	420	390	71)	71)	71)	71)	70)
C63... / 8 12...	100	1129	460	350	325	1194	475	385	470	1229	475	420	600	1234	470	455	71)	71)	71)	71)	70)

Downward pitch adjustment of 0°, 15°, 30°

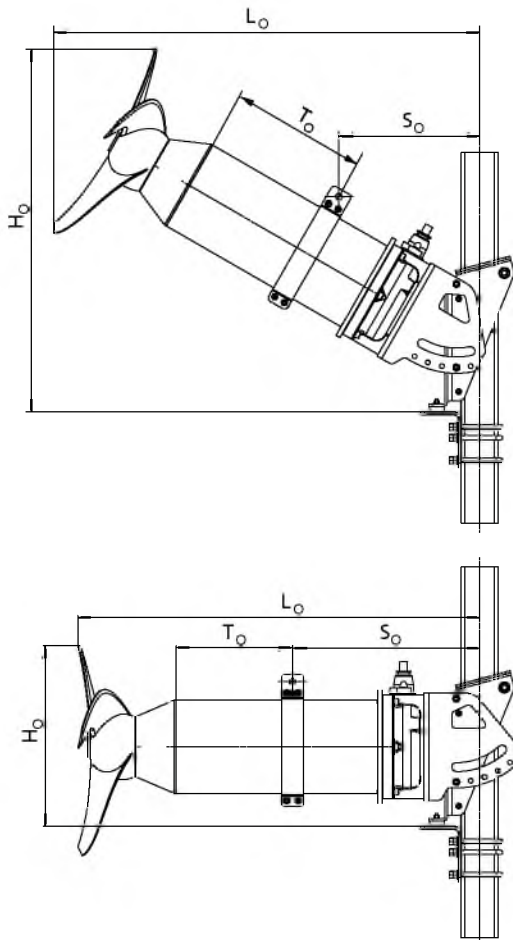
Size	Pitch = 0°				Pitch = 15°				Pitch = 30°				
	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	H _U	L _U	S _U	T _U	
	[mm]												
C57.../C63...	/ 6 12...	85	946	393	280	350	950	700	300	486	1048	579	320
	/ 10 12...	85	946	393	280	350	950	700	300	486	1048	579	320

70) On request only

71) Max. permissible pitch: 30°

Installation with upward pitch

For accessories set 22 - Amamix 200 - 600



Upward pitch adjustment

Upward pitch adjustment by 0°, 10°, 20°, 30°, 40°

Size	Pitch = 0°				Pitch = 10°				Pitch = 20°				Pitch = 30°				Pitch = 40°				
	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o	
[mm]																					
V2... / 1 4...	260	560	225	265	350	585	240	245	440	595	250	220	520	585	255	190	595	560	260	150	
V2... / 2 4...	260	560	230	260	350	585	245	240	440	595	255	215	520	585	260	185	595	560	260	150	
C2... / 1 4...	270	560	230	230	360	585	250	210	450	595	255	190	530	590	260	165	600	565	260	135	
C2... / 2 4...	270	560	235	225	360	585	255	205	450	595	260	185	530	590	265	160	600	565	260	130	
C29... / 0 6...	313	709	275	255	470	744	295	230	570	759	315	200	655	754	315	170	735	729	305	140	
C32... / 2 6...	313	709	275	255	470	744	295	230	570	759	315	200	655	754	315	170	735	729	305	140	
C37... / 3 8...	385	858	340	310	630	898	360	285	740	918	380	250	845	913	290	210	935	883	390	160	
C41... / 4 8...	385	858	340	310	630	898	360	285	740	918	380	250	845	913	290	210	935	883	390	160	
C57... / 4 12...	530	1004	400	290	765	1074	425	260	890	1114	440	225	1000	1129	445	185	⁷²⁾ 72)	⁷²⁾ 72)	⁷²⁾ 72)	⁷²⁾ 72)	
C63... / 8 12...	530	1129	460	350	785	1194	485	320	930	1229	500	280	1060	1234	505	235	⁷²⁾ 72)	⁷²⁾ 72)	⁷²⁾ 72)	⁷²⁾ 72)	

Upward pitch adjustment of 0°, 15°, 30°

Size	Pitch = 0°				Pitch = 15°				Pitch = 30°							
	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o	H _o	L _o	S _o	T _o				
[mm]																
C57.../C63...	/ 6 12...				545	946	393	280	800	1079	400	250	1050	1116	360	230
					545	946	393	280	800	1079	400	250	1050	1116	360	230

⁷²⁾ Max. permissible pitch: 30°

Options: Amamix 200, 300 with guide bracket for guide rail 100 x 100 x 5 mm

The standard version of Amamix 200, 300 with accessories set 22 is designed for a 60 x 60 x 3 mm guide rail (new installations). If a 100 x 100 x 5 mm guide rail has been specified, or if a 100 x 100 x 5 mm guide rail is already installed (e.g. in the case of KSB replacement units), Amamix 200, 300 units can be equipped with the following guide brackets instead of the standard guide brackets:

Overview of guide brackets for Amamix 200, 300 with guide rail 100 x 100 x 5 mm

Description	Amamix				Material	Mat. No.	[kg]
	200		300				
	G	C	G	C			
Guide bracket for guide rail 100 x 100 x 5 mm	X	-	X	-	EN-GJL-250	19556701	13
Guide bracket for guide rail 100 x 100 x 5 mm	○ ⁷³⁾	X	○ ⁷³⁾	X	1.4571	19202242	8.79

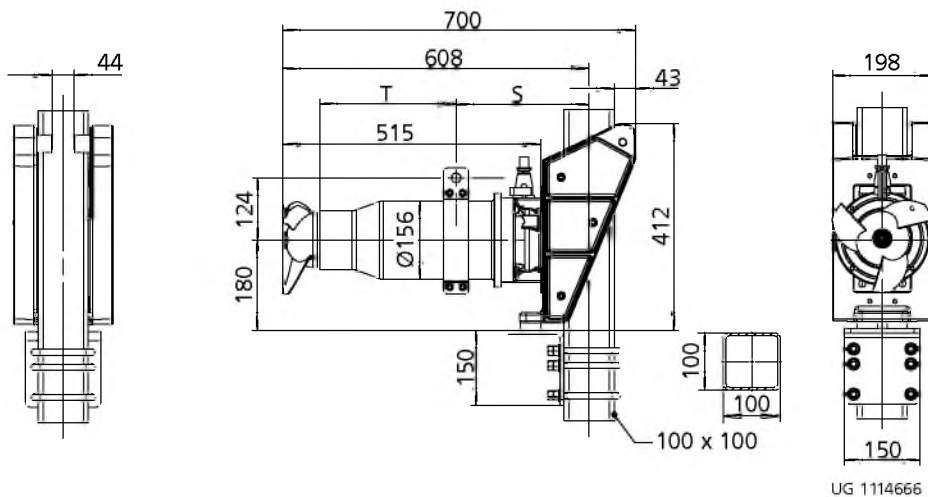
The guide brackets are already provided with the holes required for fastening the Amamix 200, 300 mixer.

Guide bracket mounted on motor housing cover with socket head cap screws

Description	Quantity	Thread	Tightening torque
Socket head cap screws	4	M8	17 Nm

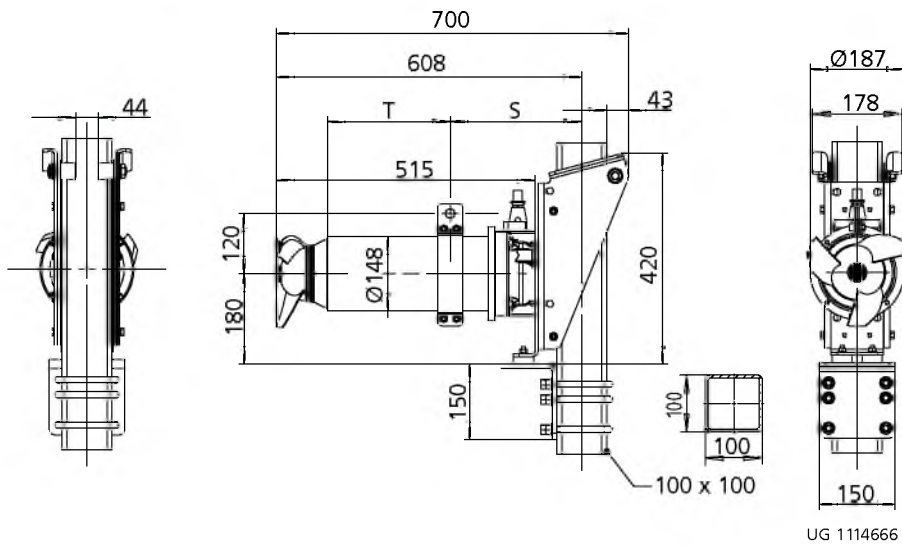
Compared to the technical data of the standard version (guide bracket for guide rail 60 x 60 x 3 mm), the complete unit weight, incl. guide bracket and 10-metre power cable, will be increased by 9.1 kg (motor housing material grey cast iron) or 5.1 kg (motor housing material stainless steel). A heavier guide bracket also results in different dimensions and a different position of the supporting clamp.

Dimensions of guide bracket for guide rail 100 x 100 x 5 mm

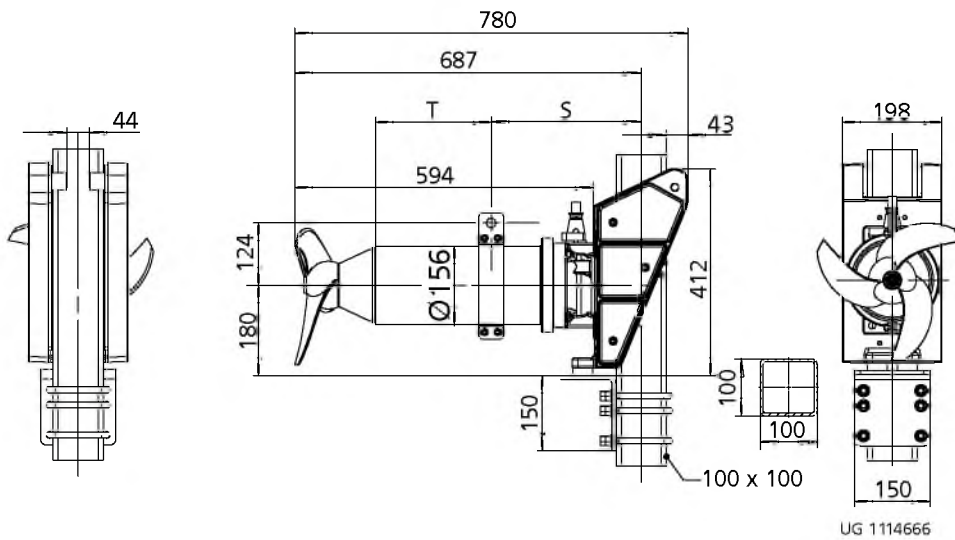


Amamix 200 G: S = 215 / T = 270, motor 1 4 = 43 kg, motor 2 4 = 43.5 kg

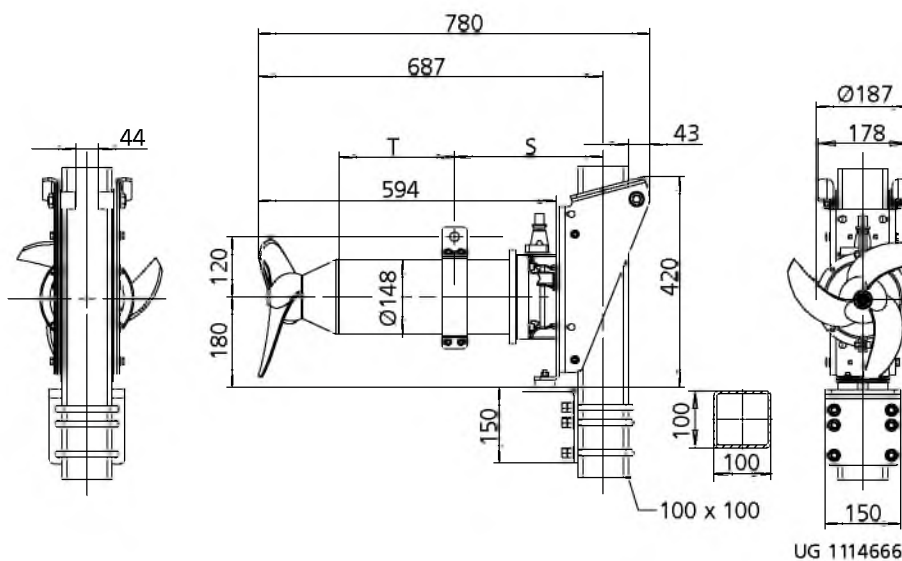
⁷³⁾ Optional



Amamix 200 C: S = 215 / T = 240 (motor 1 4) S = 220 / T = 235 (motor 2 4), motor 1 4 = 36.5 kg, motor 2 4 = 39 kg



Amamix 300 G: S = 265 / T = 260, motor 0 6 / 2 6 = 55 kg



Amamix 300 C: S = 265 / T = 260, motor 0 6 / 2 6 = 48.5 kg

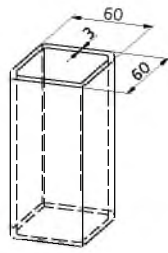
Forcing screws

Forcing screws

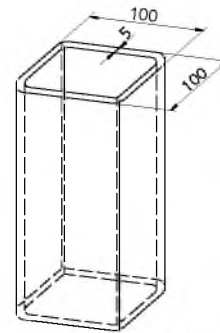
Size	Forcing screw		Mat. No.	[kg]
200	M16 x 60		11197135	0,1
300			11197135	0,1
400			11197135	0,1
600	M20 x 95		11197784	0,25

Guide rails

Overview of guide rails



Guide rail 60 x 60 x 3 mm



Guide rail 100 x 100 x 5 mm

Overview of guide rails

Description	Length	Amamix								Material	Mat. No.	[kg]
		200		300		400		600				
	[m]	G	C	G	C	G	C	G	C			
Guide rail 60 x 60 x 3 mm	1,5	X	X	X	X	X	X	-	-	1.4301	11307851	7.85
Guide rail 60 x 60 x 3 mm	1,5	X	X	X	X	X	X	-	-	1.4571	11307852	7.85
Guide rail 60 x 60 x 3 mm	3,0	X	X	X	X	X	X	-	-	1.4301	11304010	15.7
Guide rail 60 x 60 x 3 mm	3,0	X	X	X	X	X	X	-	-	1.4571	11304011	15.7
Guide rail 60 x 60 x 3 mm	6,0	X	X	X	X	X	X	-	-	1.4301	11304596	31.3
Guide rail 60 x 60 x 3 mm	6,0	X	X	X	X	X	X	-	-	1.4571	11304597	31.3
Guide rail 100 x 100 x 5 mm	3,0	-	-	-	-	X	X	X	X	1.4301	11304598	43.2
Guide rail 100 x 100 x 5 mm	3,0	-	-	-	-	X	X	X	X	1.4571	11304599	43.2
Guide rail 100 x 100 x 5 mm	6,0	-	-	-	-	X	X	X	X	1.4301	11304600	86.4
Guide rail 100 x 100 x 5 mm	6,0	-	-	-	-	X	X	X	X	1.4571	11304601	86.4

Wear-resistant adapter



Wear-resistant adapter (available against a surcharge)

If the fluid handled contains sand or similar abrasive particles, combining adapter 721 with a screwed-on wear-resistant casing wear ring is recommended.

Materials: adapter

Component	Material	
	Standard design	Special design
Adapter	Polyurethane	Polyurethane
Casing wear ring	-	1.4021/hardened to HB400

i The wear-resistant adapter (special design) is available on request.

Cable support/carabine hook

Cable support

The cable support is used for supporting the power cable at the lifting rope or tank edge (one included in standard scope of supply; additional or spare cable supports available).

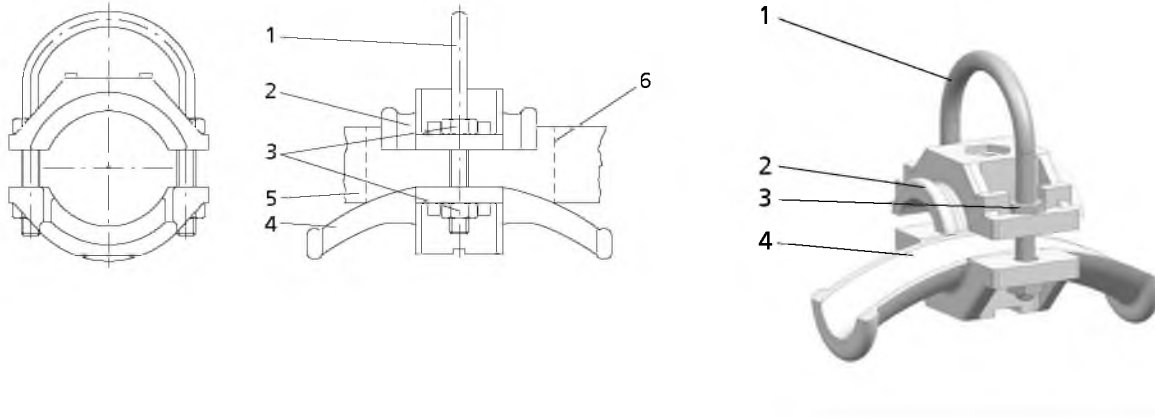
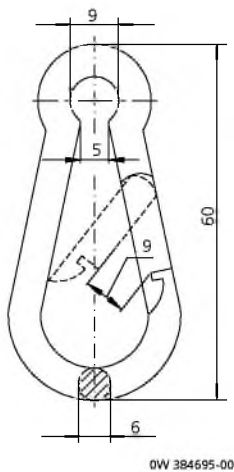


Illustration of cable support

1	Bail
2	Moulded part made of polypropylene
3	Hexagon nut made of A4
4	Moulded part made of polypropylene
5	Power cable with defined diameter ⁷⁴⁾
6	Rubber pad

i For power cable diameters ≤ 10 or 17 mm respectively a rubber pad is inserted to make sure the cable is clamped properly.

Carabine hook



Dimensions of carabine hook [mm]

⁷⁴⁾ Refer to the power cable data given in the motor catalogue.

Overview of cable supports/carabine hooks

Description	Suitable for														Material	Mat. No.	[kg]
	1 4	2 4	5 4	11 4	16 4	23 4	0 6	2 6	3 8	4 8	4 12	6 12	8 12	10 12			
Cable support, incl. carabine hooks	x ⁷⁵⁾	x ⁷⁵⁾	-	-	-	-	x ⁷⁵⁾	x ⁷⁵⁾	-	-	-	-	-	-	Cable support: plastic / A4, carabine hook: A4	1955522	0.06
Cable support, incl. carabine hooks	-	-	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	-	-	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	x ⁷⁶⁾	Cable support: plastic / A4, carabine hook: A4	1955523	0.09

75) Diameter of power cable Ø = 10-16 mm

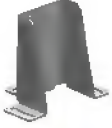
76) Diameter of power cable Ø = 17-25 mm

Scope of supply

Depending on the design variant the following components are included in the scope of supply:

Accessories of accessories set 6

- Stand for floor mounting



- Chemical anchors



Accessories of accessories set 7

- Chemical anchors



- Guide rail with guide rail extension if required



- Lower holder for mounting on the sump/tank wall or benching



- Upper holder



- Retaining bracket



- Guide bracket Version C or version G, usually supplied fitted to the mixer



Accessories of accessories set 22

- Chemical anchors



- Guide rail with guide rail extension if required



- Lower holder for mounting on a horizontal tank floor (0° - 0.5°) Version 60 x 60 or 100 x 100 mm



- Lower holder for mounting on a sloping tank floor (0.5° - 10°)



- Lower holder for mounting on an inclined tank floor or on the sump/tank wall (10° - 90°)



- Upper holder Version 60 x 60 or 100 x 100 mm



- Retaining bracket Version 60 x 60 mm or 100 x 100 mm



- Guide bracket Version C, version G, usually supplied fitted to the mixer



Special accessory - Middle support for guide rail



Special accessory - Supporting strap

Fastened to the mixer via the supporting clamp if a pitch adapter is used; usually fitted at the factory (included in the pitch adapter assembly)



Special accessory - Bail

Fastened to the mixer via the supporting clamp; usually fitted at the factory



Special accessory - Pitch adapter

Usually fitted between the motor housing cover and the guide bracket at the factory



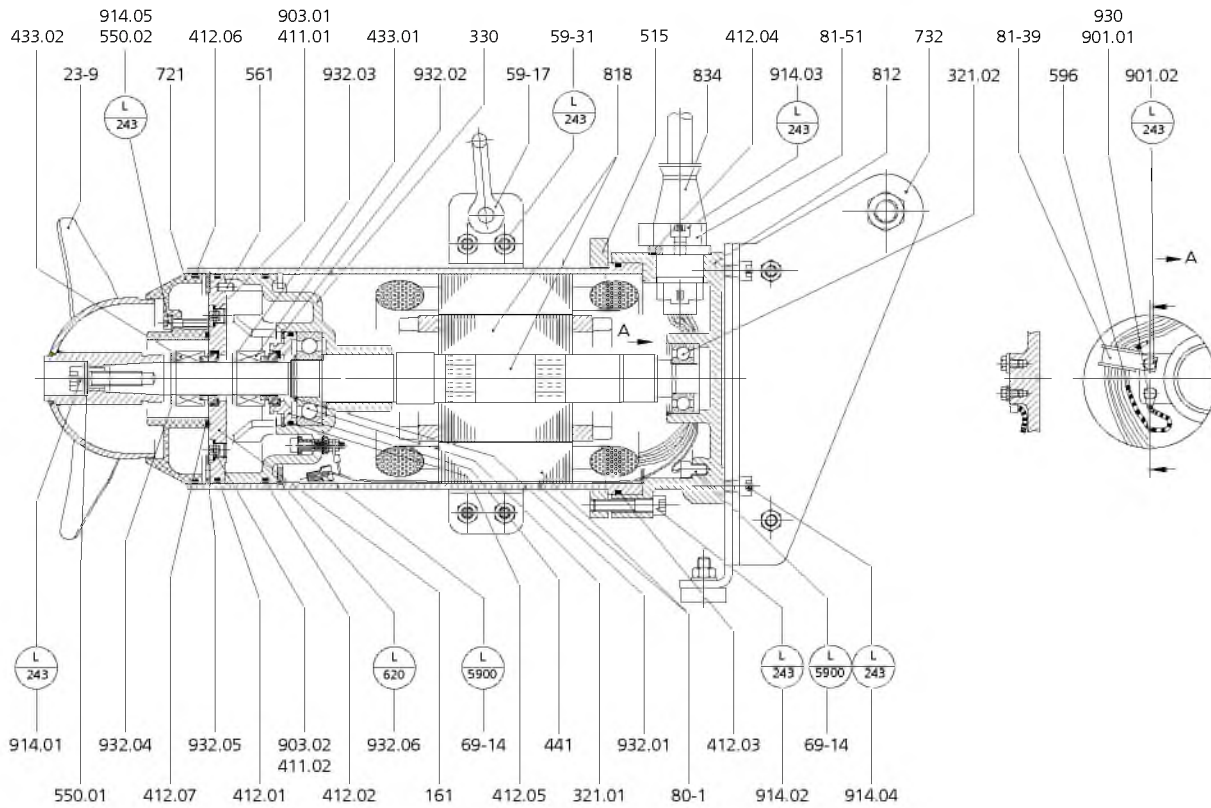
Special accessory - Pitch adapter for Amamix 600 G

Always fitted between the motor housing cover and the guide bracket at the factory



General assembly drawings with list of components

Amamix 200 - motor housing material stainless steel

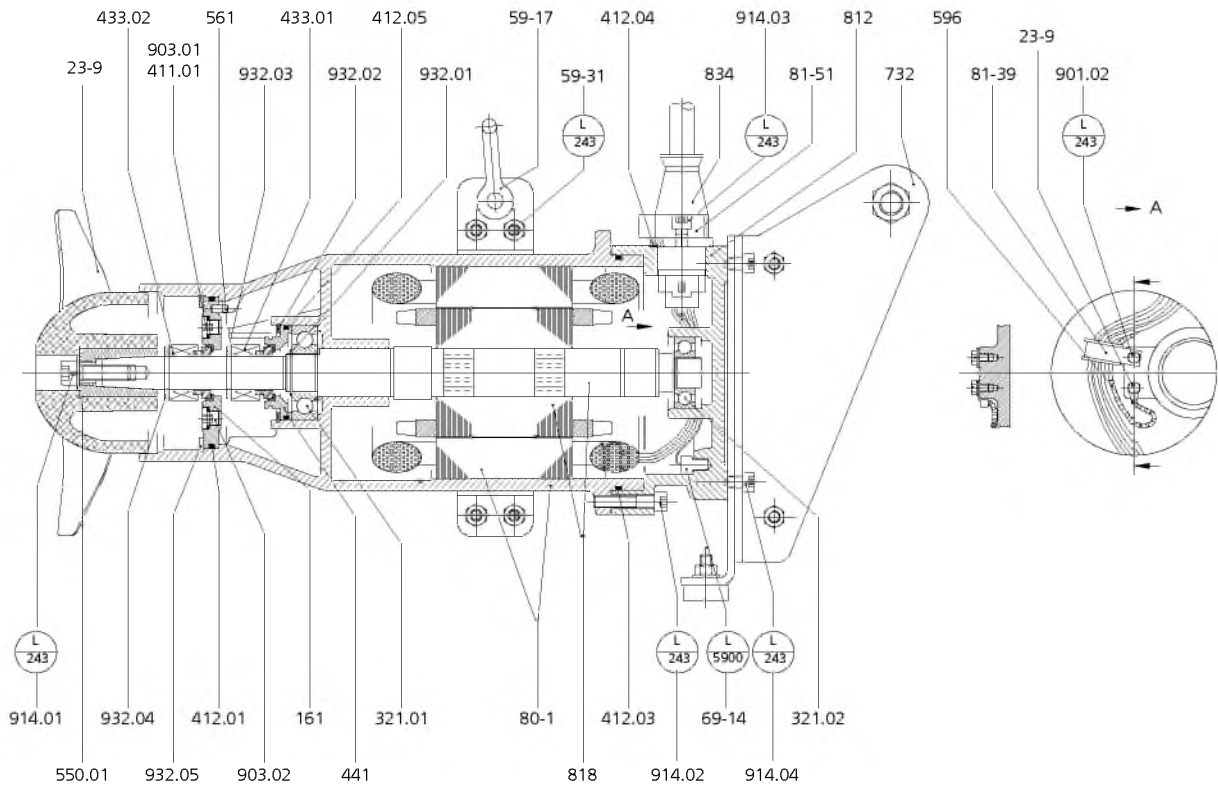


General assembly drawing of Amamix 200, motor housing material stainless steel

List of components of Amamix 200, motor housing material stainless steel

Part No.	Description	Part No.	Description
161	Casing cover	69-14	Leakage monitor
23-9	Axial propeller	721	Adapter
321	Radial ball bearing	732	Guide bracket (accessory)
330	Bearing bracket	80-1	Motor unit
411	Joint ring	81-39	Clamp
412	O-ring	81-51	Clamping element
433	Mechanical seal	812	Motor housing cover
441	Shaft seal housing	818	Rotor
515	Taper lock ring	834	Cable gland
550	Disc	901	Hexagon head bolt
561	Grooved pin	903	Screw plug
59-17	Shackle	914	Hexagon socket head cap screw
59-31	Supporting clamp	930	Safety device
596	Wire	932	Circlip

Amamix 200 - motor housing material grey cast iron

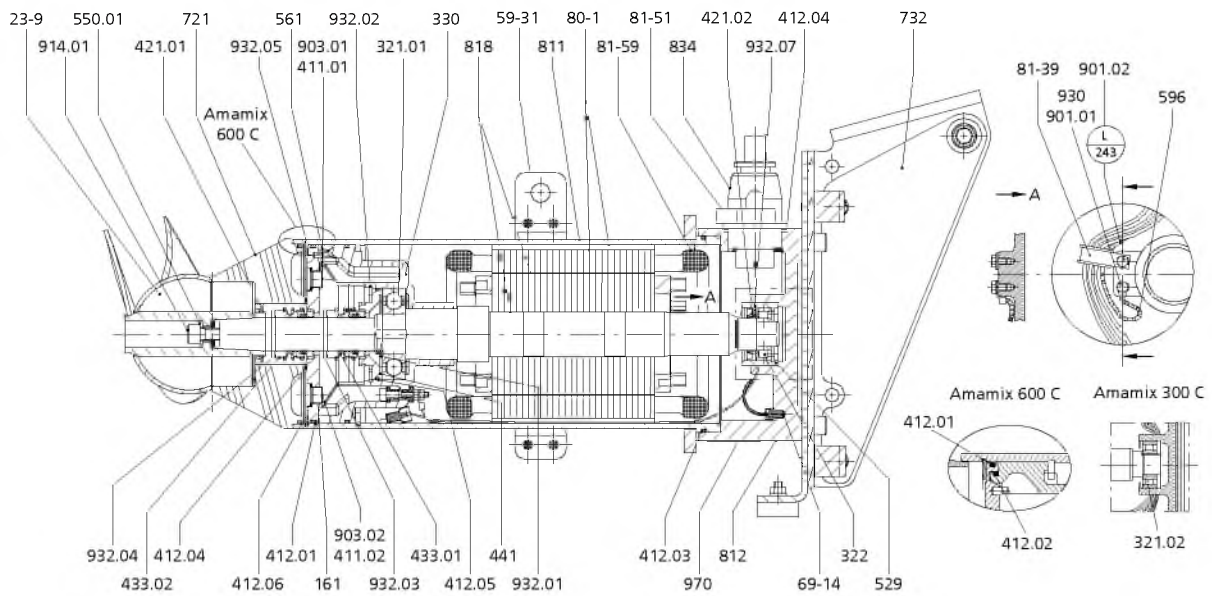


General assembly drawing of Amamix 200, motor housing material grey cast iron

List of components of Amamix 200, motor housing material grey cast iron

Part No.	Description	Part No.	Description
161	Casing cover	732	Guide bracket (accessory)
23-9	Axial propeller	80-1	Motor unit
321	Radial ball bearing	81-39	Clamp
411	Joint ring	81-51	Clamping element
412	O-ring	812	Motor housing cover
433	Mechanical seal	818	Rotor
441	Shaft seal housing	834	Cable gland
550	Disc	901	Hexagon head bolt
561	Grooved pin	903	Screw plug
59-17	Shackle	914	Hexagon socket head cap screw
59-31	Supporting clamp	930	Safety device
596	Wire (earth connection)	932	Circlip
69-14	Leakage monitor		

Amamix 300/400/600 - motor housing material stainless steel

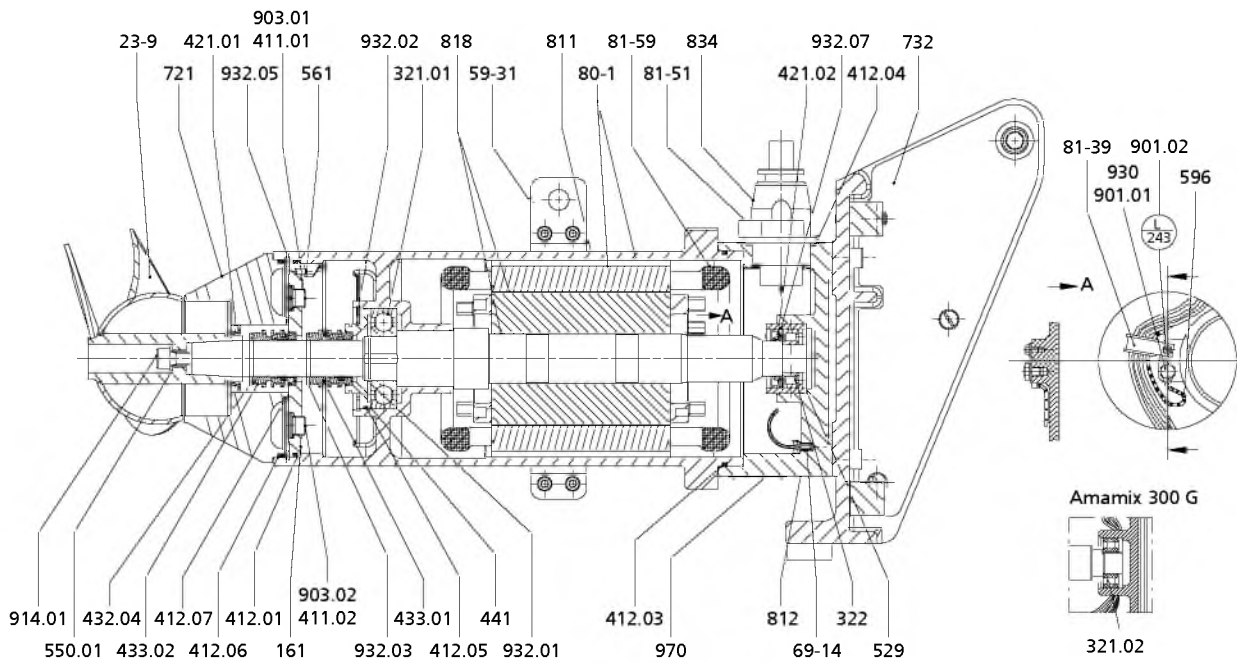


General assembly drawing of Amamix 300/400/600, motor housing material stainless steel

List of components of Amamix 300/400/600, motor housing material stainless steel

Part No.	Description	Part No.	Description
161	Casing cover	721	Adapter
23-9	Axial propeller	732	Guide bracket (accessory)
321	Radial ball bearing	80-1	Motor unit
322	Radial roller bearing	81-39	Clamp
330	Bearing bracket	81-51	Clamping element
411	Joint ring	81-59	Stator
412	O-ring	811	Motor housing
421	Lip seal	812	Motor housing cover
433	Mechanical seal	818	Rotor
441	Shaft seal housing	834	Cable gland
529	Bearing sleeve	901	Hexagon head bolt
550	Disc	903	Screw plug
561	Grooved pin	914	Hexagon socket head cap screw
59-31	Supporting clamp	930	Safety device
596	Wire (earth connection)	932	Circlip
69-14	Leakage monitor	970	Label/plate

Amamix 300/400/600 - motor housing material grey cast iron



General assembly drawing of Amamix 300/400/600, motor housing material grey cast iron

List of components of Amamix 300/400/600, motor housing material grey cast iron

Part No.	Description	Part No.	Description
161	Casing cover	721	Adapter
23-9	Axial propeller	732	Guide bracket (accessory)
321	Radial ball bearing	80-1	Motor unit
322	Radial roller bearing	81-51	Clamping element
411	Joint ring	81-59	Stator
412	O-ring	811	Motor housing
421	Lip seal	812	Motor housing cover
433	Mechanical seal	818	Rotor
441	Shaft seal housing	834	Cable gland
529	Bearing sleeve	901	Hexagon head bolt
550	Disc	903	Screw plug
561	Grooved pin	914	Hexagon socket head cap screw
59-31	Supporting clamp	930	Safety device
596	Wire (earth connection)	932	Circlip
69-14	Leakage monitor	970	Label/plate

Enquiry sheet

To:
KSB Aktiengesellschaft
Turmstraße 92
06110 Halle/Saale (Germany)
Tel.: +49 345 4826-4879/4680
Fax: +49 345 4826-5107

From:

Company name	
Contact person	
Street/number	
Post/zip code, city	
Country	
Telephone number	
Fax number	
E-mail	

Project name

--

Mains frequency:

- 50 Hz
 60 Hz

Mains voltage:

U [V]	
-------	--

Fluid

Solids content:

[%]	
-----	--

Temperature:

T [°F]	
T [°C]	

Density:

[lbs/inch]	
[kg/m³]	

Viscosity (at shear rate):

[cp.]	
[mPas]	

Loss on ignition:

[%]	
-----	--

Sludge index:

[ml/g]	
--------	--

Explosion protection:

- Yes
 No

Type of fluid:

- Activated sludge
 Municipal sewage sludge (primary/secondary)
 Digested sludge
 Raw waste water
 Other:

Flow behaviour:

- Newtonian (e.g. water)
 Pseudoplastic (e.g. thickened sewage sludge)
 Thixotropic (z. B. dispersion paint)
 Other:

Thickening method:

- Not thickened
 Static
 Mechanical by centrifuge / screening drum

Application of polymers:

- Yes
 No

Installation parts

Floor mounting (accessories set 6):

- A 276 Type 304 (1.4301)
 A 276 Type 316 Ti (1.4571)

Pump sump (accessories set 7):

- A 276 Type 304 (1.4301)
 A 276 Type 316 Ti (1.4571)

Tank (accessories set 22):

- A 276 Type 304 (1.4301)
 A 276 Type 316 Ti (1.4571)

Guide rail (accessories sets 7 and 22):

- A 276 Type 304 (1.4301)
 A 276 Type 316 Ti (1.4571)

Lifting equipment (crane)

Material:

- Galvanised steel
 A 276 Type 304 (1.4301)
 Aluminium

Aeration

Aeration method:

- None
Surface aeration:
 Brush aerator (e.g. Mammoth Rotor)
 Vertical shaft impeller

Subsurface aeration:

- Pipe diffusers
 Disc diffusers
 Plate diffusers
 Jet aerator

Air supply:

[scfm]	
[m³ √h]	

Aerated area:

[ft²]	
[m²]	

Number of aerated zones:

n	
[quantity]	

Tank/reservoir

Material:

- Concrete
- Steel
- Stainless steel
- Plastic
- Steel, enamelled

Coating:

--

Design:

- Covered
- Open

Tank geometry:

- Round
- Ring channel
- Square
- Rectangular
- Tank with circulating flow:

With curved deflector plates:

- Yes No

Tank with meandering flow:

With curved deflector plates:

- Yes No

Other:

Dimensions

Length:

[ft]	
[m]	

Width:

[ft]	
[m]	

Inside diameter:

D [ft]	
D [m]	

Fill level:

[ft]	
[m]	

Tank depth:

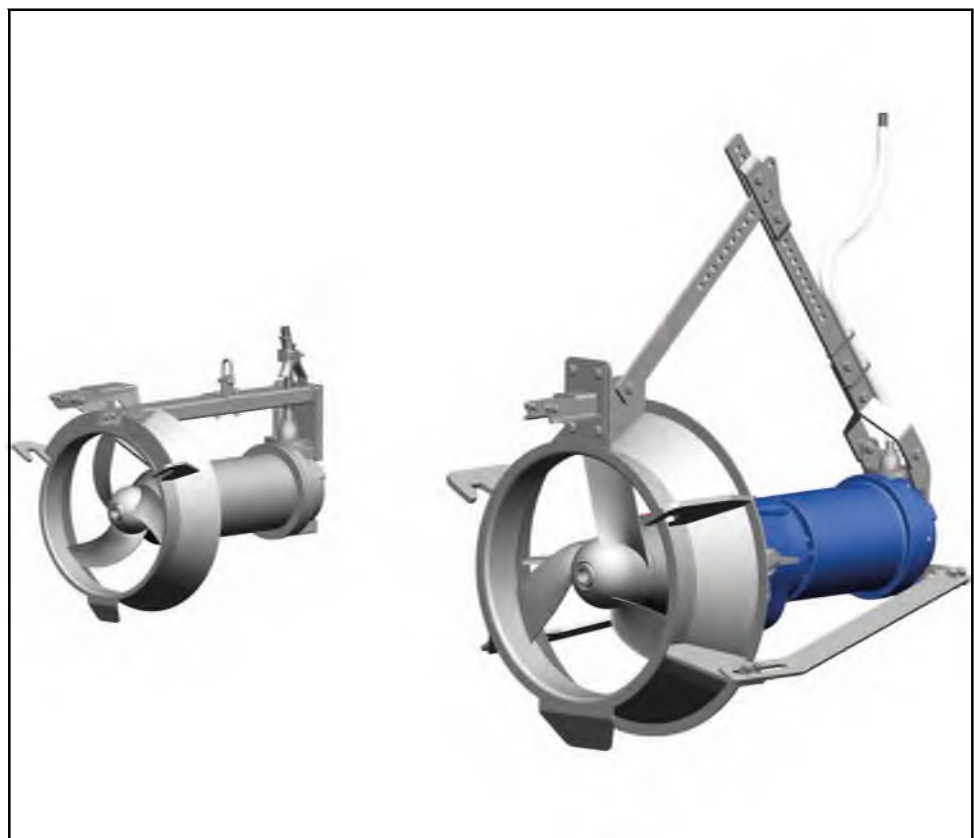
[ft]	
[m]	

Other:

Submersible Motor Pump

Amaline

Type Series Booklet



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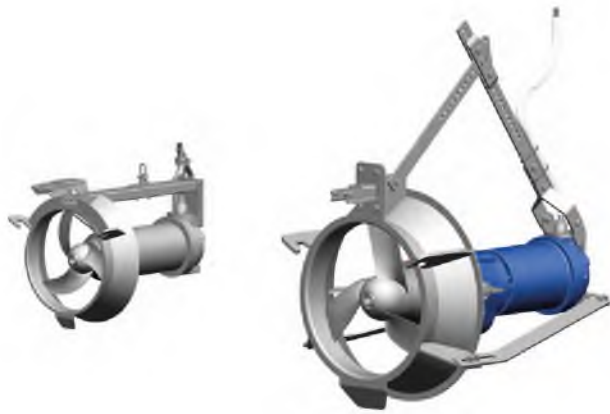
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Waste Water

Submersible Motor Pump

Amaline



Main applications

- Recirculating activated sludge from the nitrification to the denitrification stage of activated sludge tanks
- Economic handling of stormwater, river water, surface water and polder water at low heads
- Generating flow in water bodies

Fluids handled

- Activated sludge
- Stormwater
- River water
- Polder water
- Surface water

Operating data

Operating properties of Amaline 200/300/400 pumps

Characteristic		Amaline 200	Amaline 300	Amaline 400
Power	P [kW]	1.25 - 2.5	1.8 - 7.5	2.5 - 4
Head	H [m]	< 2.5	< 3.4	< 1.2
Flow rate	Q [m ³ /h]	< 425	< 1200	< 1800
Fluid temperature	t [°C]	< 40	< 40	< 40

Operating properties of Amaline 500/600/800 pumps

Characteristic		Amaline 500	Amaline 600	Amaline 800
Power	P [kW]	4.5 - 17	4.5 - 25	4.5 - 27
Head	H [m]	< 3.5	< 3.4	< 2.15
Flow rate	Q [m ³ /h]	< 2700	< 4700	< 6600
Fluid temperature	t [°C]	< 40	< 40	< 40

Designation

Example: Amaline C 2035 - 1450 / 24 UDG

Key to the designation

Code	Description	
Amaline	Type series	
C	Pump casing material	
	C	Stainless steel
	S	Galvanised steel
20	Size, nominal diameter (DN)	
	20	200
	30	300
	40	400
	50	500
	60	600
	80	800
3	Number of blades	
	2, 3	
5	Code of blade incidence angle	
	1, 2, 3, 4, 5, 6	
1450	Nominal speed of the propeller [rpm]	
2	Motor size	
	0, 1, 2, 3, 4, 6, 8, 11, 16, 17, 23, 25, 30	
4	Number of motor poles	
	2, 4, 6, 8	
UD	Motor version	
	UD	Standard version without gear unit
	YD	Explosion-proof version without gear unit to ATEX II 2GT4
	UR	Standard version with gear unit
	YR	Explosion-proof version with gear unit to ATEX II 2GT4
G	Motor housing material	
	G	Grey cast iron
	C	Stainless steel

Design details

Design

- Fully floodable submersible motor pump
- Horizontal installation
- Wet-well installation

Propeller

- Self-cleaning propeller

Shaft seal

- Two bi-directional mechanical seals in tandem arrangement, with liquid reservoir

Amaline 500/600/800:

- Additional leakage chamber between the mating ring carrier and the gear unit

Bearings

Amaline 200/300/400:

- Grease-packed rolling element bearings sealed for life

Amaline 500/600/800:

- Motor-end rolling element bearings, greased for life
- Gear-end rolling element bearings, oil-lubricated

Drive

- Three-phase asynchronous squirrel-cage motor
- Motors integrated in explosion-proof pump sets are supplied in Ex d IIB type of protection.

Amaline 200/300/400:

- Direct drive
- Amaline 500/600/800:
- Spur gear drive

Materials

Materials of an Amaline 200/300/400 pump

Component	Pump casing material	
	S	C
Casing cover	EN-GJL-250	1.4571
Adapter	PU	
Pump casing	Galvanised steel / 1.4571	1.4571
Propeller	1.4571	
Mechanical seal	Propeller end	SiC/SiC
	Drive end	SiC/SiC
Shaft ¹⁾	1.4571	
Elastomer seals	Viton (FPM)	
Screws/bolts	A4 ²⁾	

Materials of an Amaline 500/600/800 pump

Component	Pump casing material	
	S	C
Casing cover	EN-GJL-250	
Gear housing	EN-GJL-250	
Adapter ³⁾	PU	
Pump casing	Galvanised steel	1.4571
Propeller	1.4571	
Mechanical seal	Propeller end	SiC/SiC
	Drive end	SiC/SiC
Shaft ⁴⁾	1.4122	
Elastomer seals	Viton (FPM)	
Screws/bolts	A4 ²⁾	

Motor housing materials of an Amaline 200/300/400 pump

Component	Motor housing material	
	G	C
Motor housing	EN-GJL-250	1.4581
Motor housing cover	EN-GJL-250	1.4517

Motor housing materials of an Amaline 500/600/800 pump

Component	Motor housing material	
	G	C
Motor housing	EN-GJL-250	-
Motor housing cover	EN-GJL-250	-

Description of materials

Grey cast iron EN-GJL-250 (lamellar graphite cast iron):
Lamellar graphite cast iron to DIN EN 1561 is the most widely used cast material for handling municipal sewage, waste water and sludges as well as stormwater and surface water. It is suitable for neutral fluids which are only slightly aggressive and cause little wear. The pH value should be ≥ 6.5 , the sand content ≤ 0.5 g/l.

Duplex stainless steel (1.4517 or technically equivalent material)

This type of carbon steel is resistant to cavitation, has excellent strength values and is used for high circumferential speeds. An excellent resistance to pitting corrosion makes ferritic-austenitic stainless carbon steel a popular choice for pumping acidic waste water with a high chloride content as well as seawater and brackish water. Thanks to its good chemical resistance, e.g. also against waste water containing phosphorous and sulphuric acid, this material is used in a wide range of applications in the chemical industry and process engineering. Pumps made of duplex stainless steel have a very long service life, even when handling brines, chemical waste water (pH value 1 - 12), grey water and landfill leachate.

1.4571 / 1.4581 (X10 CrNiMoTi 18 10): austenitic steel

This austenitic steel to DIN 17440 is characterised by its high corrosion resistance in municipal and chemical waste water. It is stabilised with titanium and as such resistant to intergranular corrosion even when welded.

Product benefits

- Perfectly protected by absolutely water-tight cable gland protecting the motor against moisture
- Motor monitored by temperature sensors to prevent it from overheating
- Easy to install
- Two bi-directional mechanical seals with oil reservoir filled with ecologically acceptable oil provide double safety

Amaline 500/600/800:

- Leakage chamber between oil reservoir and gear unit for high reliability
- Optional: leakage sensor in leakage chamber available for non-explosionproof version

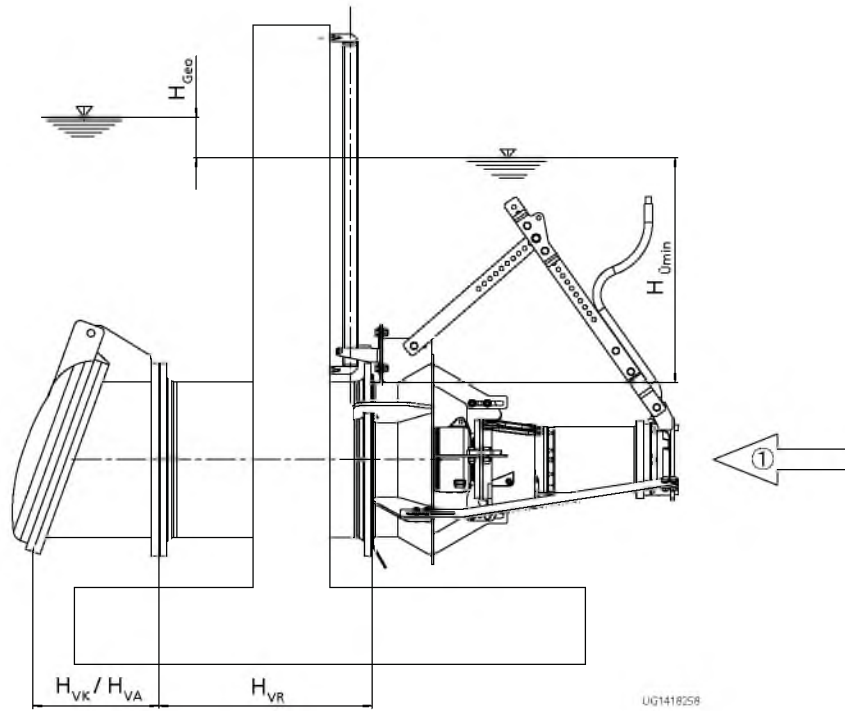
Acceptance tests / guarantees

- Every pump undergoes functional testing to KSB standard ZN 56525.
- Quality is assured by means of an audited and certified quality assurance system to DIN EN ISO 9001.

Special acceptance inspections upon request.

1) For Amaline ... -300/86 .. G; shaft made of 1.4021
 2) Equivalent to 1.4571
 3) Not for Amaline 800
 4) Gear unit output shaft

Selection information



Drawing showing the design criteria - H_0 , H_{geo} , H_{VR} , H_{VK} , H_{VA}

H_0	Submergence	H_{VR}	Head losses in the pipe
H_{geo}	Static head	H_{VK}	Head losses in the valve
H_{Vtotal}	Head losses in the system	H_{VA}	Head losses at the outlet
①	Direction of flow		

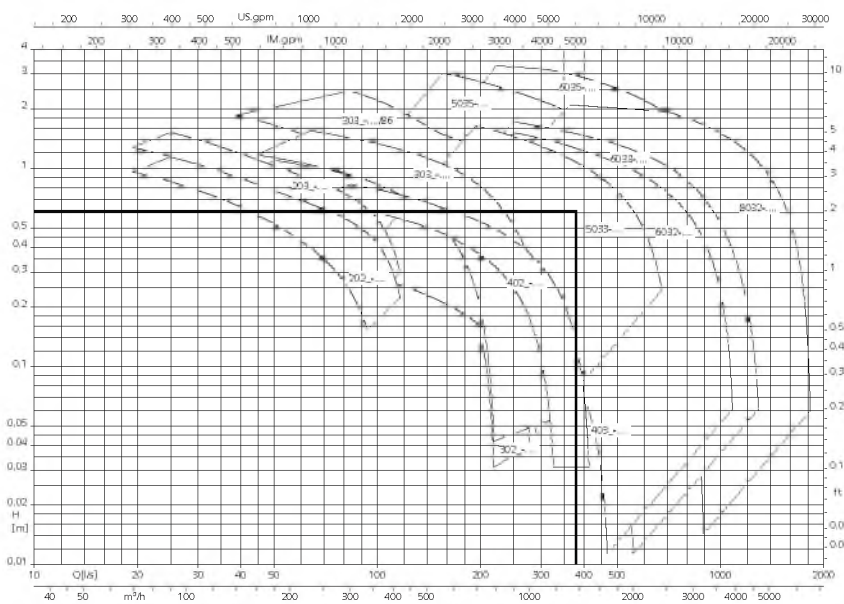
Example:

Given:

Flow rate: $Q = 1350 \text{ m}^3/\text{h}$

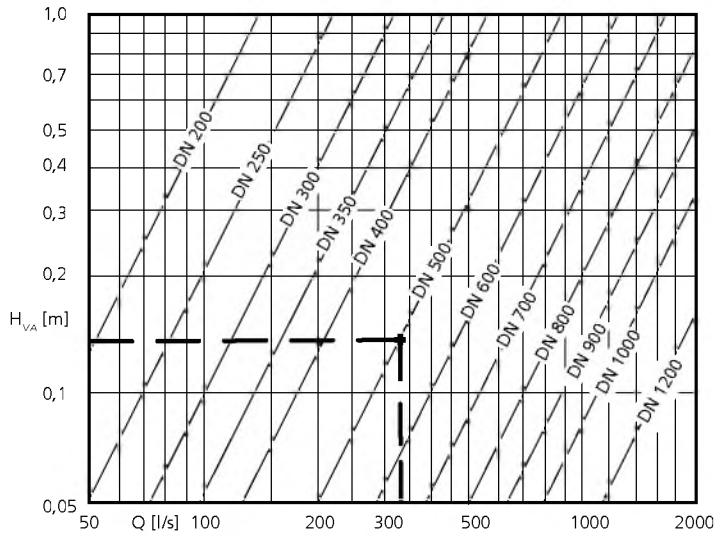
Static head: $H_{geo} = 0.3 \text{ m}$

1. Pre-selection



Pre-selection: Amaline with DN 500

2. Determining the outlet losses



Outlet loss $H_{VA} = v^2/2g$

$$H_{VA} = v^2/2g = 0.15 \text{ m}$$

3. Determining the head

$$H = H_{geo} + H_{Vtotal}$$

$$H_{Vtotal} = H_{VR} + H_{VK} + H_{VA}$$

$$H_{VR} = 0 \text{ m (short pipe)}$$

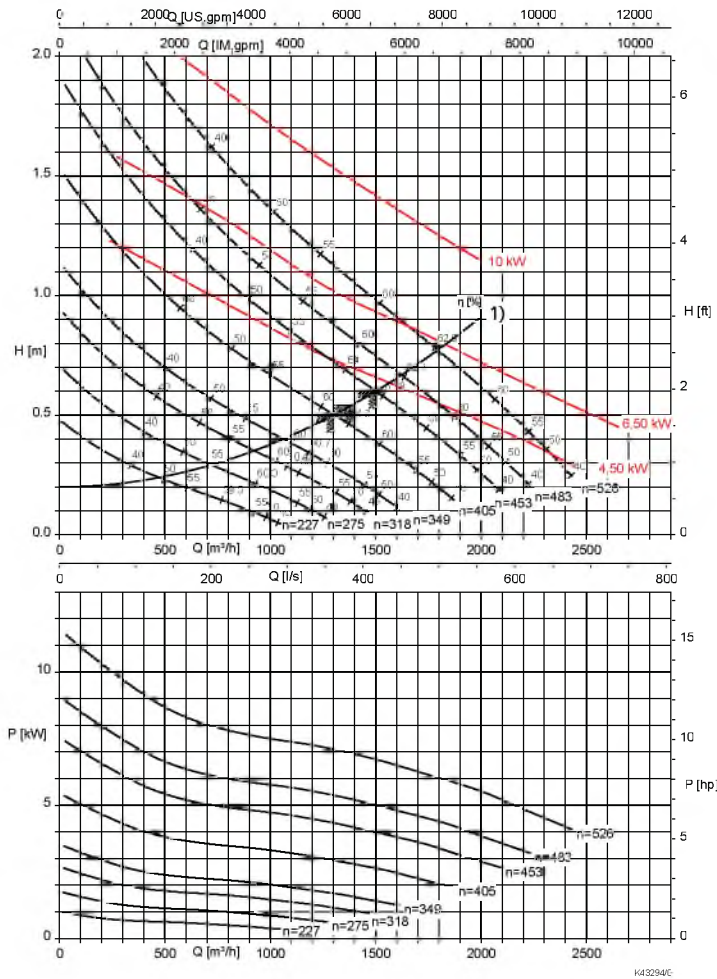
$H_{VK} = 0.15 \text{ m}$ (observe the manufacturer's information, characteristic $H_{VK(Q)}$).

$$H_{VA} = v^2/2g = 0.15 \text{ m}$$

$$H = 0.3 \text{ m} + 0 \text{ m} + 0.15 \text{ m} + 0.15 \text{ m} = 0.6 \text{ m}$$

4. Duty point = design point

If controlled by a frequency inverter the pump can be run at its design point without deviations.



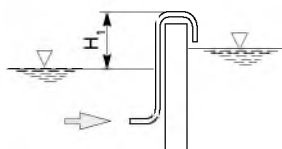
Speed performance chart Amaline 5033-____, 1) = system curve

The operating speed equals 405 rpm or 453 rpm respectively.
All pump sets have sufficient motor reserves (they use max. 85 % of the motor rating).

Technical data

Code	Speed n_{eff}	Motor power P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
5033-405/4 4	405	4.5	SP189	3.618
5033-405/6 4	405	6.5	SP189	3.618
5033-453/4 4	453	4.5	SP189	3.232
5033-453/6 4	453	6.5	SP189	3.232

5. Information on operation



Required head H_1 of the siphon line

Pipe lengths: $L > 5 \times D$:

When starting up the pump, the acceleration of the pipe content leads to higher heads. For this reason, the pump will briefly exceed its operating limits. The duty point for filling the siphon line must be below the operating limit:

- $H_{n, \text{max}} \leq \text{operating limit}$

The indicated heads and performance data apply to pumped fluids with a density $\rho = 1 \text{ kg/dm}^3$ and a kinematic viscosity $\nu \leq 20 \text{ mm}^2/\text{s}$.

Programme overview / selection tables

Overview of product features

Overview of product features: Amaline 200/300/400; motor housing made of grey cast iron

Feature	Amaline 200	Amaline 300	Amaline 400
Motor size			
4-pole	1 4 2 4	-	-
6-pole	-	0 6 2 6 8 6	-
8-pole	-	-	3 8 4 8
Propeller speed	1450 rpm	960 rpm	725 rpm
Propeller diameter	200 mm	303 mm	384 mm
Power range	1.25 kW to 2.5 kW	1.8 kW to 7.5 kW	2.5 kW to 4 kW
Bearings	Grease-packed rolling element bearings sealed for life		
Explosion protection			
Version UD	Not explosion-proof		
Version YD	⊕ ATEX II 2G Ex dc IIB T4		
Motor			
Starting method	DOL ⁵⁾		DOL or star-delta
Voltage	400 V ⁶⁾ 50 Hz, suitable for frequency inverter operation		
Cooling	By surrounding fluid handled		
Submergence	Up to 12 m ⁷⁾		
Power cable			
Length	10 m ⁸⁾		
Cable entry	Absolutely watertight		
Type	See table "Overview of power cables"		
Monitoring equipment			
Winding temperature	PTC thermistor		
Leakage	Leakage sensor in the motor space		
Coating	Two-component epoxy resin coating		
Permissible ambient temperature	40 °C		

Overview of product features: Amaline 200/300/400; motor housing made of stainless steel

Feature	Amaline 200	Amaline 300	Amaline 400
Motor size			
4-pole	1 4 2 4	-	-
6-pole	-	0 6 2 6	-
8-pole	-	-	3 8 4 8
Propeller speed	1450 rpm	960 rpm	725 rpm
Propeller diameter	200 mm	303 mm	384 mm
Power range	1.25 kW to 2.5 kW	1.8 kW to 3.2 kW	2.5 kW to 4 kW
Bearings	Grease-packed rolling element bearings sealed for life		
Explosion protection			
Version UD	Not explosion-proof		
Version YD	⊕ ATEX II 2G Ex dc IIB T4		
Motor			
Starting method	DOL		DOL or star-delta
Voltage	400 V ⁶⁾ 50 Hz		
Cooling	By surrounding fluid handled		
Submergence	Up to 12 m ⁷⁾		

- 5) For motor 8 6: DOL or star-delta
6) Optional: 500 V, 690 V on request
7) Deeper submergence on request
8) Optional: 15 m, 20 m, (> 20 m on request)

Feature	Amaline 200	Amaline 300	Amaline 400
Power cable			
Length	10 m ⁸⁾		
Cable entry	Absolutely watertight		
Type	See table "Overview of power cables"		
Monitoring equipment			
Winding temperature	PTC thermistor		
Leakage	Leakage sensor in the motor space ⁹⁾		
Coating	-		
Permissible ambient temperature	40 °C		

Overview of product features: Amaline 500/600/800; motor housing made of grey cast iron

Feature	Amaline 500	Amaline 600	Amaline 800
Motor size			
2-pole	17 2 25 2	17 2	-
4-pole	4 4 6 4 11 4 16 4	4 4 6 4 11 4	4 4 6 4 11 4 16 4 23 4 30 4
Propeller speed	227 to 719 rpm	227 to 719 rpm	206 to 466 rpm
Propeller diameter	484 mm	585 mm	787 mm
Power range	4.5 kW to 17 kW	4.5 kW to 25 kW	4.5 kW to 27 kW
Bearings			
Motor	Grease-packed rolling element bearings sealed for life		
Gear unit	Oil-lubricated rolling element bearings		
Explosion protection			
Version UR	Not explosion-proof		
Version YR	Ⓔ ATEX II 2G Ex dc IIB T4		
Motor			
Starting method	DOL or star-delta		
Voltage	400 V ⁶⁾ 50 Hz, suitable for frequency inverter operation		
Cooling	By surrounding fluid handled		
Submergence	Up to 12 m ⁷⁾		
Power cable			
Length	10 m ⁸⁾		
Cable entry	Absolutely watertight		
Type	See table "Overview of power cables"		
Monitoring equipment			
Winding temperature	PTC thermistor		
Leakage	Leakage sensor in the motor space ¹⁰⁾		
Coating	Two-component epoxy resin coating		
Permissible ambient temperature	40 °C		

Overview of power cables

Feature	S1BN8-F rubber-sheathed cable	S07RC4N8-F rubber-sheathed cable	TEHSITE Tefzel cable
Design	Standard	On request	Optional
Rated voltage	1000 V	750 V	750 V
EMC screening	-	✓	-
Insulation material	EPR ¹¹⁾	EPR ¹¹⁾	ETFE ¹²⁾
Max. continuous temperature of insulation	90 °C	90 °C	135 °C
For permanent immersion in waste water to DIN VDE 0282-16/HD22.16	✓	✓	✓

- 9) Optional for U version only: additional leakage sensor in the oil reservoir
 10) Optional for U version only: additional leakage sensor in the leakage chamber
 11) EPR = ethylene propylene rubber
 12) ETFE = ethylene tetrafluoroethylene

Combination of pump and motor: Amaline 200, 300, 400; motor housing made of grey cast iron



Amaline 200/300/400 (direct drive)¹³⁾

Overview of pump sizes and motors

Pump size	Motors						
	1 4	2 4	0 6	2 6	8 6	3 8	4 8
Amaline 200							
2021-1450	X	-	-	-	-	-	-
2022-1450	X	X	-	-	-	-	-
2034-1450	X	X	-	-	-	-	-
2035-1450	-	X	-	-	-	-	-
Amaline 300 (lower motor ratings)							
3021-960	-	-	X	-	-	-	-
3022-960	-	-	X	X	-	-	-
3031-960	-	-	X	X	-	-	-
3032-960	-	-	X	X	-	-	-
3033-960	-	-	X	X	-	-	-
Amaline 300 (higher motor ratings)							
3034-960	-	-	-	-	X	-	-
3035-960	-	-	-	-	X	-	-
3036-960	-	-	-	-	X	-	-
Amaline 400							
4021-700	-	-	-	-	-	X	-
4022-700	-	-	-	-	-	X	X
4031-700	-	-	-	-	-	X	X
4032-700	-	-	-	-	-	X	X
4033-700	-	-	-	-	-	X	X

Combination of pump and motor: Amaline 200, 300, 400; motor housing made of stainless steel



Amaline 200/300/400 (direct drive)¹⁴⁾

Overview of pump sizes and motors

Pump size	Motors					
	1 4	2 4	0 6	2 6	3 8	4 8
Amaline 200						
2021-1450	X	-	-	-	-	-
2022-1450	X	X	-	-	-	-
2034-1450	X	X	-	-	-	-
2035-1450	-	X	-	-	-	-
Amaline 300 (lower motor ratings)						
3021-960	-	-	X	-	-	-
3022-960	-	-	X	X	-	-
3031-960	-	-	X	X	-	-
3032-960	-	-	X	X	-	-
3033-960	-	-	X	X	-	-
Amaline 400						
4021-700	-	-	-	-	X	-
4022-700	-	-	-	-	X	X
4031-700	-	-	-	-	X	X
4032-700	-	-	-	-	X	X
4033-700	-	-	-	-	X	X

¹³⁾ Illustration with shackle as the attachment point (standard)

¹⁴⁾ Illustration with bail as the attachment point (optional)

Combination of pump and motor: Amaline 500, 600, 800; motor housing made of grey cast iron



Amaline 500/600/800 (spur gear drive)

Overview of pumps sizes and motors

Pump size	Motors							
	4 4	6 4	11 4	16 4	17 2	25 2	23 4	30 4
Amaline 500 (lower motor ratings)								
5033-227	X	-	-	-	-	-	-	-
5033-275	X	-	-	-	-	-	-	-
5033-318	X	-	-	-	-	-	-	-
5033-349	X	-	-	-	-	-	-	-
5033-405	X	X	-	-	-	-	-	-
5033-453	X	X	X	-	-	-	-	-
5033-483	-	X	X	-	-	-	-	-
5033-526	-	-	X	-	-	-	-	-
Amaline 500 (higher motor ratings)								
5035-453	X	-	-	-	-	-	-	-
5035-483	X	X	-	-	-	-	-	-
5035-526	X	X	-	-	-	-	-	-
5035-558	-	-	-	-	X	-	-	-
5035-608	-	-	-	-	X	-	-	-
5035-640	-	-	-	-	X	-	-	-
5035-672	-	-	-	-	X	-	-	-
5035-719	-	-	-	-	X	-	-	-
Amaline 600 (lower motor ratings)								
6032-227	X	-	-	-	-	-	-	-
6032-275	X	-	-	-	-	-	-	-
6032-318	X	-	-	-	-	-	-	-
6032-354	X	-	-	-	-	-	-	-
6032-405	X	X	-	-	-	-	-	-
6032-453	X	X	X	-	-	-	-	-
6032-483	-	X	X	-	-	-	-	-
6032-526	-	X	X	-	-	-	-	-
6033-227	X	-	-	-	-	-	-	-
6033-275	X	-	-	-	-	-	-	-
6033-318	X	-	-	-	-	-	-	-
6033-354	X	X	-	-	-	-	-	-
6033-405	X	X	X	-	-	-	-	-
6033-453	X	X	X	-	-	-	-	-
6033-483	-	X	X	-	-	-	-	-
6032-526	-	X	X	-	-	-	-	-
Amaline 600 (higher motor ratings)								
6035-357	-	-	-	X	-	-	-	-
6035-405	-	-	-	X	-	-	-	-
6035-453	-	-	X	-	-	-	-	-
6035-488	-	-	-	-	X	-	-	-
6035-522	-	-	-	-	X	-	-	-
6035-558	-	-	-	-	X	-	-	-

Pump size	Motors							
	4 4	6 4	11 4	16 4	17 2	25 2	23 4	30 4
6035-608	-	-	-	-	X	X	-	-
6035-640	-	-	-	-	X	X	-	-
6035-672	-	-	-	-	X	X	-	-
6035-719	-	-	-	-	-	X	-	-
Amaline 800								
8032-206	X	-	-	-	-	-	-	-
8032-230	X	X	-	-	-	-	-	-
8032-279	-	X	X	-	-	-	-	-
8032-317	-	-	-	X	-	-	-	-
8032-334	-	-	-	X	-	-	-	-
8032-357	-	-	-	X	-	-	X	-
8032-386	-	-	-	X	-	-	X	-
8032-405	-	-	-	-	-	-	X	X
8032-433	-	-	-	-	-	-	X	X
8032-466	-	-	-	-	-	-	X	X

Specifications required for enquiries/orders

Connection pipe (⇒ Page 37)

- Nominal diameter
- Material variant
- Dimensions l_3 and l_4

E.g. connection pipe DN 500 made of galvanised steel, $l_3 = 2$ m and $l_4 = 0.3$ m
= 122.5 kg + 78.5 kg = 201 kg

Standard and special designs

Standard and special designs

Option	Comments
Mechanical seal with covered springs	Available for all sizes
Power cable > 20 m	Available for all sizes
Leakage sensor in leakage chamber of mechanical seal	Available for all Amaline 500/600/800 sizes of version UR
Analysing device for leakage sensor, thermistor tripping unit for monitoring the winding temperature	Available for all sizes
Special voltages 500 V and 690 V	Available for all sizes
Two-component epoxy resin coating, 250 µm	Available for all sizes
Additional operating manuals	Standard: 1 operating manual per pump set
Customer-specific installation drawing	Available for all sizes
Flow measurements	Available for all sizes
Flow simulation	Available for all sizes
Installation consultancy	Available for all sizes

For any versions not documented in this type series booklet or special versions please always contact KSB for technical details, prices and delivery periods.

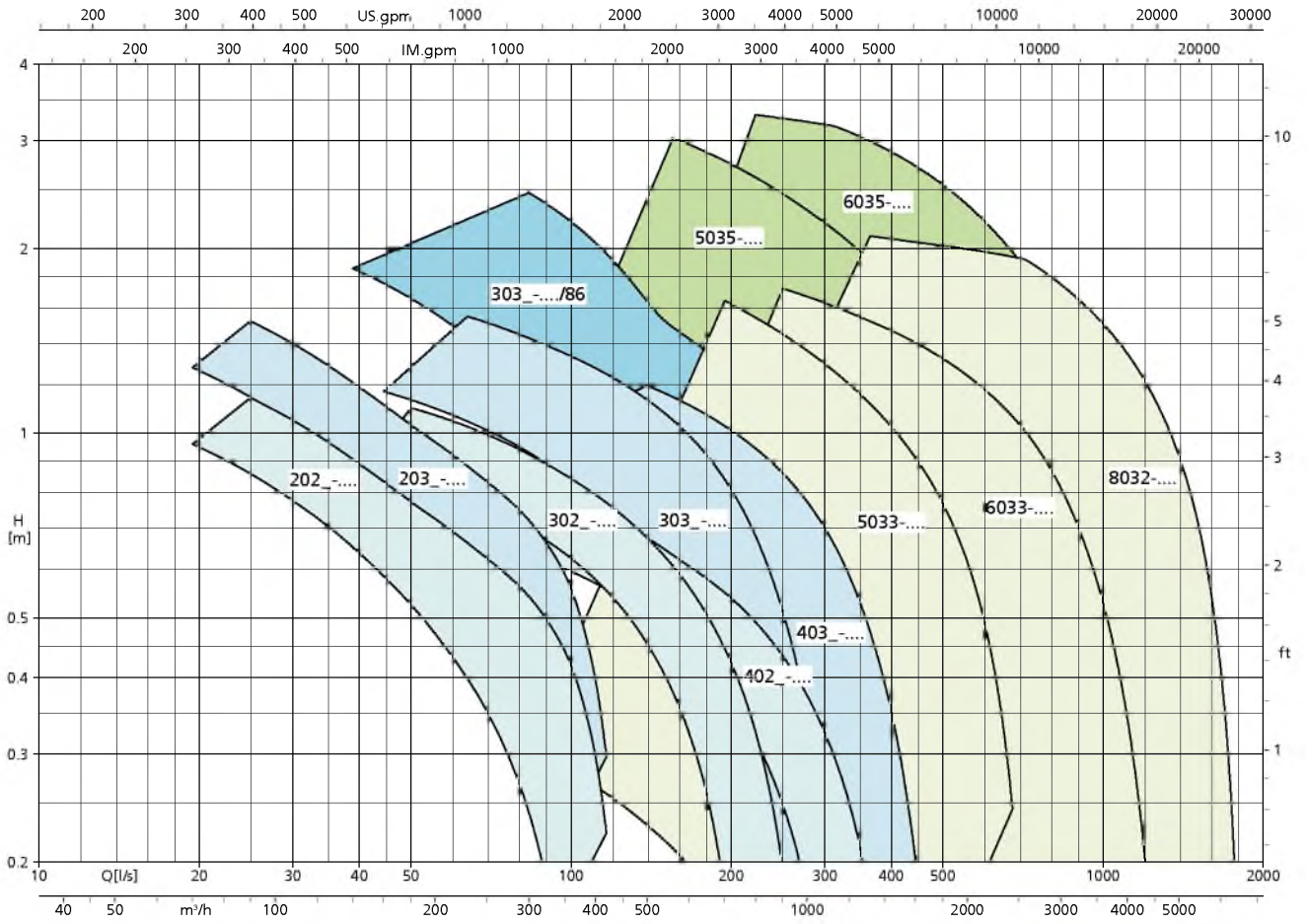
Examples:

- Other voltages (except 400 V / 500 V / 690 V)
- Special coatings
- Combinations of special motor, special propeller, special gear unit
- Special installation parts

- Special cables

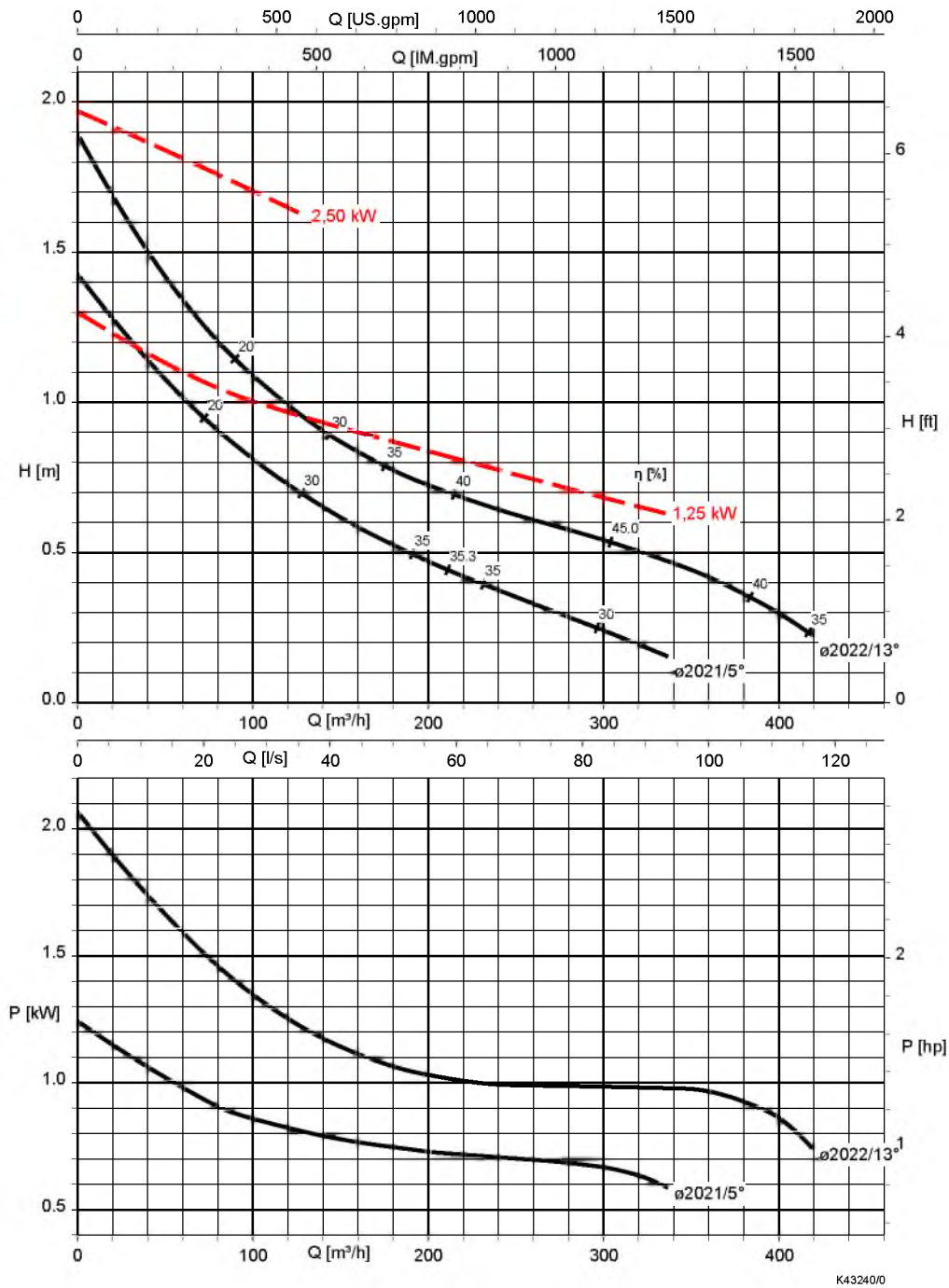
Selection chart

Amaline 200/300/400, n = 1450/960/725 rpm, Amaline 500/600/800, n = 729 - 206 rpm



Characteristic curves

Amaline 202_, motors: 1 4, 2 4

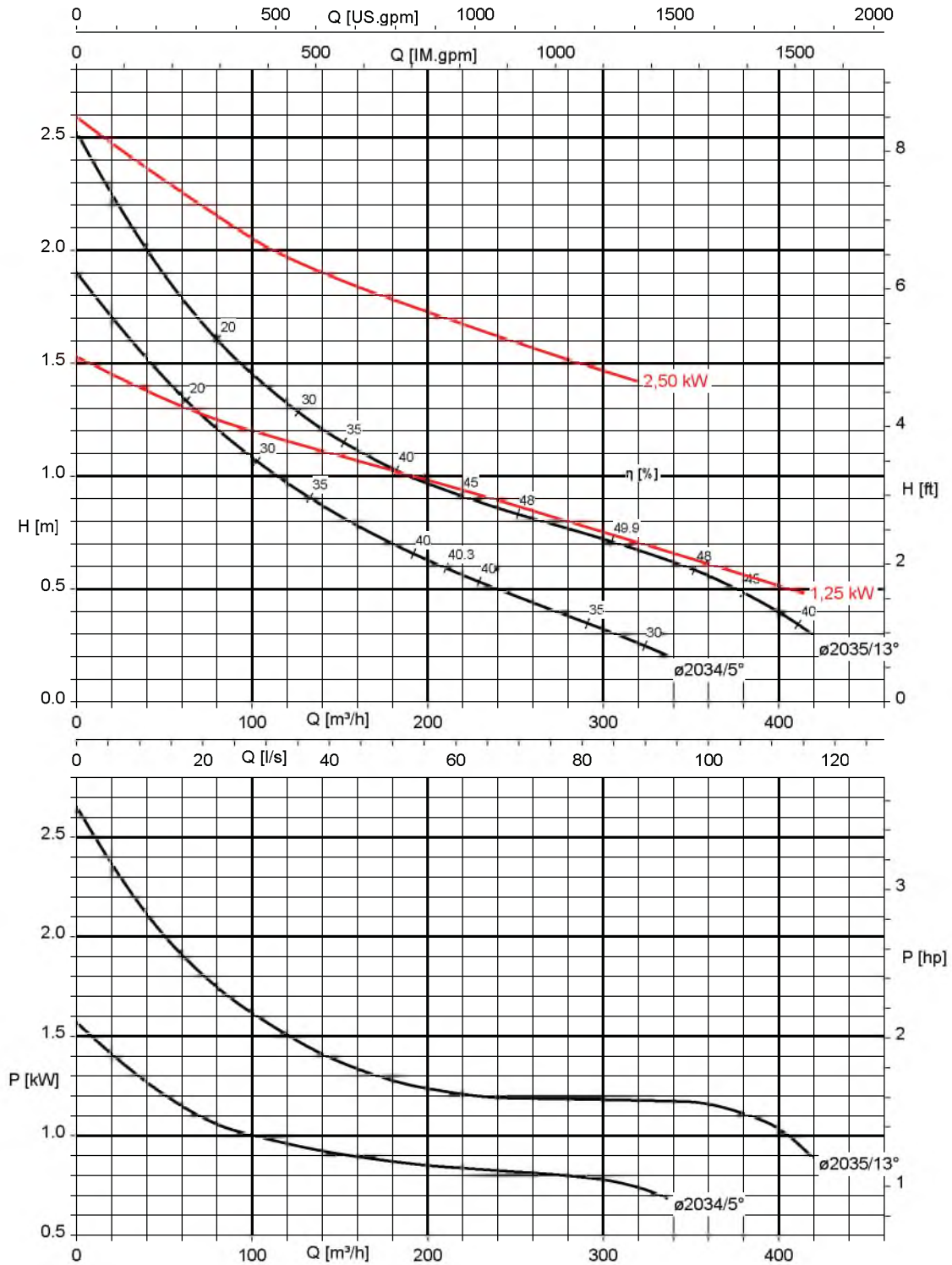


Free passage = 65 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
2021-1450/14UDG/YDG/UDC/YDC	1450	1,25
2022-1450/14UDG/YDG/UDC/YDC	1450	1,25
2022-1450/24UDG/YDG/UDC/YDC	1450	2,5

Amaline 203_ motors: 1 4, 2 4



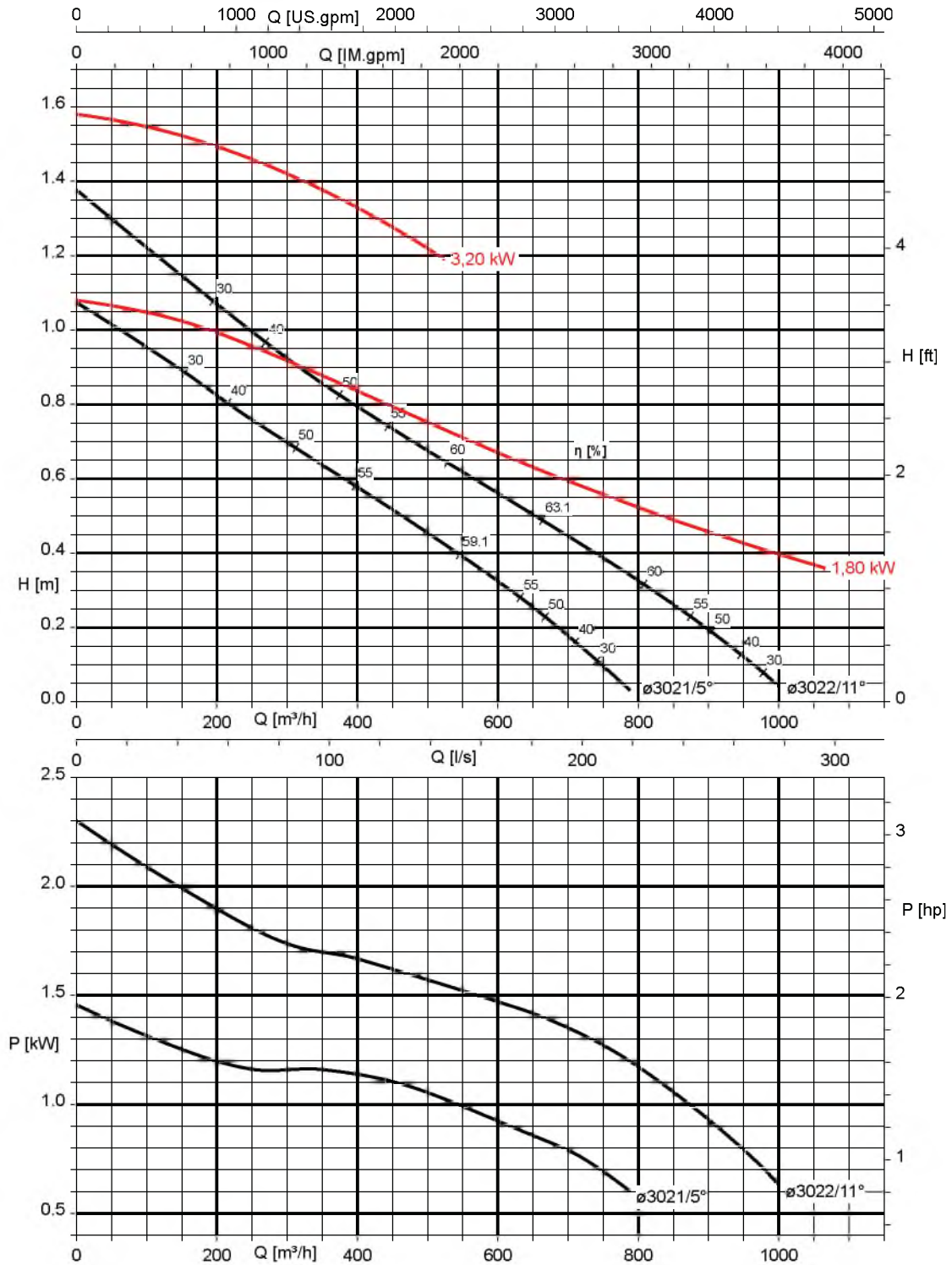
K43242/0

Free passage = 65 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
2034-1450/14UDG/YDG/UDC/YDC	1450	1,25
2034-1450/24UDG/YDG/UDC/YDC	1450	2,5
2035-1450/24UDG/YDG/UDC/YDC	1450	2,5

Amaline 302_, motors: 0 6, 2 6



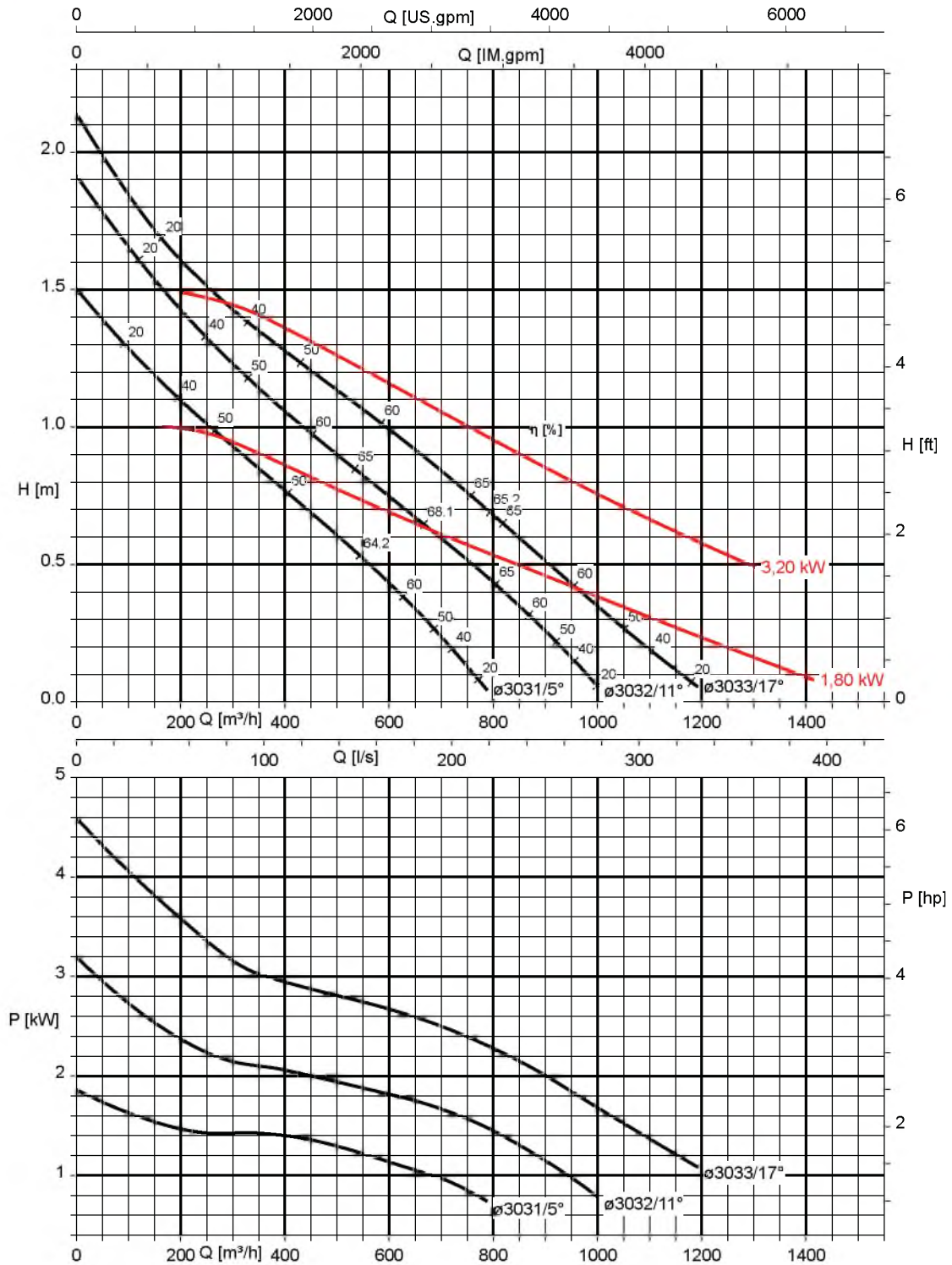
K43244/0

Free passage = 100 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
3021-960/06UDG/YDG/UDC/YDC	960	1,8
3022-960/06UDG/YDG/UDC/YDC	960	1,8
3022-960/26UDG/YDG/UDC/YDC	960	3,2

Amaline 303_, motors: 0 6, 2 6



K43246/0

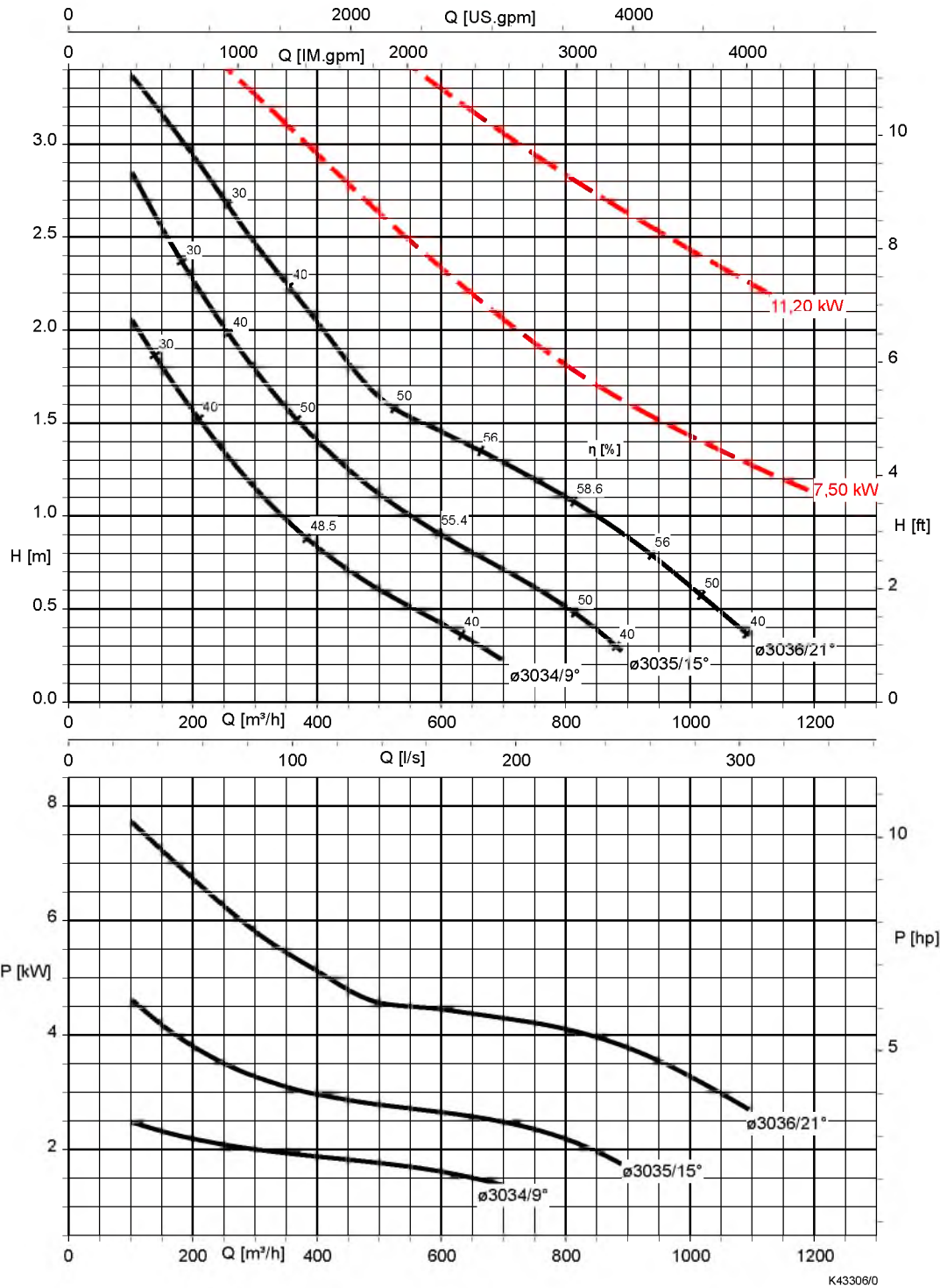
Free passage = 100 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
3031-960/06UDG/YDG/UDC/YDC	960	1,8
3032-960/06UDG/YDG/UDC/YDC	960	1,8
3033-960/06UDG/YDG/UDC/YDC	960	1,8
3031-960/26UDG/YDG/UDC/YDC	960	3,2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
3032-960/26UDG/YDG/UDC/YDC	960	3,2
3033-960/26UDG/YDG/UDC/YDC	960	3,2

Amaline 303_ motors: 8 6

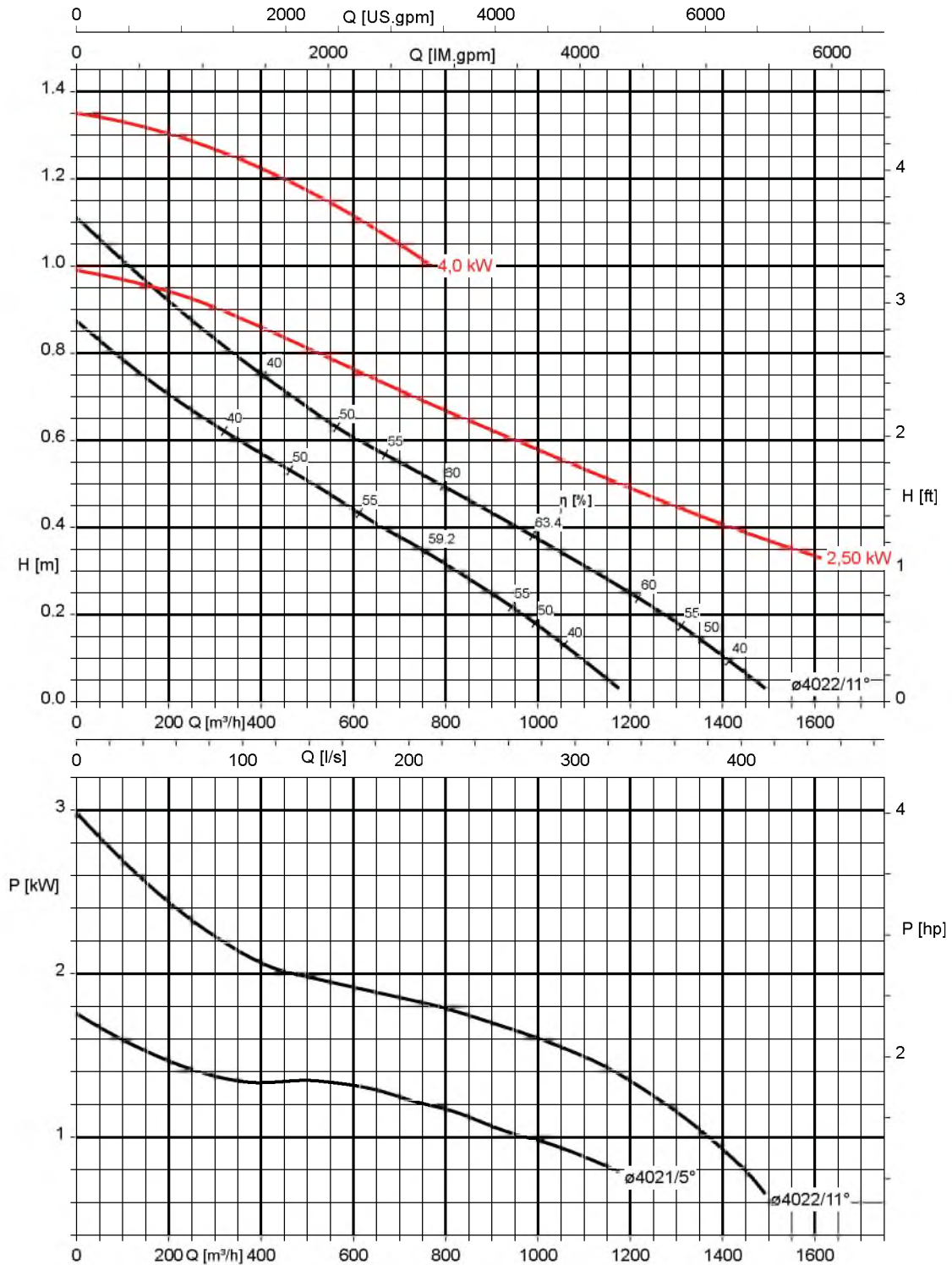


Free passage = 80 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
3036-960/86UDG/YDG	960	7,5
3035-960/86UDG/YDG	960	7,5
3034-960/86UDG/YDG	960	7,5

Amaline 402_, motors: 3 8, 4 8



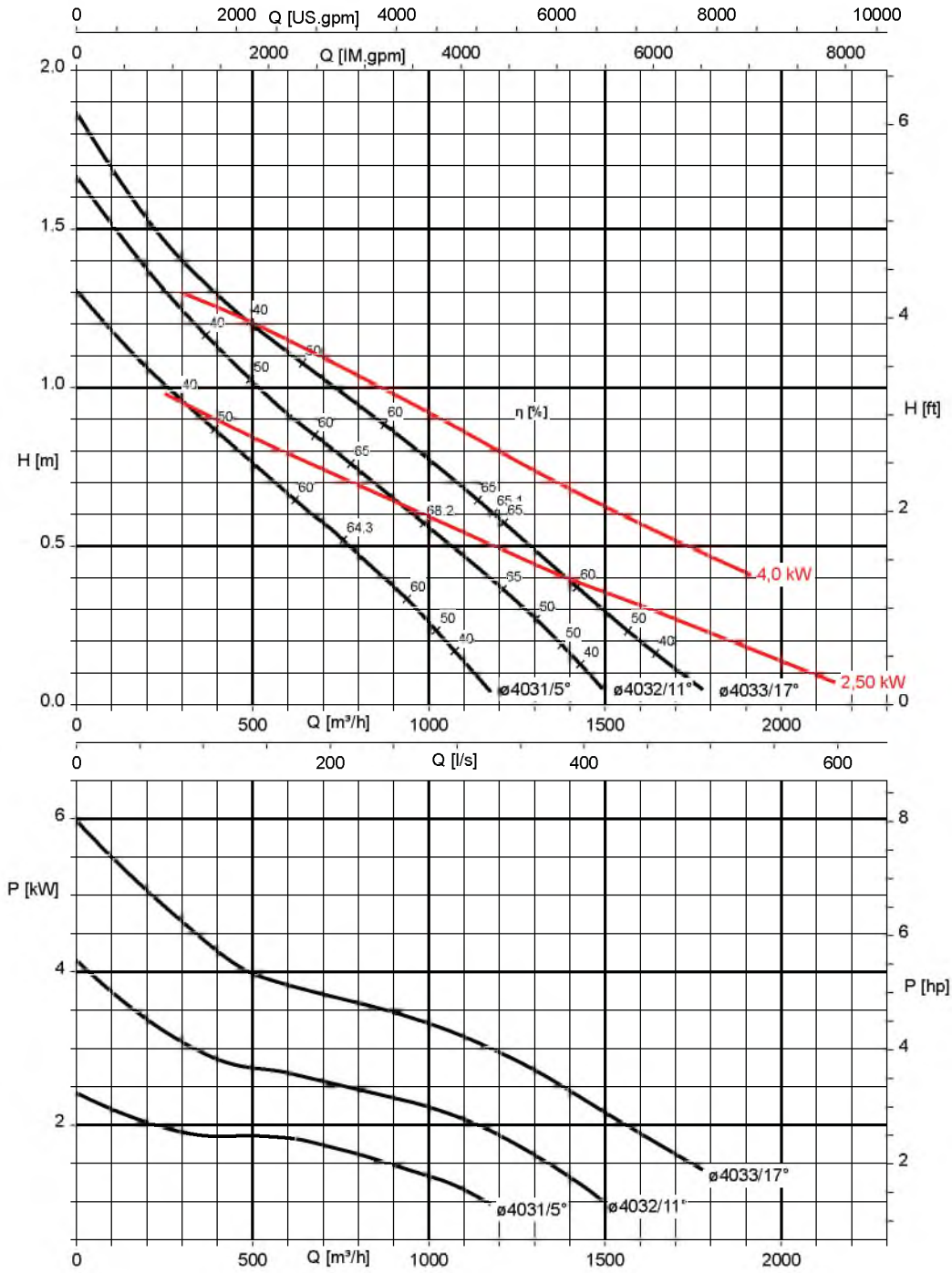
K43248/0

Free passage = 120 mm

Speed $n_{eff.}$ and motor rating P_2

Size	$n_{eff.}$	P_2
	[rpm]	[kW]
4021-725/38UDG/YDG/UDC/YDC	725	2,5
4022-725/38UDG/YDG/UDC/YDC	725	2,5
4022-725/48UDG/YDG/UDC/YDC	725	4,0

Amaline 403_, motors: 3 8, 4 8



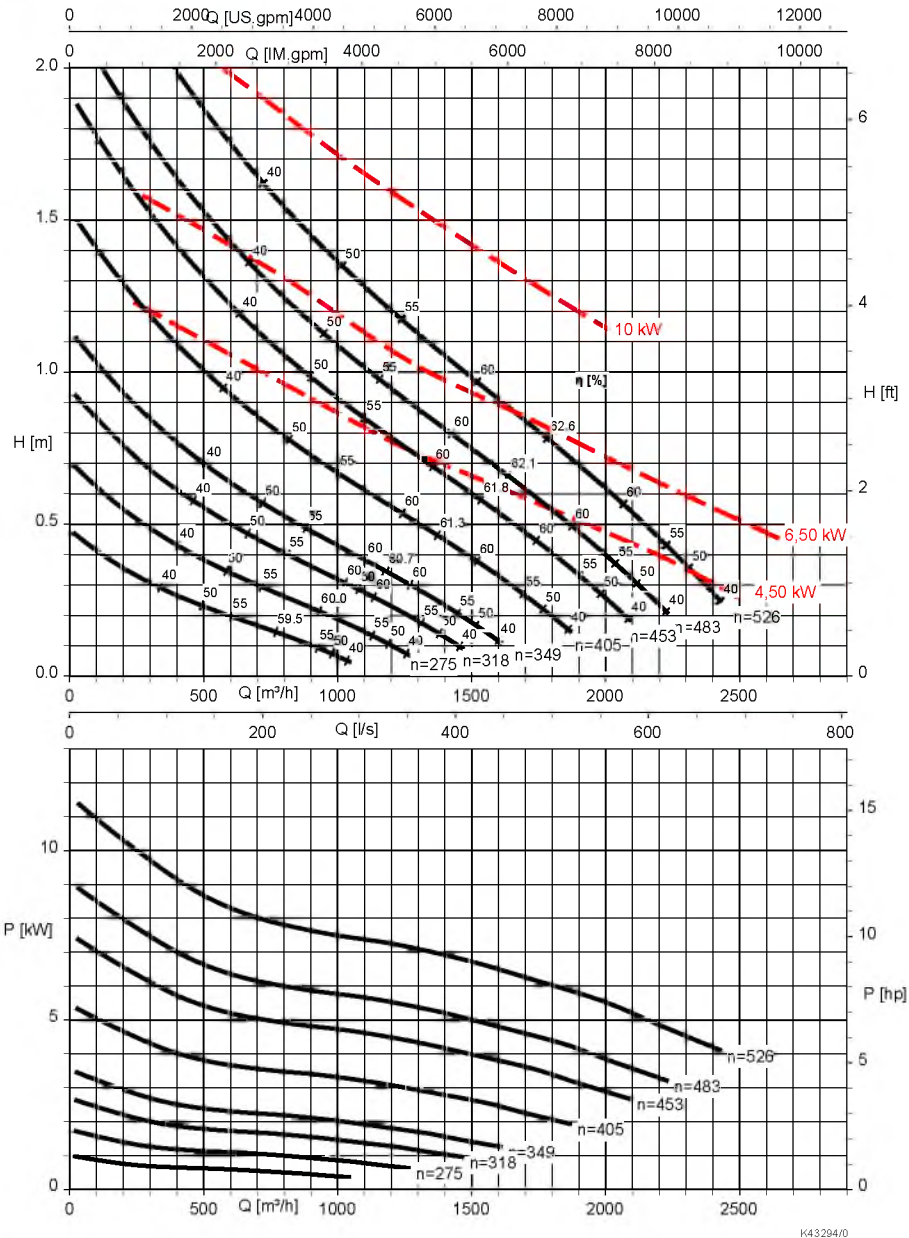
K43250/0

Free passage = 120 mm

Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2
	[rpm]	[kW]
4031-725/38UDG/YDG/UDC/YDC	725	2,5
4032-725/38UDG/YDG/UDC/YDC	725	2,5
4033-725/38UDG/YDG/UDC/YDC	725	2,5
4031-725/48UDG/YDG/UDC/YDC	725	4,0
4032-725/48UDG/YDG/UDC/YDC	725	4,0
4033-725/48UDG/YDG/UDC/YDC	725	4,0

Amaline 5033- ____, motors: 4 4, 6 4, 11 4



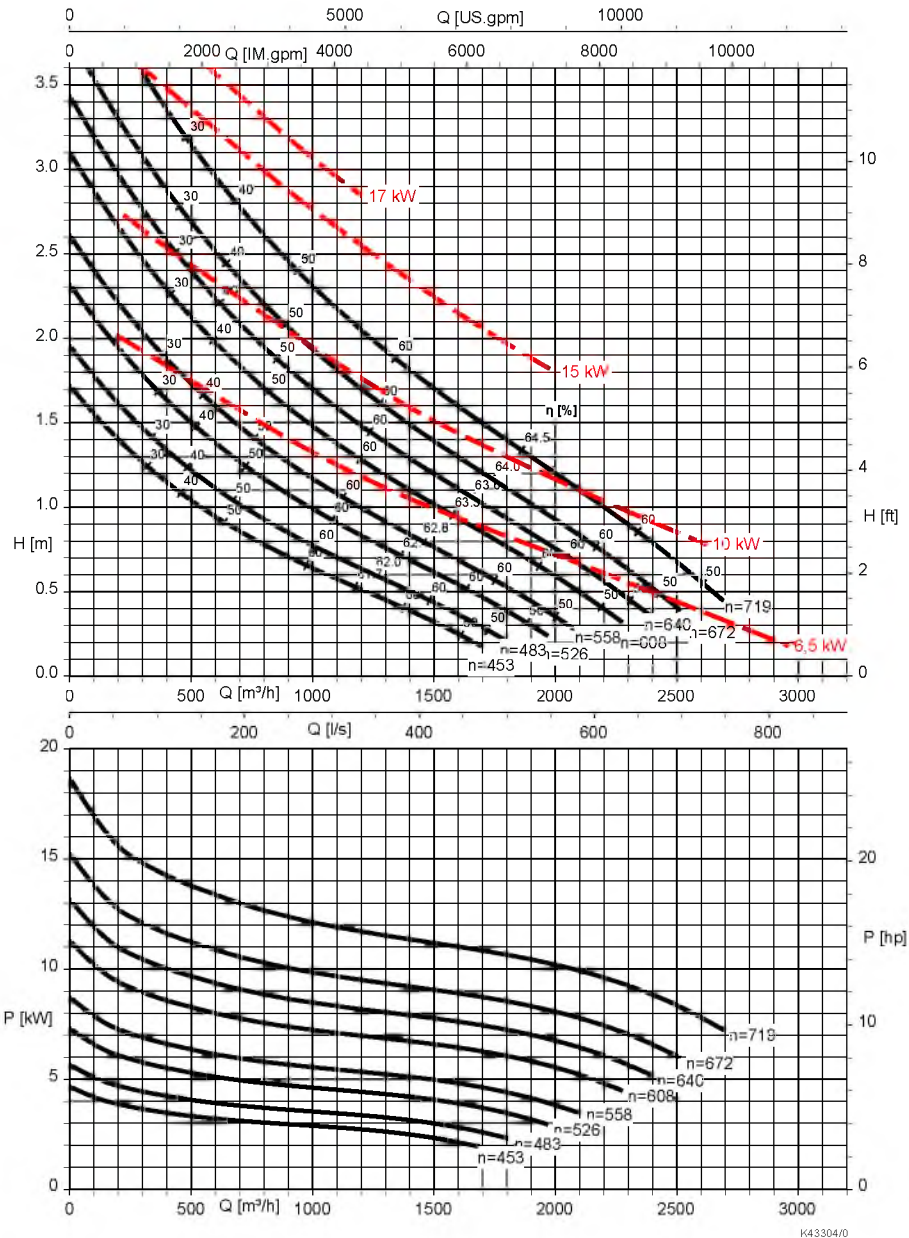
Free passage = 140 mm

Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
5033-227/44URG/YRG	227	4,5	SP189	6,356
5033-275/44URG/YRG	275	4,5	SP189	5,250
5033-318/44URG/YRG	318	4,5	SP189	4,545
5033-349/44URG/YRG	349	4,5	SP189	4,143
5033-405/44URG/YRG	405	4,5	SP189	3,618
5033-405/64URG/YRG	405	6,5	SP189	3,618
5033-453/44URG/YRG	453	4,5	SP189	3,232
5033-453/64URG/YRG	453	6,5	SP189	3,232
5033-453/114URG/YRG	453	10,0	SP189	3,232
5033-483/64URG/YRG	483	6,5	SP189	3,036

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
5033-483/114URG/YRG	483	10,0	SP189	3,036
5033-526/114URG/YRG	526	10,0	SP189	2,784

Amaline 5035- ____, motors: 17 2, 4 4, 6 4

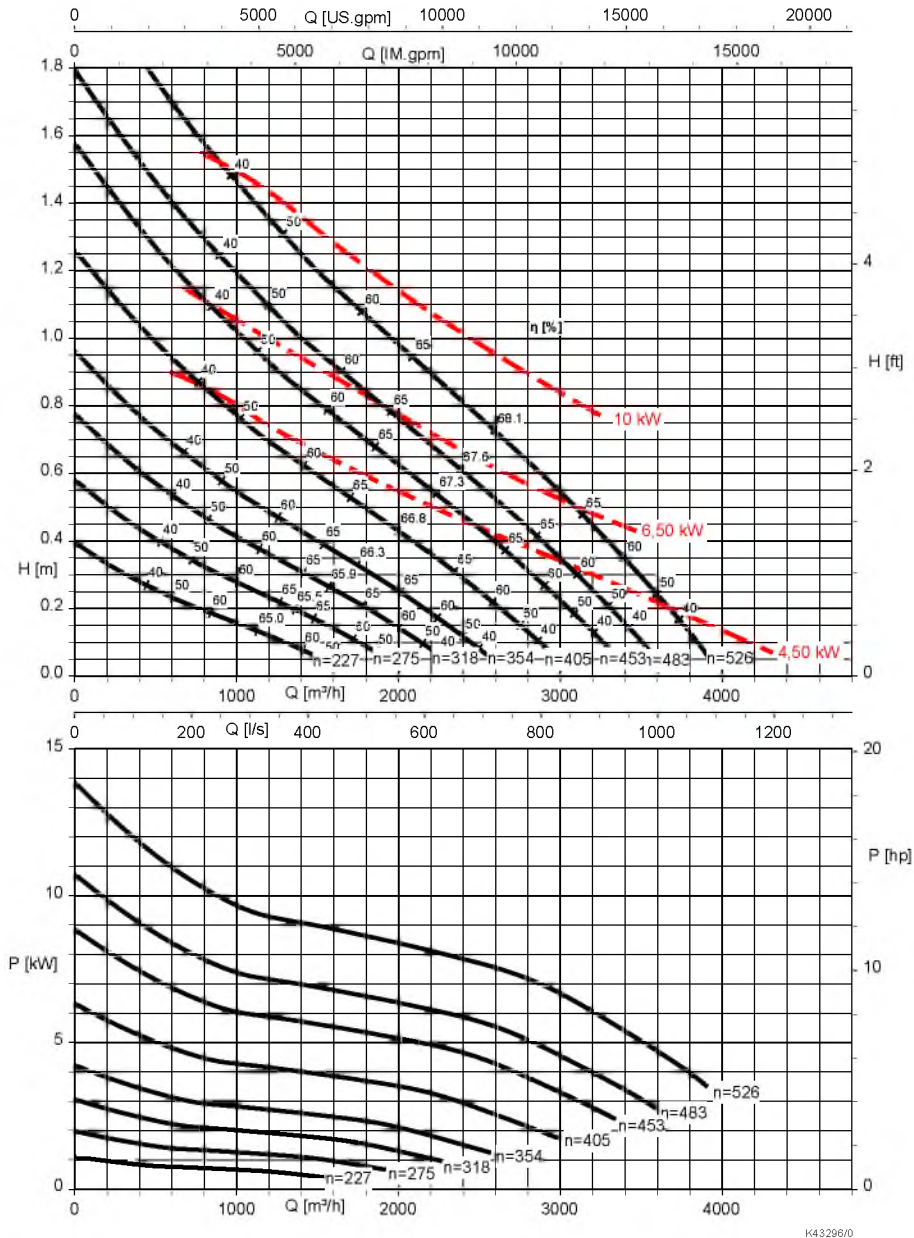


Free passage = 140 mm

Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
5035-453/44URG/YRG	453	4,5	SP189	3,232
5035-483/44URG/YRG	483	4,5	SP189	3,036
5035-483/64URG/YRG	483	6,5	SP189	3,036
5035-526/44URG/YRG	526	4,5	SP189	2,780
5035-526/64URG/YRG	526	6,5	SP189	2,780
5035-558/172URG/YRG	558	17,0	SP190	5,294
5035-608/172URG/YRG	608	17,0	SP190	4,856
5035-640/172URG/YRG	640	17,0	SP190	4,616
5035-672/172URG/YRG	672	17,0	SP190	4,392
5035-719/172URG/YRG	719	17,0	SP190	4,104

Amaline 6032- ____, motors: 4 4, 6 4, 11 4



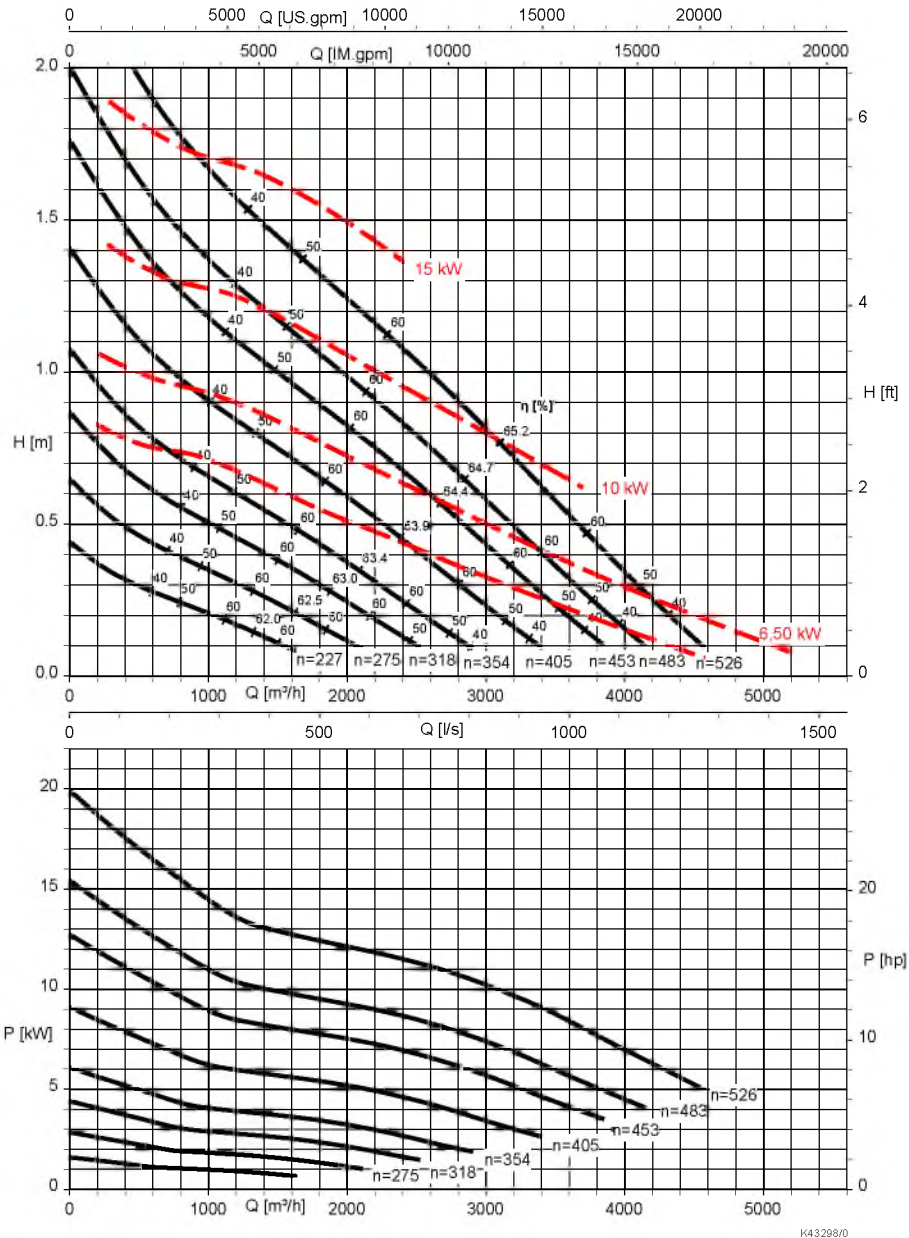
Free passage = 200 mm

Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6032-227/44URG/YRG	227	4,5	SP189	6,356
6032-275/44URG/YRG	275	4,5	SP189	5,250
6032-318/44URG/YRG	318	4,5	SP189	4,545
6032-354/44URG/YRG	354	4,5	SP189	4,143
6032-405/44URG/YRG	405	4,5	SP189	3,618
6032-405/64URG/YRG	405	6,5	SP189	3,618
6032-453/44URG/YRG	453	4,5	SP189	3,232
6032-453/64URG/YRG	453	6,5	SP189	3,232
6032-453/114URG/YRG	453	10,0	SP189	3,232
6032-483/64URG/YRG	483	6,5	SP189	3,036
6032-483/114URG/YRG	483	10,0	SP189	3,036

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6032-526/64URG/YRG	526	6,5	SP189	2,784
6032-526/114URG/YRG	526	10,0	SP189	2,784

Amaline 6033- ____, motors: 4 4, 6 4, 11 4



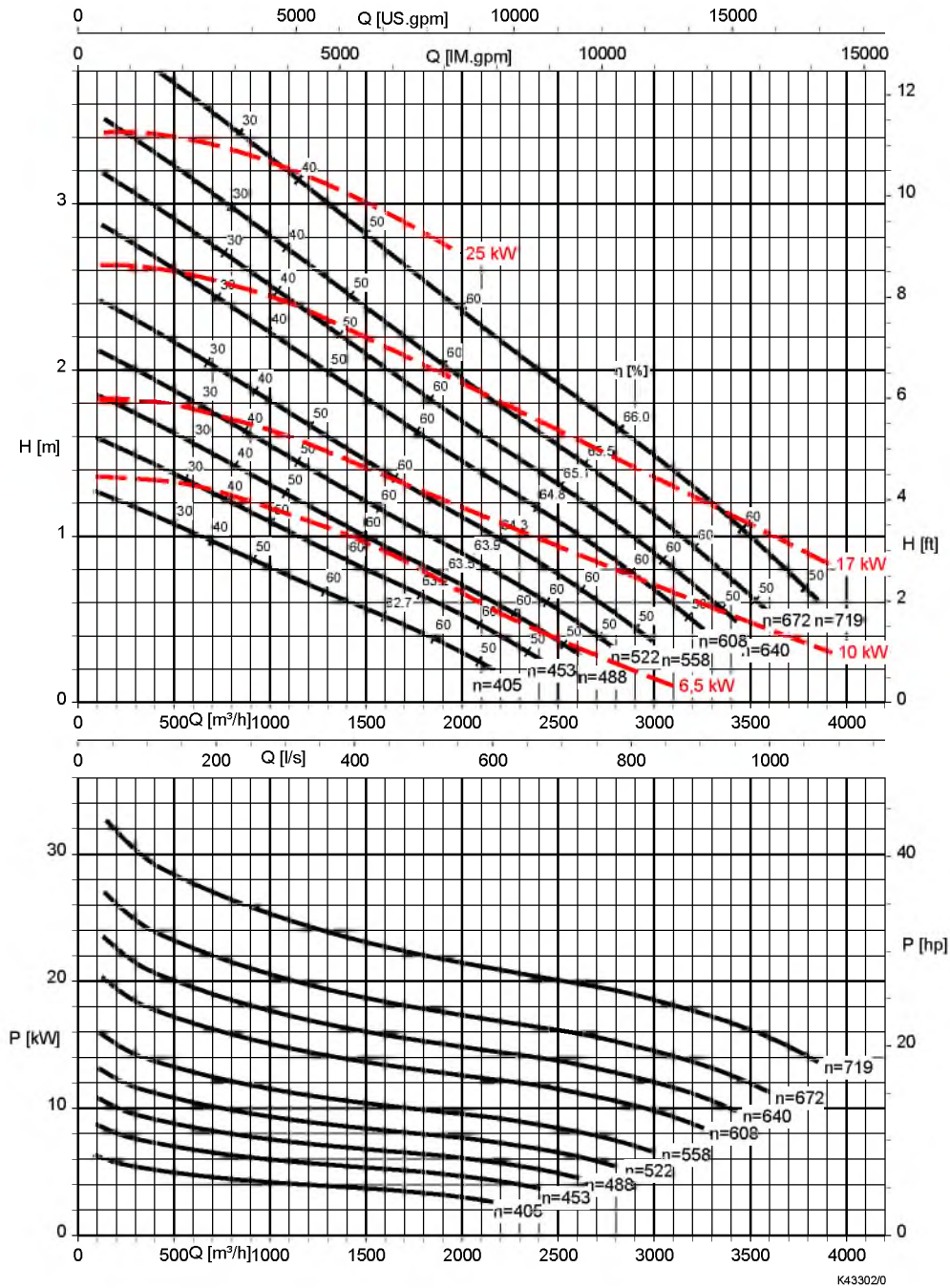
Free passage = 200 mm

Speed n_{eff} . and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6033-227/44URG/YRG	227	4,5	SP189	6,356
6033-275/44URG/YRG	275	4,5	SP189	5,250
6033-318/44URG/YRG	318	4,5	SP189	4,545
6033-354/44URG/YRG	354	4,5	SP189	4,143
6033-354/64URG/YRG	354	6,5	SP189	4,143
6033-405/44URG/YRG	405	4,5	SP189	3,618
6033-405/64URG/YRG	405	6,5	SP189	3,618
6033-405/114URG/YRG	405	10,0	SP189	3,618
6033-453/44URG/YRG	453	4,5	SP189	3,232
6033-453/64URG/YRG	453	6,5	SP189	3,232
6033-453/114URG/YRG	453	10,0	SP189	3,232

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6033-483/64URG/YRG	483	6,5	SP189	3,036
6033-483/114URG/YRG	483	10,0	SP189	3,036
6033-526/64URG/YRG	526	6,5	SP189	2,784
6033-526/114URG/YRG	526	10,0	SP189	2,784

Amaline 6035- ____, motors: 17 2, 25 2, 11 4, 16 4



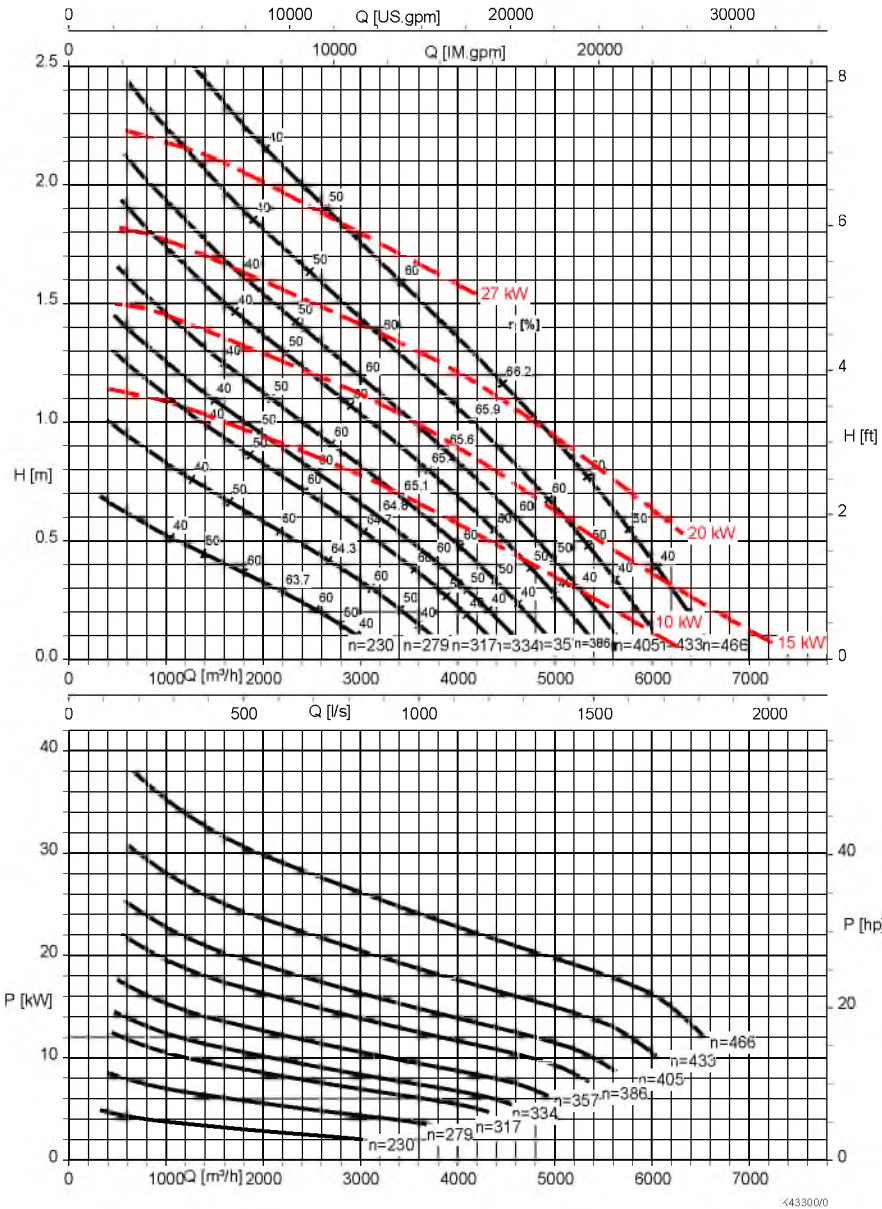
Free passage = 200 mm

Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6035-357/164URG/YRG	357	15,0	SP190	4,104
6035-405/164URG/YRG	405	15,0	SP190	3,618
6035-453/114URG/YRG	453	10,0	SP189	3,232
6035-488/172URG/YRG	488	17,0	SP190	6,051
6035-522/172URG/YRG	522	17,0	SP190	5,654
6035-558/172URG/YRG	558	17,0	SP190	5,294
6035-608/172URG/YRG	608	17,0	SP190	4,856

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
6035-608/252URG/YRG	608	25,0	SP190	4,856
6035-640/172URG/YRG	640	17,0	SP190	4,616
6035-640/252URG/YRG	640	25,0	SP190	4,616
6035-672/172URG/YRG	672	17,0	SP190	4,392
6035-672/252URG/YRG	672	25,0	SP190	4,392
6035-719/252URG/YRG	719	25,0	SP190	4,104

Amaline 8032- ____, motors: 4 4, 6 4, 11 4, 16 4, 23 4, 30 4



Free passage = 260 mm

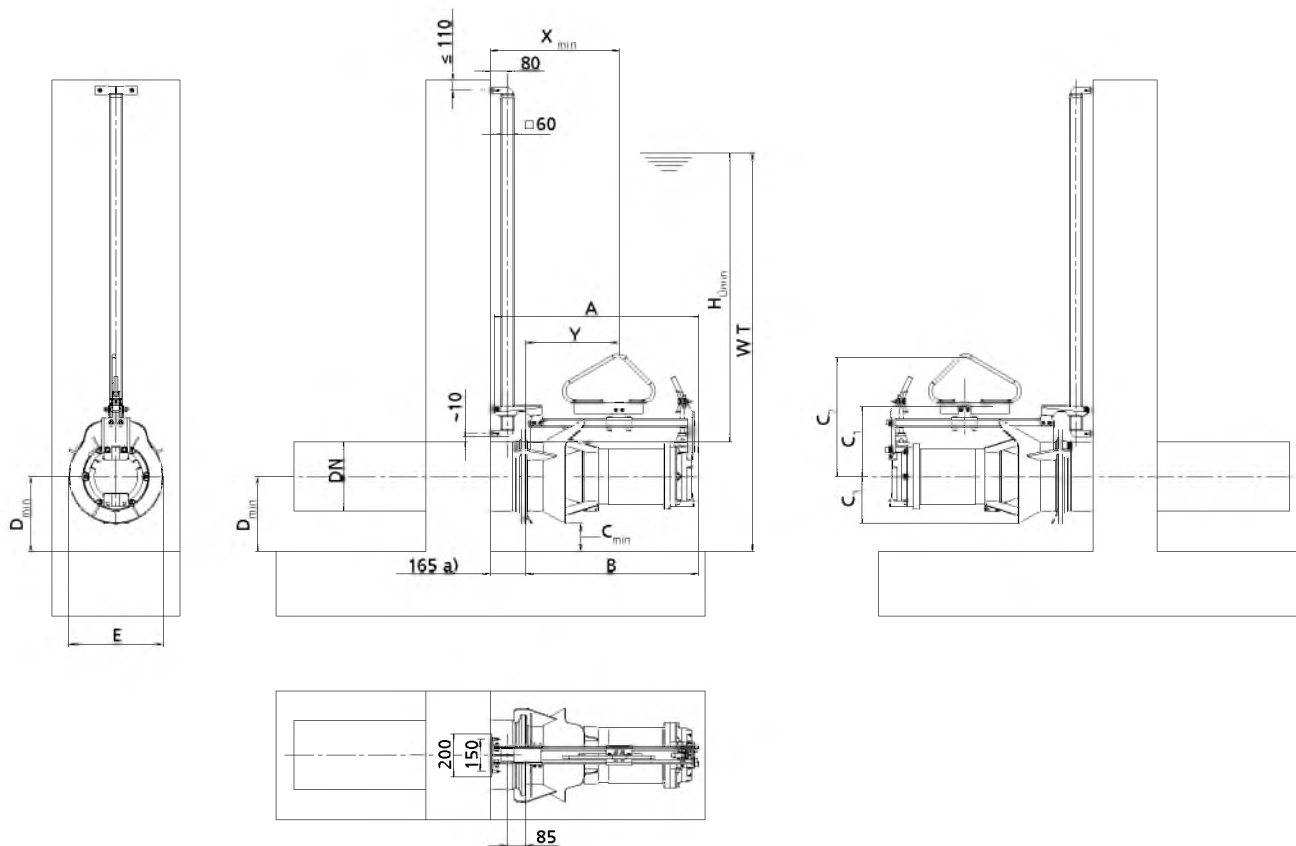
Speed n_{eff} and motor rating P_2

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
8032-206/44URG/YRG	206	4,5	SP189	7,116
8032-230/44URG/YRG	230	4,5	SP189	6,363
8032-230/64URG/YRG	230	6,5	SP189	6,363
8032-279/64URG/YRG	279	6,5	SP189	5,250
8032-279/114URG/YRG	279	10,0	SP189	5,250
8032-317/164URG/YRG	317	15,0	SP190	4,616
8032-334/164URG/YRG	334	15,0	SP190	4,392
8032-357/164URG/YRG	357	15,0	SP190	4,104
8032-357/234URG/YRG	357	20,0	SP190	4,104
8032-386/164URG/YRG	386	15,0	SP190	3,797
8032-386/234URG/YRG	386	20,0	SP190	3,797
8032-405/234URG/YRG	405	20,0	SP190	3,620
8032-405/304URG/YRG	405	27,0	SP190	3,620
8032-433/234URG/YRG	433	20,0	SP190	3,384

Size	n_{eff}	P_2	Drive with gear unit	Transmission ratio
	[rpm]	[kW]		
8032-433/304URG/YRG	433	27,0	SP190	3,384
8032-466/234URG/YRG	466	20,0	SP190	3,145
8032-466/304URG/YRG	466	27,0	SP190	3,145

Dimensions

Amaline 200, 300, 400; motor housing made of grey cast iron



Dimensions of an Amaline 200, 300, 400; motor housing made of grey cast iron

a) | Minimum

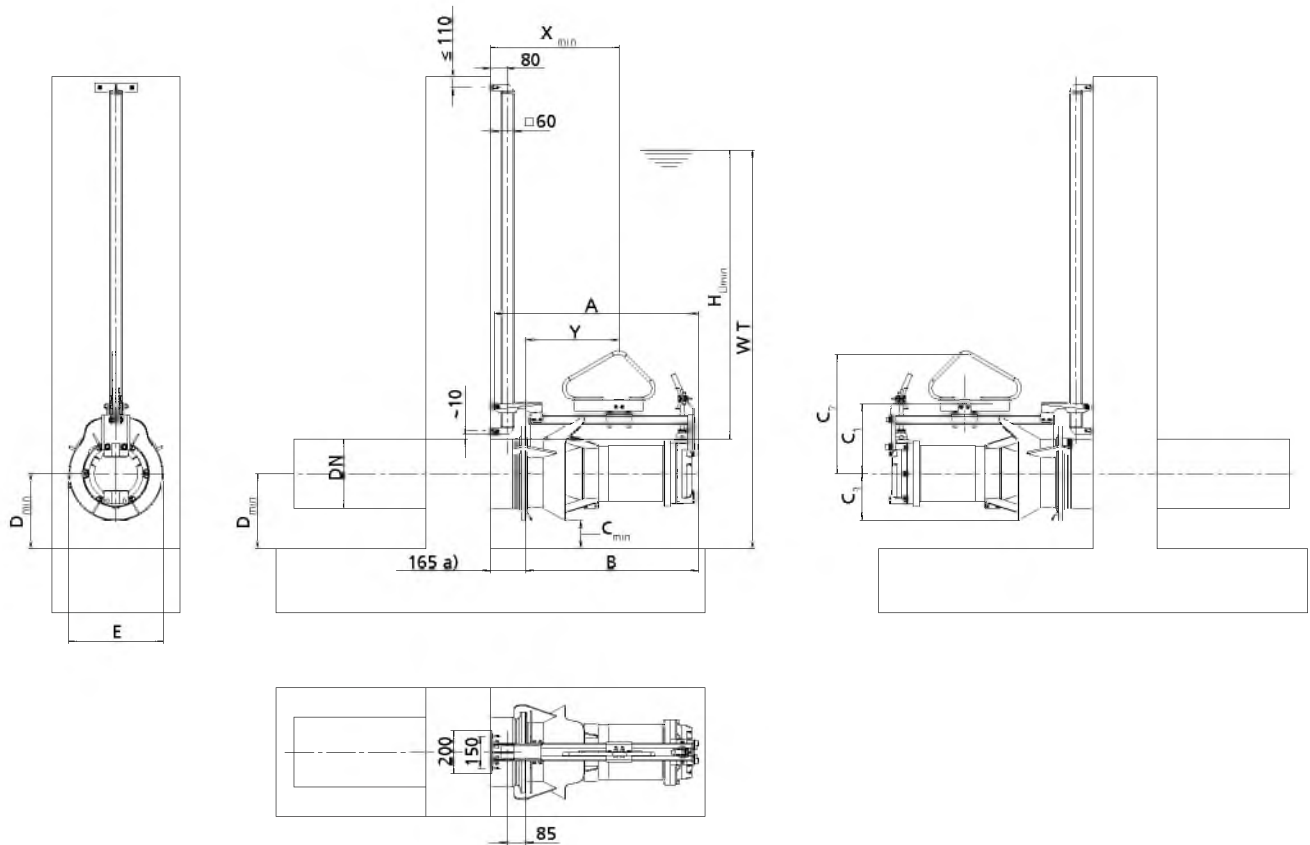
The tolerances of the connection pipe (flange diameter and flange thickness) must be observed to ensure smooth functioning. If required, the flanges must be reworked prior to installation. (→Page 37)

Dimensions [mm]

Size	A	B	C _{min}	C ₁	C ₂	C ₃	D _{min}	E	H _{min}	W _T	X _{min}	Y	[kg]
Amaline 200													
2021-1450/14	709	568	112	193	363	168	280	331	400	780	465	300	45,4
2022-1450/14	709	568	112	193	363	168	280	331	400	780	465	300	45,4
2022-1450/24	709	568	112	193	363	168	280	331	400	780	470	300	47
2034-1450/14	709	568	112	193	363	168	280	331	400	780	465	300	45,4
2034-1450/24	709	568	112	193	363	168	280	331	400	780	470	300	47
2035-1450/24	709	568	112	193	363	168	280	331	400	780	470	300	47
Amaline 300													
3021-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3022-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3022-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3031-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3031-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3032-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3032-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3033-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3033-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	58,5
3034-960/86	950	804	131	326	556	219	350	438	500	1000	555	390	169,5

Size	A	B	C _{min}	C ₁	C ₂	C ₃	D _{min}	E	Hü _{min}	W _T	X _{min}	Y	[kg]
3035-960/86	950	804	131	326	556	219	350	438	500	1000	555	390	169,5
3036-960/86	950	804	131	326	556	219	350	438	500	1000	555	390	169,5
Amaline 400													
4021-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4022-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4022-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4031-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4031-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4032-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4032-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4033-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	92,5
4033-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	92,5

Amaline 200, 300, 400; motor housing made of stainless steel



Dimensions of an Amaline 200, 300, 400; motor housing made of stainless steel

a) | Minimum

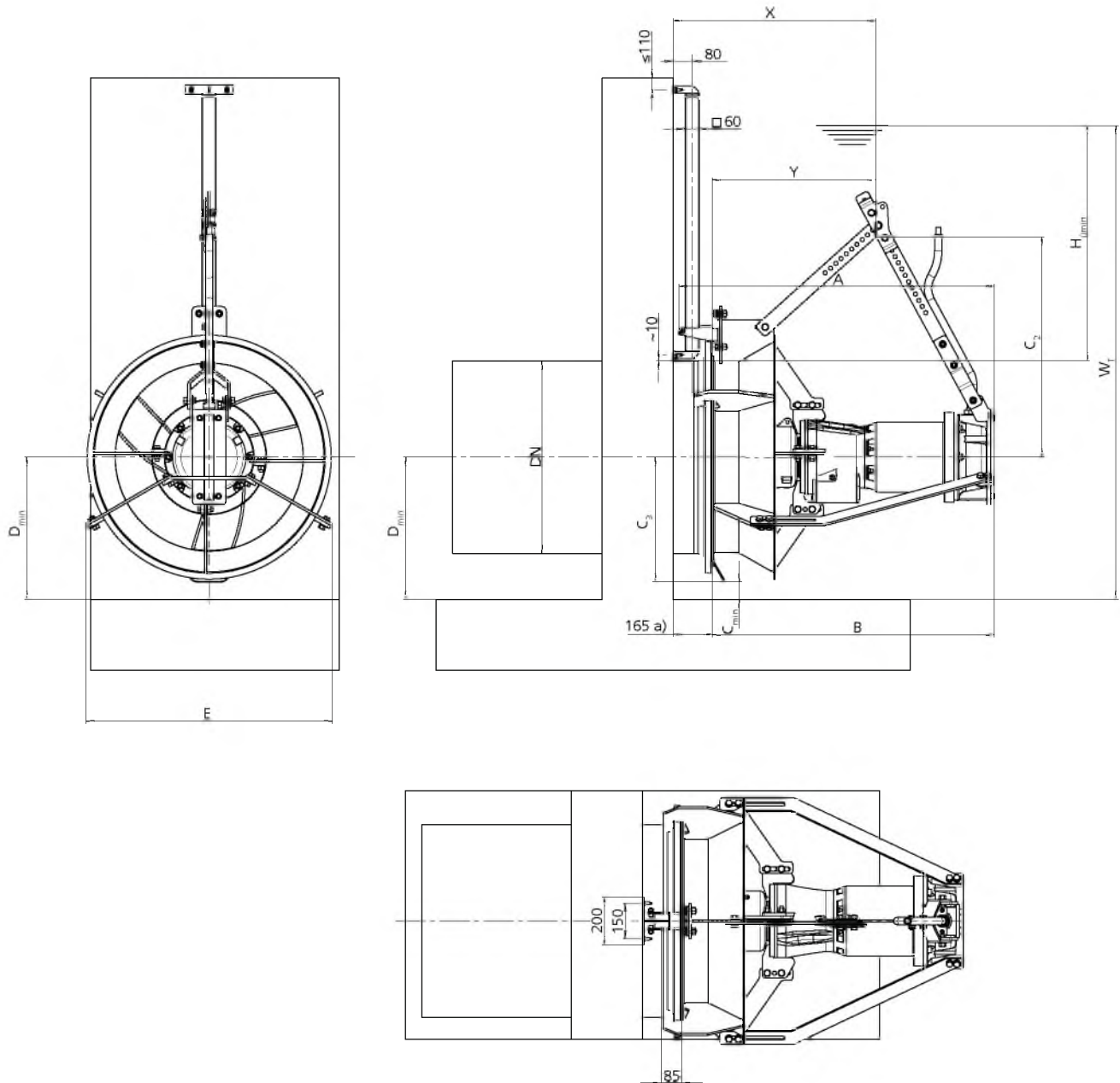
The tolerances of the connection pipe (flange diameter and flange thickness) must be observed to ensure smooth functioning. If required, the flanges must be reworked prior to installation. (→Page 37)

Dimensions [mm]

Size	A	B	C _{min}	C ₁	C ₂	C ₃	D _{min}	E	H _{min}	W _T	X _{min}	Y	[kg]
Amaline 200													
2021-1450/14	707	566	112	193	363	168	280	332	400	780	465	300	45,2
2022-1450/14	707	566	112	193	363	168	280	332	400	780	465	300	45,2
2022-1450/24	707	566	112	193	363	168	280	332	400	780	470	300	47,6
2034-1450/14	707	566	112	193	363	168	280	332	400	780	465	300	45,2
2034-1450/24	707	566	112	193	363	168	280	332	400	780	470	300	47,6
2035-1450/24	707	566	112	193	363	168	280	332	400	780	470	300	47,6
Amaline 300													
3021-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3022-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3022-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3031-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3031-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3032-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3032-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3033-960/06	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
3033-960/26	778	637	130	243	413	220	350	436	500	1000	545	380	57,7
Amaline 400													
4021-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4022-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4022-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	90,6

Size	A	B	C _{min}	C ₁	C ₂	C ₃	D _{min}	E	Hü _{min}	W _T	X _{min}	Y	[kg]
4031-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4031-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4032-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4032-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4033-700/38	867	726	135	283	498	265	400	524	600	1200	605	440	90,6
4033-700/48	867	726	135	283	498	265	400	524	600	1200	605	440	90,6

Amaline 500, 600, 800; motor housing made of grey cast iron



Dimensions of an Amaline 500, 600, 800; motor housing made of grey cast iron

a) | Minimum

The tolerances of the connection pipe (flange diameter and flange thickness) must be observed to ensure smooth functioning. If required, the flanges must be reworked prior to installation. (→Page 37)

Dimensions [mm]

Size	A	B	C _{min}	C ₂	C ₃	D _{min}	E	H _{U_{min}}	W _T	X _{min}	Y	[kg]
Amaline 500												
5033-... / 4 4...	1286	1145	70	945	380	450	768	700	1400	815	650	240,5
5033-... / 6 4...	1376	1235	70	910	380	450	768	700	1400	855	690	276
5033-... / 11 4...	1376	1235	70	910	380	450	768	700	1400	855	690	276
5035-... / 4 4...	1254	1113	70	945	380	450	768	700	1400	825	660	239
5035-... / 6 4...	1344	1203	70	905	380	450	768	700	1400	865	700	274,5

Size	A	B	C _{min}	C ₂	C ₃	D _{min}	E	Hü _{min}	W _T	X _{min}	Y	[kg]
5033-... / 17 2...	1344	1203	70	905	380	450	768	700	1400	865	700	306,5
Amaline 600												
6032-... / 4 4...	1286	1145	75	980	425	500	838	900	1700	835	670	248,5
6032-... / 6 4...	1376	1235	75	950	425	500	838	900	1700	860	695	284
6032-... / 11 4...	1376	1235	75	950	425	500	838	900	1700	860	695	284
6033-... / 4 4...	1286	1145	75	980	425	500	838	900	1700	835	670	248,5
6033-... / 6 4...	1376	1235	75	950	425	500	838	900	1700	860	695	284
6033-... / 11 4...	1376	1235	75	950	425	500	838	900	1700	860	695	284
6035-... / 11 4...	1308	1168	75	980	425	500	838	900	1700	825	660	284
6035-... / 16 4...	1340	1199	75	945	425	500	838	900	1700	815	650	315,6
6035-... / 17 2...	1340	1199	75	945	425	500	838	900	1700	815	650	315
6035-... / 25 2...	1340	1199	75	945	425	500	838	900	1700	815	650	332
Amaline 800												
8032-... / 4 4...	1179	1038	73	1000	527	600	1037	1100	2100	795	630	270
8032-... / 6 4...	1271	1130	73	1000	527	600	1037	1100	2100	935	770	305,5
8032-... / 11 4...	1271	1130	73	1000	527	600	1037	1100	2100	935	770	305,5
8032-... / 16 4...	1309	1168	73	990	527	600	1037	1100	2100	945	780	337,5
8032-... / 23 4...	1309	1168	73	990	527	600	1037	1100	2100	945	780	349,5
8032-... / 30 4...	1331	1190	73	1060	527	600	1037	1100	2100	885	720	397

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump set, complete with power cable
- Shackle
- Bail

Using a bail is recommended when the lifting rope of the crane will not remain attached to the attachment point of the pump set during operation; instead, the pump set will be pulled up or lowered by means of a hook.¹⁵⁾

Accessories

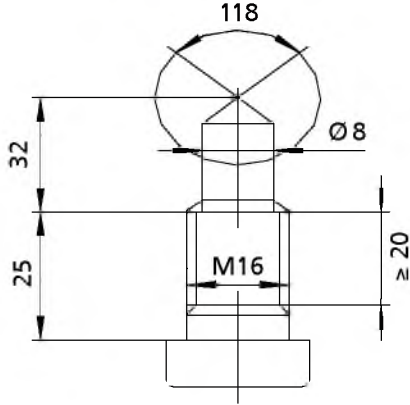
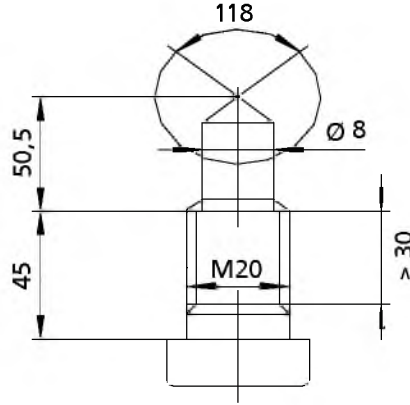
- Depending on the model the installation parts consist of:
 - Guide rail
 - Mounting brackets
 - Middle support (optional)
- Connecting pipe
- Cable support for properly routing the power cable
- Other accessories on request

¹⁵⁾ For Amaline 200, 300, 400 only

Accessories

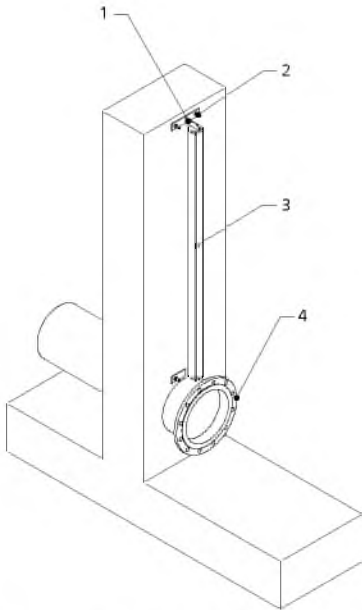
Forcing screws

Forcing screws

Amaline	Forcing screw		Mat. No.	[kg]
200	M16 x 60		11197135	0.10
300, motors: 0 6, 2 6			11197135	0.10
400			11197135	0.10
300, motors: 8 6, 11 6	M20 x 95		11197784	0.25
600			11197784	0.25
800			11197784	0.25

Installation accessories

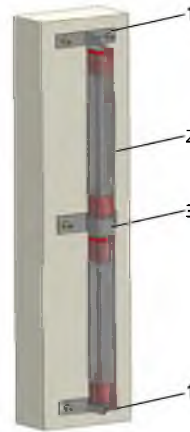
Overview of installation accessories



Overview of installation accessories

1	Holder
2	Chemical anchor M10x30
3	Guide rail
4	Connection pipe

Fastening elements for a guide rail > 6 m with middle support

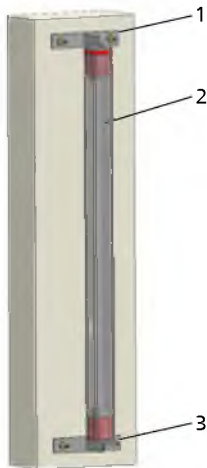


Guide rail length > 6 m

1	Holder
2	Guide rail 60 x 60 x 3 mm
3	Middle support

Fastening elements for the guide rail

Fastening elements for a guide rail < 6 m without middle support



Guide rail length < 6 m

1	Holder
2	Guide rail 60 x 60 x 3 mm


Overview of fastening elements for the guide rail

Description	Pipe length	Material	Material No.	[kg]
	[m]			
Fastening element for a guide rail 60 x 60 x 3 mm without middle support for mounting on the tank wall, incl. chemical anchors M10 x 130	6	1.4571	01428145	2.5
Fastening element for a guide rail 60 x 60 x 3 mm with middle support for mounting on the tank wall, incl. chemical anchors M10 x 130	6 - 12	1.4571	01428146	4.4

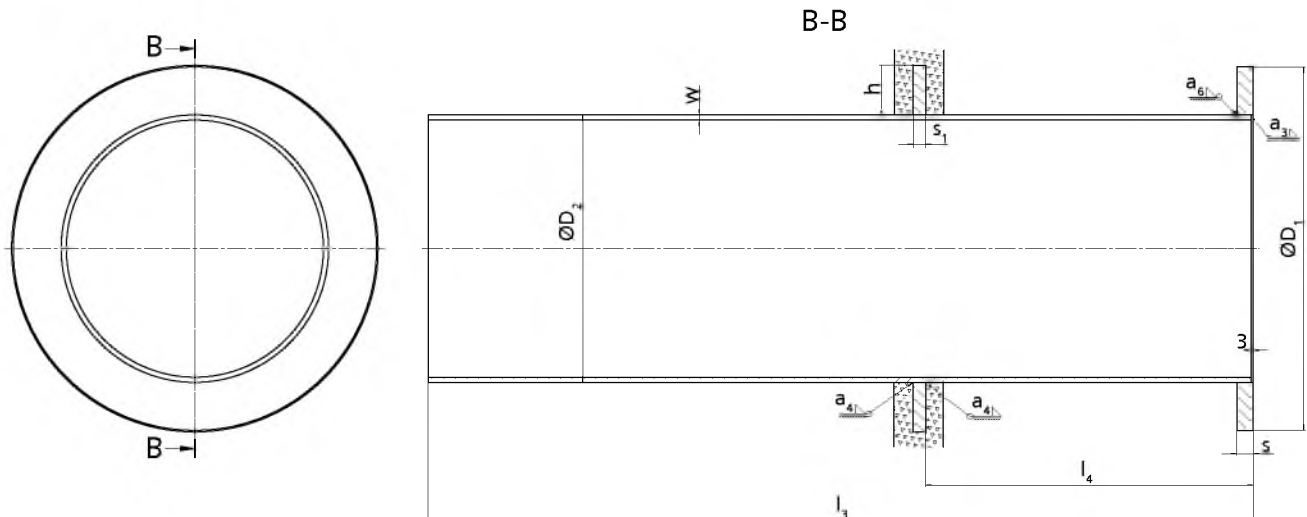
Guide rails

The guide rail length required depends on the water level. They are supplied in standard lengths of 3 m or 6 m. If the top of the guide rail is fastened to the tank edge, select the guide rail length accordingly. If necessary, shorten the guide rails at the site. For larger installation depths, extend the guide rails by adding guide rail extensions of 3 m or 6 m length at the site. Welding and subsequent treatment must be performed at the site in accordance with the relevant regulations. To allow smooth lifting and lowering of the submersible motor pumps, grind the weld seam at the outside of the guide rail down to a max. projection of 0.5 mm. For guide rail lengths > 6 m using a middle support is recommended.

Overview of guide rails

	Description	Pipe length	Material	Material No.	[kg]
		[m]			
	Guide rail 60 x 60 x 3 mm	3,0	1.4301	11304010	15.7
	Guide rail 60 x 60 x 3 mm	3,0	1.4571	11304011	15.7
	Guide rail 60 x 60 x 3 mm	6,0	1.4301	11304596	31.3
	Guide rail 60 x 60 x 3 mm	6,0	1.4571	11304597	31.3

Connection pipe



Dimensions of the connection pipe (l_3 , l_4 = order specifications provided to the manufacturer by the customer)

Prior to installation all dimensions including the indicated tolerances (especially the flange diameter and thickness) must be verified and, if required, adjusted by reworking.

Dimensions of the connection pipe [mm]

DN	ØD_1	ØD_2	$s_{-0,5}$	w^{+1}	s_1	h
200	320	219	20	6	10	50
300	440	324	22	6	15	60
400	540	406	22	6	15	65
500	645	508	24	6	15	70
600	755	610	30	6	15	75
800	975	813	30	6	15	80

Material variants of the connection pipe

	Description	DN	Mat. No.	Material	[kg]
	Connection pipe with flange to DIN EN 1092-1 / PN 6, length $l_3 \approx 1$ m	200	01488465	Galvanised steel	45.5
		200	01488466	1.4571	45.5
		300	01488467	Galvanised steel	75.5
		300	01488470	1.4571	75.5
		400	01488471	Galvanised steel	95.5
		400	01488472	1.4571	95.5
		500	01488473	Galvanised steel	122.5
		500	01488474	1.4571	122.5
		600	01488475	Galvanised steel	155
		600	01488476	1.4571	155
800	01488477	Galvanised steel	217.5		
800	01488478	1.4571	217.5		

Connection pipe extension per metre

DN	Material variant		[kg]
	Galvanised steel	1.4571	
200	X	X	33,8
300	X	X	50,8
400	X	X	64,5
500	X	X	78,5
600	X	X	94,5
800	X	X	129

Cable support/carabine hook

The cable support is used for supporting the power cable at the lifting rope or tank edge (one included in standard scope of supply; additional or spare cable supports optionally available).

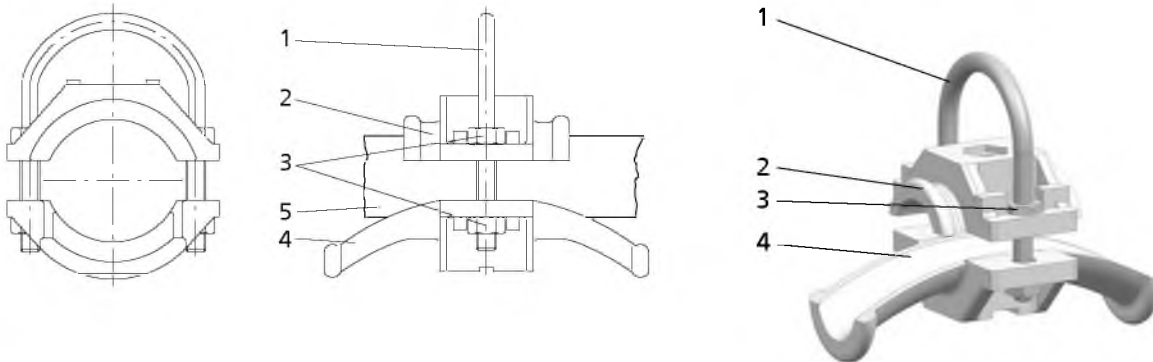
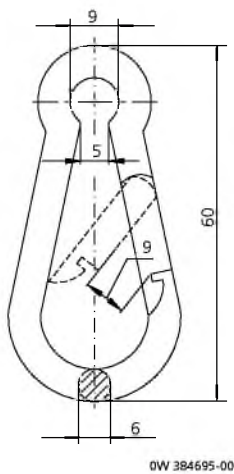


Illustration of cable support

1	Bail
2	Moulded part made of polypropylene
3	Hexagon nut made of A4
4	Moulded part made of polypropylene
5	Power cable with defined diameter ¹⁶⁾

Carabine hook



0W 384695-00

Dimensions of carabine hook [mm]

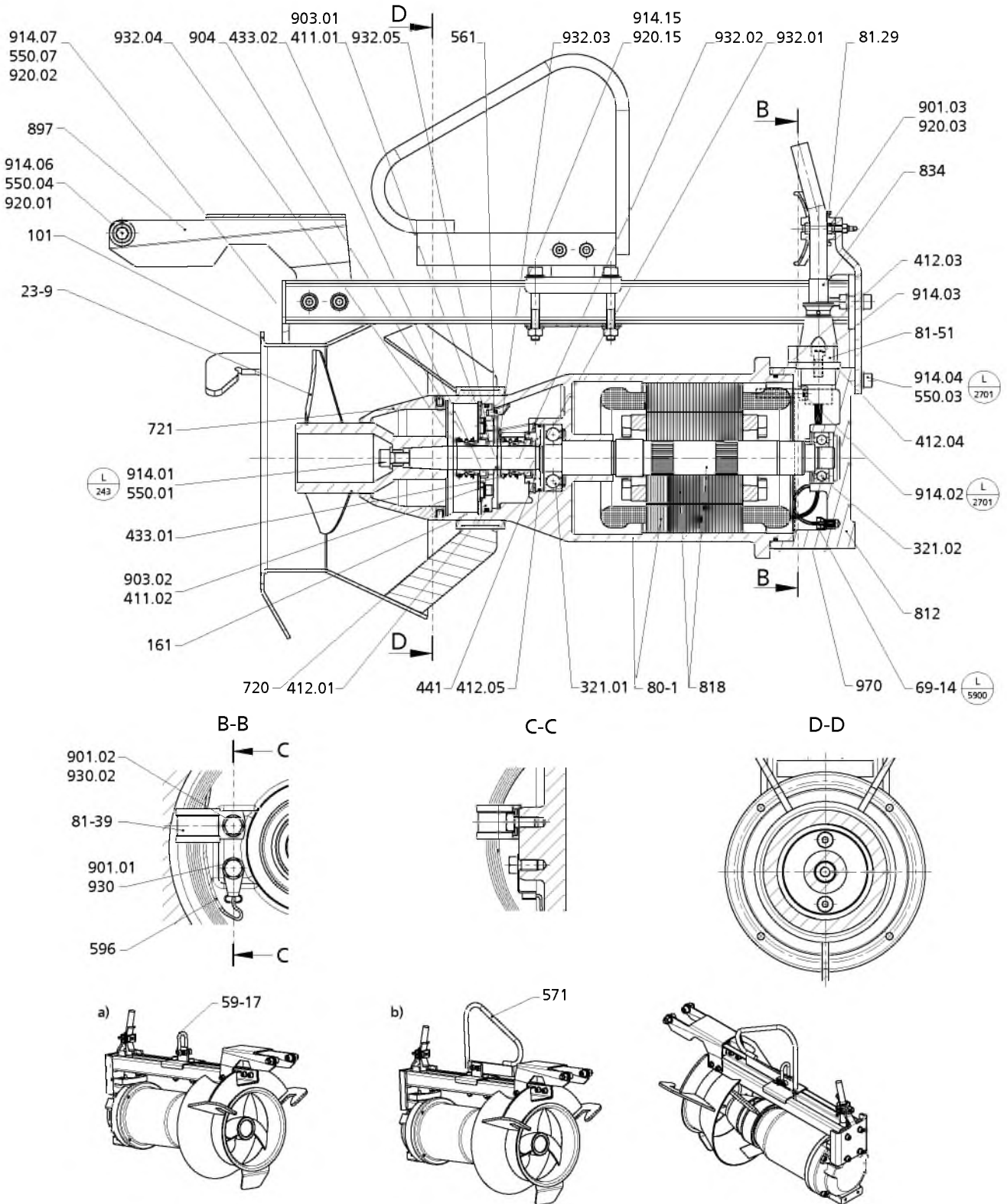
Overview of cable supports/carabine hooks

Description	Suitable for	Material	Material No.	[kg]
Cable support, incl. carabine hooks	Motors 1 4, 2 4, 0 6, 2 6 (power cable diameters: $\varnothing = 10 \dots 16 \text{ mm}$)	Cable support: plastic / A4, carabine hook: A4	1955522	0.06
Cable support, incl. carabine hooks	Motor 17 2, 25 2, 4 4, 6 4, 11 4, 16 4, 23 4, 30 4, 3 8, 4 8	Cable support: plastic / A4, carabine hook: A4	1955523	0.09

¹⁶⁾ Refer to the power cable data given in the motor catalogue.

General assembly drawings with list of components

Amaline 200 (motors: 1 4, 2 4; motor housing made of grey cast iron)

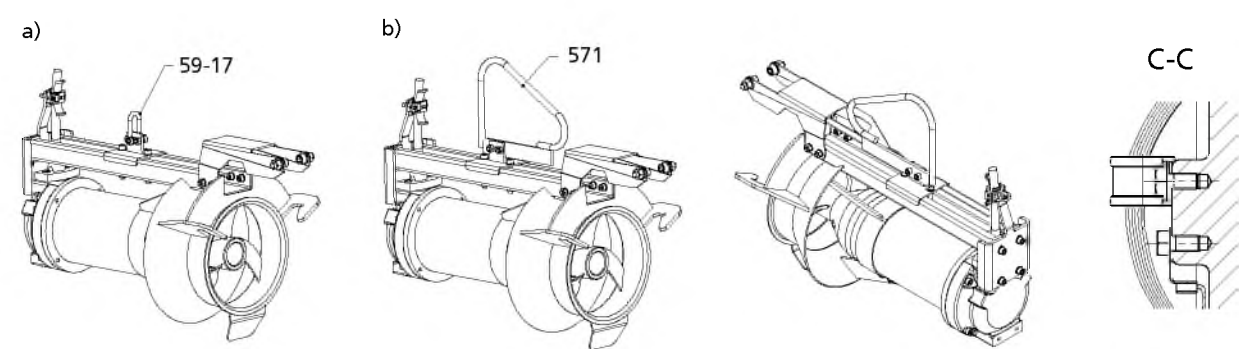
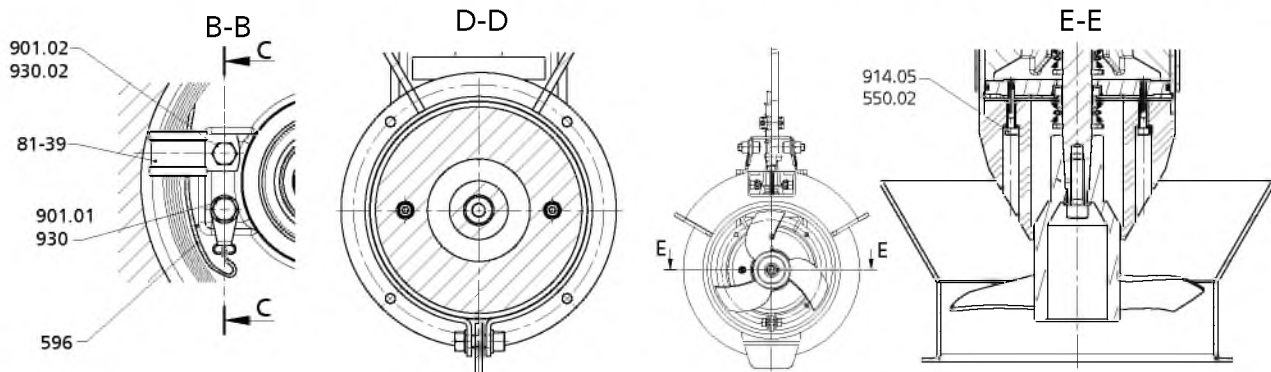
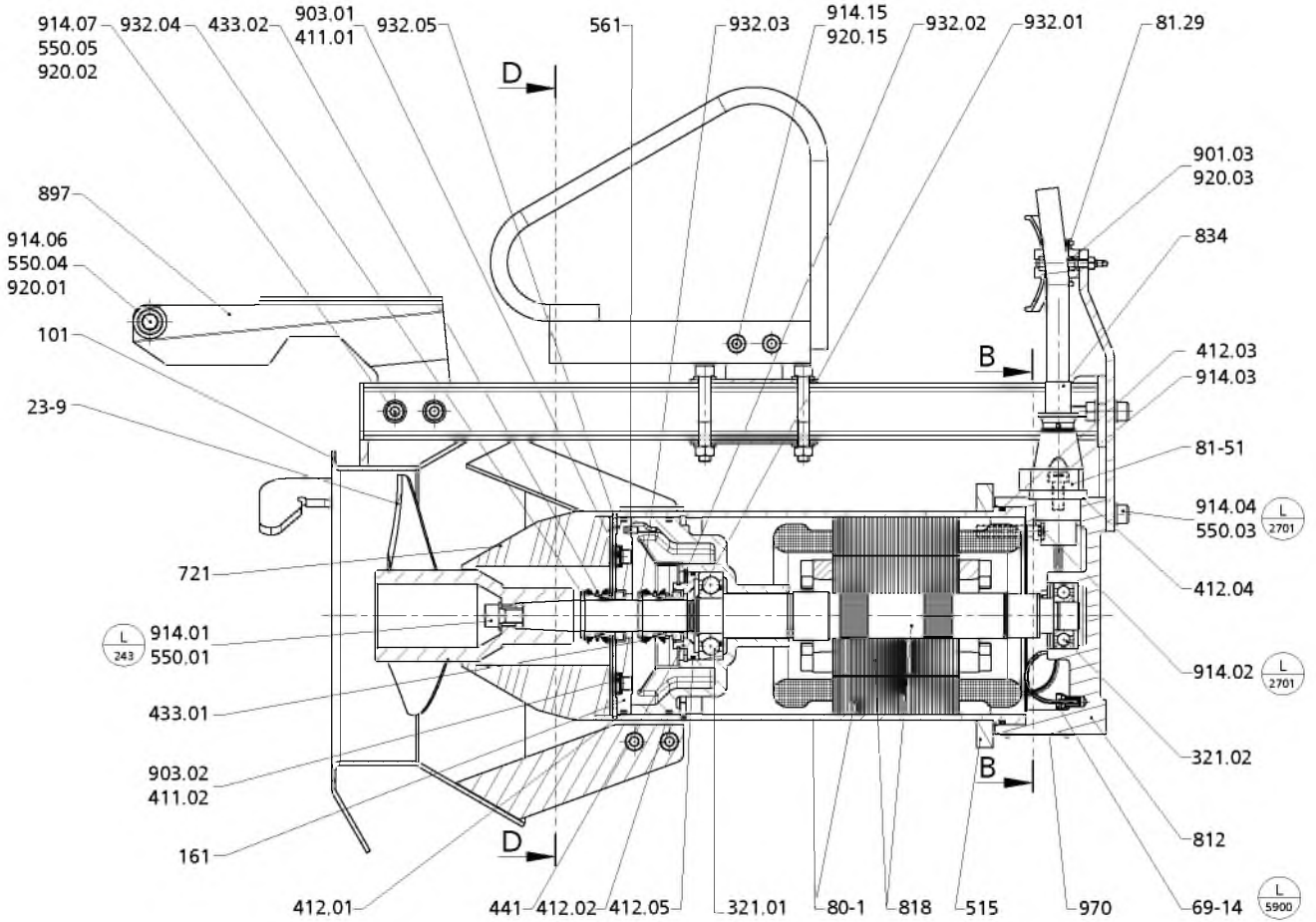


General assembly drawing: a) with shackle b) with bail (optional)

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	571	Bail (optional)
59-17	Shackle	596	Wire
69-14	Leakage sensor	720	Spacer
80-1	Motor unit	721	Adapter
81-29	Terminal	812	Motor housing cover
81-39	Clamp	818	Rotor
81-51	Clamping element	834	Cable gland
101	Pump casing	897	Guide piece
161	Casing cover	901.01/.02/.03	Hexagon head bolt
321.01/.02	Radial ball bearing	903.01/.02	Screw plug
411.01/.02	Joint ring	904	Grub screw
412.01/.03/.04/.05	O-ring	914.01/.02/.03/.04/.06/ .07/.15	Hexagon socket head cap screw
433.01/.02	Mechanical seal	920.01/.02/.03/.15	Nut
441	Shaft seal housing	930.01/.02	Safety device
550.01/.03/.04/.05	Disc	932.01/.02/.03/.04/.05	Circlip
561	Grooved pin	970	Label/plate

Amaline 200 (motors: 1 4, 2 4; motor housing made of stainless steel)

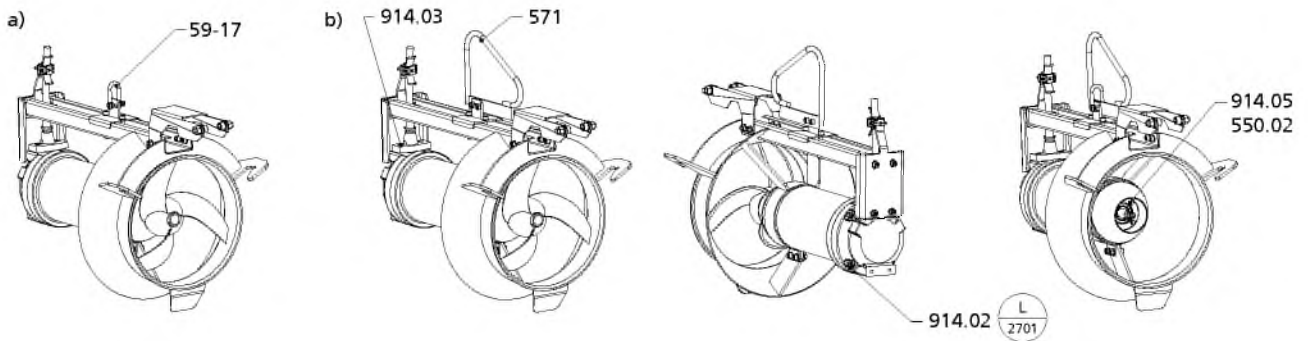
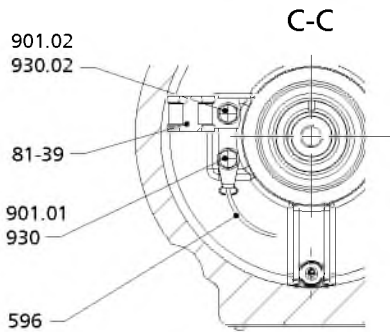
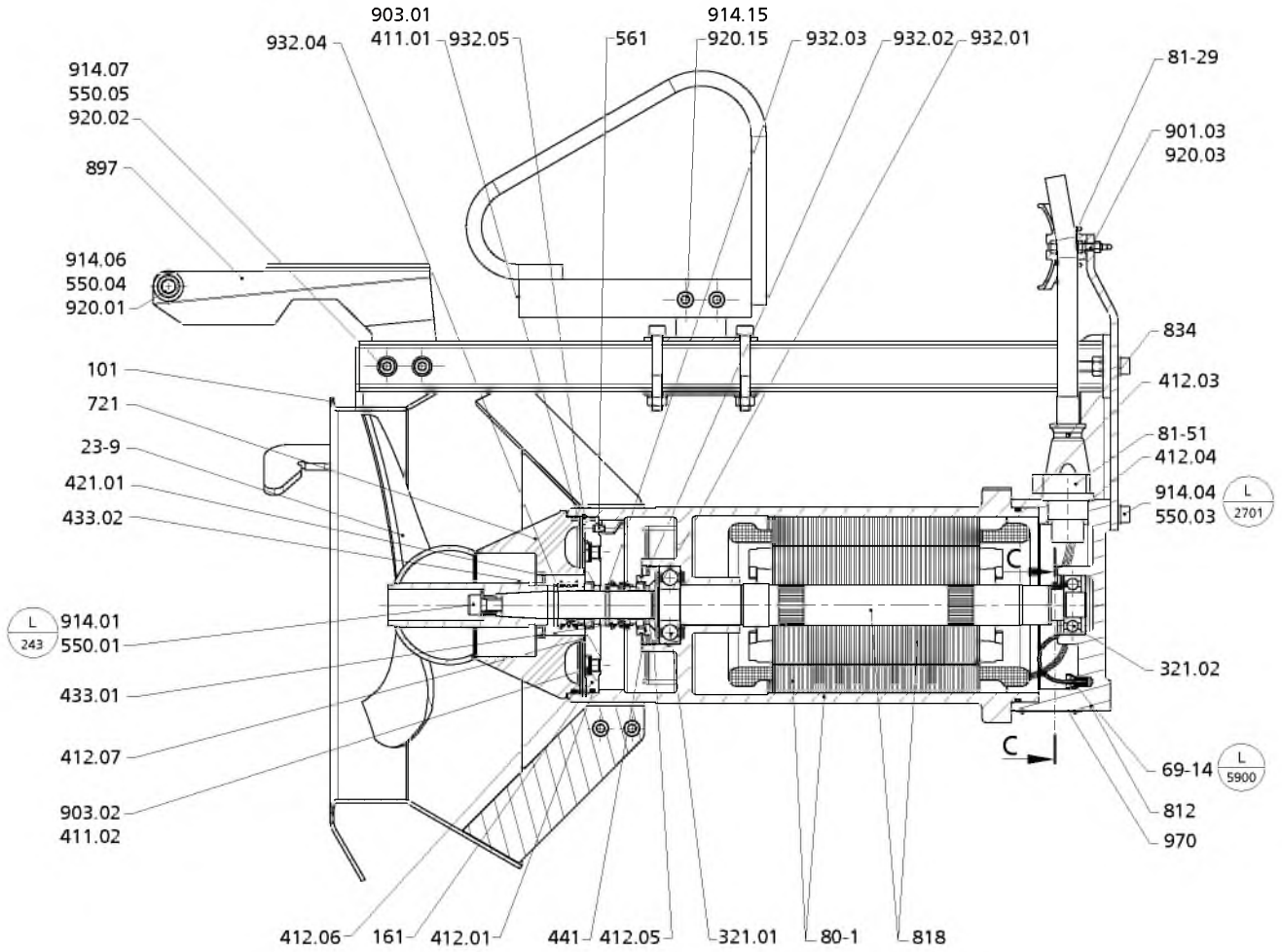


General assembly drawing: a) with shackle b) with bail (optional)

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	561	Grooved pin
59-17	Shackle	571	Bail (optional)
69-14	Leakage sensor	596	Wire
80-1	Motor unit	721	Adapter
81-29	Terminal	812	Motor housing cover
81-39	Clamp	818	Rotor
81-51	Clamping element	834	Cable gland
101	Pump casing	897	Guide piece
161	Casing cover	901.01/.02/.03	Hexagon head bolt
321.01/.02	Radial ball bearing	903.01/.02	Screw plug
411.01/.02	Joint ring	914.01/.02/.03/.04/.05/ .06/.07/.15	Hexagon socket head cap screw
412.01/.02/.03/.04/.05	Shaft seal ring	920.01/.02/.03/.15	Nut
433.01/.02	Mechanical seal	930.02	Safety device
441	Shaft seal housing	932.01/.02/.03/.04/.05	Circlip
515	Taper lock ring	970	Label/plate
550.01/.02/.03/.04/.05	Disc		

Amaline 300 (motors: 0 6, 2 6; motor housing made of grey cast iron)

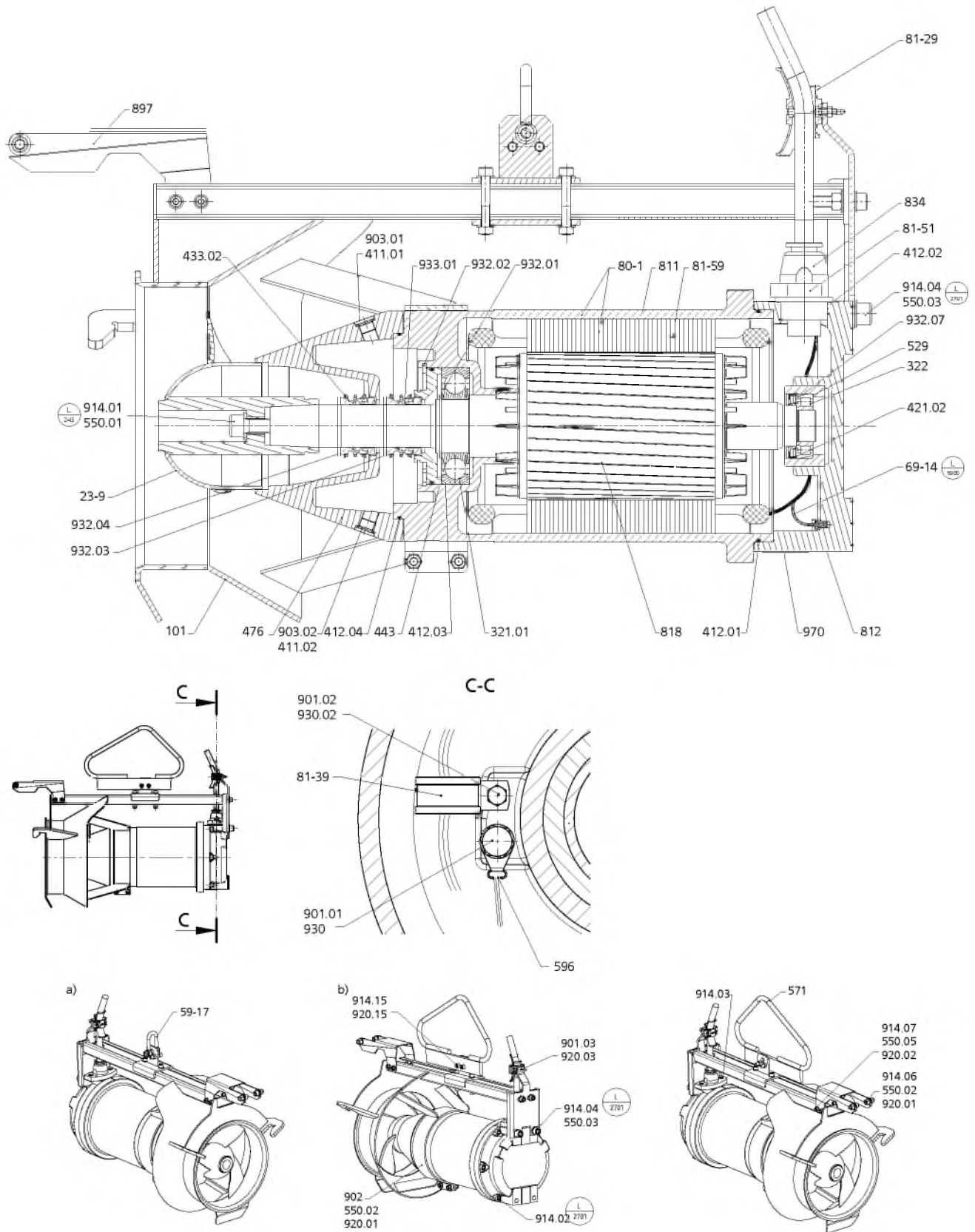


General assembly drawing: a) with shackle b) with bail (optional)

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	561	Grooved pin
59-17	Shackle	571	Bail (optional)
69-14	Leakage sensor	596	Wire
80-1	Motor unit	721	Adapter
81-29	Terminal	812	Motor housing cover
81-39	Clamp	818	Rotor
81-51	Clamping element	834	Cable gland
101	Pump casing	897	Guide piece
161	Casing cover	901.01/.02/.03	Hexagon head bolt
321.01/.02	Radial ball bearing	903.01/.02	Screw plug
411.01/.02	Joint ring	914.01/.02/.03/.04/.05/ .06/.07/.15	Hexagon socket head cap screw
412.01/.03/.04/.05/.06/.07	O-ring	920.01/.02/.03/.15	Nut
421.01	Lip seal	930.01/.02	Safety device
433.01/.02	Mechanical seal	932.01/.02/.03/.04/.05	Circlip
441	Shaft seal housing	970	Label/plate
550.01/.02/.03/.04/.05	Disc		

Amaline 300 (motors: 8 6; motor housing made of grey cast iron)

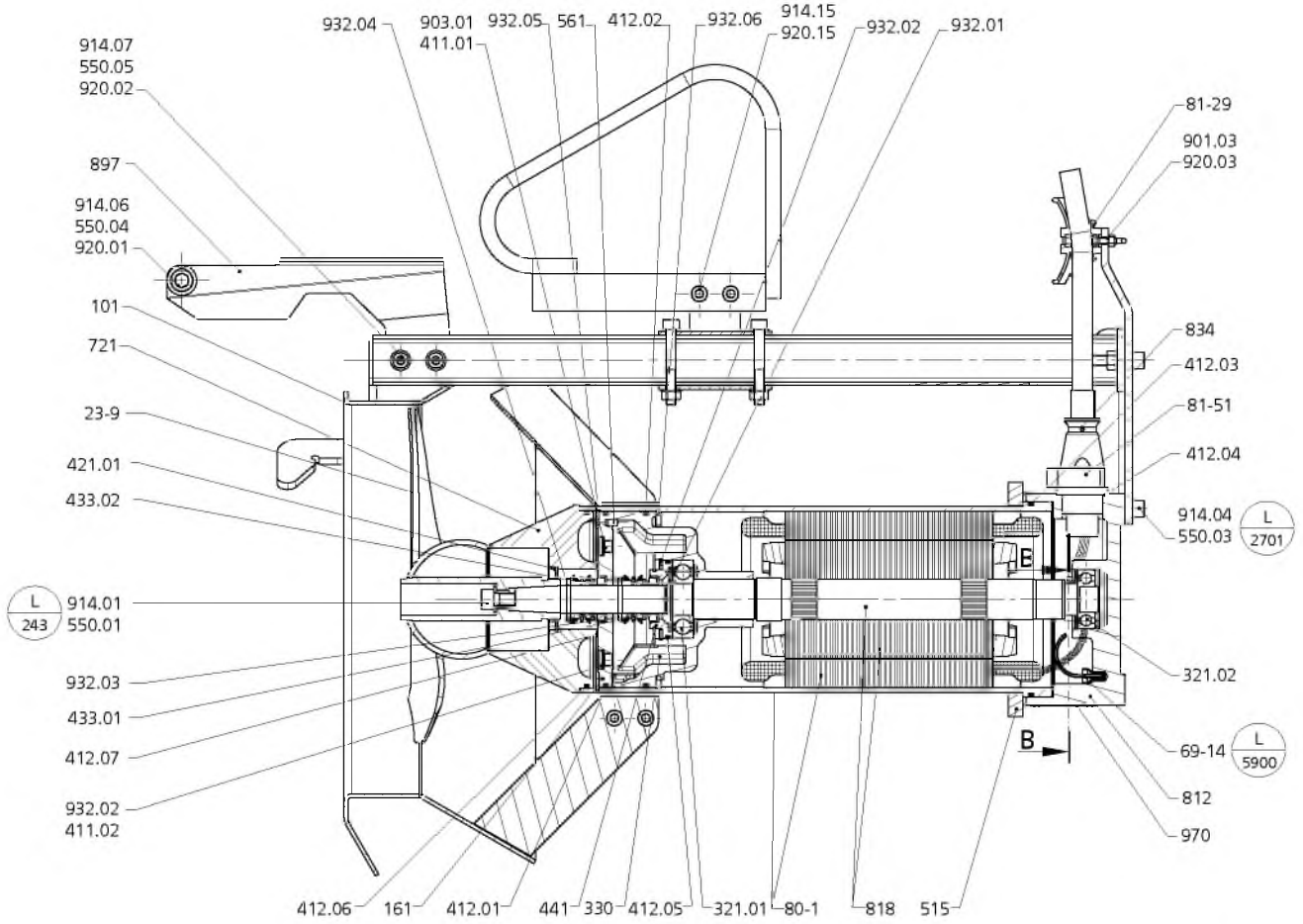


General assembly drawing: a) with shackle b) with bail (optional)

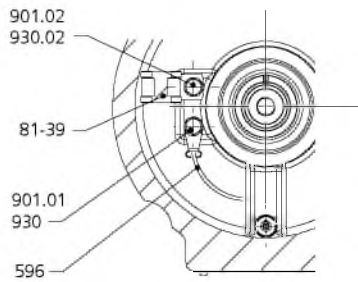
List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	529	Bearing sleeve
59-17	Shackle	550.01/.02/.03/.05	Disc
69-14	Leakage sensor	571	Bail (optional)
80-1	Motor unit	596	Wire
81-29	Terminal	811	Motor housing
81-39	Clamp	812	Motor housing cover
81-51	Clamping element	818	Rotor
81-59	Stator	834	Cable gland
101	Pump casing	897	Guide piece
321.01	Radial ball bearing	901.01/.02/.03	Hexagon head bolt
322	Radial roller bearing	902	Stud
411.01/.02	Joint ring	903.01/.02	Screw plug
412.01/.02/.03/.04	O-ring	914.01/.02/.03/.04/.06/.07/.15	Hexagon socket head cap screw
421.02	Lip seal	920.01/.02/.03/.15	Nut
433.02	Mechanical seal	930.02	Safety device
443	Seal insert	932.01/.02/.03/.04/.07	Circlip
476	Mating ring carrier	970	Label/plate

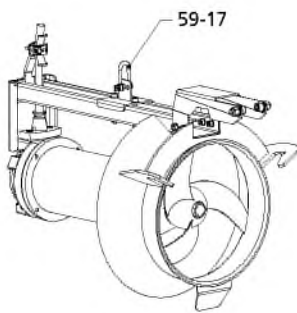
Amaline 300 (motors: 0 6, 2 6; motor housing made of stainless steel)



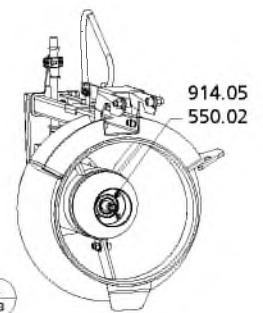
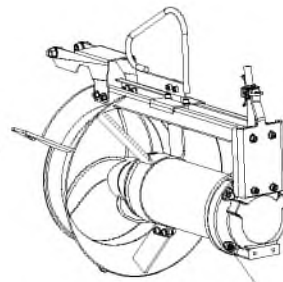
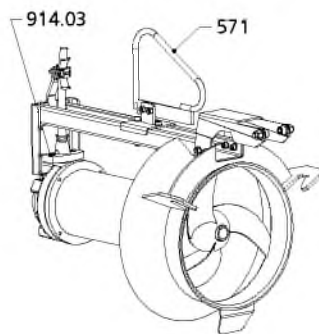
B-B



a)



b)



General assembly drawing: a) with shackle b) with bail (optional)

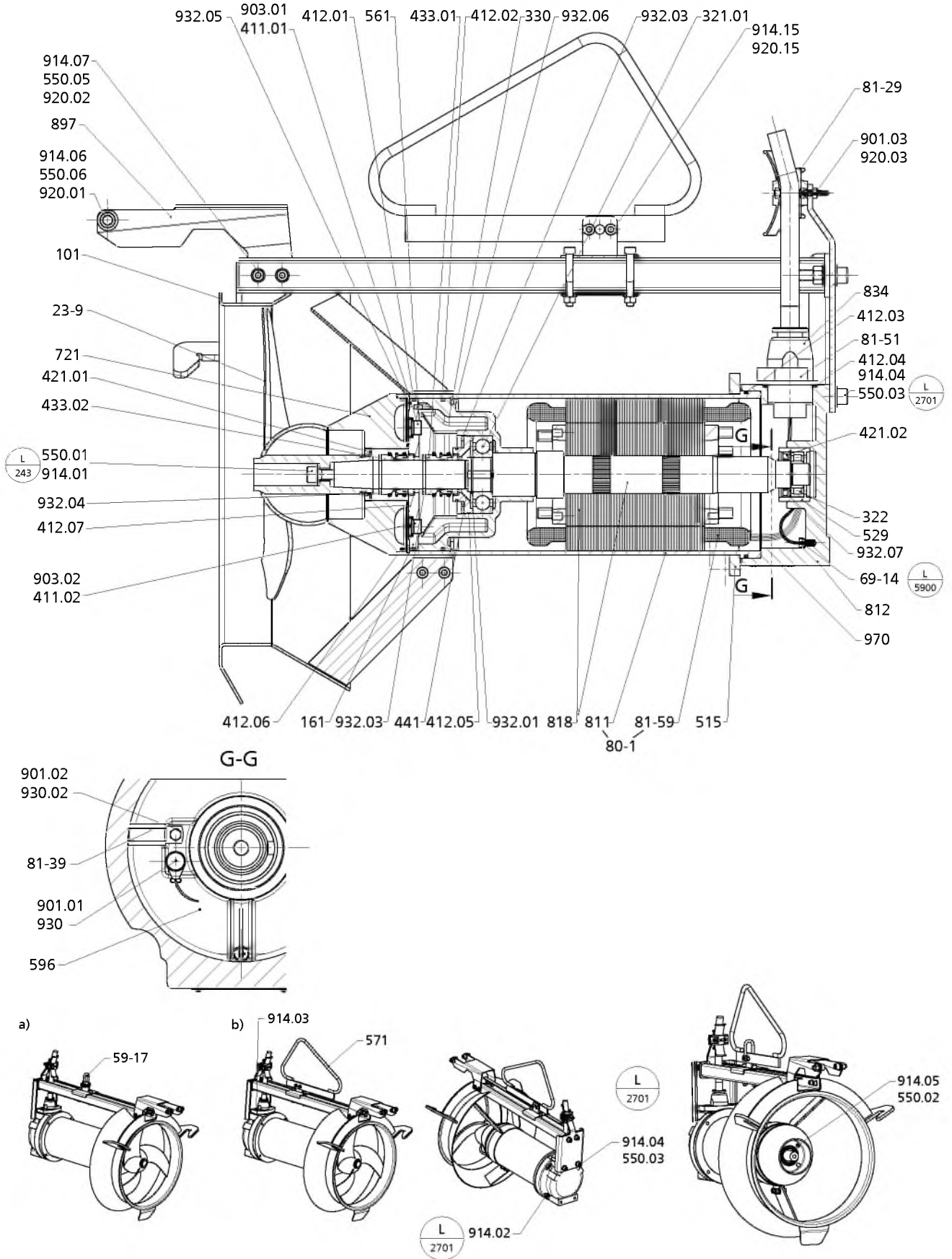
List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	550.01/.02/.03/.04/.05	Disc
59-17	Shackle	561	Grooved pin
69-14	Leakage sensor	571	Bail (optional)
80-1	Motor unit	596	Wire
81-29	Terminal	721	Adapter
81-39	Clamp	812	Motor housing cover
81-51	Stator	818	Rotor
101	Pump casing	834	Cable gland
161	Housing cover	897	Guide piece
321.01/.02	Radial ball bearing	901.01/.02/.03	Hexagon head bolt
330	Bearing bracket	903.01	Screw plug
411.01/.02	Joint ring	914.01/.02/.03/.04/.05/ .06/.07/.15	Hexagon socket head cap screw
412.01/.02/.03/.04/.05/.06/.07	O-ring	920.01/.02/.03/.15	Nut
421.01	Lip seal	930.02	Safety device
433.01/.02	Mechanical seal	932.01/.02/.03/.04/.05/.06	Circlip
441	Shaft seal housing	970	Label/plate
515	Taper lock ring		

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	529	Bearing sleeve
59-17	Shackle	550.01/.02/.03/.04/.05	Disc
69-14	Leakage sensor	561	Grooved pin
80-1	Motor unit	571	Bail (optional)
81-29	Terminal	596	Wire
81-39	Clamp	721	Adapter
81-51	Clamping element	811	Motor housing
81-59	Stator	812	Motor housing cover
101	Pump casing	834	Cable gland
161	Casing cover	897	Guide piece
321.01	Radial ball bearing	901.01/.02/.03	Hexagon head bolt
322	Radial roller bearing	903.01/.02	Screw plug
411.01/.02	Joint ring	914.01/.02/.03/.04/.05/ .06/.07/.15	Hexagon socket head cap screw
412.01/.04/.05/.06/.07	O-ring	920.01/.02/.03/.15	Nut
421.01/.02	Lip seal	930.01/.02	Safety device
433.01/.02/.03	Mechanical seal	932.01/.02/.03/.04/.05/.07	Circlip
441	Shaft seal housing	970	Label/plate

Amaline 400 (motors: 3 8, 4 8; motor housing made of stainless steel)

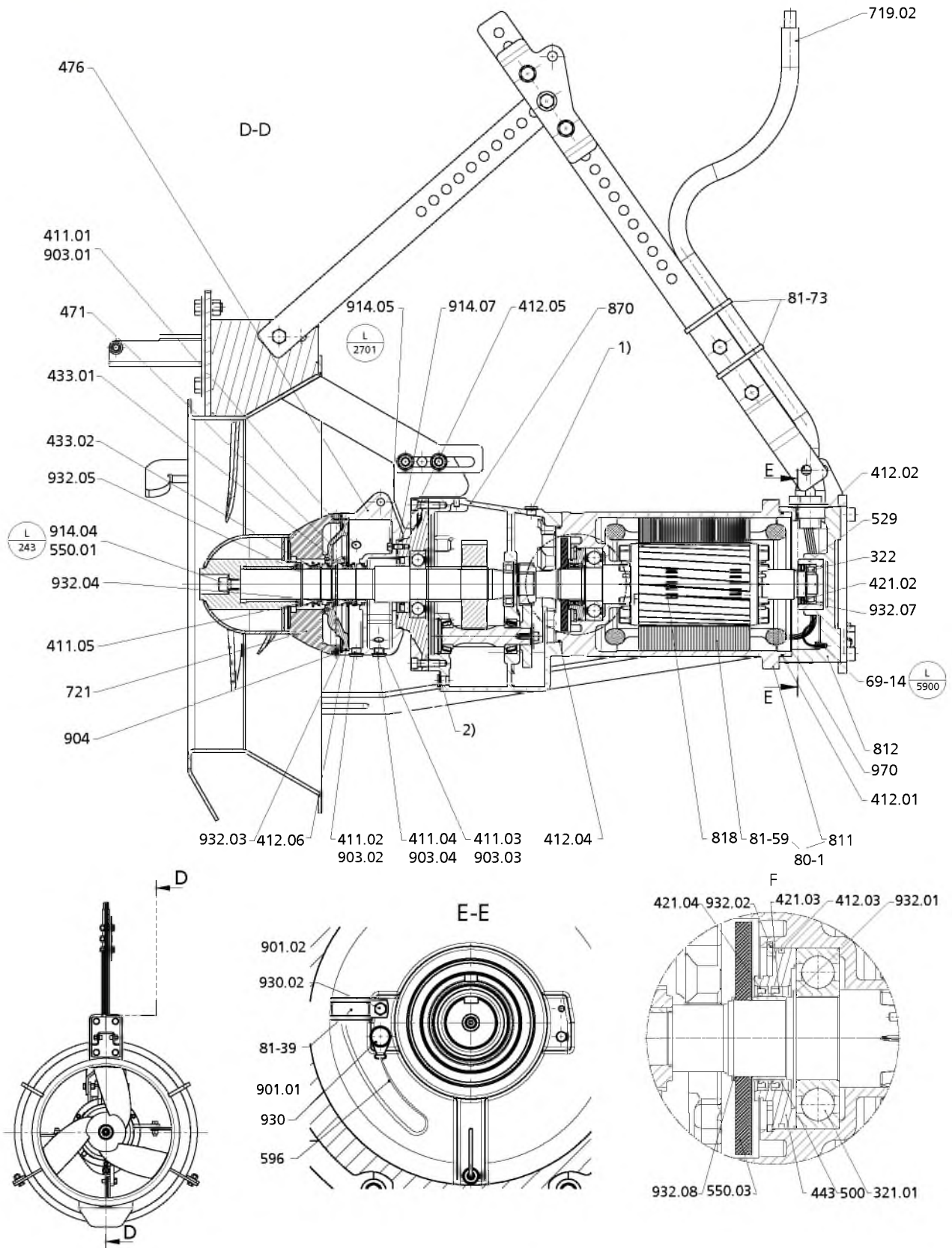


General assembly drawing: a) with shackle b) with bail (optional)

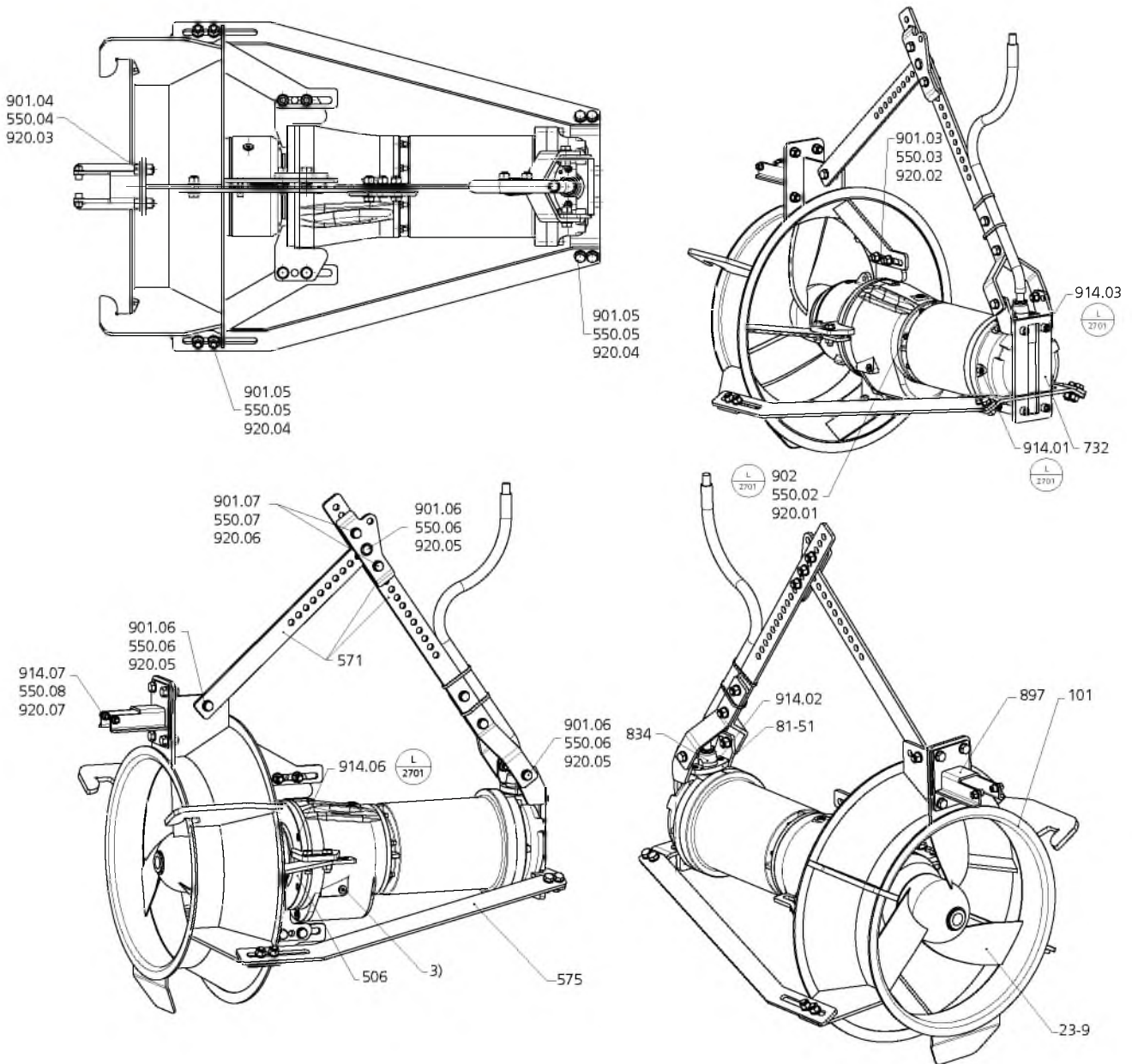
List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	529	Bearing sleeve
59-17	Shackle	550.01/.02/.03/.05/.06	Disc
69-14	Leakage sensor	561	Grooved pin
80-1	Motor unit	571	Bail (optional)
81-29	Terminal	596	Wire
81-39	Clamp	721	Adapter
81-51	Clamping element	811	Motor housing
81-59	Stator	812	Motor housing cover
101	Pump casing	818	Rotor
161	Casing cover	834	Cable gland
321.01	Radial ball bearing	897	Guide piece
322	Radial roller bearing	901.01/.02/.03	Hexagon head bolt
330	Bearing bracket	903.01/.02	Screw plug
411.01/.02	Joint ring	914.01/.02/.03/.04/.05/ .06/.07/.15	Hexagon socket head cap screw
412.01/.02/.03/.04/.05/.06/.07	O-ring	920.01/.02/.03/.15	Nut
421.01/.02	Lip seal	930.02	Safety device
433.01/.02	Mechanical seal	932.01/.03/.04/.05/.06/.07	Circlip
441	Shaft seal housing	970	Label/plate
515	Taper lock ring		

Amaline 500/600/800 (motors: 17 2, 25 2, 4 4, 6 4, 11 4, 16 4, 23 4, 30 4; motor housing made of grey cast iron)



General assembly drawing: 1) oil filler plug, 2) oil drain plug



3) oil check plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	571	Bail
69-14	Leakage sensor	575	Strip
80-1	Motor unit	596	Wire
81-39	Clamp	719.02	Flexible tube
81-51	Clamping sleeve	721 ¹⁷⁾	Adapter
81-59	Stator	732	Holder
81-73	Cable support	811	Motor housing
101	Pump casing	812	Motor housing cover
321.01	Radial ball bearing	818	Rotor
322	Radial roller bearing	834	Cable gland
411.01/.02/.03/.04/.05	Joint ring	870	Gear unit
412.01/.02/.03/.04/.05/.06	O-ring	897	Guide piece

17) For Amaline 500/600 only

Part No.	Description	Part No.	Description
421.02/.03/.04	Lip seal	901.01/.02/.03/.04/.05/ .06/.07	Hexagon head bolt
433.01/.02	Mechanical seal	902	Stud
443	Seal insert	903.01/.02/.03/.04	Screw plug
471	Seal cover	904	Grub screw
476	Mating ring carrier	914.01/.02/.03/.04/.05/ .06/.07	Hexagon socket head cap screw
500	Ring	920.01/.02/.03/.04/.05/ .06/.07	Nut
506	Retaining ring	930	Safety device
529	Bearing sleeve	932.01/.02/.03/.04/.05/ .07/.08	Circlip
550.01/.02/.03/.04/.05/ .06/.07/.08	Disc	970/970.02	Label/plate

Control Valve

BOA-CVE C/CS/W/IMS/EKB

PN 6/10/16

DN 15-200

For Automation of

BOA-SuperCompact, BOA-Compact,

BOA-W, BOA-Compact EKB and

BOA-Control IMS

Type Series Booklet



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- BOA-CVE C/CS/W/IMS/EKB 4
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Control Valves / Measurement Valves

Control Valves to DIN/EN

BOA-CVE C/CS/W/IMS/EKB



Main applications

BOA-CVE C / BOA-CVE CS / BOA-CVE W:

- Hot-water heating systems
- Air-conditioning systems
- Heat recovery systems

BOA-CVE IMS:

- Hot-water heating systems
- Air-conditioning systems
- Cooling circuits

BOA-CVE EKB:

- Domestic water supply
- Water supply systems
- Air-conditioning systems
- Cooling circuits

Fluids handled

BOA-CVE C / BOA-CVE CS / BOA-CVE W:

- Water
- Water/glycol mixtures
- Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and cast iron.
- Other fluids on request.

BOA-CVE IMS:

- Hot water for heating systems, with or without glycol ($\leq 60\%$)
- Cold water for air-conditioning systems, with or without glycol ($\leq 60\%$)
- The fluid handled should meet the requirements as specified in VdTÜV/AGFW TCh 1466 or VDI 2035.
- Only limited measurements of fluids containing gas or air can be made with ultrasound equipment. Proper venting of the systems is therefore essential.

BOA-CVE EKB:

- Drinking water
- Service water
- Not suitable for steam or fluids liable to attack EPDM and the electrostatic plastic coating.
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure BOA-CVE C	PN 6/16
Nominal pressure BOA-CVE CS	PN 6/10/16
Nominal pressure BOA-CVE W	PN 6/16
Nominal pressure BOA-CVE IMS	PN 16
Nominal pressure BOA-CVE EKB	PN 10/16
Nominal size	DN 15 - 200 ¹⁾
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+120 ²⁾

Selection as per pressure/temperature ratings (⇒ Page 5)

Design details

Design

Control valve:

- Straight-way valves PN 6 to 16 for flange connections to DIN EN 1092-2 in short or DN face-to-face length
- K_v values: 3 to 700 m³/h
- Rangeability 100:1
- EPDM-encapsulated control valve plug
- Maintenance-free stem seal with EPDM profile ring
- Marked in accordance with DIN EN 19 (ISO 5209)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

Actuators (technical data refers to basic configuration):

- Configurable, microprocessor-controlled actuators
Power supply: 24 V AC/DC
Position setpoint: 2 - 10 V DC
Actual-position feedback value: 2 - 10 V DC
Control valve characteristic: linear
Leakage rate: 0.05 % of K_v
Limit switching force-dependent in closing direction and stroke-dependent in opening direction.
- 3-point (Open/Stop/Closed) actuators

1) BOA-CVE CS: DN 20-200
2) BOA-CVE EKB: 80 °C

Power supply: 230 V AC
 Actual-position feedback value: 2 limit switches
 Leakage rate A to DIN EN 12266-1, drop-tight
 Stopping via limit switches in closing direction and opening direction

- Actuating time and actuating speed can be freely selected as a function of actuator type and K_v value.
- Operating data stored in permanent memory
- After a power failure, operation is resumed in accordance with the operating data.

Variants

- Actuator configured to match the order specification
- Integrated process controller
- Power back-up unit
- Heating of the motor space
- Other supply voltages on request
- Other actuators (e.g. AUMA) on request.

Body materials

Overview of available materials

Material	Material number
EN-GJL-250	5.1301

Product benefits

- Individually programmable actuators programmed at the factory, for optimum adaptation to all applications
- Maintenance-free design with stem sealed by EPDM profile ring
- Soft-seated valve disc enables drop-tight shut-off.
- Weight of control valve reduced by at least 50 % to simplify installation and cut installation costs.
- User-definable continuous control signal and actual-position feedback for optimum control options
- Programmable K_v s values
- Four K_v s values per nominal size
- Optionally available with integrated process controller (for EA-C actuators) for adaptation to numerous control tasks

Related documents

Information/documents

Document	Reference number
Operating manual	7520.8
BOA-SuperCompact type series booklet	7113.1
BOA-Compact type series booklet	7112.1
BOA-W type series booklet	7111.1
BOA-Compact EKB type series booklet	7112.11
BOA-Control IMS type series booklet	7128.1
Slide rule selector	0570.31

Pressure/temperature ratings

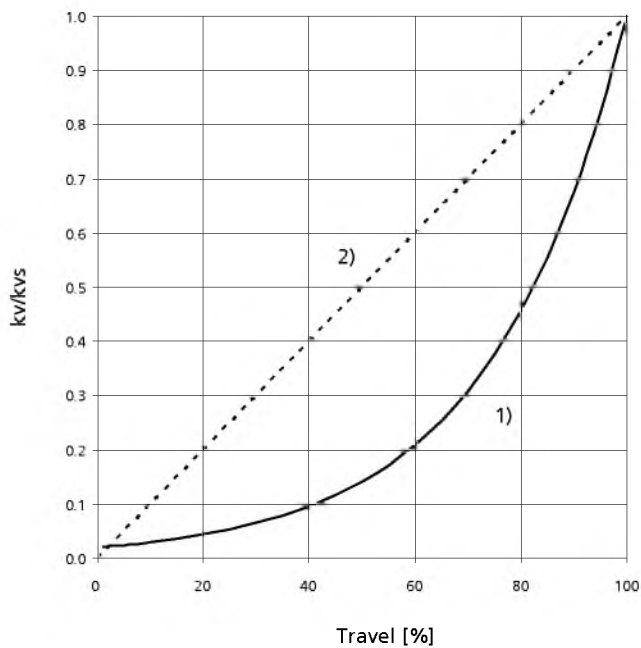
Test pressure and operating pressure

Nominal pressure	Nominal size	Shell test	Leak test (seat)	Permissible operating pressure ³⁾
		With water to DIN EN 12266-1		
		P10, P11	P12, leakage rate A	-10 to +120 °C
PN	DN	[bar]	[bar]	[bar]
6	15-200	9	6,6	6
16	15-200	24	17,6	16

3) Static load

Valve characteristics

The basic control valve configuration runs on a linear characteristic.



1)	Equal-percentage (at customer's request)	2)	Linear (basic parameter configuration)
----	--	----	--

Maximum permissible closing pressures

BOA-CVE C/CS/W/IMS/EKB are available for the following leakage rates without extra charge:

- Leakage rate 0.05 % of K_v_s
- Leakage rate 0.01 % of K_v_s
- Leakage rate A, drop-tight, to DIN EN 12266-1

The following tables can be used to select a suitable control valve as a function of the required closing pressure, leakage rate and K_v_s value.

Leakage rate 0.05 % of Kvs

Valve / actuator combinations based on actuator stroke to Kvs for a leakage rate of 0.05 % of Kvs

Type	DN	Kv _s value	Actuator stroke	Actuator type $\Delta p_{smax}^{4)}$ for a leakage rate of 0.05 % of Kvs in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 11 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 11 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 12 11 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 12 9 bar	EA-C 20 14 bar		
	32	20	16				
32	25	20					
32	30	27					
40	25	14	EA-B 12 7,5 bar	EA-C 20 10,5 bar	EA-C 40 16 bar		
40	30	17					
40	40	21					
40	50	30					
50	40	15	EA-B 12 5 bar	EA-C 20 7 bar	EA-C 40 13 bar	EA-C 80 16 bar	
50	50	19					
50	63	23					
50	80	32					
65	63	21		EA-C 20 6 bar	EA-C 40 10 bar	EA-C 80 16 bar	
65	80	26					
65	100	32					
65	130	43					
80	100	24		EA-C 20 5 bar	EA-C 40 8 bar	EA-C 80 13,5 bar	
80	130	29					
80	160	38					
80	180	47					
100	160	28			EA-C 40 5 bar	EA-C 80 8 bar	EA-C 140 13 bar
100	200	34					
100	250	42					
100	300	57					
125	200	31			EA-C 40 3 bar	EA-C 80 6 bar	EA-C 140 10 bar
125	250	38					
125	320	48					
125	400	61					
150	250	33				EA-C 80 4 bar	EA-C 140 7 bar
150	320	42					
150	400	50					
150	450	60					
200	400	37					EA-C 140 5 bar
200	550	48					
200	700	62					

4) Maximum permissible closing pressure at a leakage rate of 0.05 % of Kvs in bar

Leakage rate 0.01 % of Kvs

Valve / actuator combinations based on actuator stroke to Kvs for a leakage rate of 0.01 % of Kvs

Type	DN	Kv _s value	Actuator stroke	Actuator type $\Delta p_{smax}^{5)}$ for a leakage rate of 0.01 % of Kvs in bar				
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 10 bar				
	15	6,3	8					
	15	9	16					
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 10 bar				
	20	10	10					
	20	16	16					
	20	20	19					
	25	6,3	7		EA-B 12 10 bar			
	25	10	10					
	25	16	16					
	25	20	19					
	32	16	12	EA-B 12 8 bar		EA-C 20 13 bar		
	32	20	16					
	32	25	20					
	32	30	27					
		40	25	14	EA-B 12 6,5 bar	EA-C 20 9,5 bar	EA-C 40 16 bar	
		40	30	17				
		40	40	21				
40		50	30					
50		40	15	EA-B 12 4 bar	EA-C 20 6 bar	EA-C 40 12 bar	EA-C 80 16 bar	
50		50	19					
50		63	23					
50		80	32					
65		63	21		EA-C 20 5 bar	EA-C 40 9 bar	EA-C 80 16 bar	
65		80	26					
65	100	32						
65	130	43						
80	100	24		EA-C 20 4 bar	EA-C 40 7 bar	EA-C 80 12,5 bar		
80	130	29						
80	160	38						
80	180	47						
100	160	28			EA-C 40 4 bar	EA-C 80 7 bar	EA-C 140 12 bar	
100	200	34						
100	250	42						
100	300	57						
125	200	31			EA-C 40 2,5 bar	EA-C 80 5 bar	EA-C 140 9 bar	
125	250	38						
125	320	48						
125	400	61						
150	250	33				EA-C 80 3 bar	EA-C 140 6 bar	
150	320	42						
150	400	50						
150	450	60						
200	400	37					EA-C 140 4 bar	
200	550	48						
200	700	62						

5) Maximum permissible closing pressure at a leakage rate of 0.01 % of Kvs in bar

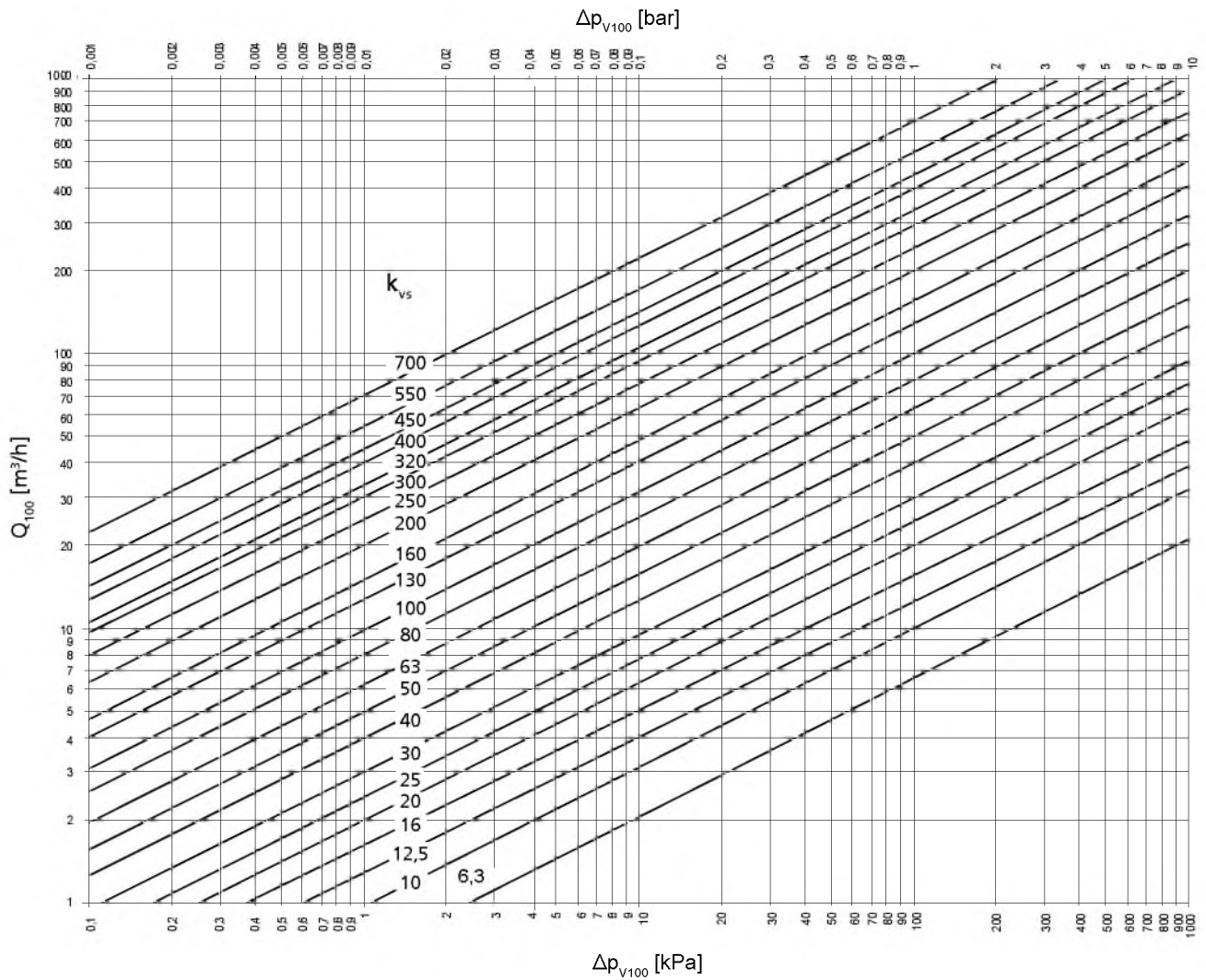
Leakage rate A to DIN EN 12266-1

Valve/actuator combinations based on actuator stroke to Kvs for leakage rate A to DIN EN 12266-1

Type	DN	Kv _s value	Actuator stroke	Actuator type $\Delta p_{smax}^{6)}$ for leakage rate A (drop-tight) in bar			
BOA-CVE C/ BOA-CVE W/ BOA-CVE EKB/ BOA-CVE IMS	15	3	5	EA-B 12 8 bar			
	15	6,3	8				
	15	9	16				
BOA-CVE C/ BOA-CVE CS/ BOA-CVE W/ BOA-CVE IMS/ BOA-CVE EKB	20	6,3	7	EA-B 12 8 bar			
	20	10	10				
	20	16	16				
	20	20	19				
	25	6,3	7	EA-B 12 8 bar			
	25	10	10				
	25	16	16				
	25	20	19				
	32	16	12	EA-B 12 6 bar	EA-C 20 11 bar		
	32	20	16				
	32	25	20				
	32	30	27				
	40	25	14	EA-B 12 4 bar	EA-C 20 7,5 bar	EA-C 40 15 bar	
	40	30	17				
40	40	21					
40	50	30					
50	40	15	EA-B 12 2 bar	EA-C 20 4 bar	EA-C 40 9 bar	EA-C 80 16 bar	
50	50	19					
50	63	23					
50	80	32					
65	63	21		EA-C 20 3 bar	EA-C 40 7 bar	EA-C 80 14 bar	
65	80	26					
65	100	32					
65	130	43					
80	100	24		EA-C 20 2 bar	EA-C 40 5,5 bar	EA-C 80 10,5 bar	
80	130	29					
80	160	38					
80	180	47					
100	160	28			EA-C 40 2,5 bar	EA-C 80 5 bar	EA-C 140 10 bar
100	200	34					
100	250	42					
100	300	57					
125	200	31			EA-C 40 1 bar	EA-C 80 3 bar	EA-C 140 8 bar
125	250	38					
125	320	48					
125	400	61					
150	250	33			EA-C 80 1 bar	EA-C 140 5 bar	
150	320	42					
150	400	50					
150	450	60					
200	400	37				EA-C 140 3 bar	
200	550	48					
200	700	62					

6) Maximum permissible closing pressure at leakage rate A (drop-tight) to DIN EN 12266-1 in bar

Flow characteristics



i A maximum flow velocity of 2 to 3 m/s in the pipe cross-section must not be exceeded.

Description of units

Unit	Description
Δp_{max}	Maximum permissible differential pressure across the control valve's control path ($\Delta p_{max} = 0.3 \cdot (p_1 - p_v)$ for water)
Δp_{V100}	Differential pressure across the open control valve
Q_{100}	Nominal volume flow rate

Technical data
Technical data - control valve

Technical data of BOA-CVE C/CS/W/IMS/EKB

Characteristic	Value
Nominal pressure	PN 6/10/16, depending on the type series
Valve characteristic	linear, optimised in the opening range
Leakage rate	Options: <ul style="list-style-type: none"> ▪ 0 - 0.05 % of K_{vs} value, VDI/VDE 2173 ▪ 0 - 0.01 % of K_{vs} value, VDI/VDE 2173 ▪ Leakage rate A, drop-tight, to DIN EN 1092-2
Permissible pressure	6 or 16 bar, depending on the type series
Flanged ends	PN 6, PN 10, PN 16 to DIN EN 1092-2
Fluid temperature	-10 to +120 °C -10 to +80 °C for BOA-CVE EKB

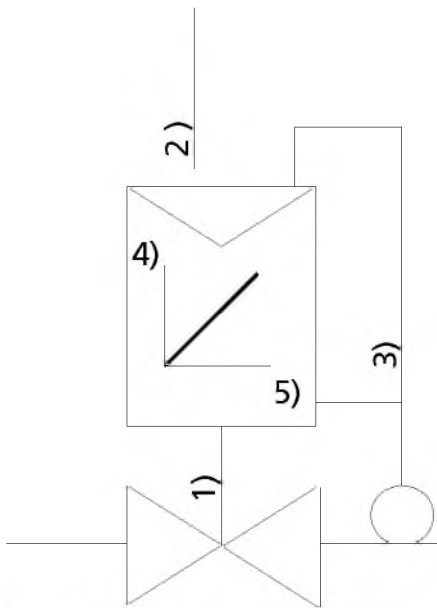
Technical data - actuators

Technical data of actuators

Characteristic		Actuator type		
		EA-B 12	EA-C 20 to 140, continuous-action	EA-C 20 to 140, 3-point
Power supply	Supply voltage	24 V AC/DC \pm 20 %	24 V AC/DC \pm 10 % 230 V AC \pm 10 %	230 V AC \pm 10 %
	Max. power input	7 VA	100 VA	
Functional data	Max. actuation force	1200 N	EA-C 20: 2 kN EA-C 40: 4.5 kN EA-C 80: 8 kN EA-C 140: 12 kN	
	Max. actuator stroke	20 mm	50 mm to 65 mm (for 12 kN actuator)	
	Actuating time	Can be freely selected depending on selected K_{vs} value/stroke		
	Actuating speed	0.12 - 0.22 mm/s	EA-C 20...40: 0.45 - 0.9 mm/s EA-C 80: 0.3 - 0.6 mm/s EA-C 140: 0.3 - 0.6 mm/s	EA-C 20...80: 0.5 mm/s EA-C 140: 0.6 mm/s
Signal inputs	Voltage	0/2 - 10 V DC	0/2 - 10 V DC	-
	Input resistance	100 k Ω	100 k Ω	-
	Current	4 - 20 mA	4 - 20 mA	-
	Input resistance		100 k Ω	-
	Binary input (3-point)	24 V AC/DC	24 V AC/DC, optional: 115 V AC / 230 V AC	24 V AC/DC, optional: 115 V AC / 230 V AC
Signal outputs	Voltage	0/2 - 10 V DC	0/2 - 10 V DC	-
	Current load	Max. 1 mA	Max. 1 mA	-
	Current		4 - 20 mA	-
Enclosure to EN 60529		IP54	IP65	
Ambient conditions	Ambient temperature	0 to +50 °C	-20 to +60 °C	
	Storage temperature	-20 to +80 °C		
	Humidity	5 to 95 % rH		
Dimensions	See (\Rightarrow Page 14)			
Electrical connection		1-m connection cable, 5 x 0.75 mm ²	Terminal box max. 2.5 mm ²	Direct connection to printed circuit board max. 2.5 mm ²

Process controller

Optional process controller for continuous-action actuators (EA-C 20 to EA-C 140)



Functional schematic of process controller

1)	Actuator stroke	2)	Setpoint Y
3)	Volume flow rate Q_{actual}	4)	Q
5)	Y		

The actuator can be equipped with an integrated process controller, which may be used as a constant-variable controller for an independent control loop.

Possible applications:

- Constant-temperature control
- Volume flow rate control

The control parameters of the PI (proportional-integral) controller can be configured at the site using a parameterisation kit. The setpoint signal and the sensor signal must have the same measuring range.

Accessories

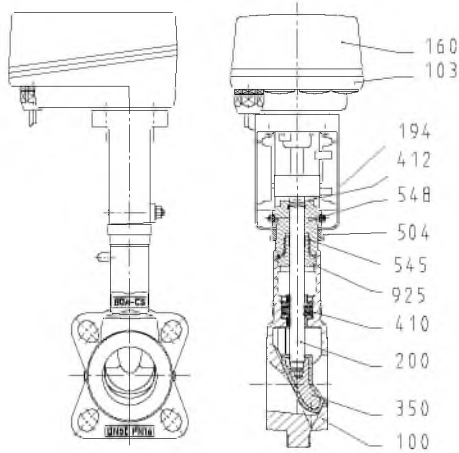
Description	Mat. No.
Parameterisation kit	46001269

The sensor used must supply an active signal (e.g. 4-20 mA or 0/2-10 V). The setpoint can be set externally via an active signal, or the device can be supplied with an internal setpoint as per customer specification.

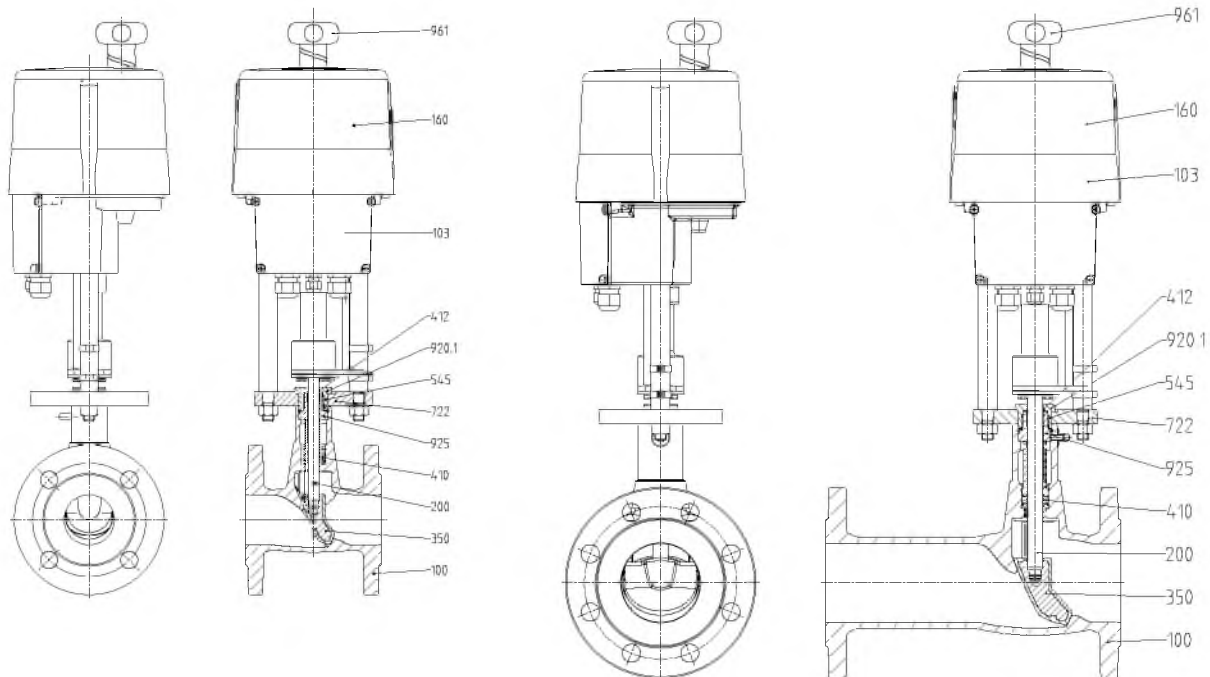
If combined with the process controller, BOA-CVE IMS with BOATRONIC MS-420 can be used for this purpose.

Refer to type series booklet 7128.1 for further data.

Materials



DN 15-50 with actuator type EA-B 12

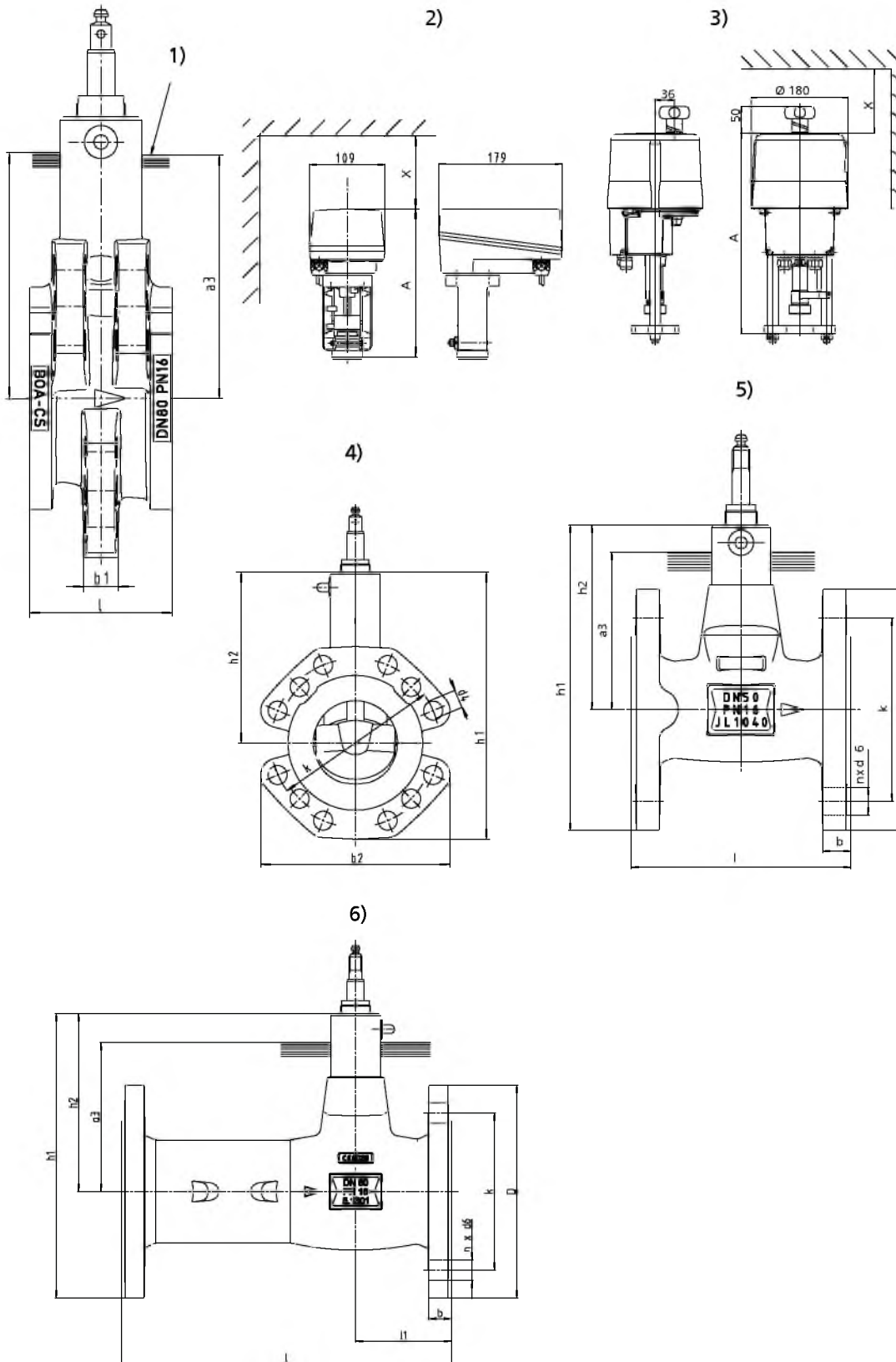


DN 32-200 with actuator type EA-C...

Parts list

Part No.	Description	Material
100	Body	EN-GJL-250 (5.1301)
103	Actuator housing	Aluminium
160	Actuator cover	Plastic/Aluminium
194	Bracket	Aluminium
200	Stem	Stainless steel, min. 13 % chrome (Cr)
350	Control valve disc	Grey cast iron/EPDM
410	Profile seal	Elastomer EPDM
412	O-ring	Elastomer NBR
504	Spacer ring	Galvanised steel
545	Bearing bush	Steel/PTFE
548	Actuating bush	Galvanised steel
722	Top flange	Steel
920.1	Union nut	Galvanised steel
925	Stem nut	Galvanised steel
961	Emergency handwheel	Plastic

Dimensions and weights



1)	Insulating boundary in acc. with German energy-saving regulations	2)	EA-B 12	3)	EA-C 20, EA-C 40, EA-C 80, EA-C 140
4)	BOA-CVE CS	5)	BOA-CVE C / BOA-CVE EKB	6)	BOA-CVE W / BOA-CVE IMS

Dimensions and weights of BOA-CVE CS
Dimensions and weights of BOA-CVE CS control valve

Dimensions [mm]

PN	DN	l	h ₁	h ₂	a ₃	k	n x d ₄	b ₁	b ₂	[kg]
6	20 ⁷⁾	25	129	87	72,5	65	4 x 11	13	85	0,75
	25 ⁷⁾	25	129	87	72,5	75	4 x 11	13	85	0,75
	32	32	163	112	85	90	4 x 14	16	103	1,5
	40	40	167	112	95	100	4 x 14	16	110	2,0
	50	50	186	126	107,5	110	4 x 14	20	120	3,0
	65	65	233	166	125	130	4 x 14	24	135	5,0
	80	80	253	162	140	150	4 x 18	20	180	7,5
	100	100	303	200	160	170	4 x 18	20	203	10,5
	125	125	365	248	175	200	8 x 18	23	230	15,0
	150	150	397	262	192,5	225	8 x 18	23	266	21,0
10	20 ⁷⁾	25	129	87	72,5	75	4 x 14	13	85	0,75
	25 ⁷⁾	25	129	87	72,5	85	4 x 14	13	85	0,75
	32	32	163	112	85	100	4 x 18	16	103	1,5
	40	40	167	112	95	110	4 x 18	16	110	2,0
	50	50	186	126	107,5	125	4 x 18	20	120	3,0
	65	65	233	166	125	145	4 x 18	24	135	5,0
	80	80	253	162	140	160	8 x 18	20	180	7,5
	100	100	303	200	160	180	8 x 18	20	203	10,5
	125	125	365	248	175	210	8 x 18	23	230	15,0
	150	150	397	262	192,5	240	8 x 22	23	266	21,0
16	20 ⁷⁾	25	129	87	72,5	75	4 x 14	13	85	0,75
	25 ⁷⁾	25	129	87	72,5	85	4 x 14	13	85	0,75
	32	32	163	112	85	100	4 x 18	16	103	1,5
	40	40	167	112	95	110	4 x 18	16	110	2,0
	50	50	186	126	107,5	125	4 x 18	20	120	3,0
	65	65	233	166	125	145	4 x 18	24	135	5,0
	80	80	253	162	140	160	8 x 18	20	180	7,5
	100	100	303	200	160	180	8 x 18	20	203	10,5
	125	125	365	248	175	210	8 x 18	23	230	15,0
	150	150	397	262	192,5	240	8 x 22	23	266	21,0
200	230	575	405	220	295	12 x 23	30	340	67,0	

Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

Mating dimensions as per standard

Face-to-face length: DN 25-150: DIN EN 558/94
 DN 200: DIN EN 558/14
 Flange facing: DIN EN 1092-2, type A

7) Single valve size: DN 20/25

Dimensions and weights of BOA-CVE C/EKB
Dimensions and weights of BOA-CVE C/EKB control valve

Dimensions [mm]

PN	DN	l	h ₁	h ₂	a ₃	Flange					[kg]
						D	b	k	n	d ₆	
6	15	115	139	99	50	80	12	55	4	11	1,7
	20	120	144	99	55	90	14	65	4	11	2,1
	25	125	149	99	65	100	14	75	4	11	2,3
	32	130	175	115	75	120	16	90	4	14	3,8
	40	140	180	115	85	130	16	100	4	14	4,3
	50	150	196	126	95	140	16	110	4	14	4,9
	65	170	246	166	112,5	160	16	130	4	14	7,7
	80	180	262	167	135	190	18	150	4	19	10,9
	100	190	314	209	155	210	18	170	4	19	14,7
	125	200	368	248	170	240	20	200	8	19	21,0
	150	210	394	261,5	182,5	265	20	225	8	19	26,5
	200	230	575	405	220	340	30	280	8	19	71,0
16	15	115	146,5	99	57,5	95	14	65	4	14	2,3
	20	120	151,5	99	62,5	105	16	75	4	14	2,7
	25	125	156,5	99	72,5	115	14	85	4	14	3,0
	32	130	185	115	85	140	18	100	4	19	4,8
	40	140	190	115	95	150	18	110	4	19	5,5
	50	150	208,5	126	107,5	165	20	125	4	19	6,9
	65	170	258,5	166	125	185	20	145	4	19	10,0
	80	180	267	167	140	200	22	160	8	19	12,5
	100	190	319	209	160	220	24	180	8	19	17,1
	125	200	373	248	175	250	26	210	8	19	26,5
	150	210	404	261,5	192,5	285	26	240	8	23	31,0
	200	230	575	405	220	340	30	295	12	23	71,0

Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

Mating dimensions as per standard

Face-to-face lengths: DIN EN 558/14, ISO 5752/14
 Flanges: DIN EN 1092-2, flange type 21
 Flange facing: DIN EN 1092-2, type B

Dimensions and weights of BOA-CVE W/IMS
Dimensions and weights of BOA-CVE W/IMS control valve

Dimensions [mm]

PN	DN	l	l ₁	h ₁	h ₂	a ₃	Flange				[kg]
							D	k	n x d ₆	b	
6	15	130	42,5	129	89	50	80	55	4 x 11	12	1,5
	20	150	48	134	89	55	90	65	4 x 11	14	2,0
	25	160	54,5	149	99	65	100	75	4 x 11	14	2,6
	32	180	65	175	115	75	120	90	4 x 14	16	4,1
	40	200	70	180	115	85	130	100	4 x 14	16	4,8
	50	230	75	196	126	95	140	110	4 x 14	16	5,7
	65	290	85	246	166	112,5	160	130	4 x 14	16	9,3
	80	310	90	262	167	135	190	150	4 x 19	18	12,9
	100	350	95	313,5	208,5	155	210	170	4 x 19	18	18,4
	125	400	125	368	248	170	240	200	8 x 19	20	26,1
	150	480	150	394	261,5	182,5	265	225	8 x 19	20	36,0
	200	600	180,5	565	405	220	320	280	8 x 19	22	82,7
16	15	130	42,5	136,5	89	57,5	95	65	4 x 14	14	1,9
	20	150	48	141,5	89	62,5	105	75	4 x 14	16	2,4
	25	160	54,5	156,5	99	72,5	115	85	4 x 14	16	3,1
	32	180	65	185	115	85	140	100	4 x 19	18	5,0
	40	200	70	190	115	95	150	110	4 x 19	18	5,8
	50	230	75	208,5	126	107,5	165	125	4 x 19	20	7,6
	65	290	85	258,5	166	125	185	145	4 x 19	20	11,5
	80	310	90	267	167	140	200	160	8 x 19	22	14,5
	100	350	95	318,5	208,5	160	220	180	8 x 19	24	20,7
	125	400	125	373	248	175	250	210	8 x 19	26	31,7
	150	480	150	404	261,5	192,5	285	240	8 x 23	26	41,6
	200	600	180,5	575	405	220	340	295	12 x 23	30	90,7

Dimensions and weights of electric actuator types EA-B 12, EA-C 20 to EA-C 140

Dimensions [mm]

Actuator	Actuating force [N]	A	X	[kg]		
				Continuous-action 24 V AC	Continuous-action 230 V AC	3-point 230 V AC
EA-B 12	1200	215	150	1,5	-	-
EA-C 20	2000	425	120	6,0	7,0	7,0
EA-C 40	4500	425	120	6,0	7,0	7,0
EA-C 80	8000	455	120	9,0	10,0	10,0
EA-C 140	12000	520	120	10,0	10,0	10,0

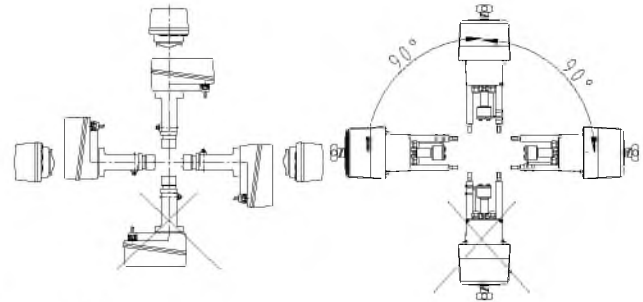
Mating dimensions as per standard

Face-to-face lengths: DIN EN 558/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21
 Flange facing: DIN EN 1092-2, type B

Installation instructions

- Flow through control valves is in the direction of the embossed arrow on the valve body as standard.
- In heating systems, the valves should preferably be installed in the return line, which is characterised by lower temperatures. This will prolong the stem seal's service life.
- Water quality requirements to VdTÜV/AGFW TCh 1466.
- Recommendation: A strainer fitted upstream of the control valve will further enhance the control valve's functional reliability.

Installation positions:



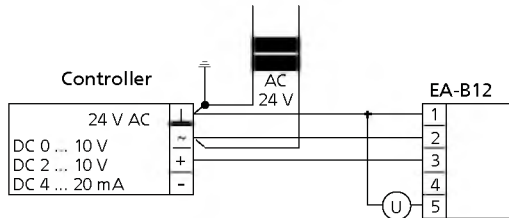
EA-B 12⁸⁾

EA-C 20 to EA-C 140 and
EA-C 3-point⁸⁾

Wiring diagrams

Terminal configuration EA-B 12/24

Continuous-action actuation

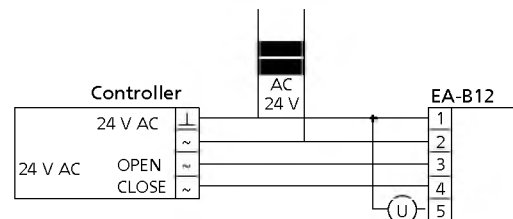


Wiring diagram EA-B 12/24

3-point (Open/Stop/Closed) actuation

AC	
1	⊥ 24 V (Ground for Y1, Y2 and U)
2	~ 24 V
3	Y1 Control signal OPEN (24 VAC)
4	Y2 Control signal CLOSE (24 VAC)
5	U Actual-position feedback value (DC 2...10 V)

3-point (Open/Stop/Closed) actuation



8) Installation of BOA-CVE IMS with the valve stem in a horizontal position is not allowed.

Terminal configuration EA-C 20 to 140, 24 V AC/DC, with terminal box
Continuous-action actuation 24 V AC/DC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Pushbutton	
↑	↑	↑	↓	↓	↓	↑↑	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN 24 V AC/DC □ 115 V AC □ 230 V AC □	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)		(Optional)			
Ⓐ				Ⓑ			Ⓒ		Ⓒ		Ⓔ		Ⓕ		Ⓖ			Ⓗ		Ⓙ		Ⓚ		Ⓝ	Ⓞ	Ⓜ	
						Ⓝ																					

i In continuous-action configuration, only the terminals in columns Ⓐ, Ⓑ and Ⓚ are active!

3-point (Open/Stop/Closed) actuation 24 V AC/DC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Pushbutton	
↑	↑	↑	↓	↓	↓	↑↑	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑↓	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN 24 V AC/DC □ 115 V AC □ 230 V AC □	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)		(Optional)			
Ⓐ				Ⓑ			Ⓒ		Ⓒ		Ⓔ		Ⓕ		Ⓖ			Ⓗ		Ⓙ		Ⓚ		Ⓝ	Ⓞ	Ⓜ	
						Ⓝ																					

i In 3-point (Open/Stop/Closed) configuration, only the terminals in columns Ⓑ, Ⓒ and Ⓚ are active!

Key

Ⓐ	Setpoint input	Ⓚ	Open
Ⓑ	Active actual-position feedback	Ⓛ	Power supply
Ⓒ	Volt-free fault message (optional)	Ⓝ	Field bus connection (optional)
Ⓔ	Binary control (standard 24 V AC/DC)	Ⓞ	Communication with PC
Ⓕ	Power failure signal	Ⓜ	Commissioning
Ⓖ	Supply	Ⓝ	Galvanically isolated 1 kV
Ⓖ	Actual value	Ⓞ	Process sensor (optional)
Ⓗ	Closed	Ⓟ	Limit switch, volt-free contact

Terminal configuration EA-C 20 to 140, 230 V AC

Continuous-action actuation, 230 V AC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Push-button
↑	↑	↑	↓	↓	↓	↑↑	↑↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↓	↑↓	↑↓	↑↓	↑	↑				
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	24 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)	PE	(Optional)		
A			B			C		D			E		F		G		H			I		J		K	L	M
N						O						P						Q								

i In continuous-action configuration, only the terminals in columns A, B and J are active!

Key

A	Setpoint input	I	Open
B	Active actual-position feedback	J	Power supply
C	Volt-free fault message (optional)	K	Field bus connection (optional)
D	Binary control (standard 24 V AC/DC)	L	Communication with PC
E	Power failure signal	M	Commissioning
F	Supply	N	Galvanically isolated 1 kV
G	Actual value	O	Process sensor (optional)
H	Closed	P	Limit switch, volt-free contact

3-point (Open/Stop/Closed) actuation, 230 V AC

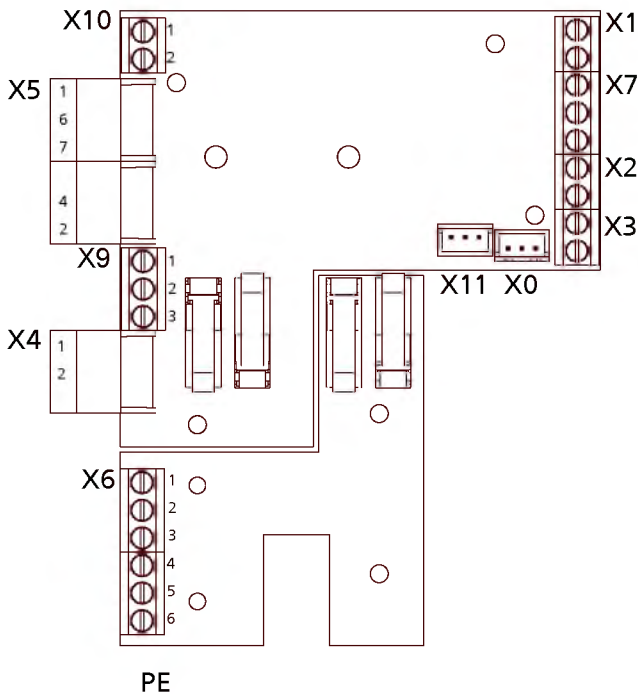
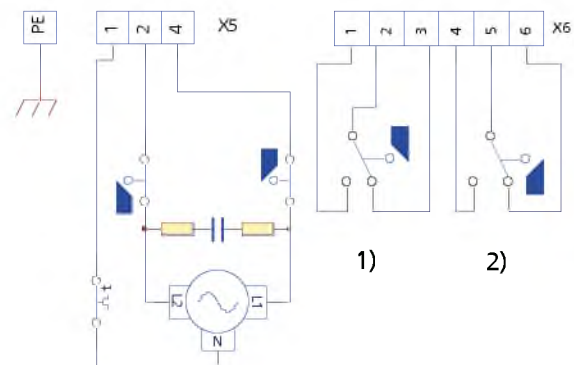


Fig. 1: Terminal configuration on printed circuit board

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring

X4	Potentiometer 1
X5/1	Neutral
X5/2	Motor phase to open
X5/4	Motor phase to close
X5/6 and X5/7	Thermal circuit breaker as volt-free contact
X6	Additional limit switches
X7	Not used
X8	Heating resistor
X9	Potentiometer 2
PE	Earth connection on housing



Terminal configuration of power supply

Terminal configuration of additional limit switches

1)	Closed	2)	Open
----	--------	----	------

9) Measuring, open-loop and closed-loop control task

Specification sheet for valve selection
Operating data

Point of control	Measuring/control task ⁹⁾			Potentially explosive atmosphere (zone)	
Ambient temperature	[°C]	Max.		Min.	
Pipe	-	DN		PN	
Fluid handled	-				

Process data

Volume flow rate	[m³/h]	
Kvs value	[m³/h]	
Inlet pressure p1 (pressure upstream of control valve)	[bar]	
Outlet pressure p2 (pressure downstream of control valve)	[bar]	
Closing pressure Δp_{\max}	[bar]	
Differential pressure in closed-loop control operation Δp_{\max}	[bar]	

Valve data

Valve type	-	BOA-CVE CS	BOA-CVE C	BOA-CVE W	BOA-CVE IMS	BOA-CVE EKB
Pressure class PN	-	6/10/16 □	6 □ 16 □	6 □ 16 □	16 □	10 □ 16 □
Nominal size DN	-					
Body material	-	Grey cast iron EN-GJL-250				

Actuator data

Actuator selection	Δp closes (actuator selection)	[bar]			
	Feature/function	Continuous 24 V or 230 V		3-point 24 V	3-point 230 V
	Characteristic	Linear ¹⁰⁾ <input type="checkbox"/> Equal-percentage <input type="checkbox"/>		Linear	Linear
	Actuating time	[s]			
	Position value		Setpoint	Actual	Actual
		DC 0-10 V			¹¹⁾ -
		DC 2-10 V ¹⁰⁾			¹¹⁾
		0-20 mA		¹¹⁾	¹¹⁾
		4-20 mA		¹¹⁾	¹¹⁾
	Feedback via 2 limit switches		-	-	X
Leakage rate	0.05 % of Kvs ¹⁰⁾			-	-
	0.01 % of Kvs			-	-
	Leakage rate A (DIN EN 12266-1)				X
Accessories	Process controller			-	-
	Programming tool required for process controller			-	-
	Actuator heating				
	Power back-up unit				-

10) Default setting

11) Only possible with EA-C actuators

Chemical resistance charts
BOA-CVE C
Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water¹²⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) ¹³⁾	○
Distilled water ¹³⁾	○
Heating water ¹³⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water ¹⁴⁾	✓
Partly desalinated water ¹³⁾	○
Thermal water	✘
Drinking water	✘
Fully desalinated water ¹³⁾	○

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

- 12) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 13) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 14) Without larger solids or stringy material

BOA-CVE CS
Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

 Chemical resistance chart for water¹⁵⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) ¹⁶⁾	○
Distilled water ¹⁶⁾	○
Heating water ¹⁶⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water ¹⁷⁾	✓
Partly desalinated water ¹⁶⁾	○
Thermal water	✘
Drinking water	✘
Fully desalinated water ¹⁶⁾	○

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

- 15) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 16) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 17) Without larger solids or stringy material

BOA-CVE W
Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water¹⁸⁾

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) ¹⁹⁾	○
Distilled water ¹⁹⁾	○
Heating water ¹⁹⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water ²⁰⁾	✓
Partly desalinated water ¹⁹⁾	○
Thermal water	✘
Drinking water	✘
Fully desalinated water ¹⁹⁾	○

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	✓
Glycol (ethylene glycol)	✓
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	✓
Lye for metal cleaning	✘

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

- 18) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 19) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 20) Without larger solids or stringy material

BOA-CVE IMS
Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if ²¹⁾ is observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
X	The fluid handled is not suitable for sensor measurement.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water

Fluids handled	
Bathing water (fresh water)	○
Bathing water (seawater)	✘
Brackish water	✘
Service water	○
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water) ²²⁾	○
Distilled water ²²⁾	○
Heating water ²²⁾	✓
Condensate	○
Oil-free cooling water	○
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	○
Grey water ²³⁾	○
Partly desalinated water ²²⁾	○
Thermal water	✘
Drinking water	✘
Fully desalinated water ²²⁾	○

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil/water emulsion	✘
Kerosene	✘

- 21) General criteria for water to be handled by products made of non-alloyed materials: pH > 7; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 22) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content of ≤ 0.02 mg/l are also recommended.
- 23) Without larger solids or stringy material

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	X
Glycol (ethylene glycol)	X
Water/glycol mixture (max. 50 %, max. 90 °C)	✓
Inorganic cooling brine, pH 7.5	○

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	X
Lye for metal cleaning	✘

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	X
Oil-containing compressed air	✘
Aqueous glycerine	X
Carbon dioxide (gas)	X
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

Evaluation shown includes measurement capability of valve.

BOA-CVE EKB
Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials. Valve can be used if and are observed.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The material or valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water²⁴⁾

Fluids handled	
Bathing water (fresh water)	✓
Bathing water (seawater)	✘
Brackish water	✘
Service water	✓
Chlorinated water (max. 0.6 mg/kg)	✓
Deionised water (demineralised water)	✓
Distilled water	✓
Heating water (max. 80 °C)	✓
Condensate	✓
Oil-free cooling water	✓
Oil-containing cooling water	✘
Seawater	✘
Ozonised water (max. 0.5 mg/kg)	✓
Pure water	✓
Raw water	✓
Waste water ²⁵⁾	✓
Partly desalinated water	✓
Thermal water	○
Drinking water	✓
Fully desalinated water	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✘
Mineral oils	✘
Synthetic oils	✘
Petroleum	✘
Oil-water emulsion	✘
Kerosene	✘

Chemical resistance chart for refrigerants

Fluids handled	
Ammonium hydroxide (max. 25 %, max. 25 °C)	○
Glycol (ethylene glycol)	✘
Water/glycol mixture (max. 50 %, max. 80 °C)	○
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3)	○
Lye for metal cleaning	○

Chemical resistance chart for other fluids

Fluids handled	
Landfill gas	○
Oil-containing compressed air	✘
Aqueous glycerine	○
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✘
Oxygen O ₂	✘

24) General criteria for water to be handled by products made of non-alloyed materials: pH 6.5 - 12; chlorides (Cl⁻) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!

25) Without larger solids or stringy material

Balancing and Shut-off Valve

BOA-Control SAR

PN 16
DN 10-50
NPS 3/8"-2"

Type Series Booklet



Contents

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Control and Measurement Valves

Balancing and Shut-off Valves to DIN/EN

BOA-Control SAR



Main applications

- Hot-water heating systems
- Air-conditioning systems

Fluids handled

- Water
- Water/glycol mixtures
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 10 - 50
Nominal size	NPS 3/8" - 2"
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]	-25
Max. permissible temperature [°C]	+150

Body materials

Overview of available materials

Material	Temperature limit
Bronze	≤ 150 °C

Design details

Design

Valves to type series booklet 7129.1

- Y-pattern straight-way globe valve with female screwed ends
- 2 self-sealing measuring connections for direct pressure measurement and flow measurement with PFM 2000 measuring computer
- Non-rising handwheel
- Non-rotating stem
- Digital travel position indicator with 40 settings and indication of full and 1/10 rotations, readable from above and below
- Locking device
- Travel stop
- Lead-sealable
- Double stem seal by two O-rings and adjustable gland
- Pressure measurement connection branches with protective cap
- Handwheel colour: orange
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Group 2.

Product benefits

- Flow rate can be adjusted precisely and read from above and below, due to digital handwheel with top/bottom display and 40 control positions.
- PTFE joint ring ensures tight shut-off for life.
- Hydraulically optimised body for high flow rates.
- Double sealing to atmosphere as stem is sealed by O-ring and back-up gland packing.

Related documents

- For precise flow measurement we recommend our PFM 2000 measuring computer (available for hire, please contact KSB for details)

Information/documents

Document	Reference number
Flow characteristics	7129.4
Operating manual	0570.88

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

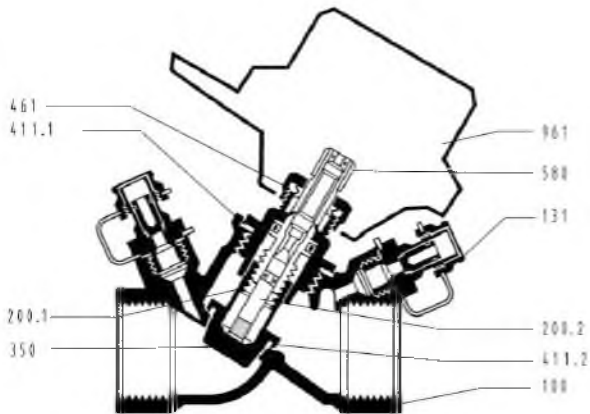
1. Type
2. Nominal pressure
3. Nominal size
4. Reference number

Pressure/temperature ratings

Test pressure and operating pressure

PN	DN	Shell test	Leak test (seat)	Permissible operating pressure ¹⁾
		With water		
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12, leakage rate A to DIN EN 12266-1 [bar]	-25 to +150 °C [bar]
16	3/8" -2" (10-50)	24	17,6	16

Materials



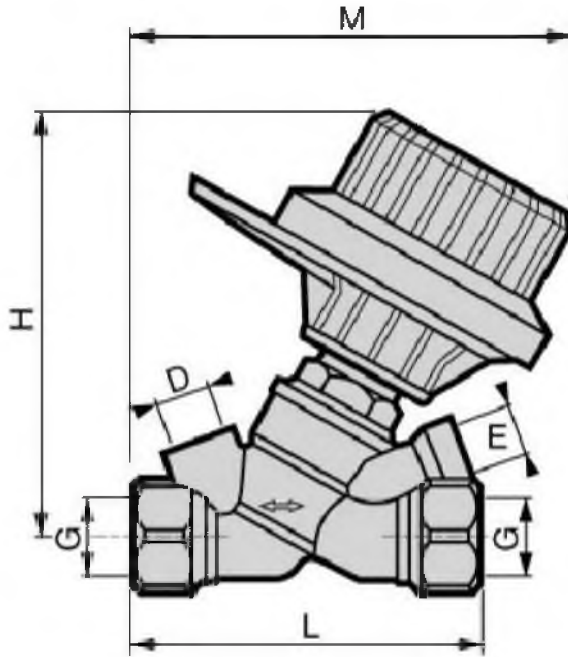
BOA-Control SAR

Overview of available materials

Part No.	Description	Material	Note
100	Body	Bronze	-
131	Pressure measurement connection branch	Brass	-
200.1	Valve stem	Brass	-
200.2	Memo stem	Cu Zn 40 Pb3	Dezincification-free
350	Valve disc	Cu Zn 36 Pb2 AS	-
411.1	Joint ring	EPDM	-
411.2	Joint ring	EPDM	Metal gasket, for DN 3/8"
461	Gland packing	Brass	-
580	Cap	Leaded red brass	-
961	Handwheel	Polyamide 6-6 with 30 % glass fibre	-

¹⁾ Static load

Dimensions and weights



BOA-Control SAR

Dimensions [mm] and weights [kg]

PN	DN	G	D	E	L	H	M	[kg]
16	10	3/8"	1/4"	1/4"	88,5	104	106	0.6
	15	1/2"	1/4"	1/4"	88,5	104	106	0.6
	20	3/4"	1/4"	1/4"	95,5	104	112	0.6
	25	1"	1/4"	1/4"	96	108	116	0.9
	32	1 1/4"	3/8"	1/4"	117	117	127	1.1
	40	1 1/2"	3/8"	1/4"	125	122	133	1.2
	50	2"	3/8"	1/4"	149	126	146	2

Installation instructions

BOA-Control SAR balancing and shut-off valves can be installed in supply lines as well as return lines, and in any position. This allows fluid flow in both directions. However, flow direction from A to B (marked on the valve body) is recommended to achieve an optimum valve setting.

i For optimum measuring results, a stabilisation distance of 15 x DN is recommended both upstream and downstream of the valve.

However, a minimum upstream stabilisation distance of

- 10 x DN downstream of a pump, and
- 5 x DN downstream of valves and fittings should be provided.

General minimum downstream stabilisation distance: 2 x DN

i For adjusting BOA-Control SAR, customers may borrow our PFM 2000 measuring computer. Please contact us for details.

Manual Actuator

MN

MN Manual Gearbox
Force Transmission via Worm Gear
Torque Range up to 1200 Nm

Type Series Booklet



Manual Actuators

Manual Gearboxes

MN



- The MN manual gearboxes developed by KSB-AMRI cover torques of up to 1200 Nm.
- The MN manual gearboxes feature irreversible gear kinematics in any position. They are suitable for all fields of application and all types of quarter-turn valves (centred-disc or offset-disc butterfly valves, ball valves, etc.).
- Exterior coating: polyurethane coating, average thickness 60 µm, colour: RAL 9011 black
- Actuator/valve interface to ISO 5211
- The manual gearboxes are equipped with removable adapters allowing them to be mounted on valves with different types of stem end (square or flat ends).
- The force required for actuating the handwheel is defined in the EN 12570 standard.
- The manual gearboxes are equipped with a handwheel and position indicator.

Benefits

- Grease-packed for life (silicone-free grease) at the factory, therefore maintenance-free.
- Irreversible gear kinematics in any position
- Visual position indicator made of stainless steel

Main applications

- Heating systems
- Domestic water supply
- Drinking water supply
- Heating and cooling applications in
 - Heating circuits
 - Ventilation circuits
 - Air-conditioning circuits
- Industry
- Water
- Building services

Operating data

Operating properties

Characteristic	Value
MN	MN 12 MN 25 MN 40 MN 80
Temperature <ul style="list-style-type: none"> ▪ Standard design 	<ul style="list-style-type: none"> ▪ -40 °C to +120 °C
Output torque	Up to 1200 Nm
Enclosure <ul style="list-style-type: none"> ▪ Standard design 	<ul style="list-style-type: none"> ▪ IP 67

Design details

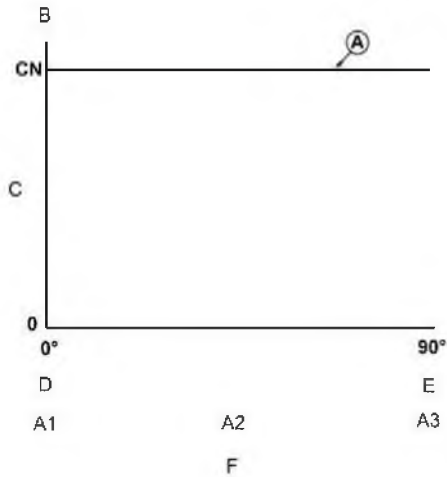
Design

Technical data

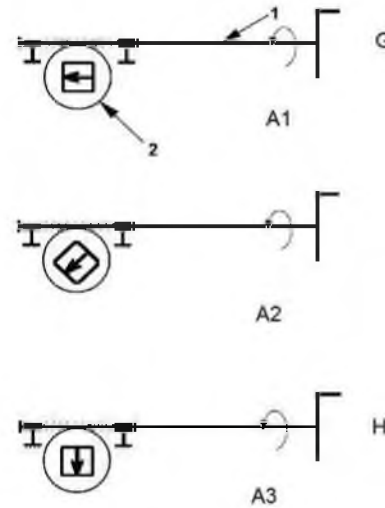
Function

Force transmission via worm gear provides a constant output torque over the entire worm shaft travel.
When the handwheel ① connected to the worm is actuated, the worm wheel ② rotates together with the valve stem.

Curve A: constant output torque



Schematic of force transmission via worm gear



- | | | | | | |
|----|---------------|---|----------------------------|---|--------|
| A1 | Fig. 1 | C | Multiplication coefficient | G | Closed |
| A2 | Fig. 2 | D | Closing | H | Open |
| A3 | Fig. 3 | E | Opening | | |
| B | Output torque | F | Opening angle in degrees | | |

MN manual gearboxes are designed for valve closure in clockwise direction.

Type series

[mm]

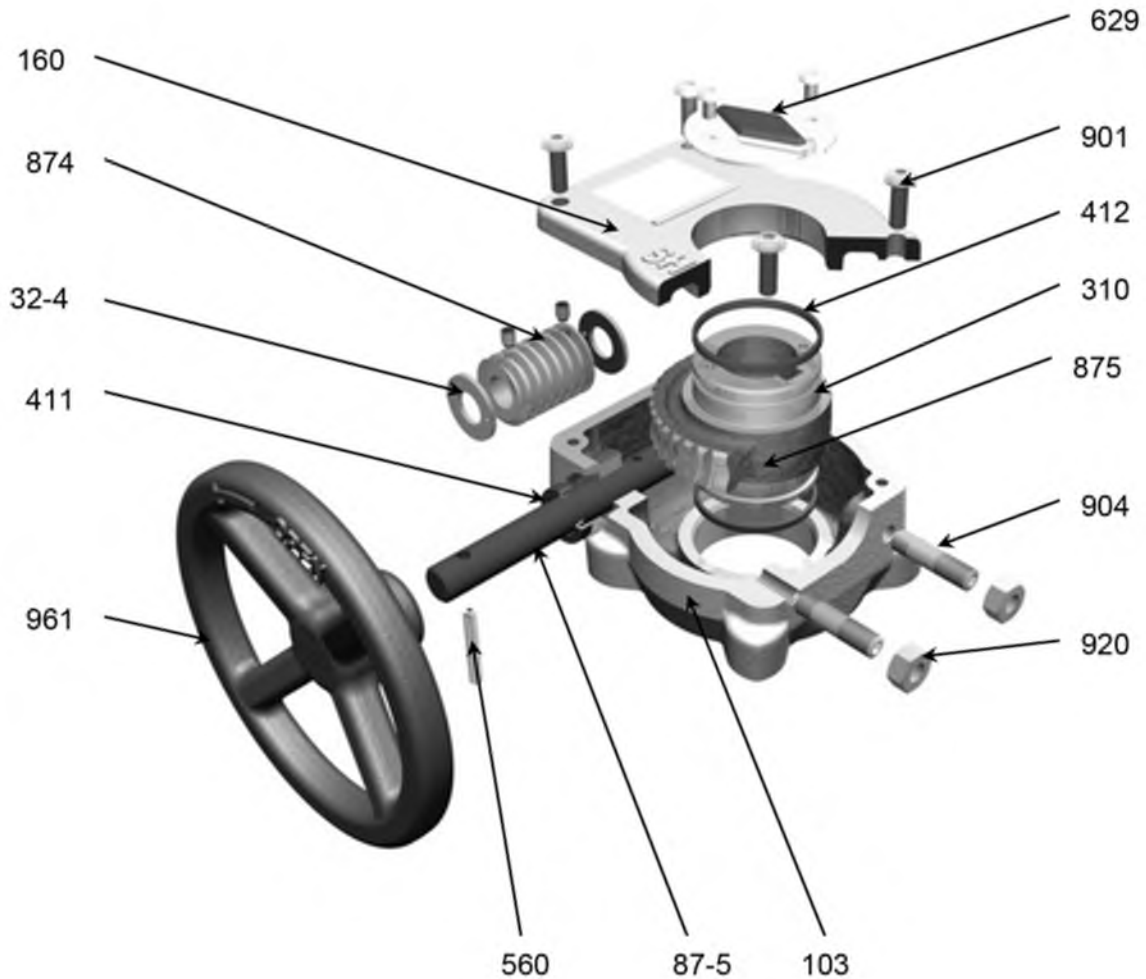
Type	Nominal output torque [Nm]	Nominal input torque [Nm]	Number of handwheel turns	Interface, standardised to ISO 5211*	Max. permissible stem dimensions		
					Height	Drive	
						Square end	Flat end
12	165	12,5	10	F05 - F07	37	-	14
25	300	25	10	F07 / F10	47	19	19
40	650	40	10	F07 - F10 - F12	57	25	22
80	1200	80	10	F10 - F12	63	36	22

* Direct mounting in the case of identical interfaces
Mounting by means of intermediate flange in the case of different interface sizes and footprints

Materials

Sectional drawing

Handwheel-actuated design



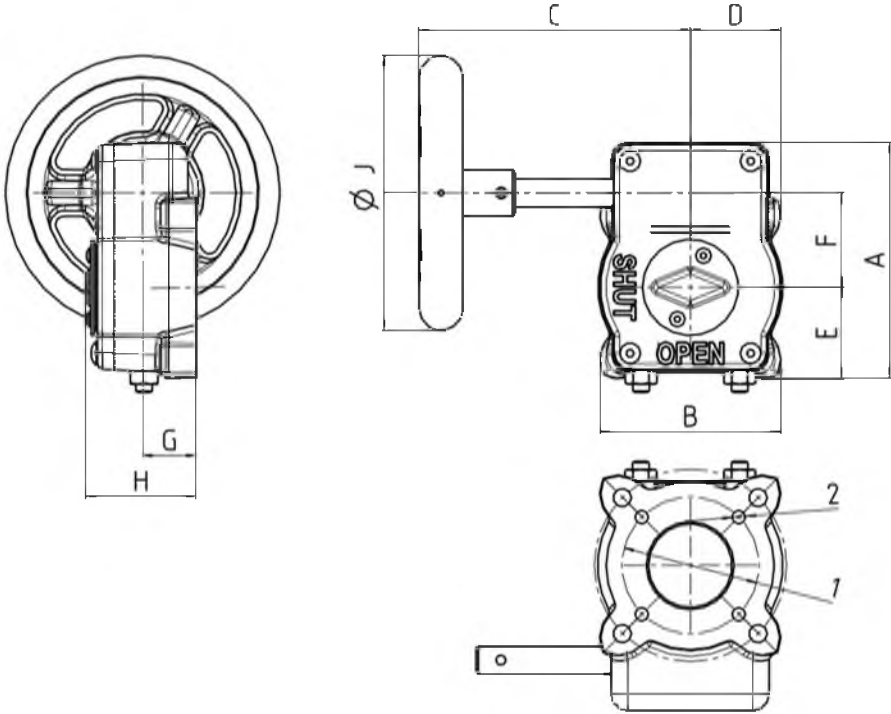
List of components

Part No.	Description	Materials
32-4	Stop disc	Tempered steel
87-5	Actuating stem	Steel + electrophoretic coating
103	Gear housing	Lamellar graphite cast iron EN-GJL-250
160	Cover	Lamellar graphite cast iron EN-GJL-250
310	Bearing	Steel with PTFE coating
411	Shaft seal ring	Nitrile
412	O-ring	Nitrile
560	Handwheel pin	Stainless steel
629	Position indicator	Stainless steel
874	Worm	Tempered steel
875	Worm wheel	Nodular cast iron EN-GJS-400-15
901	Bolt	Galvanised steel
904	Adjustable grub screw	Galvanised steel
920	Nut	Galvanised steel
961	Handwheel	Nodular cast iron EN-GJS-400-15 or steel

Dimensions

Drawings

Actuation by handwheel



- 1 : Bore diameter Ød1
- 2 : 4 evenly spaced holes Ød2

Dimensions

[mm]

Size	Actuation by handwheel								
	A	B	C	D	E	F	G	H	ØJ
MN 12	82	68	146	34	30	34	20	37	100
MN 25	109	92	242	46	38	41	28	47	200
MN 40	142	114	294	57	59	55	34	57	250
MN 80	173	134	283	67	70	69	34	63	300

[mm]

Size	Actuation by handwheel			Weight [kg]
	ISO 5211 interface			
MN	Reference	Diameter d1	Diameter d2	
12	F05	50	M6	1,0
	F07	70	M8	
25	F07	70	M8	1,9
	F10	102	M10	
40	F07	70	M8	3,9
	F10	102	M10	
	F12	125	M12	
80	F10	102	M10	5,7
	F12	125	M12	

Manual Actuator

S / SR / SP Levers

Type Series Booklet



Manual Actuators

Levers

S / SR / SP Levers



Design details

- 3 handle lengths: 180 mm, 260 mm and 330 mm
- Lever coating: polyurethane, thickness 80 µm, colour: grey RAL 7016 (P28)
- Locking:
 - S lever: can be locked in the two limit positions (Open and Closed)
 - SR lever: can be locked in 9 positions (2 limit positions (Open and Closed) and 7 evenly spaced intermediate positions)
 - SP lever: can be locked in any position
- The levers can be padlocked (N.B.: padlock not included in scope of supply).
- Seals for TIR transport (Transports Internationaux Routiers).
- The levers can be equipped with AMTROBOX M limit switch boxes.

Product benefits

- Stop plate made of stainless steel with olive-chromated zinc coating. Good corrosion protection.
- Spring made of stainless steel (S and SR levers)
- Position indicator (open/closed)
- The lever can be padlocked.

Main applications

- Industrial recirculation systems
- Heating systems
- Hot-water heating systems
- Domestic water supply
- Drinking water supply
- Heating and cooling applications in
 - Heating circuits
 - Ventilation circuits
 - Air-conditioning circuits
- Water treatment/conditioning
- Industry
- Water
- Waste water

Operating data

Operating properties

Characteristic	Value
S	S 180
	S 260
	S 330
SR	SR 180
	SR 260
	SR 330
SP	SP 260
	SP 330
Max. permissible temperature	Standard: -20 °C to +80 °C

Technical data

Function

S / SR levers

The lever is locked in the required position by engaging the handle (576) in the respective slotted holes of the stop plate (195).

SP lever

The lever is locked in the required position by means of the locking lever (57-3).

Application options

The below table specifies the application options available, depending on the top flange and stem interface of the valve.

The handle length depends on the valve's actuating torque.

Handle length	180 mm	260 mm	330 mm	
ISO top flange	F05 - F07	F05 - F07	F05 - F07	F10
Flat end	11	11	11 - 14	14
Square end	16	16	16	16

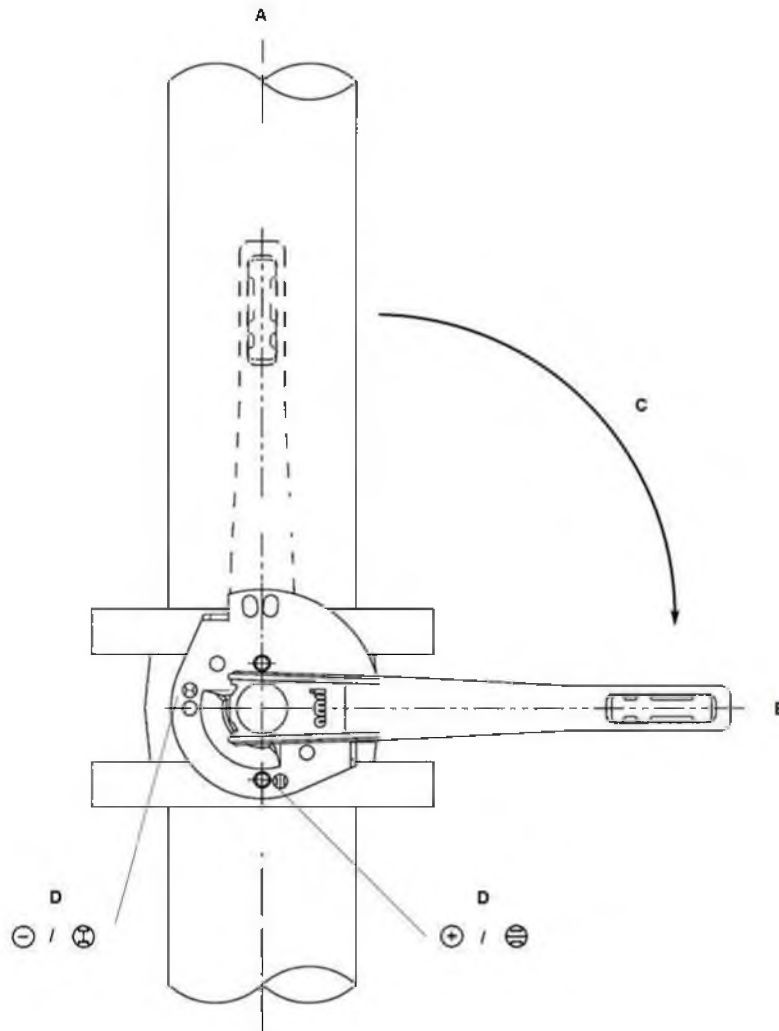
Installation

The valve is closed by a clockwise rotation of the lever.

The position of the lever indicates the position of the valve disc. See drawing.

Two dotting marks on the stop plate indicate the installation positions to be observed in order to ensure the correct indication and swivelling range of the lever.

- ⊖ / ⊕ - at a right angle to the pipe: valve is closed
- ⊕ / ⊖ - aligned with the pipe axis: valve is open

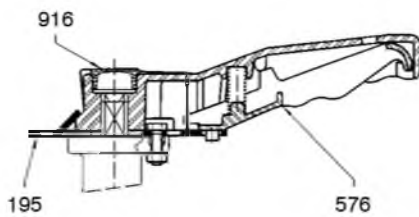


- A Valve is open.
- B Valve is closed.
- C Closing
- D Dotting mark

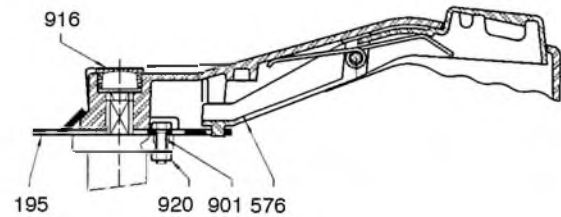
Materials

S / SR levers (180 mm, 260 mm and 330 mm)

Handle length 180 mm

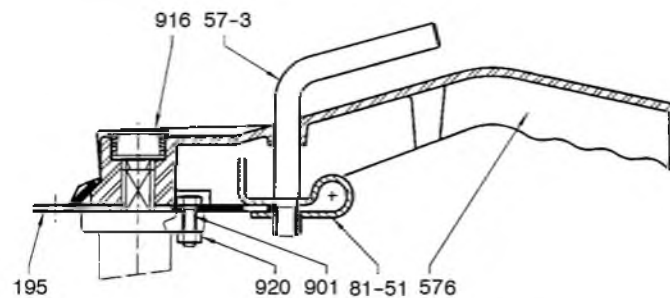


Handle lengths 260 or 330 mm



Part No.	Description	Materials
195	Stop plate	Steel, cadmium-plated or galvanised
576	Handle	Aluminium alloy
901	Hexagon head bolt	Steel, cadmium-plated or galvanised, Class 8.8
916	Plug	Polyethylene
920	Nut	Steel, cadmium-plated or galvanised, Class 8.8

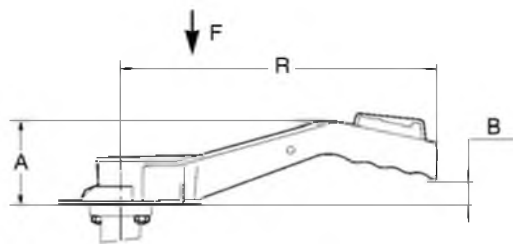
SP lever (260 and 330 mm)



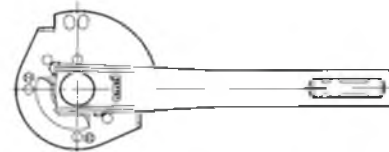
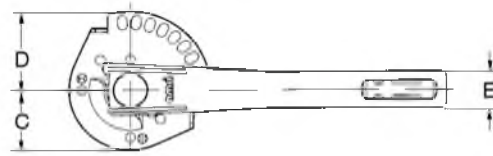
Part No.	Description	Materials
195	Stop plate	Steel, cadmium-plated or galvanised
576	Handle	Aluminium alloy
57-3	Locking lever	Steel, cadmium-plated or galvanised
81-51	Clamping element	Steel, cadmium-plated or galvanised
901	Hexagon head bolt	Steel, cadmium-plated or galvanised, Class 8.8
916	Plug	Polyethylene
920	Nut	Steel, cadmium-plated or galvanised, Class 8.8

Dimensions

S / SR levers (180 mm, 260 mm and 330 mm)

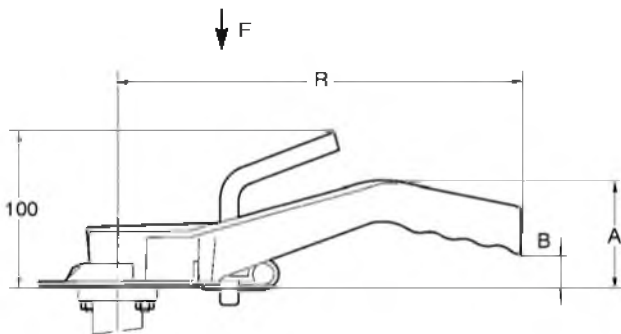


View from direction F

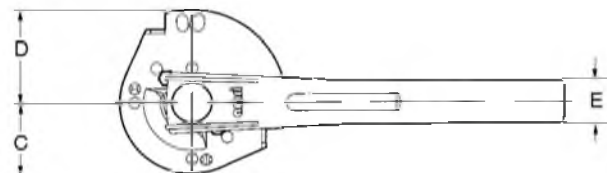


Length R	A	B	C	D	E	Weight [kg]
180	55	30	50	66	25	0,5
260	75	20	50	66	25	0,6
330	85	30	50	66	25	0,7

SP lever (260 and 330 mm)



View from direction F



Length R	A	B	C	D	E	Weight [kg]
260	68	20	50	66	25	0,73
330	82	30	50	66	25	0,80

Variants

Options

Padlocking

S / SR levers

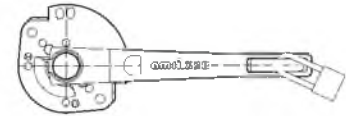
There are two different padlocking methods.

In either case the rotation axis of the handle is riveted to prevent loosening. The fastening bolts are lead-sealed in addition.

Lockable by means of padlocks with diameters of 6 to 8 mm.

A maximum of three padlocks can be fitted.

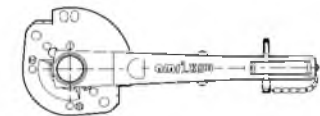
N.B.: Padlocks are not included in our scope of supply.



TIR seal

Lockable by means of a chain and pin slotted for the seal

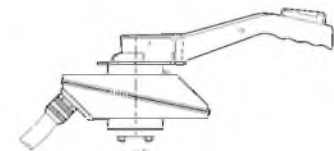
N.B.: The chain and pin are included in the scope of supply.



AMTROBOX M limit switch box

The levers of the "S" series can be equipped with limit switch box type AMTROBOX M.

For more information refer to the type series booklet of AMTROBOX M, reference No. 8523.1.



Manual Actuator

MR

MR Manual Gearbox
Force Transmission via Worm Gear
Force Transmission via Scotch-yoke Mechanism
Torque Range up to 16,000 Nm

Type Series Booklet



Manual Actuators

Manual Gearboxes

MR



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding

Operating data

Operating properties

Characteristic	Value
MR	MR 25 MR 50 MR 100 MR 200 MR 400 MR 800 MR 1600
Temperature	<ul style="list-style-type: none"> ▪ Standard version: -20 °C to +80 °C ▪ Marine version: -50 °C to +80 °C
Output torque	Up to 16,000 Nm
Enclosure	<ul style="list-style-type: none"> ▪ Standard: IP 67 ▪ Variant: IP 68 (30 metres of water)

Design details

Design

- The MR manual gearboxes developed by KSB-AMRI cover torques of up to 16,000 Nm.

- The MR manual gearboxes feature irreversible gear kinematics in any position. They are suitable for all fields of application and all types of quarter-turn valves (centred-disc or offset-disc butterfly valves, ball valves, etc.).
- Exterior coating:
 - Sealed standard version: polyurethane coating, average thickness 80 µm, colour: RAL 7016 anthracite grey
 - Marine version: two-coat system with epoxy top coat, average thickness 150 µm, colour: RAL 7016 anthracite grey.
- Actuator/valve interface to ISO 5211
- The manual gearboxes are equipped with removable adapters allowing them to be mounted on valves with different types of stem end (square or flat ends).
- The standard manual gearbox is supplied with a handwheel and a position indicator.
- The force required for actuating the handwheel is defined in the EN 12570 standard.
- MR manual gearboxes feature adjustable limit stops:
 - MR 25 to 200 (± 2°) for opening and closing
 - MR 400 to 1600 (± 2.5°) for closing
- Impact resistance: at least IK08 to EN 62262

Variants

- Operation via cardan joint, square for hydrant key or chain wheel after replacing the handwheel on site.
- AMTROBOX limit switch box
- Position indication by flag
- Handwheel locking arrangement with chain and padlock
- Anti-clockwise closing
- Special coatings for special ambient conditions
- Number of input turns (MR 400 to 1600 only): design modified to require a lower number of input turns (on request)
- Accessories for remote actuation
- Design to APSAD
- Design to UL

Product benefits

- Grease-packed for life (silicone-free grease) at the factory, therefore maintenance-free.
- Irreversible gear kinematics in any position

Technical data

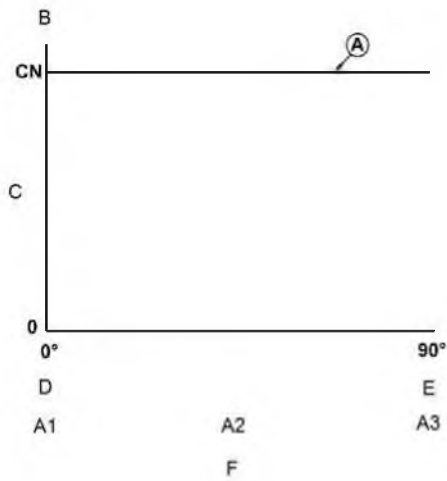
Function

Standard MR manual gearboxes are designed for valve closure in clockwise direction. They can also be fitted in reverse if necessary.

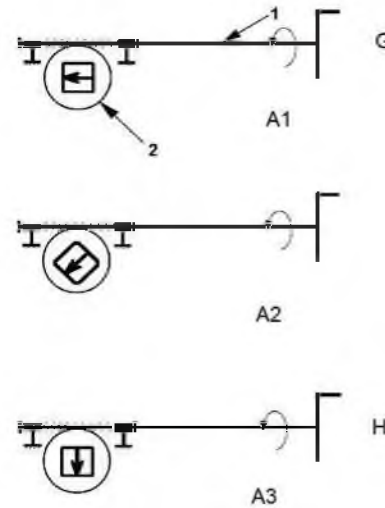
MR 25 to 200: force transmission via irreversible worm gear kinematics in any position

Force transmission via worm gear provides a constant output torque over the entire worm shaft travel. When the operating element (handwheel, cardan joint, square for hydrant key, chain wheel) connected to the worm shaft ① is actuated, the worm wheel ② connected to the valve stem rotates.

Curve A: constant output torque



Schematic of force transmission via worm gear



- | | | |
|------------------|-------------------------------|-----------|
| A1: Fig. 1 | C: Multiplication coefficient | G: Closed |
| A2: Fig. 2 | D: Closing | H: Open |
| A3: Fig. 3 | E: Opening | |
| B: Output torque | F: Opening angle in degrees | |

MR 400 to 1600: force transmission via irreversible scotch-yoke kinematics in any position

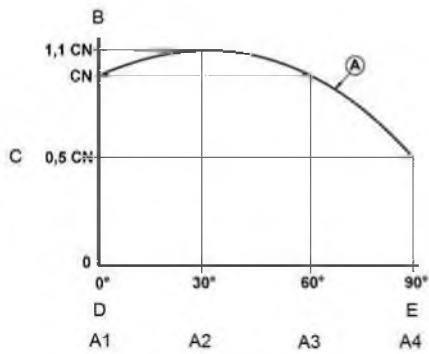
Force transmission via scotch-yoke kinematics generates output torques suitable for actuating butterfly valves with hydrodynamic torque (equal to the valve's maximum torque).

The movement is transmitted by means of the actuating stem ①, the sliding nut ②, the sliding pads ③ and the yoke ④.

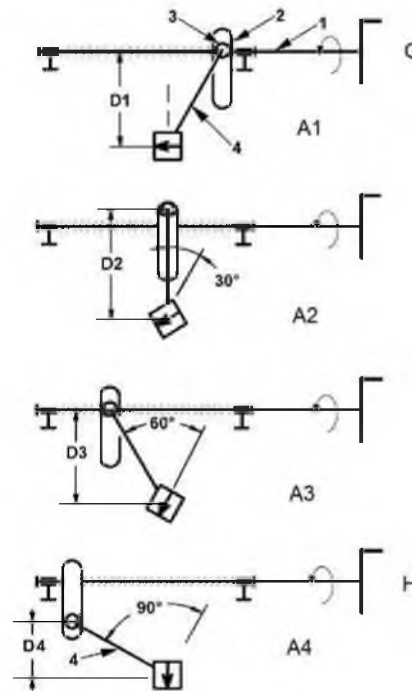
Actuation of the operating element (handwheel, cardan joint, square for hydrant key, chain wheel) connected to the actuating stem ① results in linear travel of the sliding nut ②.

This movement drives the sliding pads ③ in the grooves of the sliding nut ②, causing rotation of the yoke ④ together with the valve stem.

Curve A: output torque for F constant (C = F x D)



Schematic of force transmission via scotch-yoke kinematics



- A1: Fig. 1
- A2: Fig. 2
- A3: Fig. 3
- A4: Fig. 4

- B: Output torque
- C: Multiplication coefficient
- D: Closing
- E: Opening

- F: Opening angle in degrees
- G: Closed
- H: Open

Type series

[mm]

Size MR	Nominal output torque [Nm]	Nominal input torque [Nm]	Number of handwheel turns	Actuator flange, standardised to ISO*	Max. permissible stem dimensions		
					Height	Drive	
						Square end	Flat end
25	250	27	8,0	F07 - F10	50	22	22
50	500	42	10,0	F10 - F12	60	27	27
100	1000	70	12,5	F12 ou F14	70	36	36
200	2000	100	20,0	F14 ou F16	63	50	46
400	4000	100	48,0	F16	80	60	55
600	6000	170	53,5	F16 - F25	95	70	75
800	8000	100	138,0	F16 - F25	95	70	75
1200	12000	292	69,0	F25 - F30	110	90	85
1600	16000	100	290,5	F25 - F30	110	90	85

- * Direct mounting in the case of identical interfaces
Mounting by means of intermediate flange in the case of different interface sizes and footprints

Special features

MR 25 to 2000

Two different versions are available as required by the application.

Sealed standard version

**Marine version
VDI/VDE interface
Increased safety and protection**



Applications

- Industrial, non-saline, moderately corrosive atmospheres
- Cannot be equipped with a limit switch box

Applications

- Marine applications
- Industrial atmospheres with increased corrosivity
- Buried-service design
- Submersible design
- AMTROBOX limit switch box, VDI/VDE 3845 interface

MR 400, 800 and 1600

The manual gearboxes can be retrofitted with electric actuators on site.

Select the manual gearboxes and the suitable design from the table below.

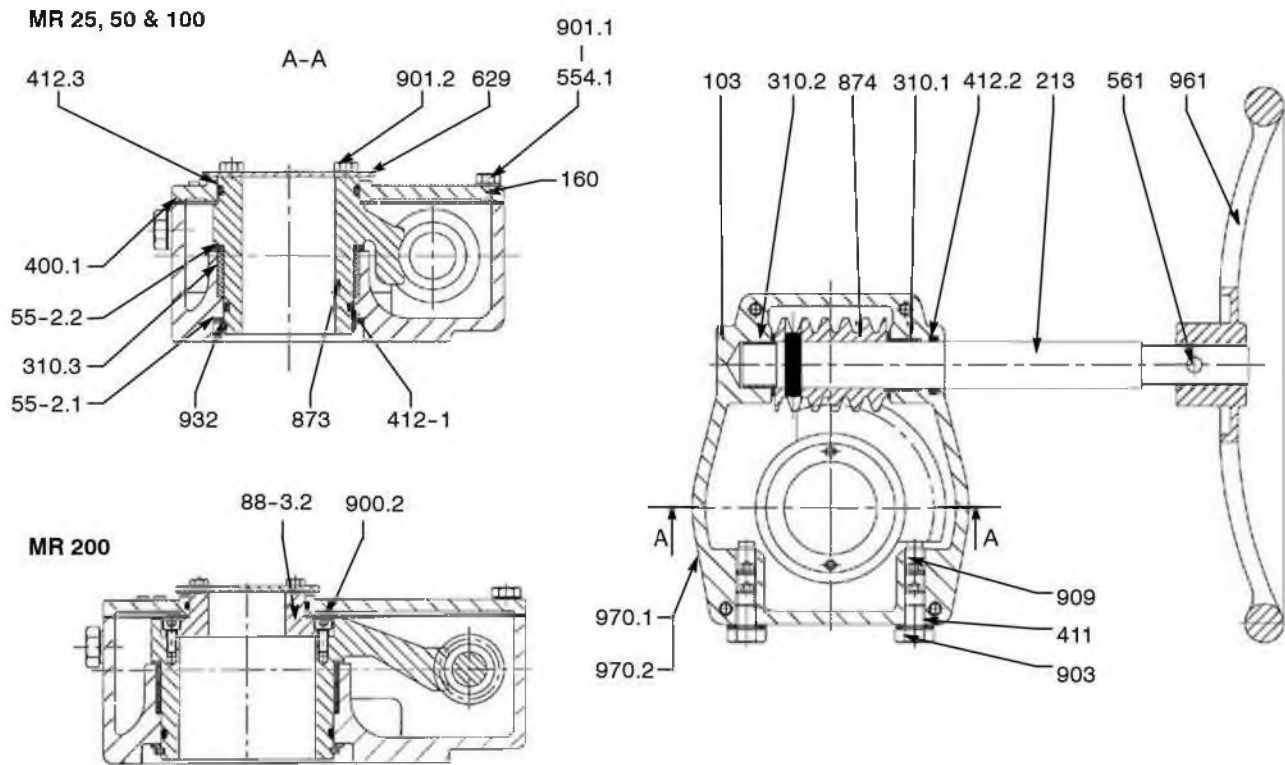
For local or remote electric actuation	Replaces manual gearbox as per "Actuator selection" document
Manual gearbox to be used	
MR 400	MR 200 MR 400
MR 800	MR 600 MR 800
MR 1600	MR 1200 MR 1600

Materials

MR 25, 50, 100 and 200 - sealed standard version

Sectional drawing - Handwheel-actuated design

Handwheel-actuated design



List of components: MR 25, 50, 100 and 200 - sealed standard version

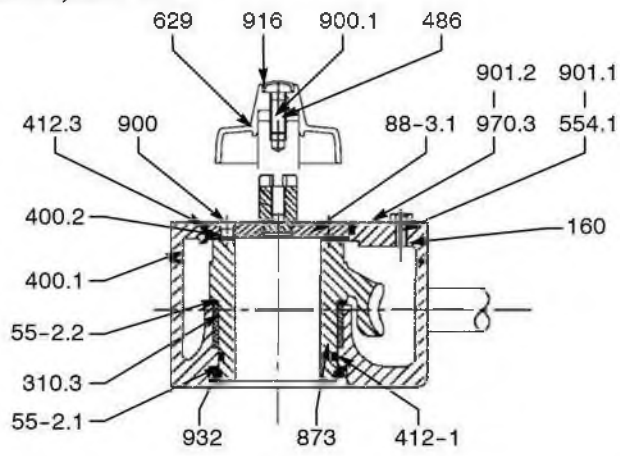
Part No.	Description	Materials
103	Gear housing	Nodular cast iron JS 1040
160	Cover	Nodular cast iron JS 1040
213	Actuating stem	Stainless steel (13% chrome)
310.1	Self-lubricating plain bearing	Steel with PTFE coating
310.2	Self-lubricating plain bearing	Steel with PTFE coating
310.3	Self-lubricating plain bearing or surface treatment	Surface treatment
400.1	Gasket	Composite
411	Joint ring	Composite
412.1	O-ring	Nitrile
412.2	O-ring	Nitrile
412.3	O-ring	Nitrile
55-2.1	Anti-friction disc	Tempered steel
55-2.2	Anti-friction disc or surface treatment	Surface treatment
554.1	Washer	Stainless steel
561	Pin	Stainless steel
629	Position indicator	Polyamide 6-6
873	Worm wheel	Nodular cast iron JS 1040
874	Worm shaft	Tempered steel
88-3.2	Torque-transmitting element	Steel (MR 200 only)
900.2	Hexagon socket head cap screw	Tempered steel (MR 200 only)
901.1	Hexagon head bolt	Stainless steel
901.2	Hexagon head bolt	Stainless steel
903	Plug	Polyethylene or stainless steel
909	Adjusting screw	Tempered steel
932	External circlip	Tempered steel
961	Handwheel	Nodular cast iron
970.1	Name plate	Stainless steel
970.2	Installation instructions	

MR 25, 50, 100 and 200 - marine version

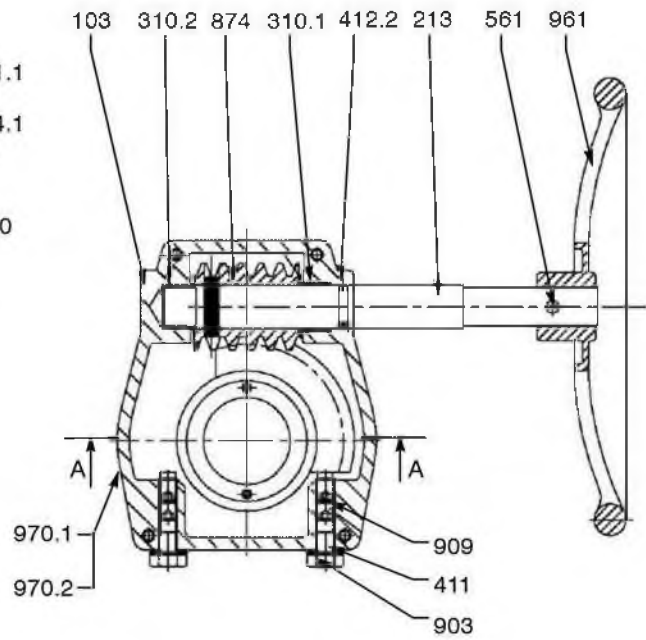
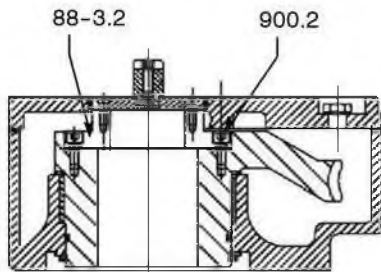
Sectional drawing: MR 25, 50, 100 and 200 - marine version

MR 25, 50 & 100

A-A



MR 200

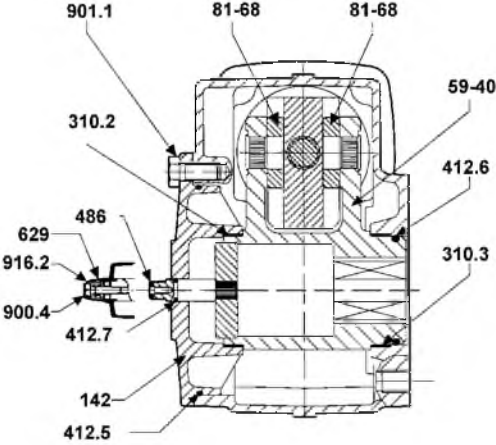
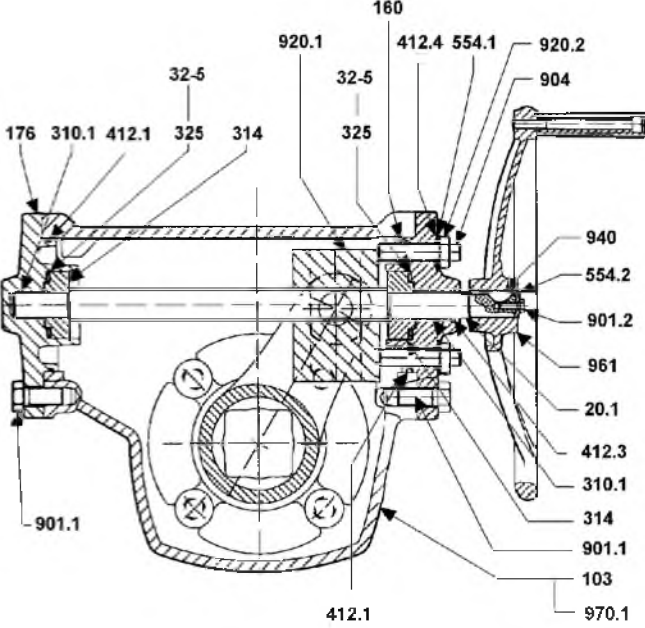


List of components: MR 25, 50, 100 and 200 - marine version

Part No.	Description	Materials
103	Gear housing	Nodular cast iron JS 1040
160	Cover	Nodular cast iron JS 1040
213	Actuating stem	Stainless steel 17.4
310.1	Self-lubricating plain bearing	Steel with PTFE coating
310.2	Self-lubricating plain bearing	Steel with PTFE coating
310.3	Self-lubricating plain bearing or surface treatment	Surface treatment
400.1	Gasket	Composite
400.2	Gasket	Composite
411	Joint ring	Composite
412.1	O-ring	Nitrile
412.2	O-ring	Nitrile
412.3	O-ring	Nitrile
486	Ball	Stainless steel
55-2.1	Anti-friction disc	Tempered steel
55-2.2	Anti-friction disc or surface treatment	Surface treatment
554.1	Washer	Stainless steel A4
561	Pin	Stainless steel
629	Position indicator	Polyamide 6-6
873	Worm wheel	Nodular cast iron JS 1040
874	Worm shaft	Tempered steel
88-3.1	Torque-transmitting element	Stainless steel 316L
88-3.2	Torque-transmitting element	Tempered steel (MR 200 only)
900	Countersunk head screw	Stainless steel A4
900.1	Hexagon socket head cap screw	Stainless steel A4
900.2	Hexagon socket head cap screw	Tempered steel (MR 200 only)
901.1	Hexagon head bolt	Stainless steel A4
901.2	Hexagon head bolt	Stainless steel A4
903	Plug	Stainless steel A4
909	Adjusting screw	Tempered steel
916	Plug	Polyethylene
932	External circlip	Tempered steel
961	Handwheel	Nodular cast iron
970.1	Name plate	Stainless steel
970.2	Installation instructions	
970.3	Label/plate	Stainless steel

MR 400, 600 and 1200

Sectional drawing: MR 400, 600 and 1200



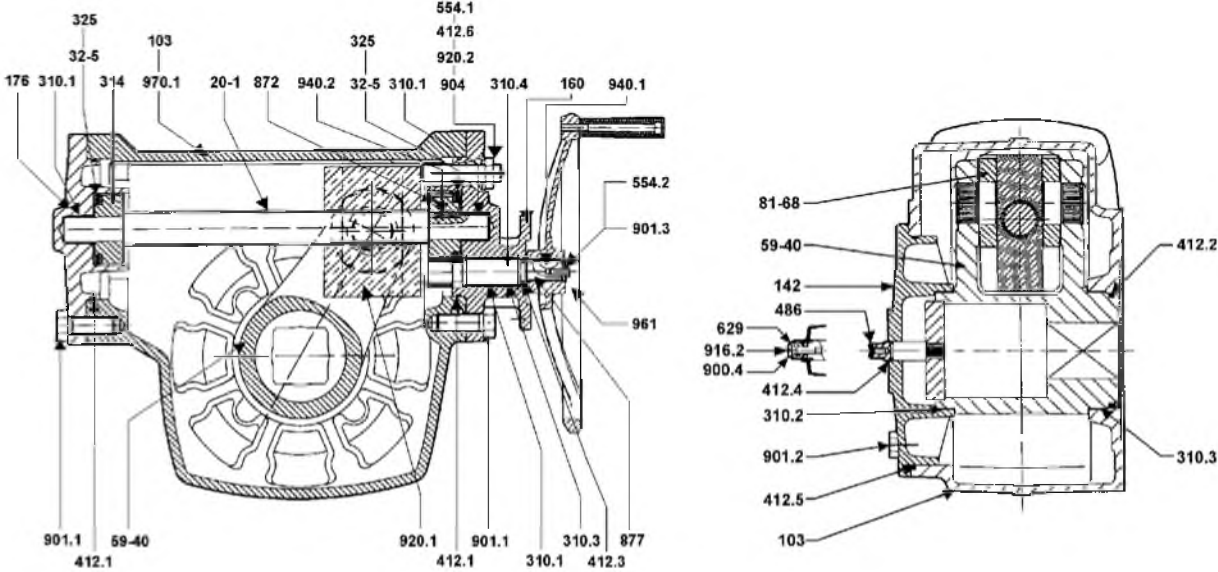
List of components: MR 400, 600 and 1200

Part No.	Description	Materials
103	Gear housing	Lamellar graphite cast iron JL 1040 or JS 1019* or nodular cast iron JS 1030 or JS 1019*
142	Cap	Lamellar graphite cast iron JL 1040 or JS 1019* or nodular cast iron JS 1030 or JS 1019*
160	Cover	Lamellar graphite cast iron JL 1040 or nodular cast iron JS 1030
176	Bottom	Lamellar graphite cast iron JL 1040 or nodular cast iron JS 1030
20-1	Actuating stem	Phosphate or nickel steel
310.1	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
310.2	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
310.3	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
314	Stop disc	Phosphate steel
325	Needle bearing	Tempered steel
32-5	Bearing disc	Tempered steel
412.1	O-ring	Nitrile
412.3	O-ring	Nitrile
412.4	O-ring	Nitrile
412.5	O-ring	Nitrile
412.6	O-ring	Nitrile
412.7	O-ring	Nitrile
486	Ball	Stainless steel
554.1	Washer	Stainless steel A4
554.2	Washer	Stainless steel A4
59-40	Actuating bush + indicator shaft	Nodular cast iron JS 1030 + stainless steel
629	Position indicator	Polyamide 6-6
81-68	Sliding pad	Nitrided steel
900.4	Bolt/screw	Stainless steel A4
901.1	Bolt/screw	Stainless steel A4
901.2	Bolt/screw	Stainless steel A4
904	Bolt/screw	Stainless steel A4
916.2	Plug	Polyamide 6-6
920.1	Sliding nut	Nodular cast iron JS 1060
920.2	Nut	Stainless steel A4
940	Woodruff key	Stainless steel
961	Handwheel	Nodular cast iron for MR 400 / steel for MR 600 and 1200
970.1	Name plate	Adhesive polyester

* JS 1019 for low-temperature version

MR 800 and 1600

Sectional drawing: actuation via handwheel and input-side primary reduction gear



List of components: MR

Part No.	Description	Materials
103	Gear housing	Lamellar graphite cast iron JL 1040 or JS 1019* or nodular cast iron JS 1030 or JS 1019*
142	Cap	Lamellar graphite cast iron JL 1040 or JS 1019* or nodular cast iron JS 1030 or JS 1019*
160	Cover with F10 motor interface	Lamellar graphite cast iron JL 1040 or nodular cast iron JS 1030
176	Bottom	Lamellar graphite cast iron JL 1040 or nodular cast iron JS 1030
20-1	Actuating stem	Phosphate or nickel steel
310.1	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
310.2	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
310.3	Self-lubricating plain bearing	Stainless steel with reinforced PTFE coating
310.4	Plain bearing	Stainless steel with reinforced PTFE coating
314	Stop disc	Phosphate steel
325	Needle bearing	Tempered steel
32-5	Bearing disc	Tempered steel
412.1	O-ring	Nitrile
412.2	O-ring	Nitrile
412.3	O-ring	Nitrile
412.4	O-ring	Nitrile
412.5	O-ring	Nitrile
412.6	O-ring	Nitrile
486	Ball	Stainless steel
554.1	Washer	Stainless steel A4
554.2	Washer	Stainless steel A4
59-40	Actuating bush + indicator shaft	Nodular cast iron JS 1030 + stainless steel
629	Position indicator	Polyamide 6-6
81-68	Sliding pad	Nitrided steel
900.4	Bolt/screw	Stainless steel A4
901.1	Bolt/screw	Stainless steel A4
901.2	Bolt/screw	Stainless steel A4
901.3	Bolt/screw	Stainless steel A4
904	Bolt/screw	Stainless steel A4
916.2	Plug	Polyamide 6-6
920.1	Sliding nut	Bronze
920.2	Nut	Stainless steel A4
940.1	Woodruff key	Stainless steel
940.2	Key	Steel
961	Handwheel	Nodular cast iron
970.1	Name plate	Adhesive polyester

* JS 1019 for low-temperature version

Removable adapter

The manual gearboxes are equipped with removable adapters selected in accordance with the required size and type of valve stem end (square, flat, keyed).

MR 25 and 50

Worm wheel with star drive for fitting the adapter in 45° increments

Flat-end adapter



Keyed adapter



Square-end adapter



MR 100 to 1600

Actuating bush with square drive for fitting the adapter in 90° increments

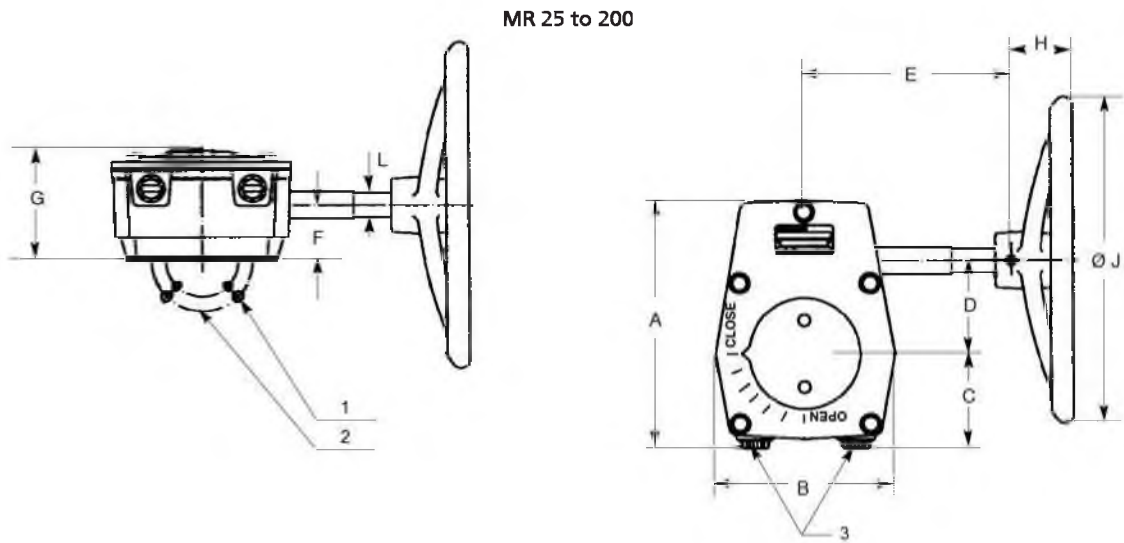
Square-end adapter



Dimensions

Drawings

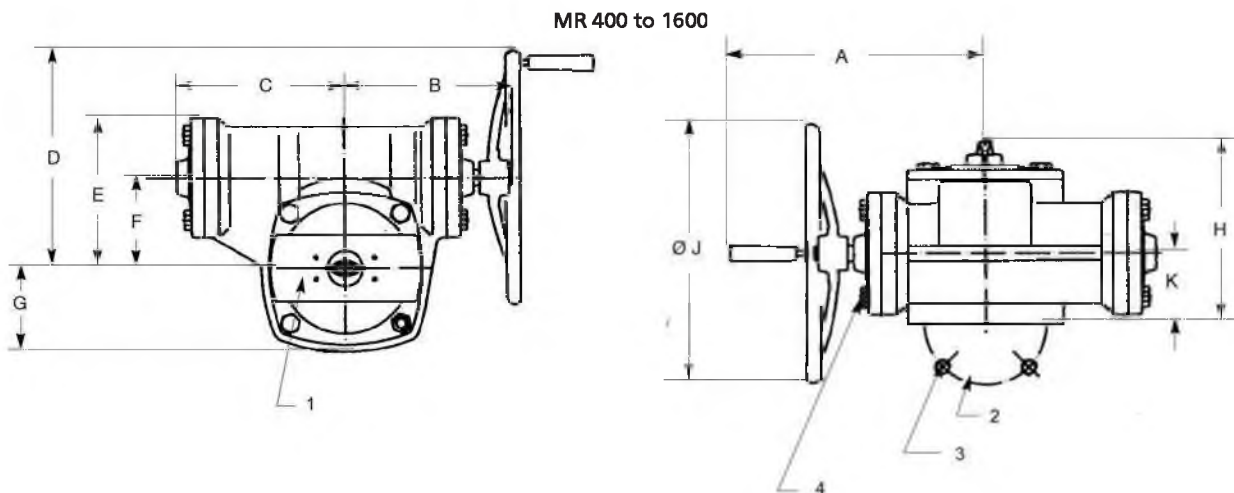
Actuation by handwheel



- 1 : n evenly spaced holes, dia. d2
- 2 : Bore diameter d1

- 3 : Adjustable stop bolts

Marine version: differs in dimension G and NAMUR VDI / VDE 3845 interface



- 1 : NAMUR VDI/VDE 3845 interface
- 2 : Bore diameter d1

- 3 : n evenly spaced holes, dia. d2
- 4 : Adjustable stop bolts for closing

Dimensions

[mm]

Size	Actuation by handwheel											
	A	B	C	D	E	F	G		H	J	K	L
MR							Sealed version	Marine version				
25	140	115	57	56	139	33	75	102	42	225	--	16
50	161	134	63	66	147	39	76	107	42	225	-	16
100	195	165	79	78	200	43	90	120	43	350	-	16
200	235	240	90	116	220	48	95	124	43	350	-	16
400	332	230	229	300	208	125	115		246	350	95	-
600	511	275	271	440	245	140	155		280	600	109	-
800	394	295	271	315	245	140	155		280	350	109	-
1200	680	320	337	580	338	180	180		336	800	131	-
1600	446	342	337	352	338	180	180		336	350	131	-

[mm]

Size	Actuation by handwheel				Weight [kg]
	ISO 5211 interface				
MR	Reference	Diameter d1	Diameter d2	n	
25	F07	70	M8	4	6,0
25	F10	102	M10	4	6,0
50	F10	102	M10	4	7,5
50	F12	125	M12	4	7,5
100	F12	125	M12	4	14,0
100	F14	140	M16	4	14,0
200	F14	140	M16	4	21,5
200	F16	165	M20	4	21,5
400	F16	165	M20	4	58,0
600	F16	165	M20	4	105,0
600	F25	254	M16	8	105,0
800	F16	165	M20	4	110,0
800	F25	254	M16	8	110,0
1200	F25	254	M16	8	175,0
1200	F30	298	M20	8	175,0
1600	F25	254	M16	8	183,0
1600	F30	298	M20	8	183,0

Variants

Actuation via cardan joint (tempered steel or stainless steel)

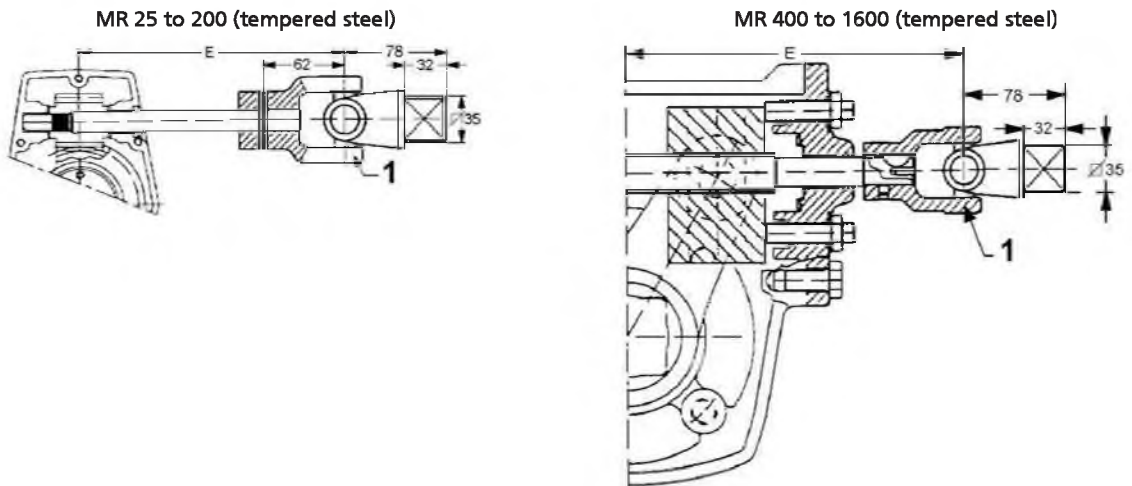
To enable actuation from a deck stand, the actuating stem is fitted with a cardan joint made of tempered steel and a 35-mm square end.

The cardan joint is galvanised.

The required length of transmission shaft (dia. 35 mm, max. length: 6 m) is included in the deck stand scope of supply.

A stainless steel variant of the cardan joint can be supplied for the entire type series.

Actuation from a deck stand is described in the "Options - Actuation accessories - Actuation from a deck stand" section.



1: cross, diameter 22 x 54

Size	E	Weight
MR	[mm]	[kg]
25	201	6,0
50	210	7,5
100	262	12,5
200	282	20,0
400	244	58,0
600	285	105,0
800	318	110,0
1200	335	175,0
1600	367	183,0

Actuation via square for hydrant key

For valves installed in buried drinking water supply systems, the actuating stem is equipped with a square for hydrant key operation (30 or 50 mm) made of nodular cast iron.

Manual gearboxes with a square for hydrant key operation can be operated as follows:

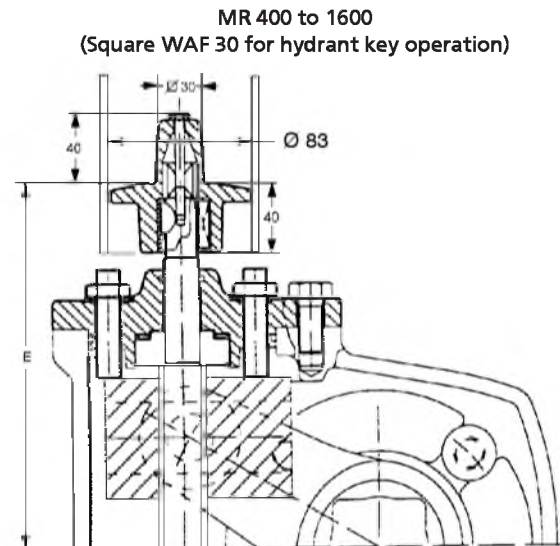
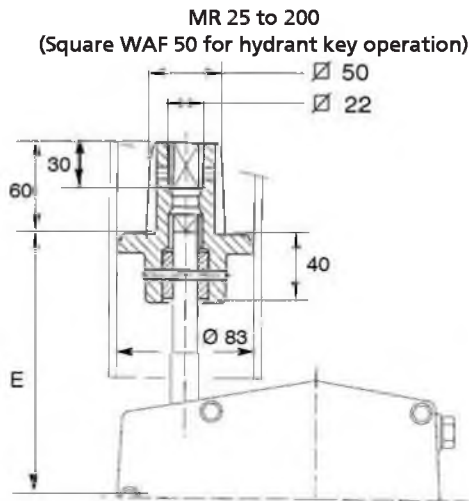
30-mm square:

- Handwheel (diameter: 315) made of nodular cast iron
- Socket wrench
- Straight lever (length: 370 mm) made of nodular cast iron

50-mm square:

- Extension rod with square end, protecting tube and valve box

Accessories are described in the "Options - Actuation accessories - Accessories for actuation via square for hydrant key operation" section



Size	Square WAF 30		Square WAF 50	
	MR	E [mm]	MR	E [mm]
25	165	5,5	165	6,0
50	173	7,0	173	7,5
100	226	12,0	226	12,5
200	246	19,5	246	20,0
400	222	57,0	222	59,0
600	325	103,0	330	107,0
800	295	108,0	295	111,0
1200	370	173,0	375	177,0
1600	345	180,0	345	184,0

Actuation via chain wheel

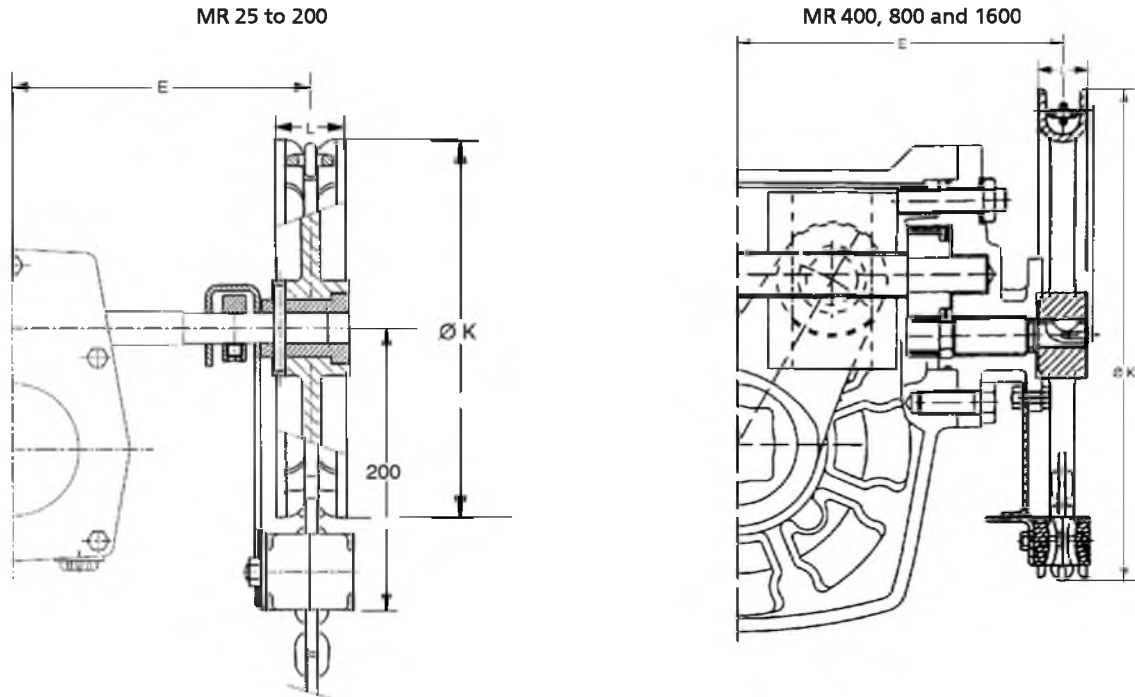
If piping is situated at a higher level and the actuating element is not accessible, the valve can be actuated via a chain wheel fitted on the stem of the manual gearbox (remote actuation).

The total chain length must be indicated when ordering (pitch: 18.5, size: 5, to DIN 766).

The chain is made of tempered steel or stainless steel.

For horizontal piping the MR manual gearbox must be fitted below the pipe, to ensure that the chain hangs down vertically.

* Weight per metre of chain: 0.8 kg



Size	E	K	L	Weight
MR	[mm]	[mm]	[mm]	[kg]
25	157	200	40	9,5
50	165	200	40	10,5
100	217	300	40	18,0
200	248	300	40	25,0
400	202	400	40	70,0
600	-	-	-	-
800	275	400	40	125,0
1200	-	-	-	-
1600	325	400	40	200,0

Actuation by handwheel, with extension

For some applications, the handwheel needs to be fitted at a distance from the manual gearbox.

This is accomplished by fitting a handwheel extension:

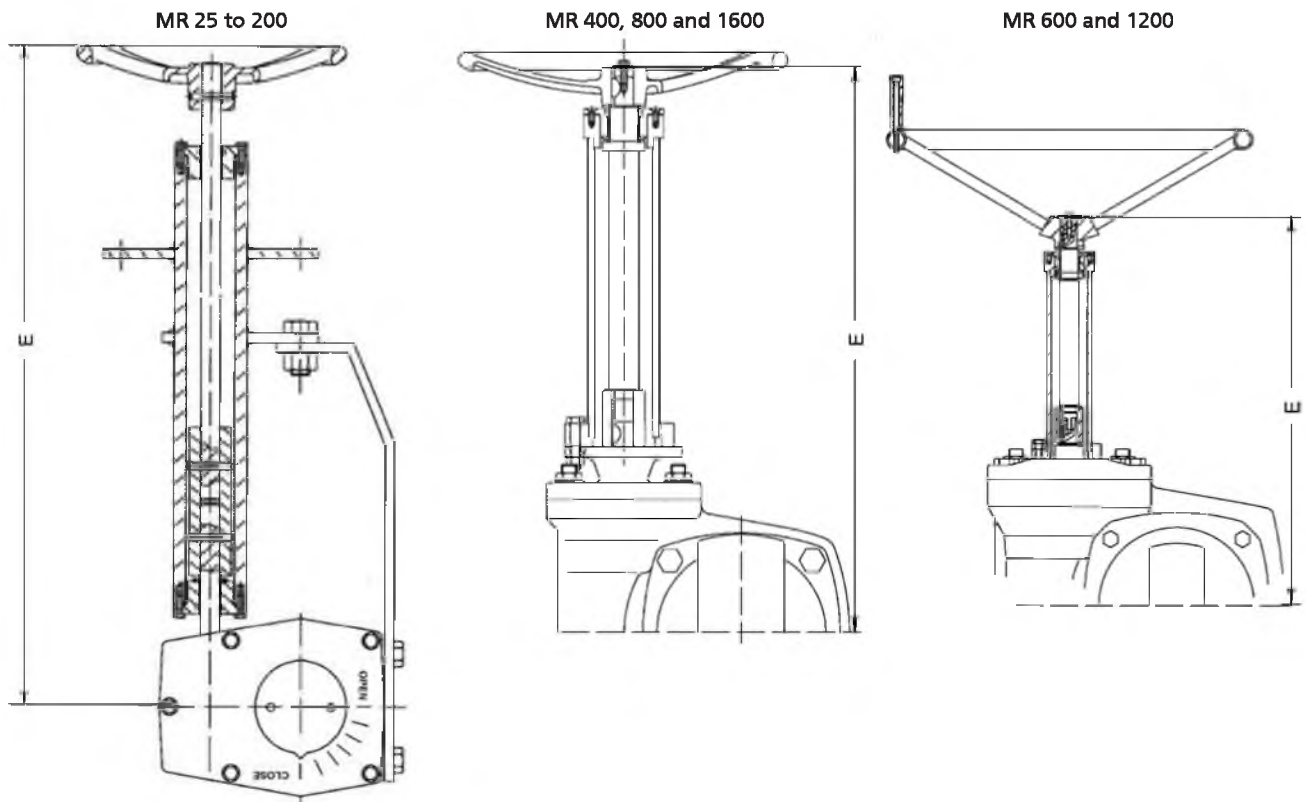
- Extension made of steel, with polyurethane coating, RAL 7016, thickness 80 µm (standard version)
- Transmission shaft and bolting made of stainless steel
- Handwheel (identical to standard handwheel of the manual gearbox)

Maximum extension (dimension E): 3 m. Longer extensions on request. Minimum length see table below.

Fitting an extra support is strongly recommended to safeguard the rigidity of the assembly. It must be supplied and fitted by the customer at the site.

Recommended set-up for this version:

- Valve fitted in a horizontal position
- MR fitted with the actuating stem in the vertical position
- Extension fitted with the axis in the vertical position



Size	E min.
MR	[mm]
25	500
50	550
100	600
200	600
400	500
600	500
800	500
1200	600
1600	600

Simpler solutions are available for the MR 25 to 200 models, provided that the transmission shaft is perfectly guided at the site (on request).

Options - Actuation accessories

Actuation from a deck stand

Standard version: actuation by handwheel

Some installations require valves to be actuated from a different level.

In others, site conditions require the valve's actuating element to be installed at a distance from the valve for reasons of accessibility.

A deck stand enables valves installed at a lower level to be actuated from a higher-level location.

The actuation process is performed either manually or electrically.

In such cases, the valve will be equipped with an MR manual gearbox with an output-side cardan joint and transmission shaft(s). Cardan joints are capable of accommodating some offset between the manual gearbox output shaft and the deck stand output shaft.

The maximum offset angle between the transmission shaft axis and the output shaft of the deck stand (or the manual gearbox) must not exceed 30°.

The cast standard deck stands are dust and splash-proof (IP 65).

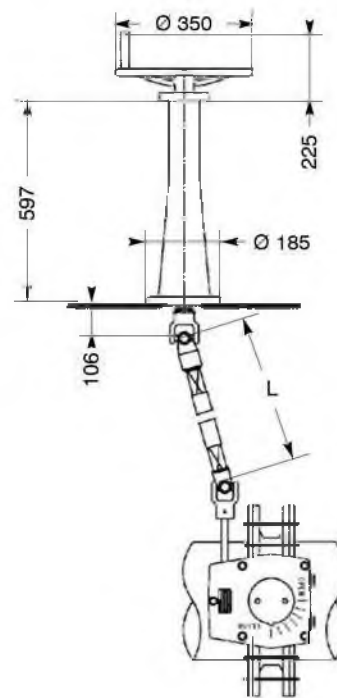
- Deck stand made of nodular cast iron
- Handwheel made of nodular cast iron
- Transmission elements made of tempered steel
- Cardan joint made of galvanised steel or stainless steel (optional)

Dimension L must equal at least 150 mm; it must not exceed 6 m.

The basic deck stand design is not equipped with a position indicator.

A variant with position indicator can be supplied.

Protection by polyurethane coating, thickness 80 µm, colour: RAL 7016 anthracite grey



The following manual gearboxes can be operated from a deck stand: MR 25, MR 50, MR 100, MR 200, MR 400, MR 800 and MR 1600.

MR 600 and MR 1200: request particulars.

Variant: electric actuation

The valve is actuated by an electric actuator which replaces the handwheel.

This actuation method can only be implemented on manual gearbox types MR 400, MR 800 and MR 1600 that can be motorised and feature a cardan joint output.

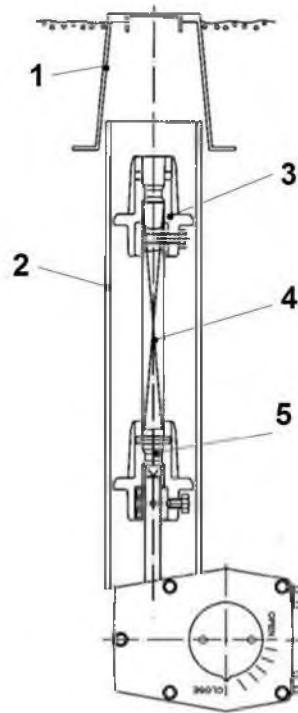
Remote actuation for buried MR

For buried service, remote actuation can be implemented by extension of the actuating element.

The extension set-up consists of:

- MR, actuated via a square for hydrant key operation (WAF 50, mandatory) which functions as an extension socket
- Extension rod with square (WAF 22), a standard length of 2 metres + square for hydrant key operation (WAF 30 or 50)
- Valve box and PVC protecting tube

Note: The extension rod is cut to the required length on site.
The assembly can be extended further by adding another extension socket and extension rod.

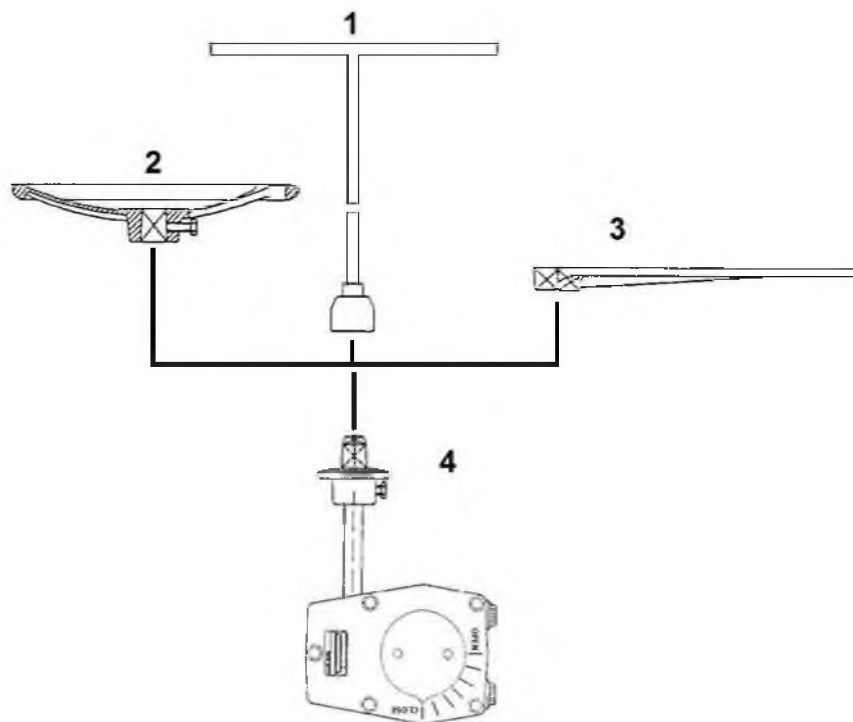


- | | |
|--|---|
| <p>1 : Valve box</p> <p>2 : Protecting tube</p> <p>3 : Square WAF 30 or 50 for hydrant key operation</p> | <p>4 : Extension rod with square (WAF 22), max. length: 2 m</p> <p>5 : Manual gearbox with square (WAF 50) for hydrant key operation / extension socket</p> |
|--|---|

Accessories for actuating the square for hydrant key operation

The following accessories are available for operating manual gearboxes with a WAF 30 square for hydrant key operation:

- Handwheel made of nodular cast iron, dia. 315
- Socket wrench
- Straight lever, length: 370 mm



- | | |
|-------------------------|---|
| 1 : Socket wrench | 3 : Straight lever, length: 370 mm |
| 2 : Handwheel, dia. 315 | 4 : Manual gearbox with WAF 30 square for hydrant key operation |

For operating manual gearboxes with WAF 50 square for hydrant key operation: request particulars

Motorisation (MR 400, 800 and 1600 only)

MR manual gearboxes can also be supplied in a motorisable design. For this purpose, the sliding nut made of cast iron is replaced by one made of bronze, and an ISO 5210 - F10 interface is selected to accommodate the actuator (on request). These manual gearboxes (supplied with a handwheel) can be subsequently motorised or actuated remotely through a cardan output (remote actuation from an electrically operated deck stand).



Lead-sealed closed-position limit stop

The closed-position limit stop of the MR manual gearbox can be locked with a stainless steel wire/lead fixture. This option can be implemented on MR 25 to 200, marine version, and MR 400 to 1600.

Limit switch box

MR manual gearboxes can be fitted with an AMTROBOX limit switch box. This box can be equipped with a maximum of three switches (1 for Open, 1 for Closed, and 1 for an adjustable intermediate position):

- Electrical standard or explosion-proof limit switch
- Standard or intrinsically safe proximity switch

Connection is effected either by cable gland or connector.

The limit switch box has an IP 67 enclosure as standard.

The AMTROBOX limit switch box is also available in an intrinsically safe or explosion-proof design.

MR 25 to 200
Marine version



MR 400 to 1600



Options

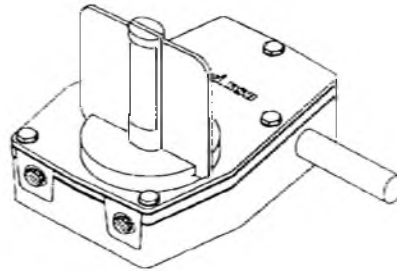
Flag indicator

MR 25 to 200

If the position of the valve disc needs to be visible from a distance, the position indicator is replaced by a yellow flag (RAL 1003) measuring 100x100 mm. Other colours are available on request.

MR 25 to 1600

Flag measuring 150x250 mm, red on both sides, normally used in marine applications. Flag can be designed to customer specification.



Handwheel locking arrangement

- By chain and padlock

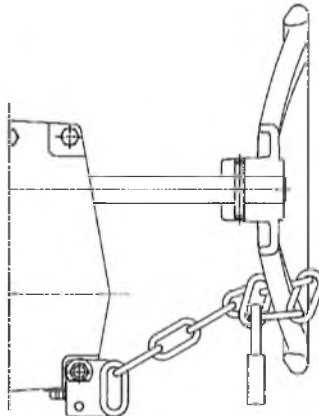
On request, MR manual gearboxes can be supplied with an arrangement for locking the handwheel using a padlock and stainless steel chain.

(Padlock included in KSB's scope of supply).

- By stainless steel plate and padlock

On request, MR manual gearboxes can be supplied with an arrangement for locking the handwheel using a stainless steel plate and padlock.

(Padlock included in KSB's scope of supply).



Design to APSAD

MR 25 to 1600

These actuators comply with the French APSAD fire protection regulations.
In combination with ISORIA butterfly valves, MR manual gearboxes feature

- a gear housing made of nodular cast iron
- a system enabling blind mounting or a flat-ended actuating stem
- a yellow flag, 100x100 mm,
- a handwheel locking arrangement with chain and padlock,
- integrated contacts for electrical signals (optional for MR 25 to 200).

This unit is certified to APSAD.

Design to U.L. - UNDERWRITERS LABORATIES -

MR 25 to 400

These actuators meet the requirements on fire protection systems in acc. with UL 1091.

In combination with ISORIA butterfly valves, MR manual gearboxes feature

- a system enabling blind mounting or a flat-ended actuating stem
- a yellow flag, 100x100 mm,
- a handwheel locking arrangement with chain and padlock.

This unit is certified to UL.

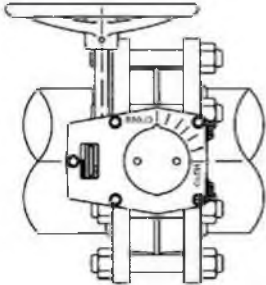
Mounting onto the valve

MR 25 to 200

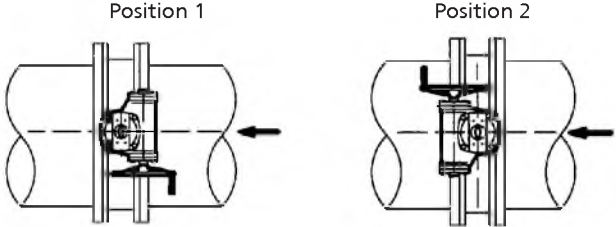
MR 400 to 1600

The actuator can be mounted on the valve in one position only.

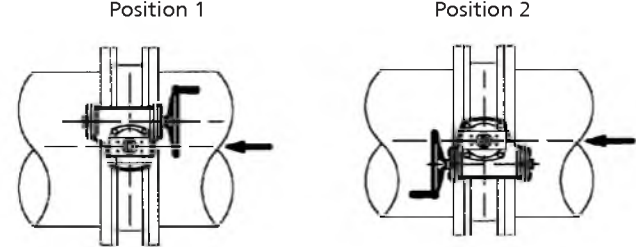
The actuator can be mounted on the valve in 4 different positions, offset by 90° (normal mounting position = N / 1).



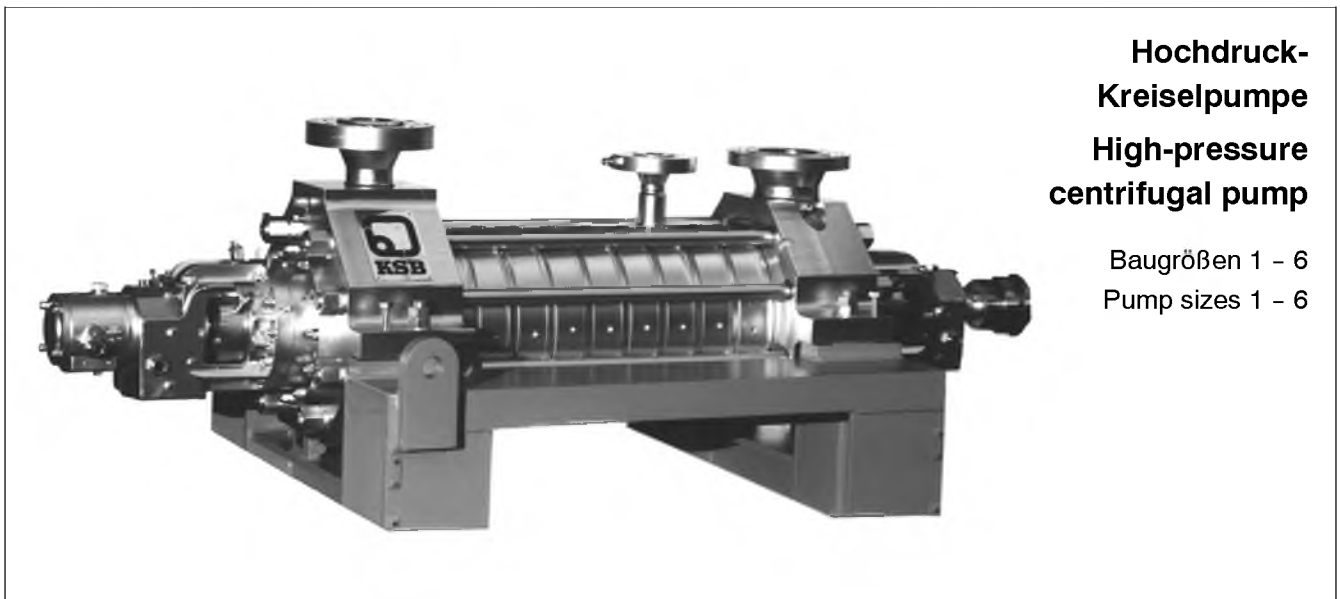
Mounting position N



Mounting position M



← Flow direction of fluid handled – Valve shown in closed position



**Hochdruck-
Kreiselpumpe**
**High-pressure
centrifugal pump**

Baugrößen 1 - 6
Pump sizes 1 - 6

Einsatzgebiete

- Speisewasser- und Kondensatförderung in Kraftwerken und Industrieanlagen
- Druckwassererzeugung, z.B. für Press-, Entrindungs-, Entzunderungsanlagen und Schneekanonen

Fields of Application

- Handling feed water and condensate in power stations and industrial plants
- Generation of pressurized water, e.g. for presses, decorticator, descaling plants and snow generators

Betriebsdaten

Förderstrom bei max. Drehzahl	Q bis	400 l/s
Förderhöhen	H bis	4200 m
Förderguttemperatur	T bis	200 °C
Pumpenzulaufdruck	p_s bis	30 bar
Pumpenenddruck	p_d bis	420 bar
Drehzahlen	n bis	7000 min ⁻¹

Operating Data

Capacity at max. speed	Q up to	400 l/s
Heads	H up to	4200 m
Temperature of medium handled	T up to	200 °C
Pump suction pressure	p_s up to	30 bar
Pump discharge pressure	p_d up to	420 bar
Speeds	n up to	7000 min ⁻¹

Bauart

Horizontale, quergeteilte Gliederpumpe mit Radialrädern, ein- oder zweiströmig, mehrstufig. Die Gehäuse sind untereinander mit O-Ringen oder metallisch an den Stirnflächen abgedichtet und durch Verbindungsschrauben verspannt.

Design

Horizontal, radially split, ring-section pump with radial impellers, single or double-flow entry, multistage. The stages are sealed against each other by O-rings or by metallic sealing faces and fastened by tie bolts.

PumpenfüÙe

HG 1	1. Stufengehäuse und Druckgehäuse	/ unten
HG 2	1. Stufengehäuse und Druckgehäuse	/ unten
HG 2	1. Stufengehäuse und Druckgehäuse	/ Achsmittle
HG 3	1. Stufengehäuse und Druckgehäuse	/ Achsmittle
HG 3	Sauggehäuse und Druckgehäuse	/ Achsmittle
HG 3-6	Sauggehäuse und Druckgehäuse	/ Achsmittle

Ort / Stellung

Pump Feet

HG 1	1st stage casing and discharge casing	/ bottom
HG 2	1st stage casing and discharge casing	/ bottom
HG 2	1st stage casing and discharge casing	/ centerline
HG 3	1st stage casing and discharge casing	/ centerline
HG 3	Suction casing and discharge casing	/ centerline
HG 3-6	Suction casing and discharge casing	/ centerline

Location / Position

Radiallager, Schmierung

Wälzlager ungekühlt, Ringschmierung
 Wälzlager gekühlt, Ringschmierung
 Gleitlager ungekühlt, Ringschmierung
 Gleitlager gekühlt, Ringschmierung
 Gleitlager, Druckölschmierung

Radial Bearing, Lubrication

Rolling element bearing uncooled, oil ring lubrication
 Rolling element bearing cooled, oil ring lubrication
 Plain bearing uncooled, oil ring lubrication
 Plain bearing cooled, oil ring lubrication
 Plain bearing, forced oil lubrication

Axiallager, Schmierung

Wälzlager gekühlt, Ringschmierung (HG 1-3)
 Gleitlager, Druckölschmierung (HG 1-6)

Thrust Bearing, Lubrication

Rolling element bearing cooled, oil ring lubrication (HG 1-3)
 Plain bearing, forced oil lubrication (HG 1-6)

Entlastungseinrichtung

Axialschubausgleich durch die hydraulische Entlastungseinrichtung an der Druckseite. Entlastung durch Scheibe oder Doppelkolben.

Balancing Device

Thrust compensation by the hydraulic balancing device located at the discharge side. Balancing by disc or double piston.

Wellendichtung

Packungsstopfbuchse ungekühlt oder gekühlt.
 Gleitringdichtung ungekühlt, mit Mantelkühlung, Gegenringkühlung, Injektion oder Zirkulation.
 Die Welle ist im Bereich der Dichtung mit auswechselbarer Wellenhülse versehen.

Shaft Seal

Packed stuffing box uncooled or cooled.
 Mechanical seal uncooled, with jacket cooling, seat ring cooling, injection or circulation.
 The shaft is provided with exchangeable shaft sleeve in the shaft seal area.

Stutzenstellung

Saugstutzen: Radial, senkrecht nach oben oder unten
 Druckstutzen: Radial, senkrecht nach oben
 Anzapfung: Radial, in allen Stufengehäusen, in verschiedenen Richtungen, auf Anfrage.

Nozzle Orientation

Suction nozzle: radially, vertically upwards or vertically downwards
 Discharge nozzle: radially, vertically upwards
 Tapping nozzle: radially, in all stage casings, in various directions, upon request.

Flansche

AnschlussmaÙe nach EN oder ASME.

Flanges

Connection dimensions according to EN or ASME.

Antrieb

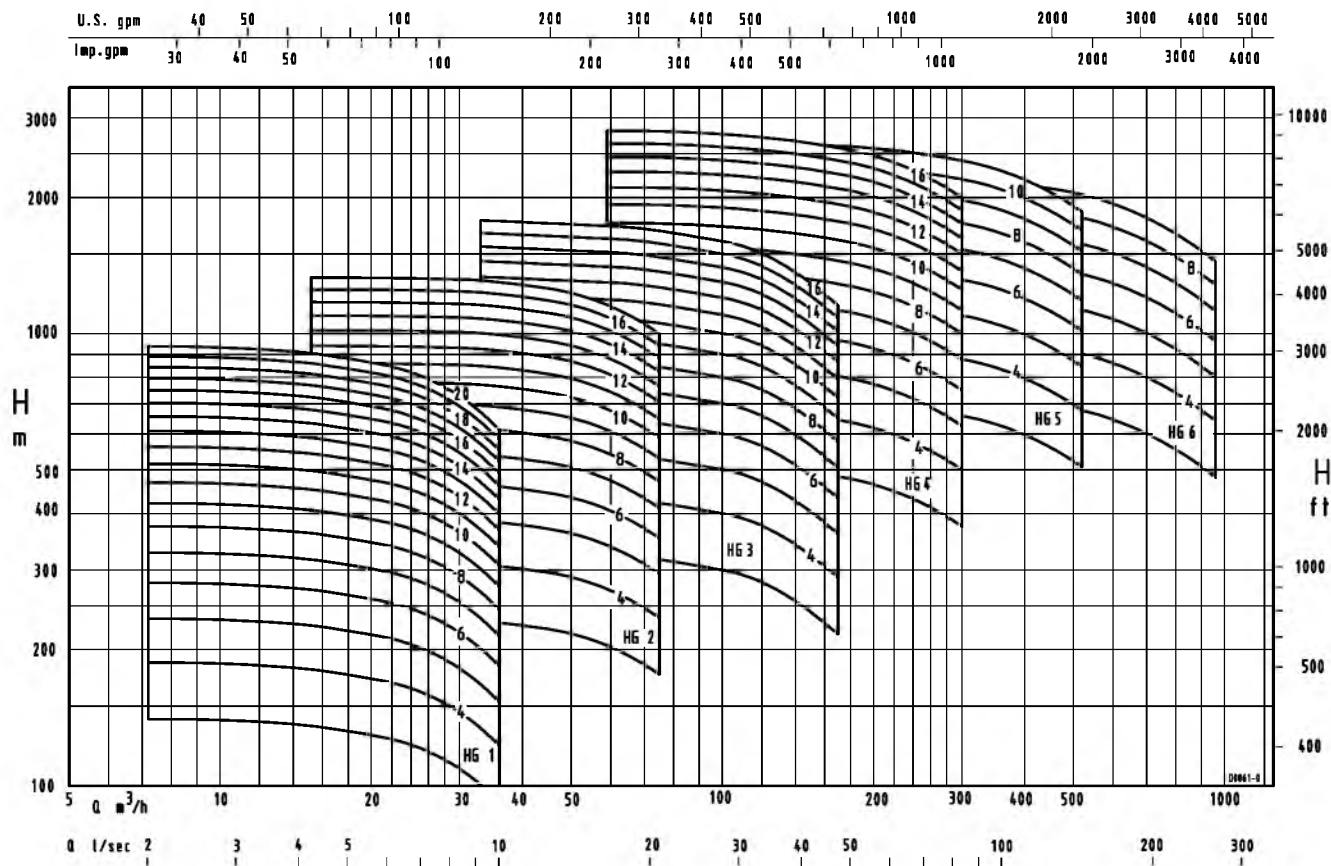
Direkt durch E-Motor, Turbine oder Verbrennungsmotor oder indirekt über Getriebe, hydraulische Regelkupplung oder Getrieberegelnkupplung.

Drive

Direct by electric motor, turbine or combustion engine, or indirect through a gearbox, hydraulic coupling or variable speed coupling.

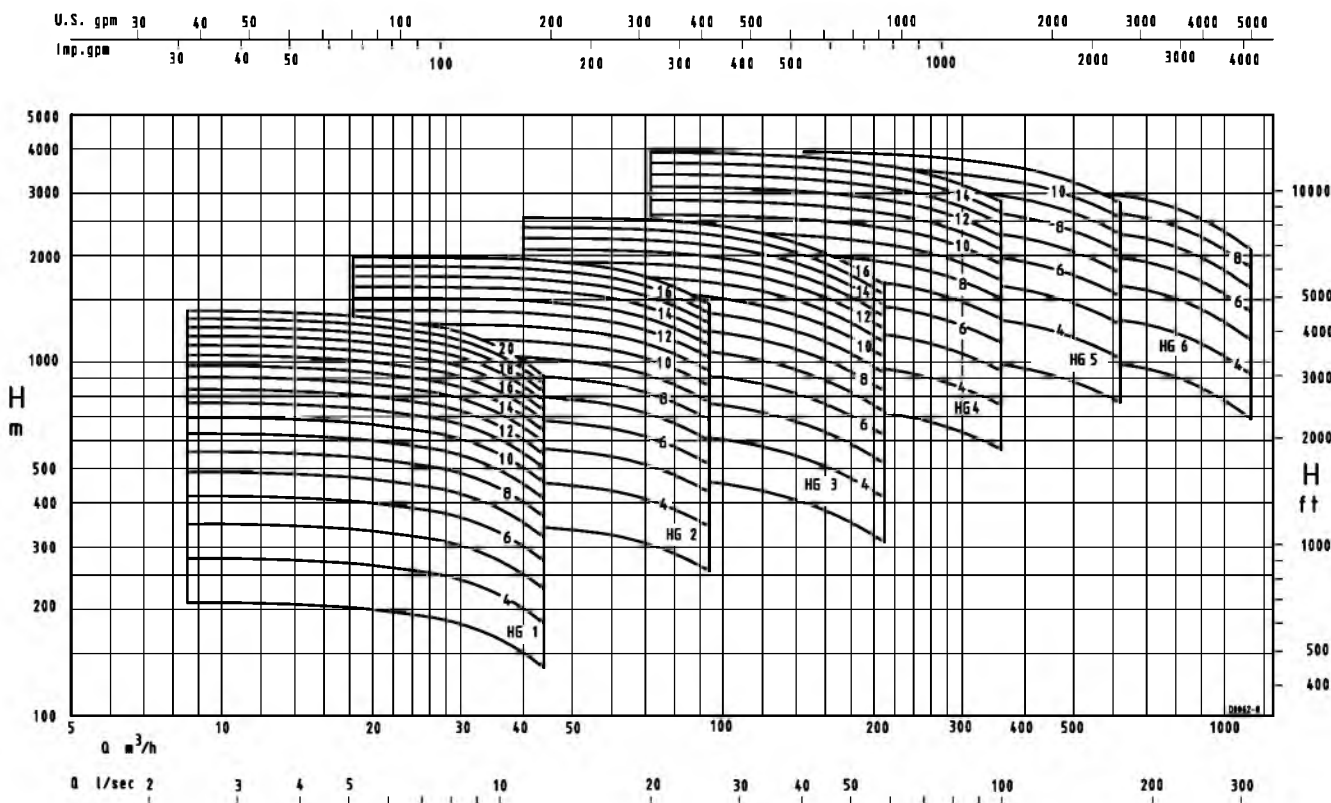
Sammelkennfeld 50 Hz $n = 2950 \text{ min}^{-1}$

Selection Chart 50 Hz

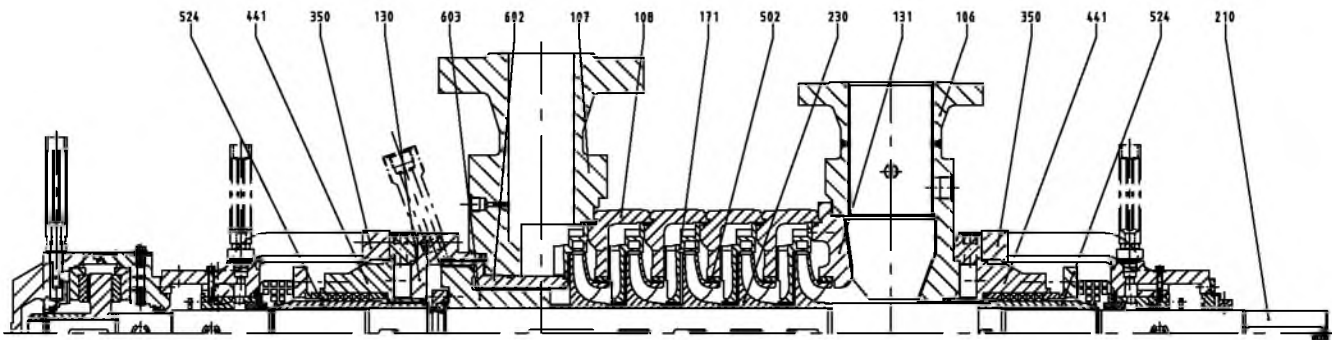


Sammelkennfeld 60 Hz $n = 3550 \text{ min}^{-1}$

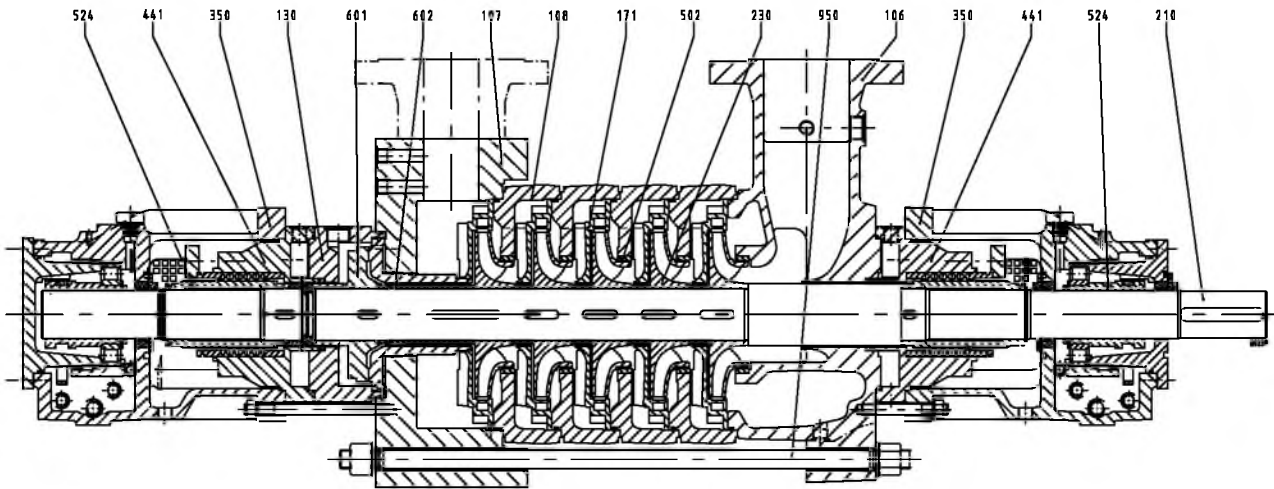
Selection Chart 60 Hz



Teilverzeichnis / List of Components



Beispiel: Gleitlager, Entlastungskolben, Packung gekühlt, Sauggehäuse Stahl, Druckgehäuse mit Vorschweißflansch,
 Example: Plain bearing, Balance drum, Packed stuffing box cooled, Suction casing forged, Discharge casing with welding neck flange,



Beispiel: Wälzlager, Entlastungsscheibe, Packung gekühlt, Sauggehäuse Guß, Druckgehäuse mit Blockflansch,
 Example: Rolling element bearing, Balance disc, Packed stuffing box cooled, Suction casing cast, Discharge casing with integral flange

Werkstoffe / Materials

Teile-Nr. Part No.	Benennung Designation	Werkstoffauswahl / Material Selection	
		HGB	HGC
106	Sauggehäuse - suction casing	C-Stahl / C-steel	C-Stahl plattiert, Cr-Stahl / C-steel plated, Cr-steel
107	Druckgehäuse - discharge casing	C-Stahl / C-steel	C-Stahl plattiert, Cr-Stahl / C-steel plated, Cr-steel
108	Stufengehäuse - stage casing	C-Stahl / C-steel	Cr-Stahl / Cr-steel
130	Gehäuseteil - casing part	C-Stahl / C-steel	Cr-Stahl / Cr-steel
131	Einlaufring - inlet ring	C-Stahl, Cr-Stahl / C-steel, C-steel, Cr-steel	
171	Leitrad - diffuser	Grauguß, Cr-Stahl / Cast iron, Cr-steel	
210	Welle - shaft	C-Stahl, Cr-Stahl / C-steel, C-steel, Cr-steel	
230	Lauftrad - impeller	Grauguß, Cr-Stahlguß / Cast iron, Cr-steel casting	
350	Lagergehäuse - bearing housing	Grauguß / Cast iron	
441	Gehäuse für Dichtung - shaft seal housing	C-Stahl, Cr-Stahl / C-steel, Cr-steel	
502	Spaltring - casing wear ring	Cr-Stahl / Cr-steel	
524	Wellenschutzhülse - shaft protecting sleeve	Cr-Stahl / Cr-steel	
601	Entlastungsscheibe - balance disc	Cr-Stahl / Cr-steel	
602	Entlastungsgegenscheibe - balance disc seat	Cr-Stahl / Cr-steel	
603	Entlastungskolben - balance drum	Cr-Stahl / Cr-steel	
905	Verbindungsschraube - tie bolt	Vergütungsstahl / quenched and tempered steel	

Barrel Casing Pump

CHTD

With Single-entry Inlet

Type Series Booklet



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CHTD 7/5, pump with floating ring seal	7

Energy

Barrel Casing Pump

CHTD



Main applications

- Feed water transport in power stations
- New and retrofitted installations
- Boiler feed applications

Fluids handled

- Boiler feed water
- Condensate
- Clean hot or cold water

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 3600
	Q [l/s]	≤ 355
Head	H [m]	≤ 5500
Fluid temperature	T [°C]	≤ 210
Inlet pressure	p _s [bar]	≤ 70
Discharge pressure ¹⁾	p _d [bar]	≤ 560
Discharge pressure ²⁾	p _d [bar]	≤ 490
Speed	n [rpm]	≤ 6500
Power input	P [kW]	≤ 40000
Max. circumferential speed at the impeller	[m/s]	≤ 130
Max. circumferential speed at Q _{min}	[m]	≤ 1000

1) At Q = 0, T = 20 °C

2) At Q = 0, T = 210 °C

Designation

Example: CHT D 7/6

Designation key

Code	Description	
CHT	Type series group	
D	Type series	
7	Size	
	6	CHTD 6
	7	CHTD 7
6	Number of stages	

Design details

Design

- Horizontal installation
- Radially split pump
- Single-entry or double-entry
- Multistage
- Profile seals for static sealing within the pump and to atmosphere, stage casings with metal contact faces, O-rings for areas in contact with oil
- Nozzles always arranged radially
 - Nozzles available with weld end or flange
 - Positions: suction nozzle/discharge nozzle top or bottom, or opposite to each other
 - Tapping nozzle top or bottom, angles 45° and 170°
- Sizes and number of stages
 - Sizes 3 to 10, selection to flow rate at a nominal speed of 4060 rpm
 - Number of stages: 3 minimum, 9 maximum
- Individual support of shrink-fitted impellers and split ring for axial force transmission

Impeller type

- Radial impellers

Bearings

Depending on pump size and design:

Plain bearings with forced oil lubrication

- Radial bearing
 - 2 grooved multi-lobe plain bearings
- Thrust bearing
 - 1 bi-directional tilting-pad thrust bearing
- Measurement of the residual axial force via wire strain gauges on cardanic ring
- Cardanic ring designed as flexible component, adaptation to rotor deflection line, measurement of residual thrust

Balancing device

- Double drum: 2 radial clearances of fixed width and 1 axial clearance of adjustable width
- The residual axial thrust is absorbed by the thrust bearing, which forms one functional unit with the double drum.

Shaft seal

Depending on pump size and design:

- Mechanical seal: cartridge design with circulation and jacket cooling (API plan 23)
- Dosing might be required at high circumferential speed.
- Floating ring seal: Throttling seal in cartridge design with several narrow, radially flexible throttling distances in a line
- External supply with sealing condensate required.
- Shaft equipped with a replaceable shaft sleeve in the shaft seal area

Flanges

- Mating dimensions to ASME and DIN

Options

- Adaptation to customer specifications
- Single-piece cover
- 2. tapping
- Kicker stage
- 2. shaft end (discharge side) for driving a booster pump
- Interstage bushes with grooved or cellular surface
- Direction of rotation clockwise or anti-clockwise
- Connection for a temperature balance valve
- Type series is cold/heat shock resistant

Hydraulic systems:

- 4 basic hydraulic systems (C, H, N and S) with individual adaptation of the balancing device
- Suction impeller and suction elbow, adapted to the available NPSH conditions
- End volute available for increasing the efficiency

Geometry:

- The outer dimensions depend on the hydraulic system, the pressure enclosure including nozzle projection and positions, the shaft seal type, and the measurement instruments fitted.

Pump set components

Drive

- Variable-speed condensing turbine
- Electric motor with geared variable speed coupling
- Electric motor with Vorecon gear
- Electric motor with frequency inverter and fixed-ratio gear
- Curved tooth and flexible disc couplings, low weight decisive for rotor dynamics

Installation:

- Pump on its own baseplate or together with the gear unit
- Booster pump (slow rotation due to step-down gear) at the same shaft assembly or with its own drive
- Booster pump on suction side or discharge side of the main pump (direction of rotation)

Additional systems

- Minimum flow system
 - Separate pump set skid
 - Self-regulating valve
- Dosing system for mechanical seals
- Barrier fluid supply system for floating ring seals
 - Relatively independent or strongly integrated in the power station system

- Balancing liquid return to the feed water tank or in intermediate pipe

Materials

Material variants

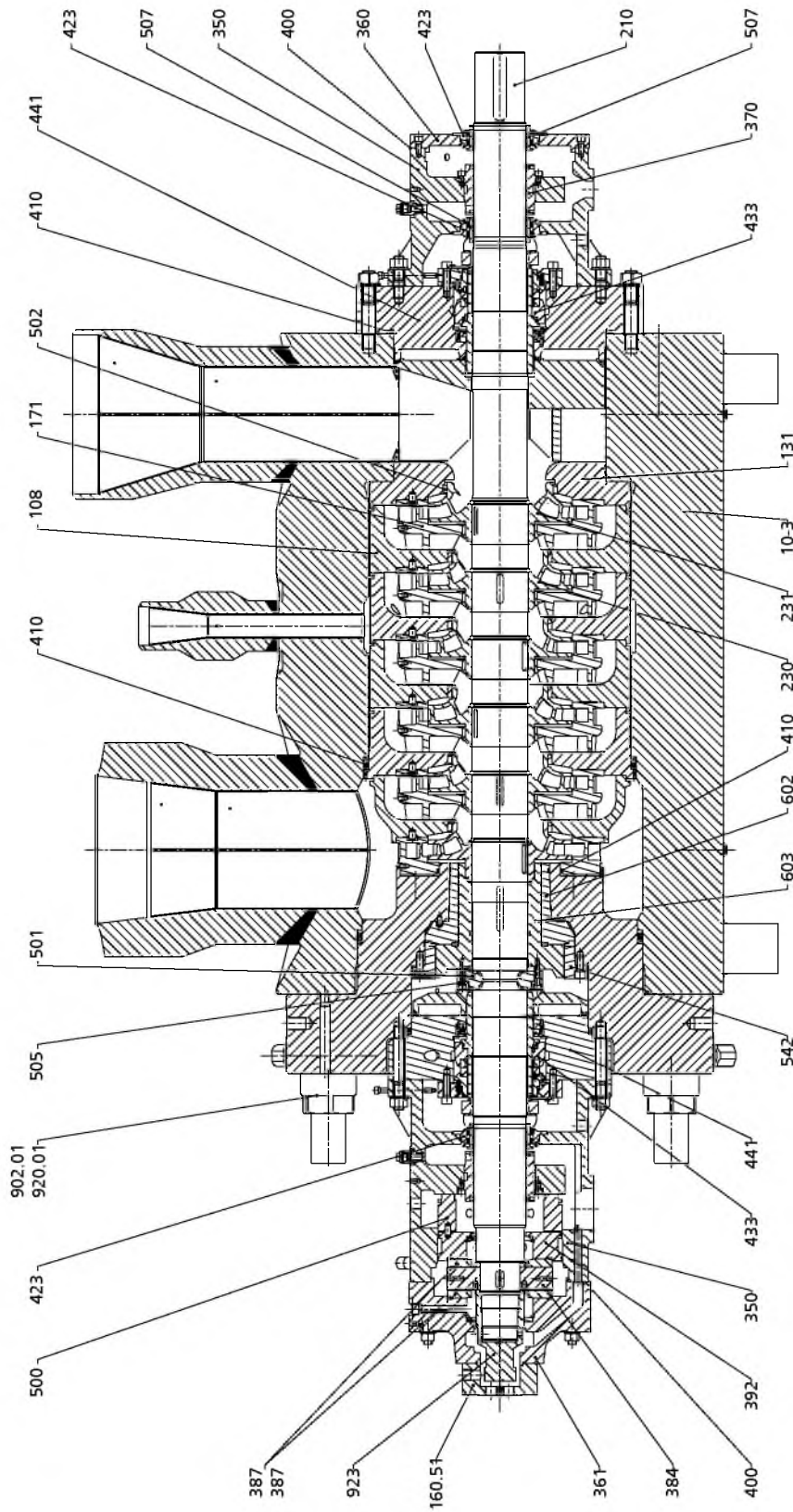
Description	Material
Barrel casing	Carbon steel, plated
Stage casing	Chrome steel
Nozzle	Steel which is creep-resistant at elevated temperatures, plated
Cover	Chrome steel
Hydraulic components	Chrome steel
Shaft seal housing	Chrome steel
Bearing housing	Grey cast iron or cast steel

Product benefits

- High operating reliability:
 - For balancing by double drum: residual axial thrust absorbed by pivoted segmental thrust bearing
 - Optimised casing design regarding the distribution of forces
 - Adaptation of pump casing to rotor deflection line
- Long service life
 - Prevention of wear at the thrust bearing by axial forces being transmitted to the bearing housing via a cardanic ring
 - Low NPSH value by using suction impeller as standard
- Service-friendly: pump cartridge can be replaced without dismantling the pump, and wear parts can be serviced without opening the pump.
- Reduced operating costs by high efficiency (cellular surface wear rings)

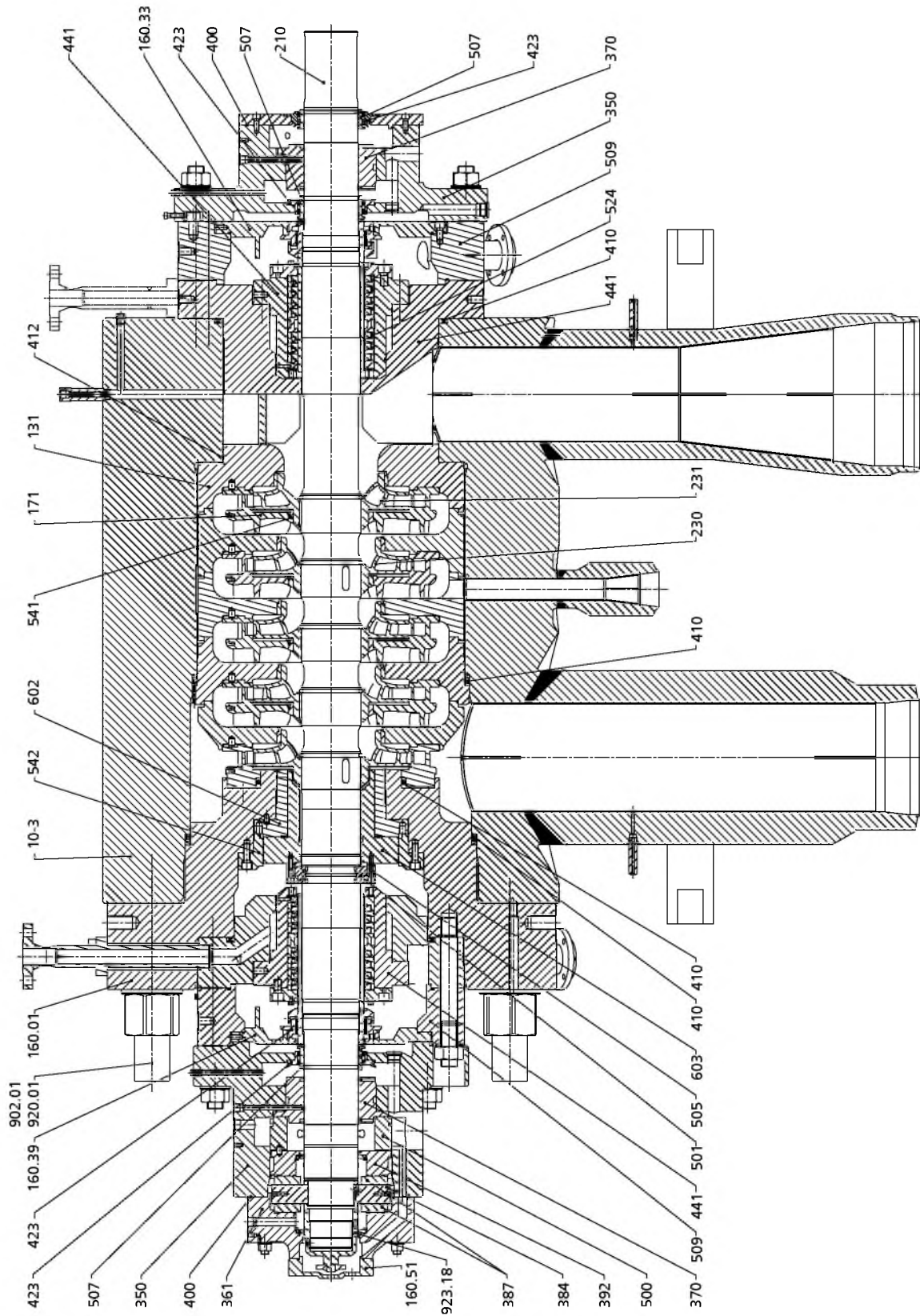
General assembly drawings with list of components

CHTD 6/6, pump with mechanical seal



General assembly drawing with list of components

CHTD 7/5, pump with floating ring seal

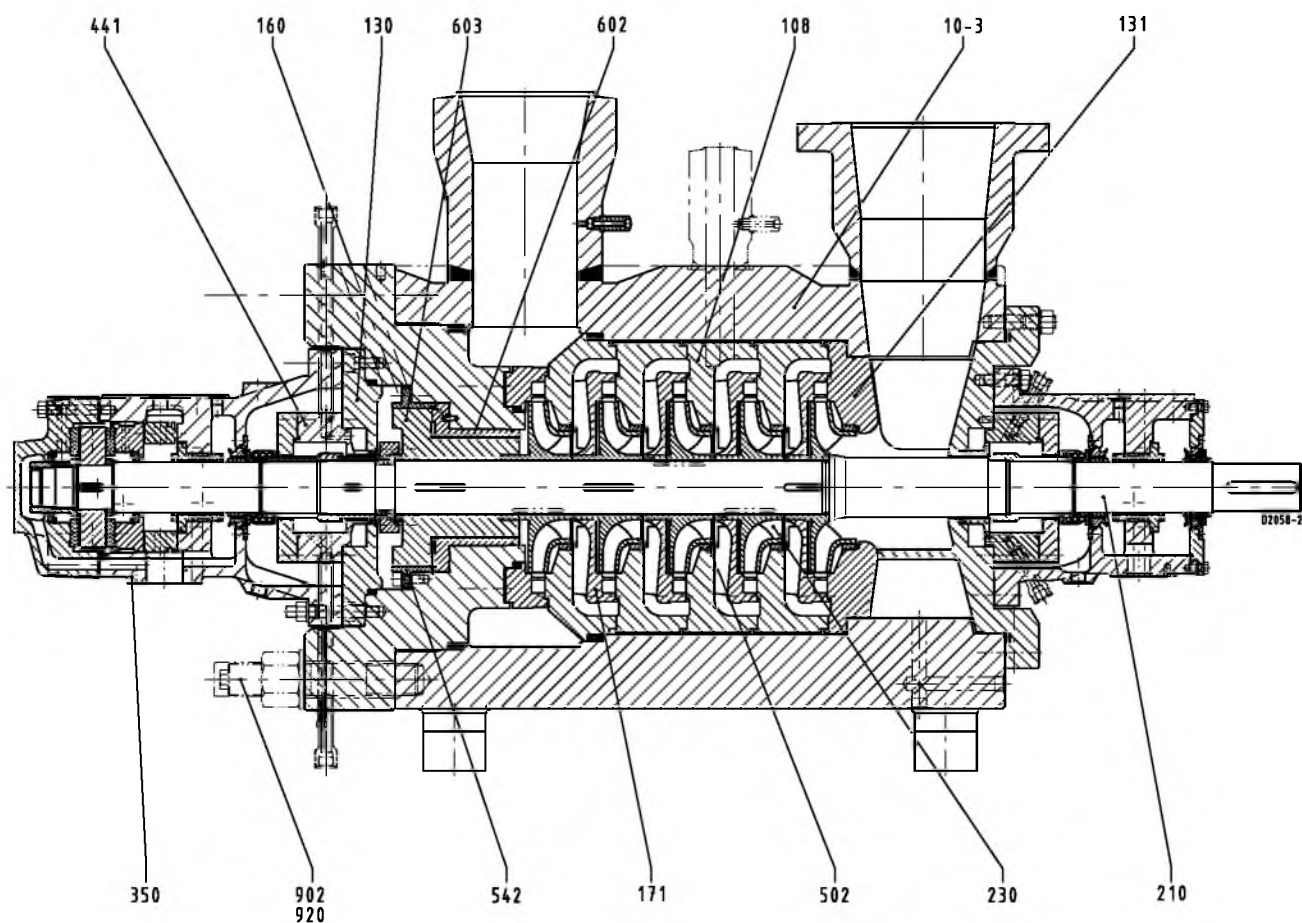


General assembly drawing with list of components

List of components and materials

Part No.	Description	Material selection
10-3	Barrel casing	Carbon steel, plated
108	Stage casing	Chrome steel
131	Inlet ring	Chrome steel
160.01	Cover	Chrome steel
160.33	Cover	Structural steel
160.39	Cover	Structural steel
160.51	Cover	Carbon steel
171	Diffuser	Chrome steel
210	Shaft	Chrome steel
230	Impeller	Chrome steel
231	Suction stage impeller	Chrome steel
350	Bearing housing	Grey cast iron / cast steel
360	Bearing cover	Carbon steel, plated
361	Non-drive end bearing cover	Grey cast iron
370	Bearing shell	Case-hardened steel, plated
384	Thrust bearing plate	Tempered steel
387	Thrust bearing segment	Carbon steel, plated
392	Bearing segment carrier	Tempered steel
400	Gasket	Synthetic fibre
410	Profile seal	PTFE compound
412	O-ring	Elastomer seal
423	Labyrinth ring	Bronze alloy
433	Mechanical seal, complete	-
441	Shaft seal housing	Chrome steel
500	Ring	Tempered steel
501	Segmental ring	Chrome steel
502	Casing wear ring	Chrome steel
505	Loose collar	Chrome steel
507	Thrower	Chrome steel / tempered steel
509	Intermediate ring	Structural steel
524	Shaft protecting sleeve	Chrome steel
541	Interstage bush	Chrome steel
542	Throttling bush	Chrome steel
602	Balance disc seat	Chrome steel
603	Balance drum	Chrome steel
902.01	Stud	Tempered steel
920.01	Nut	Tempered steel
923	Shaft nut	Tempered steel

Teileverzeichnis/List of Components



Werkstoffe/Materials

Teile-Nr. / Part No.	Benennung / Designation	Werkstoffauswahl / Material Selection
10-3	Mantelgehäuse - barrel	C-Stahl plattiert / C-steel plated
108	Stufengehäuse - stage casing	Cr-Stahl / Cr-steel
130	Gehäuseteil - casing part	Cr-Stahl / Cr-steel
131	Einlauftring - inlet ring	Cr-Stahl / Cr-steel
160	Deckel - cover	Cr-Stahl / Cr-steel
171	Leitrad - diffuser	Cr-Stahl / Cr-steel
210	Welle - shaft	Cr-Stahl / Cr-steel
230	Lauftrad - impeller	Cr-Stahl / Cr-steel
350	Lagergehäuse - bearing housing	Grauguß / cast iron
441	Gehäuse für Dichtung - seal casing	Cr-Stahl / Cr-steel
502	Spaltring - casing wear ring	Cr-Stahl / Cr-steel
542	Drosselbuchse - throttle bush	Cr-Stahl / Cr-steel
602	Entlastungsgegenscheibe - balance counter disc	Cr-Stahl / Cr-steel
603	Entlastungskolben - balance drum	Cr-Stahl / Cr-steel
902	Stiftschraube - stud	Vergütungsstahl / quenched a. tempered steel
920	Mutter - nut	Vergütungsstahl / quenched a. tempered steel

Technische Änderungen bleiben vorbehalten.
We reserve the right to alter specification

XBS

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1860.1/02-90



Hochdruck- Mantelgehäusepumpe

High-Pressure Barrel-Type Pump

Baugrößen 3 - 6

Pump sizes 3 - 6

Einsatzgebiete

- Speisewasser- und Kondensatförderung in Kraftwerken
- Kesselspeisung und Kondensatförderung in Industrieanlagen
- Druckwassererzeugung in Press-, Entrindungs- und Endzunderungsanlagen

Fields of Application

- Handling feed water and condensate in power stations
- Boiler feeding and condensate handling in industrial plants
- generation of pressurized water, e.g. for presses, decorticator and descaling plants

Betriebsdaten

Förderstrom bei max. Drehzahl	Q bis	1278 m ³ /h
	(Q bis	355 l/s)
Förderhöhen	H bis	4000 m
Förderguttemperatur	t bis	200 °C
Pumpenzulaufdruck	p _s bis	30 bar
Pumpenenddruck	p _d bis	400 bar
Drehzahlen	n bis	6750 min ⁻¹

Operating Data

Capacity at max. speed	Q up to	1278 m ³ /h
	(Q up to	355 l/s)
Heads	H up to	4000 m
Temperature of medium handled	t up to	200 °C
Pump suction pressure	p _s up to	30 bar
Pump discharge pressure	p _d up to	400 bar
Speeds	n up to	6750 min ⁻¹

Bauart

Horizontale Mantelgehäusepumpe mit Radialrädern, einströmig, mehrstufig. Einlauf einströmig

Design

Horizontal barrel type pump with radial impellers, single flow, multistage. Single flow entry

Pumpenfüße

Mantelgehäuse

Ort / Stellung

Achsmitte

Pump Feet

Barrel

Location / Position

centerline

Radiallager, Schmierung

Gleitlager, Druckölschmierung

Journal Bearing, Lubrication

Plain bearing, forced oil lubrication

Axiallager, Schmierung

Gleitlager, Druckölschmierung

Thrust Bearing, Lubrication

Plain bearing, forced oil lubrication

Entlastungseinrichtung

Axialschubausgleich durch die hydraulische Entlastungseinrichtung an der Druckseite. Entlastung durch Doppelkolben.

Balancing Device

Thrust compensation by hydraulic balancing device located at the discharge side. Balancing by double piston.

Wellendichtung

Gleitringdichtung mit Zirkulation bzw. Zirkulation und Mantelkühlung in Cartridge-Bauweise
Die Gleitringdichtung ist mit Wellenhülse und Dichtungsdeckel ohne Einstellarbeiten auswechselbar.

Shaft Seal

Mechanical seal with circulation or with circulation and shroud cooling
The mechanical seal including shaft sleeve and seal cover can be replaced without further adjustments.

Stutzenstellung

Saugstutzen: Radial, senkrecht nach oben oder unten
Druckstutzen: Radial, senkrecht nach oben oder unten
Anzapfung: Radial 45° oben rechts
(Blickrichtung vom Antrieb)

Nozzle Orientation

Suction nozzle: radially, vertically upwards or vertically downwards
Discharge nozzle: radially, vertically upwards or vertically downwards
Tapping nozzle: radially 45° top right
(as viewed from suction side)

Schweißstutzen/Flansche

Anschlussmaße nach EN oder ASME.

Weld Nozzles/Flanges

Connection dimensions according to EN or ASME.

Antrieb

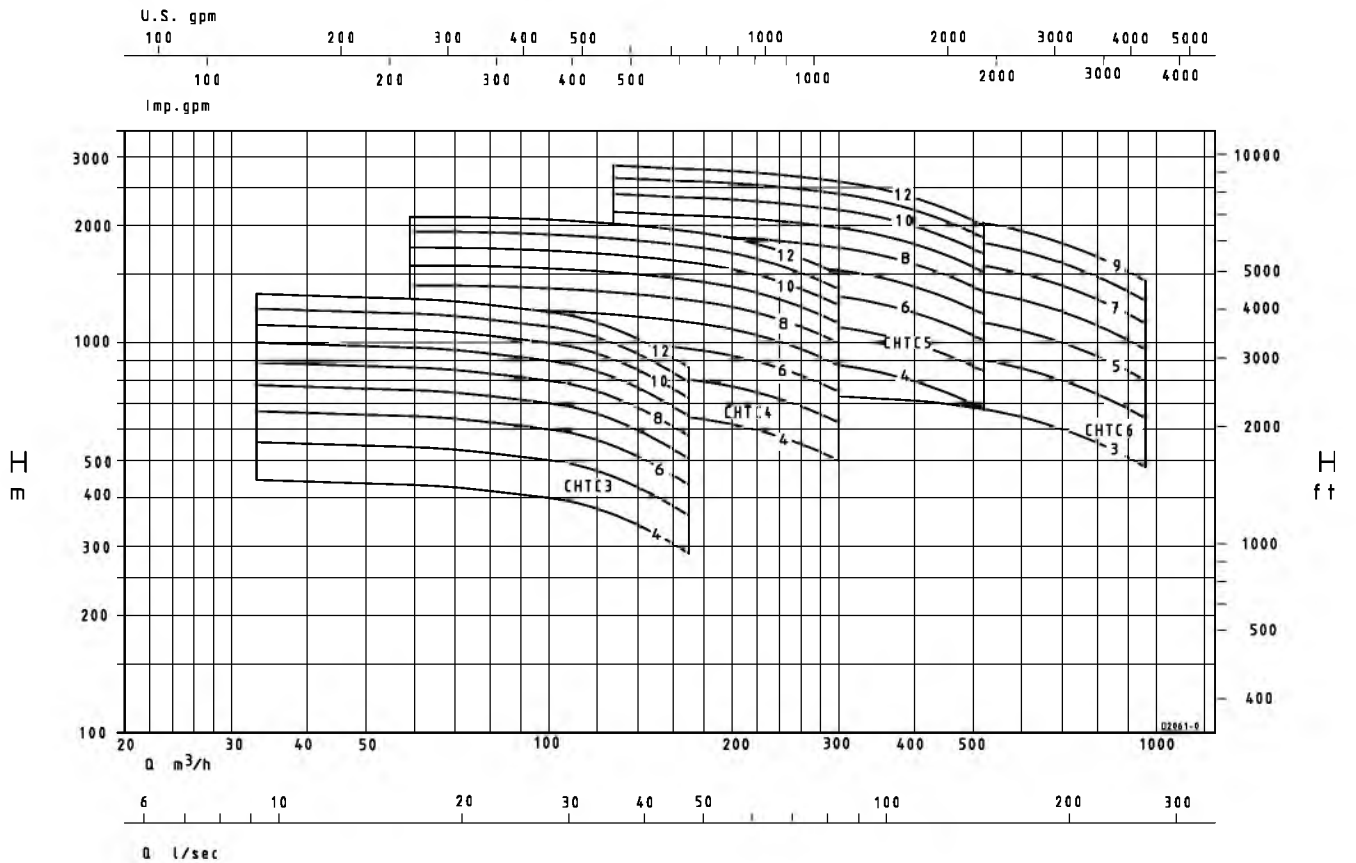
Direkt durch E-Motor, Turbine oder Verbrennungsmotor, oder indirekt über Getriebe, hydraulische Regelkupplung oder Getrieberegelnkupplung.

Drive

Direct drive by electric motor, turbine or combustion engine, or indirectly through a gearbox, hydraulic coupling or variable speed coupling.

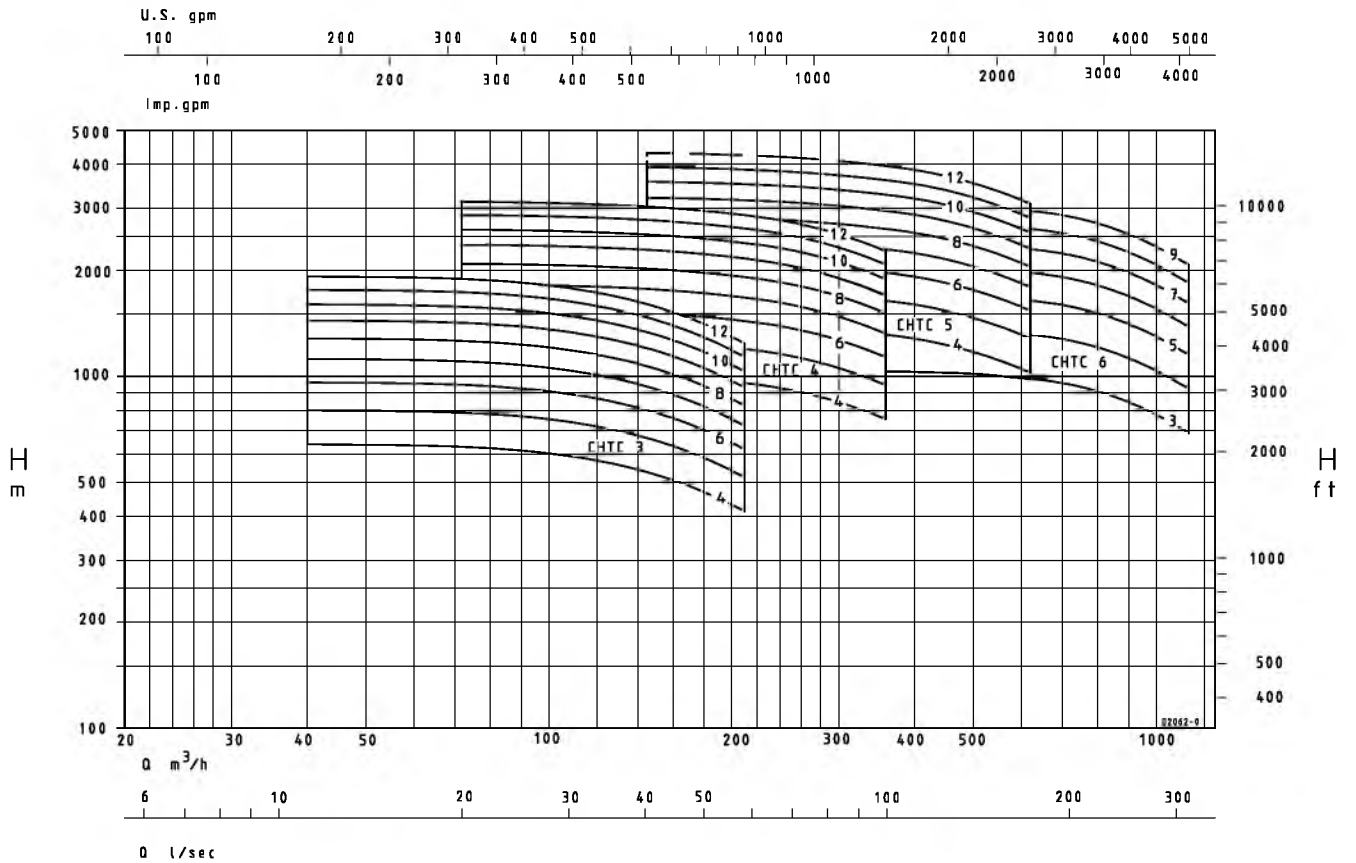
Sammelkennfeld 50 Hz $n = 2950 \text{ min}^{-1}$

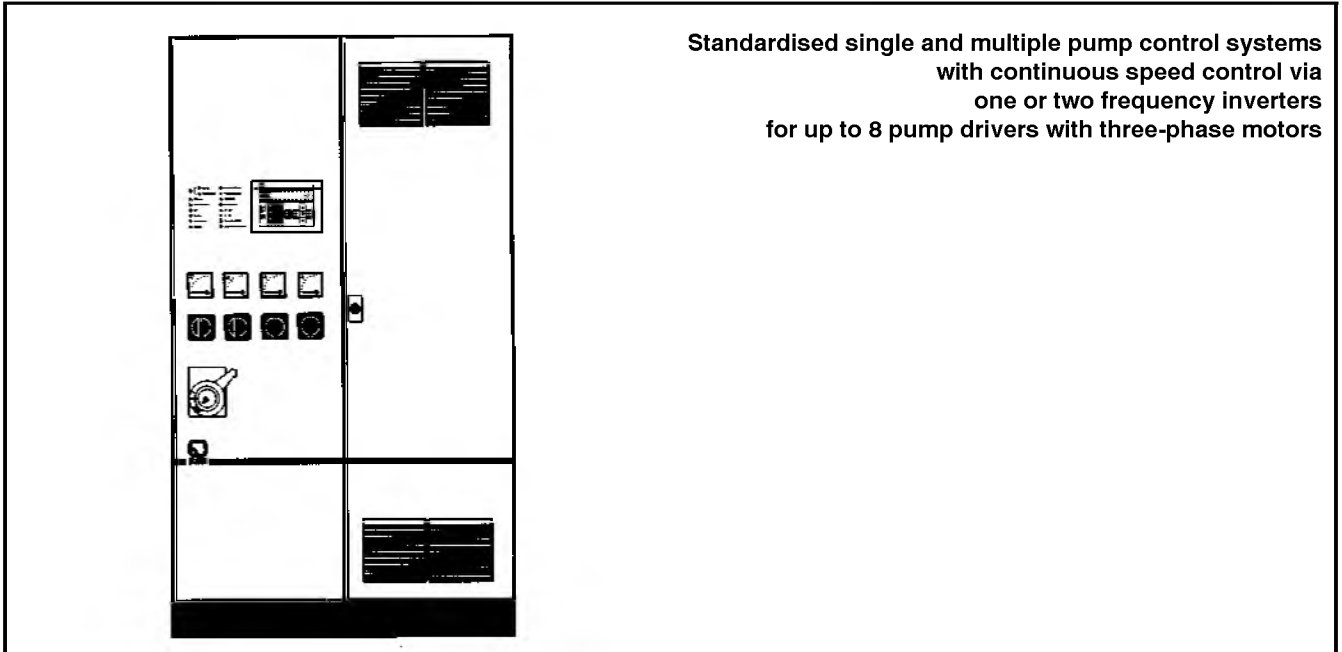
Selection Chart 50 Hz



Sammelkennfeld 60 Hz $n = 3550 \text{ min}^{-1}$

Selection Chart 60 Hz





**Standardised single and multiple pump control systems
with continuous speed control via
one or two frequency inverters
for up to 8 pump drivers with three-phase motors**

Fields of Application

- Industry: Process loops, industrial water supply, cooling, lubrication and other process engineering applications.
Water extraction, water treatment, water supply, waste water disposal.
- District heating: cogeneration plants, heat transfer stations

Performance Data

Number of pumps: 1 to 8 pumps, different pump sizes possible.
Motor ratings: up to 400 kW
Number of frequency inverters: 1 or 2
Mains voltages: 3 x 400 V ± 10 %
3 x 500 V ± 10 %
Mains frequency: 50 Hz

Functional Description

The Hyamaster ISB control system is specially designed for pumps with three-phase motors. It consists of the electronic control and monitoring unit and all necessary power components such as main switch, frequency inverter, contactors, fuses. All components are installed in a control cabinet. The design is based on a modular concept, thus achieving the necessary flexibility to provide solutions for all applications that occur. A manual-0-automatic switch for each pump provides for both manual and automatic operation.

Closed loop control: Transmitters installed in the plant transfer the current plant data to the control unit. This unit continuously compares the actual value with the set values and provides for continuously variable correction of any deviations.

Open loop control: The open and closed loop control system integrates process-related optimisations such as startup and shutdown of additional pumps and standby control which will be performed automatically depending on the process conditions. Pump change-over, periodic check of operation, and changing of set value can be freely selected using a realtime clock.

Monitoring: The components are monitored automatically by the electronic control system. In the event of any malfunctions, the process is maintained in operation as far as possible and the malfunction is reported and recorded.

Low load operation: Pumps with different performance characteristics, e.g. jockey or low load pumps, can be connected upstream of the main pumps in several combinations or can be operated in connection with the main pumps on a separate frequency inverter, if necessary.

The bad-value evaluation of a maximum of 3 measuring points assures optimum plant supply.

Control Modes

- Pressure / differential pressure
- Pressure / differential pressure (flow-dependent set value)
- Flow
- Level
- Temperature / differential temperature (related to ambient temperature)
- Temperature / differential temperature (related to pressure / differential pressure)
- Bad-value evaluation of a maximum of 3 measuring points (optimum plant supply)

Designation

Hyamaster ISB 8 - 300 / 2

Type series _____
Industry standard _____
Number of pumps _____
Rating of the largest motor: kW x 10 (example: 30 kW) _____
Number of frequency inverters _____

Variants on request

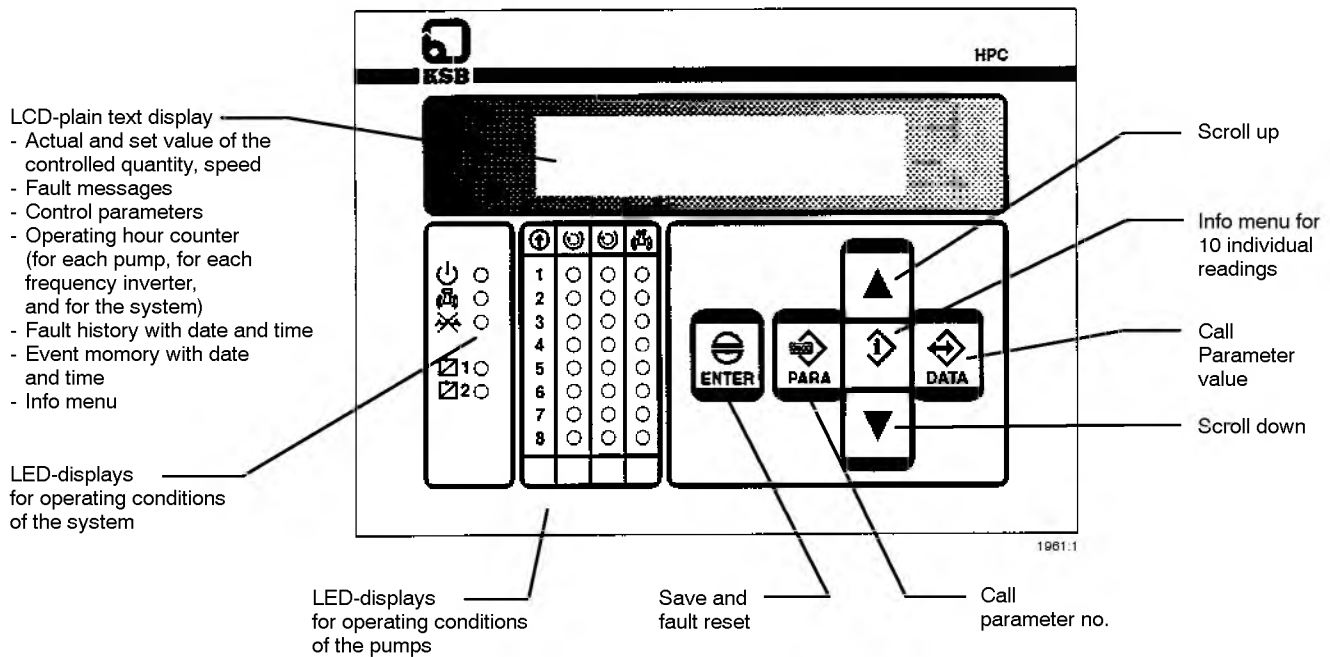
- Motor ratings
- Number of frequency inverters
- Voltage
- Enclosure
- Customer specification
- Hyamaster SPS with Siemens programmable logic controller Simatic S7 for systems with bus connection and more complex control tasks



General Member of

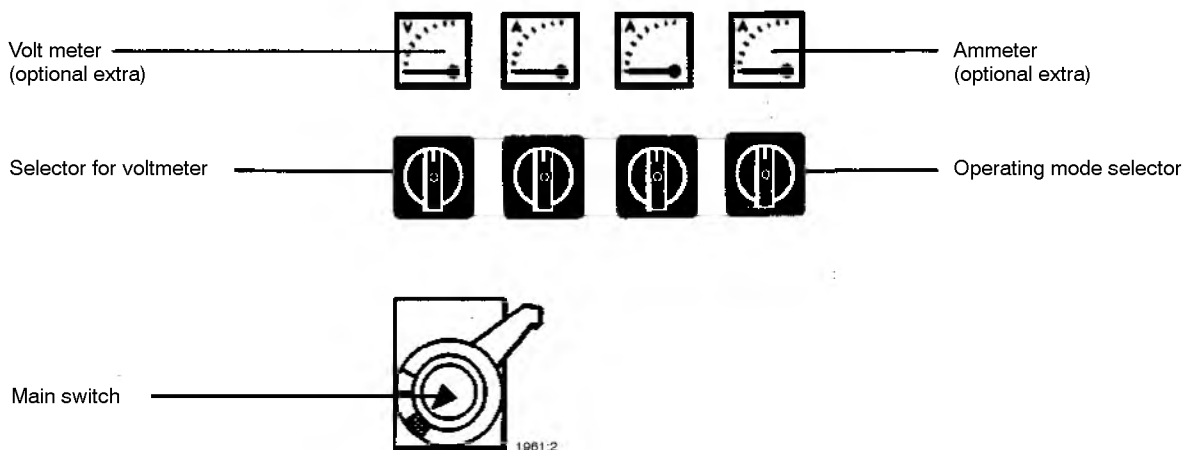


Display and operation on location



The electronic control unit is a powerful microcontroller based device for control and monitoring jobs with integrated display and manual control features.

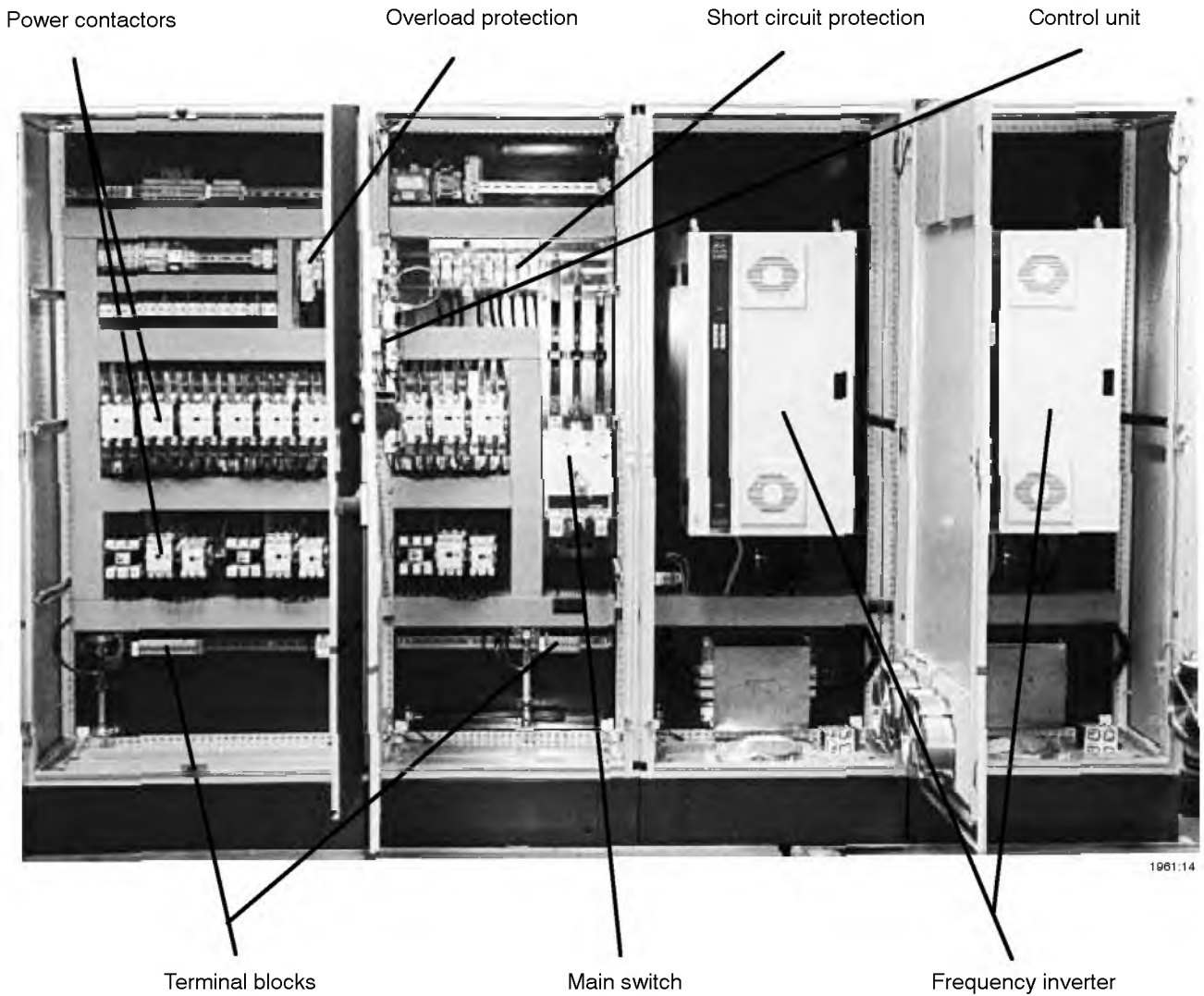
The **LCD plain text display** clearly shows the current system information. **Parameter setting** is menu-controlled via the keypad. The parameters are stored in non-volatile memory to prevent loss of data in case of a power failure. The **LED displays** show stand-by mode, operation or malfunction of the pumps and operation of the frequency inverters.



Equipment example for 3 pumps

An **operating mode selector** is assigned to each pump, thus enabling an individual pump to be excluded from the automatic process. The pump can be operated **manually** on the mains.

This manual operation is purely electromechanical without any electronic control system. This increases reliability, e.g. in the event of failure of the feedback value transmitter.



Control cabinet Hyamaster ISB
for 3 pumps with 75 kW each and 2 frequency inverters

The control system is completely equipped and wired. The steel sheet housing complies with enclosure IP 54 with internal components in IP 41. The components are selected under consideration of pump-specific requirements and with a view to the highest possible reliability. The control system is designed according to DIN VDE 0660, part 500 / DIN EN 60439, part 1; DIN VDE 0113 / part 1 / DIN EN 60204 / part 1, DIN VDE 0470 / IEC 70 / VBG 4; EN 50081 and EN 50082.

The frequency inverter is the control element for speed adjustment of the pump motor. The variable pump performance curve generated in this way allows for continuously variable and therefore optimal operation throughout the entire control range. All the frequency inverters used in the Hyamaster ISB system have been adapted to the most varying pump designs with a view to noise level, mains feedback, radio interference level etc.

Basic Equipment

Housing and Internal Parts

- Steel sheet housing, colour to RAL 7032, IP 54, for indoor installation without base
- Main switch (load switch) to be operated from the front, can be locked
- Ventilation of control cabinet with filter fan (including thermostat)
- Protective devices (fuses, motor protection)
- Frequency inverter
- Control transformer; control voltage 230 V AC, 24 V DC
- Electronic control equipment (installed in front panel)
- Manual-0-automatic switch for each pump (installed in front panel)

Analogue input connections

- Feedback value 1 (controlled quantity) 0/2 - 10 V or 0/4-20 mA, resistance KTY 10
- Feedback value 2 (overlay quantity - e.g. flow rate, reproduction of pipeline curve etc.) 0/2 - 10 V or 0/4-20 mA, resistance KTY 10
- External set value 0/2-10 V or 0/4-20 mA, resistance KTY 10

Digital input connections

- Automatik-on-off, 24 V DC
- PTC resistor or clixon cut-out under automatic operation
- Dry run protection under automatic operation, off-load voltage 24 V DC
- Change-over to second parameter set 24 V DC
- Remote reset of general fault message contact via impulse, 24 V DC
- Peak load release 1-7 pumps, 24 V DC
- External pump change-over via impulse, 24 V DC

Digital output connections

- Relay output connections 250 V AC, 1 A (zero potential)
- General fault message as change-over contact
- Control unit operational message as change-over contact

Interfaces

RS 232/485, D-Sub 9 female

Auxiliary energy

- for transmitter 24 V DC, max. 100 mA

Safety concept for the complete system

Monitoring the pumps and the hydraulic system

- Overcurrent monitoring
- Full motor protection with PTC resistors or bimetal switches for automatic operation, monitoring and message for manual operation
- Dry run protection

Reaction in case of faults

- Change-over to standby pump in case of failure of one pump set.
- On failure of a frequency inverter: change-over to mains operation of the motors or shut-down of all pumps or change-over to second frequency inverter (if available)

- Measuring signal monitoring with Life-Zero (4-20 mA) or (2-10 V)

If the measuring signal fails:

Message, fault contact, maintaining the pump speed or shutdown of the system (user-definable)

Protective measures to prevent malfunction

- Pump change-over periods can be defined by the user
- Intervals for periodic check of operation can be defined by the user

Optional Extras

Display and Operation (Installed on front panel)

- Operating hour counter for each pump
- Ammeter for each pump
- Signal lamps for operation and fault including thermistor relay for each pump
- Signal lamps for operation and fault for each frequency inverter
- Manual speed adjustment via potentiometer
- Voltmeter with phase change-over
- Phase lamps
- Lockable front frame with transparent window (IP 54)
- Frequency inverter display

Remote transmission on terminal blocks (DDC-messages)

- Operation and fault for each pump, zero-potential, max. 230 V, max. 1 A
- Operation and fault for each frequency inverter, zero-potential, max. 230 V, max. 1 A
- Position report of manual-zero-automatic switch for each pump, zero-potential, max. 230 V, max. 1 A
- Repair switch for each pump (at the pump)
- Buffer amplifier for analogue input/output: Feedback value 1, feedback value 2, external set value
- Remote interference option: automatic-off and remote-on-off for mains operation of each pump

Internal parts in control cabinet

- Double marking of component
- Light and socket connected before the main switch for each control field
- Lightning (overvoltage) protection of power input
- Mains monitoring: phase failure/phase inversion; under-/overvoltage
- Mains monitoring: voltage asymmetry
- Control cabinet heating with thermostat
- Wire marking with terminal number
- Wiring layout matched to circuit diagram layout

Variants on request

- Other voltages
- Higher powers
- Additional DDC messages
- Higher enclosures
- Soft starter
- Different motor ratings
- Motor gate valve control
- Component specifications

Notes for Planning

Caution

Special VDE guidelines and regulations of the local energy supply companies as well as local requirements must be adhered to.

Measurement and control lines

Actual value transmitter (type 16D)	3 x 0.75 mm ²	shielded	max. 100 m
Actual value transmitter (other)	... x 0.75 mm ²	shielded	max. 100 m
PTC resistor (per motor)	2 x 0.75 mm ²	shielded	
DDC lines, digital (24 V, DC)	... x 0.75 mm ²	shielded	
DDC lines, digital (220 V, AC)	... x 0.75 mm ²		
DDC lines, analogue (0/2-10 V or 0/4-20 mA)	... x 0.75 mm ²	shielded	max. 100 m

Motor power cables for standardised motors 3 ~ 400 V/50 Hz

 kW	≈ A	Minimum cross-section	Starting	Minimum design-base cross sections
		mm ²		
1.1 - 4	2.6 - 8.5	4 x 1.5	direct	DIN VDE 0100, part 430, supplement 1; current-carrying capacity of PVC-insulated cables and conductors, type of installation B 2 for an ambient temperature of 30 °C.
5.5 - 7.5	11.5 - 15.5	2 x 4 x 1.5	Y Δ	
11	22.5	2 x 4 x 2.5		
15 - 18.5	30 - 36	2 x 4 x 4		
22	43	2 x 4 x 6		
30	58	2 x 4 x 10		
37 - 45	72 - 85	2 x 4 x 16		
55	104	2 x 4 x 25		
75	142	2 x 4 x 35		
90	169	2 x 4 x 50		
110 -	on request			

Shielding of the motor power cables is required for observing the radio-interference suppression level, e.g. type NYCY or NYCWY. For cable lengths of 15 m and less, normal installation cables can be routed through steel armoured conduit or flexible metal tubing. Ducts and tubing made of plastic are unsuitable.

Total rated power

Total rated power = Motor rating x number of motors (incl. standby units, if any)

Heat losses

The heat losses generated by the frequency inverters dissipate into the **control unit room** via filter fans. It may be necessary to extract some or all that heat from the room. The relevant heat generation can amount to roughly 3-5 % of the motor rating.

Control cabinet dimensions

Hyamaster ISB with one frequency inverter

 kW	with 2 pumps			with 3 pumps			with 4 pumps			up to 8 pumps
	W	H	D mm	W	H	D mm	W	H	D mm	
1.1 - 4	600	800	250	600	1000	250	600	1000	250	on request
5.5 - 7.5	800	1000	300	800	1200	300	800	1200	300	on request
11 - 15	800	1800	400	800	1800	400	1200	1800	400	on request
18.5	800	1800	400	800	1800	400	1200	1800	400	on request
22 - 30	1200	1800	400	1200	1800	400	1800	2000	500	on request
37	1200	1800	400	1200	1800	400	on request			on request
45	1800	2000	500	1800	2000	500	on request			on request
55 - 75	1800	2000	500	2000	2000	500	on request			on request
90	2000	2000	600	2000	2000	600	on request			on request
110	on request			on request			on request			on request

Hyamaster ISB with two frequency inverters

 kW	with 2 pumps			with 3 pumps			with 4 pumps			up to 8 pumps
	W	H	D mm	W	H	D mm	W	H	D mm	
1.1 - 4	800	1200	300	800	1200	300	800	1200	300	on request
5.5 - 7.5	1200	1800	400	1200	1800	400	1200	1800	400	on request
11 - 15	1200	1800	400	1200	1800	400	on request			on request
18.5 - 22	1600	1800	400	1600	1800	400	on request			on request
30 - 37	1600	1800	400	1800	2000	500	on request			on request
45	1800	2000	500	2000	2000	500	on request			on request
55 - 75	2400	2000	500	2800	2000	500	on request			on request
90	on request			on request			on request			on request

Accessories

Pressure transmitter

	Measuring range (bar)	Max. pressure (bar)
Auxiliary energy 24 V DC (available from open and closed loop control unit)	0 - 1	25
Analogue output; 4 - 20 mA; two-conductor cable, max. working resistance 600 Ohm	0 - 2.5	
Ambient temperature -20 °C to +70 °C	0 - 4	
Pressure connection via olive-ring pipe union for 6 mm pipe	0 - 6	
Product temperature -20 °C to +100 °C	0 - 10	
	0 - 16	

Pressure / Differential pressure transmitter

	Measuring range (bar)	Max. pressure (bar)
(Wall mounted)	0 - 1	16
Auxiliary energy 24 V DC (available from open and closed loop control unit)	0 - 2.5	25
Analogue output; 4-20 mA; three-conductor cable, max. working resistance 500 Ohm	0 - 4	25
Ambient temperature -10°C to + 50 °C	0 - 6	25
Pressure connection via olive-ring pipe union for 6 mm pipe	0 - 10	25
Max. product temperature +70°C	0 - 16	25

Flow rate transmitter

	Measuring range (m ³ /h)	DN	PN
Magnetic-inductive measuring principle (MIF):	12	25	30
Compact design	24	32	30
Auxiliary energy 230 V AC	36	40	30
Analogue output; 0/4-20 mA; adjustable, max. working resistance 750 Ohm	60	50	30
Pulse output; adjustable; 0-1000 pulses/unit	120	65	30
Conductivity of medium handled $\geq 5 \mu\text{ s/cm}$	180	80	30
Flanged connection	240	100	16
Ambient temperature -10°C to + 60 °C	420	125	16
Product temperature -25°C to +130 °C	600	150	16
	1080	200	10
	1800	250	10
Ultrasonic measuring principle:	18	32	40
- Measurement pick-up	30	40	40
Flanged connection	45	50	50
Product temperature - 20 °C to +100 °C	75	65	16
- Measuring transducer (wall mounted)	100	80	16
Auxiliary energy 230 V AC	180	100	16
Analogue output 0/4-20 mA, max. working resistance 1000 Ohm	260	125	16
Frequency output 0 - 3.3 kHz	700	150	16
Pulse output 0 - 15 Hz	1500	200	16
	2000	250	16

Flow control device

	Setting range (cm/s)
Calorimetric measuring principle, for dry running protection incl. transducer	ca. 3 - 300
- Measurement pick-up	
Sensor connection G 1/2 A	
Product temperature -25 °C to +80 °C	
- Measuring transducer (mounted in control cabinet)	
Auxiliary energy 230 V AC	
Zero-potential output; one change-over contact; max. 230 V, max. 1 A	

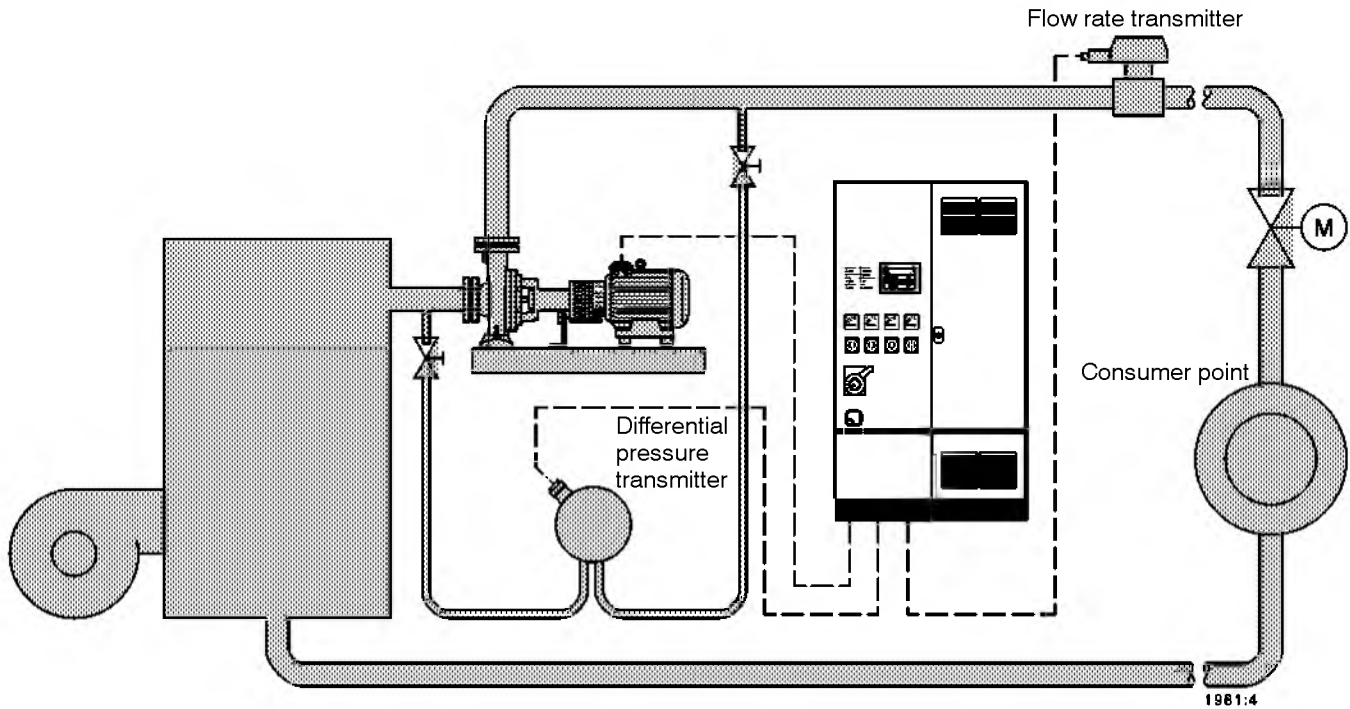
Accessories
Level transmitter

	Measuring range (mm)	
Capacitive measuring principle Auxiliary energy 24 V DC (available from open and closed loop control unit) Analogue output; 4-20 mA; two-conductor cable, max. working resistance 600 Ohm Threaded connection G 1 1/2 A Ambient temperature -10 °C to +60 °C Product temperature -50 °C to +100 °C Bar electrode made of steel; fully insulated	1000 to 4000 (please indicate required bar length in the purchase order)	
	Measuring range (bar)	
Hydrostatic measuring principle Auxiliary energy 24 V DC (available from open and closed loop control unit) Analogue output; 4-20 mA; two-conductor cable, max. working resistance 600 Ohm Threaded connection G 1 1/2 A Pressure transmitter for vertical installation Length of connecting pipe: 1 m to 20 m Ambient temperature -20°C to + 60 °C Product temperature -20°C to +80°C	0 - 0.1 to 0 - 20 (Please indicate required measuring range and length of connecting pipe in the purchase order)	

Temperature sensor

	Measuring range (°C)	
Clip-on sensor	0 to +120	
Immersion-type sensor with 100 mm stainless steel immersion sleeve Ø 15 R 1/2 A Max. test pressure 25 bar	0 to +120	
Immersion-type sensor with transducer with 160 mm stainless steel protective sleeve Ø 9 PN 16	-20 to +350	

Example: Heat / District heat supply system with DFS curve

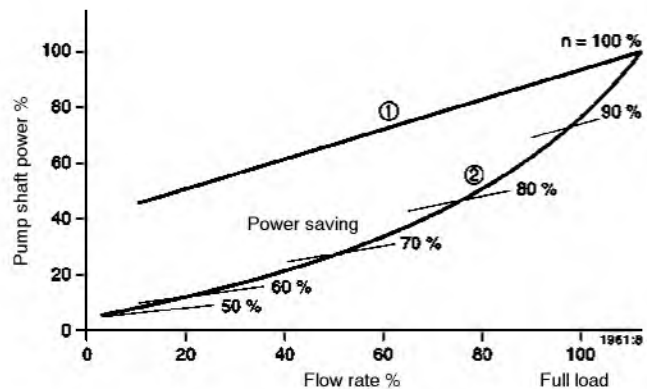
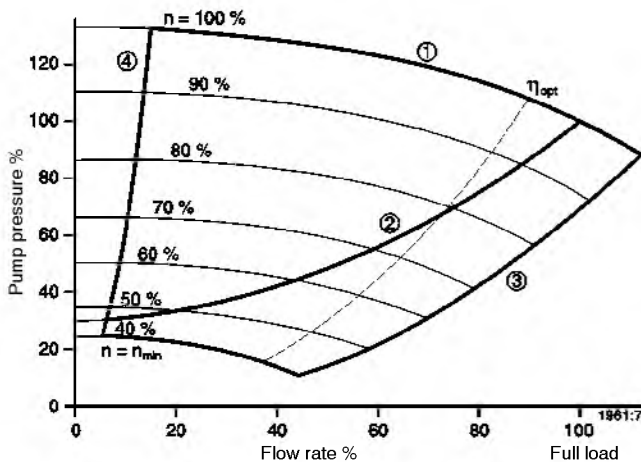


Control task:

Maintaining the differential supply pressure at all bad-value points, even with changing operating conditions and interferences, without requiring measuring points at the far end of the heating system.

In many heat / district heat supply systems, it is difficult to detect bad-value points (points where the supply pressure is too low at times) in the piping system. The **DFS** curve (differential pressure control with flow-dependent set point adjustment) allows optimised control without information about bad-value points.

With the help of differential pressure and flow rate measurements, the flow-dependent influence of pipe friction losses is compensated. The pumps are in continuously variable operation from low-load operation with small pump heads to full-load operation with high heads. The feedback signals can be tapped in the pumping station, obviating the complex and defect-prone transmission of measurements taken at the bad-value points.

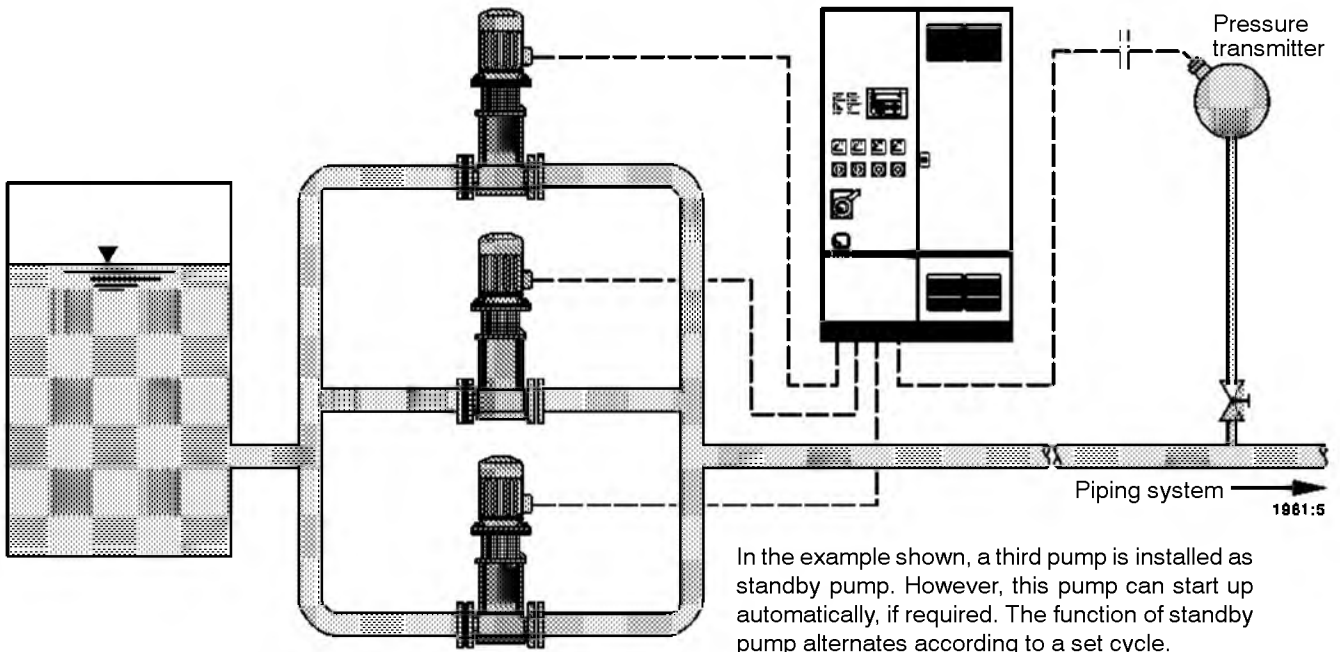


η_{opt} Optimum pump efficiency curve

- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Duty point curve of pump in controlled operation on frequency inverter ($n = \text{variable}$)
- ③ Limit for continuous operation (max.)
- ④ Operating limit (min)

- ① Pump power input curve at fixed speed ($n = 100\%$)
- ② Pump power input curve for controlled operation at frequency inverter ($n = \text{variable}$)

Example: Supply system with peak-load operation

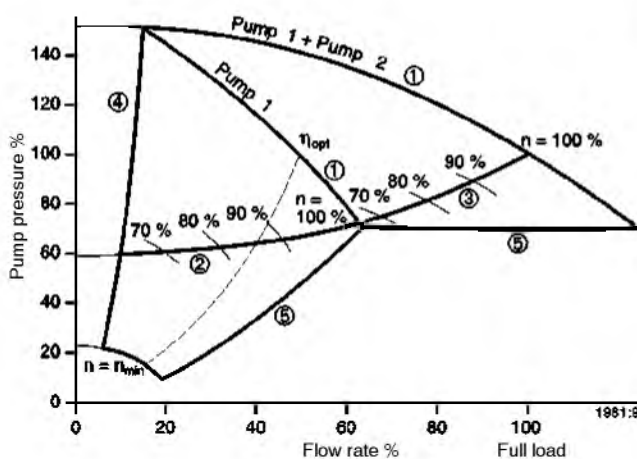


Control task:

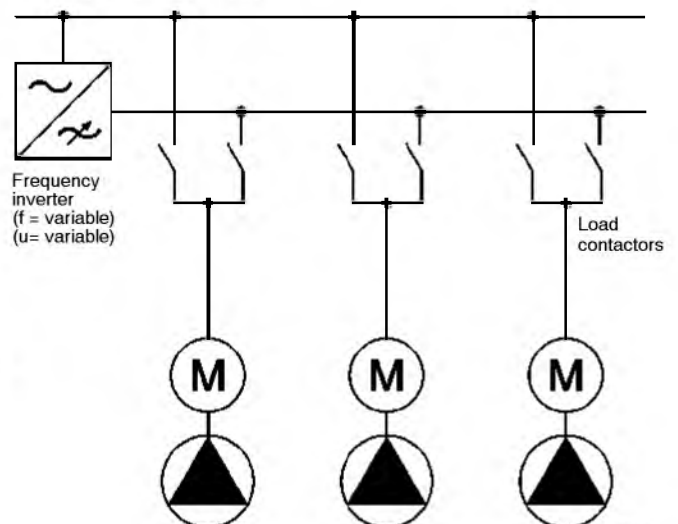
Maintaining constant pressure at a point of reference despite widely differing and fluctuating consumption.

Splitting the total flow rate on several pumps allows a proportionate reduction in pump and frequency inverter power. Efficiencies in part-load operation are higher than when using a full-load pump. Pressure is kept constant by infinitely variable speed adjustment of one pump.

This base-load pump provides the required flows up to its max. capacity. For higher consumption, a peak-load pump is switched on automatically. Pressure, however, is still controlled by the base-load pump. Pressure deviations, which occur when the peak-load pumps are switched on or off, generally do not affect the process.



Mains 3 x 400 V AC (f = 50 Hz)

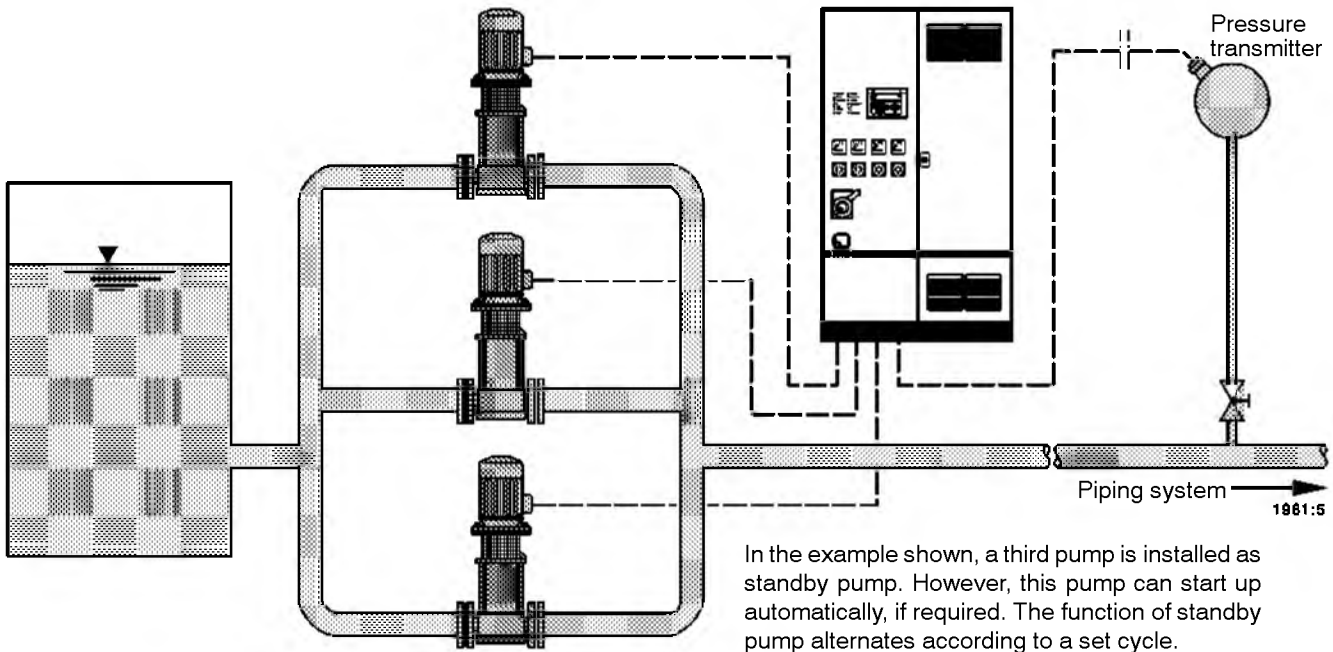


Wiring principle

η_{opt} Optimum pump efficiency curve

- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Duty point curve of pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ③ Duty point curve for controlled operation with
1 peak-load pump directly connected to the mains ($n = 100\%$)
1 base-load pump connected to a frequency inverter ($n = \text{variable}$)
- ④ Limit for continuous operation (min)
- ⑤ Operating limit (max)

Example: Supply system with two frequency inverters



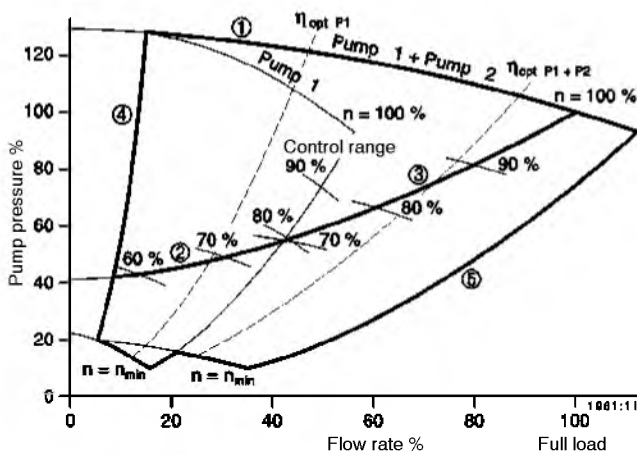
In the example shown, a third pump is installed as standby pump. However, this pump can start up automatically, if required. The function of standby pump alternates according to a set cycle.

Control task:

Maintaining constant pressure at a point of reference, even with changing operating conditions and interferences.

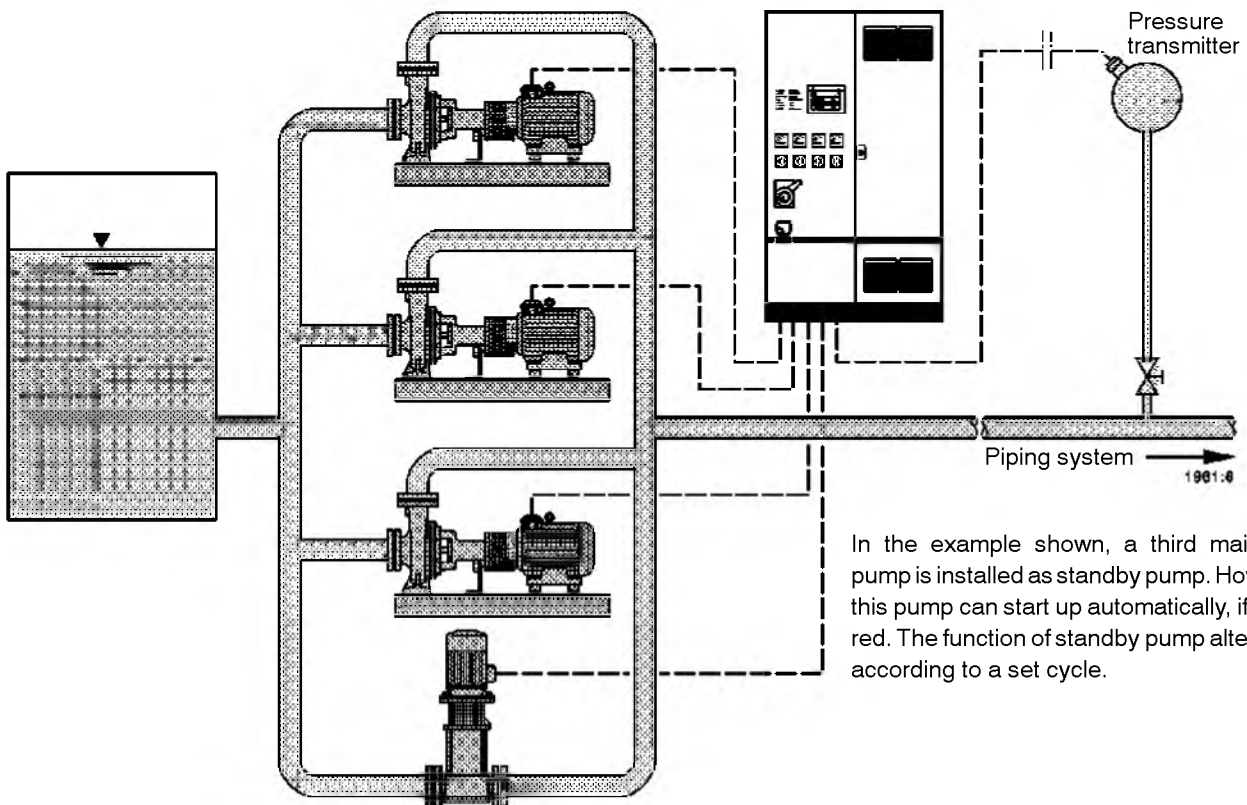
In conventional pumping systems, unwanted pressure fluctuations occur, due to changes in inlet pressures, quantities tapped and pressure losses in the supply system, which are compensated by a high-level distributing tank.

In the present example, the Hyamaster ISB takes on the function of the high-level tank in maintaining a constant supply pressure at a point of reference. Two pump sets with one frequency inverter each, running both in single and parallel operation, cover the entire flow range from minimum flow to full load. The pumps operate in the best-efficiency range. The second frequency inverter also serves as a standby unit.



- η_{opt} Optimum pump efficiency curve
- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Duty point curve of pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ③ Duty point curve of two parallel pumps in controlled operation at peak load on two frequency inverters ($n = \text{variable}$)
- ④ Limit for continuous operation (min)
- ⑤ Operating limit (max)

Example: Low-load and main-load pumps with up to 2 frequency inverters

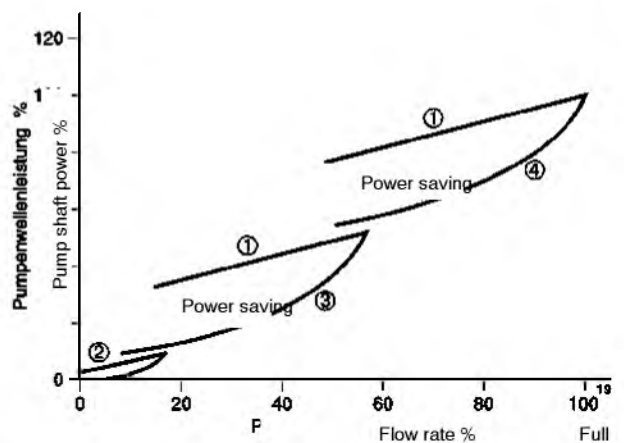
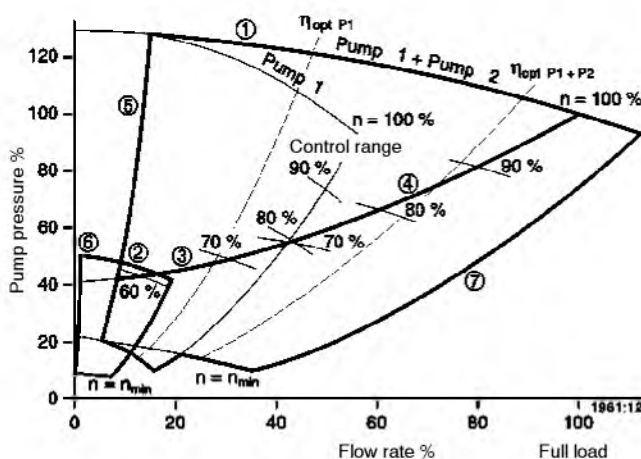


Control task:

Optimising the low-load operation of the hydraulic system.

Even at low speeds, continuously speed-controlled pumps require a certain minimum flow rate. In many cases, however, these minimum flows are much too high. To avoid pump damage in the long run, the flow rate must not fall below this limit in continuous pump operation. In the low-load range below this limit, a hydraulic bypass is normally used.

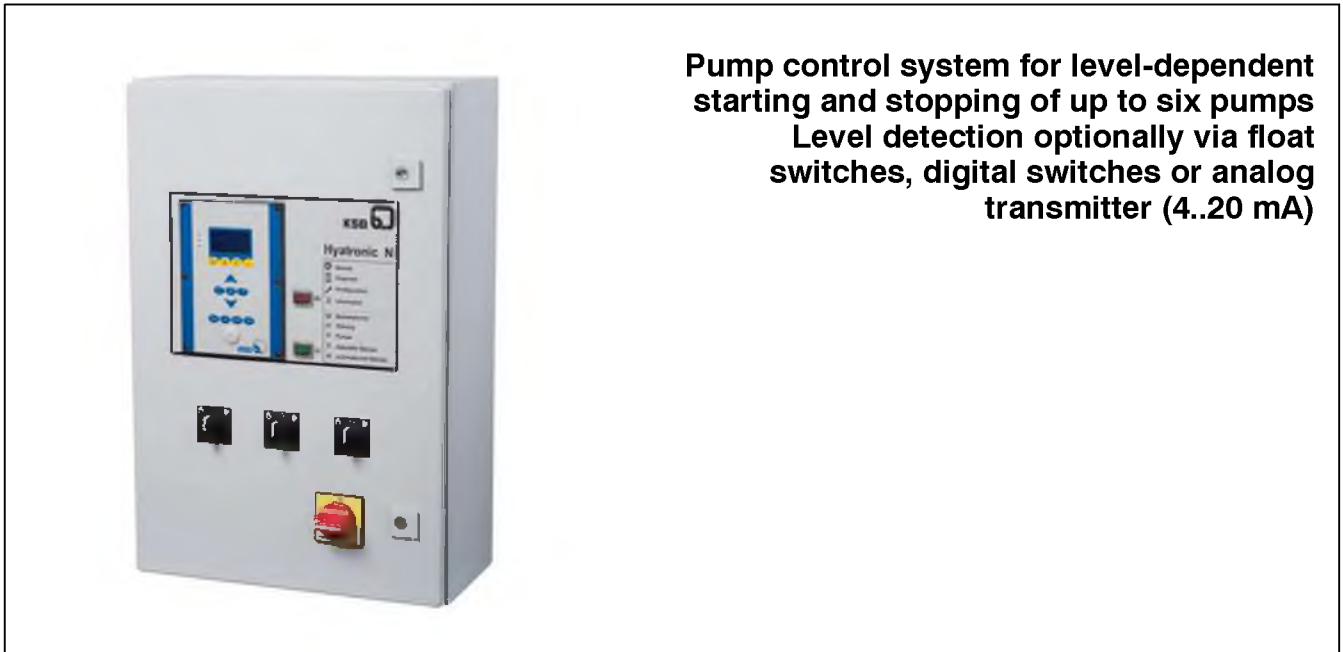
However, the flow routed through this bypass cannot be used. A low-load pump which is rated for this flow range and operates at optimum efficiency, can expand the control range of the entire system to include this low-load range.



η_{opt} Optimum pump efficiency curve

- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Characteristic curve of low-load pump ($n = 100\%$)
- ③ Duty point curve of main-load pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ④ Duty point curve of two parallel main-load pumps in controlled operation at peak load with two frequency inverters ($n = \text{variable}$)
- ⑤ Limit for continuous operation (min), main-load pump
- ⑥ Limit for continuous operation (min), low-load pump
- ⑦ Operating limit (max)

- ① Pump power input curve at fixed speed ($n = 100\%$)
- ② Power curve curve of low-load pump ($n = 100\%$)
- ③ Power curve of pump in controlled operation at base load with 1 main-load pump on frequency inverter ($n = \text{variable}$)
- ④ Power curve of pump in controlled operation at peak load with 2 main-load pumps in parallel on two frequency inverters ($n = \text{variable}$)



Pump control system for level-dependent starting and stopping of up to six pumps
Level detection optionally via float switches, digital switches or analog transmitter (4..20 mA)

Applications

Level-dependent control of up to six pumps in irrigation and drainage duties, e.g.:

- Lifting units
- Collecting tanks
- Lifting stations
- Waste water treatment plants
- Biological filtering systems
- And many more

Operating data/technical specifications

For pumps with power ratings from 0.55 to 22 kW
(higher ratings on request)

For up to 6 pumps (usually 3 pumps)

4-wire or 5-wire system

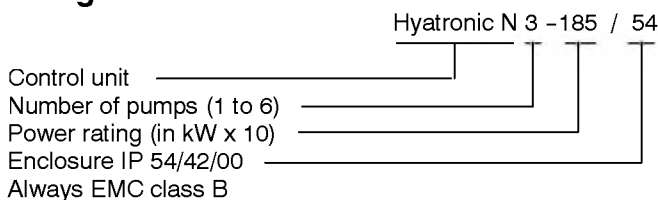
Mains voltage 3~400 V, 50 Hz

(other voltages on request)

Max. voltage fluctuations +6/-10% to IEC 38

Ambient temperature 0 to +45 °C max.

Designation



Function

Hyatronic N is a level-dependent pump control and monitoring unit with display for controlling up to six pumps.

Liquid levels can be detected either via float switches, digital transmitter or analog transmitter (4..20 mA). Pumps are sequenced in as a function of liquid level.

Hyatronic N can be used in tank draining and filling processes. The ATEX-compliant variant of the control unit can be used for pumps in potentially explosive atmospheres. In this case, the control unit must be installed outside the potentially explosive atmosphere.

Other functions of Hyatronic N:

- Automatic pump changeover for even distribution of operating hours among the pumps connected in base load operation
- Automatic pump changeover in the case of a pump fault to ensure maximum availability and operating reliability
- Automatic stand-by function
- Automatic time-of-day based functional check run to prevent pump seizure
- Manual emergency operation
- Lack-of-water monitoring in filling mode
- Automatic restart after power failure or lack of water with user-definable time delay
- Display of faults in plain text
- Optional: individual signals
- And many more

Certification

Certified quality management to ISO 9001

Operation and display

1 Control unit

The control unit is based on a PLC which performs all control, monitoring and signalling functions and is equipped with a display for convenient operation.

Volt-free signals provided as a standard:

General fault message

General "System Operational" message

Optional volt-free signals:

Operation per pump

Fault per pump

2 Operating mode selector switch

Via the operating mode selector switch, the user can assign the following operating modes to the individual pumps:

Automatic	Either of the following operating modes is assigned to the individual pumps as required: <ul style="list-style-type: none"> - Base load operation directly on mains power - Peak load operation directly on mains power - Stand-by mode
Zero	The pump is switched off and is not available for automatic operation
Manual	The pump runs directly on mains power and is not available for automatic operation

3 Master switch (emergency OFF)

The control unit is equipped with a master switch for switching the system on or off (emergency OFF under load).

4 Control cabinet

The control cabinet is designed for wall or floor mounting, depending on the power rating/number of pumps. It contains the ready-wired power components (fuses, contactors, overcurrent trip, connection option for a winding monitoring device, e.g. TCB, PTC resistors)

5 Plain-text display

Graphical display for indicating the operating status and any active messages.

Basic equipment

Housing and internal equipment

Design is to DIN EN 60204-1 (VDE 0113-1), DIN EN 60439-1 (VDE 0660-600-1), DIN EN 61439-2 (VDE 0660-600-2), DIN EN 61000-6-2 (VDE 0839-6-2) and DIN EN 61000-6-3 (VDE 0839-6-3).

Description:

- Steel sheet housing RAL 7035, for indoor installation, enclosure IP 54
- Master switch (power circuit breaker), lockable
- 400 V / 230 V AC control transformer
- Modular PLC, top hat rail mounted
- Door-mounted display
- Door-mounted operating mode selector switch
- Motor protection switch or motor protection relay with fuses per pump
- Contactor combination per pump
- Terminal strips for connecting mains, motor, sensors and inputs/outputs for connection to the building management system (BMS)
- Cable entries and exits below (lateral entries/exits also available on option).

Control unit functions and display

Standard design:

- Operational availability and general fault message are displayed.
- Live-zero monitoring of measuring signals (if analog)
- Changeover in case of pump failure to pump available for operation
- Motor overcurrent monitoring
- Menu-driven display
- Activation and time selection of timer-controlled pump changeover
- Limitation of max. number of pumps running (e.g. for reduced emergency power supply)
- Activation and time selection of timer-controlled functional check run
- Display of all operating parameters

Optional analog inputs for analog level detection:

The PLC supplies power to all transmitters.

Two analog inputs are provided. Via the respective terminal, the input can be used for voltage or current input.

- Voltage: $R_u = 200 \text{ k}\Omega$
- Current: $R_i = 250 \text{ Ohm}$

Digital inputs:

The PLC supplies power to all digital inputs.

- Automatic system ON/OFF
- Remote acknowledgement
- External pump changeover
- External functional check run
- Dry running monitoring
- Level 1 to 6

Digital outputs:

Relay outputs 230 V, 1 A

- General fault message
- General "System Operational" message

Overall safety concept

Monitoring the pumps and the hydraulic system

- Overcurrent monitoring
- Full motor protection by PTC resistors or bimetal switches in manual or automatic operation
- Dry running protection

Fault response

- Changeover to stand-by pump if a pump set fails
- Live-zero monitoring of measuring signal (4–20 mA) for analog level detection

If the feedback value transmitter fails, a fault is signalled and the system is switched off.

Protective measures to prevent fault conditions

- Enable pump changeover
- Enable functional check run

Variants on request

- Other voltages
- Higher power ratings
- Additional volt-free signals for connection to the building management system (BMS)
- Higher types of protection
- Soft starters
- Other components (specified brands)

Supplementary equipment (options)

- Ammeter per pump
- Voltmeter with phase changeover for the complete system
- Operating hours counter for each pump
- Control cabinet light with socket
- Connection to modem (transmission of 4 digital messages)
- Further options on request

BMS signals connected to terminal strip

Volt-free, max. 230 V, 1 A



Intelligent single and multiple pump control system with continuous speed control by frequency inverter, with PLC SIMATIC[®] S7

Fields of Application

- Industry: process loops, industrial water supply, cooling, lubrication and other process engineering applications.
- Energy supply: cogeneration plants, heat transfer stations, district heating.
- Water management: water extraction, water treatment, water supply, waste water disposal.

Performance Data

- Number of pumps: standard: 1 to 4, different pump sizes possible.
- Motor ratings: up to 650 kW
- Number of frequency inverters: 1 to 4
- Mains voltages: 3 x 400 V ± 10 %
3 x 500 V ± 10 %
3 x 690 V ± 10 %
- Mains frequency: 50 Hz/60 Hz

Functional Description

The Hyamaster SPS control system is specially designed for pumps with three-phase motors of all designs and makes. It consists of a programmable logic controller (**Speicher Programmierbare Steuerung, SPS**) with operator panel (**OP**) and all necessary power components such as master switch, frequency inverter, contactors, fuses and control voltage transformer. All components are installed in a control cabinet. A characteristic feature of the Hyamaster SPS control system is its high flexibility. Both during commissioning and operation, parameters can be set without an external programming device, by entering them on the operator panel OP7. The wide selection of well-proven functions for a large variety of problems which sometimes only emerge in the everyday operation of the pumping system are activated by simply setting the requisite parameters. Complicated and thus expensive modifications critical to the operation of the system are not required.

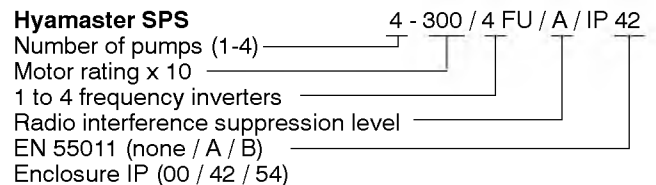
- The modular design of both software and hardware ensures:
- reliable solutions for all situations occurring in hydraulic systems.
 - high availability
 - adaptation to changing system requirements

- manual and automatic operation via OP7 and field bus.

Hyamaster SPS

- uses two independent PI controllers and optimized switching algorithms to control:
 - pressure - differential pressure
 - flow rate - liquid level
 - temperature - differential temperature
 Additional functions, e.g.: combination of different controlled variables, bad-value selection and redundancies are possible.
- effects self-optimizing control of:
 - start-up and shutdown of additional pumps
 - pump changeover
 - function check
- monitors automatically; the process is kept up in the best possible way.
 - performance range monitoring - fault behaviour
 - lack of water - overload
- communicates via field bus and/or volt-free contacts
 - operation and fault, pumps and frequency inverters
 - 4 analog standardized signal inputs
 - controller operational message
 - remote acknowledgement, etc.
 - general fault message

Hyamaster SPS



Other Variants on Request

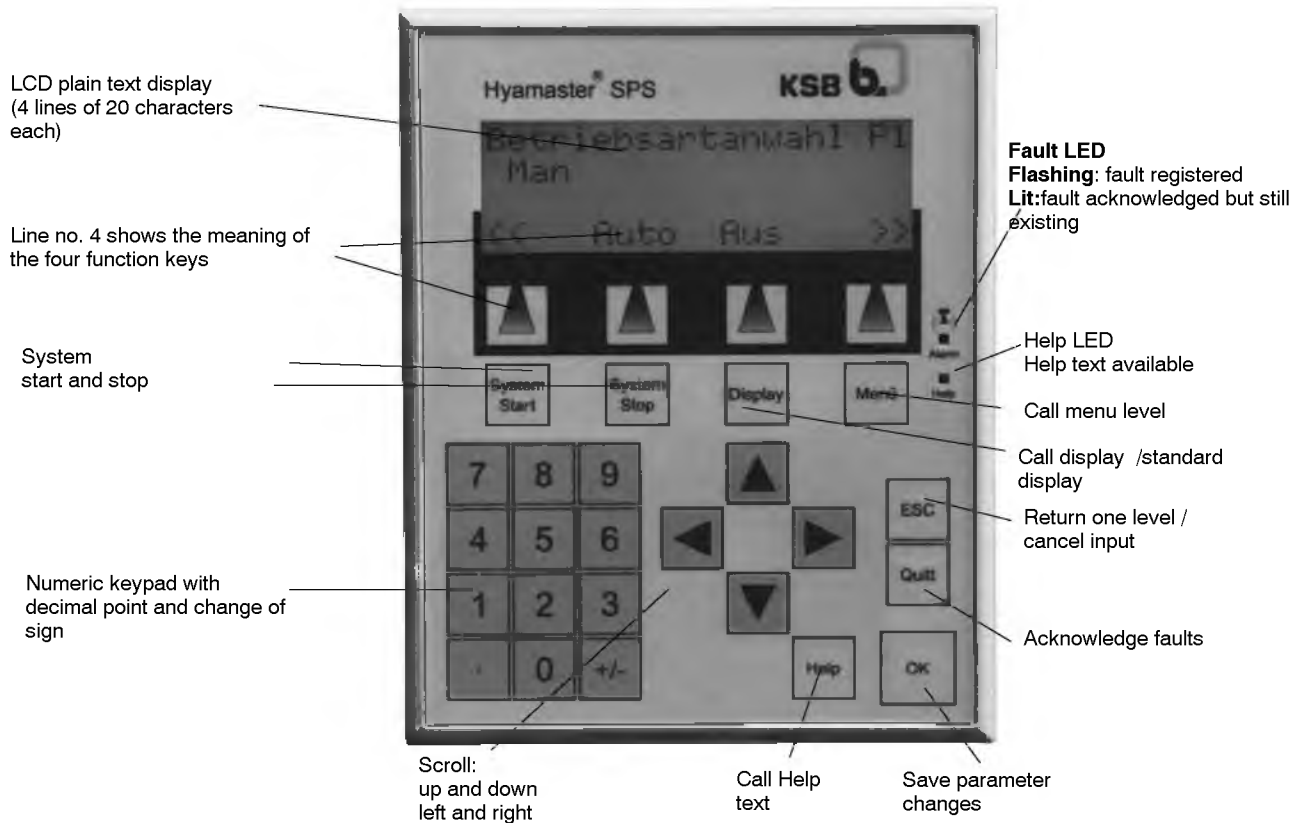
- Motor rating
- Enclosure
- Number of frequency inverters
- Customer specification
- Teleservice
- Voltage
- Number of pumps
- Additional control functions e.g. for additional auxiliary pumps, valves, etc.



General Member of



Operator Panel



The LCD plain text display of the Operator Panel (OP7) shows operating status, parameters, help texts and faults in various levels. The first and the last function key, respectively, serve to page up and down within a level.

As an option, the operator panel OP7 can also be installed directly in a control room, so that the Hyamaster SPS with manual and automatic operating mode, with operation and fault messages and parameterization can be monitored and operated directly at the OP7. Maximum cable length without RS 485 Repeater: approx. 50 m.

Display Levels

The plain text display is organized in levels.

Entry level

- Unacknowledged faults
- Operating status messages

Display level

- Control mode selected for the pumps, i.e. manual, 0, automatic
- Pump operating mode i.e. OFF, direct, frequency inverter 1, frequency inverter 2, etc.
- Feedback values and set values, parameter sets 1 and 2
- Rotational speed of frequency inverter operated pumps
- Set-value analysis, parameter sets 1 and 2
- Analog values (feedback values of analog inputs)
- Works and order number
- Software versions
- Time and date
- Operating hours counter of pumps and frequency inverters

Menu level

- Pump menu
- Quick menu
- Fault menu
- Operating status message menu
- Parameter menu

Fault level

- Any faults registered are displayed in plain text.

Basic Equipment of Control Cabinet

Housing and internal equipment

- Steel sheet housing: Colour: RAL 7032
- Type of protection IP 54 for indoor installation, internal equipment in type of protection IP 42
- Ventilation of control cabinet by filter fan
- Lockable master switch, operated from the front
- Current distribution and protection by fuses-overload contactors
- Frequency inverter(s)
- Control transformer 400/230V AC
- PLC modules and display module incl. 24V DC power supply unit (max. 100 mA available, e.g. for supplying a pressure / differential pressure transmitter).

Analog inputs

- 4 analog inputs 0/4-20 mA; 0/2-10V

Digital inputs (24 VDC)

- Automatic ON/OFF
- Monitoring lack of medium
- Changeover to second parameter set
- Remote acknowledgement
- Pump changeover
- Peak-load limitation

Digital outputs (relay, max. 230 V AC/1A)

- General fault message (NC contact)
- General "system operational" message

Auxiliary energy

- for transmitter 24 V DC, max. 200 mA

Overall safety concept

Monitoring the pumps and the hydraulic system

- Overcurrent monitoring
- Full motor protection by PTC resistors or bimetal switches for automatic control mode, monitoring and message for manual control mode
- Dry-running protection

Fault response

- Pump failure: changeover to standby pump
- Frequency inverter failure: changeover to direct operation, or shutdown of all pumps or changeover to second frequency inverter (if available)
- Monitoring of measuring signal: live-zero (4-20 mA) or (2-10 V)
If measuring signal fails:
message, fault contact, hold pump speed or shut down system (user-definable)

Protective measures to prevent fault conditions

- Pump changeover time freely selectable
- Function check time freely selectable

Operating modes

Manual operating mode per pump in direct (i.e. mains) or frequency inverter controlled operation via operator panel OP7, menu-driven, or via data bus. Hand operating mode per pump in direct (i.e. mains) operation (frequency inverter operation if direct operation is not provided for). In this case the pumps are operated electromechanically, to ensure emergency operation in the event of a PLC failure.

Optional Extras

Displays and operating facilities (on front panel)

- Operating hours counter per pump (in addition to software counter)
- Ammeter per pump
- Manual speed adjustment at control panel of frequency inverter (in addition to manual operating mode via operator panel OP7)
- Voltmeter with phase changeover
- Phase lamps
- Lockable front frame with transparent window (IP 54)
- Frequency inverter display
- Gate / butterfly valve control per pump
- Control of bypass valve
- Hand-0-automatic switch per pump

Remote transmission on terminal blocks (DDC messages)

- Operation and fault per pump, volt-free, max. 230 V, max. 1 A
- Operation and fault per frequency inverter, volt-free, max. 230 V, max. 1 A
- Position message of hand-0-automatic switch per pump, volt-free, max. 230 V, max. 1 A
- Repair switch per pump (on the pump)
- Isolating amplifier for analog inputs and outputs: Feedback value 1, Feedback value 2, external set value

Remote transmission by data bus (DP bus)

Messages to control room (Send)

- Operation and fault per pump and frequency inverter
- Control modes and operating modes per pump
- Measuring signals, set values and rotational speeds
- Operating status and fault messages of the system as a whole

Commands from control room (Receive)

- Automatic, manual pump operation, direct (i.e. mains) or frequency inverter controlled, with remote speed control or stopping
- Remote acknowledgement, system start-stop
- Remote measuring signals and remote set point setting
- Commands concerning the system as a whole

Internal control cabinet elements

- Double marking of electrical components
- Light and socket connected before master switch per switchboard section
- Lightning (overvoltage) protection of power input
- Mains monitoring: phase failure/inversion, under-/overvoltage
- Control cabinet heater with thermostat
- Wire marking with terminal number
- Wiring layout matched to circuit diagram layout

Variants on request

- Other voltages
- Higher power ratings
- Additional DDC messages
- Higher types of protection
- Soft starter
- Different motor ratings
- Component specifications
- Additional functions

Notes for Planning

Caution Special VDE guidelines and regulations of the local energy supply companies as well as local regulations must be adhered to.

Measuring and control line	Cross-sectional area	Version	
Feedback value transmitter (16 D)	3 x 0.75 mm ²	shielded	
Other feedback value transmitters	.. x 0.75 mm ²	shielded	
PTC resistor (per motor)	2 x 0.75 mm ²	shielded	
DDC lines (24 V DC)	.. x 0.75 mm ²	shielded	
DDC lines (230 V AC)	.. x 0.75 mm ²		
DDC lines, analog (0/2-10V or 0/4-20mA)	.. x 0.75 mm ²	shielded	

Motor power cables for standardized motors 3 ~ 400 V/50 Hz

 kW	≈ A	Minimum cross-section mm ²	Starting method	Version
				Minimum cross-sections
1.1 - 4	2.6 - 8.5	4 x 1.5	d.o.l.	DIN VDE 0100, Part 430, supplement 1; current-carrying capacity of PVC-insulated cables and conductors, type of installation B 2 for an ambient temperature of 30 °C
5.5 - 7.5	11.5 - 15.5	2 x 4 x 1.5	Y Δ	
11	22.5	2 x 4 x 2.5		
15 - 18.5	30 - 36	2 x 4 x 4		
22	43	2 x 4 x 6		
30	58	2 x 4 x 10		
37 - 45	72 - 85	2 x 4 x 16		
55	104	2 x 4 x 25		
75	142	2 x 4 x 35		
90	169	2 x 4 x 50		
110 -	on request			

The motor cable must be shielded to ensure compliance with EMC specifications concerning emissions. The motor must be earthed separately.

Total rated power

Total rated power = Motor rating x number of motors (incl. standby units, if any)

Heat Losses

The heat losses generated by the frequency inverters are dissipated into the **control unit room** by filter fans. It may be necessary to extract some or all that heat from the room. Heat losses amount to roughly 3 - 5 % of the rated motor power.

Control Cabinet Dimensions (for Planning only)
Hyamaster SPS with one frequency inverter

 kW	with 2 pumps W H D mm			with 3 pumps W H D mm			with 4 pumps W H D mm		
	1.1 - 4	800	1000	300	800	1000	300	800	1000	300
5.5 - 7.5	800	1000	300	800	1200	300	800	1200	300
11 - 15	800	1800	400	800	1800	400	1200	1800	400
18.5 - 22	800	1800	400	800	1800	400	1200	1800	400
30 - 45	1200	1800	400	1200	1800	400	1800	2000	500
55 - 75	1800	2000	500	2000	2000	500	on request		
90	2000	2000	600	2000	2000	600	on request		
110	on request			on request			on request		

Control cabinet dimensions Hyamaster SPS with 3 or 4 frequency inverters on request

Hyamaster SPS with two frequency inverters

 kW	with 2 pumps W H D mm			with 3 pumps W H D mm			with 4 pumps W H D mm		
	1.1 - 4	800	1200	300	800	1200	300	800	1200	300
5.5 - 7.5	1200	1800	400	1200	1800	400	1200	1800	400
11 - 15	1200	1800	400	1200	1800	400	on request		
18.5 - 22	1600	1800	400	1600	1800	400	on request		
30 - 37	1600	1800	400	1800	2000	500	on request		
45	1800	2000	500	2000	2000	500	on request		
55 - 75	2400	2000	500	2800	2000	500	on request		
90	on request			on request			on request		

Accessories

Pressure transmitter

	Measuring range (bar)	Max. pressure (bar)
Auxiliary energy 24 V DC (available from PLC power supply unit)	0 - 1	25
Analog output; 4 - 20 mA; 2-wire design; max. working resistance 600 Ohm	0 - 2.5	
Ambient temperature -20 °C to +70 °C	0 - 4	
Pressure connection via olive-ring pipe union for 6 mm pipe	0 - 6	
Product temperature -20 °C to +100 °C	0 - 10	
	0 - 16	

Pressure/Differential pressure transmitter

	Measuring range (bar)	Max. pressure (bar)
(Wall-mounted)	0 - 1	16
Auxiliary energy 24 V DC (available from PLC power supply unit)	0 - 2.5	25
Analog output; 4 - 20 mA; 3-wire design; max. working resistance 500 Ohm	0 - 4	25
Ambient temperature -10 °C to +50 °C	0 - 6	25
Pressure connection via olive-ring pipe union for 6 mm pipe	0 - 10	25
Max. product temperature +70 °C	0 - 16	25

Flow rate transmitter

	Max. measuring range (m ³ /h)	DN	PN
Magnetic-inductive measuring principle (MIF):	12	25	30
Compact design	24	32	30
Auxiliary energy 230 V AC	36	40	30
Analog output; 0/4 - 20 mA; adjustable; max. working resistance 750 Ohm	60	50	30
Pulse output; adjustable; 0 - 1000 pulses/unit	120	65	30
Conductivity of medium handled $\geq 5 \mu\text{s/cm}$	180	80	30
Flanged connection	240	100	16
Ambient temperature -10 °C to +60 °C	420	125	16
Product temperature -25 °C to +130 °C	600	150	16
	1080	200	10
	1800	250	10
Ultrasonic measuring principle:	18	32	40
- Measurement pick-up	30	40	40
Flanged connection	45	50	50
Product temperature - 20 °C to +100 °C	75	65	16
- Measuring transducer (wall-mounted)	100	80	16
Auxiliary energy 230 V AC	180	100	16
Analog output 0/4 -20 mA; max. working resistance 1000 Ohm	260	125	16
Frequency output 0 - 3.3 kHz	700	150	16
Pulse output 0 - 15 Hz	1500	200	16
	2000	250	16

Flow control unit

	Setting range (cm/s)
Calorimetric measuring principle, for dry-running protection incl. transducer	approx. 3 - 300
- Measurement pick-up	
Sensor connection G 1/2 A	
Product temperature -25 °C to +80 °C	
- Measuring transducer (mounted in control cabinet)	
Auxiliary energy 230 V AC	
Volt-free output; one change-over contact; max. 230 V, max. 1 A	

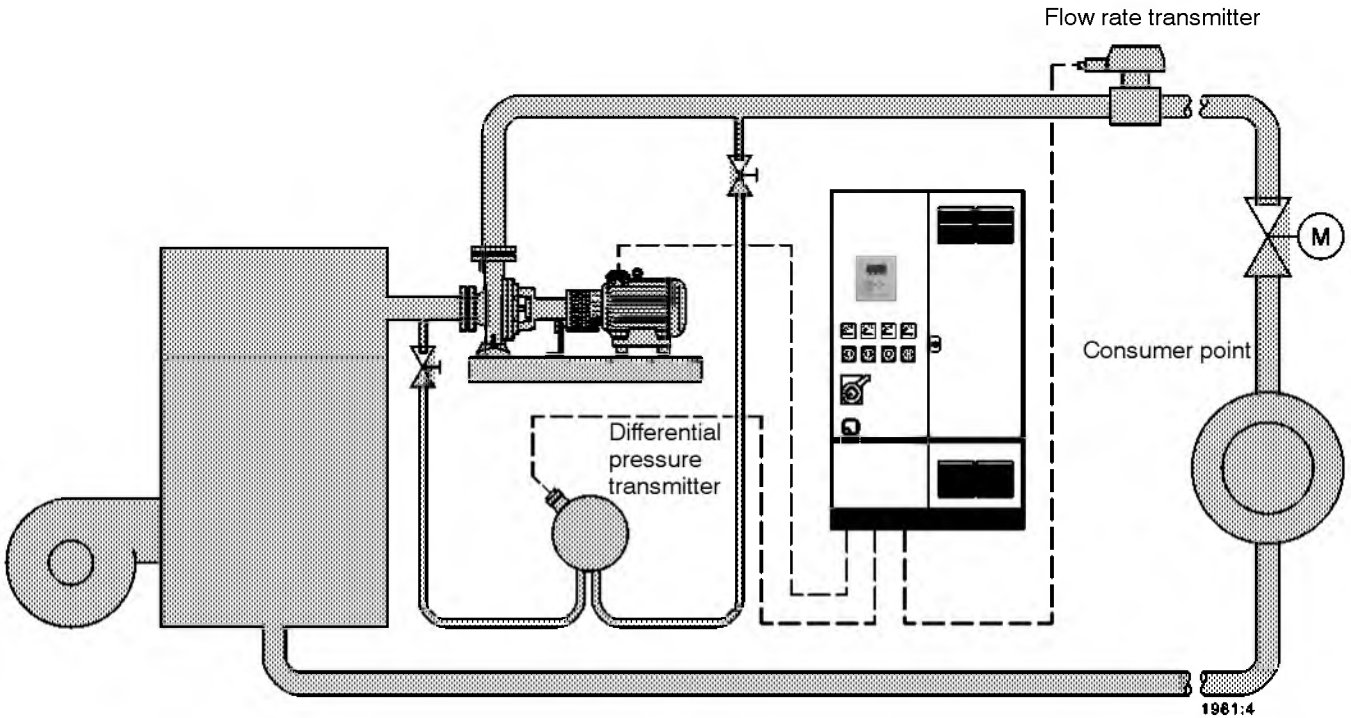
Accessories
Level transmitter

	Measuring range (mm)	
Capacitive measuring principle Auxiliary energy 24 V DC (available from control system) Analog output; 4 - 20 mA; 2-wire design; max. working resistance 600 Ohm Threaded connection G 1 1/2 A Ambient temperature -10 °C to +60 °C Product temperature -50 °C to +100 °C Bar electrode: made of steel; fully insulated	1000 to 4000 (Please indicate required bar length in purchase order)	
	Measuring range (bar)	
Hydrostatic measuring principle Auxiliary energy 24 V DC (available from control system) Analog output; 4 - 20 mA; 2-wire design; max. working resistance 600 Ohm Threaded connection G 1 1/2 A Pressure sensor for vertical installation Length of connecting pipe: 1 - 20 m Ambient temperature -20 °C to +60 °C Product temperature -20 °C to +80 °C	0 - 0.1 to 0 - 20 Please indicate required measuring range and length of connecting pipe in purchase order)	

Temperature sensor

	Measuring range (°C)	
Clip-on sensor	0 to +120	
Immersion-type sensor with 100 mm stainless steel immersion sleeve Ø 15 R 1/2 A max. test pressure 25 bar	0 to +120	
Immersion-type sensor with transducer with 160 mm stainless steel protective sleeve Ø 9 PN 16	-20 to +350	

Example: Heat-/District heat supply system with DFS curve



Control task:

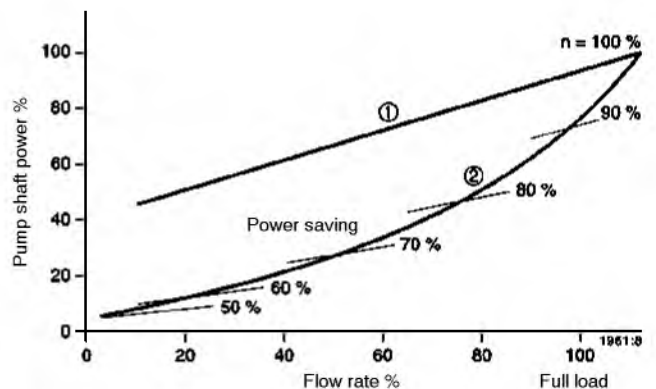
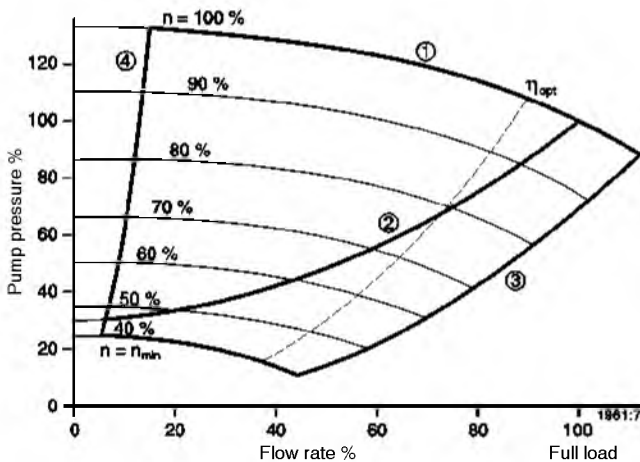
Maintaining the differential supply pressure at all bad-value points, even with changing operating conditions and interferences, without requiring measuring points at the far end of the heating system.

In many heat / district heat supply systems, it is difficult to detect bad-value points (points where the supply pressure is too low at times) in the piping system. The **DFS** curve (differential pressure control with flow-dependent set point adjustment) allows optimized control without information about bad-value points.

With the help of differential pressure and flow rate measurements, the flow-dependent influence of pipe friction

losses is compensated. The pumps are in continuously variable operation from low-load operation with small pump heads to full-load operation with high heads. The feedback signals can be tapped in the pumping station, obviating the complex and defect-prone transmission of measurements taken at the bad-value points.

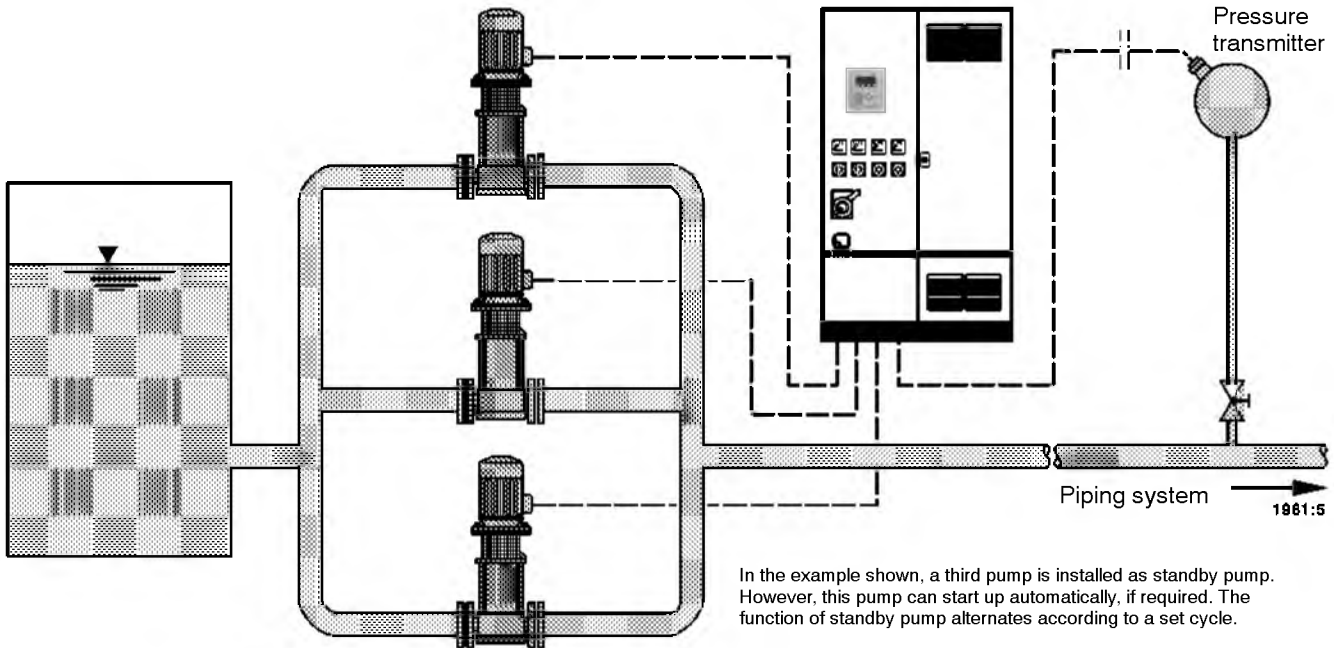
In a later extension, the differential pressure signal of the bad-value points can be determined via the bus. In this case, control by DFS curve serves as a back-up operating mode if there is a fault in bus communication. This makes for a considerable increase in the operating reliability of the pumping station.



- ① Optimum pump efficiency curve
- ② Pump characteristic curve at fixed speed ($n = 100\%$)
- ③ Duty point curve of pump in controlled operation on frequency inverter ($n = \text{variable}$)
- ④ Limit for continuous operation (max)
- ⑤ Operating limit (min)

- ① Power input curve at fixed speed ($n = 100\%$)
- ② Pump power input curve for controlled operation at frequency inverter ($n = \text{variable}$)

Example: Supply system with peak-load operation

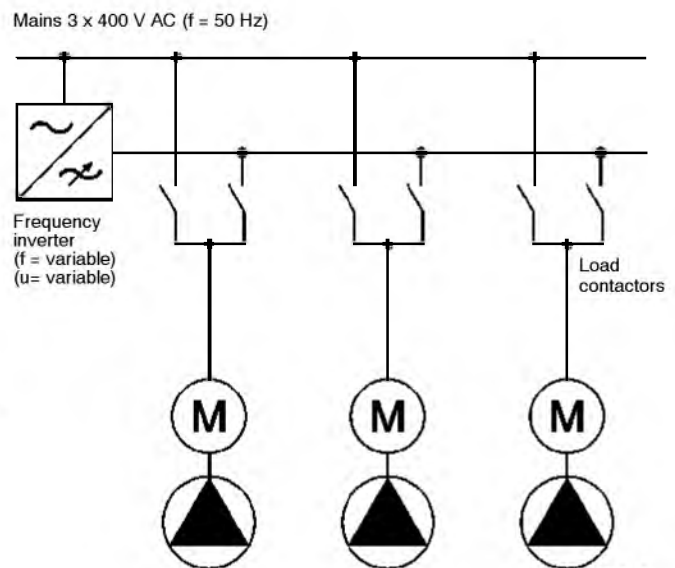
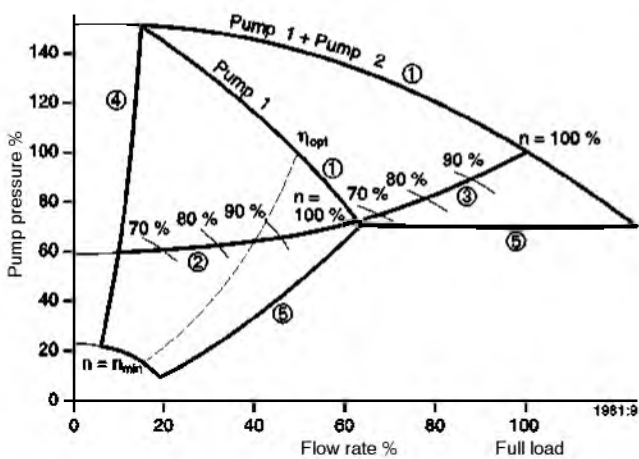


Control task:

Maintaining constant pressure at a point of reference despite widely differing and fluctuating consumption.

Splitting the total flow rate onto several pumps allows a proportionate reduction in pump and frequency inverter power. Efficiencies in part-load operation are higher than when using a full-load pump.

Pressure is kept constant by infinitely variable speed adjustment of one pump. This base-load pump provides the required flows up to its max. capacity. For higher consumption, a peak-load pump is switched on automatically. Pressure, however, is still regulated by the base-load pump. Pressure deviations, which occur when the peak-load pumps are switched on or off, generally do not affect the process.

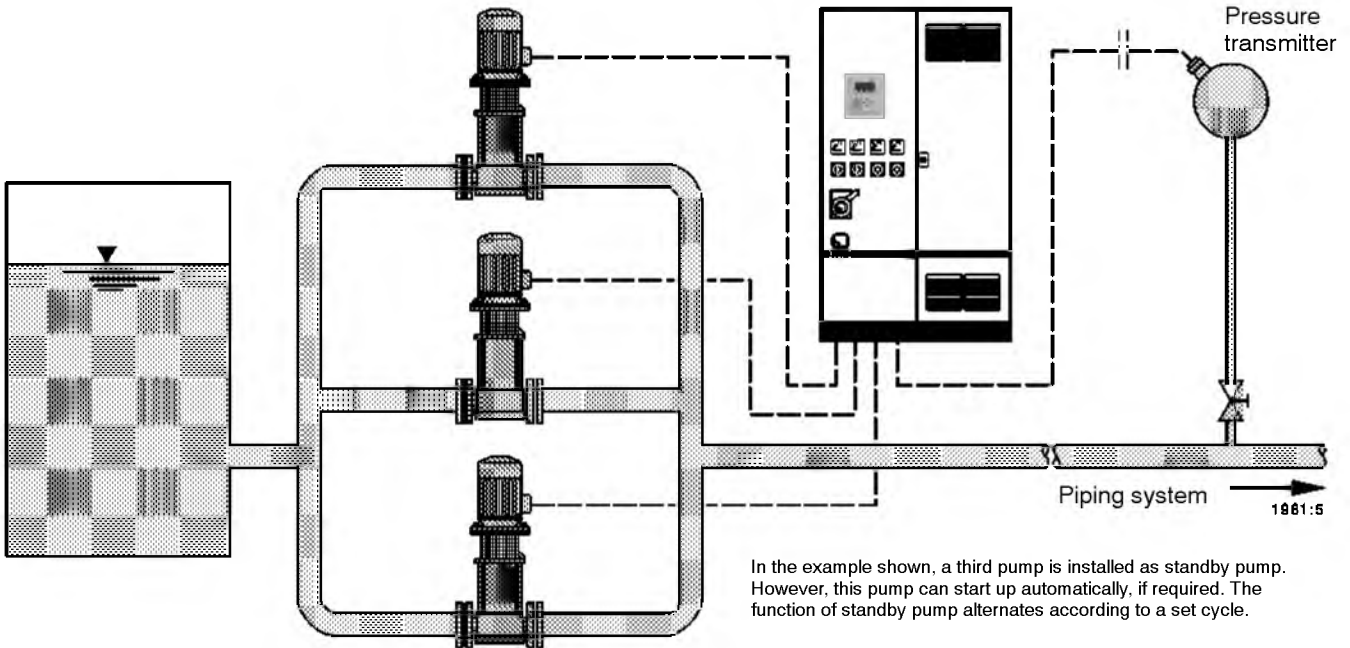


- η_{opt} Optimum pump efficiency curve
- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Duty point curve of pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ③ Duty point curve for controlled operation with 1 peak-load pump directly connected to the mains ($n = 100\%$) and 1 base-load pump connected to a frequency inverter ($n = \text{variable}$)
- ④ Limit for continuous operation (min)
- ⑤ Operating limit (max)

Wiring principle

1961:10

Example: Supply system with two frequency inverters



In the example shown, a third pump is installed as standby pump. However, this pump can start up automatically, if required. The function of standby pump alternates according to a set cycle.

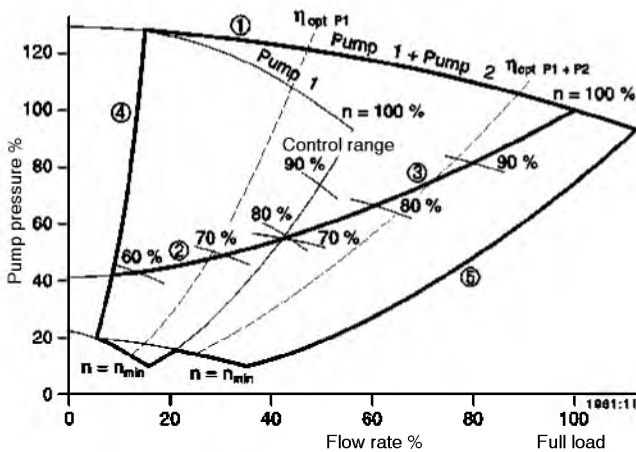
Control task:

Maintaining constant pressure at a point of reference, even with changing operating conditions and interferences.

In conventional pumping systems, unwanted pressure fluctuations occur, due to changes in inlet pressures, quantities tapped and pressure losses in the supply system, which are compensated by a high-level distributing tank.

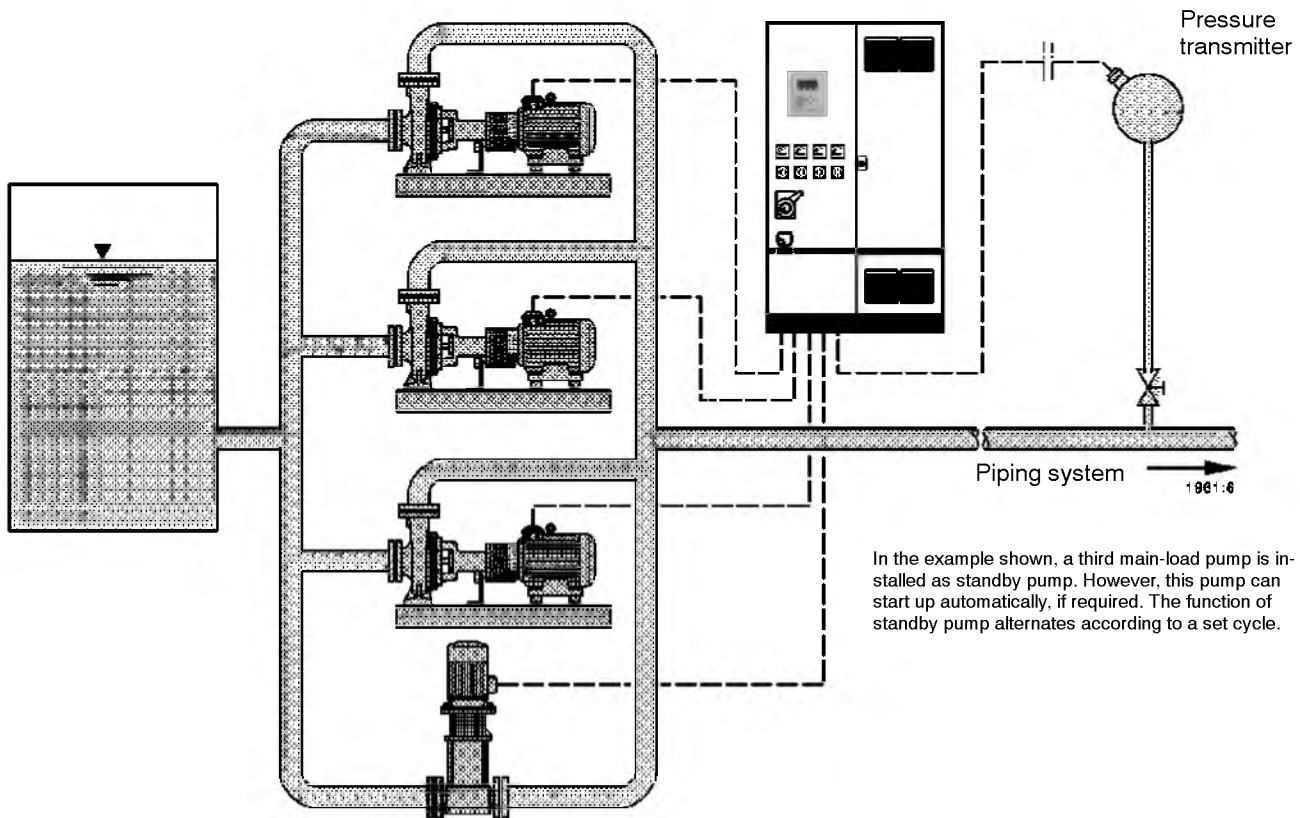
In the present example, the Hyamaster SPS takes on the function of the high-level tank in maintaining constant supply pressure at a point of reference. Two pump sets with one frequency inverter each, running both in single and parallel operation, cover the entire flow range from minimum flow to full load. The pumps operate in the best-efficiency range. The second frequency inverter also serves as a standby unit.

In this case, the second pump is in direct (i.e. mains) operation as a peak-load pump. The set value is then increased in accordance with the operating limit (max.) of one pump, so that the pumps run reliably within the allowable control range again.



- η_{opt} Optimum pump efficiency curve
- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Duty point curve of pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ③ Duty point curve of two parallel pumps in controlled operation at peak load on two frequency inverters ($n = \text{variable}$)
- ④ Limit for continuous operation (min)
- ⑤ Operating limit (max)

Example: Low-load and main-load pumps with 2 frequency inverters

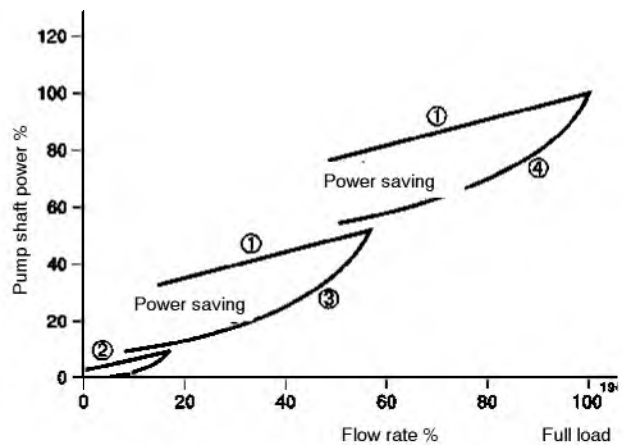
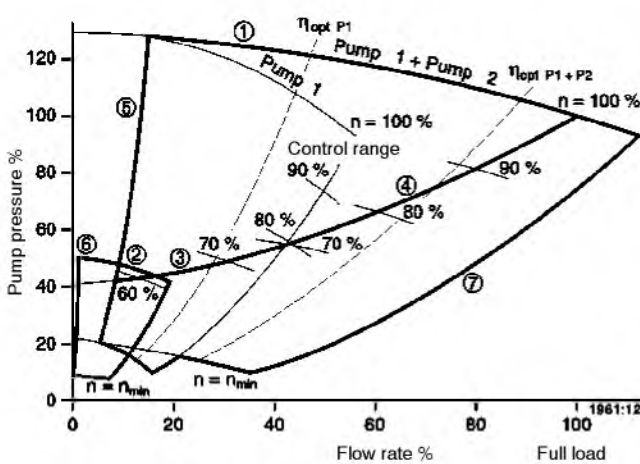


Control task:

Optimizing the low-load operation of the hydraulic system.

Even at low speeds, continuously speed-controlled pumps require a certain minimum flow rate.^⑤ In many cases, however, these minimum flows are much too high. To avoid pump damage in the long run, the flow rate must not fall below this limit in continuous pump operation.

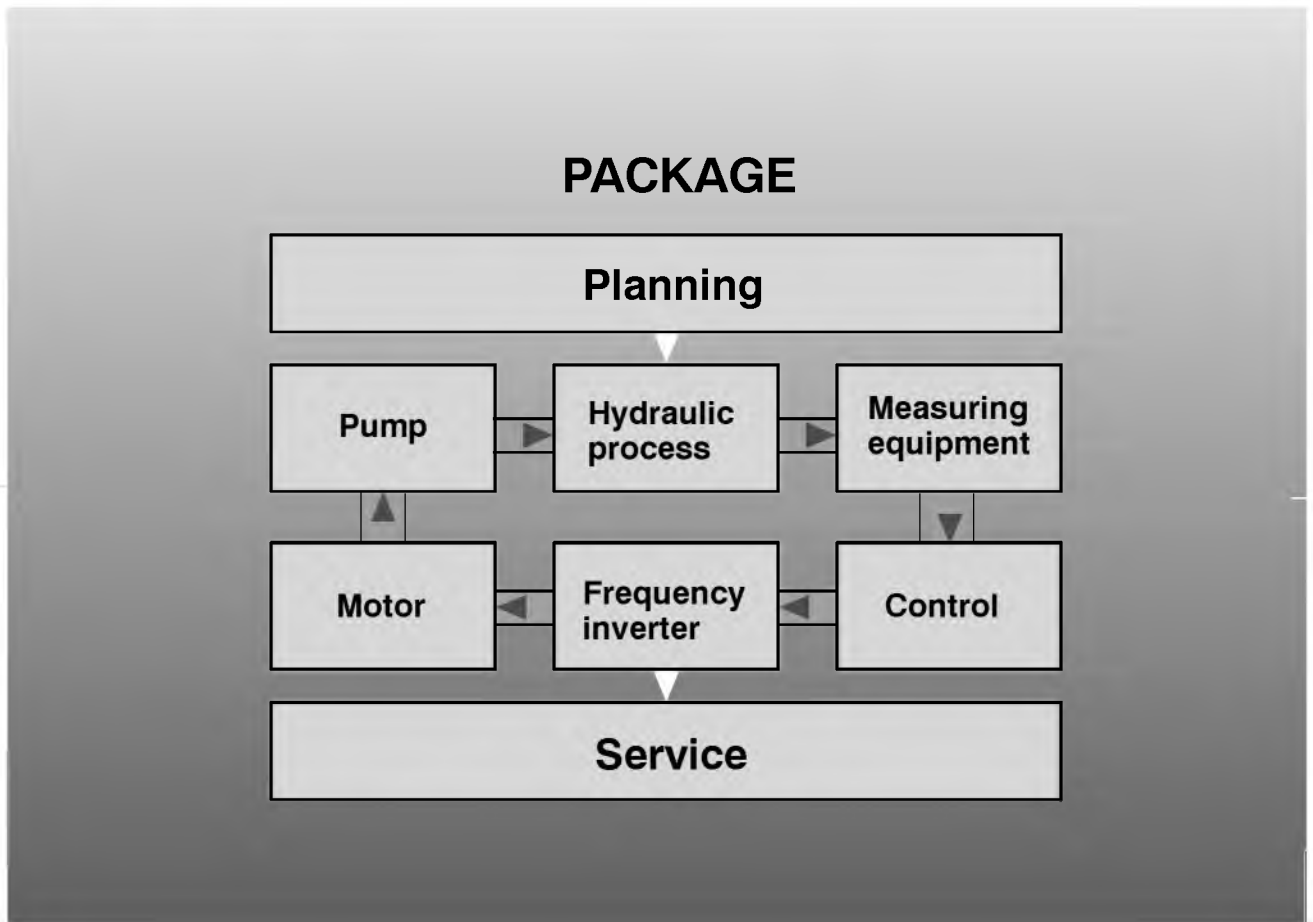
In the low-load range below this limit, a hydraulic bypass is normally used. However, the flow routed through this bypass cannot be used. A low-load pump which is rated for this flow range and operates at optimum efficiency, can expand the control range of the entire system to include this low-load range.



η_{opt} Optimum pump efficiency curve

- ① Pump characteristic curve at fixed speed ($n = 100\%$)
- ② Characteristic curve of low-load pump ($n = 100\%$)
- ③ Duty point curve of main-load pump in controlled operation at base load on frequency inverter ($n = \text{variable}$)
- ④ Duty point curve of two parallel main-load pumps in controlled operation at peak load with two frequency inverters ($n = \text{variable}$)
- ⑤ Limit for continuous operation (min), main-load pump
- ⑥ Limit for continuous operation (min), low-load pump
- ⑦ Operating limit (max)

- ① Pump power input curve at fixed speed ($n = 100\%$)
- ② Power input curve of low-load pump ($n = 100\%$)
- ③ Power curve of pump in controlled operation at base load with 1 main-load pump on frequency inverter ($n = \text{variable}$)
- ④ Power curve of pump for controlled operation at peak load with 2 main-load pumps in parallel on two frequency inverters ($n = \text{variable}$)



KSB offers a comprehensive service package comprising system planning of pumps, valves and switchgear, delivery, installation and commissioning as well as technical support during system operation.

Automatic Control Unit

Controlmatic E

Type Series Booklet



Building Services: Water Supply

Automatic Control Units

Controlmatic E



Designation

Example: Controlmatic E

Key to the designation

Code	Description
Controlmatic	Type series
E	Single-phase AC

Configuration and function



Main applications

- Pressure-controlled starting, stopping and monitoring of small pumps in water supply systems

Can be used with the following pumps (→ Page 6)

Type series	Size	Connection
Multi Eco	33 E, 34 E, 35 E, 36 E, 65 E	G 1
Ixo	45 E, 55 E, 65 E, 48 E, 58 E	G 1 1/4
S 100D	1/7, 1/9, 1/12, 1/14, 1/16, 2/7, 2/11, 2/15, 2/18, 4/4, 4/6, 4/9, 4/12, 7/5, 7/7, 7/9	G 1 1/4

Fluids handled

- Drinking water
- Service water
- Stormwater
- Fire-fighting water
- Cooling water

Operating data

Operating properties

Characteristic		Value
Flow rate	Q	Up to 10 m ³ /h (2.77 l/s)
Minimum flow rate	Q _{min}	0.1 m ³ /h
Start-up pressure (adjustable)	p	1.5 - 2.6 bar

Design of Controlmatic E

1	Housing	5	Green signal lamp - Energised
2	Pressure gauge	6	Amber signal lamp - Pump running
3	Plug socket (IP44)	7	Red signal lamp - Fault or lack of water
4	Power cable with shockproof plug		

Function

The pump can be connected via the plug socket (3) of the automatic control unit. Once the power cable with shockproof plug (4) has been connected to the power supply, the automatic control unit is ready for operation. The green signal lamp (5) is lit. When a shut-off valve in the piping is opened, the system pressure decreases and the pump is started up. The system pressure is indicated at the pressure gauge (2). The pump starts to deliver fluid and the amber signal lamp (6) is lit. When the tap has been closed and the flow rate is zero, the pump is stopped after 10 seconds.

Protective functions

- The pump is protected against dry-running by simultaneous monitoring of pressure and flow rate. If there is a lack of water, the automatic control unit stops the pump and the red signal lamp (7) is lit.

Materials

Overview of materials used

Component	Material
Housing	Polyamide
Membrane	Elastomer

Product benefits

- Easily connected to power supply by shockproof plug
- The pump is started and stopped automatically by simultaneous monitoring of pressure and flow rate.
- Variety of use due to user-definable start-up pressure (1.5 - 2.6 bar)
- Dry-running protection by stopping the motor
- User-friendly due to integrated pressure indication

Certifications

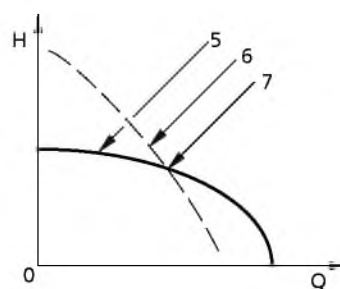
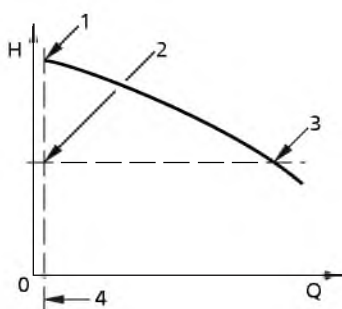
Designation	Valid in:	Note
ACS	France	French drinking water approval

Selection information

- System pressures ≥ 10 bar may damage the automatic control unit and must be avoided by all means.
- The start-up pressure of the automatic control unit must always be lower than the maximum pressure at zero flow.
- Minimum flow rate: 0.1 m³/h
- The start-up pressure has been set to 1.5 bar.

Maximum pressure capability:

- Pressure_{suction side} + pressure_{max. pump} (at zero flow) ≤ 10 bar
- If in doubt about the suction side pressure:
 - **either** add a safety margin of 3 bar to the nominal pressure
(Pressure_{suction side} + 3 bar) + [Pressure_{max. pump} (at zero flow)] ≤ 10 bar
 - **or** fit a pressure reducer (stabiliser) between the pump and the automatic control unit or on the pump's suction side, to prevent excessive pressure.
- If pressure surges are to be expected in the system as a result of quick-closing valves (e.g. solenoid valves) please contact KSB to check the unit's suitability for the specific application.

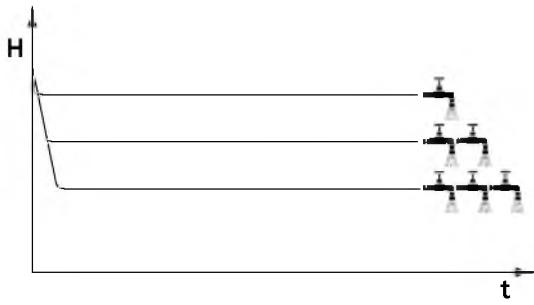


H/Q diagrams

1	Minimum flow rate	5	Curve to be selected
2	Minimum start-up pressure	6	Curve to be avoided
3	Pump start-up point	7	Maximum operating point
4	Pump stop point		

Pressure curve

Unlike domestic water supply systems with accumulators, pumps operated with automatic control units maintain a characteristically constant pressure at any flow rate.



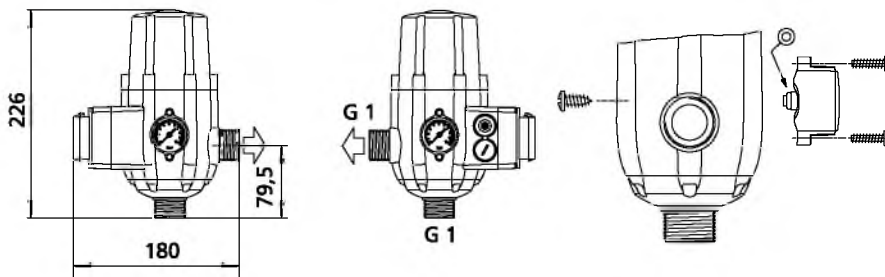
Pressure curves

Technical data

Selection table

Description	Value
Maximum operating pressure	10 bar ¹⁾
Flow rate	10 m ³ /h (2.77 l/s)
Enclosure	IP 44
Maximum ambient temperature	0 to 60 °C
Maximum fluid temperature	0 to 60 °C
Mains voltage	1~230 V, 50/60 Hz
Maximum current requirement	10 A
Protection against lack of water	Yes
Restart after lack of water	Manual
Weight	1.3 kg
Mat. No.	90053395

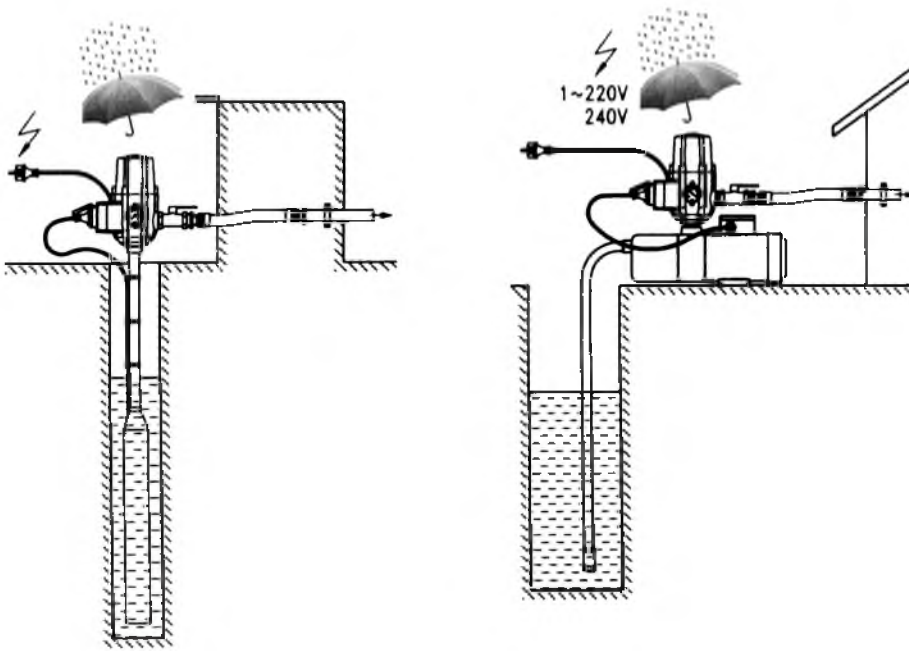
Dimensions



Dimensions [mm] - The pressure gauge can be fitted in two different positions.

¹⁾ The automatic control unit must be protected against any pressures exceeding the maximum operating pressure. Otherwise, the automatic control unit might be damaged!

Notes on installation



Typical installation positions

NOTE! The automatic control unit is not suitable for outdoor installation and must be protected from weather.

Accessories

Connection parts

Connection parts

Description		Connection	Mat. No.	[kg]
Connection part made of brass for Controlmatic	for Multi Eco type series (1 piece)	Rp 1 / G 1	39019415	0.2
	for Ixo, S 100D type series (1 piece)	Rp 1 1/4" G 1	39019530	0.2

Automatic Control Unit

Cervomatic EDP.2

Type Series Booklet



Water Supply

Automatic Control Units

Cervomatic EDP.2



Main applications

Control and monitoring unit for small pump sets.
Can be used in the following applications:

- Spray irrigation systems
- Irrigation systems
- Rainwater harvesting
- Water supply systems

Fluids handled

For handling clean to turbid water not containing aggressive, abrasive or solid substances.

- River, lake and groundwater

Operating data

Operating properties

Characteristic		Value
Flow rate	Q	Up to 15 m ³ /h (4.17 l/s)
Operating pressure	p	10 bar
Fluid temperature	t	0 to 40 °C

Designation

Example: Cervomatic EDP.2

Key to the designation

Code	Description
Cervomatic	Type series
E	Single-phase AC
D	Three-phase current
P	Electrical protection
.2	Product version

Function

Ensures gentle system operation by:

- Pressure-dependent pump start
- Pressure-dependent or flow-dependent stop of the pump
- Integrated dry running protection
- Integrated overload protection

Operating modes

The unit offers two different operating modes which can be selected during parameterisation:

On/off mode:

- The pump set is started when the pressure in the pipe drops
- The pump set is stopped when flow in the pipe is interrupted

Pressure-dependent mode:

- The pump set is started when the pressure in the pipe drops
- The pump set is stopped when the set pressure in the pipe is exceeded

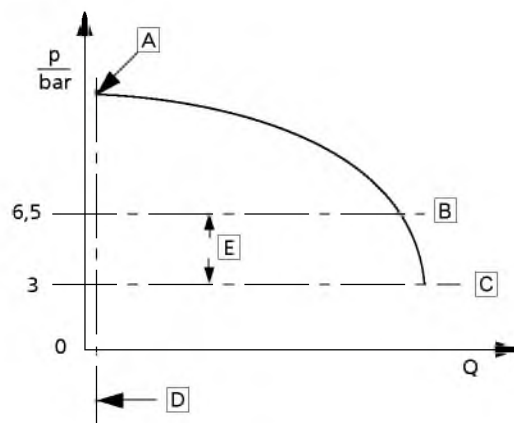
Further functions:

- Integrated dry running protection of the pump
- Integrated overload protection

i The lift check valve required for pressure maintenance is not integrated in the automatic control unit. It must be installed in the pipe in addition. (→Page 6)

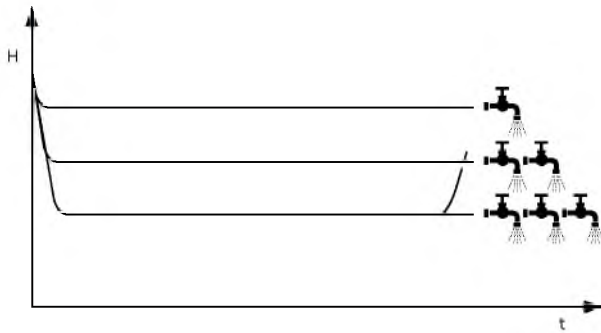
Pressure curve

The start pressure is set to 3 bar at the factory and can be decreased to 1 bar or increased to 6.5 bar if necessary. For further information, refer to the operating manual.



Start-up range

A	Shutoff head
B	$p_{E \max}$
C	p_E Factory setting
D	Pump set is stopped at $Q < 2$ l/s
E	Pump start



System pressure in relation to withdrawn fluid quantities

H	Pump head
t	Time

Product benefits

- The pump is started and stopped automatically by simultaneous monitoring of pressure and flow rate.
- Constant pressure depending on the flow rate by simultaneous monitoring of pressure and flow rate
- Dry-running protection by stopping the motor
- Digital indication of (actual and set) pressure
- Extremely straightforward menu-controlled setting of parameters
- Pressure-dependent pump start
- Pressure-dependent or flow-dependent stop of the pump

Materials

Overview of available materials

Component	Material
Housing	Polyamide
Membrane	Elastomer
Built-in components	EPDM, NR, Noryl, ceramics

Technical specifications

Selection table

Characteristic	Value
Range of start pressure (on/off mode)	1 - 5 bar
Minimum flow (on/off mode) ¹⁾	2 l/min
Maximum start pressure (pressure-dependent mode)	6.5 bar
Maximum stop pressure (pressure-dependent mode)	7 bar
Maximum operating pressure	10 bar
Burst pressure ²⁾	40 bar
Flow rate	15 m ³ /h (4.17 l/s)
Enclosure	IP 54
Ambient temperature	0 to 50 °C
Fluid temperature	0 to 40 °C
Mains voltage	1~230 V, 50/60 Hz 3~230 V, 50/60 Hz 3~400 V, 50/60 Hz
Maximum current requirement	10 A (16 A for short periods)
Protection against lack of water	Yes
Restart after detected lack of water	ART system (Automatic Reset Test) <ul style="list-style-type: none"> ▪ One restart attempt after 5.5 minutes ▪ In the case of persisting lack of water: restart attempt repeated every 30 minutes for a period of 24 hours ▪ In the case of permanent lack of water: pump is permanently stopped until the problem is remedied
Inlet tank monitoring	Optional
Weight [kg]	2.5
Mat. No.	01185581

¹⁾ The pump set is stopped when the actual flow is lower than the minimum flow.

²⁾ The control unit must be protected at all times against excess pressure (incl. system-induced surge pressures) exceeding the permissible maximum burst pressure of pB = 40 bar. If in doubt about the maximum suction-side pressure, either add a safety margin of 5 bar to the nominal pressure, or install a pressure reducer between the pump set and the unit or on the pump set's suction side. In addition, a lift check valve must be installed on the pump set's suction side.


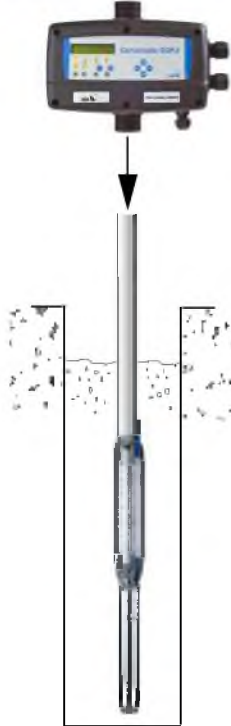
For use with the following pumps:

Selection table³⁾

Type series	Multi Eco	Ixo	S 100 D UPA 100 C UPA 150 C
Size	33 E/D, 34 E/D, 35 E/D, 36 E/D, 65 E/D	45 E/D, 55 E/D, 65 E/D, 48 E/D, 58 E/D	1/7, 1/9, 1/12, 1/14, 1/16, 2/7, 2/11, 2/15, 2/18, 4/4, 4/6, 4/9, 4/12, 7/5, 7/7, 7/9
			
	Rp1 connection	G 1 1/4 connection	G 1 1/4 connection

Installation examples

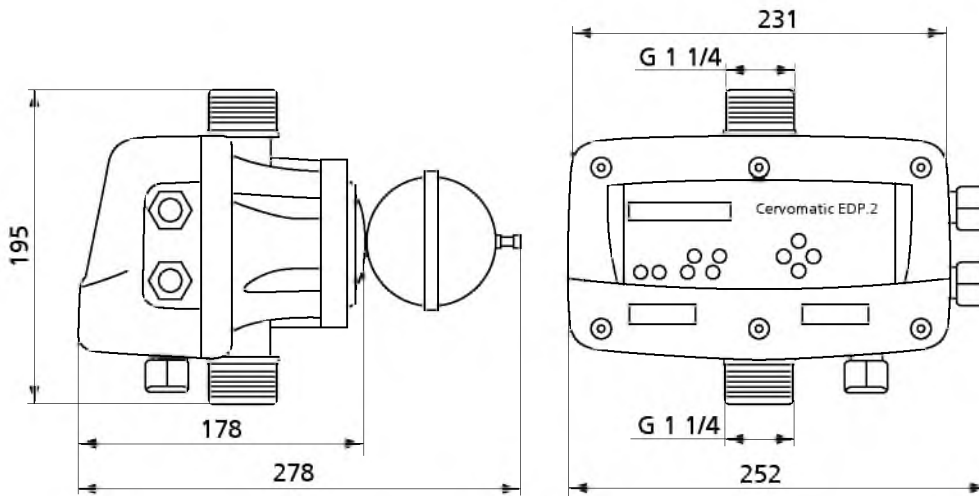
Selection table

Cervomatic EDP.2 with Multi Eco	Cervomatic EDP.2 with S 100D Cervomatic EDP.2 with Ixo
 <p>Use screwed pump unions for installation! (⇒Page 6)</p>	

³⁾ Accessories required




Dimensions

Dimensions in mm



Accessories

Optional accessories

Illustration	Description	[kg]	Mat. No.
	2 screwed pump unions G1 to G 1 1/4 (union nut)	0.3	00136434
	Pipe adapter set for installing the unit in horizontal pipes	0	01198308
	Check valve, for using the unit in combination with pumps without integrated swing check valve	0.6	00410207



Product description

LevelControl:

- Can be integrated in an on-site control cabinet (BasicUnit)
- Can be used for controlling and monitoring one or two pumps
- Can be used for tank draining applications
- ATEX-compliant model can be operated in potentially explosive atmospheres

Applications

In waste water engineering and lifting/pumping stations in applications such as drainage, dewatering, water extraction, liquid transport and disposal. Other applications on request.

Level Control can be used with the following pumps:

- Ama-Drainer
- Rotex
- MK
- Ama-Porter
- Amarex N
- Amarex KRT
- Compacta
- Ama-Porter CK
- Other pumps on request

Operating modes

CompactUnit and SwitchgearUnit are equipped with one selector switch (manual-0-automatic) per pump.

On the BasicUnit, selector switches can be connected for every pump.

"0" position: The pump is switched off and non-operational.

"Automatic" position: If the switches are set to "Automatic", the pumps will be started and stopped by the control unit as a function of the liquid level.

"Manual" (H) position: The pump can be started up manually by turning the switch to "manual" mode (non-locking).

Designation

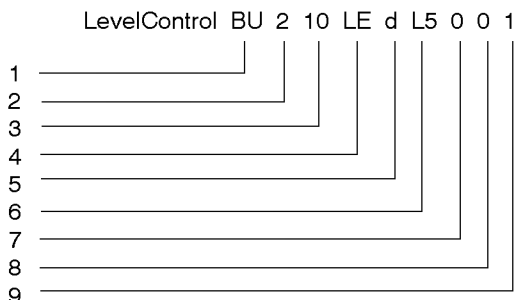


Fig. 1: Designation

- 1 Type series
- 2 Number of pumps
- 3 Maximum output current per pump [A]:
10, 14, 18, 25, 40, 63
- 4 Sensors:
LE = level switch, analog sensor (4..20 mA)
H03 = pressure sensor for 0 to 3.5 m
H10 = pressure sensor for 0 to 10.5 m
A03 = pressure sensor for 0 to 3.5 m with compressor for bubbler system
A10 = pressure sensor for 0 to 10.5 m with compressor for bubbler system
X1 = 1 level switch in potentially explosive atmosphere
X2 = 2 level switches in potentially explosive atmosphere
X3 = 3 level switches in potentially explosive atmosphere
X4 = 4 level switches in potentially explosive atmosphere
- 5 Motor starting method:
d = direct starting
sd = star-delta starting
- 6 Mains type:
L5 = three-phase
L35 = single- or three-phase
- 7 ATEX functions:
1 = yes
0 = no
- 8 Field bus (in preparation):
L = Lonbus
P = Profibus
M = ModBus
0 = without
- 9 Language version
1 = German, English, French, Dutch

Ordering key

The information listed below is required for ordering. Only one option can be selected for each feature. The codes of the individual options are reflected in the unit designation (see left):

Type series BU

Order information	Options
Number of pumps	-
Maximum output current per pump [A]	-
Sensors	LE, H03, H10
Motor starting method	-
Mains type	-
ATEX functions	0
Field bus	0
Language version	1

Table 1: Ordering key for type series BU

Type series CU

Order information	Options
Number of pumps	1, 2
Maximum output current per pump [A]	10
Sensors	LE, H03, H10, X1, X2, X3, X4
Motor starting method	d
Mains type	L35
ATEX functions	0, 1
Field bus	0
Language version	1

Table 2: Ordering key for type series CU

Type series SU

Order information	Options
Number of pumps	1, 2
Maximum output current per pump [A]	10, 14, 18, 25, 40, 63
Sensors	LE, H03, H10, A03, A10, X1, X2, X3, X4
Motor starting method	d, sd
Mains type	L5
ATEX functions	0, 1
Field bus	0
Language version	1

Table 3: Ordering key for type series SU

Technical data

Characteristics		LevelControl BU	LevelControl CU	LevelControl SU
Rated voltage		3~ 400 V AC +/- 10 %, 1~ 230 V AC	3~ 400 V AC +/- 10 %, 1~ 230 V AC	3~ 400 V AC +/- 10 %, 1~ 230 V AC
Mains frequency		50/60 Hz	50/60 Hz	50/60 Hz
Rated insulation voltage		500 V AC	500 V AC	500 V AC
Rated power per motor		with internal current transformers: up to 4 kW with external current transformers: any power	Direct starting: up to 4 kW	Direct or star-delta starting: 0.37 to 22 kW.
Rated current per motor		with internal current transformers: max. 10 A with external current transformers: any current	max. 10 A max. 10 A	1.0 to 63 A 1.0 to 63 A
Enclosure		IP 20	IP 54	IP 54
Material	Housing	Plastic	Plastic	Sheet steel
	Housing cover	PBT, glass fibre reinforced	Plastic	Sheet steel

Table 4: Technical data

Functions

Control

- Tank drainage
- Even distribution of pump operating hours
- Automatic pump changeover after every pump start or as a function of operating hours
- Pump start-up and shutdown in response to service demand
- Pump changeover in the case of a pump fault
- Periodic check of operation
- Sequenced starting/stopping if both pumps have to be started or stopped, to prevent pressure surges and reduce starting currents
- Freely selectable automatic re-start after fault
- Adjustable after-run time (slurp mode, forced drainage)
- Variable stop delay to prevent deposits in the tank

Tank drainage can be realized by means of level switches or an analog sensor.

Monitoring

- Internal mains-independent alarm buzzer
- High-water alert
- Operational availability
- General "System Operational" message
- General fault message
- Phase monitoring
- Overload detection per pump
- Thermal monitoring of pump motors
- Sensor fault / Live zero
- Fault / Warning per pump
- Low-load detection
- Archiving of data of the last 30 faults
- Monitoring of service interval

Information displayed

- Water level
- Alerts and warnings in plain text
- "Pump operational" and "Pump running" messages per pump
- Status information
- Operating hours per pump
- Operating hours per system

- Motor current per pump
- Mains voltage
- Mains frequency
- Effective power per pump
- Rotary field direction of mains supply
- Starts per pump
- Parameterization / Settings
- Electronic name plate
- Languages: German, English, French, Dutch

Operation

Operating option	BU	CU	SU
KSB control panel	optional	x	x
RS232 interface	x	x	x
Selector switch	site-supplied	x	x
Master switch	site-supplied	without	x

Table 5: Operating options

Communication

RS232 interface

Accessories/Options

Accessories/Option	BU	CU	SU
Control panel	x	—	—
Ammeter 6, 10, 15, 25 or 40 A	—	—	x
Voltmeter with integrated changeover switch 500 V	—	—	x
Flashlight 12 V DC, IP 65	—	—	x
Horn 12 V DC, IP 33	—	—	x
PTC thermistor relay with automatic reset	—	—	x
Control cabinet heating	—	x	x

Table 6: Accessories/Options

Application example: Waste water disposal, level control via three float switches

Ama-Drainer 301 NE/303 NE with LevelControl

- Disposal of heavily contaminated, fibre-containing waste water in an industrial business.
- Two submersible motor pumps installed in a site-supplied sump are controlled as a function of the liquid level in the sump.
- Control of the Ama-Drainer pumps is effected by LevelControl.
- Two float switches detect base load and peak load conditions. A third float switch is used to detect high water.

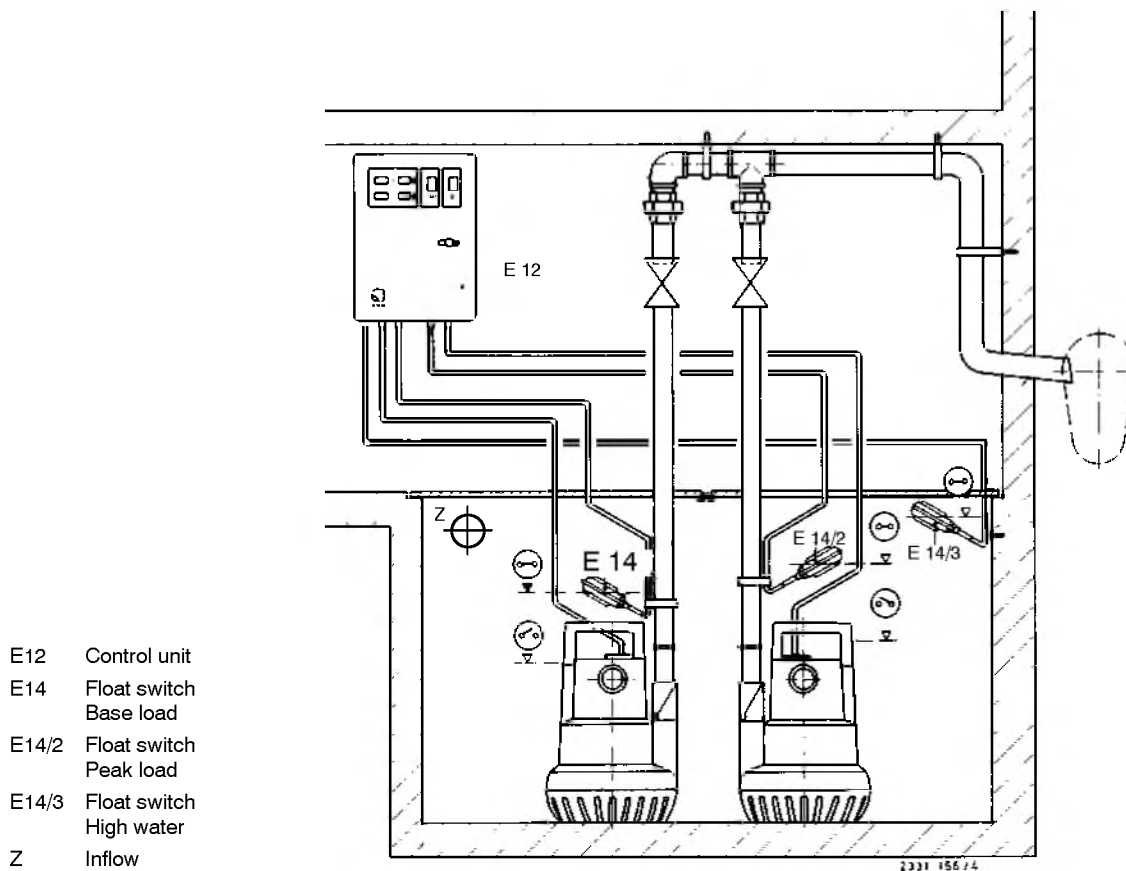


Fig. 2: Ama-Drainer pumps with LevelControl

Operating principle in automatic mode

- The fluid to be handled flows into the pump sump. When the fluid reaches the start-up level of the "base load" float, pump 1 is started up.
- When the liquid level drops again and falls below the stop level of the "base load" float, pump 1 is stopped.
- As the liquid level rises again, the start-stop cycle starts again. This time, however, pump 2 is started up (pump changeover), provided both selector switches have been set to "automatic" mode. Pump changeover is effected after each switching cycle.

Process Pump

RPH

Type Series Booklet



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Centrifugal Pumps with Shaft Seal

Process Pumps

RPH



Main applications

Pump for handling the large variety of crude oil products in refineries as well as in the chemical and petrochemical industry.

- Refineries
- Chemical industry
- Petrochemical industry

Operating data

Operating properties

Characteristic		Value
Flow rate	Q	Up to 4150 m ³ /h
Head	H	Up to 270 m
Operating temperature	T	-70 °C to +450 °C
Operating pressure ¹⁾	p	Up to 51 bar (at 20 °C) (ASME B 16.5 class 300) for A 216 Grade WBC

Designation

Example: RPH-H-I S1 80-280B

Key to the designation

Code	Description
RPH	Type series
H	Heatable model
I	Version with auxiliary impeller (inducer)
S1	Material variant to API 610
80	Nominal discharge nozzle diameter [mm]

¹⁾ Higher pressures and flange pressure ratings on request

Code	Description
280	Nominal impeller diameter [mm]
B	Special hydraulic system (type B)

Design details

Design

- Volute casing pump
- Horizontal installation
- Back pull-out design
- Single-stage
- Meets technical requirements to API 610, 11th edition / ISO 13709

Pump casing

- Volute casing with integrally cast pump feet
- Centreline pump feet
- Single or double volute, depending on the pump size
- Radially split volute casing
- Axial inlet nozzle, tangential discharge nozzle pointing vertically upwards.
(From DN 250 / from impeller diameter 500 / pump size 200-401: radial discharge nozzle pointing vertically upwards)
- Volute casing with casing wear ring
- Casing cover (with casing wear ring, as required)

Optional:

- Casing and casing cover heatable/coolable, depending on size

Impeller type

- Closed radial impeller
- Impeller with impeller wear ring on the suction side (if required also on the discharge side)
- Sealing gap and balancing holes balance axial forces.

Optional:

- Inducer to improve the NPSH value

Shaft seal

- Cartridge seal to API 682

Bearings

- Uncooled

Optional:

- Cooled bearing bracket

Drive-end bearing:

- Fixed bearing
- Paired angular contact ball bearings
- Oil bath lubrication
- **Optional:** oil mist lubrication

Pump-end bearing:

- Radial bearing

- Cylindrical roller bearing
- Absorbs radial loads only
- Oil bath lubrication
- **Optional:** oil mist lubrication

Bearing bracket designation

Example: B03

Bearing bracket designation

Designation	Description
B	Back pull-out bearing bracket
03	Size code (based on dimensions of seal chamber, shaft end and bearings)

Bearings used

Bearing design

KSB designation	FAG designation	SKF designation
B.MUA	B-MP-UA	BECBM

Standard bearing assembly

Bearing bracket	Rolling element bearings	
	Pump end	Motor end
B02	NU211C3	2 x 7309B-MUA
B03	NU213C3	2 x 7311B-MUA
B05	NU316C3	2 x 7315B-MUA
B06	NU324C3	2 x 7224B-MUA
B07	NU324C3	2 x 7324B-MUA

Reinforced bearing assembly (triple bearing assembly)

Bearing bracket	Rolling element bearings	
	Pump end	Motor end
B02	NU211C3	3 x 7309B-MUA
B03	NU213C3	3 x 7311B-MUA
B05	NU316C3	3 x 7315B-MUA
B06	NU324C3	3 x 7224B-MUA
B07	NU324C3	3 x 7324B-MUA

Bearing life

The calculated minimum bearing life is:

- 25,000 h to API 610

Materials

Materials

Part No.	Description	Design						
		S1 ²⁾	S5 ³⁾⁴⁾	S6	S8	A8	C6	D1
102	Volute casing	CS				316AUS	12Cr	DSS
161	Casing cover (uncooled)	CS				316AUS	12Cr	DSS
	Casing cover (cooled)	CS				316AUS	12Cr	DSS
210	Shaft ⁵⁾	CS	12Cr+H ³⁾ 4140AS ⁴⁾	12Cr+H ²⁾³⁾ 4140AS ⁴⁾	DSS	DSS 316AUS ⁴⁾	12Cr+H ²⁾³⁾ 12Cr ⁴⁾	DSS
230	Impeller	CI	CS	12Cr	316AUS	316AUS	12Cr	DSS

²⁾ Europe

³⁾ Asia

⁴⁾ Americas

⁵⁾ Above 250 °C: CrMo; -10 °C to 250 °C: CS; -40 °C to +300 °C: DSS

Part No.	Description	Design						
		S1 ²⁾	S5 ³⁾⁴⁾	S6	S8	A8	C6	D1
330	Bearing bracket	CS						
411.10	Joint ring	AUS/ graphite						DSS/ graphite
502.01/02	Casing wear ring	27Cr	27Cr 12Cr+H ³⁾⁴⁾	316AUS	316AUS 316AUS+HF ³⁾ 12Cr ⁴⁾	27Cr 12Cr+H ³⁾⁴⁾	AUS DSS ³⁾⁴⁾	
503.01/02	Impeller wear ring	12Cr+H	12Cr+H	316AUS	316AUS 12Cr ⁴⁾	12Cr+H	AUS DSS ³⁾⁴⁾	
542.02	Throttling bush	12Cr+H	12Cr+H 12Cr ⁴⁾	316AUS		12Cr+H 12Cr ⁴⁾	AUS DSS ³⁾⁴⁾	
902.01/920.01	Casing screws/ hexagon nut	CrMoV / CrMo 4140AS ³⁾⁴⁾						

Material variant for pump components

Description	Material class	Material		
		Europe	Asia	Americas
Cast components, general	CI	JS1025	-	-
	CS	A216 Gr WCB	A216 Gr WCB	A216 Gr WCB
	316AUS	1.4408 1.4409	A743 Gr CF3M A743 Gr CF8M	A743 Gr CF8M
	12Cr	1.4008	A743 Gr CA6NM	A743 Gr CA6NM
	27Cr	VG434	-	-
	DSS	1.4593 A890 Gr 1B	A890 Gr 1B	A890 Gr 1B
Pressure-retaining cast components	CS	A216 Gr WCB	A216 Gr WCB	A216 Gr WCB
	316AUS	A351 Gr CF3M A351 Gr CF8M	A351 Gr CF3M A351 Gr CF8M	A351 Gr CF8M
	12Cr	A217 Gr CA15	A487 Gr CA6NM	A487 Gr CA6NM
	DSS	1.4593 A995 Gr 1B	A995 Gr 1B	A995 Gr 1B
Bar stock (shaft)	CS	C45+N	-	-
	CrMo	1.7709	-	-
	316AUS	-	-	A276 Type 316
	4140AS	-	-	A434 Cl. BB
	12Cr	-	-	A276 Type 420
	12Cr+H	1.4021+QT700	A276 Type 410 H&T	-
Bar stock	DSS	1.4462	AISI 329 1.4462	1.4462
	AUS	1.4539	-	-
	316AUS	1.4571	A 276 Type 316	AISI 316 A276 Type 316
	12Cr	-	-	AISI 420 A276 Type 420
	12Cr+H	1.4027+QT	1.4024.19 A276 Type 410 H&T	AISI 420 Hard
	DSS	1.4462	AISI 329 1.4462	1.4462
Screw/bolt/stud	4140AS	-	A193 Gr B7	A193 Gr B7
	CrMo	1.7709	-	-
Nut	4140AS	-	A194 Gr 2H	A194 Gr 2H
	CrMo	1.7258	-	-

- 2) Europe
3) Asia
4) Americas

Abbreviations used

Abbreviation	Material
CI	Cast iron
CS	Unalloyed steel
316AUS	Austenitic stainless steel >2 % molybdenum
12Cr	12 % chrome steel
27Cr	27 % chrome steel
DSS	Duplex stainless steel
4140AS	4140 alloyed steel
+H	Hardened
+HF	Hard-faced

Table of comparison of materials

Material type	Code	Material No.	Standard	Closest ASTM equivalent
Cast iron	GJS-400-15	JS1030	EN 1563	A 536 Grade 60-40-18
	GJS-400-18-LT	JS1025	EN 1563	A 536
	GJL-250	JL1040	EN 1561	A 48 Class 30
Cast steel	GP240GH+N	1.0619+N	EN 10213-2	A 216 Grade WCB
Cast stainless steel	GX5CrNiMo19-11-2	1.4408	EN 10213-4	A 351 Grade CF8M
	GX5CrNiMo19-11-2	1.4408	EN 10213	A 743 Grade CF8M
	GX2CrNiMo19-11-2	1.4409	EN 10213-4	A 351 Grade CF3M
	GX2CrNiMo19-11-2	1.4409	EN 10213	A 743 Grade CF3M
	GX3CrNiMoCuN24-6-2-3	1.4593	-	-
	GX2CrNiMoCuN25-6-3-3	1.4517	EN 10213	-
Cast chrome steel	GX20Cr 14+QT	1.4027+QT	SEW 410	A 743 Grade CA15
	GX35CrNiMo25-4	VG 434	KSB materials data sheet Material identification code 2800	-
	GX7CrNiMo12-1	1.4008	EN 10283	A 743 Grade CA15
	GX8CrNi12	1.4107	EN 10213-2	A 217 Grade CA15
	GX25CrNi13-4	1.4317	EN 10213-2	A 487 CA6NM
	GX25CrNi13-4	1.4317	EN 10283	A 743 CA6NM
Stainless steel	X6CrNiMoTi17-12-2	1.4571	EN 10088	A 276 Type 316Ti
	X2CrNiMoN22-5-3	1.4462	EN 10088	A 182 Grade F51
Chrome steel	X20Cr13+QT700	1.4021+QT700	EN 10088	A 276 Type 420
	X20Cr13	1.4021	EN 10088	AISI 420 Hard
	X15Cr13	1.4024.19	KSB materials data sheet Material identification code 1219	A 276 Type 410
	X29CrS13	1.4029	EN 10088	-
	X12Cr13	1.4006	EN 10088	A 276 Type 410 H&T
	X5CrNiMo17-12-2	1.4401	EN 10088	A 276 Type 316
	X4CrNiMoN27-5-2	1.4460	EN 10088	AISI 329
	X2CrNiMoN17-13-3	1.4429	EN 10088	A 276 Type 316L
	Steel which is creep-resistant at elevated temperatures	21CrMoV5-7+QT	1.7709+QT	EN 10269	A 193 Grade B16
P355GH		1.0566	EN 10028-3	
Carbon steel	C45+N	1.0503+N	EN 10083	A 576 Grade 1045
	C22+N	1.0402+N	EN 10083	A 576 Grade 1020
Cast stainless steel, hard-faced	GX5CrNiMo19-11-Colm.6	1.4408-Colm.6	-	A 743 Grade CF8M-Colm.6

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Double volute from DN 80 (3 in.): low radial load and less shaft deflection for longer service life of bearings and mechanical seal
- Easy to service thanks to back pull-out design
- Heatable casing covers optionally available for high-temperature applications
- Wide variety of flanges to all standards up to PN 100 equivalent (ASME Class 600)
- Max. shaft diameter in acc. with API 610 makes for very long service life of mechanical seal
- Dimensioned for longer service life than specified by API 610, reducing maintenance expenditure and work
- Tandem bearing arrangement optionally available to absorb high axial forces

- Cast steel bearing brackets with integrated cooling fins enable higher fluid temperatures and reduce bearing temperatures.
- Optional fan impeller: no cooling water supply required for high temperatures
- Seal chamber to API 610 accommodates all mechanical seals to API 682.
- Individual adjustment of axial thrust balancing for maximum bearing life
- "Low Nss hydraulic systems" (inducer on option) for optimum selection to API

Acceptance tests / Warranties

- Materials testing
 - Test report 2.2 on request
 - Test report 3.1 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test

The operating point of each pump is warranted according to ISO 9906/2B.

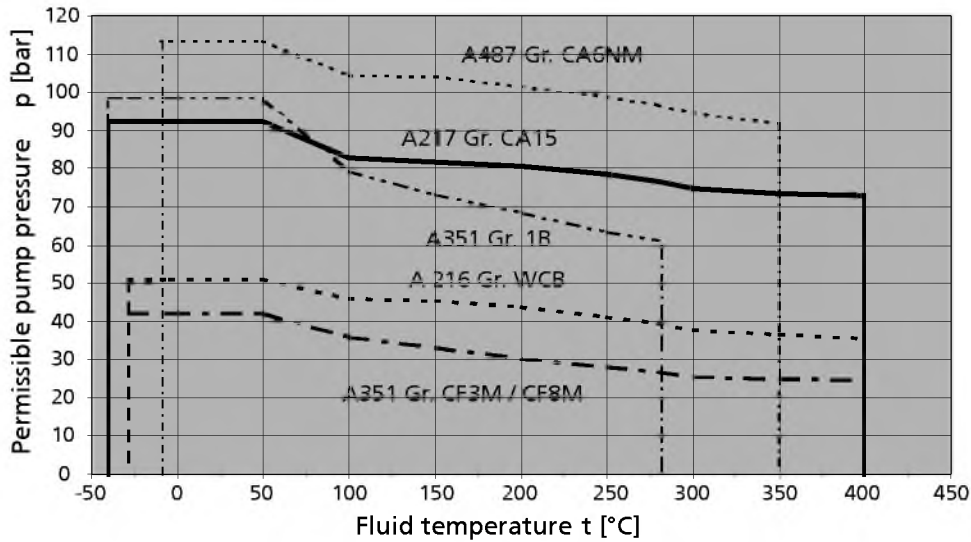
The following acceptance tests may be performed and certified at extra charge:

 - Performance test to ISO 9906
 - Performance test to API (API 610)
 - NPSH test
- Other tests (e.g. vibrations, strength) on request.
- Warranty

Warranties are given within the scope of the valid delivery conditions.

Pressure and temperature limits

Average values – the values of individual pump sizes may be higher or lower than the values indicated. (Contact KSB!)



Pressure and temperature limits of pump

Sizes

Nominal impeller diameters available

Nominal diameter of the discharge nozzle	Nominal impeller diameter																	
	180	181	230	231	280	281	360	361	400	401	450	500	501	504	506	630	670	710
25	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	X	X	X	X	X	X	-	X	-	-	-	-	-	-	-	-	-	-
50	X	-	X ⁶⁾	-	X ⁶⁾	-	X ⁶⁾	-	-	-	X ⁶⁾	-	-	-	-	-	-	-
80	X	-	X ⁶⁾	-	X ⁶⁾	-	X ⁶⁾	-	-	-	X ⁶⁾	-	-	-	-	-	-	-
100	X	-	X ⁶⁾	-	X ⁶⁾	-	X ⁶⁾	-	-	-	X ⁶⁾	-	-	-	-	-	-	-
150	-	-	X ⁶⁾	-	X ⁶⁾	-	X ⁶⁾	-	-	X ⁶⁾⁷⁾	X ⁶⁾	-	X ⁶⁾⁷⁾	-	-	X ⁶⁾⁷⁾	-	X ⁶⁾⁷⁾
200	-	-	-	-	X ⁶⁾	-	X ⁶⁾	-	-	X ⁶⁾⁷⁾	X ⁶⁾	-	X ⁶⁾⁷⁾	-	-	-	X ⁶⁾⁷⁾	-
250	-	-	-	-	-	-	-	-	-	X ⁶⁾⁷⁾	-	-	X ⁶⁾⁷⁾	-	-	X ⁶⁾⁷⁾	-	X ⁶⁾⁷⁾
300	-	-	-	-	-	-	-	-	X ⁶⁾⁷⁾	-	-	X ⁶⁾⁷⁾	-	-	-	X ⁶⁾⁷⁾	-	X ⁶⁾⁷⁾⁸⁾
350	-	-	-	-	-	-	-	-	X ⁶⁾⁷⁾	-	-	X ⁶⁾⁷⁾⁸⁾	-	-	-	X ⁶⁾⁷⁾⁸⁾	-	X ⁶⁾⁷⁾⁸⁾
400	-	-	-	-	-	-	-	-	-	-	-	-	-	X ⁶⁾⁷⁾⁸⁾	X ⁶⁾⁸⁾⁹⁾	X ⁶⁾⁷⁾⁸⁾	-	X ⁶⁾⁷⁾⁸⁾

- 6) Casing with double volute
- 7) Complementary sizes: only in combination with 4-pole drive
- 8) Size on request
- 9) Complementary sizes: only in combination with 6-pole drive

Technical data

Bearing brackets B02S - B06

Size	Bearing bracket ¹⁰⁾	Impeller				Shaft diameter				Drive				
		Impeller outlet width	Impeller inlet diameter	Impeller diameter		In seal chamber	At bearings		At coupling	P/n value ¹¹⁾	Max. drive power at			
				Max.	Min.		Pump end	Drive end ¹²⁾			n = 1450 rpm	n = 1750 rpm	n = 2900 rpm	n = 3500 rpm
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kW]	[kW]	[kW]	[kW]
25-180	BS02S	6	48	179	120	50	55	45	32	0,0226	32,77	39,55	65,54	79,10
25-230	BS02S	6	48	224	180	50	55	45	32	0,0226	32,77	39,55	65,54	79,10
40-180	BS02S	6	58	180	130	50	55	45	32	0,0226	32,77	39,55	65,54	79,10
40-230	BS02S	6,2	57	224	1	50	55	45	32	0,0226	32,77	39,55	65,54	79,10
40-181	BS02L	7,8	75	180	130	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
40-231	BS02L	7,7	75	230	180	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
40-280	BS02L	7,5	61	278	220	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
40-281	BS02L	7,7	71	278	230	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
40-361	BS02L	7,9	69	343	280	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
50-180	BS02L	10,9	88	180	140	50	55	45	32	0,0334	48,43	58,45	96,86	116,90
50-230	B03	10	95	230	180	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
50-280	B03	9,6	93	286	230	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
50-360	B03	9,6	88	343	280	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
50-450	B03	10	87	430	340	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
80-180	B03	17	110	190	140	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
80-230	B03	14	113	235	190	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
80-280	B03	12,5	110	286	230	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
80-360	B03	11,5	111	350	280	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
80-450	B05S	12	110	430	350	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
100-180	B03	28	133	190	150	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
100-230	B03	22,3	128	235	190	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
100-280	B03	17,8	130	295	230	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
100-360	B05S	15,5	136	355	295	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
100-450	B05S	14,5	140	440	355	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
150-230	B03	35	161	240	190	60	65	55	42	0,0675	97,88	118,13	195,75	236,25
150-280	B05S	28,5	164	295	230	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
150-360	B05S	22	160	365	295	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
150-450	B05L	19,5	171	450	360	80	80	75	60	0,3259	472,56	570,33	945,11	1140,65
150-501	B05L	23	190	504	400	80	80	75	60	0,3259	472,56	570,33	-	-
150-630	B06	20,9	201,9	636	520	100	120	120	95	0,8514	1234,53	1489,95	-	-
200-280	B05S	43,1	198	295	235	80	80	75	60	0,2141	311,32	375,73	622,63	751,45
200-360	B05L	35,5	204	360	295	80	80	75	60	0,3259	472,56	570,33	945,11	1140,65
200-401	B05L	40	222	408	320	80	80	75	60	0,3259	472,56	570,33	-	-
200-450	B05L	28	204	456	360	80	80	75	60	0,3259	472,56	570,33	945,11	1140,65
200-501	B05L	32	222	509	400	80	80	75	60	0,3259	472,56	570,33	-	-
200-670	B06	26	220	690	530	100	120	120	95	0,8514	1234,53	1489,95	-	-
250-401	B05L	63	294	404	320	80	80	75	60	0,3259	472,56	570,33	-	-
250-501	B05L	43	280	504	400	80	80	75	60	0,3259	472,56	570,33	-	-
250-630	B06	38	275	630	515	100	120	120	95	0,8514	1234,53	1489,95	-	-
250-710	B06	38	275	719	520	100	120	120	95	0,8514	1234,53	1489,95	-	-
300-400	B05L	68	294	404	353	80	80	75	60	0,3259	472,56	570,33	-	-
300-500	B05L	58	320	504	410	80	80	75	60	0,3259	472,56	570,33	-	-
300-630	B06	59	317	638	548	100	120	120	95	0,8514	1234,53	1489,95	-	-
350-400	B06	115,4	337	408	380	100	120	120	95	0,4530	656,70	792,60	-	-
400-506	B07	106,4	400	560	450	120	120	120	95	1,2357	1186,3 ¹³⁾	1421,1 ¹³⁾	-	-

10) Coolable on request

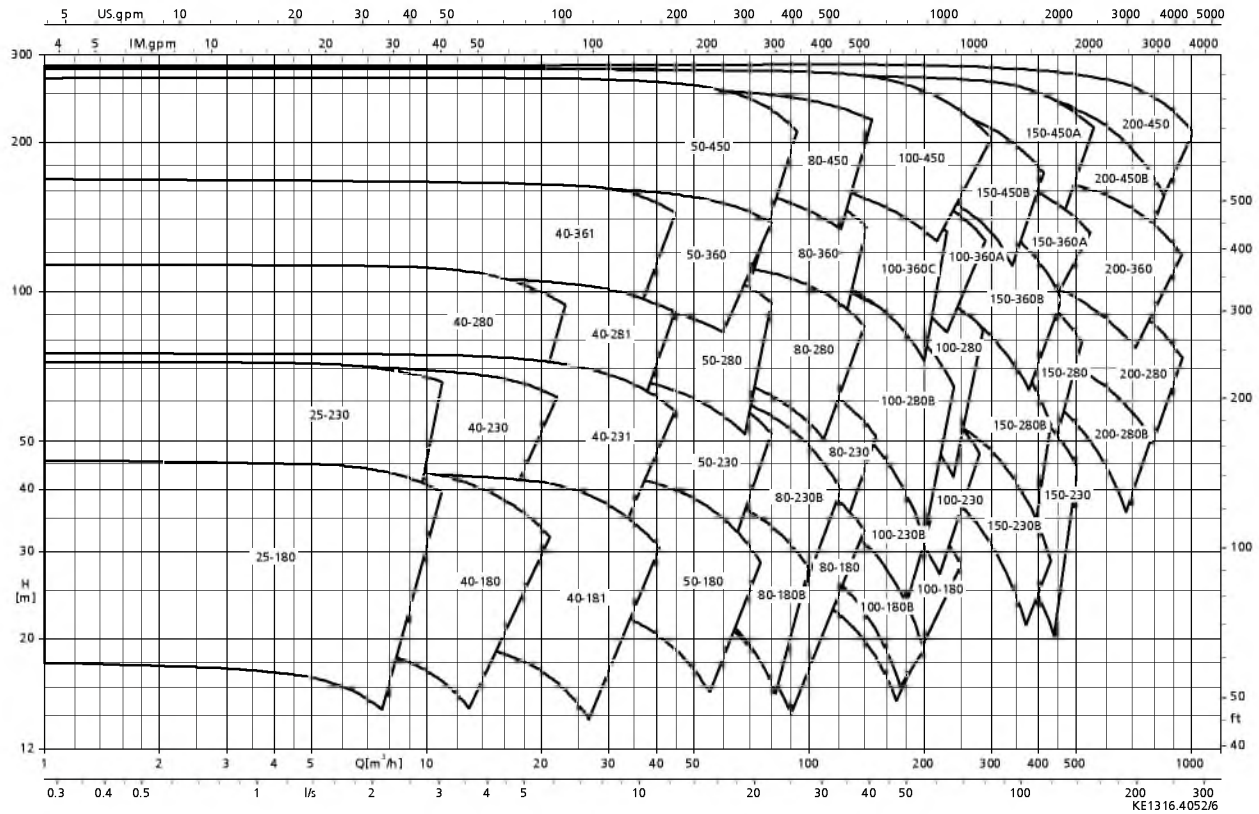
11) Values indicated refer to shaft in material C45+N, key in C45+K, impeller in JS1025 and T < 100 °C; for other materials and higher temperatures contact KSB.

12) For triple bearing assembly: 3 identical bearings as indicated, for high inlet pressures

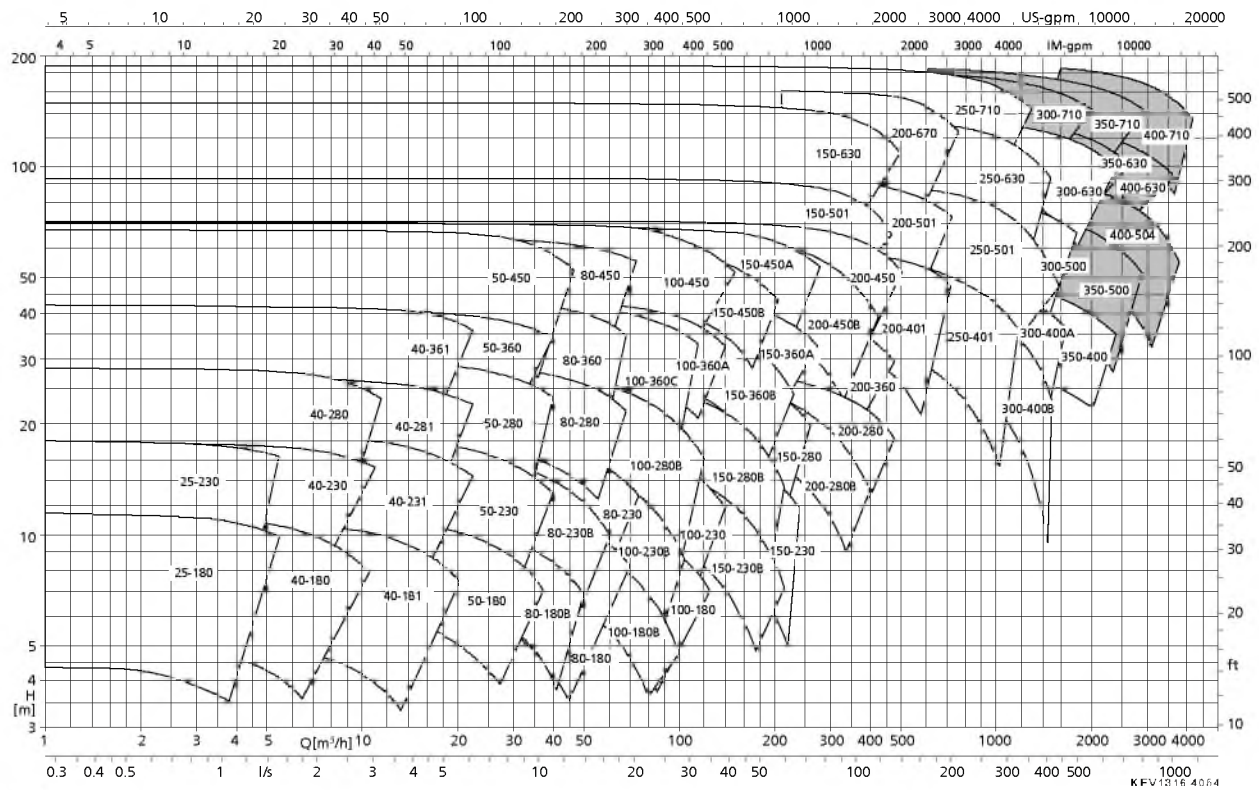
13) Only 6-pole operation is permissible for 960 rpm or 1150 rpm.

Selection charts

RPH, n = 2900 rpm

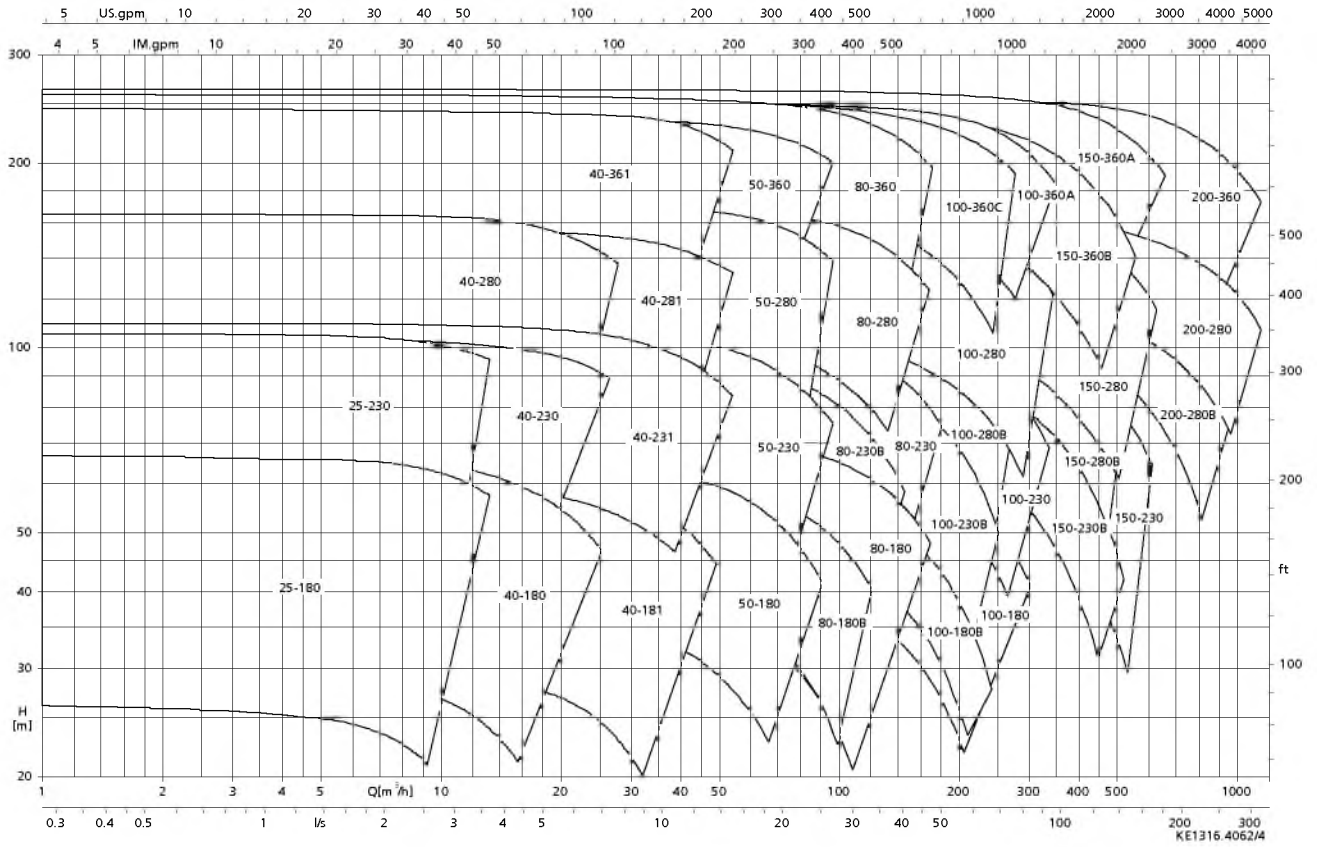


RPH, n = 1450 rpm

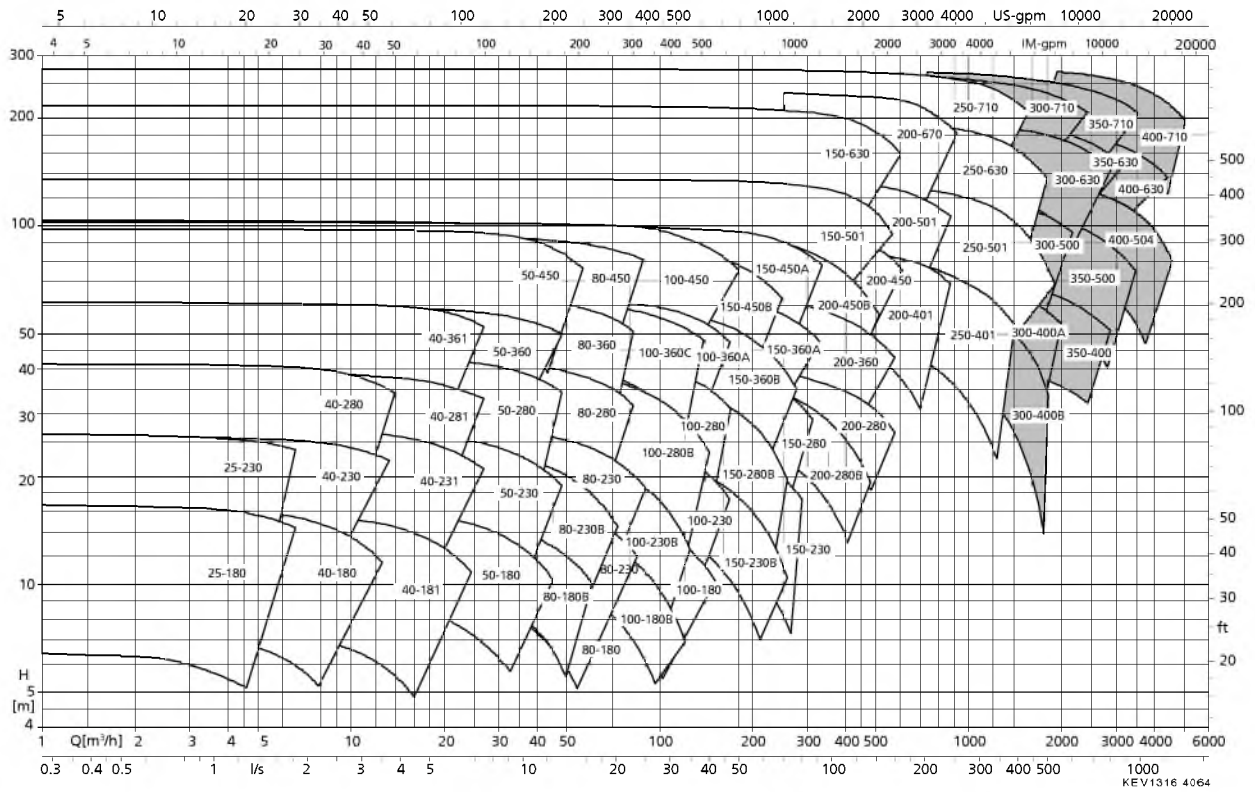


Size on request

RPH, n = 3500 rpm



RPH, n = 1750 rpm



■ Size on request

Dimensions and connections

Shaft seal connections

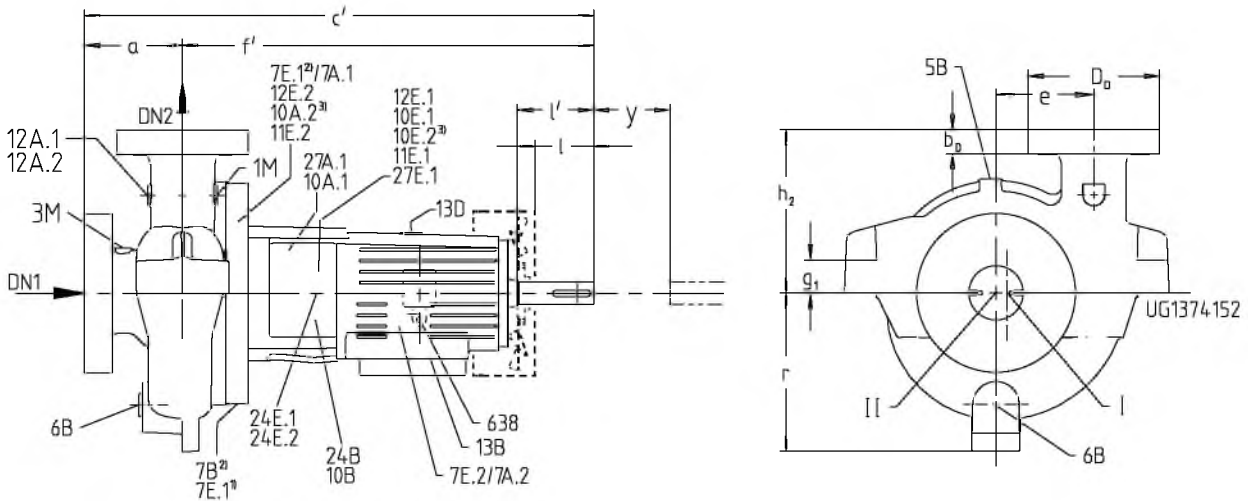
Design	Mechanical seal with quench supply, single	Mechanical seal, double (unpressurised tandem arrangement)	Mechanical seal, double (pressurised tandem arrangement)	Mechanical seal, back-to-back	Mechanical seal, single (API 23)
KSB standard					
API standard					

Connection types

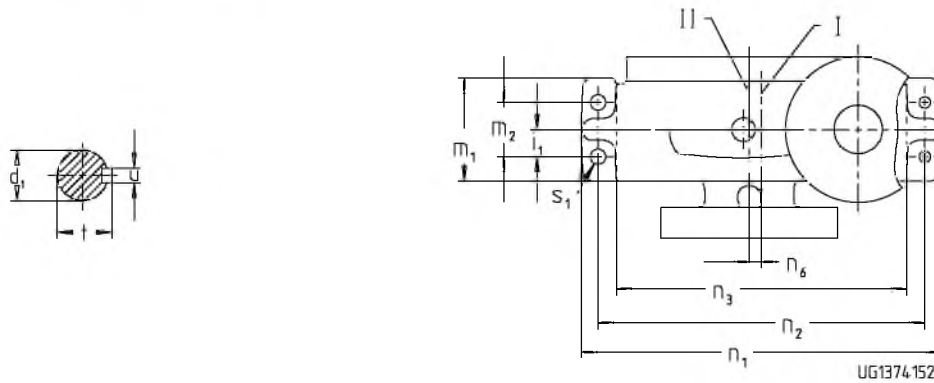
Connection	≤ DN 50	≥ DN 80	Description
1M	NPT 1/2-14	NPT 1/2-14	Pressure gauge
3M	NPT 1/2-14	NPT 1/2-14	Pressure gauge
5B	NPT 1/2-14	NPT 1/2-14	Vent
6B	DN15 ASME B16.5		Fluid drain
7B	NPT 1/2-14	NPT 1/2-14	Cooling liquid drain
7E.1/A.1	NPT 1/2-14	NPT 1/2-14	Cooling liquid IN/OUT
7E.2/A.2	NPT 1/2-14	NPT 1/2-14	Cooling liquid IN/OUT
10B	NPT 1/2-14	NPT 1/2-14	Barrier fluid drain
10E.1/A.1	NPT 1/2-14	NPT 1/2-14 ¹⁴⁾	Barrier fluid IN/OUT
10E.2/A.2	NPT 1/2-14	NPT 1/2-14 ¹⁴⁾	Barrier fluid IN/OUT
11E.1	NPT 1/2-14	NPT 1/2-14	Flushing liquid IN
11E.2	NPT 1/2-14	NPT 1/2-14	Flushing liquid IN
12E.1/A.1	NPT 1/2-14	NPT 1/2-14	Circulation liquid IN/OUT
12E.2/A.2	NPT 1/2-14	NPT 1/2-14	Circulation liquid IN/OUT
13B	NPT 1/2-14	NPT 1/2-14	Oil drain
13D	NPT 1/2-14	NPT 1/2-14	Vent plug
24B	NPT 3/8-18	NPT 3/8-18	Quench liquid drain
24 E.1/A.1	NPT 3/8-18	NPT 3/8-18	Quench liquid IN/OUT
24 E.2/A.2	NPT 3/8-18	NPT 3/8-18	Quench liquid IN/OUT
27B	NPT 1/2-14	NPT 1/2-14	Buffer liquid drain
27 E.1/A.1	NPT 1/2-14	NPT 1/2-14 ¹⁴⁾	Buffer liquid inlet/outlet
638	NPT 3/8-18	NPT 3/8-18	Constant level oiler

¹⁴⁾ NPT3/4-14 on bearing brackets B05 and B06

Standard sizes



Dimensions of standard pump sizes



Foot bolt and shaft end dimensions of standard pump sizes

1)	Not for material variant S and bearing bracket B06
2)	For pressurised tandem seals
3)	For "back-to-back" seals
I	Middle of pump foot
II	Middle of DN ₁ shaft

Dimensions of standard pump sizes

Size	Bearing bracket	Weight [kg]	Pump dimensions												
			DN ₁	DN ₂	a	c'	e	f'	g ₁	h ₂	m ₁	n ₁	n ₃	n ₆	r
25-180	B02S	116	40	25	120	772	105	652	40	230	130	420	320	0	185
25-230	B02S	131	40	25	120	772	125	652	40	255	130	460	360	0	205
40-180	B02S	122	50	40	130	782	105	652	40	250	130	420	320	0	188
40-181	B02L	136	50	40	130	786	110	656	40	250	130	420	320	0	198
40-230	B02S	138	50	40	130	782	130	652	40	265	136	460	360	0	215
40-231	B02L	158	50	40	140	796	135	656	40	265	146	460	360	0	220
40-280	B02L	197	50	40	140	796	160	656	40	290	146	540	440	0	238
40-281	B02L	195	50	40	140	796	160	656	40	290	150	540	440	0	248
40-361	B02L	249	50	40	150	806	195	656	40	305	150	640	540	0	275
50-180	B02L	153	80	50	150	806	120	656	50	265	150	470	360	0	220
50-230	B03	240	80	50	155	910	140	755	50	265	150	510	400	0	230
50-280	B03	289	80	50	170	915	170	755	50	290	150	550	440	0	255
50-360	B03	347	80	50	170	915	200	755	50	310	150	650	540	0	285
50-450	B03	441	80	50	180	935	245	755	50	365	150	750	640	0	325
80-180	B03	242	100	80	175	945	140	770	60	290	170	510	400	0	235
80-230	B03	264	100	80	170	925	160	755	60	290	170	550	440	20	265
80-280	B03	317	100	80	180	935	180	755	60	300	170	590	480	20	290
80-360	B03	361	100	80	190	945	210	755	60	310	170	650	540	15	325

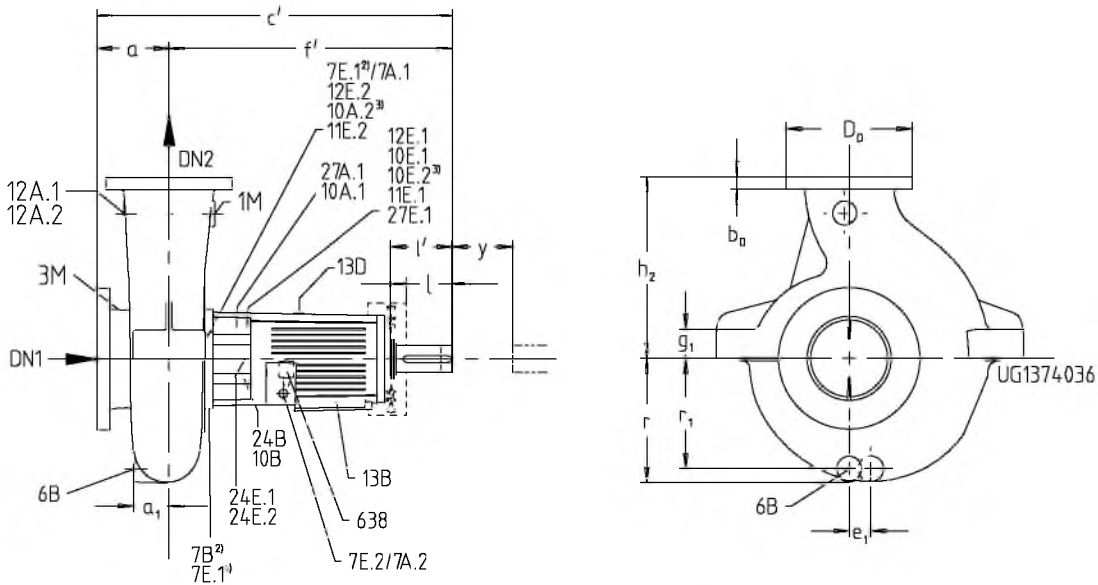
Size	Bearing bracket	Weight [kg]	Pump dimensions												
			DN ₁	DN ₂	a	c'	e	f'	g ₁	h ₂	m ₁	n ₁	n ₃	n ₆	r
80-450	B05S	547	100	80	200	1080	260	880	60	370	170	760	650	20	375
100-180	B03	289	150	100	185	955	170	770	70	325	190	590	480	25	275
100-230	B03	303	150	100	170	925	175	755	70	325	170	590	480	30	285
100-280	B03	345	150	100	170	925	200	755	70	335	190	650	540	30	315
100-360	B05S	477	150	100	200	1080	225	880	70	355	190	730	590	25	340
100-450	B05S	576	150	100	210	1090	270	880	70	385	190	860	720	30	395
150-230	B03	369	200	150	200	955	210	755	80	335	200	730	590	45	330
150-280	B05S	461	200	150	200	1080	225	880	80	365	200	730	590	40	355
150-360	B05S	533	200	150	230	1110	250	880	80	365	200	780	640	40	385
150-450	B05L	659	200	150	230	1110	280	880	80	415	200	870	720	35	420
200-280	B05S	575	250	200	230	1110	260	880	90	395	230	870	720	50	400
200-360	B05L	683	250	200	230	1110	275	880	90	395	230	910	760	60	430
200-450	B05L	804	250	200	250	1130	310	880	90	435	230	970	820	50	475

Shaft end and foot bolt dimensions of standard pump sizes

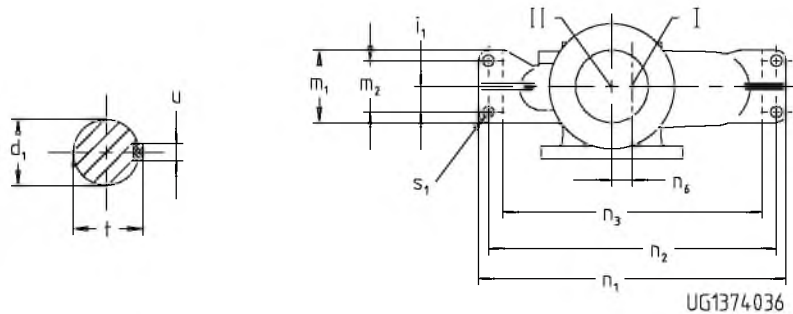
Size	Bearing bracket	Shaft end						Foot bolts			
		d ₁ ¹⁵⁾	l	l'	t	u	y	i ₁	m ₂	n ₂	s ₁
25-180	B02S	32	80	115	35	10	140	30	60	380	17,5
25-230	B02S	32	80	115	35	10	140	30	60	420	17,5
40-180	B02S	32	80	115	35	10	140	30	60	380	17,5
40-230	B02S	32	80	115	35	10	140	30	60	420	17,5
40-181	B02L	32	80	115	35	10	140	30	60	380	17,5
40-231	B02L	32	80	115	35	10	140	30	60	420	17,5
40-280	B02L	32	80	115	35	10	140	35	70	500	17,5
40-281	B02L	32	80	115	35	10	140	35	70	500	17,5
40-361	B02L	32	80	115	35	10	140	35	70	600	17,5
50-180	B02L	32	80	115	35	10	140	35	70	420	22
50-230	B03	42	110	140	45	12	140	35	70	460	22
50-280	B03	42	110	140	45	12	140	35	70	500	22
50-360	B03	42	110	140	45	12	140	45	90	600	22
50-450	B03	42	110	140	45	12	140	45	90	700	22
80-180	B03	42	110	140	45	12	140	45	90	460	22
80-230	B03	42	110	140	45	12	140	45	90	500	22
80-280	B03	42	110	140	45	12	140	45	90	540	22
80-360	B03	42	110	140	45	12	140	45	90	600	22
80-450	B05S	60	140	182	64	18	180	45	90	710	22
100-180	B03	42	110	140	45	12	140	50	100	540	26
100-230	B03	42	110	140	45	12	140	50	100	540	26
100-280	B03	42	110	140	45	12	140	50	100	600	26
100-360	B05S	60	140	140	64	18	180	55	110	670	26
100-450	B05S	60	140	182	64	18	180	55	110	800	26
150-230	B03	42	110	140	45	12	140	50	100	670	33
150-280	B05S	60	140	182	64	18	180	60	120	670	33
150-360	B05S	60	140	182	64	18	180	60	120	720	33
150-450	B05L	60	140	182	64	18	180	55	110	800	33
200-280	B05S	60	140	182	64	18	180	55	110	800	36
200-360	B05L	60	140	182	64	18	180	55	110	840	36
200-450	B05L	60	140	182	64	18	180	55	110	900	36

¹⁵⁾ d1 Ø k6 for bearing brackets B02 and B03; d1 Ø n6 for bearing bracket B05

Complementary sizes



Dimensions of complementary pump sizes



Foot bolt and shaft end dimensions of complementary pump sizes

1)	Not for material variant S and bearing bracket B06
2)	For pressurised tandem seals
3)	For "back-to-back" seals
I	Middle of pump foot
II	Middle of DN ₁ , shaft

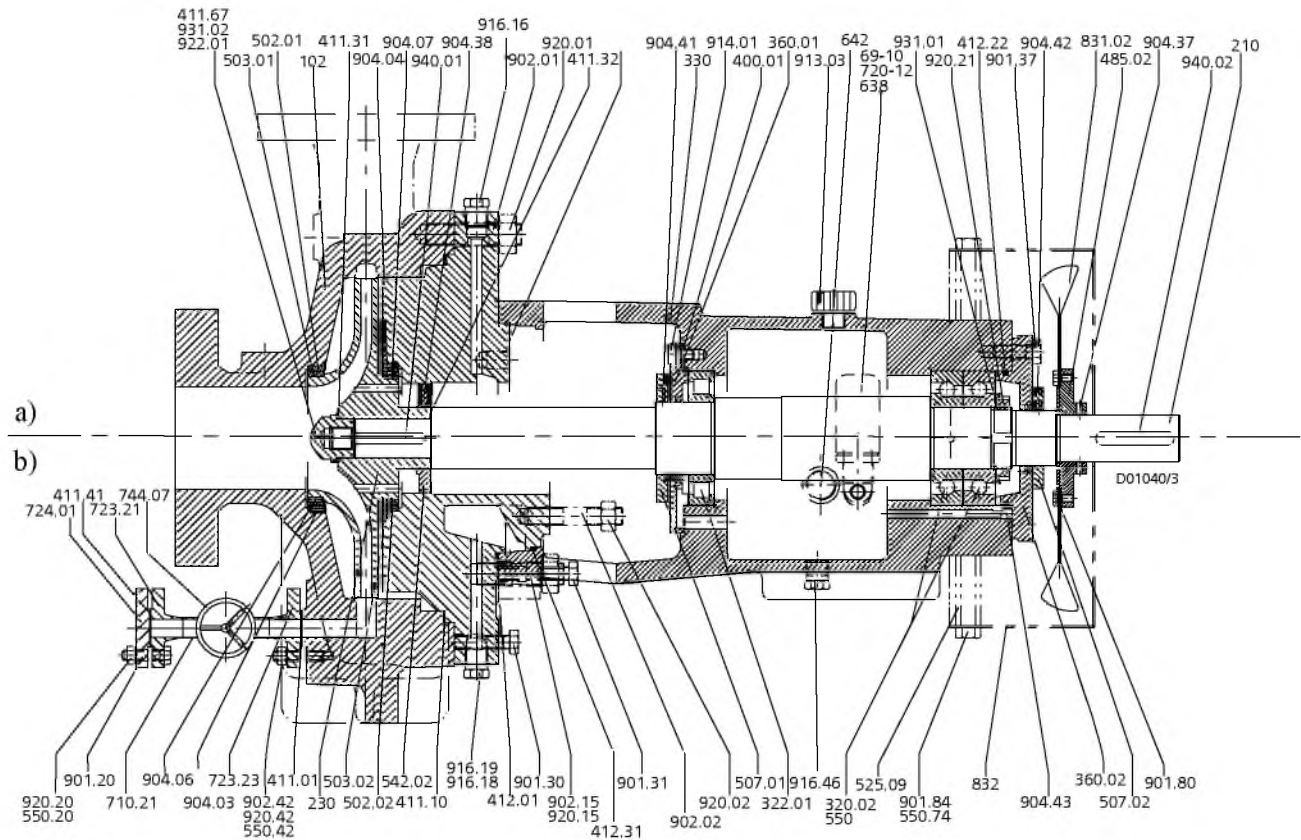
Dimensions of complementary pump sizes

Size	Bearing bracket	Weight [kg]	Pump dimensions										
			DN ₁	DN ₂	a	c'	f'	g ₁	h ₂	m ₁	n ₁	n ₃	n ₆
150-501	B05L	516	200	150	180	1080	900	90	500	180	960	820	0
150-630	B06	1190	200	150	250	1435	1185	90	670	310	1200	1020	60
200-401	B05L	528	250	200	190	1095	905	90	510	180	960	820	0
200-501	B05L	676	250	200	200	1085	885	90	560	180	1060	920	0
200-670	B06	1440	250	200	250	1430	1180	90	670	310	1360	1180	0
250-401	B05L	734	300	250	240	1140	900	90	600	210	1160	1000	0
250-501	B05L	926	300	250	200	1100	900	90	670	210	1200	1040	0
250-630	B06	1500	300	250	300	1440	1140	90	750	310	1200	1020	70
250-710	B06	1630	300	250	300	1430	1130	90	800	310	1460	1280	0
300-400	B05L	1135	350	300	310	1197	887	90	640	310	1200	1020	0
300-500	B05L	1255	350	300	300	1174	874	120	750	300	1270	1070	85
300-630	B06	1722	350	300	300	1489	1189	90	800	300	1460	1280	0
350-350	B06	1690	350	300	350	1509	1159	120	750	310	1370	1180	80
400-506	B07	2410	400	400	350	1615	1265	120	900	400	1560	1320	90

Shaft end and foot bolt dimensions of complementary pump sizes

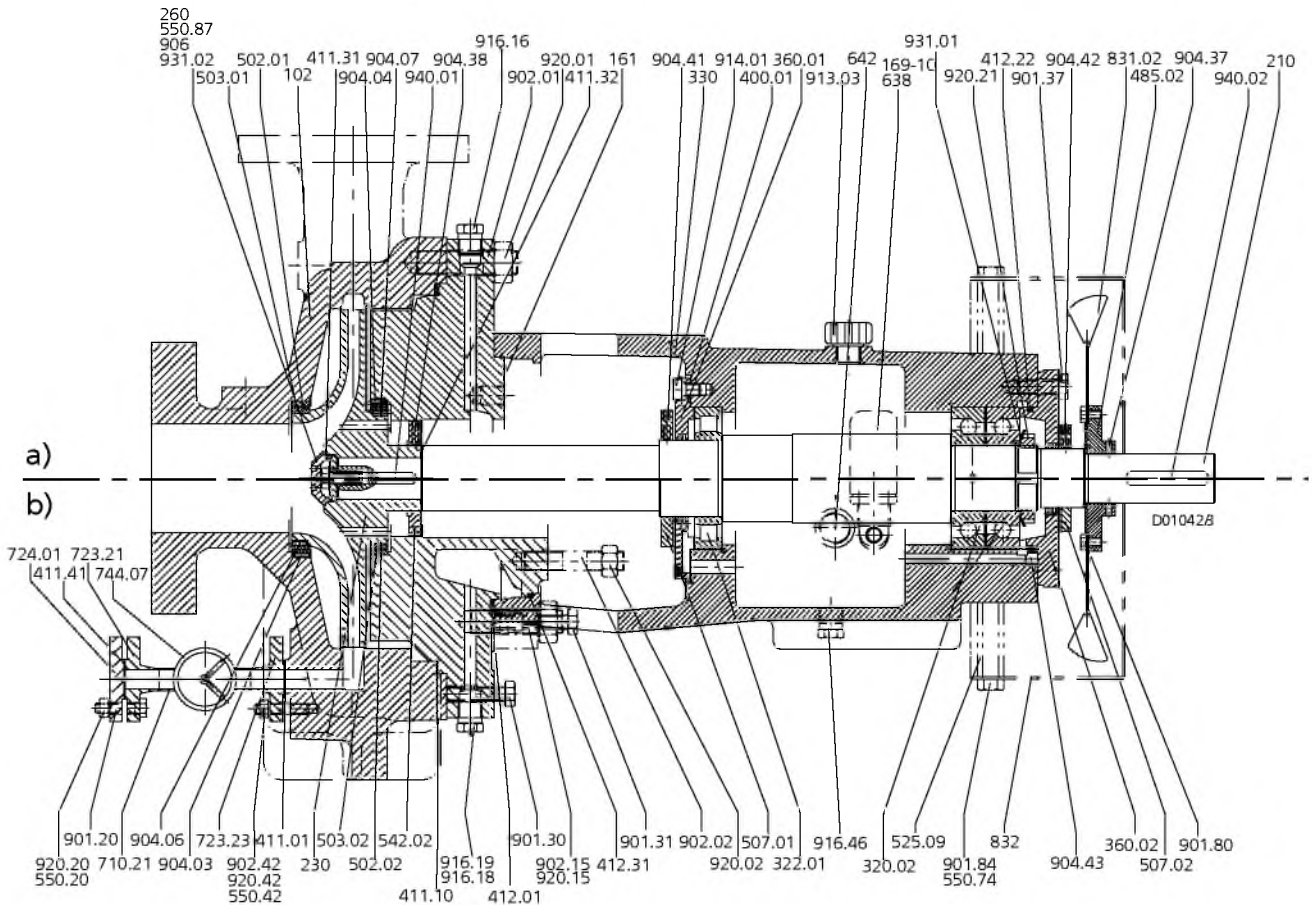
Size	Bearing bracket	Shaft end						Foot bolts				Drain line		
		d ₁ ¹⁶⁾	l	l'	t	u	y	i ₁	m ₂	n ₂	s ₁	e ₁	r ₁	a ₁
150-501	B05L	60	140	182	64	18	180	60	120	900	33	0	315	63,5
150-630	B06	95	170	215	100	25	250	105	210	1120	36	85	412,5	80
200-401	B05L	60	140	182	64	18	180	60	120	900	33	0	330	64,5
200-501	B05L	60	140	182	64	18	180	60	120	1000	33	0	360	78,5
200-670	B06	95	170	215	100	25	250	105	210	1280	36	0	425	73
250-401	B05L	60	140	182	64	18	180	75	150	1080	33	0	365	105
250-501	B05L	60	140	182	64	18	180	75	150	1120	33	0	412	102
250-630	B06	95	170	215	100	25	250	105	210	1120	36	0	425	108
250-710	B06	95	170	215	100	25	250	105	210	1380	36	0	500	122
300-400	B05L	60	140	182	64	18	250	130	210	1120	33	0	395	167
300-500	B05L	60	140	182	64	18	250	105	210	1190	33	0	455	147
300-630	B06	95	170	215	100	25	250	105	210	1380	36	0	503	173
350-350	B06	95	170	215	100	25	330	105	210	1280	33	50	500	161
400-506	B07	110	205	255	116	28	350	150	300	1460	36	90	585	186

General assembly drawing with list of components



Bearing brackets B02 to B05, a) uncooled and b) cooled

16) d1 Ø n6



Bearing brackets B06 and B07, a) uncooled and b) cooled

List of components

Part No.	Comprising	Description
102	102	Volute casing
	411.10	Joint ring
	502.01	Casing wear ring
	902.01	Stud
	904.03	Grub screw
	916.01 ¹⁷⁾	Plug
	920.01	Hexagon nut
161	161	Casing cover
	411.10	Joint ring
	412.01/.31 ¹⁸⁾	O-ring
	502.02 ²⁵⁾	Casing wear ring
	901.30	Hexagon head bolt
	902.15	Stud
	904.04 ²⁵⁾	Grub screw
210	916.16	Plug
	920.15	Hexagon nut
	210	Shaft
	920.21	Slotted round nut
230	931.01	Lock washer
	940.01/.02	Key
	230	Impeller
	931.02	Lock washer
	503.01/.02	Impeller wear ring

17) Not shown in drawing

18) For cooled design only

Part No.	Comprising	Description
	904.06/07	Grub screw
	411.31 ¹⁹⁾ /32 ¹⁹⁾ /67 ¹⁹⁾²⁰⁾	Joint ring
260 ²¹⁾	260	Impeller hub cap
	550.87	Disc
	906	Impeller screw
320.02/550 ²²⁾	320.02 ²³⁾	Angular contact ball bearing
	550 ²⁴⁾	Adjusting washer
322.01	322.01	Cylindrical roller bearing
330	330	Bearing bracket
	69.10	Protective cage
	360.01/02	Bearing cover
	400.01	Gasket
	412.22	O-ring
	638	Constant level oiler
	642	Oil level sight glass
	710.21	Pipe
	901.31/37	Hexagon head bolt
	913.03	Vent plug
	916.46	Plug
	914.01	Hexagon socket head cap screw
360.01/02	360.01/02	Bearing cover
	400.01	Gasket
	412.22	O-ring
	914.01	Hexagon socket head cap screw
502.01/02 ²⁵⁾	502.01/02	Casing wear ring
	904.03/04 ²⁵⁾	Grub screw
503.01/02 ²⁵⁾	503.01/02	Impeller wear ring
	904.06/07 ²⁵⁾	Grub screw
507.01/02	507.01/02	Thrower
	904.41/42	Grub screw
542.02	542.02	Throttling bush
	904.38	Grub screw
638	638	Constant level oiler
70-3 ²⁰⁾	70-3	Drain line
	411.01	Joint ring
	902.42	Stud
	920.42	Hexagon nut
	550.42	Disc
	723.23	Flange
	744.07	Gate valve
	710.21	Pipe
	723.21	Flange
	411.41	Joint ring
	724.01	Blind flange
	901.20	Hexagon head bolt
	920.20	Hexagon nut
	550.20	Disc
831.02 ²⁰⁾	831.02	Fan impeller
	832	Fan hood
	485.02	Fan hub
	904.37	Grub screw
922.01 ¹⁹⁾	922.01	Impeller nut
	931.02	Lock washer
99-g ¹⁷⁾	99-g ¹⁷⁾	Set of sealing elements, complete

- 19) For bearing brackets B02 to B05 only
20) Optional
21) For bearing brackets B06 and B07 only
22) For bearing brackets B03 and B05 only
23) For bearing brackets B03 and B05 only
24) For bearing brackets B03 and B05 only
25) For impellers with balancing of axial thrust only

Design variants

Design variants

Design	Detailed view
Design with coolable bearing bracket	
Design with thrower	
Design with plug	
Design with welded drain	

Design	Detailed view
<p>Design with bearings in tandem arrangement</p>	
<p>Design with heatable casing</p>	
<p>Design with auxiliary impeller</p>	

Heat Transfer Fluid / Hot Water Pump

HPK-L

Type Series Booklet



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Centrifugal Pumps with Shaft Seal

Heat Transfer Fluid / Hot Water Pumps

HPK-L



Main applications

Pump for handling hot water and organic or synthetic heat transfer fluids in piping or tank systems.

- Heating systems
- Forced-circulation boiler
- District heating
- Heat transfer systems

Operating data

Operating properties

Characteristic		Value	
		50 Hz	60 Hz
Flow rate	Q [m³/h]	≤ 1160	≤ 1400
Head	H [m]	≤ 162	≤ 233
Fluid temperature	T [°C]	Version S/Z:	
		-40 to +350	
Operating pressure	p [bar]	Version E/Y:	
		-40 to +400	
Operating pressure	p [bar]	Version E/S:	
		≤ 25 bar	
		Version Y/Z:	
		≤ 40 bar	

Designation

Example: HPKL050-032-160 EGBS x

Key to the designation

Code	Description
HPKL	Type series
050	Nominal suction nozzle diameter [mm]
032	Nominal discharge nozzle diameter [mm]
160	Nominal impeller diameter [mm]
Y	Material of the casing and casing cover

Code	Description	
	S	Unalloyed steel and nodular cast iron
	E	Unalloyed steel and P250GH/ 1.7335/ P355NL1 (Europe) or unalloyed steel (Asia)
	Z	1.7706 and nodular cast iron
	Y	1.7706 and P250GH/ 1.7335/ P355NL1
G	Impeller material	
	G	Cast iron
	C	Stainless steel
BS	Mechanical seal, air-cooled	
	BS	Single mechanical seal
	TL	Tandem mechanical seals
x	Additional code	
	x	Special design

Further information on the designation

(⇒ Page 21)

Design details

Design

- Volute casing pump
- Horizontal installation
- Back pull-out design
- Single-stage
- Meets the technical requirements to ISO 5199
- Dimensions and ratings to ISO 2858 complemented by pumps of nominal diameters DN 25, DN 200 and above

Pump casing

- Single or double volute, depending on the pump size
- Radially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings (as required)

Impeller type

- Closed radial impeller with multiply curved vanes

Shaft seal

- KSB mechanical seal, optimised for installation in an HPK-L pump, with integrated shaft sleeve (standard Europe)
- Optional commercial single mechanical seals with replaceable shaft sleeve (standard Asia/Americas)
- Versions with two mechanical seals can be supplied for heat transfer applications.

Bearings

Bearings:

- Version with single mechanical seal
 - Radial bearing: plain bearing, product-lubricated
 - Fixed bearings: two angular ball bearings, grease-packed
- Version with two mechanical seals
 - Radial bearing: plain bearing, product-lubricated

- Fixed bearing: one deep groove ball bearing or one four-point bearing (depending on the pump size), grease-packed

Bearing bracket designation

Example: CS50

Bearing bracket designation

Code	Description
CS	Bearing bracket
50	Size

Bearings used

Design	Bearing bracket	Plain bearing	Ball bearing
One mechanical seal	CS40	SSiC	2x7307
	CS50	SSiC	2x7307
	CS60	SSiC	2x7309
	CS80	SSiC	2x7313
Two mechanical seals	CS40	SSiC	1x6307 or QJ307
	CS50	SSiC	1x6307 or QJ307
	CS60	SSiC	1x6309
	CS80	SSiC	1x6313 or QJ313

Automation (Europe only)

Automation options:

- Hyamaster
- hyatronic
- PumpDrive

Materials

Overview of available materials (Europe)

Description	Material variant							
	SG	SC	EG	EC	ZG	ZC	YG	YC
Volute casing	GP240GH+N				1.7706			
Casing cover	EN-GJS-400-18-LT		P250GH/1.7335/P355NL ¹⁾		EN-GJS-40-18-LT		P250GH/1.7335/P355NL ¹⁾	
Impeller	EN-GJL-250	1.4408	EN-GJL-250	1.4408	EN-GJL-250	1.4408	EN-GJL-250	1.4408
Shaft	1.4021+QT800							
Shaft sleeve	1.4021+QT800							
Bearing bracket	EN-GJS-400-18-LT							
Support foot	Steel							
Casing wear ring	None ²⁾	None ³⁾	None ²⁾	None ³⁾	None ²⁾	None ³⁾	None ²⁾	None ³⁾
Impeller wear ring	None ⁴⁾	None ⁵⁾	None ⁴⁾	None ⁵⁾	None ⁴⁾	None ⁵⁾	None ⁴⁾	None ⁵⁾
Impeller nut	AISI316							
Gasket	CrNi graphite 1G							

Overview of available materials (Asia)

Description	Material variant	
	EG	EE
Volute casing	A216 Gr WCB	
Casing cover	A216 Gr WCB	
Impeller	A48CL35B	A216 Gr WCB
Shaft	A276 Type 410 COND. H	

¹⁾ Depending on the size

²⁾ Optional casing wear ring made of EN-GJL-250 or VG434

³⁾ Optional casing wear ring made of VG434

⁴⁾ Optional impeller wear ring made of 1.4021+QT in combination with casing wear ring made of EN-GJL-250 or VG434

⁵⁾ Optional impeller wear ring made of CrNiMoSt in combination with casing wear ring made of VG434

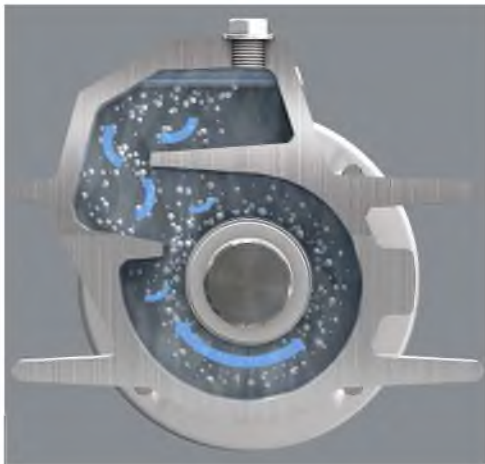
Description	Material variant	
	EG	EE
Shaft sleeve	A276 Type 410 COND. H	
Bearing bracket	A216 Gr WCB	
Support foot	Steel	
Casing wear ring	A48CL35B	None ⁶⁾
Impeller wear ring	None	None ⁶⁾
Impeller nut	AISI 316	
Gasket	CrNi graphite 1G	

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Low temperature in the mechanical seal chamber; no cooling water required thanks to air-cooled bearing bracket with heat barrier.
- Increased operating reliability of versions for heat transfer applications by an optional two mechanical seals preventing leakage.
- Higher efficiencies than the previous HPK-L model by continued development of the flow passage within the hydraulic system.
- Optimised venting of mechanical seal chamber by patented VenJet profile.



VenJet profile

Acceptance tests and warranty

- Materials testing
 - Test report 2.2 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test

The duty point of each pump is guaranteed according to ISO 9906/2A.

The following acceptance tests can be performed and certified at extra charge:

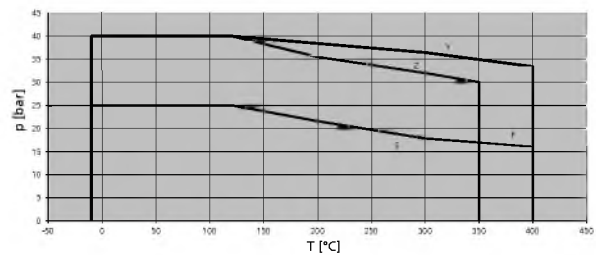
 - Performance test to ISO 9906

- NPSH test

- Other tests (e.g. vibrations, strength) on request.
- Warranty

Warranties are given within the scope of the valid delivery conditions.

Pressure and temperature limits



Pressure and temperature limits of the pump

ASME flanges do not have any impact on the pressure and temperature limits of the pump.

⁶⁾ Optional casing wear ring made of Chrome hard 400 in combination with impeller wear ring made of A743 Gr CA15

Technical data

Size	Bearing bracket						Impeller						Shaft diameter						Speed limit		Weights	Volute type ⁷⁾		
	Impeller outlet width		Free passage		Impeller inlet width		Max. impeller diameter		Min. impeller diameter		Without shaft sleeve		Pump-end bearing		Drive-end bearing		Coupling		Shaft sleeve				Minimum	Maximum
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[rpm]	[rpm]		
040-025-160	C540	6	5,7	44	169	130	28	24	24	35	24	33	800	3600	50	E								
040-025-200	C540	6	5,7	44	209	160	28	24	24	35	24	33	800	3600	60	E								
050-032-125.1	C540	7	6,0	52	139	114	28	24	24	35	24	33	800	3600	47	E								
050-032-160.1	C540	6	5,4	52	170	138	28	24	24	35	24	33	800	3600	51	E								
050-032-200.1	C540	6	5,3	54	204	138	28	24	24	35	24	33	800	3600	60	E								
050-032-250.1	C550	6	5,2	58	254	220	38	35	35	35	32	43	800	3600	87	E								
050-032-125	C540	10	5,7	63	139	110	28	24	24	35	24	33	800	3600	47	E								
050-032-160	C540	9	5,8	63	174	135	28	24	24	35	24	33	800	3600	51	E								
050-032-200	C540	7	6,7	62	209	178	28	24	24	35	24	33	800	3600	61	E								
050-032-250	C550	8	7,1	63	261	212	38	35	35	35	32	43	800	3600	87	E								
065-040-160.1	C540	9	8,5	65	169	130	28	24	24	35	24	33	800	3600	50	E								
065-040-250.1	C550	7	6,6	68	260	200	28	24	24	35	24	43	800	3600	88	E								
065-040-125	C540	14	9,6	74	139	110	28	24	24	35	24	33	800	3600	48	E								
065-040-160	C540	13	11,5	70	174	135	28	24	24	35	24	33	800	3600	50	E								
065-040-200	C540	9	8,9	69	209	175	28	24	24	35	24	33	800	3600	64	E								
065-040-250	C550	8	8,0	73	260	214	38	35	35	35	32	43	800	3600	88	E								
065-040-315	C550	8	7,1	75	326	278	38	35	35	35	32	43	800	3600	119	E								
080-050-315.1	C550	8	7,6	85	320	260	38	35	35	35	32	43	800	3600	136	E								
080-050-125	C540	20	11,6	88	142	114	28	24	24	35	24	33	800	3600	55	E								
080-050-160	C540	17	11,6	87	174	135	28	24	24	35	24	33	800	3600	57	E								
080-050-200	C540	14	11,9	83	219	180	28	24	24	35	24	33	800	3600	66	E								
080-050-250	C550	11	10	84	260	220	38	35	35	35	32	43	800	3600	136	E								
100-065-125	C540	26	12,9	99	141	114	28	24	24	35	24	33	800	3600	56	E								
100-065-160	C550	21	12,2	92	174	132	38	35	35	35	32	43	800	3600	89	E								
100-065-200	C550	17	13,3	100	219	180	38	35	35	35	32	43	800	3600	91	E								
100-065-250	C550	15	14,3	101	260	220	38	35	35	35	32	43	800	3600	109	E								
100-065-315	C560	14	13,0	107	320	270	48	38	38	45	42	53	800	3600	152	E								
125-080-160	C550	32	15,1	124	174	122	38	35	35	35	32	43	800	3600	95	E								
125-080-200	C550	25	15,2	115	219	180	38	35	35	35	32	43	800	3600	98	E								
125-080-250	C550	19	15,8	115	269	220	38	35	35	35	32	43	800	3600	118	D								
125-080-315	C560	19	17,8	115	334	281	48	38	38	45	42	53	800	3600	159	D								
125-080-400	C560	15	14,3	129	398	330	48	38	38	45	42	53	800	1800	234	E								
125-100-160	C550	38	16,4	135	185	155	38	35	35	35	32	43	800	3600	115	E								
125-100-200	C550	33	17,9	142	219	179	38	35	35	35	32	43	800	3600	108	E								
125-100-250	C560	27	18,8	145	262	216	48	38	38	45	42	53	800	3600	134	D								
125-100-315	C560	23	19,9	142	334	280	48	38	38	45	42	53	800	3600	166	D								
125-100-400	C560	18	17,1	142	401	329	48	38	38	45	42	53	800	1800	243	E								
150-125-200	C560	41	21,1	160	224	162	48	38	38	45	42	53	800	3600	142	D								
150-125-250	C560	37	22,4	162	269	218	48	38	38	45	42	53	800	1800	167	E								
150-125-315	C560	31	22,6	162	334	280	48	38	38	45	42	53	800	1800	208	E								
150-125-400	C560	26	20,9	162	419	330	48	38	38	45	42	53	800	1800	263	D								
200-150-200	C560	60	25,2	179	224	158	48	38	38	45	42	53	800	1800	213	E								
200-150-250	C560	49	23,0	191	269	220	48	38	38	45	42	53	800	1800	201	E								
200-150-315	C580	40	26,9	192	334	264	60	47	47	65	48	65	800	1800	278	E								
200-150-400	C580	33	23,8	191	419	330	60	47	47	65	48	65	800	1800	327	D								
200-150-500	C580	23	19,1	190	504	400	60	47	47	65	48	65	800	1800	454	D								
200-200-250	C580	62	37,2	190	260	200	60	47	47	65	48	65	800	1800	327	E								
250-200-315	C580	50	20,8	222	320	260	60	47	47	65	48	65	800	1800	342	E								
250-200-400	C580	40	18,4	222	404	320	60	47	47	65	48	65	800	1800	409	D								

7) E = single volume, D = double volume

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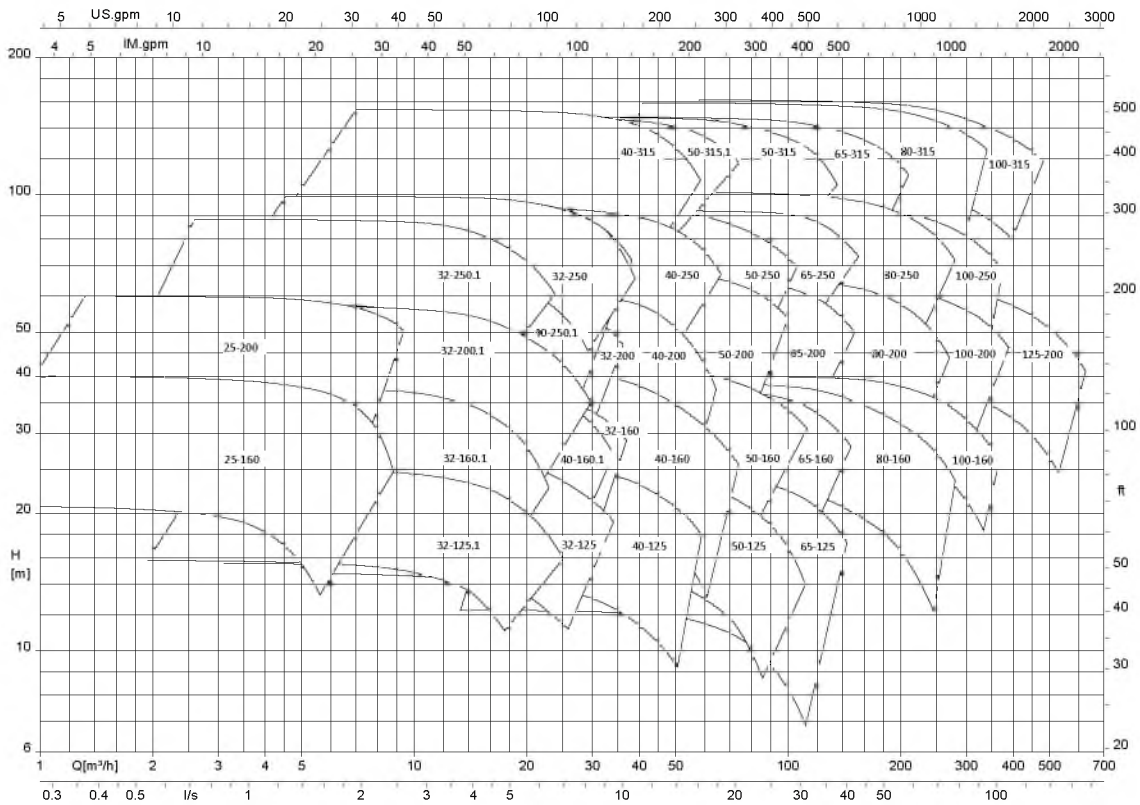


Centrifugal Pumps with Shaft Seal
Heat Transfer Fluid / Hot Water Pumps

Size	Bearing bracket		Impeller				Shaft diameter				Speed limit		Weights	Volute type ⁷⁾	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[rpm]	[rpm]				
250-200-500	CS80	32	20,6	222	504	400	60	47	65	48	65	800	1800	565	D
300-250-315	CS80	73	26,7	270	324	260	60	47	65	48	65	800	1800	505	D

Selection charts

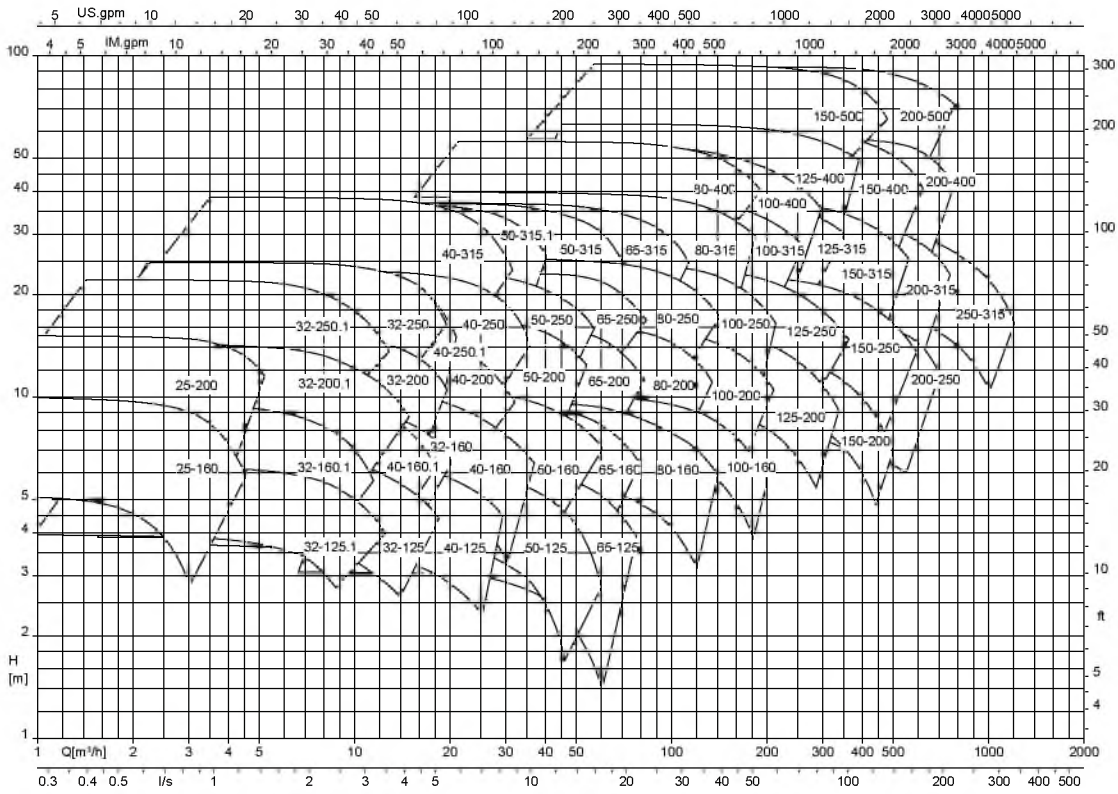
HPK-L, n = 2900 rpm



Size 065-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

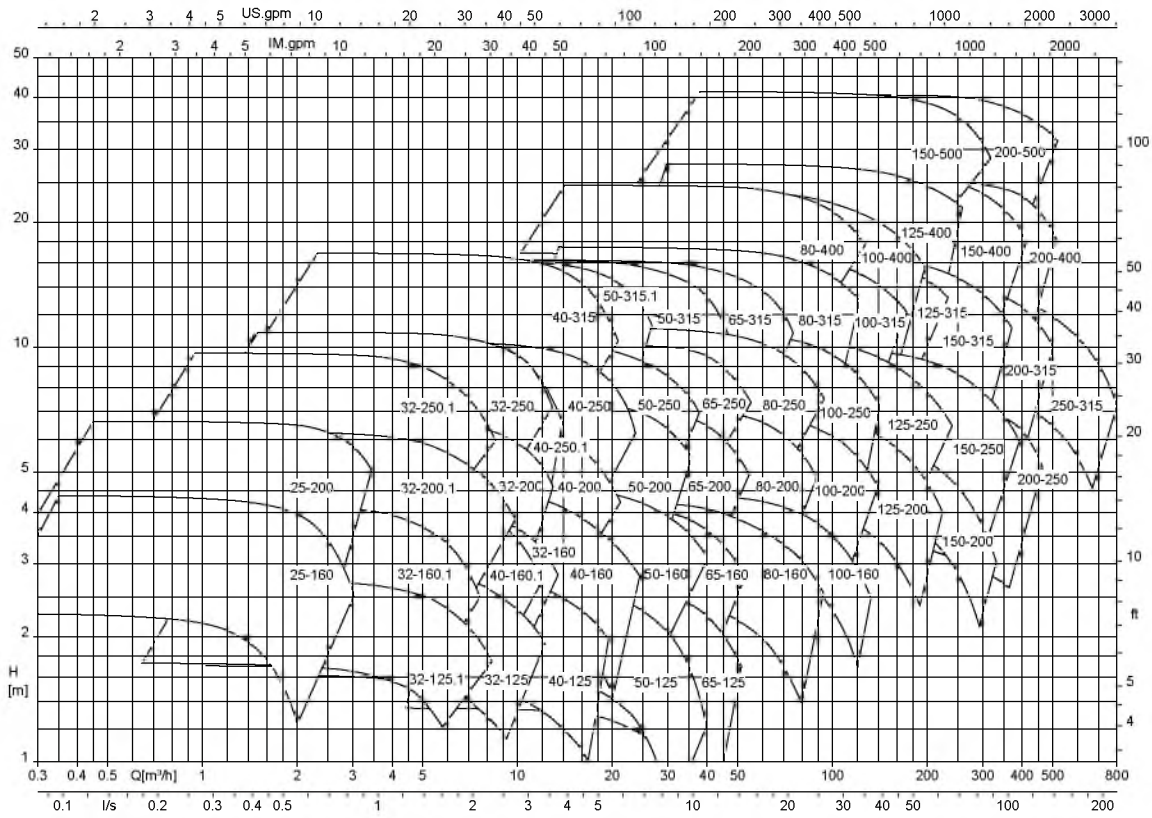
HPK-L, n = 1450 rpm



Size 65-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

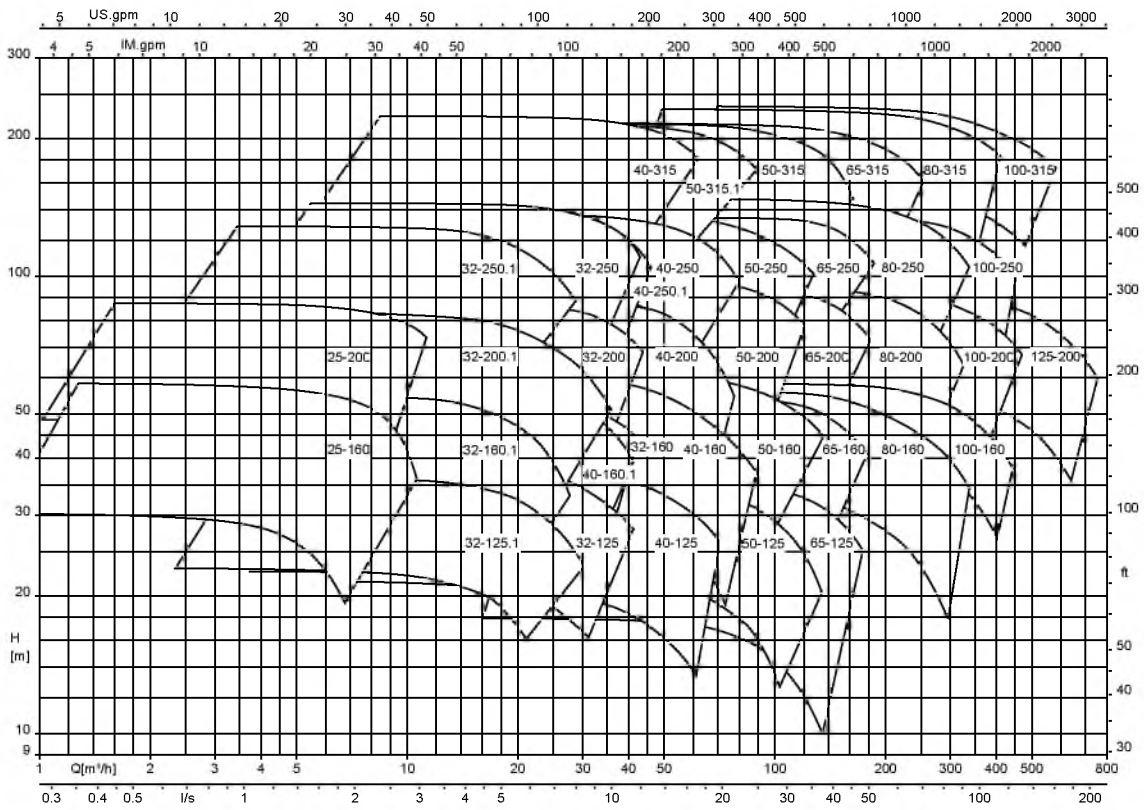
HPK-L, n = 960 rpm



Size 65-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

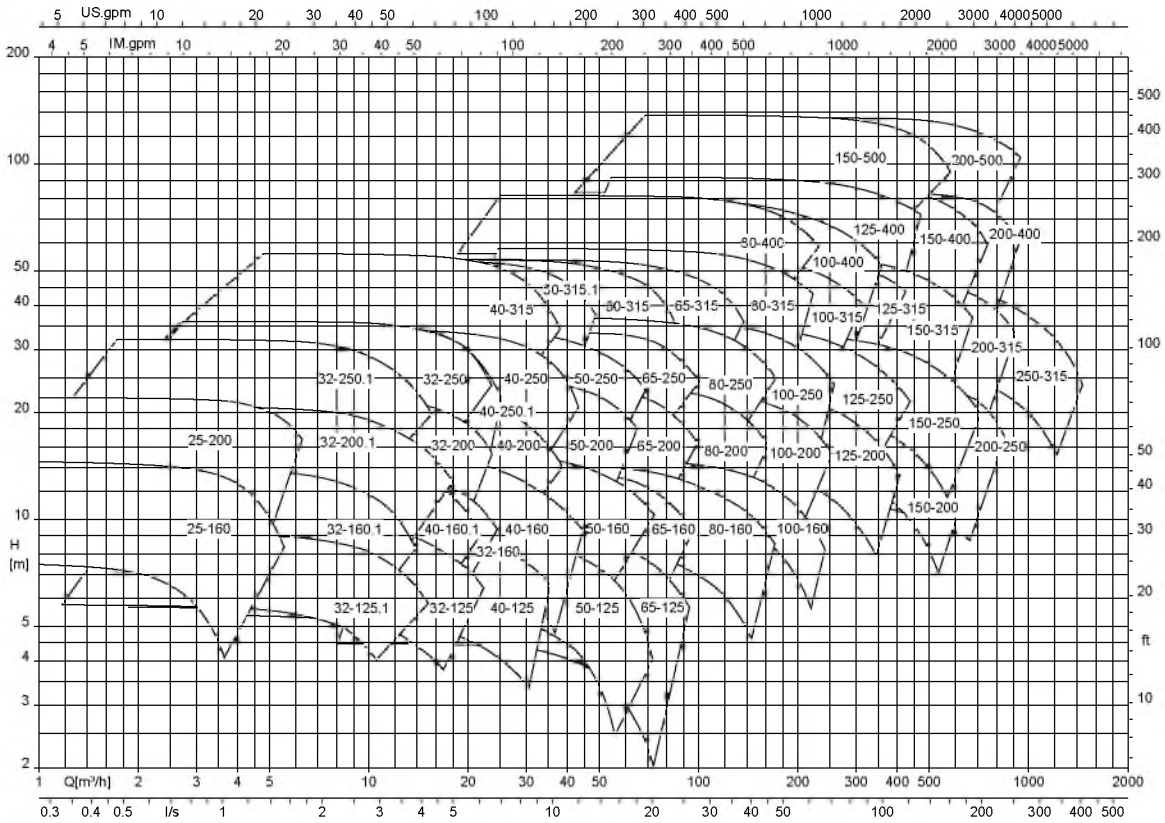
HPK-L, n = 3500 rpm



Size 65-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

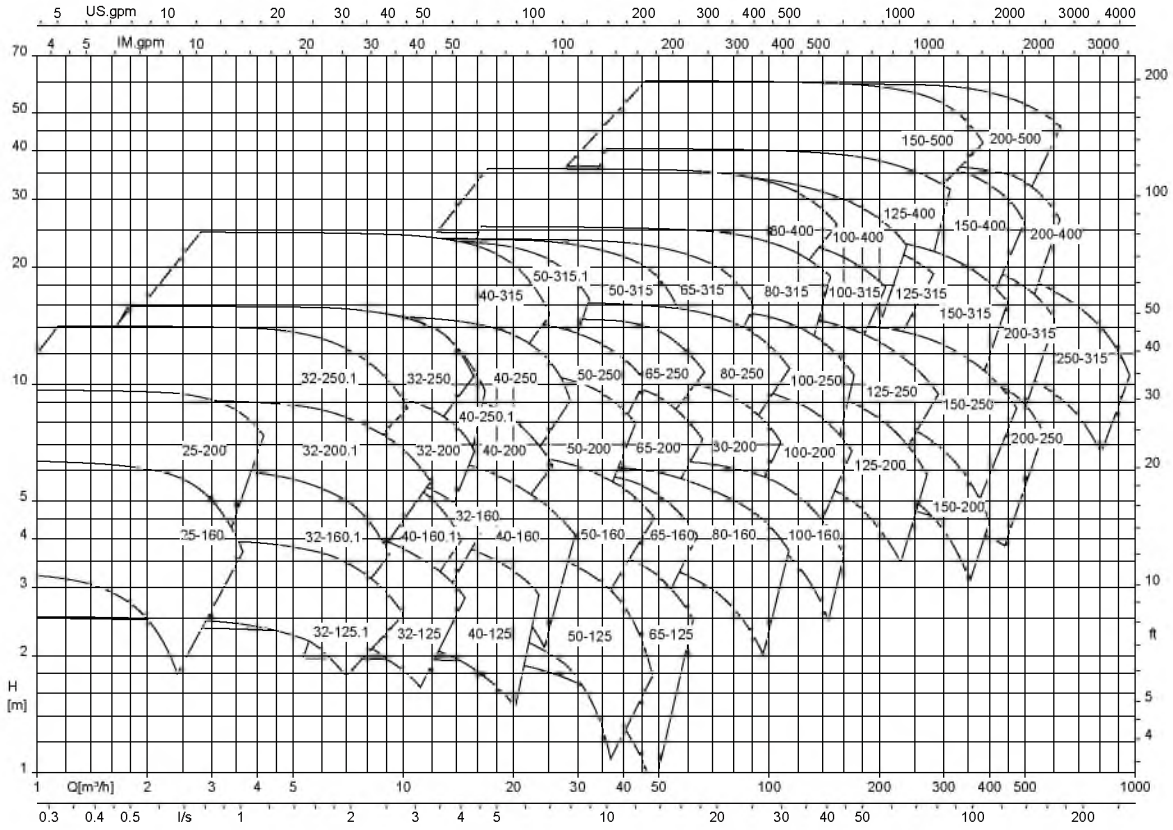
HPK-L, n = 1750 rpm



Size 65-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

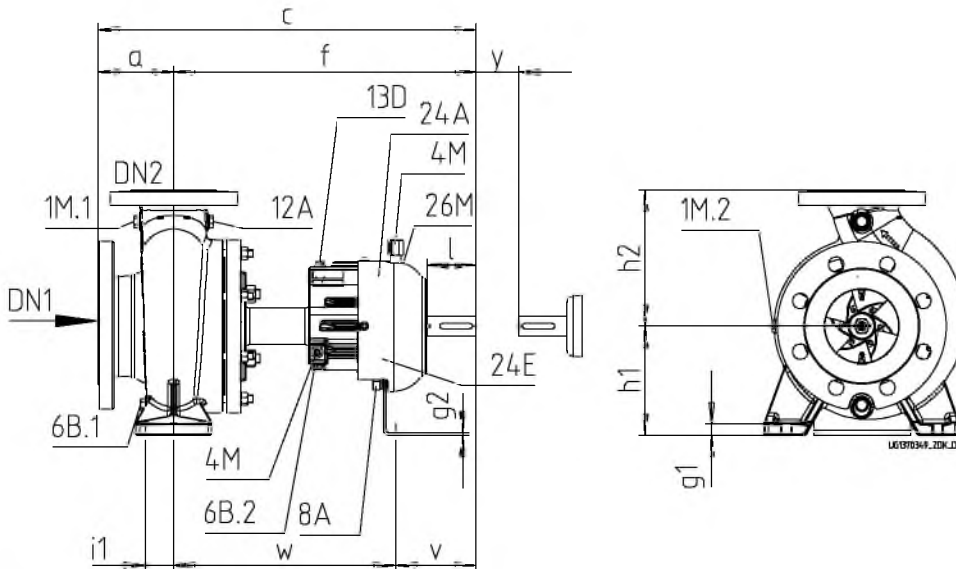
HPK-L, n = 1160 rpm



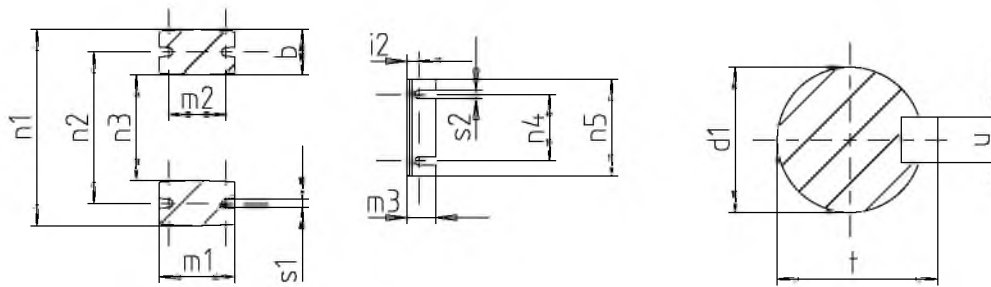
Size 65-125 not available in Asia

Sizes 040-160.1, 040-250.1 and 050-315.1 are only available in Europe.

Dimensions and connections



Dimensions and connections of the pump



Dimensions of pump feet and shaft end

Connection types, Europe

Connection	Discharge nozzle			Description
	≤ DN 50	DN 65 - DN 80	≥ DN 100	
1M.1	G1/4	G3/8	G1/2	Pressure gauge
1M.2	G1/4	G3/8	G1/2	Pressure gauge
4M		G1/4		Temperature measuring instrument
6B.1	G1/4	G3/8	G1/2	Fluid drain
6B.2		G1/4		Fluid drain
8A		R1/4		Leakage drain
12A	G1/4	G3/8	G1/2	Auxiliary connection
13D		G1/4		Vent plug
24 E/A		G1/2		Quench fluid IN/OUT
26M		M8		Vibration measurement

Connection types, Asia/Americas

Connection	Discharge nozzle			Description
	≤ DN 50	DN 65 - DN 80	≥ DN 100	
1M.1	NPT1/4	NPT3/8	NPT1/2	Pressure gauge
1M.2	NPT1/4	NPT3/8	NPT1/2	Pressure gauge
4M		G1/4		Temperature measuring instrument
6B.1	NPT1/4	NPT3/8	NPT1/2	Fluid drain
6B.2		G1/4		Fluid drain
8A		R1/4		Leakage drain
12A	NPT1/4	NPT3/8	NPT1/2	Auxiliary connection
13D		G1/4		Vent plug
24 E/A		NPT1/2		Quench fluid IN/OUT
26M		M8		Vibration measurement

Pump dimensions

Size	Bearing bracket	Pump dimensions														
		DN1	DN2	a	b	c	f	g1	g2	h1	h2	m1	m3	n1	n3	n5
040-025-160	CS40	40	25	80	50	465	385	15	4	132	160	100	48	240	140	160
040-025-200	CS40	40	25	80	50	465	385	15	4	160	180	100	48	240	140	160
050-032-125	CS40	50	32	80	50	465	385	15	4	112	140	100	48	190	90	160
050-032-125.1	CS40	50	32	80	50	465	385	15	4	112	140	100	48	190	90	160
050-032-160.1	CS40	50	32	80	50	465	385	15	4	132	160	100	48	240	140	160
050-032-200.1	CS40	50	32	80	50	465	385	18	4	160	180	100	48	240	140	160
050-032-250.1	CS50	50	32	100	65	600	500	18	4	180	225	125	48	320	190	160
050-032-160	CS40	50	32	80	50	465	385	15	4	132	160	100	48	240	140	160
050-032-200	CS40	50	32	80	50	465	385	18	4	160	180	100	48	240	140	160
050-032-250	CS50	50	32	100	65	600	500	18	4	180	225	125	48	320	190	160
065-040-160.1	CS40	65	40	80	50	465	385	15	4	132	160	100	48	240	140	160

Size	Bearing bracket	Pump dimensions														
		DN1	DN2	a	b	c	f	g1	g2	h1	h2	m1	m3	n1	n3	n5
065-040-250.1	CS50	65	40	100	65	600	500	18	4	180	225	125	48	320	190	160
065-040-125	CS40	65	40	80	50	465	385	15	4	112	140	100	48	210	110	160
065-040-160	CS40	65	40	80	50	465	385	15	4	132	160	100	48	240	140	160
065-040-200	CS40	65	40	100	50	485	385	18	4	160	180	100	48	265	165	160
065-040-250	CS50	65	40	100	65	600	500	18	4	180	225	125	48	320	190	160
065-040-315	CS50	65	40	125	65	625	500	18	6	200	250	125	48	345	215	160
080-050-315.1	CS50	80	50	125	65	625	500	18	6	225	280	125	48	345	215	160
080-050-125	CS40	80	50	100	50	465	385	18	4	132	160	100	48	240	140	160
080-050-160	CS40	80	50	100	50	485	385	18	4	160	180	100	48	265	165	160
080-050-200	CS40	80	50	100	50	485	385	18	4	160	200	100	48	265	165	160
080-050-250	CS50	80	50	125	65	625	500	18	4	180	225	125	48	320	190	160
080-050-315	CS50	80	50	125	65	625	500	18	6	225	280	125	48	345	215	160
100-065-125	CS40	100	65	100	65	485	385	18	4	160	180	125	48	280	150	160
100-065-160	CS50	100	65	100	65	600	500	18	4	160	200	125	48	280	150	160
100-065-200	CS50	100	65	100	65	600	500	18	4	180	225	125	48	320	190	160
100-065-250	CS50	100	65	125	80	625	500	20	6	200	250	160	48	360	200	160
100-065-315	CS60	100	65	125	80	655	530	20	6	225	280	160	48	400	240	160
125-080-160	CS50	125	80	125	65	625	500	18	4	180	225	125	48	320	190	160
125-080-200	CS50	125	80	125	65	625	500	18	4	180	250	125	48	345	215	160
125-080-250	CS50	125	80	125	80	625	500	18	6	225	280	160	48	400	240	160
125-080-315	CS60	125	80	125	80	655	530	20	6	250	315	160	48	400	240	160
125-080-400	CS60	125	80	125	80	655	530	20	6	280	355	160	48	435	275	160
125-100-160	CS50	125	100	125	80	625	500	18	6	200	280	160	48	360	200	160
125-100-200	CS50	125	100	125	80	625	500	18	6	200	280	160	48	360	200	160
125-100-250	CS60	125	100	140	80	670	530	18	6	225	280	160	48	400	240	160
125-100-315	CS60	125	100	140	80	670	530	18	6	250	315	160	48	400	240	160
125-100-400	CS60	125	100	140	100	670	530	20	6	280	355	200	48	500	300	160
150-125-200	CS60	150	125	140	80	670	530	20	6	250	315	160	48	400	240	160
150-125-250	CS60	150	125	140	80	670	530	20	6	250	355	160	48	400	240	160
150-125-315	CS60	150	125	140	100	670	530	20	6	280	355	200	48	500	300	160
150-125-400	CS60	150	125	140	100	670	530	20	6	315	400	200	48	500	300	160
200-150-200	CS60	200	150	180	100	710	530	20	6	280	400	200	48	550	350	160
200-150-250	CS60	200	150	160	100	690	530	20	6	280	375	200	48	500	300	160
200-150-315	CS80	200	150	160	100	830	670	20	12	315	400	200	60	550	350	200
200-150-400	CS80	200	150	160	100	830	670	20	12	315	450	200	60	550	350	200
200-150-500	CS80	200	150	180	100	850	670	22	12	375	500	200	60	550	350	200
200-200-250	CS80	200	200	180	100	850	670	22	12	355	425	200	60	550	350	200
250-200-315	CS80	250	200	200	100	870	670	22	12	355	450	200	60	550	350	200
250-200-400	CS80	250	200	180	100	850	670	22	12	355	500	200	60	550	350	200
250-200-500	CS80	250	200	200	100	870	670	22	12	425	560	200	60	660	460	200
300-250-315	CS80	300	250	250	130	920	670	26	12	400	560	260	60	690	430	200

Dimensions of shaft end and foot bolts

Size	Bearing bracket	Shaft end					Foot bolts									
		d1	l	t	u	y	i1	i2	m2	n2	n4	s1	s2	v	w	
040-025-160	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
040-025-200	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
050-032-125	CS40	24	50	27	8	100	35	20	70	140	110	14	14	100	285	
050-032-125.1	CS40	24	50	27	8	100	35	20	70	140	110	14	14	100	285	
050-032-160.1	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
050-032-200.1	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
050-032-250.1	CS50	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
050-032-160	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
050-032-200	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
050-032-250	CS50	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	

Size	Bearing bracket	Shaft end					Foot bolts									
		d1	l	t	u	y	i1	i2	m2	n2	n4	s1	s2	v	w	
065-040-160.1	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
065-040-250.1	CS50	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
065-040-125	CS40	24	50	27	8	100	35	20	70	160	110	14	14	100	285	
065-040-160	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
065-040-200	CS40	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
065-040-250	CS50	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
065-040-315	CS50	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370	
080-050-315.1	CS50	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370	
080-050-125	CS40	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
080-050-160	CS40	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
080-050-200	CS40	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
080-050-250	CS50	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
080-050-315	CS50	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370	
100-065-125	CS40	24	50	27	8	100	47,5	20	95	212	110	14	14	100	285	
100-065-160	CS50	32	80	35	10	100	47,5	20	95	212	110	14	14	130	370	
100-065-200	CS50	32	80	35	10	140	47,5	20	95	250	110	14	14	130	370	
100-065-250	CS50	32	80	35	10	140	60	20	120	280	110	18	14	130	370	
100-065-315	CS60	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
125-080-160	CS50	32	80	35	10	140	47,5	20	95	250	110	14	14	130	370	
125-080-200	CS50	32	80	35	10	140	47,5	20	95	280	110	14	14	130	370	
125-080-250	CS50	32	80	35	10	140	60	20	120	315	110	18	14	130	370	
125-080-315	CS60	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
125-080-400	CS60	42	110	45	12	140	60	20	120	355	110	18	14	160	370	
125-100-160	CS50	32	80	35	10	140	60	20	120	280	110	19	14	130	370	
125-100-200	CS50	32	80	35	10	140	60	20	120	280	110	18	14	130	370	
125-100-250	CS60	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
125-100-315	CS60	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
125-100-400	CS60	42	110	45	12	140	75	20	150	400	110	23	14	160	370	
150-125-200	CS60	42	110	45	12	140	60	20	120	315	110	19	14	160	370	
150-125-250	CS60	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
150-125-315	CS60	42	110	45	12	140	75	20	150	400	110	23	14	160	370	
150-125-400	CS60	42	110	45	12	140	75	20	150	400	110	23	14	160	370	
200-150-200	CS60	42	110	45	12	180	75	20	150	450	110	24	14	160	370	
200-150-250	CS60	42	110	45	12	180	75	20	150	400	110	23	14	160	370	
200-150-315	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
200-150-400	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
200-150-500	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
200-200-250	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
250-200-315	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
250-200-400	CS80	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
250-200-500	CS80	48	110	51	14	180	75	39	150	560	140	23	18	170	500	
300-250-315	CS80	48	110	51	14	180	95	39	190	560	140	28	18	170	500	

Flange design

Flange design by materials

Material	Standard	Pressure class
E/S	EN 1092-1	PN 25
	Drilled to ASME B16.5	Class 300 ⁸⁾
Y/Z	EN 1092-1	PN 40
	Drilled to ASME B16.5	Class 300

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump

Drive

- Surface-cooled IEC frame three-phase squirrel-cage motor

Coupling

- Flexible coupling with or without spacer

Contact guard

- Coupling guard

Baseplate

Europe:

⁸⁾ Not possible for size 100-065-125

- Baseplate (to ISO 3661), cast or welded, for pump and motor, in torsion-resistant design
- Channel section steel or folded steel plate

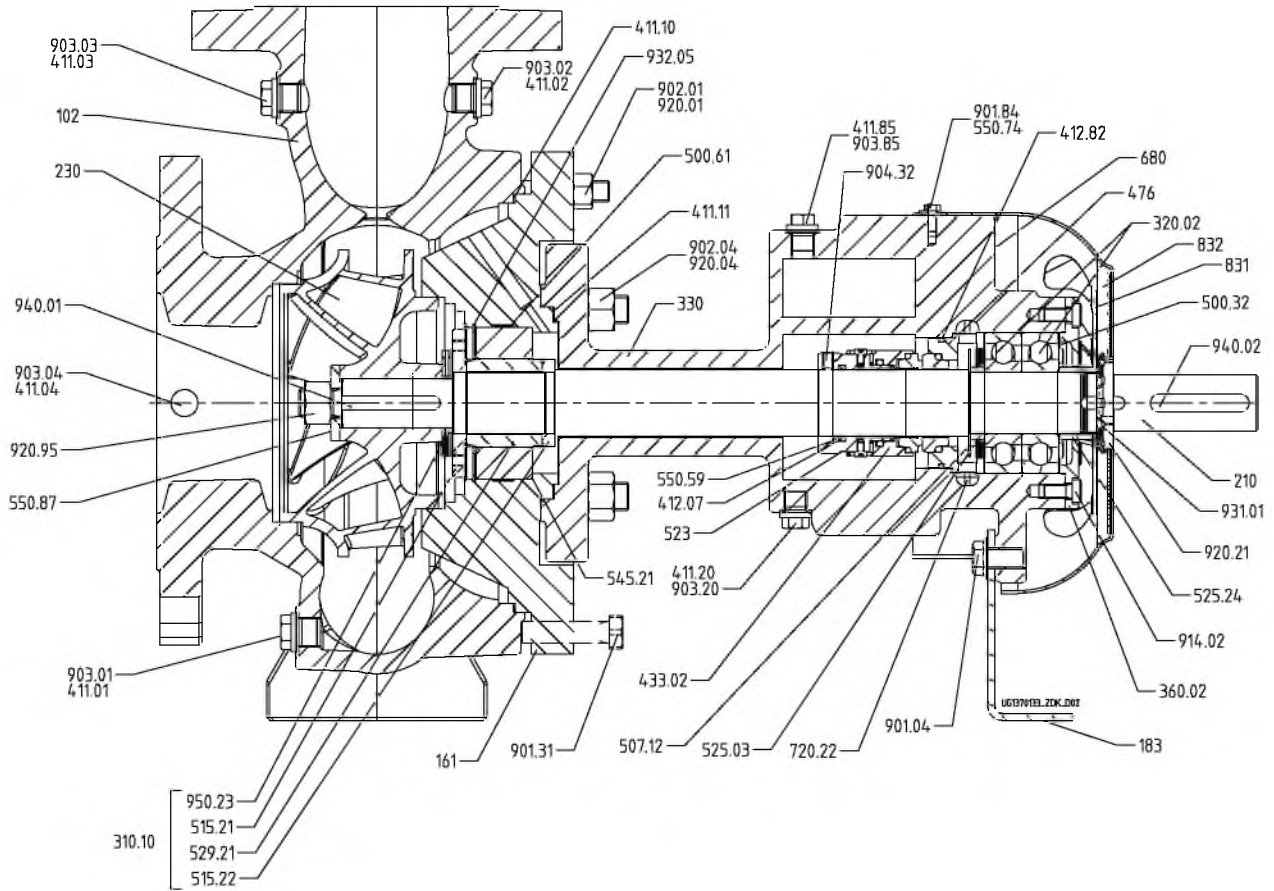
Asia/Americas:

- Baseplate to local KSB standard

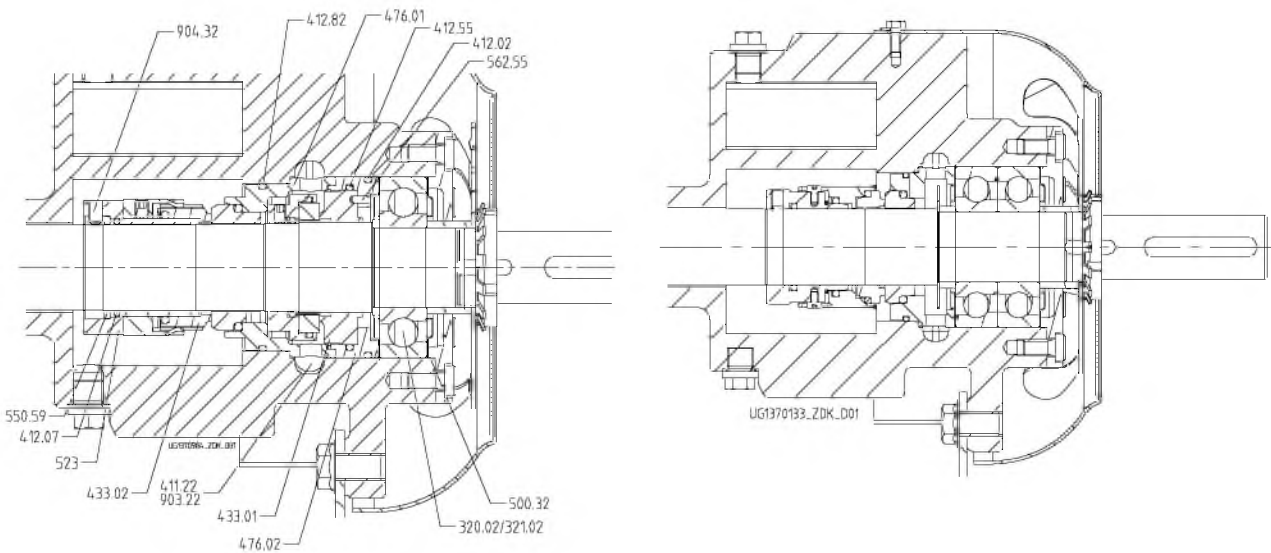
Special accessories

- As required

General assembly drawing with list of components

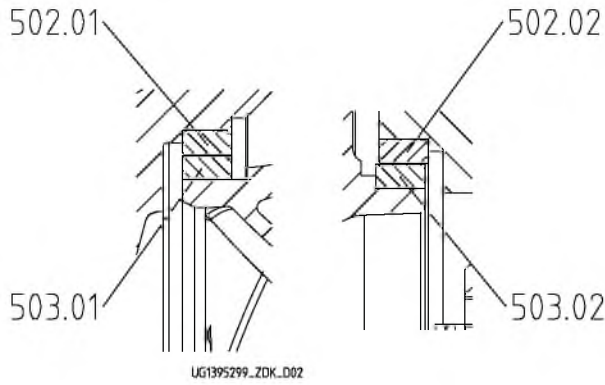


General assembly drawing, version with single mechanical seal

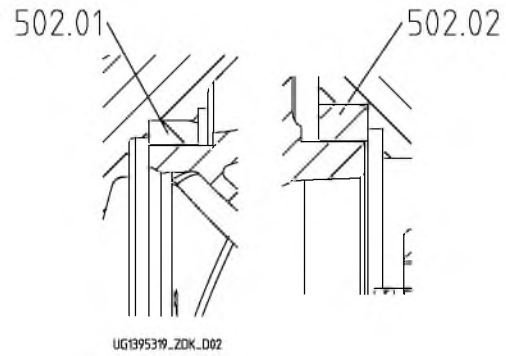


Version with two mechanical seals

Dead-end seal arrangement



Version with casing wear ring and impeller wear ring



Version with casing wear ring

List of components

Part No.	Comprising	Description
102	102	Volute casing
	411.01/.02/.03/.04/.10	Joint ring
	502.01 ⁹⁾	Casing wear ring
	902.01	Stud
	903.01/.02/.03/.04	Screw plug
	920.01	Hexagon nut
161	161	Casing cover
	411.11	Joint ring
	500.61	Tolerance ring
	502.02 ⁹⁾	Casing wear ring
	545.21	Bearing bush
	901.31	Hexagon head bolt
	902.04	Stud
	920.04	Hexagon nut
932.05	Circlip	
183	183	Support foot
210	210	Shaft
	550.87	Disc
	920.21	Slotted round nut
	920.95	Hexagon nut
	931.01	Lock washer
	940.01/02	Key
230	230	Impeller
	503.01/.02 ¹⁰⁾	Impeller wear ring
310.10	310.10	Plain bearing
	515.21/.22	Locking ring
	529.21	Bearing sleeve
	950.23	Disc spring
320.02 ¹¹⁾	320.02 ¹¹⁾	Angular contact ball bearing
321.02 ¹¹⁾	321.02 ¹¹⁾	Deep groove ball bearing
330	330	Bearing bracket
360.02	360.02	Bearing cover
411.20/.22/.35 ¹²⁾ /.36 ¹²⁾ /.55/.85	411.20/.22/.35 ¹²⁾ /.36 ¹²⁾ /.55/.85	Joint ring
412.02/.82	412.02/.82	O-ring
412.07 ¹³⁾	412.07 ¹³⁾	O-ring
433.01	433.01	Mechanical seal
433.02	433.02	Mechanical seal
476/.01/.02	476/.01/.02	Mating ring carrier

9) On pumps with casing wear ring only
 10) On pumps with casing wear ring and impeller wear ring only
 11) Depending on the design
 12) On pumps with two mechanical seals only
 13) Not fitted on pumps with KSB mechanical seal

Part No.	Comprising	Description
500.32	500.32	Nilos ring
507.12	507.12	Thrower
523 ¹³⁾	523 ¹³⁾	Shaft sleeve
525.03/.24	525.03/.24	Spacer sleeve
550.59 ¹³⁾	550.59 ¹³⁾	Support disc
550.74	550.74	Disc
562.55	562.55	Parallel pin
680	680	Guard
720.22	720.22	Hexagon nipple
720.35 ¹²⁾ /.36 ¹²⁾	720.35 ¹²⁾ /.36 ¹²⁾	Extension
831	831	Fan impeller
832	832	Fan hood
901.04/.84	901.04/.84	Hexagon head bolt
902.04	902.04	Stud
903.20/.22/.85	903.20/.22/.85	Screw plug
904.32 ¹³⁾	904.32 ¹³⁾	Grub screw
914.02	914.02	Hexagon socket head cap screw
920.04	920.04	Hexagon nut

Detailed designation

Product code example

Position																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
H	P	K	L	0	5	0	-	0	3	2	-	2	5	0	1	E	G	B	S		X	W		W	0	0	7	5	4		B
See name plate and data sheet																				See data sheet											

Key to the designation

Position	Code	Description
1-4	Pump type	
	HPK-L	Type series
5-16	Size	
	050	Nominal suction nozzle diameter [mm]
	032	Nominal discharge nozzle diameter [mm]
17	Material of pump casing and casing cover	
	S	Pump casing: GP240GH+N/ A216 Gr WCB Casing cover: EN-GJS-400-18-18-LT
	E	Pump casing: GP240GH+N/ A216 Gr WCB Casing cover: P250GH/1.7335/P355NL1 (Europe) or Casing cover: GP240GH+N/ A216 Gr WCB (Asia)
	Z	Pump casing: 1.7706 Casing cover: EN-GJS-400-18-18-LT
18	Impeller material	
	G	Grey cast iron EN-GJL-250 / grey cast iron A 48 CL 35B
	C	Stainless steel 1.4408 / A743 GR CF8M
19-21	Seal variants	
	BS	Single mechanical seal, dead-end arrangement, air-cooled
22	Special design	
	TL	Tandem mechanical seals, dead-end arrangement, air-cooled
23	Fluid handled	
	X	Special design
24	Blank	
	-	Standard
	W	Hot water
25	Bearing bracket design	
	O	Heat transfer fluids
25	Bearing bracket design	
	W	Bearing bracket for heat transfer applications

Position		Code	Description
26-29	Motor rating		
		1 3 2 0	132 kW
		0 0 7 5	7.5 KW
		0 0 0 7	0.75 KW
30	Number of poles		
		2	2 poles
		4	4 poles
		6	6 poles
31-32	Product generation		
		B	Product generation HPK-L 2013 Global Pump
		A	Product generation HPK-L 2001



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Hygienic Pump

Vitachrom

Type Series Booklet



Legal information/Copyright

Type Series Booklet Vitachrom

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Close-coupled Pump

Hygienic Pump

Vitachrom



The product illustrated as an example may include options and accessories incurring a surcharge.

Main applications

- Food and beverages industry
- Pharmaceutical industry
- Chemical industry

Fluids handled

- Fluids not chemically or mechanically aggressive to the materials

Further information on fluids handled

(⇒Page 7)

Operating data

Operating properties

Characteristic	Value	
	50 Hz	60 Hz
Flow rate	Q [m³/h] ≤ 340	≤ 320
Head	H [m] ≤ 100	≤ 112
Operating pressure	p [bar] ≤ 12	
Fluid temperature	T [°C] ≤ 110	
Connection sizes	DN	50 - 125

Designation

Example: VC 050-050-125 CC IO1MM1

Designation key

Code	Description
VC	Type series VC | Vitachrom
050	Nominal suction nozzle diameter [mm]
050	Nominal discharge nozzle diameter [mm]
125	Nominal impeller diameter [mm]
C	Casing material C | 1.4404
C	Impeller material C | 1.4409
IO1	Seal code of the mechanical seal I O 1 | Q12Q1E1-04GG (SiC/SiC/EPDM)
M	Mounting arrangement M | Motor foot
M	Pipe connection M | Pipe union to DIN 11851
1	Material of O-rings 1 | EPDM

Further information on the designation

(⇒Page 52)

Design details

Design

- Standard design with materials to Regulation (EC) No. 1935/2004
- Design to ATEX

Design

- Centrifugal pump
- Close-coupled design
- Single-stage
- Wetted parts made of stainless steel 1.4404/1.4409 (AISI 316L/CF3M)
- CIP/SIP-compatible
- Pump version with inducer for fluids pumped from vessels under vacuum (pump sizes 65-160-IND, 80-250-IND and 80-250.1-IND only) and for low NPSH values.

Pump casing

- Circular casing

Impeller type

- Semi-open multi-vane impeller

Shaft seal

- Single mechanical seal surrounded by fluid handled to EN 12756, hygienic or sterile design
Hygienic design: inboard seal with spring surrounded by fluid handled, uni-directional
Sterile design: inboard seal with covered spring, polished surface, bi-directional
- Double mechanical seal in tandem arrangement with quench to EN 12756 in hygienic or sterile design

Bearings

- No separate pump bearings

Drive

- Surface-cooled KSB squirrel-cage motor
- Type of construction V1, V15 / B5, B35

- IP55 enclosure
- Thermal class F; 3 PTC thermistors
- Mode of operation: continuous operation S1
- 50 Hz winding:
Up to 2.2 kW: 220-240 V/380-420 V
3 kW and higher: 380-420 V/660-725 V
- 60 Hz winding, 440 - 480 V

Explosion-proof version:

- KSB surface-cooled IEC frame three-phase current squirrel-cage motor

Winding	50 Hz Up to 1.85 kW: 220-240 V/380-420 V 2.5 kW and higher: 380-420 V/ 660-725 V
Type of construction	Up to 3.3 kW: IM V1 4.6 kW and higher: IM V15
Enclosure	IP55 or IP54
Type of protection	EExe II and EExde II
Temperature class	T3
Mode of operation	Continuous operation S1

Automation

Automation options:

- PumpDrive
- PumpMeter

Connections

Axial suction nozzle, tangential discharge nozzle

Adjustable through 360°

Standard:

- Threaded connection to DIN 11851
- Flange to EN 1092-1

Alternative:

- Flange to DIN 11864-2-NF-A
- Flange to EN 1092-1-F
- Flange to APV-FN
- Threaded connection to DIN 11864-1-GS-A
- Threaded connection to IDF (ISO 2853)
- Threaded connection to SMS standard
- Clamped connection to DIN 32676-A and ISO 2852
- Other variants on request.

Materials

Overview of available materials

Component	Material
Circular casing ¹⁾	1.4404/1.4409 (AISI 316L/CF3M)
Discharge cover ¹⁾	1.4409 (AISI CF3M)
Impeller ¹⁾	1.4409 (AISI CF3M)
Inducer ¹⁾	1.4409 (AISI CF3M)
Impeller nut ¹⁾	1.4404 (AISI 316L)
Pump shaft	1.4571 (AISI 316 Ti)
Drive lantern	GJL with cataphoretic coating

All materials that will be in contact with the fluid handled conform with Regulation (EC) No. 1935/2004 and Commission Regulation (EC) No. 2023/2006.

¹⁾ Wetted components

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Easy to clean due to little dead volume and excellent flushability
- Service-friendly design, easy and fast to dismantle
- Stub shaft allows combination with all commercial standardised motors
- High surface quality thanks to special polishing techniques
- Corrosion-resistant by using high-quality stainless steel
- Operating costs reduced by trimming the impeller diameter to match the specified duty point
- Highly suitable for CIP/SIP routines

Certifications

Overview

Label	Valid in:	Comment
	All countries	Certified quality management to ISO 9001
	All countries	EHEDG-certified cleanability
	All countries	Elastomers certified to FDA, 3A, USP Class VI
	France	French drinking water approval

Acceptance tests and warranty

- Materials testing
 - Material test report 2.2 on request
 - Material test report 3.1 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test against surcharge
 - To ISO 9906/2B or ISO 9906/3B
 - NPSH test
- Other tests
Other tests (e.g. vibrations, strength, noise characteristics) on request.

- Warranties
Warranties are given within the scope of the valid terms and conditions of sale and delivery.

Overview of fluids handled

Fluid selection table

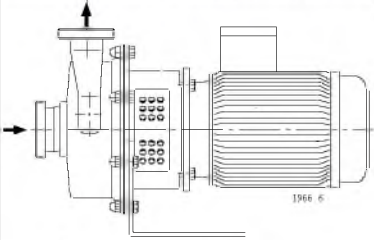
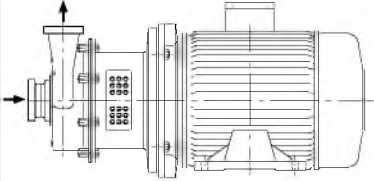
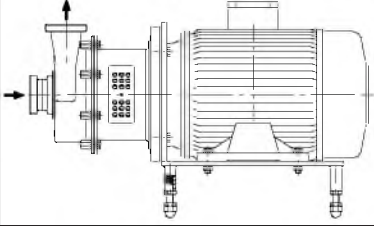
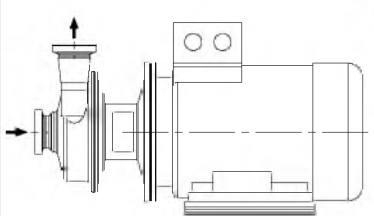
			Mechanical seal design											
			Single mechanical seal					Double mechanical seal in tandem arrangement						
			Secondary seal BQ1EGG											
			BQ1E1-04GG	Q12Q1E1-04GG	BQ1V26GG	Q12Q1V26GG	Q22Q2E1-04GG	Q12Q1M1GG	BQ1E1-04GG	Q12Q1E1-04GG	BQ1V26GG	Q12Q1V26GG	Q22Q2E1-04GG	Q12Q1M1GG
Design code														
Mechanical seal with spring surrounded by fluid handled			I01	I03	I02	I04	-	I21	T11	T13	T12	T14	-	T31
Mechanical seal with covered spring			I06	I08	I07	I09	I10	-	T16	T18	T17	T19	T20	-
Fluid handled	Concentration [%]	t _{max} [°C]												
Alcohol (ethanol)	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Alcohol (methanol)	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Alcohol (propanol)	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Aluminium sulphate	Up to 5 %	30	-	X	-	-	-	-	-	-	-	-	-	-
	Up to 10	30	-	-	-	-	-	-	-	X	-	-	-	-
Formic acid	10	20	X	-	-	-	-	-	-	-	-	-	-	-
Malic acid	Unsaturated solution	60	-	X	-	-	-	-	-	-	-	-	-	-
Apple purée	-	20	X	-	-	-	-	-	-	-	-	-	-	-
Apple juice	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Cider	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Benzoic acid	10	100	-	-	-	X	-	-	-	-	-	-	-	-
Beer	-	100	X	-	-	-	-	-	-	-	-	-	-	-
Beer hops	-	100	-	-	-	-	-	-	-	X	-	-	-	-
Beer mash	-	100	-	X	-	-	-	-	-	-	-	-	-	-
Beer trub	-	100	-	X	-	-	-	-	-	-	-	-	-	-
Beer wort	-	100	-	-	-	-	-	-	-	X	-	-	-	-
Spirits	10	60	X	-	-	-	-	-	-	-	-	-	-	-
Buttermilk	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Calcium nitrate	10	30	-	X	-	-	-	-	-	-	-	-	-	-
Potassium acetate	Unsaturated solution	100	X	-	-	-	-	-	-	-	-	-	-	-
Fluids for CIP	-	90	-	-	-	-	-	X	-	-	-	-	-	-
Coke	-	20	X	-	-	-	-	-	-	-	-	-	-	-
Coke concentrate	-	20	-	X	-	-	-	-	-	-	-	-	-	-
Deionised water (fully desalinated water)	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Egg, liquid	-	100	-	-	-	X	-	-	-	-	-	-	-	-
Egg, liquid mixed with sugar	-	100	-	-	-	-	-	-	-	-	X	-	-	-
Liqueur with egg yolks	-	50	X	-	-	-	-	-	-	-	-	-	-	-
Vinegar (wine vinegar)	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Vinegar concentrate	25	25	X	-	-	-	-	-	-	-	-	-	-	-
Acetic acid	10	60	X	-	-	-	-	-	-	-	-	-	-	-
	50	20	-	-	-	-	-	-	X	-	-	-	-	-
Fruit juices and fruit acids	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Fruit liqueur	-	60	-	-	-	-	-	-	X	-	-	-	-	-
Gallic acid	Unsaturated solution	100	-	-	X	-	-	-	-	-	-	-	-	-
Vegetable juice	-	100	X	-	-	-	-	-	-	-	-	-	-	-
Tannic acid	Unsaturated solution	100	X	-	-	-	-	-	-	-	-	-	-	-
Glucose	Unsaturated aqueous solution	50	-	X	-	-	-	-	-	-	-	-	-	-
Glycerine	45	100	X	-	-	-	-	-	-	-	-	-	-	-
Glycol (ethylene glycol)	100	60	-	-	-	-	-	-	X	-	-	-	-	-
	50	60	X	-	-	-	-	-	-	-	-	-	-	-
Yeast	-	60	-	X	-	-	-	-	-	-	-	-	-	-
Sal volatile (ammonium carbonate) (ammonium bicarbonate)	Unsaturated solution	20	X	-	-	-	-	-	-	-	-	-	-	-
Coffee (extract)	-	60	-	-	-	X	-	-	-	-	-	-	-	-
Cocoa milk	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Evaporated milk	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Evaporated milk, with sugar (condensed milk)	-	60	-	X	-	-	-	-	-	-	-	-	-	-
Herbal liqueur	-	60	X	X	-	-	-	-	-	-	-	-	-	-
Linseed oil	-	60	-	-	X	-	-	-	-	-	-	-	-	-

			Mechanical seal design											
			Single mechanical seal						Double mechanical seal in tandem arrangement					
									Secondary seal BQ1EGG					
									BQ1E1-04GG	Q12Q1E1-04GG	BQ1V26GG	Q12Q1V26GG	Q22Q2E1-04GG	Q12Q1M1GG	BQ1E1-04GG	Q12Q1E1-04GG	BQ1V26GG	Q12Q1V26GG	Q22Q2E1-04GG	Q12Q1M1GG
			Design code											
Mechanical seal with spring surrounded by fluid handled			I01	I03	I02	I04	-	I21	T11	T13	T12	T14	-	T31
Mechanical seal with covered spring			I06	I08	I07	I09	I10	-	T16	T18	T17	T19	T20	-
Fluid handled	Concentration [%]	t _{max} [°C]												
Linseed oil (3 % sulphuric acid)	-	20	-	-	X	-	-	-	-	-	-	-	-	-
Lemonade	-	90	-	X	-	-	-	-	-	-	-	-	-	-
Lysol	-	60	-	-	X	-	-	-	-	-	-	-	-	-
Skim milk	-	40	X	-	-	-	-	-	-	-	-	-	-	-
Skim milk, sour	-	40	X	-	-	-	-	-	-	-	-	-	-	-
Malt	-	100	-	X	-	-	-	-	-	-	-	-	-	-
Methyl alcohol	-	60	-	-	-	-	-	-	X	-	-	-	-	-
Milk	-	40	X	-	-	-	-	-	-	-	-	-	-	-
Milk concentrate	15	50	-	-	-	-	-	-	-	-	-	X	-	-
Lactic acid	10	20	X	-	-	-	-	-	-	-	-	-	-	-
	Unsaturated solution	80	-	-	X	-	-	-	-	-	-	-	-	-
Must	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Sodium chloride (= common table salt)	2	20	X	-	-	-	-	-	-	-	-	-	-	-
Sodium hydroxide	Up to 20	80	-	X	-	-	-	-	-	-	-	-	-	-
	Up to 50	80	-	-	-	-	-	-	-	X	-	-	-	-
Fruit pulp	-	20	-	X	-	-	-	-	-	-	-	-	-	-
Oxalic acid	Unsaturated solution	20	-	-	-	-	-	-	X	-	-	-	-	-
Orange juice	-	-	X	-	-	-	-	-	-	-	-	-	-	-
Sap	-	50	X	-	-	-	-	-	-	-	-	-	-	-
Cream (sour/sweet)	-	40	X	-	-	-	-	-	-	-	-	-	-	-
High-purity water, ultra-pure water	-	100	-	-	-	-	X	-	-	-	-	-	-	-
Sparkling wine	-	50	-	X	-	-	-	-	-	-	-	-	-	-
Syrup	-	40	-	X	-	-	-	-	-	-	-	-	-	-
Sweet permeate (milk)	-	90	-	-	X	-	-	-	-	-	-	-	-	-
Water (fresh water) ²⁾	-	110	X	-	-	-	-	-	-	-	-	-	-	-
Wine (white and red wine)	-	60	X	-	-	-	-	-	-	-	-	-	-	-
Wine vinegar	See vinegar	-	X	-	-	-	-	-	-	-	-	-	-	-
Spirits of wine	See alcohol	-	X	-	-	-	-	-	-	-	-	-	-	-
Tartaric acid	Unsaturated solution	60	X	-	-	-	-	-	-	-	-	-	-	-
Water for injection	-	100	-	-	-	-	X	-	-	-	-	-	-	-
Wort, hot wort	-	100	-	-	-	-	-	-	-	X	-	-	-	-
Citric acid	Unsaturated solution	80	X	-	-	-	-	-	-	-	-	-	-	-
Sugar solution	< 65	100	X	-	-	-	-	-	-	-	-	-	-	-
	> 65	100	-	-	-	-	-	-	-	X	-	-	-	-
Oils														
Anise oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Cotton seed oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Peanut oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Lavender oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Corn oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Olive oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Rapeseed oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Castor oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Soy-bean oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Sunflower oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Edible oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-
Walnut oil	-	100	-	-	X	-	-	-	-	-	-	-	-	-

²⁾ General assessment criteria for results of water analysis: pH ≥ 7; chloride content (Cl) ≤ 250 mg/kg. Chlorine (Cl₂) ≤ 0.6 mg/kg.

Mounting arrangements

Mounting arrangements for horizontal installation

Mounting arrangement	Description
	Pump set angle foot mounted <ul style="list-style-type: none"> Motor frame size 90 to 112
	Pump set motor foot mounted <ul style="list-style-type: none"> Motor frame size 90 to 280
	Pump set ball feet mounted <ul style="list-style-type: none"> Motor frame size 90 to 280 Alternatively mounted on rubber-padded round base feet
	Pump set soleplate mounted <ul style="list-style-type: none"> Motor frame size 90 to 280

Technical data

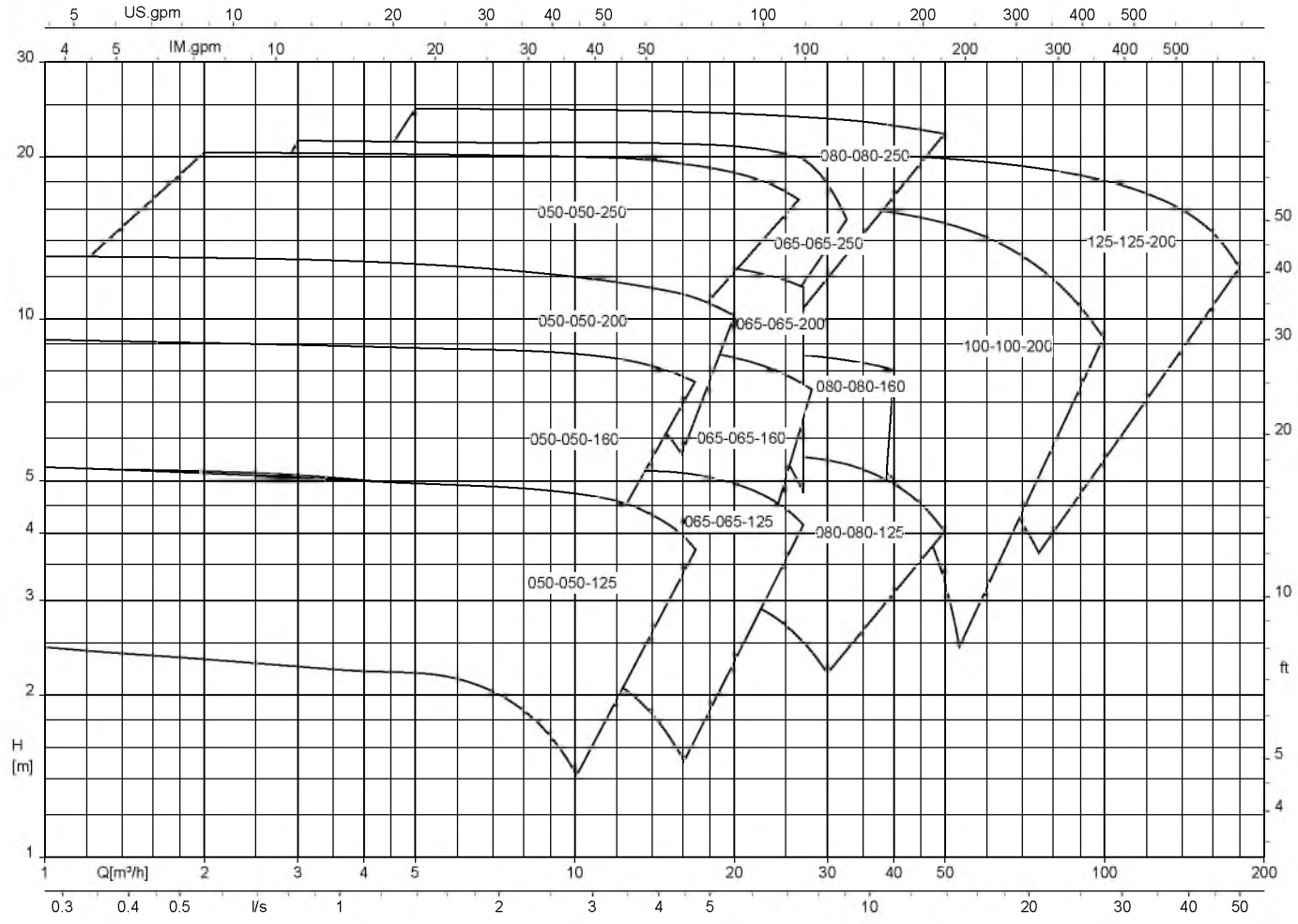
Technical data

Size	Shaft unit	Impeller diameter	Impeller outlet width	Free passage	Speed limits	
					Max.	Min.
					[rpm]	
050-050-125	25.1	138 - 100	16	11	3600	500
050-050-160	25.1	166 - 130	14.8	11	3600	500
050-050-200	25.1	196 - 160	13.5	11	3600	500
050-050-250	25.2	265 - 180	4	4	3600	500
065-065-125	25.1	136 - 100	21,5	11	3600	500
065-065-160	25.1	166 - 130	20,3	11	3600	500
065-065-200	25.1	196 - 160	19	11	3600	500
065-065-250	25.2	265 - 180	10	10	3600	500
080-080-125	25.1	145 - 110	31,3	11	3600	500
080-080-160	25.1	170 - 130	30	11	3600	500
080-080-250	25.2	265 - 180	22	16	3600	500
100-100-200	25.2	220 - 150	20	16	3600	500
125-125-200	35	240 - 150	40	25	3600 ³⁾	500

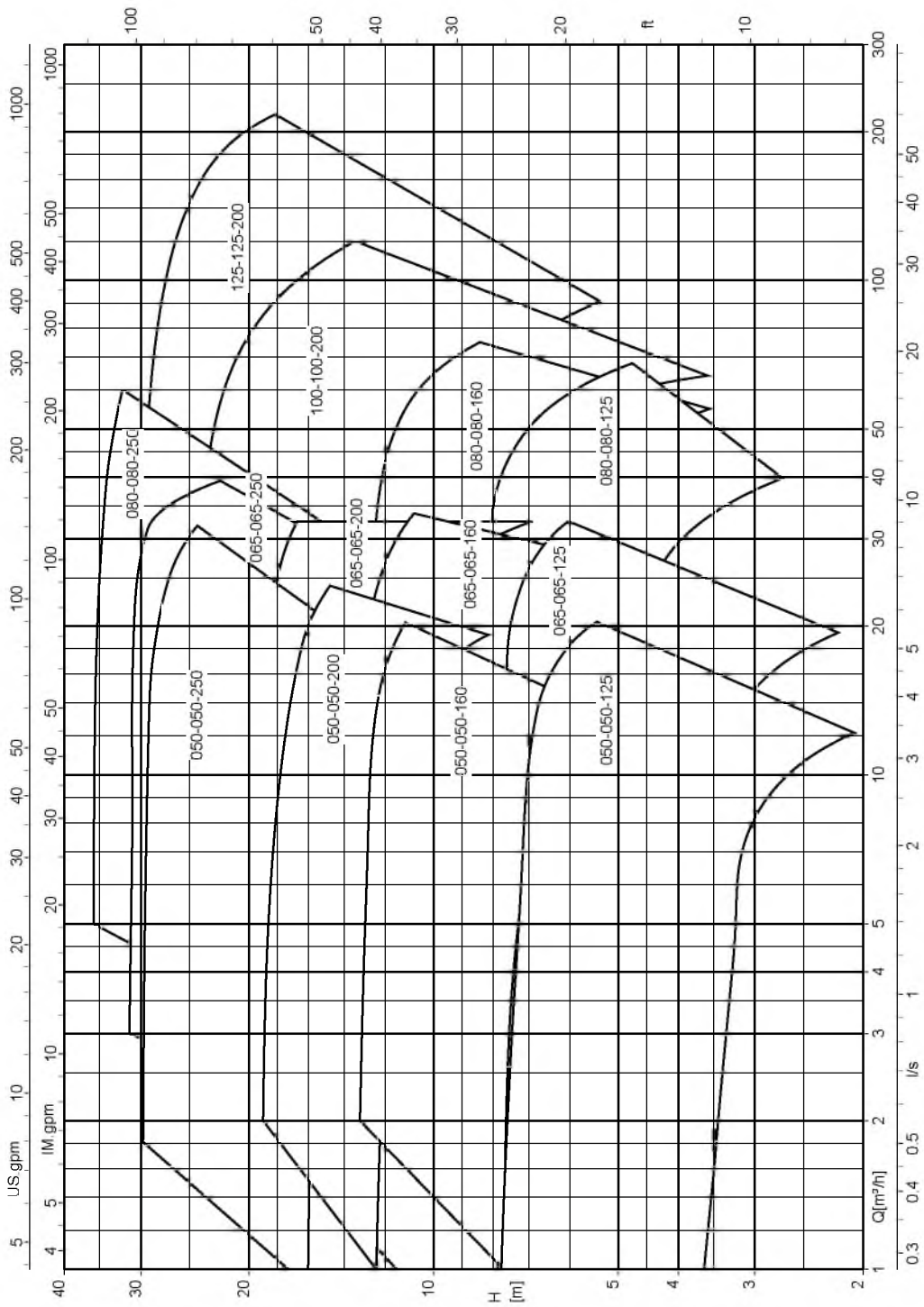
³⁾ For impeller diameters of 220 mm and larger, the maximum speed equals 3000 rpm

Selection charts

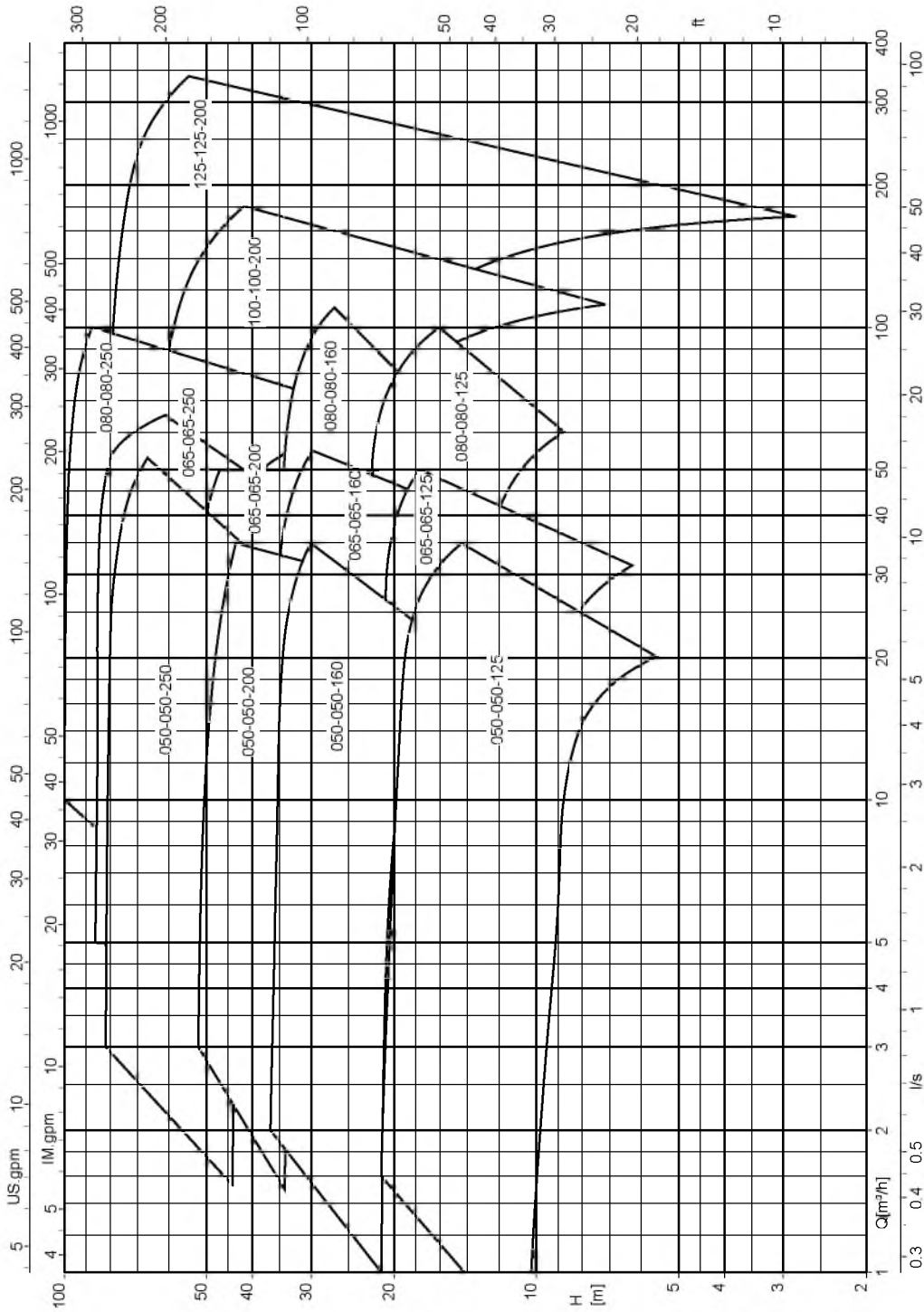
Vitachrom, n = 1450 rpm



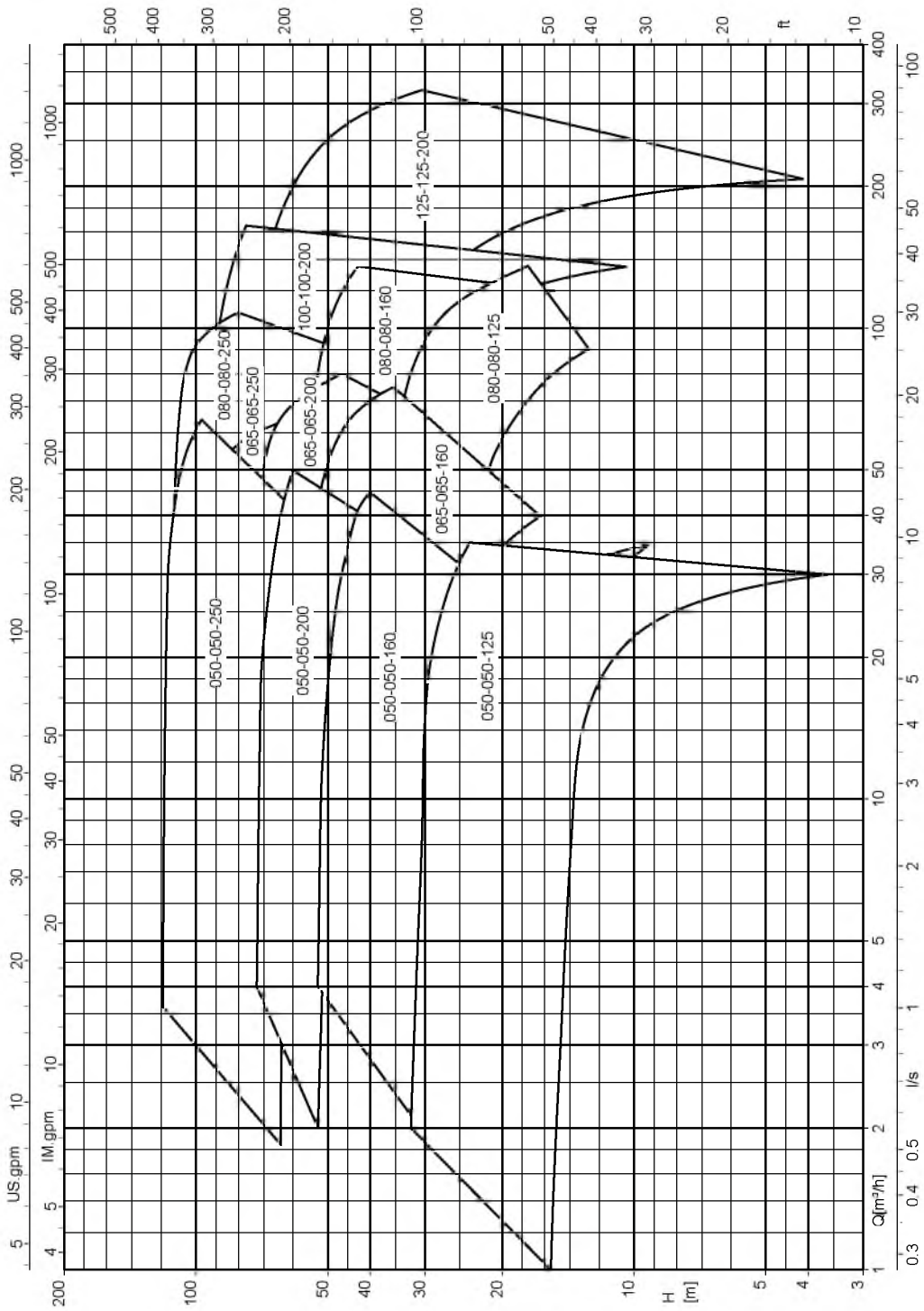
Vitachrom, n = 1750 rpm



Vitachrom, n = 2900 rpm



Vitachrom, n = 3500 rpm



Dimensions and connections

Overview of general arrangement drawings

Overview

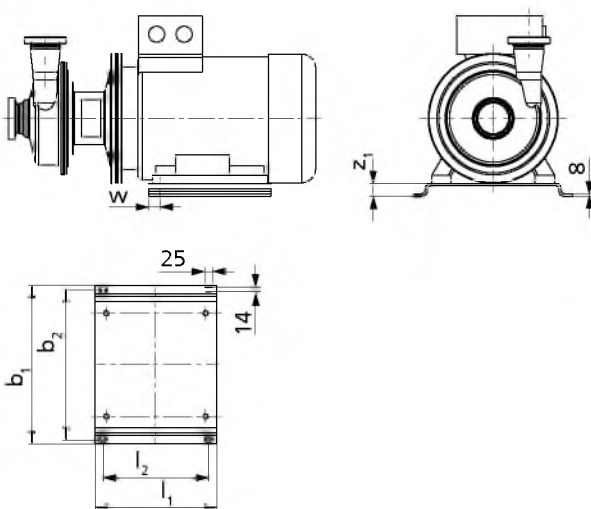
Size	Speed [rpm]				Mounting arrangement				With motor shroud	See
	1450	1750	2900	3500	With inducer	With motor feet	With angle foot	With ball feet		
DN 50	-	-	X	X	-	X	X	-	-	(⇒Page 16)
	-	-	X	X	-	-	-	X	X	(⇒Page 18)
	X	X	-	-	-	X	X	-	-	(⇒Page 38)
	X	X	-	-	-	-	-	X	X	(⇒Page 39)
DN 65	-	-	X	X	-	X	X	-	-	(⇒Page 20)
	-	-	X	X	-	-	-	X	X	(⇒Page 22)
	X	X	-	-	-	X	X	-	-	(⇒Page 40)
	X	X	-	-	-	-	-	X	X	(⇒Page 41)
	-	-	X	X	X	X	X	-	-	(⇒Page 24)
	-	-	X	X	X	-	-	X	X	(⇒Page 25)
DN 80	-	-	X	X	-	X	X	-	-	(⇒Page 26)
	-	-	X	X	-	-	-	X	X	(⇒Page 28)
	X	X	-	-	-	X	X	-	-	(⇒Page 42)
	X	X	-	-	-	-	-	X	X	(⇒Page 43)
	-	-	X	-	X	X	-	-	-	(⇒Page 29)
	-	-	X	-	X	-	-	X	X	(⇒Page 31)
	-	-	-	X	X	X	-	-	-	(⇒Page 32)
DN 100	-	-	X	X	-	X	X	-	-	(⇒Page 34)
	-	-	X	X	-	-	-	X	X	(⇒Page 35)
	X	X	-	-	-	X	X	-	-	(⇒Page 44)
	X	X	-	-	-	-	-	X	X	(⇒Page 45)
DN 125	-	-	X	X	-	X	X	-	-	(⇒Page 36)
	-	-	X	X	-	-	-	X	X	(⇒Page 37)
	X	X	-	-	-	X	X	-	-	(⇒Page 46)
	X	X	-	-	-	-	-	X	X	(⇒Page 47)

Applies to all of the following general arrangement drawings:

- Tolerances of mating dimensions to EN 735

- Mating dimensions for pumps with different pump connections on request

Overview of motor soleplates

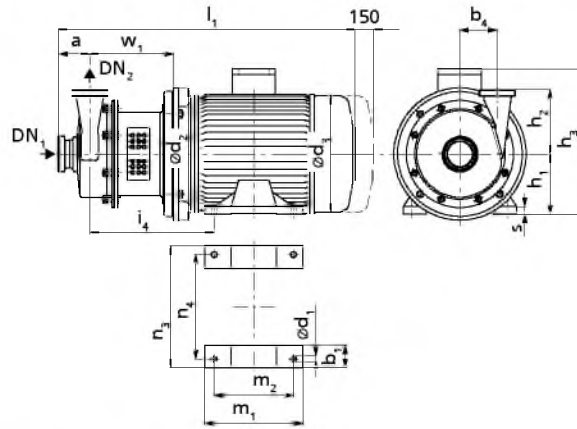


Motor soleplate dimensions [mm]

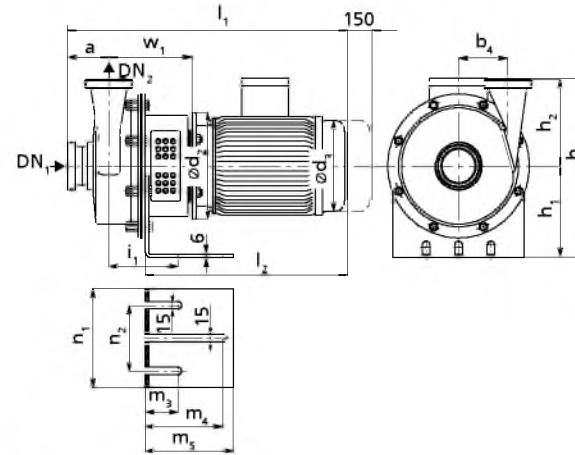
Combinations

Motor	Motor soleplate	Dimensions [mm]						Variant
		b ₁	b ₂	l ₁	l ₂	w	z ₁	
90S	G1	400	375	350	300	28	70	05
90L	G1	400	375	350	300	28	70	08
100L	G1	400	375	350	300	28	70	04
112M	G1	400	375	350	300	28	70	01
132S	G1	400	375	350	300	30	70	06
132M	G1	400	375	350	300	30	70	07
160M	G2	488	463	375	325	33	40	04
160L	G2	488	463	375	325	33	40	05
180M	G2	488	463	375	325	33	40	02
180L	G2	488	463	375	325	33	40	07
200L	G2	488	463	375	325	35	40	03

Vitachrom DN 50, n ≈ 2900 rpm and 3500 rpm



Pump set with motor feet



Pump set with angle foot

Overview of mating dimensions DN 50, pump set with motor feet or angle foot, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ⁴⁾	h ₂ ⁵⁾	~h ₃	i ₁	i ₄	~i ₁ ⁴⁾	~i ₁ ⁵⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
050-050-125 /152	50	50	70	-	70	10	200	190	160	145	160	288	140	220	516	516	371	165	140	65	155	176	225	130	143	100	164	10
050-050-125 /222	50	50	70	-	70	10	200	190	160	145	160	288	140	220	542	542	397	165	140	65	155	176	225	130	143	125	164	10
050-050-125 /302	50	50	70	-	70	12	250	213	160	145	160	295	140	237	591	591	446	196	160	65	155	176	225	130	176	140	174	12
050-050-125 /402	50	50	70	-	70	12	250	234	160	145	160	308	140	244	615	615	470	226	190	65	155	176	225	130	176	140	174	12
050-050-160 /222	50	50	70	-	85	10	200	190	160	170	185	288	140	220	542	542	397	165	140	65	155	176	236	130	143	125	164	10
050-050-160 /302	50	50	70	-	85	12	250	213	160	170	185	295	140	237	591	591	446	196	160	65	155	176	236	130	176	140	174	12
050-050-160 /402	50	50	70	-	85	12	250	234	160	170	185	308	140	244	615	615	470	226	190	65	155	176	236	130	176	140	174	12
050-050-160 /552	50	50	70	55	85	12	300	266	132	170	185	299	-	283	677	677	-	220	140	-	-	-	-	-	270	216	194	15
050-050-160 /752	50	50	70	55	85	12	300	266	132	170	185	299	-	283	677	677	-	220	140	-	-	-	-	-	270	216	194	15
050-050-160 /1102	50	50	70	70	85	15	350	325	160	170	185	357	-	332	840	840	-	300	210	-	-	-	-	-	320	254	224	21
050-050-160 /1502	50	50	70	70	85	15	350	325	160	170	185	357	-	332	840	840	-	300	210	-	-	-	-	-	320	254	224	21
050-050-200 /302	50	50	70	-	100	12	250	213	160	170	185	295	140	237	591	591	446	196	160	65	155	176	264	130	176	140	174	12
050-050-200 /402	50	50	70	-	100	12	250	234	160	170	185	308	140	244	615	615	470	226	190	65	155	176	264	130	176	140	174	12
050-050-200 /552	50	50	70	55	100	12	300	266	132	170	185	299	-	283	677	677	-	220	140	-	-	-	-	-	270	216	194	15
050-050-200 /752	50	50	70	55	100	12	300	266	132	170	185	299	-	283	677	677	-	220	140	-	-	-	-	-	270	216	194	15
050-050-200 /1102	50	50	70	70	100	15	350	325	160	170	185	357	-	332	840	840	-	300	210	-	-	-	-	-	320	254	224	21
050-050-200 /1502	50	50	70	70	100	15	350	325	160	170	185	357	-	332	840	840	-	300	210	-	-	-	-	-	320	254	224	21
050-050-200 /1852	50	50	70	70	100	15	350	325	160	170	185	357	-	332	846	846	-	314	254	-	-	-	-	-	320	254	224	21
050-050-200 /2202	50	50	70	80	100	15	350	370	180	170	185	442	-	345	904	904	-	320	241	-	-	-	-	-	360	279	224	23

4) Applicable to connections as per DIN 11851 (hygienic pipe union)

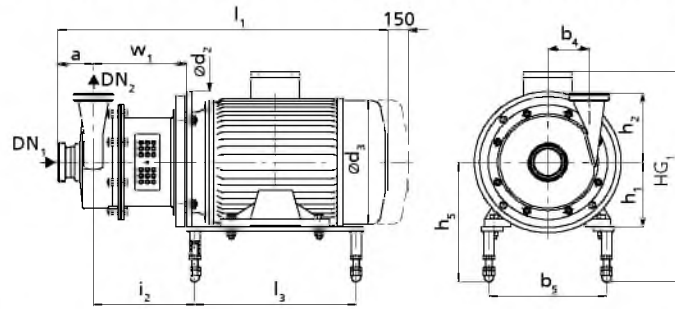
5) Applicable to flanged connections to EN 1092-1

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ⁴⁾	h ₂ ⁵⁾	~h ₃	i ₁	i ₄	~i ₁ ⁴⁾	~i ₁ ⁵⁾	~i ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s	
050-050-250 /552	50	50	95 ⁴⁾	55	125	12	300	266	132	185	195	299	-	285,5	711	706	-	220	140	-	-	-	-	-	-	270	216	196,5	15
050-050-250 /752	50	50	(90) ⁵⁾	55	125	12	300	266	132	185	195	299	-	285,5	711	706	-	220	140	-	-	-	-	-	-	270	216	196,5	15
050-050-250 /1102	50	50		70	125	15	350	325	160	185	195	357	-	337,5	877	872	-	300	210	-	-	-	-	-	-	320	254	229,5	21
050-050-250 /1502	50	50		70	125	15	350	325	160	185	195	357	-	337,5	877	872	-	300	210	-	-	-	-	-	-	320	254	229,5	21
050-050-250 /1852	50	50		70	125	15	350	325	160	185	195	357	-	337,5	883	878	-	314	254	-	-	-	-	-	-	320	254	229,5	21
050-050-250 /2202	50	50		80	125	15	350	370	180	185	195	442	-	350,5	941	936	-	320	241	-	-	-	-	-	-	360	279	229,5	23
050-050-250 /3002	50	50		85	125	19	400	422	200	185	195	505	-	362,5	1000	995	-	388	305	-	-	-	-	-	-	400	318	229,5	30
050-050-250 /3702	50	50		85	125	19	400	422	200	185	195	505	-	362,5	1000	995	-	388	305	-	-	-	-	-	-	400	318	229,5	30
050-050-250 /4502	50	50		100	125	19	450	468	225	185	195	550	-	378,5	1086	1081	-	410	311	-	-	-	-	-	-	450	356	229,5	35
050-050-250 /5502	50	50		100	125	24	550	520	250	185	195	642	-	431,5	1182	1177	-	425	349	-	-	-	-	-	-	506	406	263,5	40

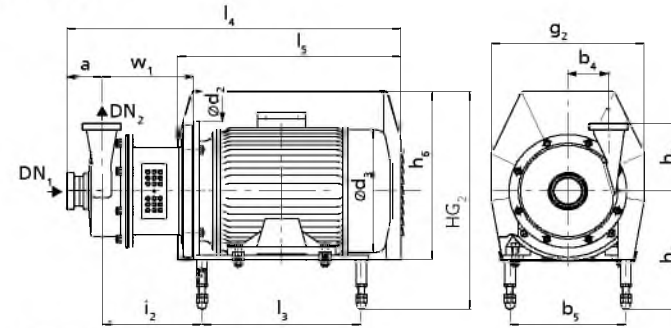
4) Applicable to connections as per DIN 11851 (hygienic pipe union)

5) Applicable to flanged connections to EN 1092-1

Vitachrom DN 50, n ≈ 2900 rpm and 3500 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

Overview of mating dimensions DN 50, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN 1	DN 2	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ⁶⁾	h ₂ ⁷⁾	h ₅		h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ⁶⁾	l ₁ ⁷⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
050-050-125 /152	50	50	70	70	200	200	190	264	90	145	160	213	248	305	376	437	158	516	516	225	646,5	450	164
050-050-125 /222	50	50	70	70	200	200	190	264	90	145	160	213	248	305	376	437	170	542	542	225	646,5	450	164
050-050-125 /302	50	50	70	70	200	250	213	264	100	145	160	223	258	305	393	437	175	591	591	265	686,5	470	174
050-050-125 /402	50	50	70	70	200	250	234	264	112	145	160	222	257	305	405	437	182	615	615	265	682,5	470	174
050-050-160 /222	50	50	70	85	200	200	190	264	90	170	185	213	248	305	376	437	170	542	542	225	646,5	450	164
050-050-160 /302	50	50	70	85	200	250	213	264	100	170	185	223	258	305	393	437	175	591	591	265	686,5	470	174
050-050-160 /402	50	50	70	85	200	250	234	264	112	170	185	222	257	305	405	437	182	615	615	265	682,5	470	174
050-050-160 /552	50	50	70	85	230	300	266	314	132	170	185	242	277	350	444	482	211	677	677	285	749,5	550	194
050-050-160 /752	50	50	70	85	230	300	266	314	132	170	185	242	277	350	444	482	211	677	677	285	749,5	550	194
050-050-160 /1102	50	50	70	85	280	350	325	372	160	170	185	270	305	423	502	555	245	840	840	385	915,5	720	224
050-050-160 /1502	50	50	70	85	280	350	325	372	160	170	185	270	305	423	502	555	245	840	840	385	915,5	720	224
050-050-200 /302	50	50	70	100	200	250	213	264	100	170	185	223	258	305	393	437	175	591	591	265	686,5	470	174
050-050-200 /402	50	50	70	100	200	250	234	264	112	170	185	222	257	305	405	437	182	615	615	265	682,5	470	174
050-050-200 /552	50	50	70	100	230	300	266	314	132	170	185	242	277	350	444	482	211	677	677	285	749,5	550	194
050-050-200 /752	50	50	70	100	230	300	266	314	132	170	185	242	277	350	444	482	211	677	677	285	749,5	550	194
050-050-200 /1102	50	50	70	100	280	350	325	372	160	170	185	270	305	423	502	555	245	840	840	385	915,5	720	224
050-050-200 /1502	50	50	70	100	280	350	325	372	160	170	185	270	305	423	502	555	245	840	840	385	915,5	720	224
050-050-200 /1852	50	50	70	100	280	350	325	372	160	170	185	270	305	423	502	555	267	846	846	385	915,5	720	224
050-050-200 /2202	50	50	70	100	305	350	370	402	180	170	185	290	325	493	587	626	292	904	904	385	970,5	740	224
050-050-250 /552	50	50	95 ⁶⁾	125	230	300	266	314	132	185	195	242	277	350	444	482	153	711	706	345	870,0	550	196,5
050-050-250 /752	50	50	(90) ⁷⁾	125	230	300	266	314	132	185	195	242	277	350	444	482	153	711	706	345	870,0	550	196,5
050-050-250 /1102	50	50		125	280	350	325	372	160	185	195	270	305	423	502	555	250	877	872	385	991,0	720	229,5
050-050-250 1502	50	50		125	280	350	325	372	160	185	195	270	305	423	502	555	250	877	872	385	991,0	720	229,5

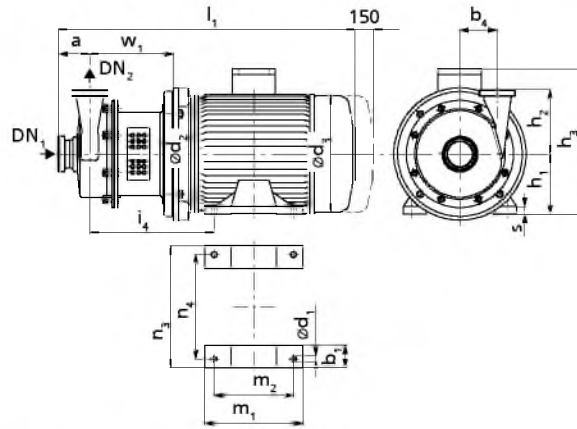
6) Applicable to connections as per DIN 11851 (hygienic pipe union)

7) Application to flanged connections to EN 1092-1

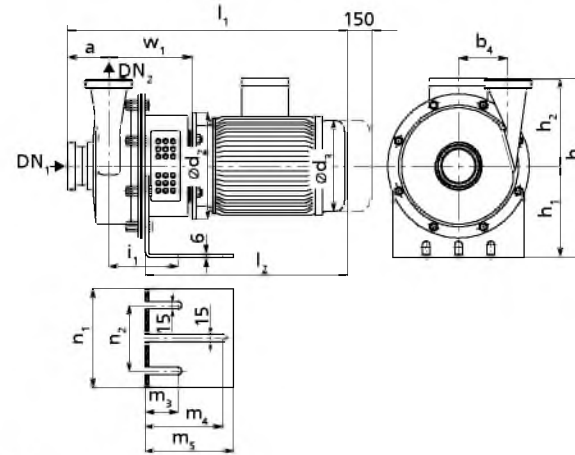
Vitachrom	DN 1	DN 2	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ⁶⁾	h ₂ ⁷⁾	h ₅		h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ⁶⁾	l ₁ ⁷⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
050-050-250 /1852	50	50		125	280	350	325	372	160	185	195	270	305	423	502	555	272	883	878	385	991,0	720	229,5
050-050-250 /2202	50	50		125	305	350	370	402	180	185	195	290	325	493	587	626	297,5	941	936	385	1075	740	229,5
050-050-250 /3002	50	50		125	345	400	422	452	200	185	195	331	353	545	658	686	307,5	1000	995	415	1144	830	229,5
050-050-250 /3702	50	50		125	345	400	422	452	200	185	195	331	353	545	658	686	307,5	1000	995	415	1144	830	229,5
050-050-250 /4502	50	50		125	390	450	468	527	225	185	195	356	378	616	703	744	306,5	1086	1081	455	1279	950	229,5
050-050-250 /5502	50	50		125	440	550	520	602	250	185	195	381	403	716	795	844	358,5	1182	1177	495	1411	1055	263,5

6) Applicable to connections as per DIN 11851 (hygienic pipe union)

7) Application to flanged connections to EN 1092-1

Vitachrom DN 65, $n \approx 2900$ rpm and 3500 rpm

Pump set with motor feet



Pump set with angle foot

Overview of mating dimensions DN 65, pump set with motor feet or angle foot, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ⁸⁾	h ₂ ⁹⁾	~h ₃	i ₁	i ₄	~l ₁ ⁸⁾	~l ₁ ⁹⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
065-065-125 /152	65	65	85	-	70	10	200	190	160	145	160	288	137	217	528	528	371	165	140	65	155	176	225	130	143	100	161	10
065-065-125 /222	65	65	85	-	70	10	200	190	160	145	160	288	137	217	554	554	397	165	140	65	155	176	225	130	143	125	161	10
065-065-125 /302	65	65	85	-	70	12	250	213	160	145	160	295	137	234	603	603	446	196	160	65	155	176	225	130	176	140	171	12
065-065-125 /402	65	65	85	-	70	12	250	234	160	145	160	308	137	241	627	627	470	226	190	65	155	176	225	130	176	140	171	12
065-065-160 /302	65	65	85	-	85	12	250	213	160	170	185	295	137	234	603	603	446	196	160	65	155	176	236	130	176	140	171	12
065-065-160 /402	65	65	85	-	85	12	250	234	160	170	185	308	137	241	627	627	470	226	190	65	155	176	236	130	176	140	171	12
065-065-160 /552	65	65	85	55	85	12	300	266	132	170	185	299	-	280	689	689	-	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /752	65	65	85	55	85	12	300	266	132	170	185	299	-	280	689	689	-	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /1102	65	65	85	70	85	15	350	325	160	170	185	357	-	329	852	852	-	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1502	65	65	85	70	85	15	350	325	160	170	185	357	-	329	852	852	-	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1852	65	65	85	70	85	15	350	325	160	170	185	357	-	329	858	858	-	314	254	-	-	-	-	-	320	254	221	21
065-065-200 /402	65	65	85	80	100	15	350	370	160	170	185	442	-	292	866	866	-	320	241	-	-	-	-	-	360	279	171	23
065-065-200 /552	65	65	85	55	100	12	300	266	132	170	185	299	-	280	689	689	-	220	140	-	-	-	-	-	270	216	191	15
065-065-200 /752	65	65	85	55	100	12	300	266	132	170	185	299	-	280	689	689	-	220	140	-	-	-	-	-	270	216	191	15
065-065-200 /1102	65	65	85	70	100	15	350	325	160	170	185	357	-	329	852	852	-	300	210	-	-	-	-	-	320	254	221	21
065-065-200 /1502	65	65	85	70	100	15	350	325	160	170	185	357	-	329	852	852	-	300	210	-	-	-	-	-	320	254	221	21
065-065-200 /1852	65	65	85	70	100	15	350	325	160	170	185	357	-	329	858	858	-	314	254	-	-	-	-	-	320	254	221	21
065-065-200 /2202	65	65	85	80	100	15	350	370	180	170	185	442	-	342	916	916	-	320	241	-	-	-	-	-	360	279	221	23

8) Applicable to connections as per DIN 11851 (hygienic pipe union)

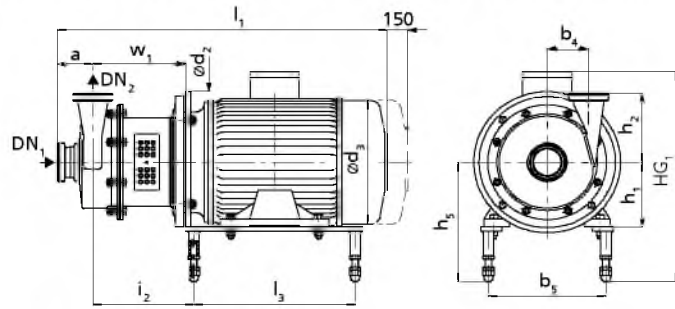
9) Application to flanged connections to EN 1092-1

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ⁸⁾	h ₂ ⁹⁾	~h ₃	i ₁	i ₄	~l ₁ ⁸⁾	~l ₁ ⁹⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s		
065-065-250 /552	65	65	105 ⁸⁾ (90) ⁹⁾	55	130	12	300	266	132	220	205	299	-	282	717	702	-	220	140	-	-	-	-	-	-	270	216	193	15	
065-065-250 /752	65	65		55	130	12	300	266	132	220	205	299	-	282	717	702	-	220	140	-	-	-	-	-	-	-	270	216	193	15
065-065-250 /1102	65	65		70	130	15	350	325	160	220	205	357	-	334	883	868	-	300	210	-	-	-	-	-	-	-	320	254	226	21
065-065-250 /1502	65	65		70	130	15	350	325	160	220	205	357	-	334	883	868	-	300	210	-	-	-	-	-	-	-	320	254	226	21
065-065-250 /1852	65	65		70	130	15	350	325	160	220	205	357	-	334	889	874	-	314	254	-	-	-	-	-	-	-	320	254	226	21
065-065-250 /2202	65	65		80	130	15	350	370	180	220	205	442	-	347	947	932	-	320	241	-	-	-	-	-	-	-	360	279	226	23
065-065-250 /3002	65	65		85	130	19	400	422	200	220	205	505	-	359	1006	991	-	388	305	-	-	-	-	-	-	-	400	318	226	30
065-065-250 /3702	65	65		85	130	19	400	422	200	220	205	505	-	359	1006	991	-	388	305	-	-	-	-	-	-	-	400	318	226	30
065-065-250 /4502	65	65		100	130	19	450	468	250	220	205	550	-	375	1092	1077	-	410	311	-	-	-	-	-	-	-	450	356	226	35
065-065-250 /5502	65	65		100	130	24	550	520	250	220	205	642	-	428	1188	1173	-	425	349	-	-	-	-	-	-	-	506	406	260	40

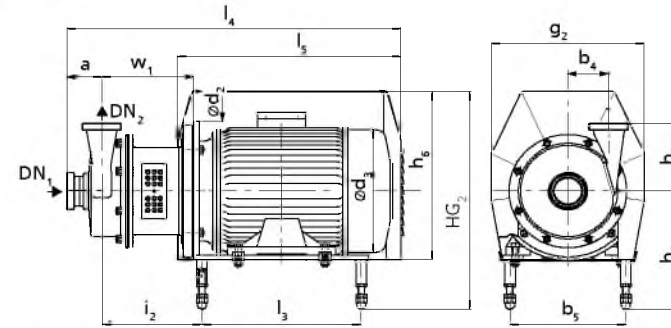
8) Applicable to connections as per DIN 11851 (hygienic pipe union)

9) Application to flanged connections to EN 1092-1

Vitachrom DN 65, n ≈ 2900 rpm and 3500 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

Overview of mating dimensions DN 65, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ¹⁰⁾	h ₂ ¹¹⁾	h ₅		h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ¹⁰⁾	l ₁ ¹¹⁾	l ₃	l ₄	l ₅	w ₁
												Max.	Max.		Max.	Max.							
065-065-125 /152	65	65	85	70	200	200	190	264	90	145	160	213	248	305	376	437	155	528	528	225	658,5	450	161
065-065-125 /222	65	65	85	70	200	200	190	264	90	145	160	213	248	305	376	437	167	554	554	225	658,5	450	161
065-065-125 /302	65	65	85	70	200	250	213	264	100	145	160	223	258	305	393	437	172	603	603	265	698,5	470	171
065-065-125 /402	65	65	85	70	200	250	234	264	112	145	160	222	257	305	405	437	179	627	627	265	698,5	470	171
065-065-160 /302	65	65	85	85	200	250	213	264	100	170	185	223	258	305	393	437	172	603	603	265	698,5	470	171
065-065-160 /402	65	65	85	85	200	250	234	264	112	170	185	222	257	305	405	437	179	627	627	265	694,5	470	171
065-065-160 /552	65	65	85	85	230	300	266	314	132	170	185	242	277	350	444	482	208	689	689	285	761,5	550	191
065-065-160 /752	65	65	85	85	230	300	266	314	132	170	185	242	277	350	444	482	208	689	689	285	761,5	550	191
065-065-160 /1102	65	65	85	85	280	350	325	372	160	170	185	270	305	423	502	555	242	852	852	385	927,5	720	221
065-065-160 /1502	65	65	85	85	280	350	325	372	160	170	185	270	305	423	502	555	242	852	852	385	927,5	720	221
065-065-160 /1852	65	65	85	85	280	350	325	372	160	170	185	270	305	423	502	555	264	858	858	385	927,5	720	221
065-065-200 /402	65	65	85	100	200	350	370	264	180	170	185	290	325	305	587	437	230	866	866	265	694,5	470	171
065-065-200 /552	65	65	85	100	230	300	266	314	132	170	185	242	277	350	444	482	208	689	689	285	761,5	550	191
065-065-200 /752	65	65	85	100	230	300	266	314	132	170	185	242	277	350	444	482	208	689	689	285	761,5	550	191
065-065-200 /1102	65	65	85	100	280	350	325	372	160	170	185	270	305	423	502	555	242	852	852	385	927,5	720	221
065-065-200 /1502	65	65	85	100	280	350	325	372	160	170	185	270	305	423	502	555	242	852	852	385	927,5	720	221
065-065-200 /1852	65	65	85	100	280	350	325	372	160	170	185	270	305	423	502	555	264	858	858	385	927,5	720	221
065-065-200 /2202	65	65	85	100	305	350	370	402	180	170	185	290	325	493	587	626	251	916	916	385	982,5	740	221
065-065-250 /552	65	65	105 ¹⁰⁾	130	230	300	266	314	132	220	205	242	277	350	444	482	149,5	717	702	345	876,0	550	193
065-065-250 /752	65	65	(90) ¹¹⁾	130	230	300	266	314	132	220	205	242	277	350	444	482	168,5	717	702	345	876,0	550	193
065-065-250 /1102	65	65		130	280	350	325	372	160	220	205	270	305	423	502	555	246,5	883	868	385	997,0	720	226
065-065-250 /1502	65	65		130	280	350	325	372	160	220	205	270	305	423	502	555	246,5	883	868	385	997,0	720	226
065-065-250 /1852	65	65		130	280	350	325	372	160	220	205	270	305	423	502	555	268,5	889	874	385	997,0	720	226

10) Applicable to connections as per DIN 11851 (hygienic pipe union)

11) Application to flanged DN connections to EN 1092-1

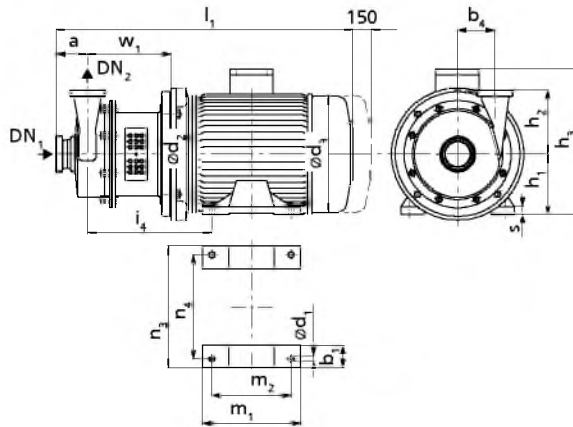
Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ¹⁰⁾	h ₂ ¹¹⁾	h ₅	h ₅	h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ¹⁰⁾	l ₁ ¹¹⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
065-065-250 /2202	65	65		130	305	350	370	402	180	220	205	290	325	493	587	626	294	947	932	385	1081	740	226
065-065-250 /3002	65	65		130	345	400	422	452	200	220	205	331	353	545	658	686	304	1006	991	415	1148	830	226
065-065-250 /3702	65	65		130	345	400	422	452	200	220	205	331	353	545	658	686	304	1006	991	415	1148	830	226
065-065-250 /4502	65	65		130	390	450	468	527	225	220	205	356	378	616	703	744	303	1092	1077	455	1285	950	226
065-065-250 /5502	65	65		130	440	550	520	602	250	220	205	381	403	716	795	844	355	1188	1173	495	1417	1055	260

10) Applicable to connections as per DIN 11851 (hygienic pipe union)

11) Application to flanged connections to EN 1092-1

Vitachrom DN 65 with inducer, n ≈ 2900 rpm and 3500 rpm

Pump set with inducer and motor feet



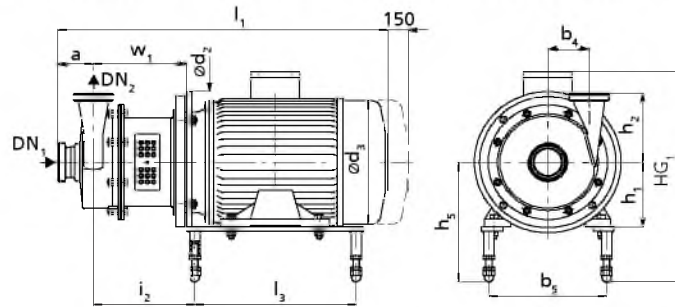
Overview of mating dimensions DN 65, pump set with inducer and motor feet, dimensions in [mm]

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	≈b ₁	b ₄	d ₁	d ₂	≈d ₃	h ₁	h ₂ ¹²⁾	h ₂ ¹³⁾	≈h ₃	i ₁	i ₄	≈l ₁ ⁸⁾	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
065-065-160 /552	0	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /752	0	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /1102	0	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1502	0	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1852	0	100	65	115	70	85	15	350	325	160	170	185	357	-	329	888	314	254	-	-	-	-	-	320	254	221	21
065-065-160 /2202	0	100	65	115	80	85	15	350	370	180	170	185	442	-	342	946	320	241	-	-	-	-	-	360	279	221	23
065-065-160 /552	1	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /752	1	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /1102	1	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1502	1	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1852	1	100	65	115	70	85	15	350	325	160	170	185	357	-	329	888	314	254	-	-	-	-	-	320	254	221	21
065-065-160 /2202	1	100	65	115	80	85	15	350	370	180	170	185	442	-	342	946	320	241	-	-	-	-	-	360	279	221	23
065-065-160 /552	2	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /752	2	100	65	115	55	85	12	300	266	132	170	185	299	-	280	719	220	140	-	-	-	-	-	270	216	191	15
065-065-160 /1102	2	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1502	2	100	65	115	70	85	15	350	325	160	170	185	357	-	329	882	300	210	-	-	-	-	-	320	254	221	21
065-065-160 /1852	2	100	65	115	70	85	15	350	325	160	170	185	357	-	329	888	314	254	-	-	-	-	-	320	254	221	21
065-065-160 /2202	2	100	65	115	80	85	15	350	370	180	170	185	442	-	342	946	320	241	-	-	-	-	-	360	279	221	23

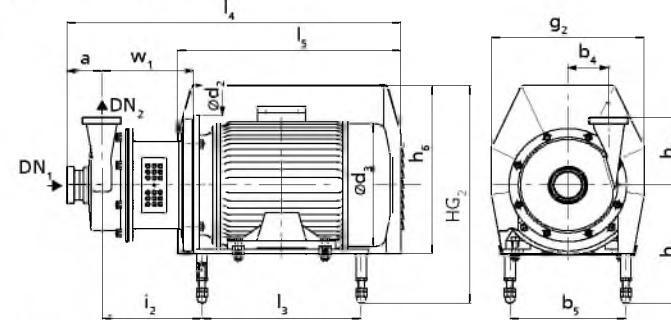
¹²⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

¹³⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 65 with inducer, n ≈ 2900 rpm and 3500 rpm, pump set with ball feet and motor shroud



Pump set with inducer and ball feet



Pump set with inducer, ball feet and motor shroud

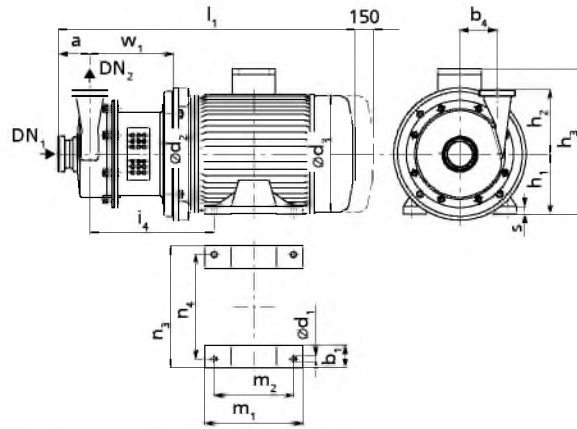
Overview of mating dimensions DN 65, pump set with inducer, ball feet and motor shroud, dimensions in [mm]

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	≈d ₃	g ₂	h ₁	h ₂ ¹⁴⁾	h ₂ ¹⁵⁾	h ₅		h ₆	≈HG		l ₂	≈l ₁	l ₃	l ₄	l ₅	w ₁
													Min.	Max.		Max.	Max.						
065-065-160 /552	0	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /752	0	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /1102	0	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1502	0	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1852	0	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	264	888	385	928	720	221
065-065-160 /2202	0	100	65	115	85	305	350	370	402	180	170	185	290	325	493	587	626	289	946	385	1013	740	221
065-065-160 /552	1	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /752	1	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /1102	1	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1502	1	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1852	1	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	264	888	385	928	720	221
065-065-160 /2202	1	100	65	115	85	305	350	370	402	180	170	185	290	325	493	587	626	289	946	385	1013	740	221
065-065-160 /552	2	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /752	2	100	65	115	85	230	300	266	314	132	170	185	242	277	350	444	482	208	719	285	762	550	191
065-065-160 /1102	2	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1502	2	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	242	882	385	928	720	221
065-065-160 /1852	2	100	65	115	85	280	350	325	372	160	170	185	270	305	423	502	555	264	888	385	928	720	221
065-065-160 /2202	2	100	65	115	85	305	350	370	402	180	170	185	290	325	493	587	626	289	946	385	1013	740	221

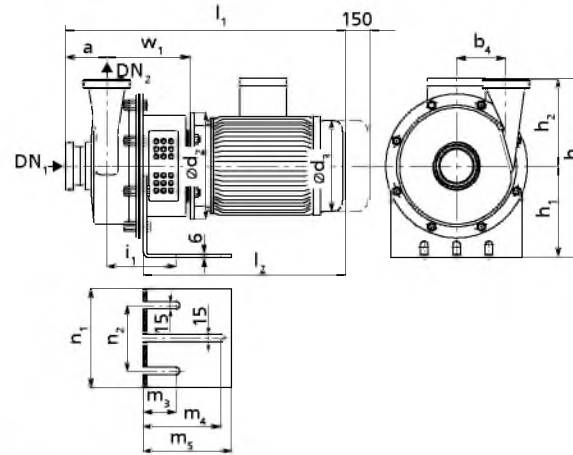
14) Applicable to connections as per DIN 11851 (hygienic pipe union)

15) Applicable to flanged connections to EN 1092-1

Vitachrom DN 80, n ≈ 2900 rpm and 3500 rpm



Pump set with motor feet



Pump set with angle foot

Overview of mating dimensions DN 80, pump set with motor feet or angle foot, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ¹⁶⁾	h ₂ ¹⁷⁾	~h ₃	i ₁	i ₄	~i ₁ ¹⁶⁾	~i ₁ ¹⁷⁾	~i ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
080-080-125 /402	80	80	100	-	85	12	250	234	160	170	185	308	144,5	248,5	650	650	470	226	190	65	155	176	236	130	176	140	178,5	12
080-080-125 /552	80	80	100	55	85	12	300	266	132	170	185	299	-	287,5	712	712	-	220	140	-	-	-	-	-	270	216	198,5	15
080-080-125 /752	80	80	100	55	85	12	300	266	132	170	185	299	-	287,5	712	712	-	220	140	-	-	-	-	-	270	216	198,5	15
080-080-125 /1102	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	875	875	-	300	210	-	-	-	-	-	320	254	228,5	21
080-080-125 /1502	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	875	875	-	300	210	-	-	-	-	-	320	254	228,5	21
080-080-125 /1852	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	881	881	-	314	254	-	-	-	-	-	320	254	228,5	21
080-080-160 /552	80	80	100	55	85	12	300	266	132	170	185	299	-	287,5	712	712	-	220	140	-	-	-	-	-	270	216	198,5	15
080-080-160 /752	80	80	100	55	85	12	300	266	132	170	185	299	-	287,5	712	712	-	220	140	-	-	-	-	-	270	216	198,5	15
080-080-160 /1102	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	875	875	-	300	210	-	-	-	-	-	320	254	228,5	21
080-080-160 /1502	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	875	875	-	300	210	-	-	-	-	-	320	254	228,5	21
080-080-160 /1852	80	80	100	70	85	15	350	325	160	170	185	357	-	336,5	881	891	-	314	254	-	-	-	-	-	320	254	228,5	21
080-080-160 /2202	80	80	100	80	85	15	350	370	180	170	185	442	-	349,5	939	939	-	320	241	-	-	-	-	-	360	279	228,5	23
080-080-250 /752	80	80	115 ¹⁶⁾ (95) ¹⁷⁾	55	125	12	300	266	132	225	205	299	-	279,5	725	705	-	220	140	-	-	-	-	-	270	216	190,5	15
080-080-250 /1102	80	80	(95) ¹⁷⁾	70	125	15	350	325	160	225	205	357	-	331,5	891	871	-	300	210	-	-	-	-	-	320	254	223,5	21
080-080-250 /1502	80	80	(95) ¹⁷⁾	70	125	15	350	325	160	225	205	357	-	331,5	891	871	-	300	210	-	-	-	-	-	320	254	223,5	21
080-080-250 /1852	80	80	(95) ¹⁷⁾	70	125	15	350	325	160	225	205	357	-	331,5	897	877	-	314	254	-	-	-	-	-	320	254	223,5	21
080-080-250 /2202	80	80	(95) ¹⁷⁾	80	125	15	350	370	180	225	205	442	-	344,5	955	935	-	320	241	-	-	-	-	-	360	279	223,5	23
080-080-250 /3002	80	80	(95) ¹⁷⁾	85	125	19	400	422	200	225	205	505	-	356,5	1014	994	-	388	305	-	-	-	-	-	400	318	223,5	30
080-080-250 /3702	80	80	(95) ¹⁷⁾	85	125	19	400	422	200	225	205	505	-	356,5	1014	994	-	388	305	-	-	-	-	-	400	318	223,5	30

¹⁶⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

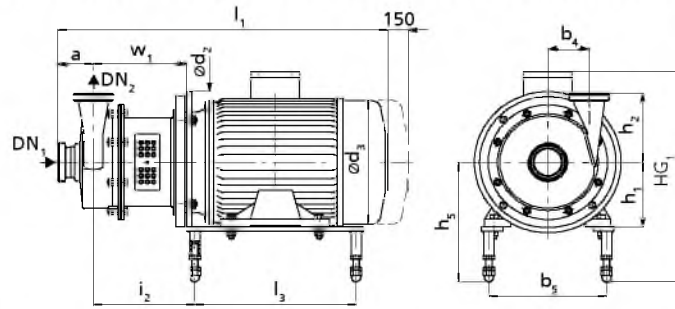
¹⁷⁾ Applicable to flanged connections to EN 1092-1

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ¹⁶⁾	h ₂ ¹⁷⁾	~h ₃	i ₁	i ₄	~l ₁ ¹⁶⁾	~l ₁ ¹⁷⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s	
080-080-250 /4502	80	80		100	125	19	450	468	225	225	205	550	-	372,5	1100	1080	-	410	311	-	-	-	-	-	-	450	356	223,5	35
080-080-250 /5502	80	80		100	125	24	550	520	250	225	205	642	-	425,5	1196	1176	-	425	349	-	-	-	-	-	-	506	406	257,5	40

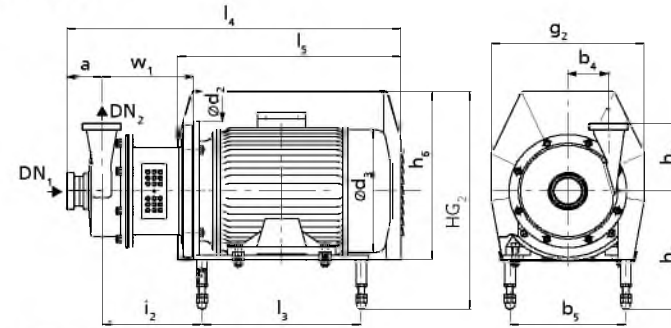
¹⁶⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

¹⁷⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 80, n ≈ 2900 rpm and 3500 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

Overview of mating dimensions DN 80, pump set with ball feet and motor shroud, dimensions in [mm]

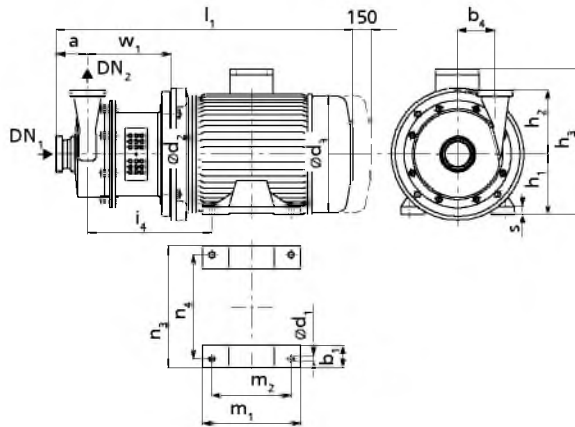
Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ¹⁸⁾	h ₂ ¹⁹⁾	h ₅		h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ¹⁸⁾	l ₁ ¹⁹⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
080-080-125 /402	80	80	100	85	200	250	234	264	112	170	185	222	257	305	405	437	186	650	650	265	717	470	179
080-080-125 /552	80	80	100	85	230	300	266	314	132	170	185	242	277	350	444	482	215	712	712	285	784	550	199
080-080-125 /752	80	80	100	85	230	300	266	314	132	170	185	242	277	350	444	482	215	712	712	285	784	550	199
080-080-125 /1102	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	249	875	875	385	950	720	229
080-080-125 /1502	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	249	875	875	385	950	720	229
080-080-125 /1852	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	271	881	881	385	950	720	229
080-080-160 /552	80	80	100	85	230	300	266	314	132	170	185	242	277	350	444	482	215	712	712	285	784	550	199
080-080-160 /752	80	80	100	85	230	300	266	314	132	170	185	242	277	350	444	482	215	712	712	285	784	550	199
080-080-160 /1102	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	249	875	875	385	950	720	229
080-080-160 /1502	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	249	875	875	385	950	720	229
080-080-160 /1852	80	80	100	85	280	350	325	372	160	170	185	270	305	423	502	555	271	881	881	385	950	720	229
080-080-160 /2202	80	80	100	85	305	350	370	402	180	170	185	290	325	493	587	626	259	939	939	385	1005	740	229
080-080-250 /752	80	80	115 ¹⁸⁾ (95) ¹⁹⁾	125	230	300	266	314	132	225	205	242	277	350	444	482	147	725	705	345	884	550	190,5
080-080-250 /1102	80	80		125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	871	385	1005	720	223,5
080-080-250 /1502	80	80		125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	871	385	1005	720	223,5
080-080-250 /1852	80	80		125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	877	385	1005	720	223,5
080-080-250 /2202	80	80		125	305	350	370	402	180	225	205	290	325	493	587	626	291	955	935	385	1091	740	223,5
080-080-250 /3002	80	80		125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	994	415	1156	830	223,5
080-080-250 /3702	80	80		125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	994	415	1156	830	223,5
080-080-250 /4502	80	80		125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	1080	455	1148	950	223,5
080-080-250 /5502	80	80	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	1176	495	1425	1055	257,5	

¹⁸⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

¹⁹⁾ Applicable to flanged DN connections to EN 1092-1

Vitachrom DN 80 with inducer, n ≈ 2900 rpm

Pump set with inducer and motor feet



Overview of mating dimensions DN 80, pump set with inducer and motor feet, dimensions in [mm]

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	≈b ₁	b ₄	d ₁	d ₂	d ₃	h ₁	h ₂ ²⁰⁾	h ₂ ²¹⁾	≈h ₃	i ₄	≈l ₁	m ₁	m ₂	n ₃	n ₄	w ₁	s
080-080-250 /1502	0	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-080-250 /1852	0	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-080-250 /2202	0	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-080-250 /3002	0	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-080-250 /3702	0	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-080-250 /4502	0	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-080-250 /5502	0	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40
080-080-250 /1502	1	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-080-250 /1852	1	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-080-250 /2202	1	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-080-250 /3002	1	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-080-250 /3702	1	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-080-250 /4502	1	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-080-250 /5502	1	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40
080-080-250 /1502	2	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-080-250 /1852	2	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-080-250 /2202	2	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-080-250 /3002	2	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-080-250 /3702	2	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30

20) Applicable to connections as per DIN 11851 (hygienic pipe union)

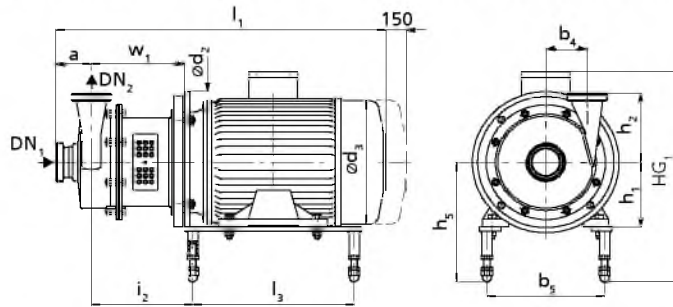
21) Applicable to flanged connections to EN 1092-1

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	d ₃	h ₁	h ₂ ²⁰⁾	h ₂ ²¹⁾	~h ₃	i ₄	~l ₁	m ₁	m ₂	n ₃	n ₄	w ₁	s
080-080-250 /4502	2	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-080-250 /5502	2	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40

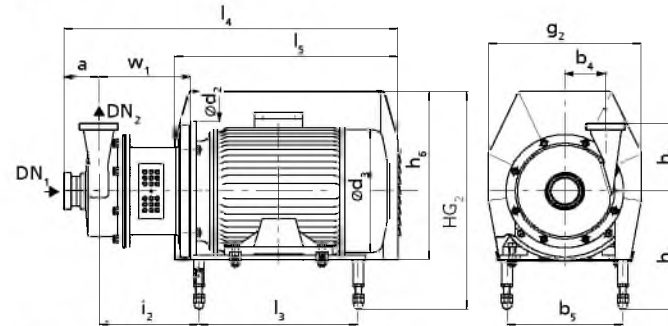
²⁰⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

²¹⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 80 with inducer, n ≈ 2900 rpm, pump set with ball feet and motor shroud



Pump set with inducer and ball feet



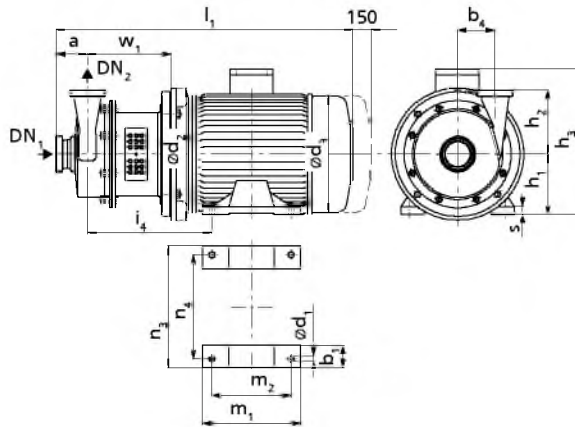
Pump set with inducer, ball feet and motor shroud

Overview of mating dimensions DN 80, pump set with inducer, ball feet and motor shroud, dimensions in [mm]

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	~d ₃	g ₂	h ₁	h ₂	h ₂	h ₅ Min.	h ₅ Max.	h ₆	~HG ₁	~HG ₂	i ₂	~l ₁	l ₃	l ₄	l ₅	w ₁
																Max.	Max.						
080-080-250 /1502	0	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250 /1852	0	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250 /2202	0	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250 /3002	0	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /3702	0	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /4502	0	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	1148	950	223,5
080-080-250 /5502	0	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1425	1055	257,5
080-080-250 /1502	1	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250 /1852	1	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250 /2202	1	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250 /3002	1	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /3702	1	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /4502	1	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	1148	950	223,5
080-080-250 /5502	1	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1425	1055	257,5
080-080-250 /1502	2	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250 /1852	2	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250 /2202	2	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250 /3002	2	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /3702	2	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250 /4502	2	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	1148	950	223,5
080-080-250 /5502	2	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1425	1055	257,5

Vitachrom DN 80 with inducer, $n \approx 3500$ rpm

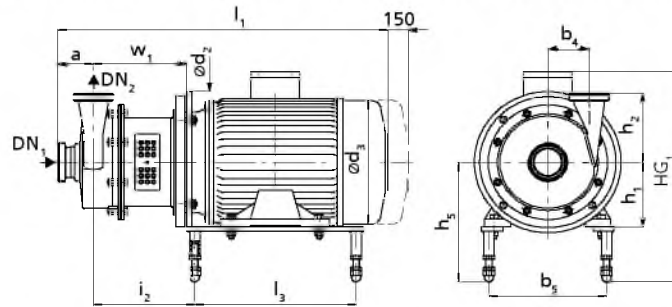
Pump set with inducer and motor feet



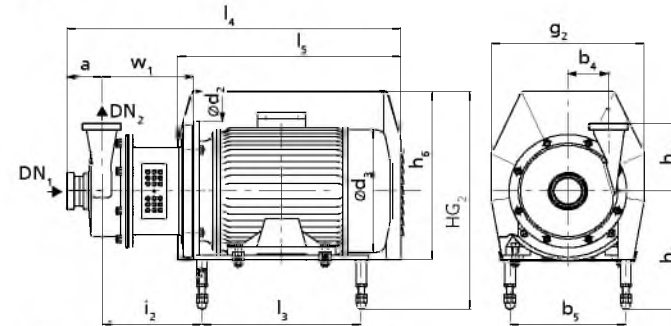
Overview of mating dimensions DN 80, pump set with inducer and motor feet, dimensions in [mm]

Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ²⁰⁾	h ₂ ²¹⁾	~h ₃	i ₄	l ₁	m ₁	m ₂	n ₃	n ₄	w ₁	s
080-880-250.1 /1502	0	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-880-250.1 /1852	0	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-880-250.1 /2202	0	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-880-250.1 /3002	0	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /3702	0	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /4502	0	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-880-250.1 /5502	0	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40
080-880-250.1 /1502	1	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-880-250.1 /1852	1	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-880-250.1 /2202	1	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-880-250.1 /3002	1	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /3702	1	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /4502	1	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-880-250.1 /5502	1	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40
080-880-250.1 /1502	2	100	80	115	70	125	15	350	325	160	225	205	357	331,5	891	300	210	320	254	223,5	21
080-880-250.1 /1852	2	100	80	115	70	125	15	350	325	160	225	205	357	331,5	897	314	254	320	254	223,5	21
080-880-250.1 /2202	2	100	80	115	80	125	15	350	370	180	225	205	442	344,5	955	320	241	360	279	223,5	23
080-880-250.1 /3002	2	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /3702	2	100	80	115	85	125	19	400	422	200	225	205	505	356,5	1014	388	305	400	318	223,5	30
080-880-250.1 /4502	2	100	80	115	100	125	19	450	468	225	225	205	550	372,5	1100	410	311	450	356	223,5	35
080-880-250.1 /5502	2	100	80	115	100	125	24	550	520	250	225	205	642	425,5	1196	425	349	506	406	257,5	40

Vitachrom DN 80 with inducer, n ≈ 3500 rpm, pump set with ball feet and motor shroud



Pump set with inducer and ball feet



Pump set with inducer, ball feet and motor shroud

Overview of mating dimensions DN 80, pump set with inducer, ball feet and motor shroud, dimensions in [mm]

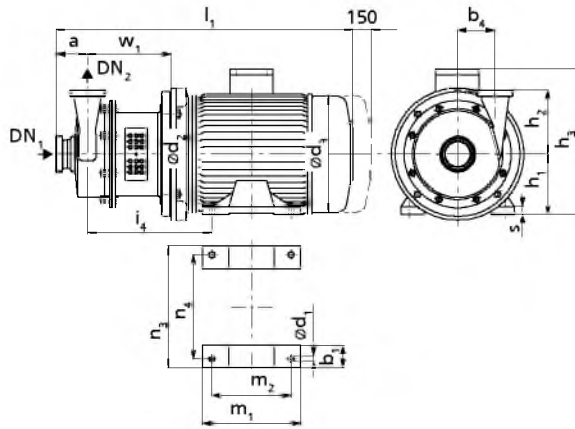
Vitachrom with inducer	Inducer	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	~d ₃	g ₂	h ₁	h ₂ ²²⁾	h ₂ ²³⁾	h ₅		h ₆	~HG		i ₂	~l ₁	l ₃	l ₄	l ₅	w ₁
													Min.	Max.		Max.	Max.						
080-080-250.1 /1502	0	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250.1 /1852	0	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250.1 /2202	0	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250.1 /3002	0	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /3702	0	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /4502	0	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	950	950	223,5
080-080-250.1 /5502	0	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1055	1055	257,5
080-080-250.1 /1502	1	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250.1 /1852	1	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250.1 /2202	1	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250.1 /3002	1	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /3702	1	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /4502	1	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	950	950	223,5
080-080-250.1 /5502	1	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1055	1055	257,5
080-080-250.1 /1502	2	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	385	1005	720	223,5
080-080-250.1 /1852	2	100	80	115	125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	385	1005	720	223,5
080-080-250.1 /2202	2	100	80	115	125	305	350	370	402	180	225	205	290	325	493	587	626	291,5	955	385	1091	740	223,5
080-080-250.1 /3002	2	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /3702	2	100	80	115	125	345	400	422	452	200	225	205	331	353	545	658	686	301,5	1014	415	1155	830	223,5
080-080-250.1 /4502	2	100	80	115	125	390	450	468	527	225	225	205	356	378	616	703	744	300,5	1100	455	950	950	223,5
080-080-250.1 /5502	2	100	80	115	125	440	550	520	602	250	225	205	381	403	716	795	844	352,5	1196	495	1055	1055	257,5

22) Applicable to connections as per DIN 11851 (hygienic pipe union)

23) Applicable to flanged connections as per EN 1092-1

Vitachrom DN 100, $n \approx 2900$ rpm and 3500 rpm

Pump set with motor feet



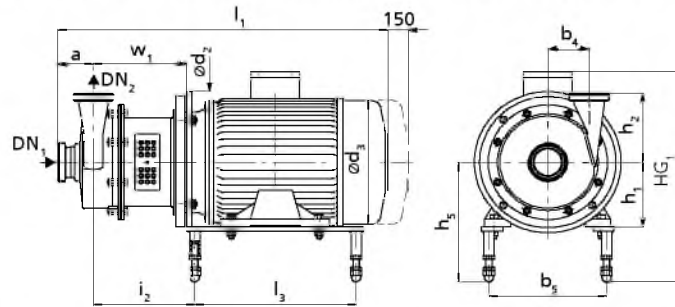
Overview of mating dimensions DN 100, pump set with motor feet, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ²⁴⁾	h ₂ ²⁵⁾	~h ₃	i ₄	~l ₁ ²⁴⁾	~l ₁ ²⁵⁾	m ₁	m ₂	n ₃	n ₄	w ₁	s
100-100-200 /752	100	100	100 ²⁴⁾	55	110	12	300	266	132	250	235	299	277	707	722	220	140	270	216	188	15
100-100-200 /1102	100	100	(115) ²⁵⁾	70	110	15	350	325	160	250	235	357	329	873	888	300	210	320	254	221	21
100-100-200 /1502	100	100		70	110	15	350	325	160	250	235	357	329	873	888	300	210	320	254	221	21
100-100-200 /1852	100	100		70	110	15	350	325	160	250	235	357	329	879	894	314	254	320	254	221	21
100-100-200 /2202	100	100		80	110	15	350	370	180	250	235	442	342	937	952	320	241	360	279	221	23
100-100-200 /3002	100	100		85	110	19	400	422	200	250	235	505	354	996	1011	388	305	400	318	221	30
100-100-200 /3702	100	100		85	110	19	400	422	200	250	235	505	354	996	1011	388	305	400	318	221	30
100-100-200 /4502	100	100		100	110	19	450	468	225	250	235	550	370	1082	1097	410	311	450	356	221	35
100-100-200 /5502	100	100		100	110	24	550	520	250	250	235	642	423	1178	1193	425	349	506	406	255	40

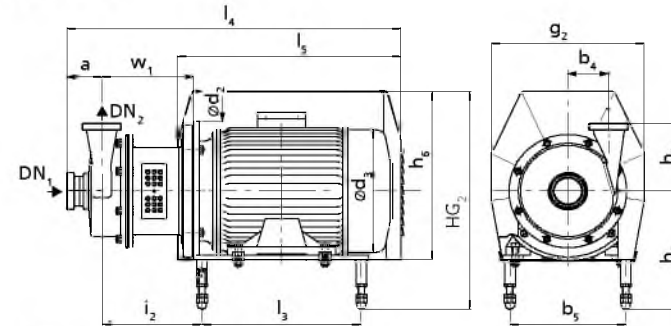
24) Applicable to connections as per DIN 11851 (hygienic pipe union)

25) Applicable to flanged connections to EN 1092-1

Vitachrom DN 100, n ≈ 2900 rpm and 3500 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

Overview of mating dimensions DN 100, pump set with ball feet and motor shroud, dimensions in [mm]

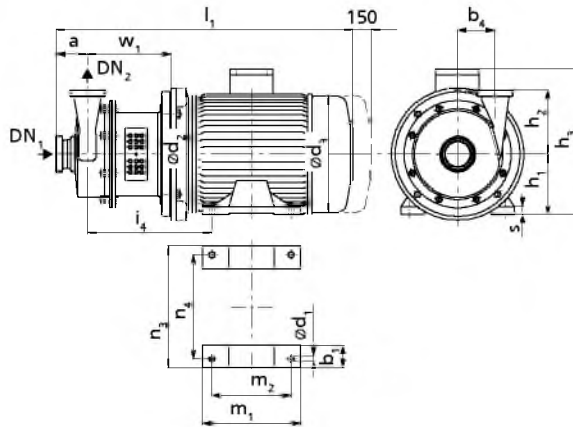
Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	~d ₃	g ₂	h ₁	h ₂ ²⁶⁾	h ₂ ²⁷⁾	h ₅		h ₆	~HG ₁		~HG ₂		l ₂	~l ₁ ²⁶⁾	l ₁ ²⁷⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.									
100-100-200 /752	100	100	100 ²⁶⁾ (115) ²⁷⁾	110	230	300	266	314	132	250	235	242	277	350	444	482	144,5	707	722	345	881	550	188		
100-100-200 /1102	100	100		110	280	350	325	372	160	250	235	270	305	423	502	555	241,5	873	888	385	1002	720	221		
100-100-200 /1502	100	100		110	280	350	325	372	160	250	235	270	305	423	502	555	241,5	873	888	385	1002	720	221		
100-100-200 /1852	100	100		110	280	350	325	372	160	250	235	270	305	423	502	555	273,5	879	894	385	1002	720	221		
100-100-200 /2202	100	100		110	305	350	370	402	180	250	235	290	325	493	587	626	289	937	952	385	1086	740	221		
100-100-200 /3002	100	100		110	345	400	422	452	200	250	235	331	353	545	658	686	299	996	1011	415	1153	830	221		
100-100-200 /3702	100	100		110	345	400	422	452	200	250	235	331	353	545	658	686	299	996	1011	415	1153	830	221		
100-100-200 /4502	100	100		110	390	450	468	527	225	250	235	356	378	616	703	744	298	1082	1097	455	1290	950	221		
100-100-200 /5502	100	100		110	440	550	520	602	250	250	235	381	403	716	795	844	350	1178	1193	495	1422	1055	255		

26) Applicable to connections as per DIN 11851 (hygienic pipe union)

27) Applicable to flanged connections to EN 1092-1

Vitachrom DN 125, $n \approx 2900$ rpm

Pump set with motor feet



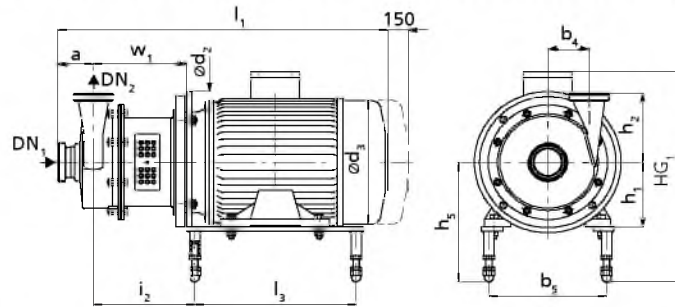
Overview of mating dimensions DN 125, pump set with motor feet, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ²⁸⁾	h ₂ ²⁹⁾	~h ₃	i ₄	~l ₁ ²⁴⁾	~l ₁ ²⁵⁾	m ₁	m ₂	n ₃	n ₄	w ₁	s
125-125-200 /752	125	125	120 ²⁴⁾	55	110	12	300	266	132	250	235	299	298	748	763	220	140	270	216	209	15
125-125-200 /1102	125	125	(135) ²⁵⁾	70	110	15	350	325	160	250	235	357	350	914	929	300	210	320	254	242	21
125-125-200 /1502	125	125		70	110	15	350	325	160	250	235	357	350	914	929	300	210	320	254	242	21
125-125-200 /1852	125	125		70	110	15	350	325	160	250	235	357	350	920	935	314	254	320	254	242	21
125-125-200 /2202	125	125		80	110	15	350	370	180	250	235	442	363	978	993	320	241	360	279	242	23
125-125-200 /3002	125	125		85	110	19	400	422	200	250	235	505	375	1037	1052	388	305	400	318	242	30
125-125-200 /3702	125	125		85	110	19	400	422	200	250	235	505	375	1037	1052	388	305	400	318	242	30
125-125-200 /4502	125	125		100	110	19	450	468	225	250	235	550	391	1123	1138	410	311	450	356	242	35
125-125-200 /5502	125	125		100	110	24	550	520	250	250	235	642	444	1219	1234	425	349	506	406	276	40
125-125-200 /7502	125	125		100	110	24	550	575	280	250	235	712	466	1327	1342	480	368	557	457	276	40
125-125-200 /9002	125	125		100	110	24	550	575	280	250	235	712	466	1382	1397	530	419	557	457	276	40

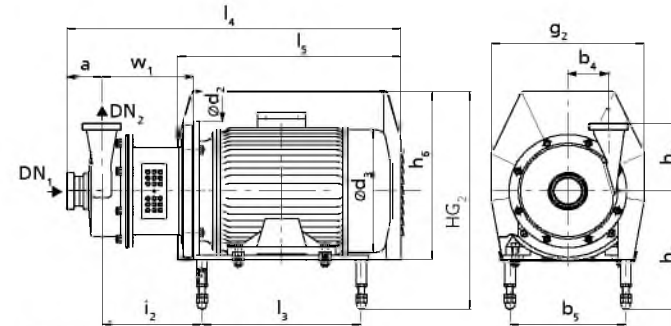
28) Applicable to connections as per DIN 11851 (hygienic pipe union)

29) Applicable to flanged connections to EN 1092-1

Vitachrom DN 125, n ≈ 2900 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

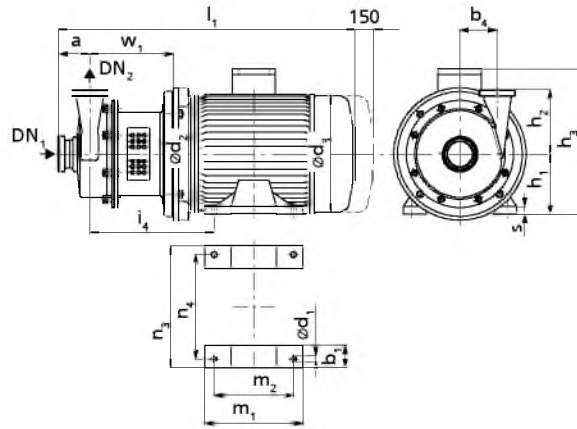
Overview of mating dimensions DN 125, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	~d ₃	g ₂	h ₁	h ₂ ³⁰⁾	h ₂ ³¹⁾	h ₅		h ₆	~HG ₁		~HG ₂		i ₂	~l ₁ ²⁶⁾	l ₁ ²⁷⁾	i ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.									
125-125-200 /752	125	125	120 ²⁶⁾ (135) ²⁷⁾	110	230	300	266	314	132	250	235	242	277	350	444	482	165,5	748	763	345	954	550	209		
125-125-200 /1102	125	125		110	280	350	325	372	160	250	235	270	305	423	502	555	262,5	914	929	385	1042	720	242		
125-125-200 /1502	125	125		110	280	350	325	372	160	250	235	270	305	423	502	555	262,5	914	929	385	1042	720	242		
125-125-200 /1852	125	125		110	280	350	325	372	160	250	235	270	305	423	502	555	284,5	920	935	385	1042	720	242		
125-125-200 /2202	125	125		110	305	350	370	402	180	250	235	290	325	493	587	626	310	978	993	385	1126	740	242		
125-125-200 /3002	125	125		110	345	400	422	452	200	250	235	331	353	545	658	686	320	1037	1052	415	1193	830	242		
125-125-200 /3702	125	125		110	345	400	422	452	200	250	235	331	353	545	658	686	320	1037	1052	415	1193	830	242		
125-125-200 /4502	125	125		110	390	450	468	527	225	250	235	356	378	616	703	744	319	1123	1138	455	1330	950	242		
125-125-200 /5502	125	125		110	440	550	520	602	250	250	235	381	403	716	795	844	371	1219	1234	495	1471	1055	276		
125-125-200 /7502	125	125		110	490	550	575	672	280	250	235	411	433	786	865	914	393	1327	1342	565	1669	1250	276		
125-125-200 /9002	125	125	110	490	550	575	672	280	250	235	411	433	786	865	914	393	1382	1397	565	1669	1250	276			

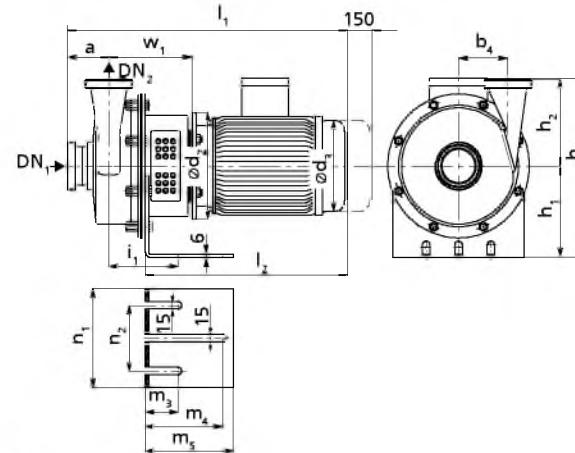
30) Applicable to connections as per DIN 11851 (hygienic pipe union)

31) Applicable to flanged connections to EN 1092-1

Vitachrom DN 50, n ≈ 1450 rpm and 1750 rpm



Pump set with motor feet



Pump set with angle foot

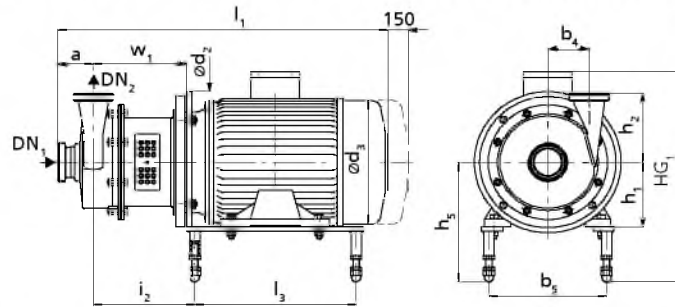
Overview of mating dimensions DN 50, pump set with motor feet or angle foot, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ³²⁾	h ₂ ³³⁾	~h ₃	i ₁	i ₄	~l ₁ ³²⁾	~l ₁ ³³⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
050-050-125 /154	50	50	70	-	70	10	200	190	160	145	160	288	138,5	220	542	542	397	165	140	65	155	176	225	130	143	125	164	10
050-050-160 /154	50	50	70	-	85	10	200	190	160	170	185	288	138,5	220	542	542	397	165	140	65	155	176	236	130	143	125	164	10
050-050-160 /224	50	50	70	-	85	12	250	213	160	170	185	295	138,5	237	591	591	446	196	160	65	155	176	236	130	176	140	174	12
050-050-200 /154	50	50	70	-	100	10	200	190	160	170	185	288	138,5	220	542	542	397	165	140	65	155	176	264	130	143	125	164	10
050-050-200 /224	50	50	70	-	100	12	250	213	160	170	185	295	138,5	237	591	591	446	196	160	65	155	176	264	130	176	140	174	12
050-050-200 /304	50	50	70	-	100	12	250	213	160	170	185	295	138,5	237	626	626	481	196	160	65	155	176	264	130	176	140	174	12
050-050-250 /154	50	50	95 ³²⁾	-	125	10	200	190	180	185	195	308	121,5	215,5	569	564	399	165	140	30	120	160	225	130	143	125	159,5	10
050-050-250 /224	50	50	(90) ³³⁾	-	125	12	250	213	180	185	195	315	121,5	236,5	622	617	452	196	160	30	120	160	225	130	176	140	173,5	12
050-050-250 /304	50	50		-	125	12	250	213	180	185	195	315	121,5	236,5	657	652	487	196	160	30	120	160	225	130	176	140	173,5	12
050-050-250 /404	50	50		-	125	12	250	234	180	185	195	328	121,5	243,5	646	641	476	226	190	30	120	160	225	130	176	140	173,5	12
050-050-250 /554	50	50		55	125	12	300	266	132	185	195	299	-	285,5	711	706	-	220	140	-	-	-	-	-	270	216	196,5	15
050-050-250 /754	50	50		59	125	12	300	298	132	185	195	299	-	285,5	739	734	-	240	178	-	-	-	-	-	270	216	196,5	15
050-050-250 /1104	50	50		70	125	15	350	325	160	185	195	357	-	337,5	877	872	-	300	210	-	-	-	-	-	320	254	229,5	21
050-050-250 /1504	50	70		70	125	15	350	325	160	185	195	357	-	337,5	883	878	-	314	254	-	-	-	-	-	320	254	229,5	21

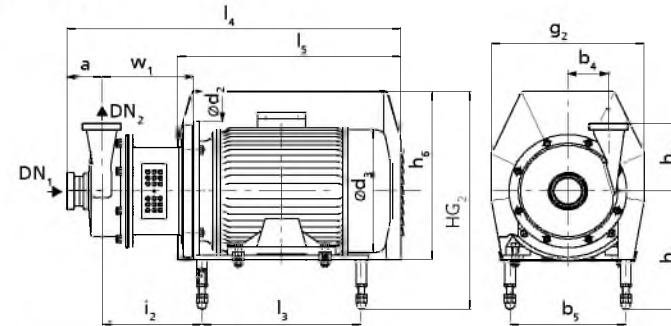
³²⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

³³⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 50, n ≈ 1450 rpm and 1750 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

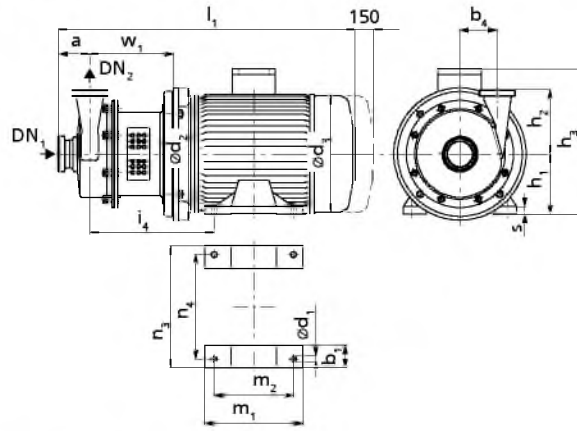
Overview of mating dimensions DN 50, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ³⁴⁾	h ₂ ³⁵⁾	h ₅		h ₆	~HG		i ₂	l ₁ ³⁴⁾	l ₁ ³⁵⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
050-050-125 /154	50	50	70	70	200	200	190	264	90	145	160	213	247,5	304,7	376	437	150	542	542	225	646,5	450	164
050-050-160 /154	50	50	70	85	200	200	190	264	90	170	185	213	247,5	304,7	376	437	150	542	542	225	646,5	450	164
050-050-160 /224	50	50	70	85	200	250	213	264	100	170	185	223	257,5	304,7	393	437	174,5	591	591	265	686,5	470	174
050-050-200 /154	50	50	70	100	200	200	190	264	90	170	185	213	247,5	304,7	376	437	150	542	542	225	646,5	450	164
050-050-200 /224	50	50	70	100	200	250	213	264	100	170	185	223	257,5	304,7	393	437	174,5	591	591	265	686,5	470	174
050-050-200 /304	50	50	70	100	200	250	213	264	100	170	185	223	257,5	304,7	393	437	174,5	626	626	265	686,5	470	174
050-050-250 /154	50	50	95 ³⁴⁾ (90) ³⁵⁾	125	200	200	190	264	90	185	195	213	247,5	304,7	376	437	105,5	568,5	563,5	285	722	450	159,5
050-050-250 /224	50	50		125	200	250	213	264	100	185	195	223	257,5	304,7	393	437	129	621,5	616,5	310	751	470	173,5
050-050-250 /304	50	50		125	200	250	213	264	100	185	195	223	257,5	304,7	393	437	129	656,5	651,5	310	751	470	173,5
050-050-250 /404	50	50		125	200	250	234	264	112	185	195	222	256,5	304,7	405	437	116	645,5	640,5	330	757	470	173,5
050-050-250 /554	50	50		125	230	300	266	314	132	185	195	242	276,5	349,7	444	482	153	710,5	705,5	345	814	550	196,5
050-050-250 /754	50	50		125	230	300	298	314	132	185	195	242	276,5	349,7	444	482	172	738,5	733,5	345	814	550	196,5
050-050-250 /1104	50	50		125	280	350	325	372	160	185	195	270	304,5	422,7	502	555	250	876,5	871,5	385	986	720	229,5
050-050-250 /1504	50	50		125	280	350	325	372	160	185	195	270	304,5	422,7	502	555	272	882,5	877,5	385	986	720	229,5

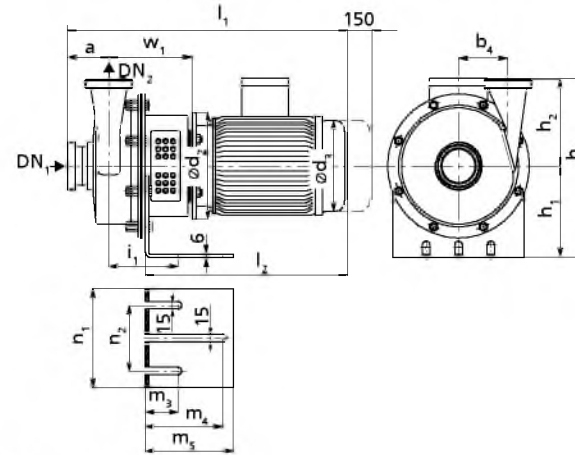
³⁴⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

³⁵⁾ Applicable to flanged connections as per EN 1092-1

Vitachrom DN 65, n ≈ 1450 rpm and 1750 rpm



Pump set with motor feet



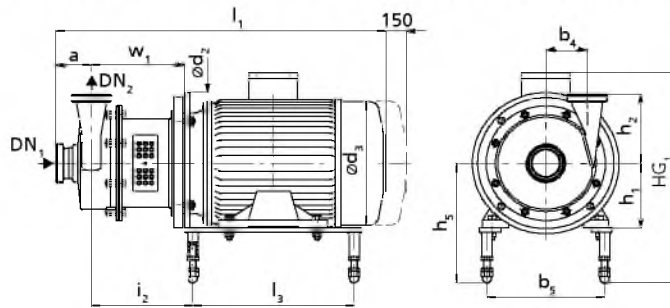
Pump set with angle foot

Overview of mating dimensions DN 65, pump set with motor feet or angle foot, dimensions in [mm]

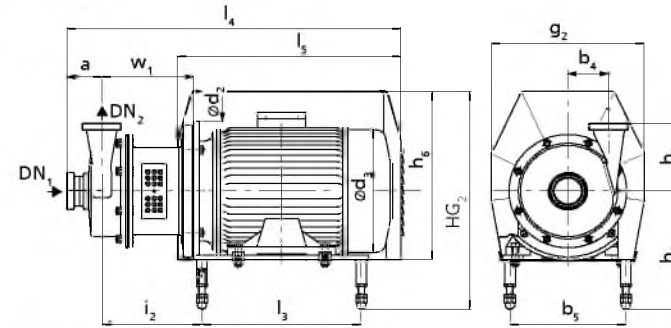
Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ³⁶⁾	h ₂ ³⁷⁾	~h ₃	i ₁	i ₄	~l ₁ ³⁶⁾	~l ₁ ³⁷⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
065-065-125 /154	65	65	85	-	70	10	200	190	160	145	160	288	135,5	217	554	554	397	165	140	65	155	176	225	130	143	125	161	10
065-065-125 /224	65	65	85	-	70	12	250	213	160	145	160	295	135,5	234	603	603	446	196	160	65	155	176	225	130	176	140	171	12
065-065-160 /154	65	65	85	-	85	10	200	190	160	170	185	288	135,5	217	554	554	397	165	140	65	155	176	236	130	143	125	161	10
065-065-160 /224	65	65	85	-	85	12	250	213	160	170	185	295	135,5	234	603	603	446	196	160	65	155	176	236	130	176	140	171	12
065-065-160 /304	65	65	85	-	85	12	250	213	160	170	185	295	135,5	234	638	638	481	196	160	65	155	176	236	130	176	140	171	12
065-065-200 /154	65	65	85	-	100	10	200	190	160	170	185	288	135,5	217	554	554	397	165	140	65	155	176	264	130	143	125	161	10
065-065-200 /224	65	65	85	-	100	12	250	213	160	170	185	295	135,5	234	603	603	446	196	160	65	155	176	264	130	176	140	171	12
065-065-200 /304	65	65	85	-	100	12	250	213	160	170	185	295	135,5	234	638	638	481	196	160	65	155	176	264	130	176	140	171	12
065-065-200 /404	65	65	85	-	100	12	250	234	160	170	185	308	135,5	241	627	627	470	226	190	65	155	176	264	130	176	140	171	12
065-065-250 /154	65	65	90 ³⁷⁾ (105) ³⁶⁾	-	130	10	200	190	180	220	205	308	118	212	575	560	399	165	140	30	120	160	225	130	143	125	156	10
065-065-250 /224	65	65		-	130	12	250	213	180	220	205	315	118	233	628	613	452	196	160	30	120	160	225	130	176	140	170	12
065-065-250 /304	65	65		-	130	12	250	213	180	220	205	315	118	233	663	648	487	196	160	30	120	160	225	130	176	140	170	12
065-065-250 /404	65	65	-	130	12	250	234	180	220	205	328	118	240	652	637	476	226	190	30	120	160	225	130	176	140	170	12	
065-065-250 /554	65	65	55	130	12	300	266	132	220	205	299	-	282	717	702	-	220	140	-	-	-	-	-	-	270	216	193	15
065-065-250 /754	65	65	59	130	12	300	298	132	220	205	299	-	282	745	730	-	240	178	-	-	-	-	-	-	270	216	193	15
065-065-250 /1104	65	65	70	130	15	350	325	160	220	205	357	-	334	883	868	-	300	210	-	-	-	-	-	-	320	254	226	21
065-065-250 /1504	65	65	70	130	15	350	325	160	220	205	357	-	334	889	874	-	314	254	-	-	-	-	-	-	320	254	226	21

³⁶⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

³⁷⁾ Applicable to flanged connections as per EN 1092-1

Vitachrom DN 65, $n \approx 1450$ rpm and 1750 rpm, pump set with ball feet and motor shroud


Pump set with ball feet



Pump set with ball feet and motor shroud

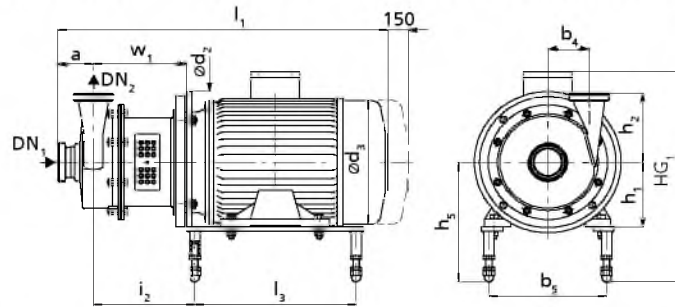
Overview of mating dimensions DN 65, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ³⁸⁾	h ₂ ³⁹⁾	h ₅ Min.	h ₅ Max.	h ₆	~HG ₁ Max.	~HG ₂ Max.	i ₂	l ₁ ³⁸⁾	l ₁ ³⁹⁾	l ₃	l ₄	l ₅	w ₁
065-065-125 /154	65	65	85	70	200	200	190	264	90	145	160	213	247,5	304,7	376	437	147	554	554	225	658,5	450	161
065-065-125 /224	65	65	85	70	200	250	213	264	100	145	160	223	257,5	304,7	393	437	171,5	603	603	265	698,5	470	171
065-065-160 /154	65	65	85	85	200	200	190	264	90	170	185	213	247,5	304,7	376	437	147	554	554	225	658,5	450	161
065-065-160 /224	65	65	85	85	200	250	213	264	100	170	185	223	257,5	304,7	393	437	171,5	603	603	265	698,5	470	171
065-065-160 /304	65	65	85	85	200	250	213	264	100	170	185	223	257,5	304,7	393	437	171,5	638	638	265	698,5	470	171
065-065-200 /154	65	65	85	100	200	200	190	264	90	170	185	213	247,5	304,7	376	437	147	554	554	225	658,5	450	161
065-065-200 /224	65	65	85	100	200	250	213	264	100	170	185	223	257,5	304,7	393	437	171,5	603	603	265	698,5	470	171
065-065-200 /304	65	65	85	100	200	250	213	264	100	170	185	223	257,5	304,7	393	437	171,5	638	638	265	698,5	470	171
065-065-200 /404	65	65	85	100	200	250	234	264	112	170	185	222	256,5	304,7	405	437	178,5	627	627	265	694,5	470	171
065-065-250 /154	65	65	90 ³⁹⁾ (105) ³⁸⁾	130	200	200	190	264	90	220	205	213	247,5	304,7	376	437	102	575	560	285	733	450	156
065-065-250 /224	65	65		130	200	250	213	264	100	220	205	223	257,5	304,7	393	437	125,5	628	613	310	762	470	170
065-065-250 /304	65	65		130	200	250	213	264	100	220	205	223	257,5	304,7	393	437	125,5	663	648	310	762	470	170
065-065-250 /404	65	65		130	200	250	234	264	112	220	205	222	256,5	304,7	405	437	112,5	652	637	330	778	470	170
065-065-250 /554	65	65		130	230	300	266	314	132	220	205	242	276,5	349,7	444	482	149,5	717	702	345	876	550	193
065-065-250 /754	65	65		130	230	300	298	314	132	220	205	242	276,5	349,7	444	482	168,5	745	730	345	876	550	193
065-065-250 /1104	65	65		130	280	350	325	372	160	220	205	270	304,5	422,7	502	555	246,5	883	868	385	997	720	226
065-065-250 /1504	65	65		130	280	350	325	372	160	220	205	270	304,5	422,7	502	555	268,5	889	874	385	997	720	226

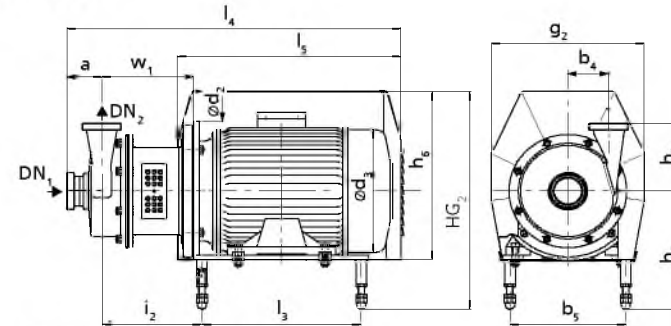
³⁸⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

³⁹⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 80, n ≈ 1450 rpm and 1750 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



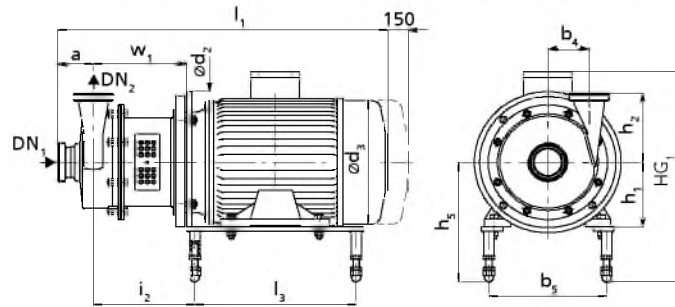
Pump set with ball feet and motor shroud

Mating dimensions DN 80, pump set with ball feet and motor shroud, dimensions in [mm]

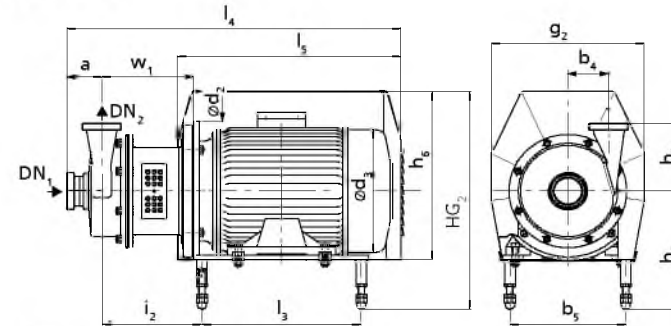
Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ⁴²⁾	h ₂ ⁴³⁾	h ₅		h ₆	~HG		i ₂	l ₁ ⁴²⁾	l ₁ ⁴³⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
080-080-125 /154	80	80	100	85	200	200	190	264	90	170	185	213	248	305	376	437	154,5	577	577	225	681	450	168,5
080-080-125 /224	80	80	100	85	200	250	213	264	100	170	185	223	258	305	393	437	179	626	626	265	721	470	178,5
080-080-125 /304	80	80	100	85	200	250	213	264	100	170	185	223	258	305	393	437	179	661	661	265	721	470	178,5
080-080-160 /154	80	80	100	85	200	200	190	264	90	170	185	213	248	305	376	437	154,5	577	577	225	681	450	168,5
080-080-160 /224	80	80	100	85	200	250	213	264	100	170	185	223	258	305	393	437	179	626	626	265	721	470	178,5
080-080-160 /304	80	80	100	85	200	250	213	264	100	170	185	223	258	305	393	437	179	661	661	265	721	470	178,5
080-080-160 /404	80	80	100	85	200	250	234	264	112	170	185	222	257	305	405	437	186	650	650	265	628	470	178,5
080-080-160 /554	80	80	100	85	230	300	266	314	132	170	185	242	277	350	444	482	215	712	712	285	784	550	198,5
080-080-250 /154	80	80	95 ⁴³⁾	125	200	200	190	264	90	225	205	213	248	305	376	437	99,5	583	562,5	285	628	450	153,5
080-080-250 /224	80	80	(115) ⁴²⁾	125	200	250	213	264	100	225	205	223	258	305	393	437	123	636	615,5	310	681	470	167,5
080-080-250 /304	80	80		125	200	250	213	264	100	225	205	223	258	305	393	437	123	671	650,5	310	681	470	167,5
080-080-250 /404	80	80		125	200	250	234	264	112	225	205	222	257	305	405	437	110	660	639,5	330	786	470	167,5
080-080-250 /554	80	80		125	230	300	266	314	132	225	205	242	277	350	444	482	147	725	704,5	345	884	550	190,5
080-080-250 /754	80	80		125	230	300	298	314	132	225	205	242	277	350	444	482	166	753	732,5	345	884	550	190,5
080-080-250 /1104	80	80		125	280	350	325	372	160	225	205	270	305	423	502	555	244	891	870,5	385	1005	720	223,5
080-080-250 /1504	80	80		125	280	350	325	372	160	225	205	270	305	423	502	555	266	897	876,5	385	1005	720	223,5

⁴²⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

⁴³⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 100, $n \approx 1450$ rpm and 1750 rpm, pump set with ball feet and motor shroud


Pump set with ball feet



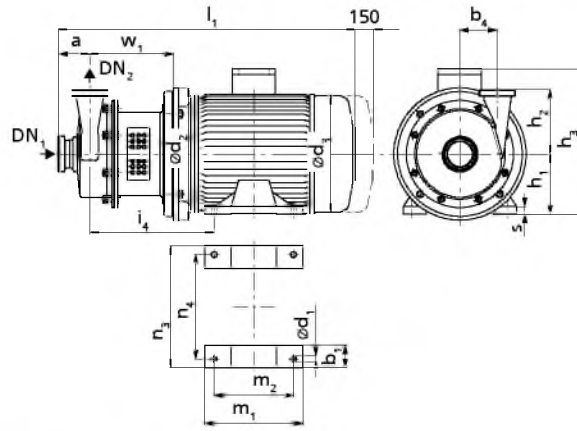
Pump set with ball feet and motor shroud

Overview of mating dimensions DN 100, pump set with ball feet and motor shroud, dimensions in [mm]

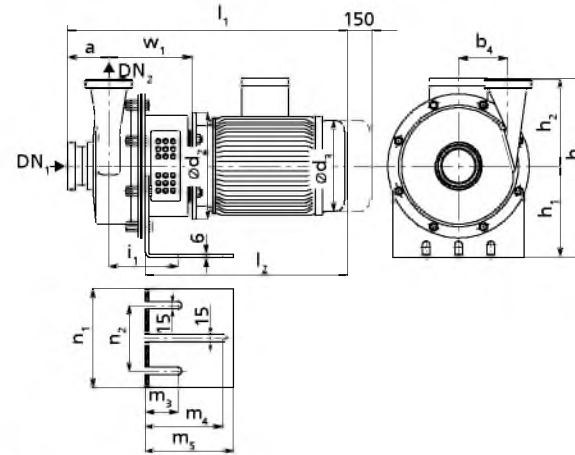
Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ⁴⁶⁾	h ₂ ⁴⁷⁾	h ₅		h ₆	~HG ₁	~HG ₂	i ₂	l ₁ ⁴⁶⁾	l ₁ ⁴⁷⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
100-100-200 /154	100	100	100 ⁴⁶⁾	200	110	200	190	264	90	250	235	213	247,5	304,7	376	437	97	565	580	285	676	450	151
100-100-200 /224	100	100	(115) ⁴⁷⁾	200	110	250	213	264	100	250	235	223	257,5	304,7	393	437	120,5	618	633	310	720	470	165
100-100-200 /304	100	100		200	110	250	213	264	100	250	235	223	257,5	304,7	393	437	120,5	653	668	310	720	470	165
100-100-200 /404	100	100		200	110	250	234	264	112	250	235	222	256,5	304,7	405	437	107,5	642	657	330	716	470	165
100-100-200 /554	100	100		230	110	300	266	314	132	250	235	242	276,5	349,7	444	482	144,5	707	722	345	819	550	188
100-100-200 /754	100	100		230	110	300	298	314	132	250	235	242	276,5	349,7	444	482	163,5	735	750	345	819	550	188
100-100-200 /1104	100	100		280	110	350	325	372	160	250	235	270	304,5	422,7	502	555	241,5	873	888	385	1000	720	221
100-100-200 /1504	100	100		280	110	350	325	372	160	250	235	270	304,5	422,7	502	555	263,5	879	894	385	1000	720	221

⁴⁶⁾ Applicable to connections as per DIN 11851 (hygienic pipe union)

⁴⁷⁾ Applicable to flanged connections to EN 1092-1

Vitachrom DN 125, $n \approx 1450$ rpm and 1750 rpm

Pump set with motor feet



Pump set with angle foot

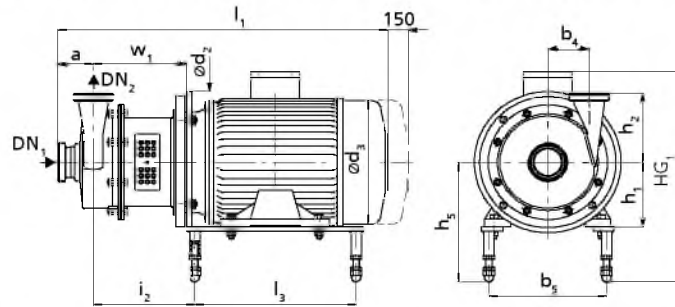
Overview of mating dimensions DN 125, pump set with motor feet or angle foot, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	~b ₁	b ₄	d ₁	d ₂	~d ₃	h ₁	h ₂ ⁴⁸⁾	h ₂ ⁴⁹⁾	~h ₃	i ₁	i ₄	~l ₁ ⁴⁴⁾	~l ₁ ⁴⁵⁾	~l ₂	m ₁	m ₂	m ₃	m ₄	m ₅	n ₁	n ₂	n ₃	n ₄	w ₁	s
125-125-200 /224	125	125	120 ⁴⁴⁾	-	110	12	250	213	180	250	235	315	138	249	659	674	377	196	160	30	120	160	260	180	176	140	186	12
125-125-200 /304	125	125	(135) ⁴⁵⁾	-	110	12	250	213	180	250	235	315	138	249	694	709	412	196	160	30	120	160	260	180	176	140	186	12
125-125-200 /404	125	125		-	110	12	250	234	180	250	235	328	138	256	683	698	401	226	190	30	120	160	260	180	176	140	186	12
125-125-200 /554	125	125		55	110	12	300	266	132	250	235	299	-	298	748	763	-	220	140	-	-	-	-	-	270	216	209	15
125-125-200 /754	125	125		59	110	12	300	298	132	250	235	299	-	298	776	791	-	240	178	-	-	-	-	-	270	216	209	15
125-125-200 /1104	125	125		70	110	15	350	325	160	250	235	357	-	350	914	929	-	300	210	-	-	-	-	-	320	254	242	21
125-125-200 /1504	125	125		70	110	15	350	325	160	250	235	357	-	350	920	935	-	314	254	-	-	-	-	-	320	254	242	21
125-125-200 /1854	125	125		70	110	15	350	325	160	250	235	357	-	350	920	935	-	314	254	-	-	-	-	-	320	254	242	21
125-125-200 /2204	125	125		80	110	15	350	370	160	250	235	442	-	363	978	993	-	320	241	-	-	-	-	-	360	279	242	23
125-125-200 /3004	125	125		85	110	19	400	422	200	250	235	505	-	375	1037	1052	-	388	305	-	-	-	-	-	400	318	242	30

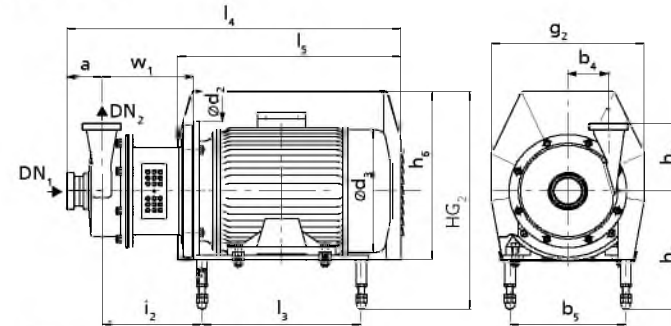
48) Applicable to connections as per DIN 11851 (hygienic pipe union)

49) Applicable to flanged connections to EN 1092-1

Vitachrom DN 125, n ≈ 1450 rpm and 1750 rpm, pump set with ball feet and motor shroud



Pump set with ball feet



Pump set with ball feet and motor shroud

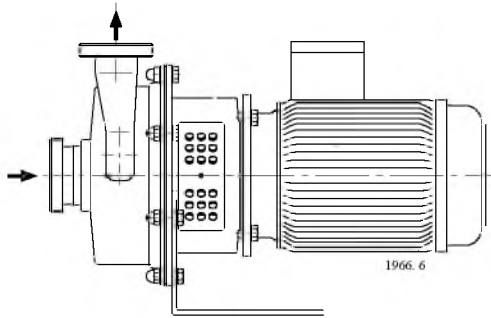
Overview of mating dimensions DN 125, pump set with ball feet and motor shroud, dimensions in [mm]

Vitachrom	DN ₁	DN ₂	a	b ₄	b ₅	d ₂	d ₃	g ₂	h ₁	h ₂ ⁵⁰⁾	h ₂ ⁵¹⁾	h ₅		h ₆	≈HG ₁	≈HG ₂	i ₂	l ₁ ⁴⁶⁾	l ₁ ⁴⁷⁾	l ₃	l ₄	l ₅	w ₁
												Min.	Max.		Max.	Max.							
125-125-200 /224	125	125	120 ⁴⁶⁾	200	110	250	213	264	100	250	235	223	257,5	304,7	393	437	141,5	659	674	310	807	470	186
125-125-200 /304	125	125	(135) ⁴⁷⁾	200	110	250	213	264	100	250	235	223	257,5	304,7	393	437	141,5	694	709	310	807	470	186
125-125-200 /404	125	125		200	110	250	234	264	112	250	235	222	256,5	304,7	405	437	128,5	683	698	330	823	470	186
125-125-200 /554	125	125		230	110	300	266	314	132	250	235	242	276,5	349,7	444	482	165,5	748	763	345	921	550	209
125-125-200 /754	125	125		230	110	300	298	314	132	250	235	242	276,5	349,7	444	482	184,5	776	791	345	921	550	209
125-125-200 /1104	125	125		280	110	350	325	372	160	250	235	270	304,5	422,7	502	555	262,5	914	929	385	1042	720	242
125-125-200 /1504	125	125		280	110	350	325	372	160	250	235	270	304,5	422,7	502	555	284,5	920	935	385	1042	720	242
125-125-200 /1854	125	125		280	110	350	325	372	160	250	235	270	304,5	422,7	502	555	284,5	920	935	385	1042	720	242
125-125-200 /2204	125	125		305	110	350	370	402	180	250	235	290	325	493	587	626	310	978	993	385	1126	740	242
125-125-200 /3004	125	125		345	110	400	422	452	200	250	235	331	353	545	658	686	320	1037	1052	415	1193	830	242

50) Applicable to connections as per DIN 11851 (hygienic pipe union)

51) Applicable to flanged connections to EN 1092-1

Installation information



Pump with angle foot

As-delivered condition for horizontal installation, fastened below

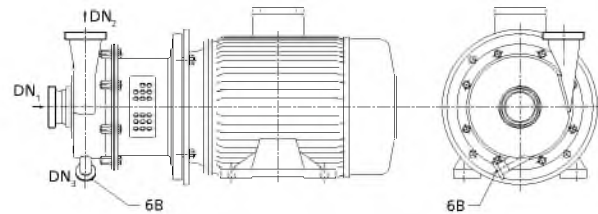
For any other installation positions, contact KSB.

NOTE!

Vertical installation with the motor below is impermissible.

Pump accessories

- Design with inducer for sizes 065-065-160 and 080-080-250
- Standard pump foot (angle foot)
- Vertically adjustable ball feet
- Motor shroud made of stainless steel
- System for supplying the mechanical seal
- Motor soleplate
- Residual drainage of pump casing



Connection for residual drainage

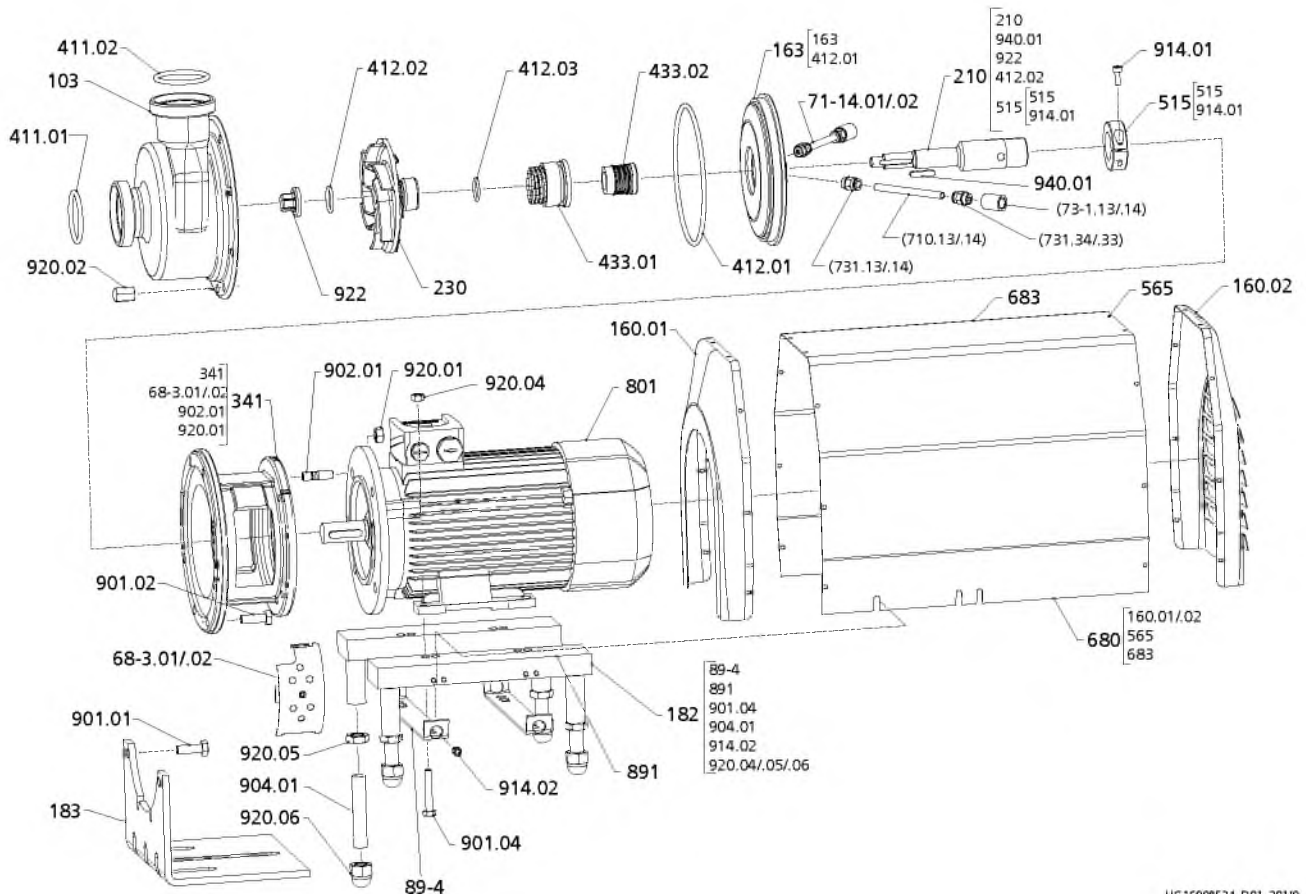
Exploded view / List of components

Exploded view, Vitachrom, size group I

This view applies to the following pump sizes:

050-050-125	065-065-125	080-080-125
050-050-160	065-065-160	080-080-160
050-050-200	065-065-200	

[Supplied in packaging units only



UG16008524_D01_201/0

Exploded view

List of components

Part number	Description	Part number	Description
103	Pump casing	71-14.01/02	Connection pipe
160.01/02	Cover	73-1.13/14	Socket
163	Discharge cover	710.13/14	Pipe
182	Foot	731.13/14/33/34	Pipe union
183	Support foot ⁵²⁾	720	Barrel nipple
210	Shaft	89-4	Shim
230	Impeller	801	Flanged motor
341	Drive lantern	891	Base frame
411.01/02	Joint ring	901.01/02/04	Hexagon head bolt
412.01/02/03	O-ring	902.01	Stud

⁵²⁾ Up to motor size 112M

Part number	Description	Part number	Description
433.01/.02	Mechanical seal	904.01	Grub screw
515	Locking ring	914.01/.02	Hexagon socket head cap screw
565	Rivet	920.01/.02/.04/.05/.06	Nut
68-3.01/.02	Cover plate	922	Impeller nut
680	Guard	940.01	Key
683	Hood		

Exploded view, Vitachrom, size group II

This view applies to the following pump sizes:

050-050-250

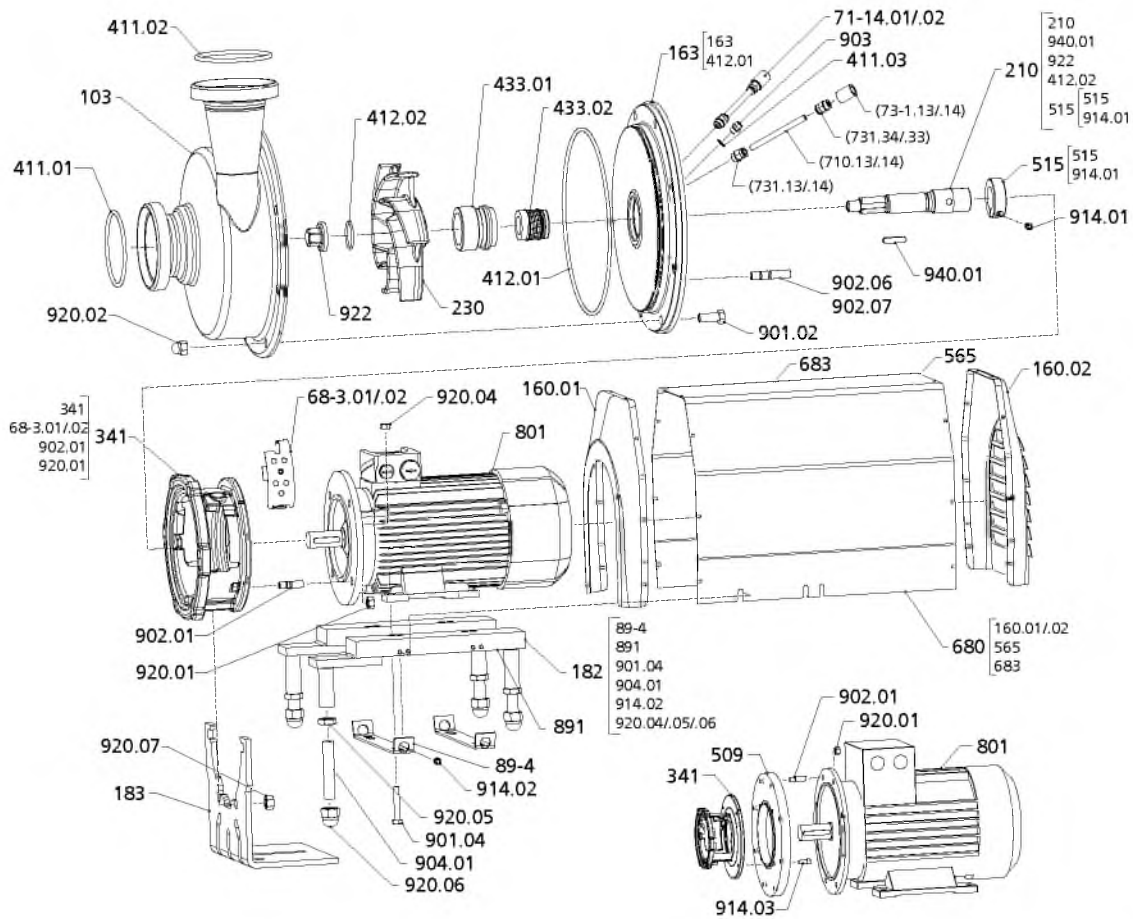
065-065-250

080-080-250

100-100-200

125-125-200

[Supplied in packaging units only



UG1608999_D01_201/0

Exploded view

List of components

Part number	Description	Part number	Description
103	Circular casing	683	Hood
160.01/02	Cover	71-14.01/02	Connection pipe
163	Discharge cover	73-1.13/.14	Socket
182	Foot	710.13/.14	Pipe
183	Support foot	731.13/.14/.33/.34	Pipe union
210	Shaft	801	Flanged motor
230	Impeller	89-4	Shim
341	Drive lantern	891	Base frame
411.01/02/03/04	Joint ring	901.02/04	Hexagon head bolt
412.01/02	O-ring	902.01/06/07	Stud
433.01/02	Mechanical seal	903	Screw plug
509	Intermediate ring	904.01	Grub screw
515	Locking ring	914.01/02/03	Hexagon socket head cap screw
565	Rivet	920.01/02/04/05/06/07	Nut
68-3.01/02	Cover plate	922	Impeller nut
680	Motor shroud	940.01	Key

Detailed designation

Designation example

Position																																												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
V	C			0	5	0	-	0	5	0	-	1	2	5		C	C	/	0	1	M	M	1	3	0	0	2				A	P	D	2					K	S	B	I	E	3
V	C	I	1	0	5	0	-	0	5	0	-	1	6	0		C	C	/	0	2	A	L	1	1	0	0	2	e	x	A	P	D	2	E	M	S	I	E	I	E	4			
See name plate and data sheet																							See data sheet																					

Designation key

Position	Code	Description
1-3	Pump type	
	V C	Vitachrom
	V C I	Vitachrom Inducer
4	Inducer	
	⁵³⁾	Without inducer
	0	Inducer 0
	1	Inducer 1
5-16	Size	
	0 5 0	Nominal suction nozzle diameter [mm]
	0 5 0	Nominal discharge nozzle diameter [mm]
	1 2 5	Nominal impeller diameter [mm]
17	Casing material	
	C	1.4404
18	Impeller material	
	C	1.4409
19	Design	
	⁵³⁾	Standard
	X	Non-standard, BT3D, BT3
20-22	Seal code	
	I 0 1	BQ1E1-04GG (carbon/SiC/EPDM)
	I 0 2	BQ1V26GG (carbon/SiC/Viton)
	I 0 3	Q12Q1E1-04GG (SiC/SiC/EPDM)
	I 0 4	Q12Q1V26GG (SiC/SiC/Viton)
	I 2 1	Q12Q1M1GG (SiC/SiC/PTFE)
	I 0 6	BQ1E1-04GG (carbon/SiC/EPDM)
	I 0 7	BQ1V26GG (carbon/SiC/Viton)
	I 0 8	Q12Q1E1-04GG (SiC/SiC/EPDM)
	I 0 9	Q12Q1V26GG (SiC/SiC/Viton)
	I 1 0	Q22Q2E1-04GG (Si-SiC/Si-SiC/EPDM)
	T 1 1	BQ1E1-04GG (carbon/SiC/EPDM) + BQ1EGG (carbon/SiC/EPDM)
	T 1 2	BQ1V26GG (carbon/SiC/Viton) + BQ1EGG (carbon/SiC/EPDM)
	T 1 3	Q12Q1E1-04GG (SiC/SiC/EPDM) + BQ1EGG (carbon/SiC/EPDM)
	T 1 4	Q12Q1V26GG (SiC/SiC/Viton) + BQ1EGG (carbon/SiC/EPDM)
	T 1 6	BQ1E1-04GG (carbon/SiC/EPDM) + BQ1EGG (carbon/SiC/EPDM)
	T 1 7	BQ1V26GG (carbon/SiC/Viton) + BQ1EGG (carbon/SiC/EPDM)
	T 1 8	Q12Q1E1-04GG (SiC/SiC/EPDM) + BQ1EGG (carbon/SiC/EPDM)
	T 1 9	Q12Q1V26GG (SiC/SiC/Viton) + BQ1EGG (carbon/SiC/EPDM)
T 2 0	Q22Q2E1-04GG (Si-SiC/Si-SiC/EPDM) + BQ1EGG (carbon/SiC/EPDM)	
T 3 1	Q12Q1M1GG (SiC/SiC/PTFE) + BQ1EGG (carbon/SiC/EPDM)	
23	Mounting arrangement	
	M	Motor feet
	A	Angle foot
	K	Ball feet
	T	Round base feet
	B	Soleplate G1/G2
24	Pipe connection	
	M	Threaded connection (hygienic pipe union)
	I	Threaded connection to IDF ISO 2853
	B	Threaded connection to DIN 11864-1

⁵³⁾ Blank

Position	Code	Description
	S	Threaded connection to SMS standard
	C	Flange to DIN 11864-2
	R	Flange to DIN 2633 (EN 1092-1) with recess
	L	Flange to EN 1092-1
	N	Neumo flange
	A	Flange to APV-FN
	G	Varivent flange
	D	Clamped connection to DIN 11864-3
	T	Clamped connection to EN 32676 / ISO 2852 / BS 4825: part 3
25	Material of O-rings	
	1	EPDM
	2	Viton
	3	PTFE
26-31	Drive	
	7 5 0 2	7502
	3 0 0 2	3002
	1 0 0 2 e x	1002ex
32	Product generation	
	A	Vitachrom
33-36	PumpDrive	
	⁵³⁾	Without PumpDrive
	P D 2	PumpDrive, 2nd generation
	P D 2 E	PumpDrive, 2nd generation, Eco
37	PumpMeter	
	⁵³⁾	Without PumpMeter
	M	PumpMeter
38-40	Motor manufacturer	
	K S B	Made by KSB
	S I E	Made by Siemens
	L O H	Made by Loher
	H A L	Made by Halter
41-43	Efficiency class	
	I E 1	IE1
	I E 2	IE2
	I E 3	IE3
	I E 4	IE4

Hygienic Pump

Vitacast Bloc

Type Series Booklet



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Close-coupled Pump

Hygienic Pump

Vitacast Bloc



Designation

Example: VAB 032-025-145 0402KB T82ME

Designation key

Code	Description
VAB	Type series
	VAB | Vitacast-Bloc
032	Nominal suction nozzle diameter [mm]
025	Nominal discharge nozzle diameter [mm]
145	Nominal impeller diameter [mm]
040	Motor rating
	040 | 4 kW
2	Number of poles
	2 | 2 poles
K	Mounting type
	K | 3-point or 4-point ball feet
B	Operating mode / flushing system of mechanical seal
	B | Without flushing system
T82	Seal code
	T82 | BQ1EGG
M	Connection types
	M | Pipe union to DIN 11851
E	Material of O-rings
	E | EPDM

Further information on the designation

(⇒ Page 28)

Main applications

- Food and beverages industry
- Pharmaceutical industry
- Chemical industry

Fluids handled

- Fluids not chemically or mechanically aggressive to the materials

Further information on fluids handled

(⇒ Page 6)

Operating data

Operating properties

Characteristic		Value	
		50 Hz	60 Hz
Flow rate	Q [m ³ /h]	≤ 340	≤ 350
Head	H [m]	≤ 105	
Operating pressure	p [bar]	≤ 10 ¹⁾	
Fluid temperature	T [°C]	≤ 140 ¹⁾	
Connection sizes	DN	25 - 150	

1) Higher values on request for individual sizes

2) Hygienic design

3) Sterile design

Design details

Design

- Standard design with materials to Regulation (EC) No 1935/2004
- Design to ATEX

Design

- Hygienic centrifugal pump
- Single-stage
- Close-coupled and long-coupled design
- Non-self-priming
- Wetted components made of stainless steel 1.4404/1.4409 (AISI 316L/CF3M)

Pump casing

- Volute casing

Impeller type

- Open multi-channel impeller

Bearings

- Grease-packed deep groove ball bearing

Shaft seal

- Single mechanical seal to EN 12756
 - Seal type T²⁾: pump-end seal with non-encapsulated spring surrounded by fluid handled, uni-directional
 - Seal type H³⁾: pump-end seal with encapsulated spring, polished surface, bi-directional

- Seal type Y: external seal
- Double mechanical seal to EN 12756
 - Seal type Q: back-to-back arrangement (pressurised barrier fluid)

- APV flange
- Varivent flange
- Other connection types on request

Drive

- Efficiency class IE3

Standard design:

- KSB surface-cooled IEC frame three-phase current squirrel-cage motor
- 50 Hz winding, 220-240 V/380-420 V \leq 2.20 kW
- 50 Hz winding, 380-420 V/660-725 V \geq 3.00 kW
- 60 Hz winding, 440-480 V \leq 2.60 kW
- 60 Hz winding, 440-480 V \geq 3.60 kW
- Type of construction IM V1 \leq 4.00 kW
- Type of construction IM V1 \geq 5.50 kW
- IP55 enclosure
- Mode of operation: continuous operation S1
- Thermal class F with temperature sensor, 3 PTC thermistors

Explosion-proof version:

- KSB surface-cooled IEC frame three-phase current squirrel-cage motor
- 50 Hz winding, 220-240 V/380-420 V \leq 1.85 kW
- 50 Hz winding, 380-420 V/660-725 V \geq 2.50 kW
- Type of construction IM V1 \leq 3.30 kW
- Type of construction IM V15 \geq 4.60 kW
- Enclosure IP55 or IP54
- Mode of operation: continuous operation S1
- Type of protection EExe II
- Temperature class T3

Automation

Automation options:

- PumpDrive
- PumpMeter

Connections

Axial suction nozzle, tangential discharge nozzle

Adjustable through 360°

Types of connection:


- Threaded connection to DIN 11851
- Threaded connection to DIN 11853
- Threaded connection to DIN 11864-1-GS-A
- Threaded connection to SMS standard
- Threaded connection to IDF standard
- Threaded connection to RJT standard
- TriClamp/TriClover fitting
- Clamped connection to DIN 11864-3-NKS-A
- Clamped connection to DIN 32676-A
- Clamped connection to ISO 2852
- Flange to EN 1092-1
- Flange to DIN 11864-2-NF-A
- Flange to ASA ASME 150

Materials

Pump section	Material
Volute casing ⁴⁾	1.4409 (AISI CF3M)
Discharge cover ⁴⁾	1.4409 (AISI CF3M)
Impeller ⁴⁾	1.4409 (AISI CF3M)
Impeller nut ⁴⁾	1.4404 (AISI 316L)
Inducer ⁴⁾	1.4409 (AISI CF3M)
Pump shaft ⁴⁾	1.4404 (AISI 316L)
Drive lantern	1.4308 (AISI CF8)
O-rings, moulded gaskets	EPDM, FPM, FEP, FFKM

Optional materials for wetted components:

- 1.4469/1.4410
- Hastelloy C276

 All materials that will be in contact with the fluid handled conform with Regulation (EC) No. 1935/2004 and Commission Regulation (EC) No. 2023/2006.

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Easy to clean due to little dead volume and excellent flushability
- Service-friendly design, easy and fast to dismantle
- Stub shaft allows combination with all commercial standardised motors
- High surface quality thanks to special polishing techniques
- Corrosion-resistant by using high-quality stainless steel
- Operating costs reduced by trimming the impeller diameter to match the specified duty point
- A large variety of materials, sealing elements and connections are available to optimally match the pump to its application.
- Highly suitable for CIP/SIP cleaning processes
- Excellent hydraulic efficiency and low NPSH values

⁴⁾ Wetted component

Fluid handled	Temperature		Seal code															Operating mode	Comment				
	Min.	Max.	T19	T64	T66	T80	T81	T82	T83	T84	H0	H1	H1D	H2	H3	H3D	H4			H5	Q71	Q72	Q79
	°C																						
Beer																							
Beer mash	0	100	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Beer wort	0	100	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Brewer's yeast	0	30	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	B, I	
Hops	0	100	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Trub (brewery)	0	90	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	B, I	
Cleaning-in-place (CIP)	0	85	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	After cleaning, flush with hot water of 90 °C max.
Beverages, alcoholic																							
Spirits (40 % ethanol)	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	Brandy 40 %
Beer	0	70	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	Beer after primary fermentation
Fruit liqueur	0	60	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Must	0	60	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	
Pernod	0	40	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Grappa	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Whiskey	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Wine (cider)	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Liqueur with egg yolks	0	50	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Herbal liqueur, alcohol content ≤ 50 %	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Sparkling wine	0	50	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Sap (juice) with 24 % ethanol	0	50	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Beverages, non-alcoholic																							
Coke	0	20	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	≤ 12°Bx
Coke concentrate	0	20	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	≤ 65°Bx
Coffee	0	60	-	-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	Coffee extract
Lemonade	0	90	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	≤ 65°Bx
Caffeine crystals (liquid)	20	100	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	max. 5 % caffeine
Glucose																							
Unsaturated aqueous solution	0	50	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	B, BQ, DB	Observe the melting point or crystallisation point. If required, heat up the casing cover prior to commissioning/start-up. Use suitable hot water as quench liquid. Concentration < 65°Bx single mechanical seal w/o flushing is ok.
Glycerine																							
Concentration ≤ 40 %	0	100	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	B, I	
Glycol (pure)																							
Diethylene glycol	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	X	-	B, I, DB	Provide water quench for indoor application (toxicity)
Ethylene glycol	0	60	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	X	-	B, I, BQ	Glycol Provide water quench for indoor application (toxicity)
Urea (carbamide)																							
Concentration ≤ 35%	0	80	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	BQ, DB	Use suitable hot water as cooling liquid.
Foodstuff (liquid)																							
Egg (liquid)	0	20	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	BQ, DB	If containing sugar, use Q72 (U2U2EGG).
Foodstuff (aqueous)																							
Malt	0	100	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Dairy products																							
Chocolate milk	0	90	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	
Sweetened condensed milk	0	90	-	-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	B, I	
Skimmed milk (fresh, sour)	0	90	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	
Milk	0	90	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	


Fluid handled	Temperature		Seal code															Operating mode	Comment				
	Min.	Max.	T19	T64	T66	T80	T81	T82	T83	T84	H0	H1	H1D	H2	H3	H3D	H4			H5	Q71	Q72	Q79
	°C	°C																					
Cream (sweet, sour)	0	90	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Sweet permeate (milk)	0	90	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Concentrated milk (15 % bone dry)	0	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	BQ, DB	Use suitable water as liquid quench.
Sodium hydroxide																							
Concentration 0 to 50 %	0	80	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	Observe the melting point or crystallisation point. If required, heat up the casing cover prior to commissioning/start-up. Use suitable hot water as continuous quench liquid
Fruit pulp																							
Apple purée	0	20	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	
Apricot purée with 40 % water	0	20	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Oil, vegetable oil																							
Anise oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Cotton seed oil	5	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Peanut oil	5	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Lavender oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Linseed oil	0	60	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Linseed oil with ≤ 3% H ₂ SO ₄	0	20	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Corn oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Olive oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Palm oil	45	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	Melting point = +27 °C to +42 °C T85 (Q1U2VGG) recommended for temperatures above 70 °C.
Rapeseed oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Castor oil	26	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	Info: viscosity = 700 mm ² /s at 25 °C
Soybean oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Sunflower oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Edible oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	Non-heatable pumps can be used if the melting point < ambient temperature. Check the melting point and viscosity with the customer.
Walnut oil	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Juice (fruit and sugar solutions)																							
Fruit juice	0	60	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	Apple juice
Vegetable juice	0	100	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Orange juice	0	60	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Pressed sap	0	50	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Sugar solutions	0	100	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	Sugar solution > 65 Bx (for single seal)
	0	95	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	DB, BQ	Use suitable water as barrier fluid, concentration > 65°Bx.
Acid, malic acid																							
Unsaturated aqueous solution	0	60	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	B, I	Solubility = 65 % at 40 °C and 72.8 % at 60 °C
Acid, citric acid																							
Concentration 1 to 50 %	0	80	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	
Acid, acetic acid																							
Concentration 1 to 25 %	0	60	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	Vinegar
Concentration ≤ 30%	0	20	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	X	-	-	BQ, DB	Use suitable water as liquid quench.
Concentration ≤ 50%	0	20	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	X	-	-	BQ, DB	Use suitable water as liquid quench.
Acid																							
Unsaturated aqueous solution	0	100	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Acid, tannic acid																							
Concentration 1 to 50%	0	100	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	B, I	
Acid, lactic acid																							
Concentration 1 to 50%	0	60	-	-	-	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	B, I	
Acid, oxalic acid																							

Fluid handled	Temperature		Seal code															Operating mode	Comment				
	Min. °C	Max. °C	T19	T64	T66	T80	T81	T82	T83	T84	H0	H1	H1D	H2	H3	H3D	H4			H5	Q71	Q72	Q79
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-
Concentration ≤ 5%	0	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	BQ, DB	Use suitable water as liquid quench.
Acid, tartaric acid																							
Concentration ≤ 8%	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
Concentration ≤ 50%	0	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
Sorbitol (solution)																							
Unsaturated aqueous solution	0	80	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DB, BQ	Mechanical seal for solutions up to 40 % max. Use suitable water as liquid quench.
Water, desalinated																							
De-ionised water	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	Water quality: conductivity > 10 µS/cm < 250 µS/cm, SiO ₂ content < 10 mg/l, solids content 5 mg/l max.
Ultrapure water	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	Use suitable water as quench liquid for temperature > 90 °C.
Water for injection	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	Use suitable water as quench liquid for temperature > 90 °C.
Drinking water																							
Mash, schnapps	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
Ice water (brewery)	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
Tap water	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
-	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	
Hot water (brewery)	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	
Water																							
Pure water	0	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B, I	

Installation types

Installation type

Installation type	Illustration	Description
K		Horizontal installation, close-coupled pump set <ul style="list-style-type: none"> Axial suction nozzle, radial discharge nozzle, adjustable through 360° Mounted on 3-point ball feet up to a drive rating of 4 kW. Mounted on 4-point ball feet for drive ratings from 5.5 to 22 kW.
M		Horizontal installation, close-coupled pump set <ul style="list-style-type: none"> Axial suction nozzle, radial discharge nozzle, adjustable through 360° Mounted on a motor foot for drive ratings from 0.33 to 22 kW.
L		Horizontal installation, close-coupled pump set <ul style="list-style-type: none"> Axial suction nozzle, radial discharge nozzle, adjustable through 360° Connected to the motor via a bearing pedestal for drive ratings of 30 kW.

 Vertical installation requires a mechanical seal with flushing system.

Installation types per pump size

Pump size	Ball feet	Motor feet	Bearing pedestal	Trolley
032-025-145	X	X	-	X
032-025-175	X	X	-	X
040-032-110	X	X	-	X
040-032-145	X	X	-	X
040-032-175	X	X	-	X
040-032-210	X	X	-	X
050-032-260	X	X	-	X
050-040-145	X	X	-	X
050-040-175	X	X	-	X
050-040-210	X	X	-	X
050-040-260	X	X	-	X
065-050-145	X	X	-	X
065-050-175	X	X	-	X
065-050-210	X	X	-	X
065-050-260	X	X	X	X
080-065-145	X	X	-	X
080-065-175	X	X	-	X
080-065-210	X	X	-	X
080-065-260	X	X	X	X
100-080-175	X	X	X	X
100-080-210	X	X	X	X
100-080-260	X	X	X	X
100-080-310	X	X	X	X
125-100-210	X	X	X	X
125-100-260	X	X	X	X
125-100-310	X	X	X	X
150-125-260	X	X	X	X

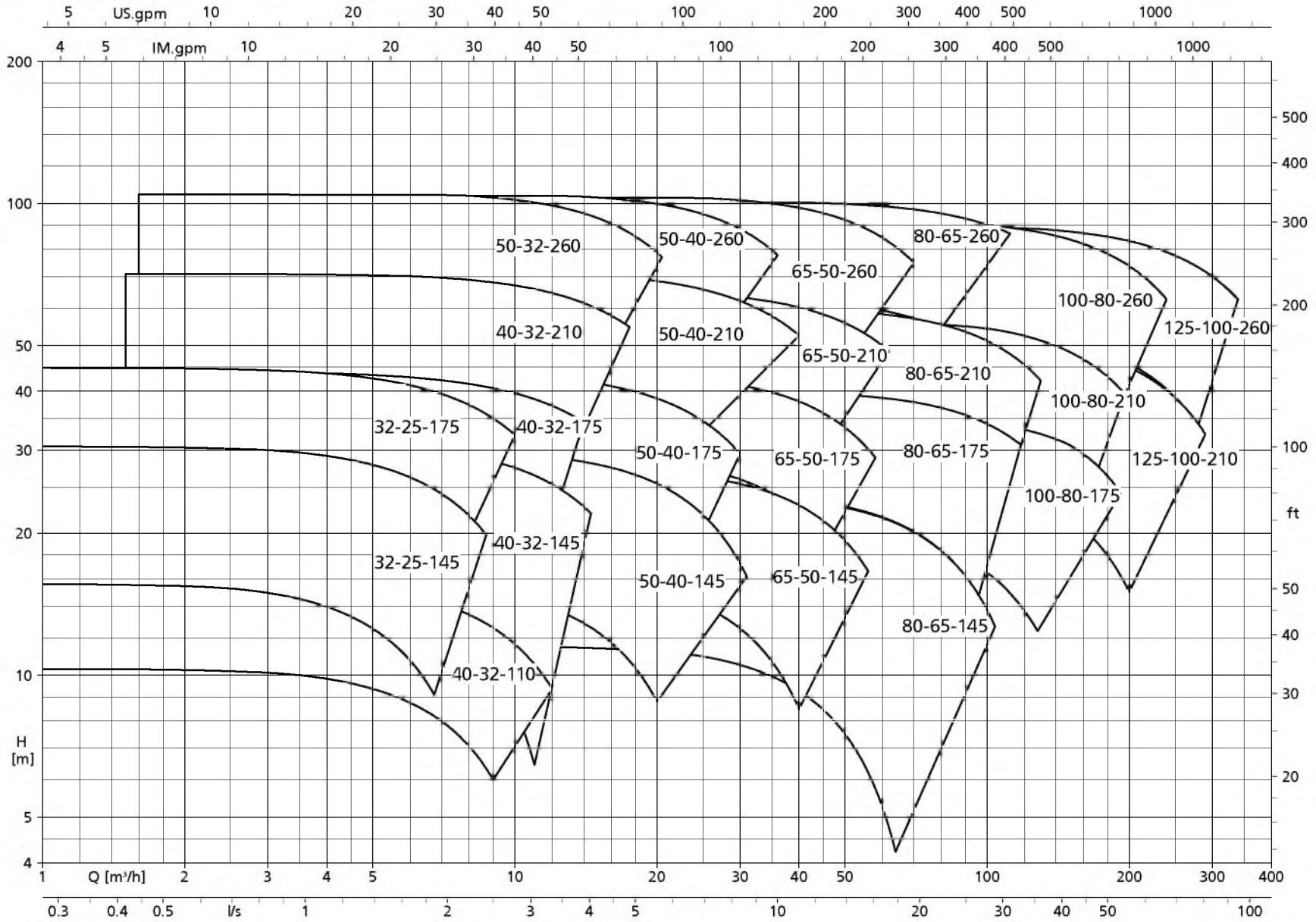
Technical data

Technical data

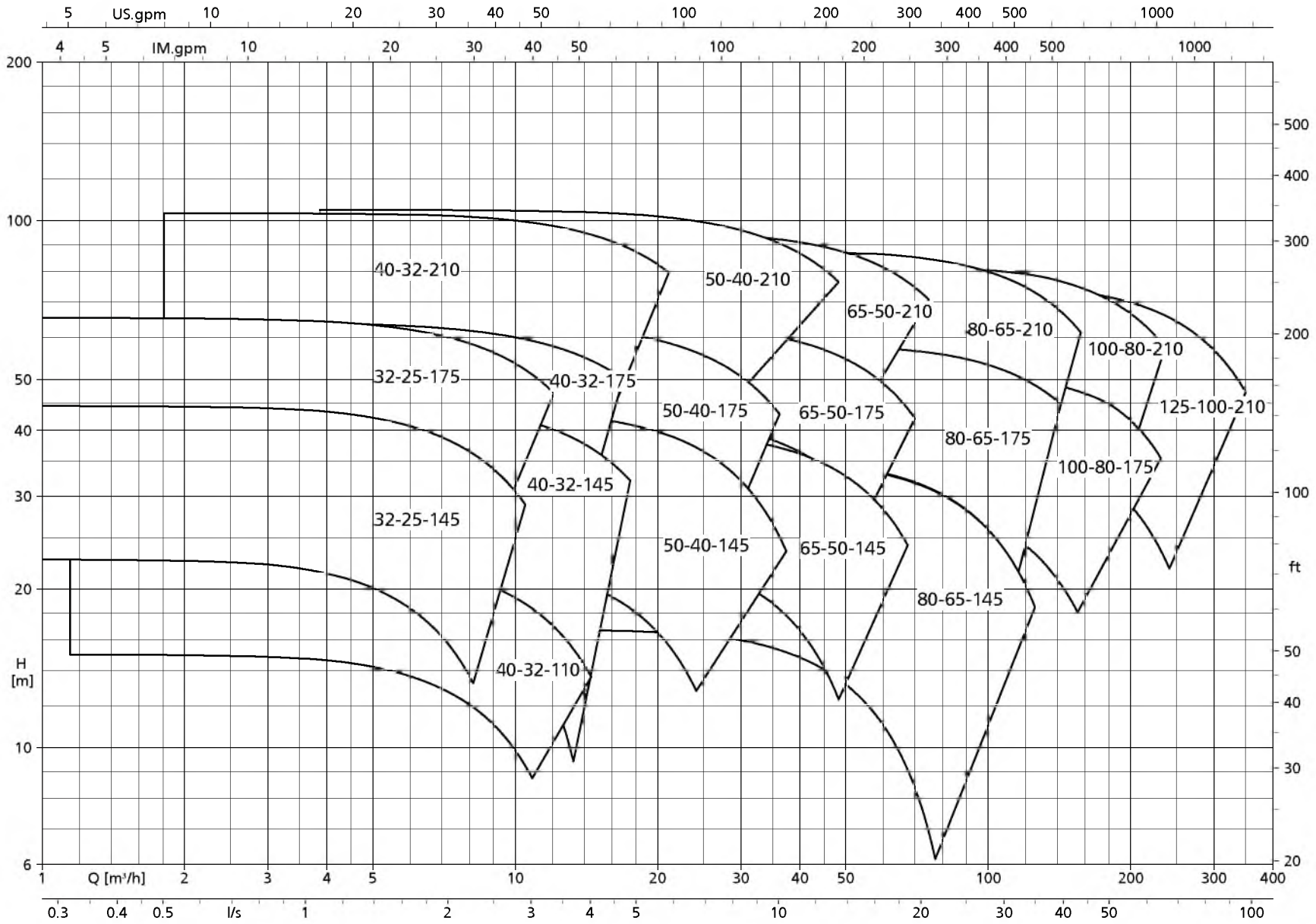
Pump size	Inducer	Shaft unit	Free passage		Minimum impeller diameter	Maximum impeller diameter	Speed limit
			4-pole	2-pole			
			[mm]	[mm]			
032-025-145	-	1	3,5	3,5	115	145	500 - 3600
032-025-175	-	1	3,5	3,5	145	175	500 - 3600
040-032-110	-	1	-	4	95	110	500 - 3600
040-032-145	X	2	5	5	115	145	500 - 3600
040-032-175	X	2	4	4	145	175	500 - 3600
040-032-210	X	2	4	4	165	210	500 - 3600
050-032-260	X	2	3,5	3,5	210	260	500 - 3000
050-040-145	X	2	6	11	115	145	500 - 3600
050-040-175	X	2	6,5	11	145	175	500 - 3600
050-040-210	X	2	6	6	165	210	500 - 3600
050-040-260	X	3	5	5	210	260	500 - 3000
065-050-145	X	2	10	16	115	145	500 - 3600
065-050-175	X	2	8	13	145	175	500 - 3600
065-050-210	X	2	8	8	165	210	500 - 3600
065-050-260	X	3	6	6	210	260	500 - 3000
080-065-145	X	2	18	23	115	145	500 - 3600
080-065-175	X	2	16	16	145	175	500 - 3600
080-065-210	X	3	12	12	165	210	500 - 3600
080-065-260	X	3	10,5	10,5	210	260	500 - 3000
100-080-175	X	3	22	22	150	177	500 - 3600
100-080-210	X	3	18	15	165	210	500 - 3600
100-080-260	X	3	14	14	200	260	500 - 3000
100-080-310	X	3	23	-	265	310	500 - 1800
125-100-210	X	3	15	28	165	210	500 - 3600
125-100-260	X	3	25	25	210	260	500 - 3000
125-100-310	X	3	30	-	265	310	500 - 1800
150-125-260	X	3	32	-	210	260	500 - 3000

Selection charts

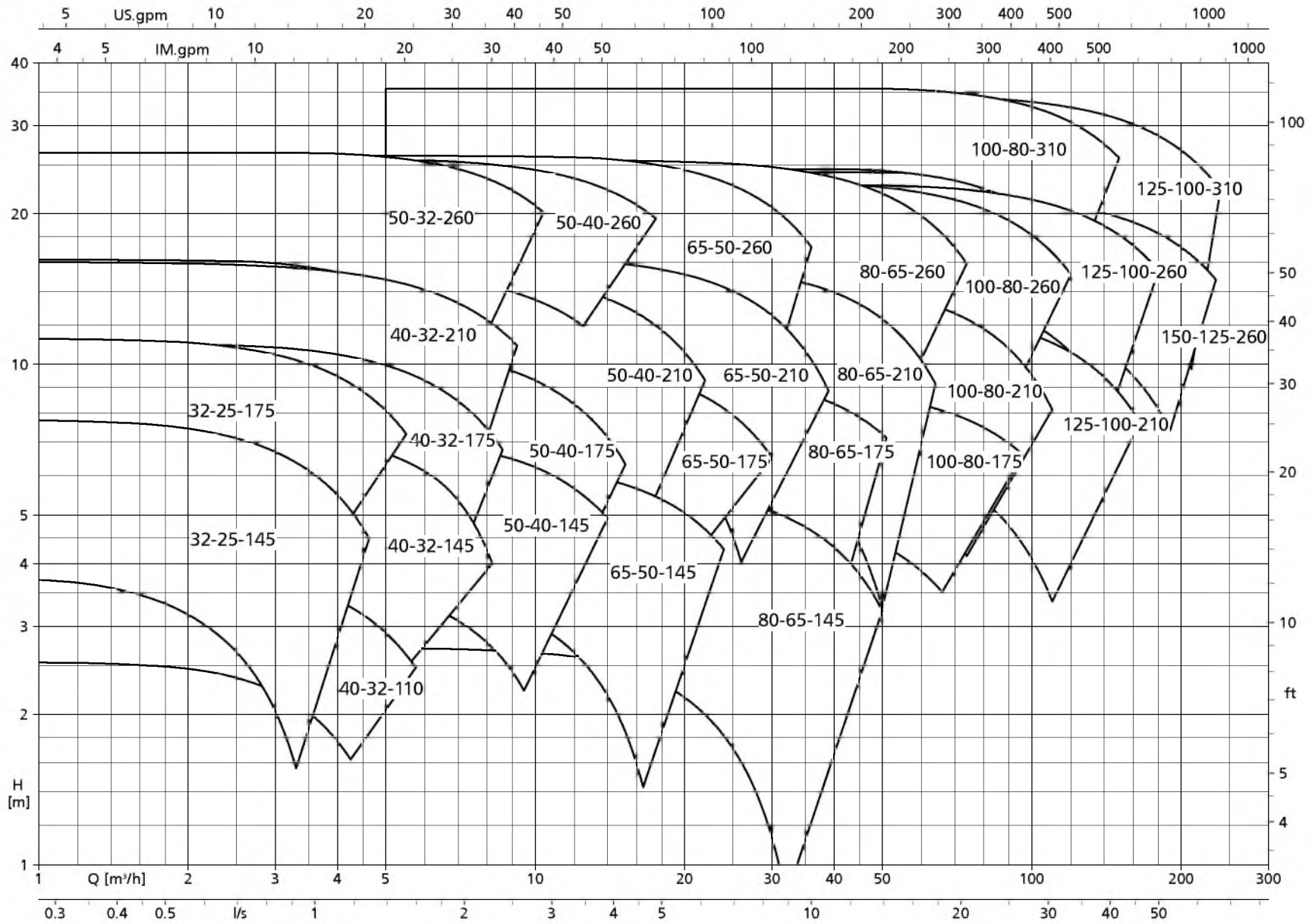
Vitacast, Vitacast Bloc, n = 2900 rpm



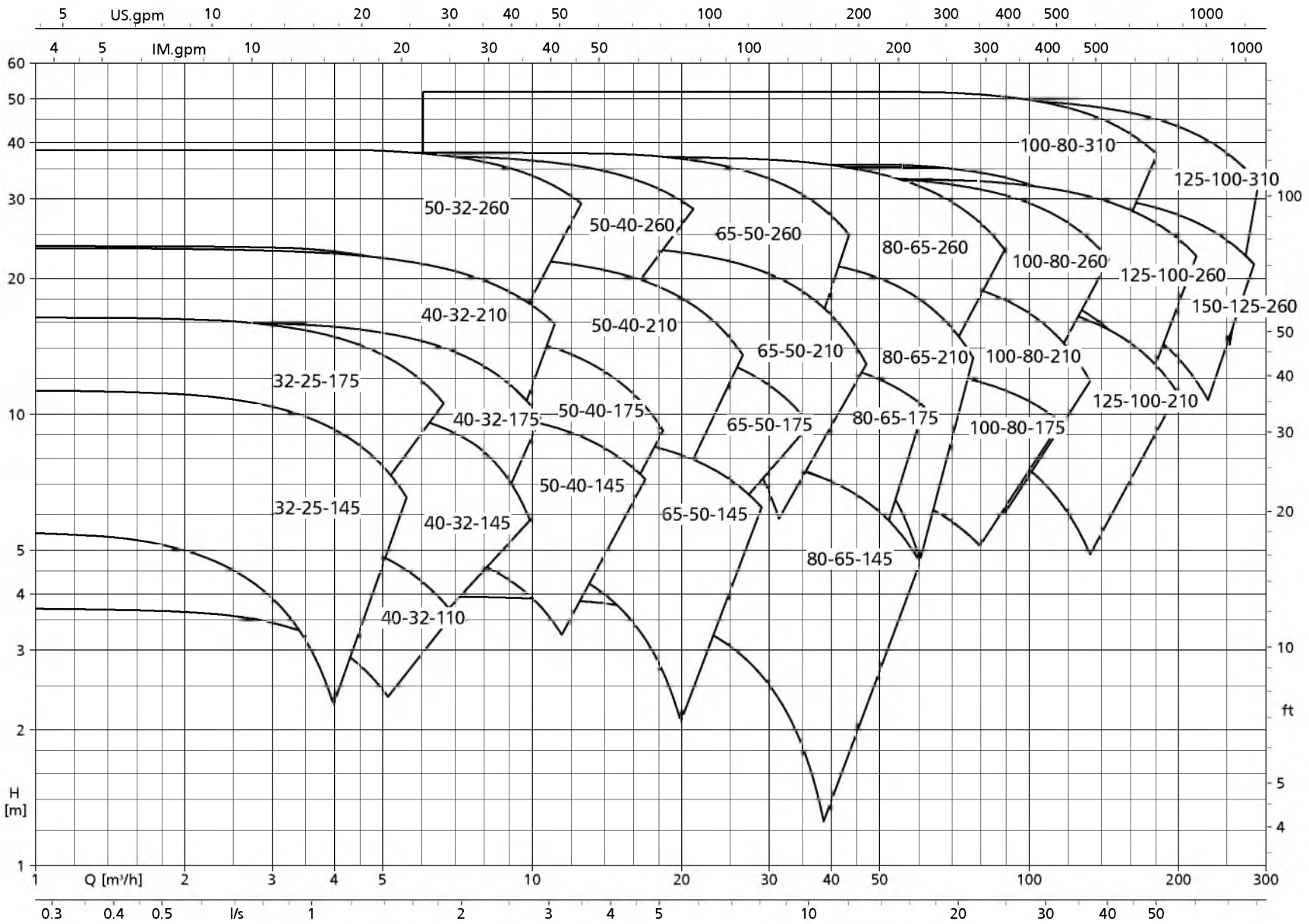
Vitacast, Vitacast Bloc, n = 3500 rpm



Vitacast, Vitacast Bloc, n = 1450 rpm



Vitacast, Vitacast Bloc, n = 1750 rpm



Dimensions

Pump set dimensions

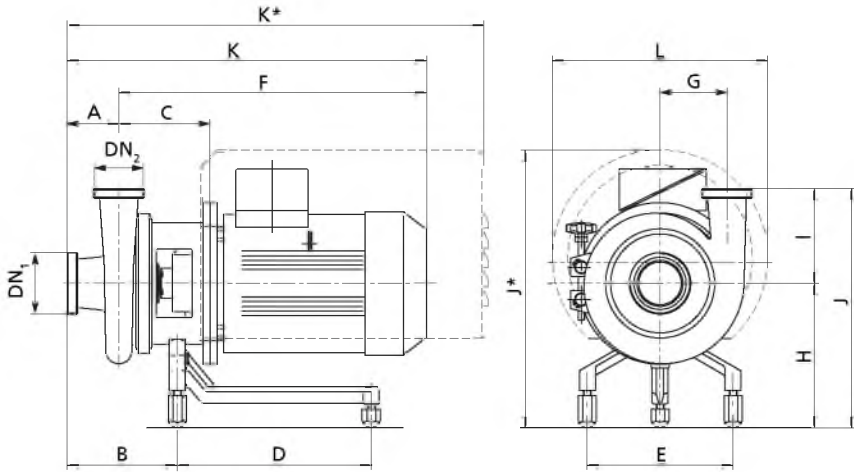


Figure 1
Pump set with 3-point ball feet

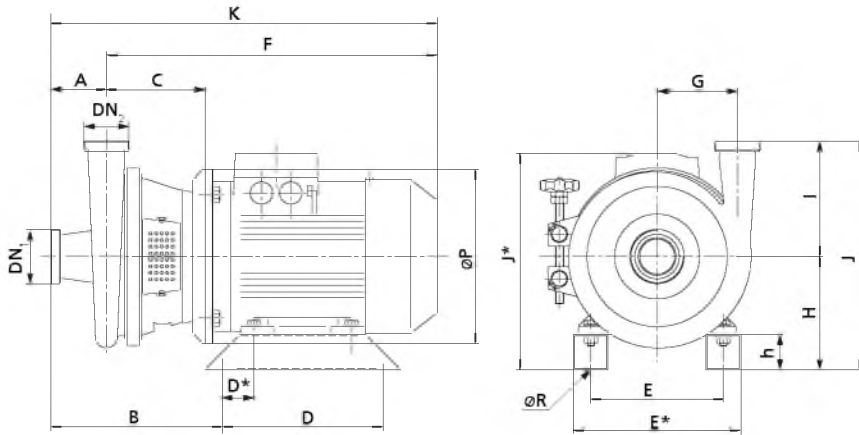


Figure 3
Pump set with motor feet

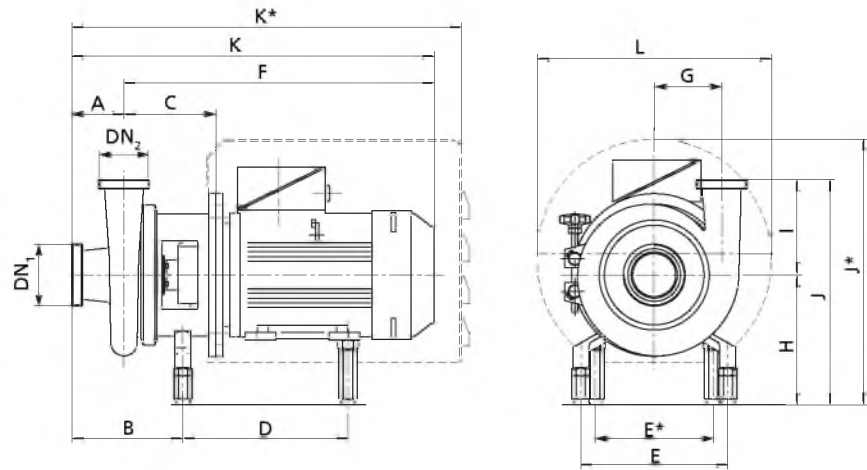


Figure 2
Pump set with 4-point ball feet

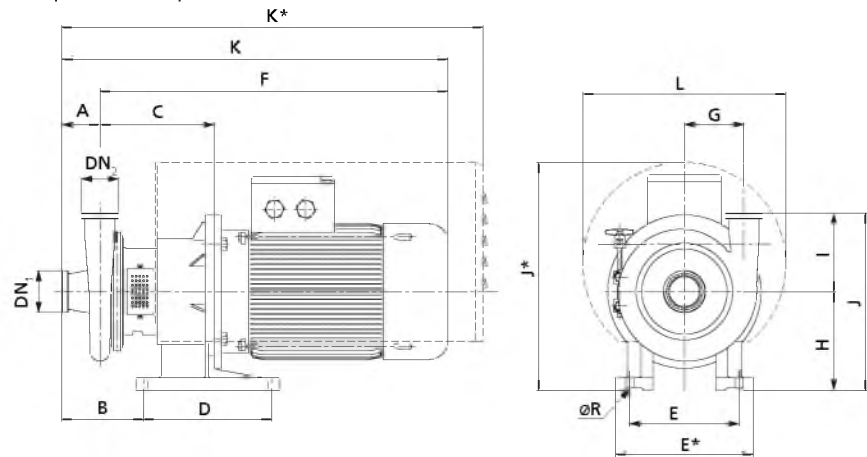


Figure 4
Pump set with bearing pedestal

Pump set dimensions, 50 Hz, 60 Hz [mm]

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
032-025-145	71M	0,37	0,25	X	-	-	-	75	144	117	190	40	178	-	331	81	50	158	406	532	145	303	301	239	-	-	-
	80M	0,75	0,55	X	-	-	-	75	144	123	190	40	178	-	410	81	55	158	485	532	145	303	301	239	-	-	-
	90S	1,5	1,1	X	-	-	-	75	144	123	190	40	178	-	460	81	70	158	535	611	145	303	340	298	-	-	-
	90L	2,2	1,5	X	-	-	-	75	144	123	190	40	178	-	460	81	57,5	158	535	611	145	303	340	298	-	-	-
	80M	0,75	0,55	-	X	X	-	75	248	123	100	40	125	150	410	81	55	80	485	532	145	225	223	239	91	200	9
	90S	1,5	1,1	-	X	X	-	75	254	123	100	40	140	165	460	81	70	90	535	611	145	235	272	298	91	200	10
	90L	2,2	1,5	-	X	X	-	75	254	123	125	40	140	165	460	81	57,5	90	535	611	145	235	272	298	91	200	10
032-025-175	71M	0,37	0,25	X	-	-	-	65	134	117	190	40	178	-	331	96	50	164	396	522	149	313	301	239	-	-	-
	80M	0,75	0,55	X	-	-	-	65	134	123	190	40	178	-	410	96	55	164	475	523	149	313	307	239	-	-	-
	90S	1,5	1,1	X	-	-	-	65	134	123	190	40	178	-	460	96	70	164	525	601	149	313	346	298	-	-	-
	90L	2,2	1,5	X	-	-	-	65	134	123	190	40	178	-	460	96	57,5	164	525	601	149	313	346	298	-	-	-
	100L	3,0	2,2	X	-	-	-	65	134	138	301	50	225	-	509	96	70	210	574	719	149	359	353	330	-	-	-
	112M	4,0	4,0	X	-	-	-	65	134	138	301	50	225	-	503	96	70	210	568	719	149	359	353	330	-	-	-
	80M	0,75	0,55	-	X	X	-	65	238	123	100	40	125	150	410	96	55	80	475	523	149	229	223	239	105	200	9
	90S	1,5	1,1	-	X	X	-	65	244	123	100	40	140	165	460	96	70	90	525	601	149	239	272	298	105	200	10
	90L	2,2	1,5	-	X	X	-	65	244	123	125	40	140	165	460	96	57,5	90	525	601	149	239	272	298	105	200	10
	100L	3,0	2,2	-	X	X	-	65	266	138	140	50	160	195	542	96	70	100	607	719	149	249	305	330	105	250	12
112M	4,0	4,0	-	X	X	-	65	273	138	140	50	190	226	525	96	70	112	590	719	149	261	317	330	105	250	12	
040-032-110	71M	0,37	0,25	X	-	-	-	70	137	117	190	40	178	-	331	65	50	149	401	527	110	259	292	239	-	-	-
	80M	0,75	0,55	X	-	-	-	70	137	123	190	40	178	-	410	65	55	149	480	527	110	259	292	239	-	-	-
	90S	1,5	1,1	X	-	-	-	70	137	123	190	40	178	-	460	65	70	149	530	606	110	259	331	298	-	-	-
	90L	2,2	1,5	X	-	-	-	70	137	123	190	40	178	-	460	65	70	149	530	606	110	259	331	298	-	-	-
	80M	0,75	0,55	-	X	X	-	70	243	123	100	40	125	150	410	65	55	80	480	527	110	190	223	239	78	200	9
	90S	1,5	1,1	-	X	X	-	70	249	123	100	40	140	165	460	65	70	90	530	606	110	200	233	298	78	200	10
	90L	2,2	1,5	-	X	X	-	70	249	123	100	40	140	165	460	65	70	90	530	606	110	200	233	298	78	200	10
040-032-145	80M	0,75	0,55	X	-	-	-	80	167	138	231	40	225	-	425	85	55	208	505	567	145	353	372	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	167	138	231	40	225	-	475	85	70	208	555	636	145	353	372	298	-	-	-
	90L	2,2	1,5	X	-	-	-	80	167	138	231	40	225	-	475	85	57,5	208	555	636	145	353	372	298	-	-	-
	100L	3	2,2	X	-	-	-	80	167	139	301	50	225	-	510	85	70	225	590	735	145	370	430	330	-	-	-
	112M	4	4	X	-	-	-	80	167	139	301	50	225	-	504	85	70	225	584	735	145	370	430	330	-	-	-
	80M	0,75	0,55	-	X	X	-	80	268	138	100	40	125	150	425	85	55	80	505	567	145	225	244	298	95	250	9
	90S	1,5	1,1	-	X	X	-	80	274	138	100	40	140	165	475	85	70	90	555	636	145	235	254	298	95	250	10
	90L	2,2	1,5	-	X	X	-	80	274	138	125	40	140	165	475	85	57,5	90	555	636	145	235	254	298	95	250	10
100L	3	2,2	-	X	X	-	80	282	139	140	50	160	196	543	85	70	100	623	735	145	245	305	330	95	250	12	

6) For 50 Hz

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	112M	4	4	-	X	X	-	80	289	139	140	50	190	226	526	85	70	112	606	735	145	257	317	330	95	250	12
040-032-175	80M	0,75	0,55	X	-	-	-	80	167	139	231	40	225	-	426	95	55	213	506	567	150	363	377	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	167	139	231	40	225	-	476	95	70	213	556	637	150	363	377	298	-	-	-
	90L	2,2	1,5	X	-	-	-	80	167	139	231	40	225	-	476	95	57,5	213	556	637	150	363	377	298	-	-	-
	100L	3	2,2	X	-	-	-	80	167	140	301	50	225	-	511	95	70	230	591	736	150	380	435	330	-	-	-
	112M	4	4	X	-	-	-	80	167	140	301	50	225	-	505	95	70	230	585	736	150	380	435	330	-	-	-
	80M	0,75	0,55	-	X	X	-	80	269	139	100	40	125	150	426	95	55	80	506	567	150	230	244	298	109	220	9
	90S	1,5	1,1	-	X	X	-	80	275	139	100	40	140	165	476	95	70	90	556	637	150	240	254	298	109	220	10
	90L	2,2	1,5	-	X	X	-	80	275	139	125	40	140	165	476	95	57,5	90	556	637	150	240	254	298	109	220	10
	100L	3	2,2	-	X	X	-	80	282	140	140	50	160	196	544	95	70	100	624	736	150	250	305	330	109	250	12
112M	4	4	-	X	X	-	80	290	140	140	50	190	226	527	95	70	112	607	736	150	262	317	330	109	250	12	
040-032-210	80M	0,75	0,55	X	-	-	-	80	158	139	231	40	225	-	426	110	55	221	506	567	165	386	385	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	158	139	231	40	225	-	476	110	70	221	556	637	165	386	426	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	158	139	231	40	225	-	476	110	57,5	221	556	637	165	386	426	330	-	-	-
	100L	3	2,2	X	-	-	-	80	158	140	301	50	225	-	511	110	70	238	591	736	165	403	443	330	-	-	-
	112M	4	4	X	-	-	-	80	158	140	301	50	225	-	505	110	70	238	585	736	165	403	443	330	-	-	-
	132S	5,5	5,5	X	X	-	-	80	158	161	298	60	225	115	596	110	103	238	676	815	165	403	501	430	-	-	-
	132M	-	7,5	X	X	-	-	80	158	161	298	60	225	115	596	110	103	238	676	815	165	403	501	430	-	-	-
	160M	11	11	X	X	-	-	80	158	206	430	50	225	140	730	110	95	238	810	944	165	403	550	480	-	-	-
	160L	18,5	15	X	X	-	-	80	158	206	430	50	225	140	760	110	95	238	840	944	165	403	550	480	-	-	-
	80M	0,75	0,55	-	X	X	-	80	269	139	100	40	125	150	426	110	55	80	506	567	165	245	254	298	126	220	9
	90S	1,5	1,1	-	X	X	-	80	275	139	100	40	140	165	476	110	70	90	556	637	165	255	295	330	126	220	10
	90L	2,2	1,5	-	X	X	-	80	275	139	125	40	140	165	476	110	57,5	90	556	637	165	255	295	330	126	220	10
	100L	3	2,2	-	X	X	-	80	283	140	140	50	160	196	544	110	70	100	624	736	165	265	317	330	126	250	12
	112M	4	4	-	X	X	-	80	290	140	140	50	190	226	527	110	70	112	607	736	165	277	317	330	126	250	12
	132S	5,5	5,5	-	X	X	-	80	330	161	140	60	216	256	596	110	103	132	676	815	165	297	395	430	126	300	12
	132M	-	7,5	-	X	X	-	80	330	161	140	60	216	256	596	110	103	132	676	815	165	297	395	430	126	300	12
	160M	11	11	-	X	X	-	80	394	206	210	50	254	300	730	110	95	160	810	944	165	325	472	480	126	350	15
160L	18,5	15	-	X	X	-	80	394	206	210	50	254	300	760	110	95	160	840	944	165	325	472	480	126	350	15	
050-032-260	90S	1,5	1,1	X	-	-	-	90	184	163	231	40	225	-	500	140	70	221	590	671	172	393	443	330	-	-	-
	90L	2,2	1,5	X	-	-	-	90	184	163	231	40	225	-	500	140	57,5	221	590	671	172	393	443	330	-	-	-
	100L	3	2,2	X	-	-	-	90	184	164	301	50	225	-	535	140	70	238	625	770	172	410	501	430	-	-	-
	112M	4	4	X	-	-	-	90	184	164	301	50	225	-	529	140	70	238	619	770	172	410	501	430	-	-	-
	132S	5,5	5,5	X	X	-	-	90	184	185	307	60	225	115	620	140	103	238	710	851	172	410	501	430	-	-	-
132M	-	7,5	X	X	-	-	90	184	185	307	60	225	115	620	140	103	238	710	851	172	410	501	430	-	-	-	

6) For 50 Hz



Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	160M	11	11	X	X	-	-	90	184	225	434	50	225	140	749	140	95	247	839	977	172	419	557	480	-	-	-
	160L	18,5	15	X	X	-	-	90	184	225	434	50	225	140	779	140	95	247	869	977	172	419	557	480	-	-	-
	90S	1,5	1,1	-	X	X	-	90	309	163	100	40	140	165	500	140	70	90	590	671	172	262	295	330	153	200	10
	90L	2,2	1,5	-	X	X	-	90	309	163	125	40	140	165	500	140	57,5	90	590	671	172	262	295	330	153	200	10
	100L	3	2,2	-	X	X	-	90	317	164	140	50	160	196	568	140	70	100	658	770	172	272	363	430	153	250	12
	112M	4	4	-	X	X	-	90	324	164	140	50	190	226	551	140	70	112	641	770	172	284	375	330	153	250	12
	132S	5,5	5,5	-	X	X	-	90	364	185	140	60	216	256	620	140	103	132	710	851	172	304	395	430	153	300	12
	132M	-	7,5	-	X	X	-	90	364	185	140	60	216	256	620	140	103	132	710	851	172	304	395	430	153	300	12
	160M	11	11	-	X	X	-	90	423	225	210	50	254	300	749	140	95	160	839	977	172	332	472	480	153	350	15
	160L	18,5	15	-	X	X	-	90	423	225	210	50	254	300	779	140	95	160	869	977	172	332	472	480	153	350	15
050-040-145	80M	0,75	0,55	X	-	-	-	80	168	139	231	40	225	-	426	90	55	208	506	567	133	341	372	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	168	139	231	40	225	-	476	90	70	208	556	637	133	341	372	298	-	-	-
	90L	2,2	1,5	X	-	-	-	80	168	139	231	40	225	-	476	90	57,5	208	556	637	133	341	372	298	-	-	-
	100L	3	2,2	X	-	-	-	80	168	140	301	50	225	-	511	90	70	225	591	736	133	358	430	330	-	-	-
	112M	4	4	X	-	-	-	80	168	140	301	50	225	-	505	90	70	225	585	736	133	358	430	330	-	-	-
	80M	0,75	0,55	-	X	X	-	80	269	139	100	40	125	150	426	90	55	80	506	567	133	213	244	298	103	220	9
	90S	1,5	1,1	-	X	X	-	80	275	139	100	40	140	165	476	90	70	90	556	637	133	223	254	298	103	220	10
	90L	2,2	1,5	-	X	X	-	80	275	139	125	40	140	165	476	90	57,5	90	556	637	133	223	254	298	103	220	10
	100L	3	2,2	-	X	X	-	80	283	140	140	50	160	196	544	90	70	100	624	736	133	233	305	330	103	250	12
	112M	4	4	-	X	X	-	80	289	140	140	50	190	226	527	90	70	112	607	736	133	245	317	330	103	250	12
050-040-175	80M	0,75	0,55	X	-	-	-	80	169	141	231	40	225	-	428	95	55	213	508	567	150	363	377	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	169	141	231	40	225	-	478	95	70	213	558	639	150	363	393	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	169	141	231	40	225	-	478	95	57,5	213	558	639	150	363	377	298	-	-	-
	100L	3	2,2	X	-	-	-	80	169	142	301	50	225	-	513	95	70	230	593	738	150	380	435	330	-	-	-
	112M	4	4	X	-	-	-	80	169	142	301	50	225	-	507	95	70	230	587	738	150	380	435	330	-	-	-
	132S	5,5	5,5	X	X	-	-	80	169	164	290	60	225	115	599	95	103	230	679	817	150	380	493	430	-	-	-
	132M	-	7,5	X	X	-	-	80	169	164	290	60	225	115	599	95	103	230	679	817	150	380	493	430	-	-	-
	160M	11	11	X	X	-	-	80	161	208	422	50	225	140	732	115	95	238	812	946	165	403	542	480	-	-	-
	80M	0,75	0,55	-	X	X	-	80	271	141	100	40	125	150	428	95	55	80	508	567	150	230	244	298	113	220	9
	90S	1,5	1,1	-	X	X	-	80	277	141	100	40	140	165	478	95	70	90	558	639	150	240	295	330	113	220	10
	90L	2,2	1,5	-	X	X	-	80	277	141	125	40	140	165	478	95	57,5	90	558	639	150	240	254	298	113	220	10
	100L	3	2,2	-	X	X	-	80	284	142	140	50	160	196	546	95	70	100	626	738	150	250	305	330	113	250	12
	112M	4	4	-	X	X	-	80	291	142	140	50	190	226	529	95	70	112	609	738	150	262	317	330	113	250	12
	132S	5,5	5,5	-	X	X	-	80	333	164	140	60	216	256	599	95	103	132	679	817	150	282	395	430	113	300	12
	132M	-	7,5	-	X	X	-	80	333	164	140	60	216	256	599	95	103	132	679	817	150	282	395	430	113	300	12
	160M	11	11	-	X	X	-	80	396	208	210	50	254	300	732	95	95	160	812	946	150	310	472	480	113	350	15

6) For 50 Hz

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
050-040-210	80M	0,75	0,55	X	-	-	-	80	161	141	231	40	225	-	428	115	55	221	508	567	165	386	385	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	161	141	231	40	225	-	478	115	70	221	558	639	165	386	426	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	161	141	231	40	225	-	478	115	57,5	221	558	639	165	386	426	330	-	-	-
	100L	3	2,2	X	-	-	-	80	161	142	301	50	225	-	513	115	70	238	593	738	165	403	443	330	-	-	-
	112M	4	4	X	-	-	-	80	161	142	301	50	225	-	507	115	70	238	587	738	165	403	443	330	-	-	-
	132S	5,5	5,5	X	X	-	-	80	161	164	298	60	225	115	599	115	103	238	679	817	165	403	501	430	-	-	-
	132M	-	7,5	X	X	-	-	80	161	164	298	60	225	115	599	115	103	238	679	817	165	403	501	430	-	-	-
	160M	11	11	X	X	-	-	80	161	208	430	50	225	140	732	115	95	238	812	946	165	403	550	480	-	-	-
	80M	0,75	0,55	-	X	X	-	80	271	141	100	40	125	150	428	115	55	80	508	567	165	245	244	298	131	220	9
	90S	1,5	1,1	-	X	X	-	80	277	141	100	40	140	165	478	115	70	90	558	639	165	255	295	330	131	220	10
	90L	2,2	1,5	-	X	X	-	80	277	141	125	40	140	165	478	115	57,5	90	558	639	165	255	295	330	131	220	10
	100L	3	2,2	-	X	X	-	80	285	142	140	50	160	196	546	115	70	100	626	738	165	265	305	330	131	250	12
	112M	4	4	-	X	X	-	80	292	142	140	50	190	226	529	115	70	112	609	738	165	277	317	330	131	250	12
	132S	5,5	5,5	-	X	X	-	80	333	164	140	60	216	256	599	115	103	132	679	817	165	297	395	430	131	300	12
	132M	-	7,5	-	X	X	-	80	333	164	140	60	216	256	599	115	103	132	679	817	165	297	395	430	131	300	12
	160M	11	11	-	X	X	-	80	396	208	210/254	50	254	300	732	115	95	160	812	946	165	325	472	480	131	350	15
050-040-260	90S	1,5	1,1	X	-	-	-	100	194	163	231	40	225	-	500	145	70	221	600	681	172	393	401	330	-	-	-
	90L	2,2	1,5	X	-	-	-	100	194	163	231	40	225	-	500	145	57,5	221	600	681	172	393	401	330	-	-	-
	100L	3	2,2	X	-	-	-	100	194	164	301	50	225	-	535	145	70	238	635	780	172	410	493	430	-	-	-
	112M	4	4	X	-	-	-	100	194	164	301	50	225	-	529	145	70	238	629	770	172	410	493	430	-	-	-
	132S	5,5	5,5	X	X	-	-	100	194	185	307	60	225	115	620	145	103	238	720	861	172	410	501	430	-	-	-
	132M	-	7,5	X	X	-	-	100	194	185	307	60	225	115	620	145	84	238	720	861	172	410	501	430	-	-	-
	160M	11	11	X	X	-	-	100	194	225	434	50	225	140	749	145	95	247	849	987	172	419	559	480	-	-	-
	160L	18,5	15	X	X	-	-	100	194	225	434	50	225	140	779	145	73	247	879	987	172	419	559	480	-	-	-
	180M	22	18,5	X	X	-	-	100	194	225	532	60	225	279	860	145	103,5	247	960	1104	172	419	559	480	-	-	-
	90S	1,5	1,1	-	X	X	-	100	319	163	125	40	140	165	500	145	70	90	600	681	172	262	295	330	157	220	10
	90L	2,2	1,5	-	X	X	-	100	319	163	125	40	140	165	500	145	57,5	90	600	681	172	262	295	330	157	220	10
	100L	3	2,2	-	X	X	-	100	327	164	140	50	160	196	568	145	70	100	668	780	172	272	363	430	157	250	12
	112M	4	4	-	X	X	-	100	334	164	140	50	190	226	551	145	70	112	651	770	172	284	375	430	157	250	12
	132S	5,5	5,5	-	X	X	-	100	374	185	178	60	216	256	620	145	103	132	720	861	172	304	395	430	157	300	12
	132M	-	7,5	-	X	X	-	100	374	185	178	60	216	256	620	145	84	132	720	861	172	304	395	430	157	300	12
	160M	11	11	-	X	X	-	100	434	226	210	50	254	300	750	145	95	160	850	987	172	332	472	480	157	350	15
160L	18,5	15	-	X	X	-	100	434	226	254	50	254	300	780	145	73	160	880	987	172	332	472	480	157	350	15	
180M	22	18,5	-	X	X	-	100	447	226	241	60	279	340	861	145	103,5	180	961	1104	172	352	492	480	157	350	15	
065-050-145	80M	0,75	0,55	X	-	-	-	80	170	141	231	40	225	-	428	95	55	208	508	639	145	353	372	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	170	141	231	40	225	-	478	95	70	208	558	639	145	353	372	298	-	-	-

6) For 50 Hz

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	90L	2,2	1,5	X	-	-	-	80	170	141	231	40	225	-	478	95	57,5	208	558	639	145	353	413	330	-	-	-
	100L	3	2,2	X	-	-	-	80	170	142	301	50	225	-	513	95	70	225	593	738	145	370	430	330	-	-	-
	112M	4	4	X	-	-	-	80	170	142	301	50	225	-	507	95	70	225	587	738	145	370	430	330	-	-	-
	132S	5,5	5,5	X	X	-	-	80	170	164	289	60	225	115	599	95	103	225	679	817	145	370	493	430	-	-	-
	80M	0,75	0,55	-	X	X	-	80	271	141	100	40	125	150	428	95	55	80	508	639	145	225	244	298	118	220	9
	90S	1,5	1,1	-	X	X	-	80	277	141	100	40	140	165	478	95	70	90	558	639	145	235	295	330	118	220	10
	90L	2,2	1,5	-	X	X	-	80	277	141	125	40	140	165	478	95	57,5	90	558	639	145	235	295	330	118	220	10
	100L	3	2,2	-	X	X	-	80	285	142	140	50	160	196	546	95	70	100	626	738	145	245	305	330	118	250	12
	112M	4	4	-	X	X	-	80	292	142	140	50	190	226	529	95	70	112	609	738	145	257	317	330	118	250	12
	132S	5,5	5,5	-	X	X	-	80	333	164	140	60	216	256	599	95	103	132	679	817	145	277	488	430	118	300	12
065-050-175	80M	0,75	0,55	X	-	-	-	80	169	141	231	40	225	-	428	100	55	213	508	639	150	363	377	298	-	-	-
	90S	1,5	1,1	X	-	-	-	80	169	141	231	40	225	-	478	100	70	213	558	639	150	363	413	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	169	141	231	40	225	-	478	100	57,5	213	558	639	150	363	413	330	-	-	-
	100L	3	2,2	X	-	-	-	80	169	142	301	50	225	-	513	100	70	230	593	738	150	380	435	330	-	-	-
	112M	4	4	X	-	-	-	80	169	142	301	50	225	-	507	100	70	230	587	738	150	380	435	330	-	-	-
	132S	5,5	5,5	X	X	-	-	80	169	164	291	60	225	115	599	100	103	230	679	817	150	380	493	430	-	-	-
	132M	-	7,5	X	X	-	-	80	169	164	291	60	225	115	599	100	84	230	679	817	150	380	493	430	-	-	-
	160M	11	11	X	X	-	-	80	169	208	422	50	225	140	732	100	95	230	812	946	150	380	542	480	-	-	-
	80M	0,75	0,55	-	X	X	-	80	271	141	100	40	125	150	428	100	55	80	508	639	150	230	244	298	124	220	9
	90S	1,5	1,1	-	X	X	-	80	277	141	100	40	140	165	478	100	70	90	558	639	150	240	295	330	124	220	10
	90L	2,2	1,5	-	X	X	-	80	277	141	125	40	140	165	478	100	57,5	90	558	639	150	240	295	330	124	220	10
	100L	3	2,2	-	X	X	-	80	285	142	140	50	160	196	546	100	70	100	626	738	150	250	305	330	124	250	12
	112M	4	4	-	X	X	-	80	292	142	140	50	190	226	529	100	70	112	609	738	150	262	317	330	124	250	12
	132S	5,5	5,5	-	X	X	-	80	333	164	140	60	216	256	599	100	103	132	679	817	150	282	395	430	124	300	12
	132M	-	7,5	-	X	X	-	80	333	164	178	60	216	256	599	100	84	132	679	817	150	282	395	430	124	300	12
	160M	11	11	-	X	X	-	80	396	208	210/254	50	254	300	732	100	95	160	812	946	150	310	472	480	124	350	15
065-050-210	90S	1,5	1,1	X	-	-	-	80	161	141	231	40	225	-	478	120	70	221	558	639	165	385	426	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	161	141	231	40	225	-	478	120	57,5	221	558	639	165	385	426	330	-	-	-
	100L	3	2,2	X	-	-	-	80	161	142	301	50	225	-	513	120	70	238	593	738	165	402	501	430	-	-	-
	112M	4	4	X	-	-	-	80	161	142	301	50	225	-	507	120	70	238	587	738	165	402	501	430	-	-	-
	132S	5,5	5,5	X	X	-	-	80	161	164	298	60	225	115	599	120	103	238	679	817	165	403	501	430	-	-	-
	132M	-	7,5	X	X	-	-	80	161	164	298	60	225	115	599	120	84	238	679	817	165	403	501	430	-	-	-
	160M	11	11	X	X	-	-	80	161	208	429	50	225	140	732	120	95	238	812	946	165	403	550	480	-	-	-
	160L	18,5	15	X	X	-	-	80	161	208	429	50	225	140	762	120	73	238	842	946	165	403	550	480	-	-	-
	180M	22	18,5	X	X	-	-	80	171	223	532	60	225	279	858	120	103,5	248	938	1082	165	413	550	480	-	-	-
	90S	1,5	1,1	-	X	X	-	80	277	141	100	40	140	165	478	120	70	90	558	639	165	255	295	330	140	220	10

6) For 50 Hz

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R	
		2-pole	4-pole																									
	90L	2,2	1,5	-	X	X	-	80	277	141	125	40	140	165	478	120	57,5	90	558	639	165	255	295	330	140	220	10	
	100L	3	2,2	-	X	X	-	80	285	142	140	50	160	196	546	120	70	100	626	738	165	265	363	430	140	250	12	
	112M	4	4	-	X	X	-	80	292	142	140	50	190	226	529	120	70	112	609	738	165	277	375	430	140	250	12	
	132S	5,5	5,5	-	X	X	-	80	333	164	140	60	216	256	599	120	103	132	679	817	165	297	395	430	140	300	12	
	132M	-	7,5	-	X	X	-	80	333	164	140	60	216	256	599	120	84	132	679	817	165	297	395	430	140	300	12	
	160M	11	11	-	X	X	-	80	396	208	210	50	254	300	732	120	95	160	812	946	165	325	472	480	140	350	15	
	160L	18,5	15	-	X	X	-	80	396	208	254	50	254	300	762	120	73	160	842	946	165	325	472	480	140	350	15	
	180M	22	18,5	-	X	X	-	80	424	223	241	60	279	340	858	120	103,5	180	938	1082	165	345	492	480	140	350	15	
065-050-260	100L	3	2,2	X	-	-	-	90	185	165	301	50	225	-	536	145	70	238	626	772	175	413	501	430	-	-	-	
	112M	4	4	X	-	-	-	90	185	165	301	50	225	-	530	145	70	238	620	772	175	413	501	430	-	-	-	
	132S	5,5	5,5	X	X	-	-	90	185	187		60	225	115	622	145	103	238	712	970	175	413	501	430	-	-	-	
	132M	-	7,5	X	X	-	-	90	185	187		60	225	115	622	145	84	238	712	970	175	413	501	430	-	-	-	
	160M	11	11	X	X	-	-	90	186	228	434	50	225	140	752	145	95	247	842	979	175	422	559	480	-	-	-	
	160L	18,5	15	X	X	-	-	90	186	228	434	50	225	140	782	145	73	247	872	979	175	422	559	480	-	-	-	
	180M	22	18,5	X	X	-	-	90	186	228	532	60	225	279	863	145	103,5	247	953	1097	175	422	559	480	-	-	-	
	180L	-	22	X	X	-	-	90	186	228	532	60	225	279	891	145	84,5	247	981	1097	175	422	559	480	-	-	-	
	100L	3	2,2	-	X	X	-	-	90	319	165	140	50	160	196	569	145	70	100	659	772	175	275	363	430	165	250	12
	112M	4	4	-	X	X	-	-	90	324	165	140	50	190	226	552	145	70	112	642	772	175	287	375	430	165	250	12
	132S	5,5	5,5	-	X	X	-	-	90	185	187	140	60	216	256	622	145	103	132	712	970	175	307	501	430	165	300	12
	132M	-	7,5	-	X	X	-	-	90	185	187	178	60	216	256	622	145	84	132	712	970	175	307	501	430	165	300	12
	160M	11	11	-	X	X	-	-	90	426	228	210	50	254	300	752	145	95	160	842	979	175	335	472	480	165	350	15
	160L	18,5	15	-	X	X	-	-	90	426	228	254	50	254	300	782	145	73	160	872	979	175	335	472	480	165	350	15
	180M	22	18,5	-	X	X	-	-	90	439	228	241	60	279	340	863	145	103,5	180	953	1097	175	355	492	480	165	350	15
	180L	-	22	-	X	X	-	-	90	439	228	279	60	279	340	891	145	84,5	180	981	1097	175	355	492	480	165	350	15
	200L	30	30	-	X	X	-	-	90	201	296	335	-	284	360	1032	145	-	258	1122	1247	175	433	613	529	-	-	21
080-065-145	80M	0,75	0,55	X	-	-	-	79	173	145	231	40	225	-	432	112	55	208	511	642	145	353	372	298	-	-	-	
	90S	1,5	1,1	X	-	-	-	79	173	145	231	40	225	-	482	112	70	208	561	642	145	353	413	330	-	-	-	
	90L	2,2	1,5	X	-	-	-	79	173	145	231	40	225	-	482	112	57,5	208	561	642	145	353	413	330	-	-	-	
	100L	3	2,2	X	-	-	-	79	173	146	301	50	225	-	517	112	70	225	596	741	145	370	430	330	-	-	-	
	112M	4	4	X	-	-	-	79	173	146	301	50	225	-	511	112	70	225	590	741	145	370	430	330	-	-	-	
	132S	5,5	5,5	X	X	-	-	79	173	168	289	60	225	115	603	112	103	225	682	821	145	370	488	430	-	-	-	
	132M	-	7,5	X	X	-	-	79	173	168	289	60	225	115	603	112	84	225	682	821	145	370	488	430	-	-	-	
	160M	11	11	X	X	-	-	79	173	212	420	50	225	140	736	112	95	225	815	950	145	370	537	480	-	-	-	
	80M	0,75	0,55	-	X	X	-	-	79	274	145	100	40	125	150	432	112	55	80	511	642	145	225	244	298	140	220	9
	90S	1,5	1,1	-	X	X	-	-	79	280	145	100	40	140	165	482	112	70	90	561	642	145	235	295	330	140	220	10
	90L	2,2	1,5	-	X	X	-	-	79	280	145	125	40	140	165	482	112	57,5	90	561	642	145	235	295	330	140	220	10
	100L	3	2,2	-	X	X	-	-	79	288	146	140	50	160	196	550	112	70	100	629	741	145	245	305	330	140	250	12
	112M	4	4	-	X	X	-	-	79	295	146	140	50	190	226	533	112	70	112	612	741	145	257	317	330	140	250	12
	132S	5,5	5,5	-	X	X	-	-	79	336	168	140	60	216	256	603	112	103	132	682	821	145	277	395	430	140	300	12
	132M	-	7,5	-	X	X	-	-	79	336	168	178	60	216	256	603	112	84	132	682	821	145	277	395	430	140	300	12



Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	160M	11	11	-	X	X	-	79	399	212	210	50	254	300	736	112	95	160	815	950	145	305	472	480	140	350	15
080-065-175	90S	1,5	1,1	X	-	-	-	80	172	144	231	40	225	-	481	120	70	213	561	642	150	363	418	330	-	-	-
	90L	2,2	1,5	X	-	-	-	80	172	144	231	40	225	-	481	120	57,5	213	561	642	150	363	418	330	-	-	-
	100L	3	2,2	X	-	-	-	80	172	145	301	50	225	-	516	120	70	230	596	741	150	380	435	430	-	-	-
	112M	4	4	X	-	-	-	80	172	145	301	50	225	-	510	120	70	230	590	741	150	380	435	430	-	-	-
	132S	5,5	5,5	X	X	-	-	80	172	167	290	60	225	115	602	120	103	230	682	820	150	380	493	430	-	-	-
	132M	-	7,5	X	X	-	-	80	172	167	290	60	225	115	602	120	84	230	682	820	150	380	493	430	-	-	-
	160M	11	11	X	X	-	-	80	172	211	422	50	225	140	735	120	95	230	815	949	150	380	542	480	-	-	-
	160L	18,5	15	X	X	-	-	80	172	211	422	50	225	140	765	120	73	230	845	949	150	380	542	480	-	-	-
	180M	22	18,5	X	X	-	-	80	173	224	531	60	225	279	859	120	103,5	241	939	1085	150	391	542	480	-	-	-
	90S	1,5	1,1	-	X	X	-	80	280	144	100	40	140	165	481	120	70	90	561	642	150	240	295	330	148	220	10
	90L	2,2	1,5	-	X	X	-	80	280	144	125	40	140	165	481	120	57,5	90	561	642	150	240	295	330	148	220	10
	100L	3	2,2	-	X	X	-	80	288	145	140	50	160	196	549	120	70	100	629	741	150	250	363	430	148	250	12
	112M	4	4	-	X	X	-	80	295	145	140	50	190	226	532	120	70	112	612	741	150	262	375	430	148	250	12
	132S	5,5	5,5	-	X	X	-	80	336	167	140	60	216	256	602	120	103	132	682	820	150	282	395	430	148	300	12
	132M	-	7,5	-	X	X	-	80	336	167	178	60	216	256	602	120	84	132	682	820	150	282	395	430	148	300	12
	160M	11	11	-	X	X	-	80	399	211	210	50	254	300	735	120	95	160	815	949	150	310	472	480	148	350	15
160L	18,5	15	-	X	X	-	80	399	211	254	50	254	300	765	120	73	160	845	949	150	310	472	480	148	350	15	
180M	22	18,5	-	X	X	-	80	425	224	241	60	279	340	859	120	103,5	180	939	1085	150	330	492	480	148	350	15	
080-065-210	90S	1,5	1,1	X	-	-	-	90	189	168	231	40	225	-	505	135	70	221	595	676	165	386	426	330	-	-	-
	90L	2,2	1,5	X	-	-	-	90	189	168	231	40	225	-	505	135	57,5	221	595	676	165	386	426	330	-	-	-
	100L	3	2,2	X	-	-	-	90	189	169	301	50	225	-	540	135	70	238	630	775	165	403	501	430	-	-	-
	112M	4	4	X	-	-	-	90	189	169	301	50	225	-	534	135	70	238	624	775	165	403	501	430	-	-	-
	160M	11	11	X	X	-	-	90	189	231	434	50	225	140	755	135	95	247	845	983	165	412	559	480	-	-	-
	160L	18,5	15	X	X	-	-	90	189	231	434	50	225	140	785	135	73	247	875	983	165	412	559	480	-	-	-
	180M	22	18,5	X	X	-	-	90	189	231	532	60	225	279	866	135	103,5	247	956	983	165	412	559	480	-	-	-
	90S	1,5	1,1	-	X	X	-	90	314	168	100	40	140	165	505	135	70	90	595	676	165	255	295	330	160	220	10
	90L	2,2	1,5	-	X	X	-	90	314	168	125	40	140	165	505	135	57,5	90	595	676	165	255	295	330	160	220	10
	100L	3	2,2	-	X	X	-	90	322	169	140	50	160	196	573	135	70	100	663	775	165	265	363	430	160	250	12
	112M	4	4	-	X	X	-	90	329	169	140	50	190	226	556	135	70	112	646	775	165	277	375	430	160	250	12
	160M	11	11	-	X	X	-	90	429	231	210	50	254	300	755	135	95	160	845	983	165	325	472	480	160	350	14
160L	18,5	15	-	X	X	-	90	429	231	254	50	254	300	785	135	73	160	875	983	165	325	472	480	160	350	14	
180M	22	18,5	-	X	X	-	90	442	231	241	60	279	340	866	135	103,5	180	956	983	165	345	492	480	160	350	15	
080-065-260	100L	3	2,2	X	-	-	-	100	198	168	301	50	225	-	539	155	70	238	639	784	205	443	501	430	-	-	-
	112M	4	4	X	-	-	-	100	198	168	301	50	225	-	533	155	70	238	633	784	205	443	501	430	-	-	-
	132S	5,5	5,5	X	X	-	-	100	198	190	307	60	225	115	625	155	103	238	725	865	205	443	501	430	-	-	-
	132M	-	7,5	X	X	-	-	100	198	190	307	60	225	115	625	155	84	238	725	865	205	443	501	430	-	-	-
	160M	11	11	X	X	-	-	100	198	230	434	50	225	140	754	155	95	247	854	992	205	452	559	480	-	-	-
160L	18,5	15	X	X	-	-	100	198	230	434	50	225	140	784	155	73	247	884	992	205	452	559	480	-	-	-	

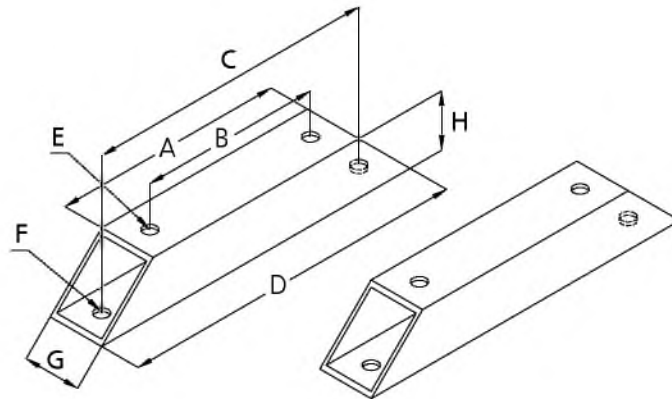
Pump size	Motor size	p ⁶ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	180M	22	18,5	X	X	-	-	100	198	230	532	60	225	279	865	155	103,5	247	965	1109	205	452	559	480	-	-	-
	100L	3	2,2	-	X	X	-	100	331	168	140	50	160	196	572	155	70	100	672	784	205	305	363	430	182	250	12
	112M	4	4	-	X	X	-	100	338	168	140	50	190	226	555	155	70	112	655	784	205	317	375	430	182	250	12
	132S	5,5	5,5	-	X	X	-	100	379	190	140	60	216	256	625	155	103	132	725	865	205	337	395	430	182	300	12
	132M	-	7,5	-	X	X	-	100	379	190	178	60	216	256	625	155	84	132	725	865	205	337	395	430	182	300	12
	160M	11	11	-	X	X	-	100	438	230	210	50	254	300	754	155	95	160	854	992	205	365	472	480	182	350	14
	160L	18,5	15	-	X	X	-	100	438	230	254	50	254	300	784	155	73	160	884	992	205	365	472	480	182	350	14
	180M	22	18,5	-	X	X	-	100	451	230	241	60	279	340	865	155	103,5	180	965	1109	205	385	492	480	182	350	15
	200L	30	30	-	-	-	X	100	213	298	335	-	284	360	1034	155	-	258	1134	1259	205	463	613	529	-	-	21
100-080-175	100L	3	2,2	X	-	-	-	100	204	174	301	50	225	-	545	139	70	230	645	790	164	394	435	430	-	-	-
	112M	4	4	X	-	-	-	100	204	174	301	50	225	-	539	139	70	230	639	790	164	394	435	430	-	-	-
	132S	5,5	5,5	X	X	-	-	100	204	195	307	60	225	115	630	139	103	230	730	869	164	394	493	430	-	-	-
	132M	-	7,5	X	X	-	-	100	204	195	307	60	225	115	630	139	84	230	730	869	164	394	493	430	-	-	-
	160M	11	11	X	X	-	-	100	205	236	432	50	225	140	760	139	95	241	860	997	164	405	504	480	-	-	-
	160L	18,5	15	X	X	-	-	100	205	236	432	50	225	140	790	139	73	241	890	997	164	405	504	480	-	-	-
	180M	22	18,5	X	X	-	-	100	205	236	531	60	225	279	871	139	103,5	241	971	1115	164	405	553	480	-	-	-
	100L	3	2,2	-	X	X	-	100	335	174	140	50	160	196	578	139	70	100	678	790	164	264	305	430	169	250	12
	112M	4	4	-	X	X	-	100	343	174	140	50	190	226	561	139	70	112	661	790	164	276	317	430	169	250	12
	132S	5,5	5,5	-	X	X	-	100	384	195	140	60	216	256	630	139	103	132	730	869	164	296	395	430	169	300	12
	132M	-	7,5	-	X	X	-	100	384	195	178	60	216	256	630	139	84	132	730	869	164	296	395	430	169	300	12
	160M	11	11	-	X	X	-	100	444	235	210	50	254	300	759	139	95	160	859	997	164	324	472	480	169	350	14
	160L	18,5	15	-	X	X	-	100	444	235	254	50	254	300	789	139	73	160	889	997	164	324	472	480	169	350	14
	180M	22	18,5	-	X	X	-	100	457	235	241	60	279	340	870	139	103,5	180	970	1115	164	344	492	480	169	350	15
200L	30	30	-	-	-	X	100	219	304	335	-	284	360	1040	139	-	258	1140	1265	164	422	613	529	-	-	21	
100-080-210	100L	3	2,2	X	-	-	-	100	201	171	301	50	225	-	542	145	70	238	642	788	165	403	501	430	-	-	-
	112M	4	4	X	-	-	-	100	201	171	301	50	225	-	536	145	70	238	636	788	165	403	501	430	-	-	-
	132S	5,5	5,5	X	X	-	-	100	201	193	307	60	225	115	628	145	103	238	728	869	165	403	501	430	-	-	-
	132M	-	7,5	X	X	-	-	100	201	193	307	60	225	115	628	145	84	238	728	869	165	403	501	430	-	-	-
	160M	11	11	X	X	-	-	100	201	233	434	50	225	140	757	145	95	247	857	996	164	411	559	480	-	-	-
	160L	18,5	15	X	X	-	-	100	201	233	434	50	225	140	787	145	73	247	887	996	164	411	559	480	-	-	-
	180M	22	18,5	X	X	-	-	100	201	233	532	60	225	279	868	145	103,5	247	968	1113	164	411	559	480	-	-	-
	100L	3	2,2	-	X	X	-	100	334	171	140	50	160	196	575	145	70	100	675	788	165	265	363	430	179	250	12
	112M	4	4	-	X	X	-	100	341	171	140	50	190	226	558	145	70	112	658	788	165	277	375	430	179	250	12
	132S	5,5	5,5	-	X	X	-	100	382	193	140	60	216	256	628	145	103	132	728	869	165	297	395	430	179	300	12
	132M	-	7,5	-	X	X	-	100	382	193	178	60	216	256	628	145	84	132	728	869	165	297	395	430	179	300	12
	160M	11	11	-	X	X	-	100	441	233	210	50	254	300	757	145	95	160	857	996	164	324	472	480	179	350	14
	160L	18,5	15	-	X	X	-	100	441	233	254	50	254	300	787	145	73	160	887	996	164	324	472	480	179	350	14
	180M	22	18,5	-	X	X	-	100	454	233	241	60	279	340	868	145	103,5	180	968	1113	164	344	492	480	179	350	15
200L	30	30	-	-	-	X	100	216	301	335	-	284	360	1037	145	-	258	1137	1263	164	422	613	529	-	-	21	

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
100-080-260	100L	3	2,2	X	-	-	-	100	201	171	301	50	225	-	542	165	70	238	642	787	209	447	501	430	-	-	-
	112M	4	4	X	-	-	-	100	201	171	301	50	225	-	536	165	70	238	636	787	209	447	501	430	-	-	-
	132S	5,5	5,5	X	X	-	-	100	201	193	307	60	225	115	628	165	103	238	728	868	209	447	501	430	-	-	-
	132M	-	7,5	X	X	-	-	100	201	193	307	60	225	115	628	165	84	238	728	868	209	447	501	430	-	-	-
	160M	11	11	X	X	-	-	100	201	233	434	50	225	140	757	165	95	247	857	995	209	456	559	480	-	-	-
	160L	18,5	15	X	X	-	-	100	201	233	434	50	225	140	787	165	73	247	887	995	209	456	559	480	-	-	-
	100L	3	2,2	-	X	X	-	100	334	171	140	50	160	196	575	165	70	100	675	787	209	309	363	430	196	250	12
	112M	4	4	-	X	X	-	100	341	171	140	50	190	226	558	165	70	112	658	787	209	321	375	430	196	250	12
	132S	5,5	5,5	-	X	X	-	100	382	193	140	60	216	256	628	165	103	132	728	868	209	341	395	430	196	300	12
	132M	-	7,5	-	X	X	-	100	382	193	178	60	216	256	628	165	84	132	728	868	209	341	395	430	196	300	12
	160M	11	11	-	X	X	-	100	441	233	210	50	254	300	757	165	95	160	857	995	209	369	472	480	196	350	15
	160L	18,5	15	-	X	X	-	100	441	233	254	50	254	300	787	165	73	160	887	995	209	369	472	480	196	350	15
200L	30	30	-	-	-	X	100	216	301	335	-	284	360	1037	165	-	258	1137	1262	209	467	613	529	-	-	21	
100-080-310	160M	11	11	X	X	-	-	100	202	235	495	50	225	254	759	200	95	250	859	997	250	500	562	480	-	-	-
	160L	18,5	15	X	X	-	-	100	202	235	495	50	225	254	789	200	73	250	889	997	250	500	562	480	-	-	-
	180M	22	18,5	X	X	-	-	100	202	235	533	60	225	279	870	200	103,5	250	970	1114	250	500	562	480	-	-	-
	180L	-	22	X	X	-	-	100	202	235	533	60	225	279	898	200	84,5	250	998	1114	250	500	562	480	-	-	-
	160M	11	11	-	X	X	-	100	443	235	254	50	254	314	759	200	95	160	859	997	250	410	562	480	226	350	14
	160L	18,5	15	-	X	X	-	100	443	235	254	50	254	314	789	200	73	160	889	997	250	410	562	480	226	350	14
	180M	22	18,5	-	X	X	-	100	456	235	279	60	279	350	870	200	103,5	180	970	1114	250	430	562	480	226	350	14
	180L	-	22	-	X	X	-	100	456	235	279	60	279	350	898	200	84,5	180	998	1114	250	430	562	480	226	350	14
200L	30	30	-	-	-	X	100	218	303	335	-	284	360	1039	200	-	258	1139	1264	250	508	613	529	-	-	21	
125-100-210	132S	5,5	5,5	X	X	-	-	111	219	200	307	60	225	115	635	161	103	238	746	885	214	452	501	430	-	-	-
	132M	-	7,5	X	X	-	-	111	219	200	307	60	225	115	635	161	84	238	746	885	214	452	501	430	-	-	-
	160M	11	11	X	X	-	-	111	219	240	210	50	225	140	764	161	95	247	875	1010	214	461	559	480	-	-	-
	160L	18,5	15	X	X	-	-	111	219	240	254	50	225	140	794	161	73	247	905	1010	214	461	559	480	-	-	-
	180M	22	18,5	X	X	-	-	111	219	240	532	60	225	279	875	161	103,5	247	986	1130	214	461	559	480	-	-	-
	132S	5,5	5,5	-	X	X	-	111	399	200	140	60	216	256	635	161	103	132	746	885	214	346	395	430	200	300	12
	132M	-	7,5	-	X	X	-	111	399	200	178	60	216	256	635	161	84	132	746	885	214	346	395	430	200	300	12
	160M	11	11	-	X	X	-	111	459	240	210	50	254	314	764	161	95	160	875	1010	214	374	472	480	200	350	14
	160L	18,5	15	-	X	X	-	111	459	240	254	50	254	314	794	161	73	160	905	1010	214	374	472	480	200	350	14
	180M	22	18,5	-	X	X	-	110	471	240	241	60	279	340	875	161	103,5	180	985	1130	214	394	492	480	200	350	15
200L	30	30	-	-	-	X	111	234	308	335	-	284	360	1044	161	-	258	1155	1280	214	472	613	529	-	-	21	
125-100-260	160M	11	11	X	X	-	-	115	218	235	434	50	225	140	759	186	95	247	874	1112	216	463	559	480	-	-	-
	160L	18,5	15	X	X	-	-	115	218	235	434	50	225	140	789	186	73	247	904	1112	216	463	559	480	-	-	-
	180M	22	18,5	X	X	-	-	115	218	235	532	60	225	279	870	186	103,5	247	985	1129	216	463	559	480	-	-	-
	160M	11	11	-	X	X	-	115	458	235	210	50	254	300	759	186	95	160	874	1112	216	376	472	480	218	350	15
	160L	18,5	15	-	X	X	-	115	458	235	254	50	254	300	789	186	73	160	904	1112	216	376	472	480	218	350	15
	180M	22	18,5	-	X	X	-	115	471	235	241	60	279	340	870	186	103,5	180	985	1129	216	396	492	480	218	350	15

Pump size	Motor size	p ⁶⁾ [kW]		Figure 1	Figure 2	Figure 3	Figure 4	A	B	C	D	D*	E	E*	F _{max}	G	h	H	K _{max}	K* _{max}	I	J	J* _{max}	L _{max}	V	Ø P	Ø R
		2-pole	4-pole																								
	180L	-	22	-	X	X	-	115	471	235	279	60	279	340	898	186	84,5	180	1013	1129	216	396	492	480	218	350	15
	200L	30	30	-	-	-	X	115	233	303	335	-	284	360	1039	186	-	258	1154	1279	216	474	613	529	-	-	21
125-100-310	160M	11	11	X	X	-	-	115	221	239	495	50	225	254	763	214	95	250	878	1015	259	509	562	480	-	-	-
	160L	18,5	15	X	X	-	-	115	221	239	495	50	225	254	793	214	73	250	908	1015	259	509	562	480	-	-	-
	180M	22	18,5	X	X	-	-	115	221	239	533	60	225	279	874	214	103,5	250	989	1132	259	509	562	480	-	-	-
	180L	-	22	X	X	-	-	115	221	239	533	60	225	279	902	214	84,5	250	1017	1132	259	509	562	480	-	-	-
	160M	11	11	-	X	X	-	115	462	239	254	50	254	314	763	214	95	160	878	1015	259	419	562	480	245	350	14
	160L	18,5	15	-	X	X	-	115	462	239	254	50	254	314	793	214	73	160	908	1015	259	419	562	480	245	350	14
	180M	22	18,5	-	X	X	-	115	475	239	279	60	279	350	874	214	103,5	180	989	1132	259	439	562	480	245	350	14
	180L	-	22	-	X	X	-	115	475	239	279	60	279	350	902	214	84,5	180	1017	1132	259	439	562	480	245	350	14
	200L	30	30	-	-	-	X	115	237	307	335	-	284	360	1043	215	-	258	1158	1282	259	517	613	529	-	-	21
150-125-260	160M	11	11	X	X	-	-	110	223	244	434	50	225	140	768	206	95	247	878	1015	216	463	559	480	-	-	-
	160L	18,5	15	X	X	-	-	110	223	244	434	50	225	140	798	206	73	247	908	1015	216	463	559	480	-	-	-
	180M	22	18,5	X	X	-	-	110	223	244	532	60	225	279	879	206	103,5	247	989	1133	216	463	559	480	-	-	-
	180L	-	22	X	X	-	-	110	223	244	532	60	225	279	907	206	84,5	247	1017	1133	216	463	559	480	-	-	-
	160M	11	11	-	X	X	-	110	462	244	210	50	254	300	768	206	95	160	878	1015	216	376	559	480	242	350	15
	160L	18,5	15	-	X	X	-	110	462	244	254	50	254	300	798	206	73	160	908	1015	216	376	559	480	242	350	15
	180M	22	18,5	-	X	X	-	110	475	244	241	60	279	340	879	206	103,5	180	989	1133	216	396	559	480	242	350	15
	180L	-	22	-	X	X	-	110	475	244	241	60	279	340	907	206	103,5	180	1017	1133	216	396	559	480	242	350	15
	200L	30	30	-	-	-	X	110	237	312	335	-	284	360	1048	206	-	258	1158	1274	216	474	613	529	242	-	-



Motor feet



Motor foot dimensions [mm]

Motor size (IEC-DIN)	p [kW]		A	B	C	D	E	F	G	H
	2-pole	4-pole								
71	0,37; 0,55	0,25; 0,37	110	90	150	190	10	10	40	40
80	0,75; 1,1	0,55; 0,75	130	100	170	210	10	10	40	40
90 S	1,5	1,1	160	100	200	240	10	10	40	40
90 L	2,2	1,5	160	125	200	240	10	10	40	40
100 L	3	3	180	140	230	280	12	12	50	50
112 M	4	4	180	140	230	280	12	12	50	50
132 S	5,5; 7,5	5,5	226	140	266	346	12	12	60	60
132 M	-	7,5	226	178	266	346	12	12	60	60
160 M	11; 15	11	310	210	330	400	14	14	50	50
160 L	18,5	15	310	254	330	400	14	14	50	50
180 M	22	18,5	328	241	387	448	15	15	60	60
180 L	-	22	328	279	387	448	15	15	60	60

Accessories

- Version with inducer for sizes 040-032-145 to 150-125-260
- Motor shroud made of stainless steel
- Vertically adjustable ball feet or motor feet
- Heatable casing/discharge cover
- Residual drainage of pump casing
- Mounted on a trolley, with switch and power cable
- System for supplying the mechanical seal

Detailed designation

Designation example

Position																																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
V	A	B		0	3	2	-	0	2	5	-	1	4	5		0	4	0	2	K	B		T	8	1	M	E	C	C	S	X	O	A
See name plate and data sheet																											See data sheet						

Designation key

Position	Code	Description
1-4	Pump type	
	V A B	Vitacast Bloc
	V A B I	Vitacast Bloc Inducer
5-16	Size	
	040	Nominal suction nozzle diameter [mm]
	025	Nominal discharge nozzle diameter [mm]
	200	Nominal impeller diameter [mm]
17-19	Motor rating	
	0 0 7	0.7 kW
	0 4 0	4 kW
	5 5 0	55 kW
20	Number of poles	
	2	2 poles
	4	4 poles
	6	6 poles
21	Mounting type	
	K	Ball feet
	T	Round base feet
	M	Motor foot
	L	Bearing bracket
	V	Trolley
22-23	Seal code	
	I	Dead end, internal circulation
	B Q	Dead end, quench
	B	Dead end, without flushing system
24-26	Seal code	
	T 1 8	U2U2VGG
	T 1 9	U2U2EGG
	T 6 4	U2Q1EGG
	T 6 9	BQ1M3GG
	T 6 6	Q1Q1M3GG
	T 6 8	U2Q1VGG
	T 8 0	BQ1VGG
	T 8 1	Q1Q1VGG
	T 8 2	BQ1EGG
	T 8 3	Q1Q1EGG
	T 8 4	Q1U2EGG
	T 8 5	Q1U2VGG
	H 0	BGEGG
	H 0 D	BGVGG
	H 1	BQ1EGG
	H 1 D	BQ1VGG
	H 2	Q1U2EGG
	H 2 D	Q1U2VGG
	H 3	Q1Q1EGG
	H 3 D	Q1Q1VGG
	H 4	U2U2EGG
	H 5	QQEGG**
	H A	U2U2EGG
	Q 7 2	U2U2EGG / BU2EGG
	Q 7 4	U2U2VGG / BU2VGG
	Q 7 8	U2U2VGG / U2U2EGG
	Q 7 9	U2U2M3GG / BU2EGG

Position	Code	Description
	Y 0 6	U2U2EGG
	Y 0 7	BU2EGG
27	Piping connection	
	M	Threaded connection to DIN 11851
	E	Threaded connection to DIN 11853
	B	Threaded connection to DIN 11864-1-GS-A
	S	Threaded connection to SMS standard
	I	Threaded connection to IDF standard
	F	Threaded connection to RJT standard
	U	Tri-Clamp fitting
	D	Clamped connection to DIN 11864-3A
	T	Clamped connection to DIN 32676-A
	V	Clamped connection to ISO 2852
	L	Flange to EN 1092-1
	C	Flange to DIN 11864-2A
	Z	Flange to ASA ASME 150
	A	APV flange
	G	Varivent flange
28	O-ring material (casing/impeller)	
	E	EPDM 70 (FDA, USP Class VI, 3A)
	V	FPM 75 (FDA, USP Class VI, 3A)
	T	PTFE (FDA)
	M	FEP (encapsulated) (FDA)
	K	Kalrez (FFKM) (FDA)
29	Casing material	
	C	1.4409
	D	1.4469/1.4410
	X	Hastelloy C276
30	Impeller material	
	C	1.4409
	D	1.4469/1.4410
	X	Hastelloy C276
31	Motor shroud	
	S	With shroud
	O	Without shroud
32	Special design	
	7)	Standard
	X	Special design, incl. ATEX
33	Drain	
	P	Casing drain via pipeline
	V	Casing drain via valve
	D	Casing drain with plug
	O	No drain
34	Generation	
	A	Generation A, current

7) Blank

Hygienic Pump

Vitastage

Type Series Booklet



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Hygienic Pumps

Sterile Process Pumps in Close-coupled Design

Vitastage



Main applications

- Food and beverage industry
- Chemical industry
- Further industrial applications with moderate hygienic requirements

Fluids handled

- Pure liquids not mechanically or chemically aggressive to the pump

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 12,5
Head	H [m]	≤ 150
Operating pressure	p [bar]	≤ 16
Fluid temperature	T [°C]	≤ 140 (higher on request)

Designation

Example: Vitastage 10/3/75 2 B T

Designation key

Code	Description
Vitastage	Type series
10	Size
3	Number of stages
75	Motor rating (7.5 kW × 10)
2	Number of poles
B	Installation type
T	Seal design

Design details

Design

- Standard design with materials to Regulation (EC) No. 1935/2004

Design

- High-pressure centrifugal pump
- Casing in ring-section design
- Multistage

Installation

- Horizontal/vertical installation

Impeller type

- Closed radial impeller with multiply curved vanes

Shaft seal

- Standardised mechanical seal to EN 12756 (⇒ Page 5)

Drive

- Self-cooling IEC squirrel cage motor
- Winding 50 Hz, 230 V/400 V up to 4 kW
- Winding 50 Hz, 400 V/690 V from 5.5 kW
- Type of construction B5/B35
- IP55 enclosure
- Thermal class F
- Other motors on request

Materials

Component	Material
Pump casing	1.4408/1.4401 (AISI 316)
Impeller/diffuser	1.4401 (AISI 316)
Impeller nut	1.4401 (AISI 316)
Welle	1.4401 (AISI 316)
Motor housing	Aluminium/Cast iron
Motor shroud	1.4301 (AISI 304)
Connections	1.4408 (AISI 316)
Installation parts	1.4301 (AISI 304)

Certifications

Overview

Label	Effective in:	Note
	All countries	Certified quality management to ISO 9001
	All countries	Elastomers FDA, 3A, USP class VI certified

Connections

Horizontal installation

- Axial suction nozzle
- Tangential discharge nozzle

Vertical installation

- Horizontal suction nozzle
- Tangential discharge nozzle

Types of connection

- Threaded connection to DIN 11851
- Threaded connection to SMS standard
- Other connection types on request

Technical details

Mechanical seal design

Mechanical seal material, elastomers, static sealing elements

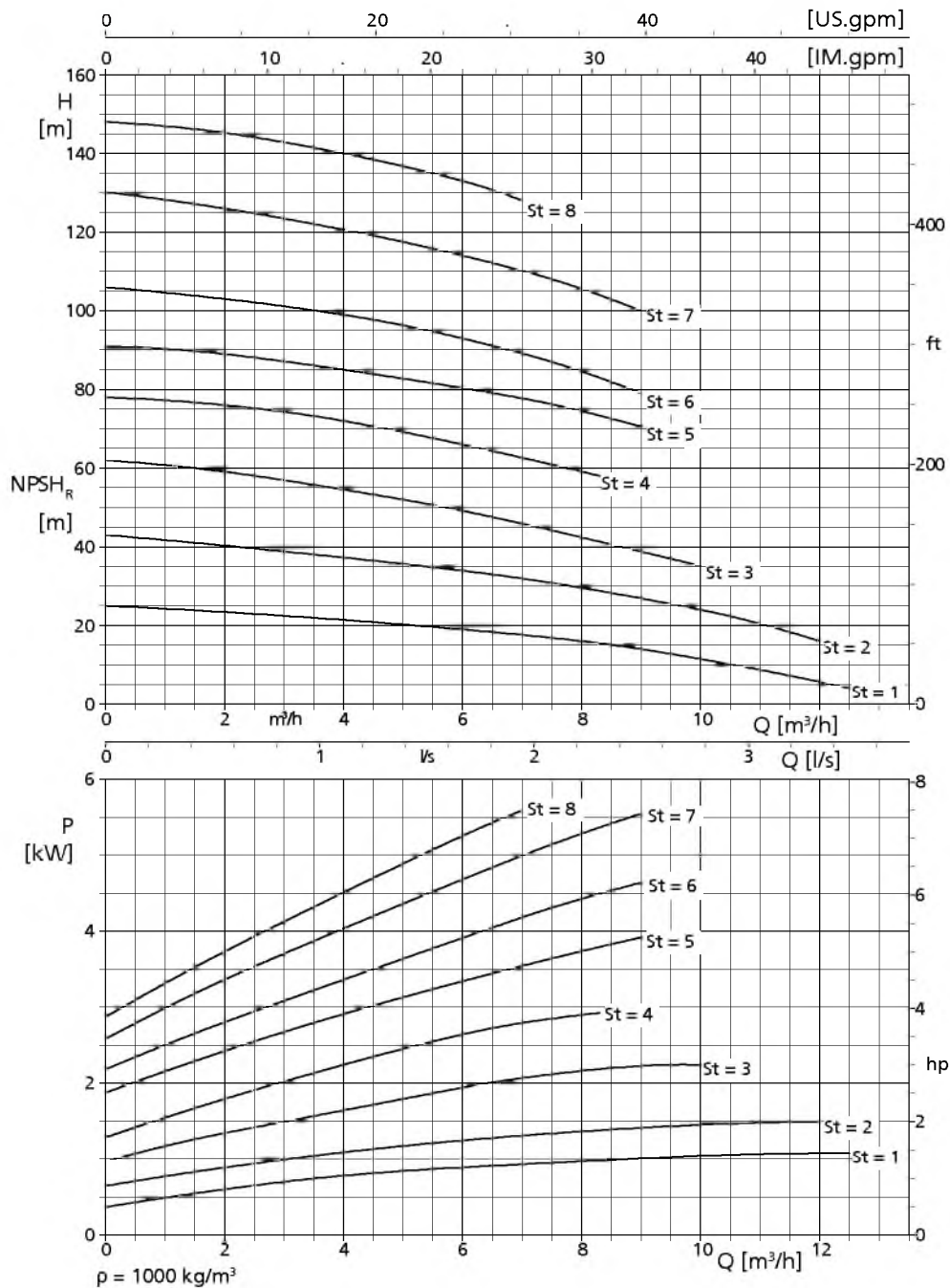
Description	Material
Mechanical seal (single internal mechanical seal)	SiC/CARB/EPDM ¹⁾ , SiC/TUC/EPDM, SiC/SiC/EPDM
Elastomers	EPDM ¹⁾ , FPM, FFPM, PTFE
Static sealing elements	EPDM ¹⁾ , NBR, FPM, FFPM, FEP

Key

Code	Material
CARB	Graphite
EPDM	Ethylene propylene diene rubber
TUC	Tungsten carbide
SiC	Silicon carbide
NBR	Nitrile rubber
FPM	Fluoroelastomer (Viton)
FFPM	Perfluoroelastomer
PTFE	Polytetrafluoroelastomer
FEP	Fluorocarbon (PTFE-encapsulated silicone)

1) Standard design

Characteristic curves



Dimensions

Horizontal installation – version without motor shroud

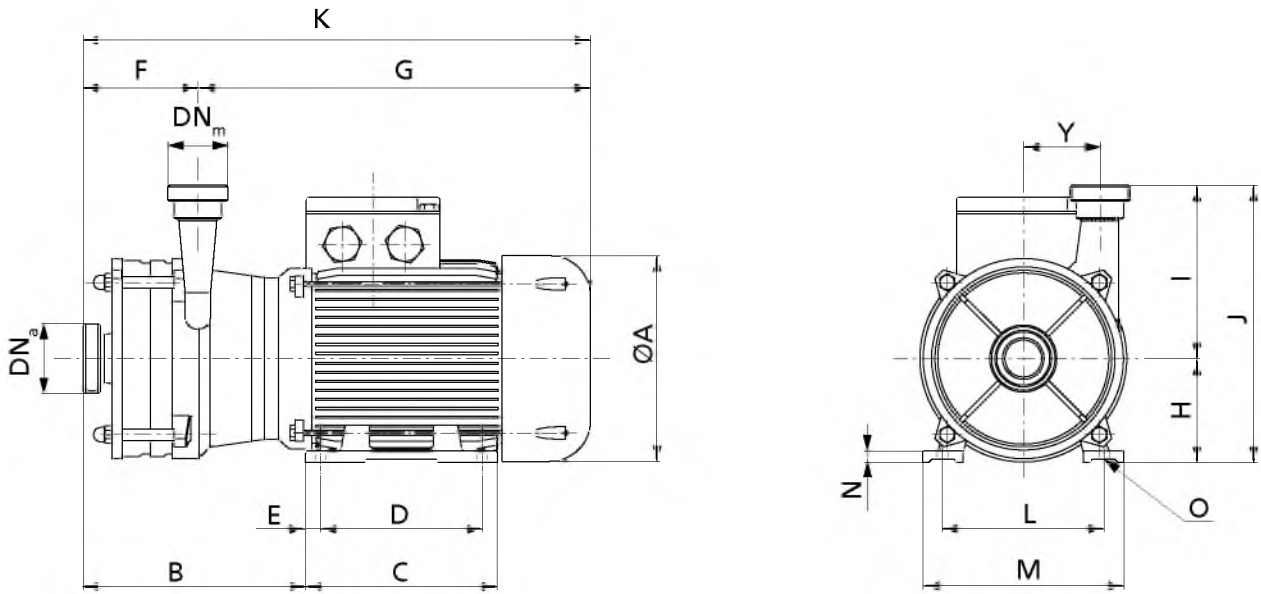


Fig. 1: Vitastage 05 without motor shroud

Dimensions

Size	P	DN _s	DN _m	ØA	B	C	D	E	F	G	K	H	J	I	L	M	N	O	Y	[kg]
	[kW]	[mm]																		
05/1	1,1	32	25	162	155	118	100	9	56	314	370	90	240	150	125	150	8	9,5	66,5	18
05/2	1,5	32	25	181	182	143	100	12,5	80	314	394	90	240	150	140	165	10	10	66,5	21
05/3	2,2	32	25	181	206	143	100	12,5	104	337	441	90	240	150	140	165	10	10	66,5	28
05/4	3,0	32	25	202	236	176	140	13	128	337	465	90	240	150	160	196	12	12	66,5	43

Horizontal installation – version with motor shroud

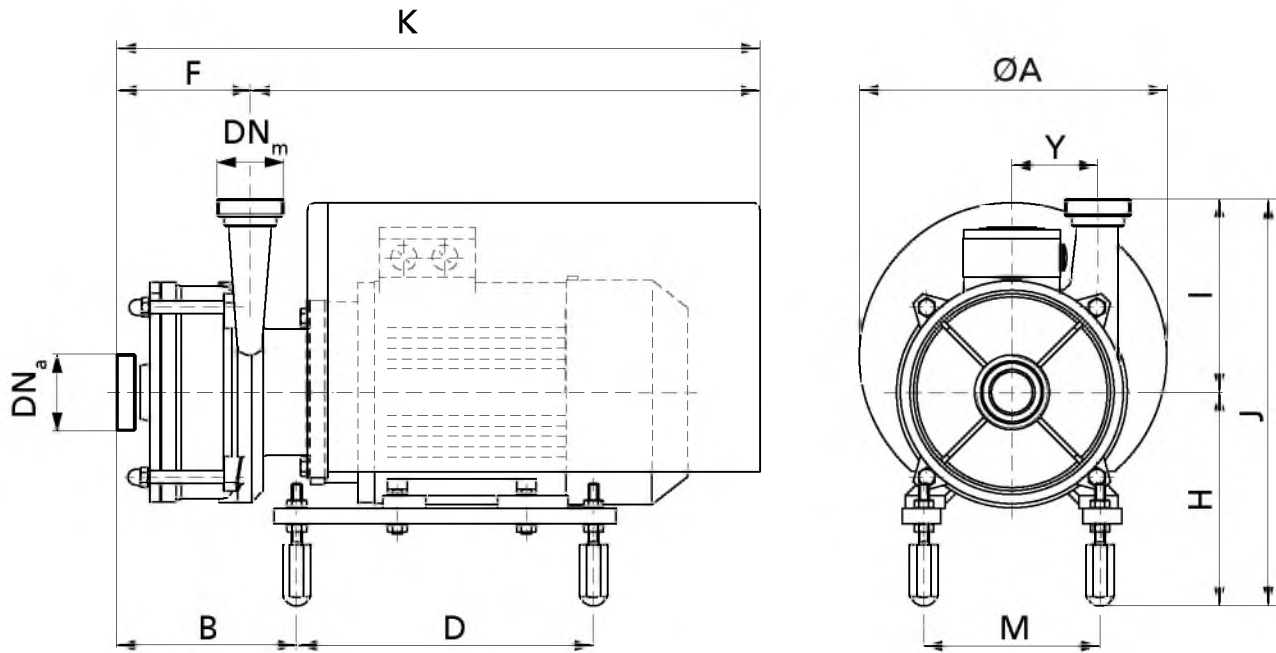


Fig. 2: Vitastage 05 with motor shroud

Dimensions

Size	P	DN _a	DN _m	ØA	B	D	F	G	H	I	K	J	M	Y	[kg]
	[kW]	[mm]													
05/1	1,1	32	25	238,5	92	230	56	395	178	150	451	315	136,5	66,5	22
05/2	1,5	32	25	238,5	118	230	80	395	178	150	477	315	136,5	66,5	25
05/3	2,2	32	25	238,5	140	230	104	395	178	150	499	315	136,5	66,5	32
05/4	3,0	32	25	238,5	164	230	128	395	178	150	523	315	136,5	66,5	48

Vertical installation

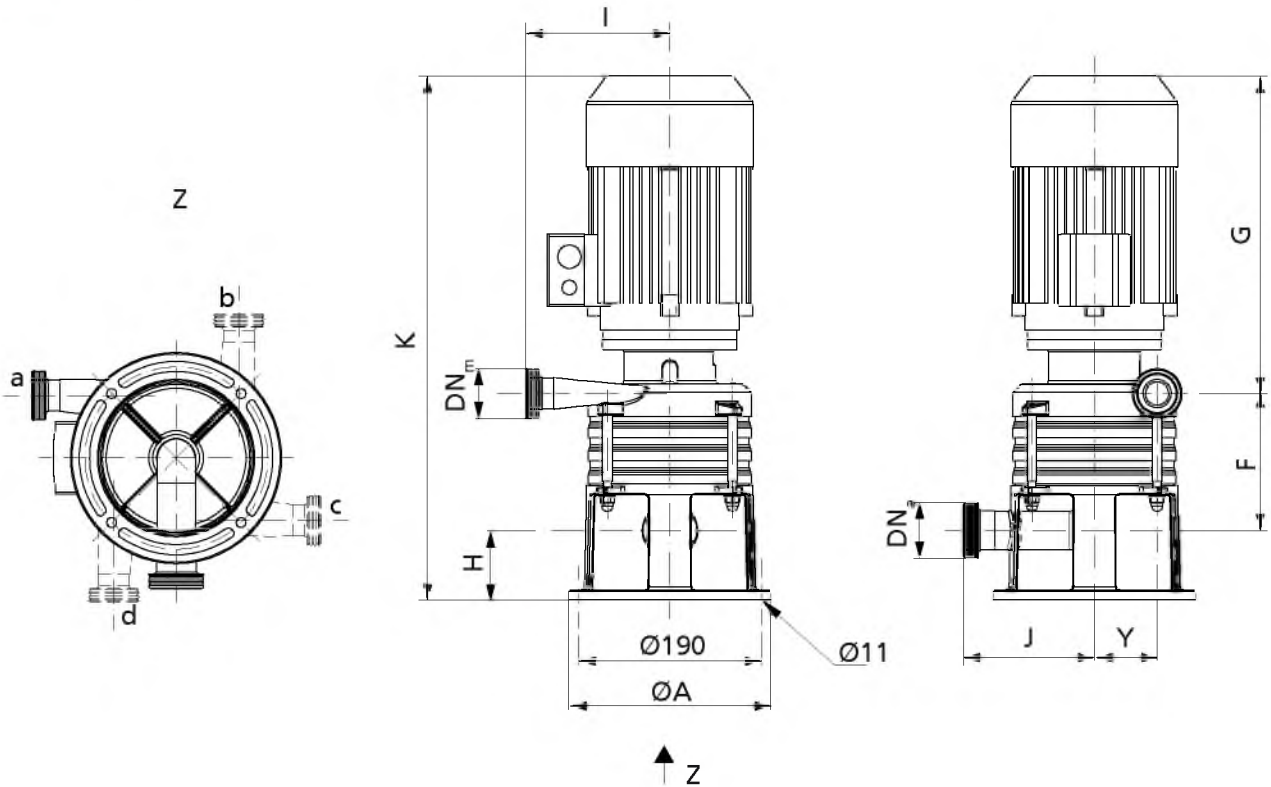


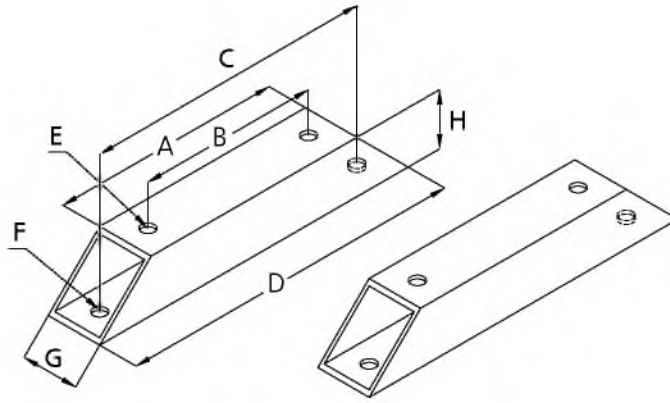
Fig. 3: Vitastage 05, vertical installation, discharge nozzle position

a	Discharge nozzle 270°
b	Discharge nozzle 0°/360°
c	Discharge nozzle 90°
d	Discharge nozzle 180°

Dimensions

Size	P	DN _a	DN _m	ØA	F	G	H	I	J	K	Y	[kg]
	[kW]	[mm]										
05/1	1,1	32	25	220	69	316	71	150	136	456	65	19
05/2	1,5	32	25	220	93	316	71	150	136	480	65	22
05/3	2,2	32	25	220	117	346	71	150	136	534	65	29
05/4	3,0	32	25	220	141	346	71	150	136	558	65	40
05/5	4,0	32	25	220	165	371	71	150	136	607	65	42
05/6	4,0	32	25	220	189	371	71	150	136	631	65	43
05/7	5,5	32	25	220	213	386	71	150	136	670	65	55
05/8	5,5	32	25	220	237	386	71	150	136	694	65	56

Motor feet



Motor foot dimensions [mm]

Motor size (IEC-DIN)	p [kW]		A	B	C	D	E	F	G	H
	2-pole	4-pole								
	71	0,37; 0,55									0,25; 0,37	110	90	150	190	10	10	40	40
80	0,75; 1,1	0,55; 0,75	130	100	170	210	10	10	40	40
90 S	1,5	1,1	160	100	200	240	10	10	40	40
90 L	2,2	1,5	160	125	200	240	10	10	40	40
100 L	3	3	180	140	230	280	12	12	50	50
112 M	4	4	180	140	230	280	12	12	50	50
132 S	5,5; 7,5	5,5	226	140	266	346	12	12	60	60
132 M	-	7,5	226	178	266	346	12	12	60	60
160 M	11; 15	11	310	210	330	400	14	14	50	50
160 L	18,5	15	310	254	330	400	14	14	50	50
180 M	22	18,5	328	241	387	448	15	15	60	60
180 L	-	22	328	279	387	448	15	15	60	60

Pump accessories

- Stainless steel motor shroud
- Mounted on a trolley, with switch and power cable
- Vertically adjustable ball feet

Dry-installed Volute Casing Pump

KWP-Bloc

Type Series Booklet



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Centrifugal Pumps with Shaft Seal

Dry-installed Volute Casing Pumps

KWP-Bloc



Main applications

- Waste water management
- Process engineering
- General industry
- Plant engineering

Fluids handled

- Contaminated fluids
- Fluids containing solids
- Pre-treated waste water
- Industrial and municipal waste water
- All types of slurries without stringy material

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 325
	Q [l/s]	≤ 90
Head	H [m]	≤ 100
Operating temperature	T [°C]	GNG: -10 to +100
		GDNG: -10 to +100
		DDDD: -20 to +100
Operating pressure	p [bar]	≤ 10
Density	ρ [kg/dm ³]	≤ 1.1

Designation

Example: KWP K 125-100-0250 GDNG 10

Designation key

Code	Description	
KWP	Type series	
K	Impeller type	
	K	Channel impeller
	O	Open multi-channel impeller ¹⁾
F	Free-flow impeller	
125	Nominal suction nozzle diameter [mm]	
100	Nominal discharge nozzle diameter [mm]	
0250	Nominal impeller diameter [mm]	
G	Casing material (⇒Page 5)	
D	Impeller material (⇒Page 5)	
N	Wear plate material (⇒Page 5)	
G	Discharge cover material (⇒Page 5)	
10	Design version	

Further information on the designation

(⇒Page 27)

Design details

Design

- Volute casing pump
- Radially split volute casing
- Close-coupled design
- Pump casing fitted with a wear plate
- Single-stage
- Single-entry

Installation types

- Horizontal installation
- Vertical installation

Shaft seal

- Uncooled mechanical seal with/without oil reservoir²⁾

Impeller type

- Various application-oriented impeller types (⇒Page 6)

Bearings

- Grease-packed deep groove ball bearings

Automation

Automation options:

- PumpDrive
- PumpMeter

Connections

- Suction flange with blind holes to DIN 2501, PN 10/16 with tapped blind holes of 1,25 d for hexagon head bolts
- Discharge flange with clearance holes to EN 1092-2, PN 16/21/B

¹⁾ Available on request only

²⁾ Pump sets for vertical installation are fitted with an oil reservoir. For horizontal installation, an oil reservoir can be fitted as an option.

Materials

Materials depending on material variant

Part No.	Description	Material variant		
		DDDD	GDNG	GNGG
101	Pump casing	Noridur 1.4593	EN-GJL-250	EN-GJL-250
135.01	Wear plate, suction side	Noridur 1.4593	ERN	ERN
146	Intermediate lantern	EN-GJL-250	EN-GJL-250	EN-GJL-250
163	Discharge cover	Noridur 1.4593	EN-GJL-250	EN-GJL-250
210	Shaft	1.4462	1.4021+QT700	1.4021+QT700
230	Impeller	Noridur 1.4593	Noridur 1.4593	ERN
509	Intermediate ring	EN-GJL-250	-	-
524.01	Shaft protecting sleeve	1.4539	1.4539	1.4539
906	Impeller screw	1.4539	C35E+N	C35E+N

Coating and preservation

- Coating and preservation to KSB standard

Warranty

Warranties are given within the scope of the valid delivery conditions.

Product benefits

- Easy to dismantle due to back pull-out design; no need to remove the pump casing from the piping
- High operating reliability by mechanical seal in casing cover with conical seal chamber for enhanced circulation and self-venting
- Long service life through wear-resistant diagonal clearance and impeller with front vanes
- Back vanes for axial thrust balancing and shaft seal balancing
- Oil level gauge and overflow
- High operating reliability with all pressure-retaining components made of quality casting and corrosion/wear allowance
- Fixed bearing prevents axial loads on the motor bearing.
- Maintenance-free bearings grease-packed for life


Selection information

Oil supply

The pump is, as a rule, operated without an oil supply. If an oil supply is required (possible reasons: temporary negative pressure on suction side, toxicity of fluid handled, etc.), this must be specified.

Certifications

Overview

Label	Effective in:	Note
	All countries	Certified quality management to ISO 9001

Acceptance tests and warranty

- Materials testing
 - Test report 2.2 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test

The operating point of each pump is guaranteed to ISO 9906/3B.

The following acceptance tests can be performed and certified at extra charge:

 - Performance test to ISO 9906
 - NPSH test
- Other inspections/tests on request

Programme overview / selection tables

Programme overview

Impeller types and material variants per pump size

Size	KWP K			KWP O			KWP F		
	DDDD	GDNG	GNNG	DDDD	GDNG	DDDD	GDNG	GNNG	
065-040-0250	X	X	X	-	-	-	-	-	
065-050-0200	X	X	X	X	X	-	-	-	
065-050-0201	-	-	-	-	-	X	X	X	
080-040-0315	X	X	X	-	-	-	-	-	
080-065-0200	X	X	X	X	X	-	-	-	
080-065-0201	-	-	-	-	-	X	X	X	
080-065-0313	X	X	X	-	-	-	-	-	
080-065-0315	X	X	X	X	X	-	-	-	
100-080-0250	X	X	X	X	X	-	-	-	
100-080-0251	-	-	-	-	-	X	X	X	
100-080-0311	-	-	-	-	-	X	X	X	
100-080-0315	X	X	X	-	-	-	-	-	
125-100-0250	X	X	X	X	X	-	-	-	
125-100-0251	-	-	-	-	-	X	X	X	
125-100-0253	X	X	X	-	-	-	-	-	
125-100-0315	X	X	X	-	-	-	-	-	

Impellers

	Closed multi-channel impeller (impeller type K)	Suitable for the following fluids contaminated, solids-laden, non-gaseous fluids without stringy material
	Open multi-vane impeller (impeller type O)	Suitable for the following fluids uncontaminated or slightly contaminated fluids with little entrapped gas as well as fluids liable to form deposits and bunch
	Free-flow impeller (impeller type F)	Suitable for the following fluids fluids containing solids and stringy material as well as fluids with entrapped air or entrapped gas

Pump/motor combinations

Motor rating and number of motor poles depending on the pump size³⁾

Size	Motor rating [kW]																																
	1,1		1,5		2,2		3,0		4,0		5,5		7,5		11,0		15,0		19,0		22,0												
	Number of motor poles																																
	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6									
Motor																																	
	90S	90L	90S	90L	100L	90L	100L	112L	100L	100L	132S	112M	112M	132M	132S	132S	132M	132S	132M	160M	160M	160M	160L	160M	160L	180L	160L	180M	200L	180M	180L	200L	
065-040-0250	-	X	X	-	X	X	-	X	-	-	X	-	X	X	-	X	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-
065-050-0200	-	-	X	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	-	X	-	-	X	-	-	X	-	-	
065-050-0201	-	X	X	-	X	X	-	X	-	X	X	-	X	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-
080-040-0315	-	X	X	-	X	X	-	X	-	X	X	-	X	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-
080-065-0200	-	X	X	-	X	X	-	X	-	X	X	-	X	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-

³⁾ Electric motors (< 5.5 kW: type of construction V1; ≥ 5.5 kW: type of construction V15) are used as standard.

Size	Motor rating [kW]																																
	1,1		1,5		2,2		3,0		4,0		5,5		7,5		11,0		15,0		19,0		22,0												
	Number of motor poles																																
	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6	2	4	6									
	Motor																																
	90S	90L	90S	90L	100L	90L	100L	112L	100L	100L	132S	112M	112M	132M	132S	132S	132M	132S	132M	160M	160M	160M	160L	160M	160L	180L	160L	180M	200L	180M	180L	200L	
080-065-0201	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
080-065-0313	-	-	X	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	
080-065-0315	-	-	X	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	
100-080-0250	-	-	X	-	X	X	-	X	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
100-080-0251	-	-	X	-	X	X	-	X	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
100-080-0311	-	-	-	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	
100-080-0315	-	-	-	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	
125-100-0250	-	-	X	-	X	X	-	X	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
125-100-0251	-	-	X	-	X	X	-	X	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
125-100-0253	-	-	X	-	X	X	-	X	X	-	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-	X	-
125-100-0315	-	-	-	-	-	X	-	-	X	-	-	X	-	X	X	-	X	X	-	X	X	-	X	-	X	-	X	-	X	-	X	-	

Bearings

Grease-packed deep groove ball bearing

Motor	Deep groove ball bearing (to DIN 625)
90S, 90L, 100L, 112M	6012 C3 2RS
132S, 132M, 160M, 160L, 180M, 180L	6312 C3 2RS

Shaft seal

Overview of mechanical seals

Design ⁴⁾	Make	Type	Material combination to EN 12756
Single mechanical seal, balanced	KSB	4 KBL	U ₁ U ₁ VGG ₁
			Q ₁ Q ₁ VGG ₁
Single mechanical seal, unbalanced	Burgmann ⁵⁾	MG1 - G6	Q ₁ Q ₁ VGG
			Q ₁ Q ₁ EGG
	John Crane	2100	Q ₅ Q ₅ VGG
			Q ₅ Q ₅ EGG

Pressure limits and temperature limits

Pressure limits and temperature limits of the pump

Material variant	Fluid temperature	Operating pressure	Test pressure
	[°C]	[bar]	[bar]
DDDD	-20 to +100	≤ 10	15
GDNG	-10 to +100	≤ 10	15
GNGG	-10 to +100	≤ 10	15

⁴⁾ Only single mechanical seals are fitted in the conical discharge chamber.

⁵⁾ Other mechanical seals to EN 12756 (DIN 24960), version I1k can be fitted

Technical data

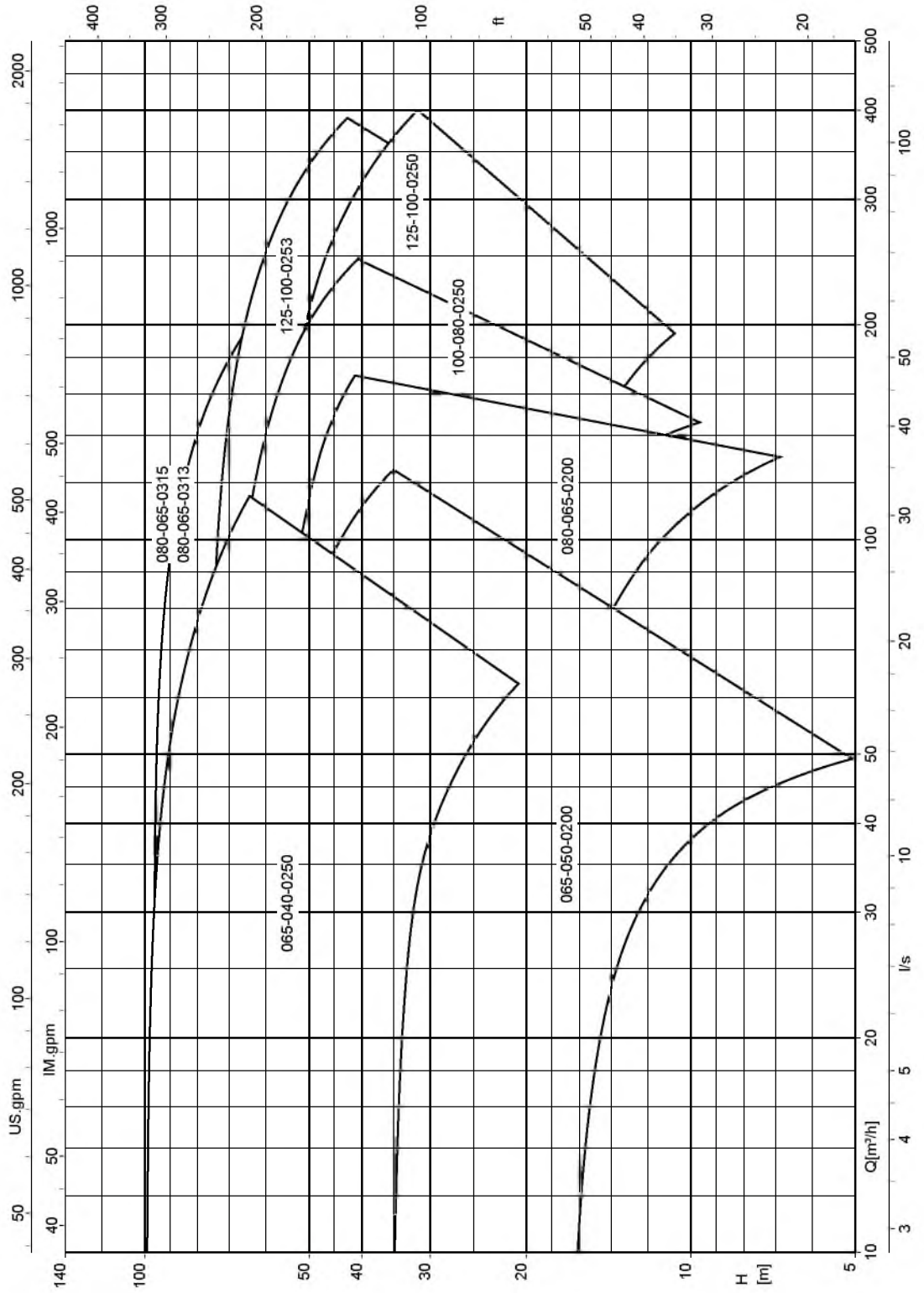
Technical data

Size	Impeller diameter						Free passage			Shaft diameter				Weight ⁶⁾	
	KWP K		KWP O		KWP F		KWP K	KWP O	KWP F	Impeller	Shaft protecting sleeve 4KBL	Shaft protecting sleeve standardised mechanical seal	Bearing	Motor 90S, 90L, 100L, 112M	Motor 132S, 132M 160M, 160L, 180M, 180L
	Min.	Max.	Min.	Max.	Min.	Max.									
065-040-0250	170	260	-	-	-	-	15	-	-	27	31	43	60	75	85
065-050-0200	120	209	160	209	-	-	34	-	-	30	38	43	60	70	80
065-050-0201	-	-	-	-	130	209	-	-	45	-	31	43	60	70	80
080-040-0315	230	320	-	-	-	-	15	-	-	27	31	43	60	115	125
080-065-0200	145	209	160	209	-	-	46	30	-	27	31	43	60	75	85
080-065-0201	-	-	-	-	145	209	-	-	55	27	31	43	60	75	85
080-065-0313	230	320	-	-	-	-	15	-	-	35	38	43	60	110	120
080-065-0315	230	320	230	320	-	-	42	25	-	35	38	43	60	110	120
100-080-0250	170	260	170	260	-	-	50	36	-	27	31	43	60	90	100
100-080-0251	-	-	-	-	170	260	-	-	60	27	31	43	60	90	100
100-080-0311	-	-	-	-	260	320	-	-	50	35	38	43	60	-	130
100-080-0315	260	320	-	-	-	-	44	-	-	35	38	43	60	-	130
125-100-0250	180	260	180	260	-	-	60	50	-	35	38	43	60	100	110
125-100-0251	-	-	-	-	180	260	-	-	50	35	38	43	60	100	110
125-100-0253	180	260	-	-	-	-	28	-	-	35	38	43	60	100	110
125-100-0315	230	320	-	-	-	-	54	-	-	35	38	43	60	125	135

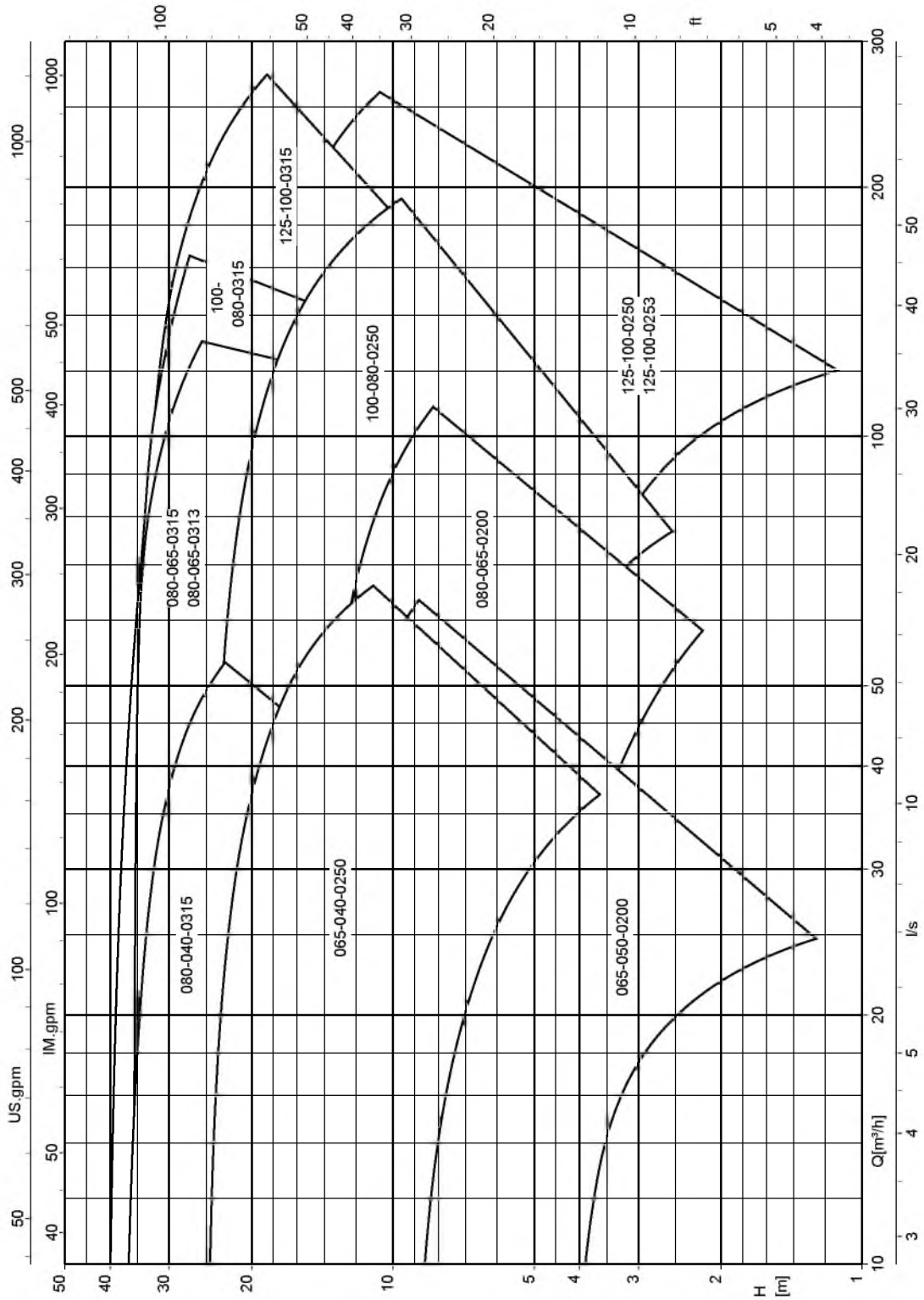
⁶⁾ The weights indicated refer to the pump without motor, mounting plate or foundation rails

Selection charts

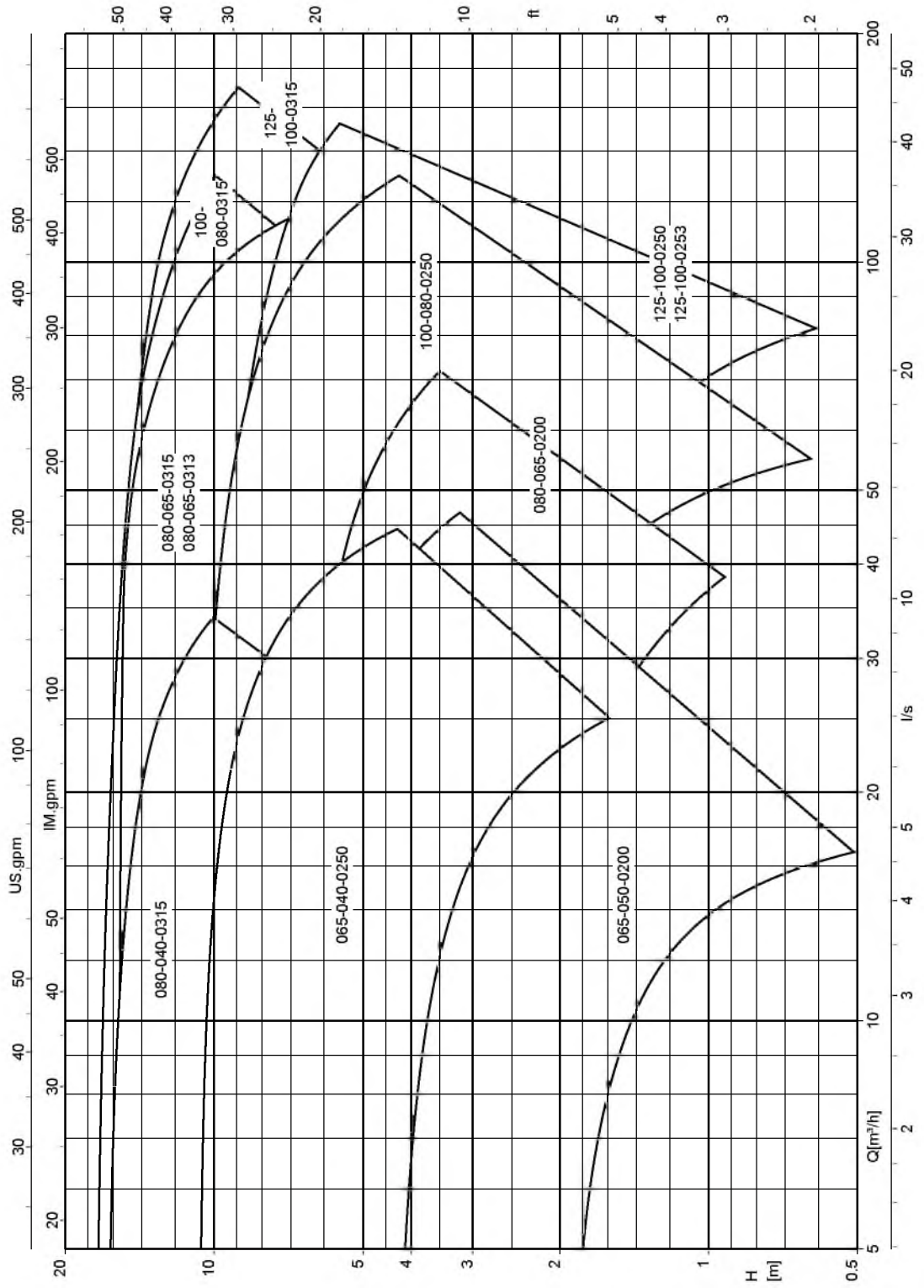
KWP K, n = 2900 rpm



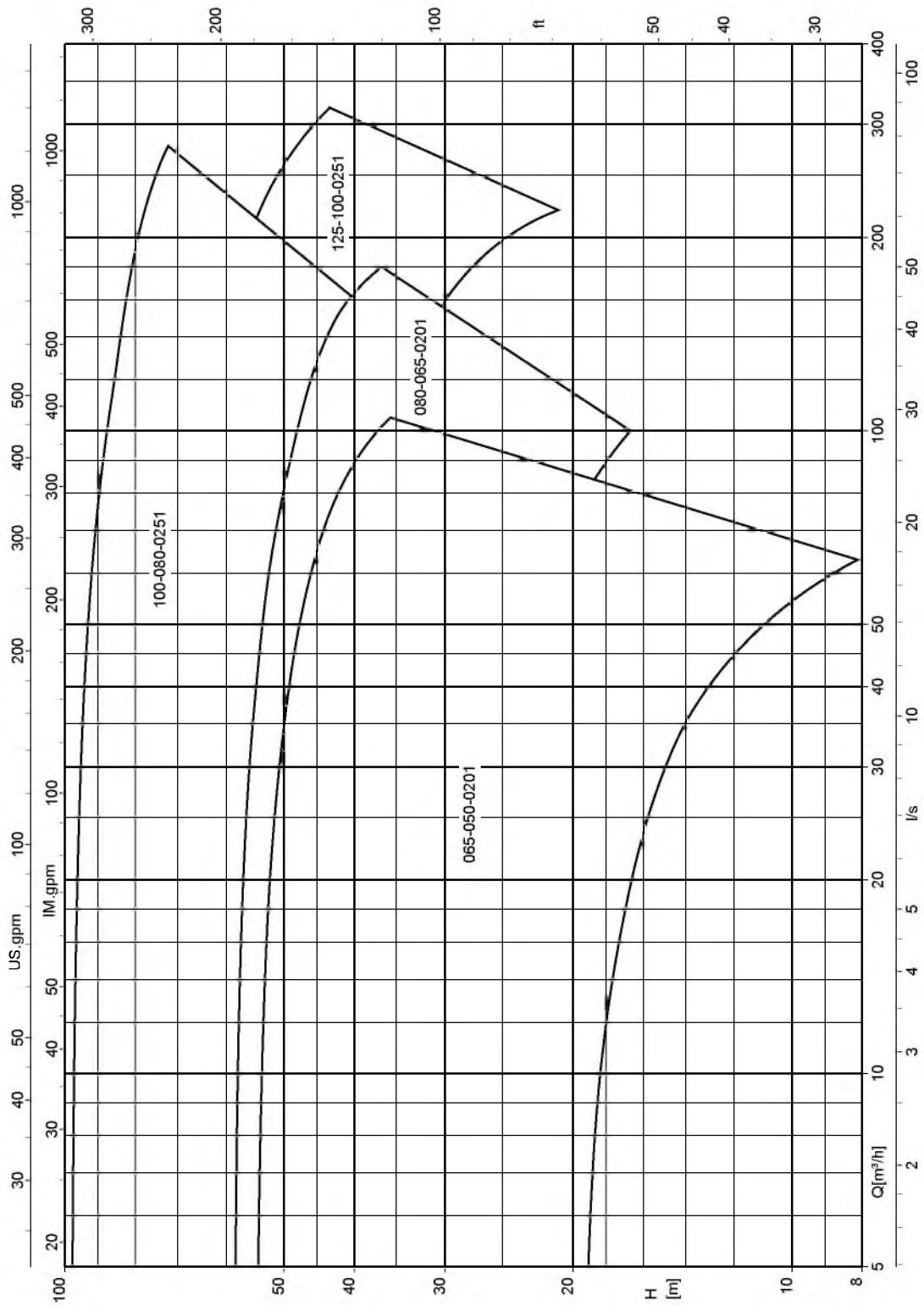
KWP K, n = 1450 rpm



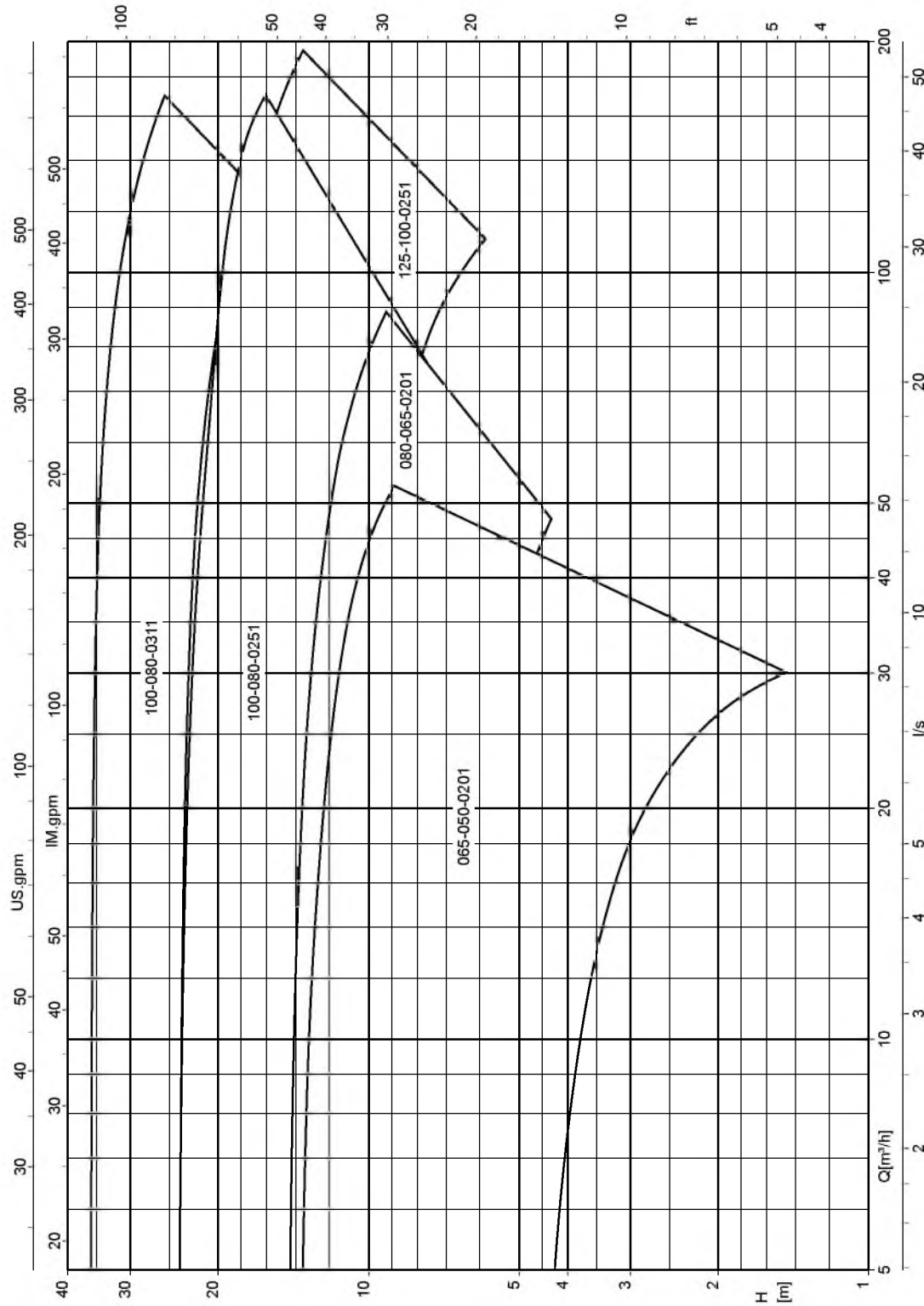
KWP K, n = 960 rpm



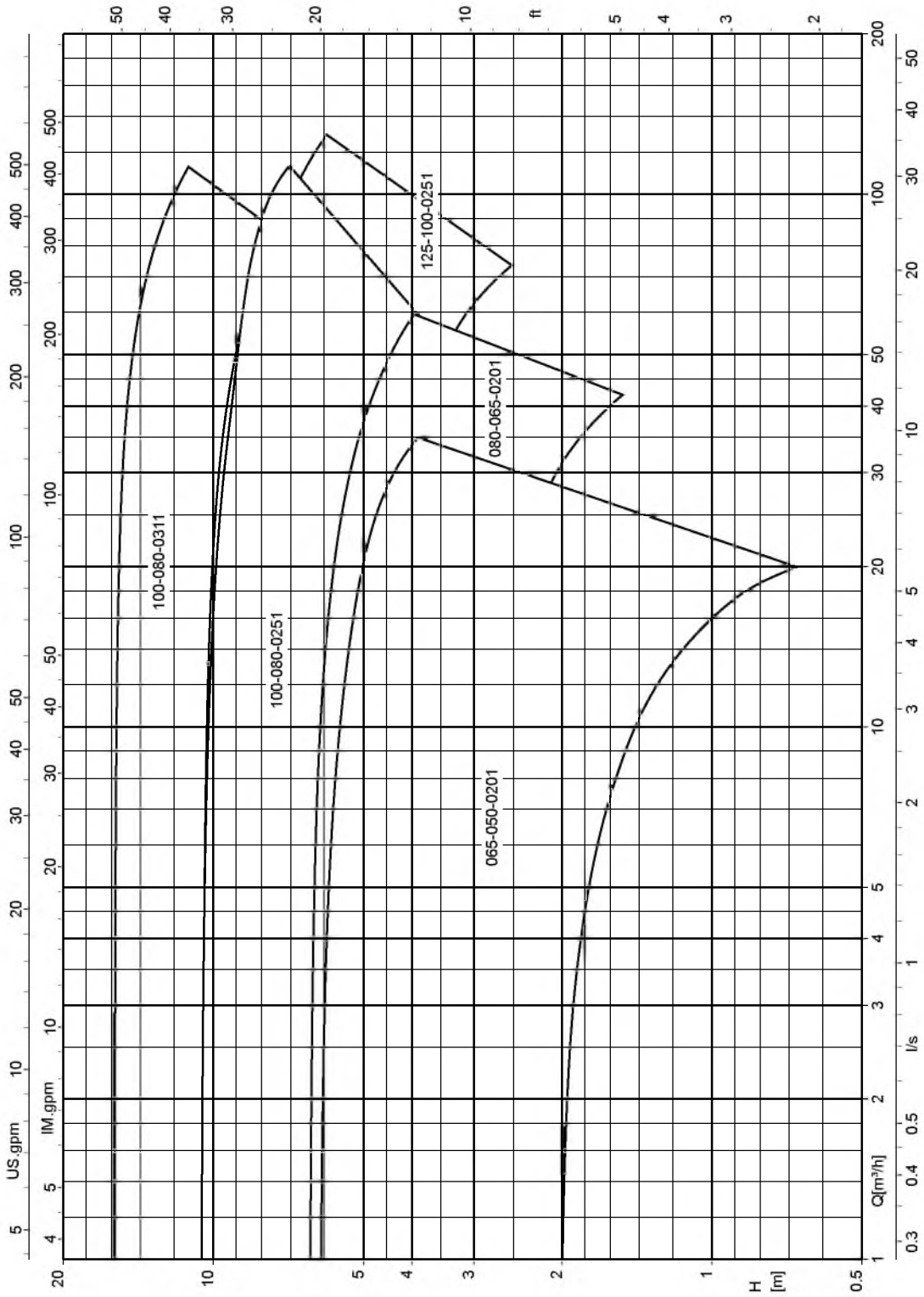
KWP F, n = 2900 rpm



KWP F, n = 1450 rpm

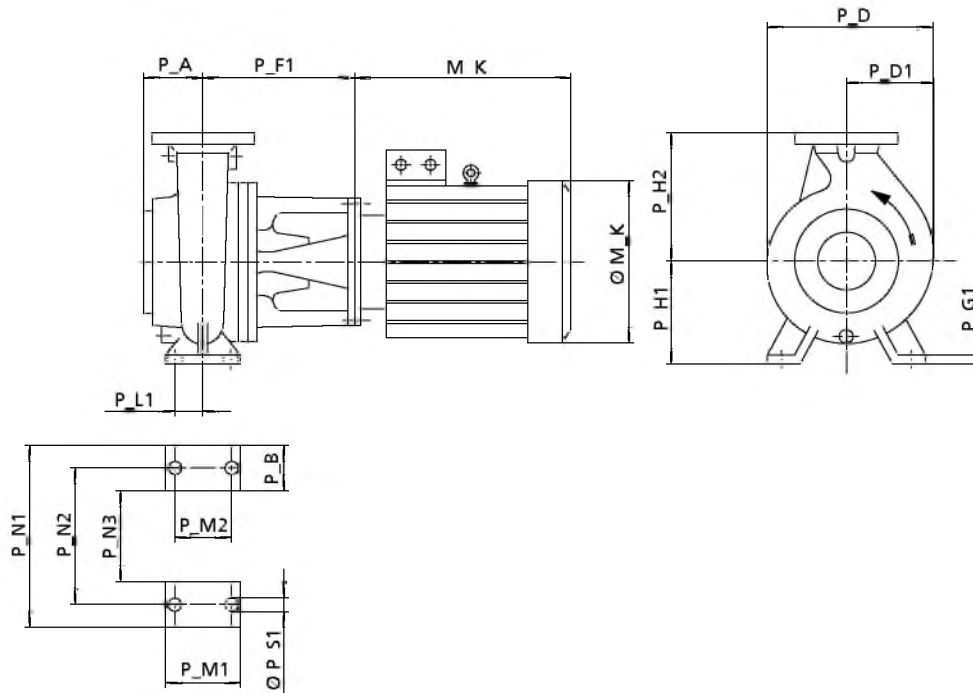


KWP F, n = 960 rpm



Dimensions and connections

Pump set dimensions



Dimensions

Pump dimensions in [mm] depending on the pump size

Size	P_A	P_B	P_D	P_D1	P_G1	P_H1	P_H2	P_L1	P_M1	P_M2	P_N1	P_N2	P_N3	P_S1
065-040-0250 ⁷⁾	100	65	356	178	16	180	225	47,5	125	95	320	250	190	16
080-040-0315	125	80	402	204	18	225	250	60	160	120	400	315	1240	18
065-050-0200 ⁷⁾	112	50	270	138	14	160	200	35	100	70	265	212	165	17
065-050-0201 ⁷⁾	112	50	270	138	14	160	200	35	100	70	265	212	165	17
080-065-0200 ⁷⁾	125	65	291	152	16	180	225	47,5	125	95	320	250	190	17
080-065-0201 ⁷⁾	125	65	291	152	16	180	225	47,5	125	95	320	250	190	17
080-065-0313	140	80	388	193	18	225	280	60	160	120	400	315	240	21
080-065-0315	140	80	388	193	18	225	280	60	160	120	400	315	240	21
100-080-0250	125	80	352	183	18	225	280	60	160	120	400	315	240	21
100-080-0251	125	80	352	183	18	225	280	60	160	120	400	315	240	21
100-080-0311	140	80	411	206	18	225	280	60	160	120	400	315	240	21
100-080-0315	140	80	411	206	18	225	280	60	160	120	400	315	240	21
125-100-0250	140	80	379	199	18	225	280	60	160	120	400	315	240	21
125-100-0251	140	80	379	199	18	225	280	60	160	120	400	315	240	21
125-100-0253	140	80	379	199	18	225	280	60	160	120	400	315	240	21
125-100-0315	140	80	420	220	18	250	315	60	180	120	400	315	240	21

Dimensions [mm] of motors 90S, 90L, 100L, 112M, 132S depending on the pump size

Size	90S			90L			100L			112M			132S		
	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K
065-040-0250	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
080-040-0315	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
065-050-0200	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
065-050-0201	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220

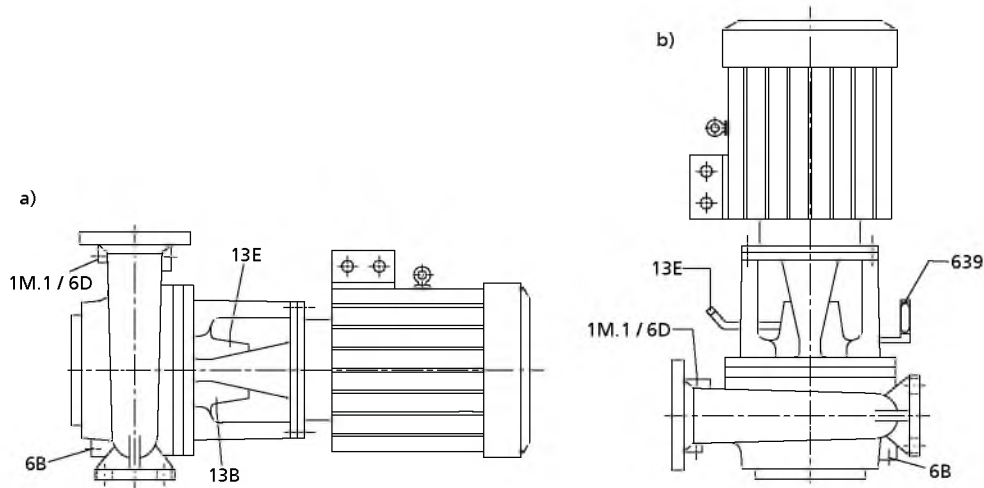
⁷⁾ For combinations with motor 132S, 132M, 160M, 160L, 180M or 180L foundation rails or mounting plates are required. For all other combinations they are optional.

Size	90S			90L			100L			112M			132S		
	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K
080-065-0200	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
080-065-0201	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
080-065-0313	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
080-065-0315	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
100-080-0250	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
100-080-0251	262	235	186	262	260	186	262	302	200	262	323	224	323	354	220
100-080-0311	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
100-080-0315	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
125-100-0250	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
125-100-0251	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
125-100-0253	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220
125-100-0315	-	-	-	-	-	-	274	302	200	274	323	224	335	354	220

Dimensions [mm] of motors 132M, 160M, 160L, 180M, 180L depending on the pump size

Size	132M			160M			160L			180M			180L		
	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K	P_F1	M_K	Ø M_K
065-040-0250	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
080-040-0315	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
065-050-0200	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
065-050-0201	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
080-065-0200	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
080-065-0201	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
080-065-0313	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
080-065-0315	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
100-080-0250	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
100-080-0251	323	411	260	323	446	260	323	527	330	323	533	330	-	-	-
100-080-0311	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
100-080-0315	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
125-100-0250	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
125-100-0251	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
125-100-0253	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330
125-100-0315	335	411	260	335	446	260	335	527	330	335	533	330	335	552	330

Connections



Connections a) Horizontal installation b) Vertical installation

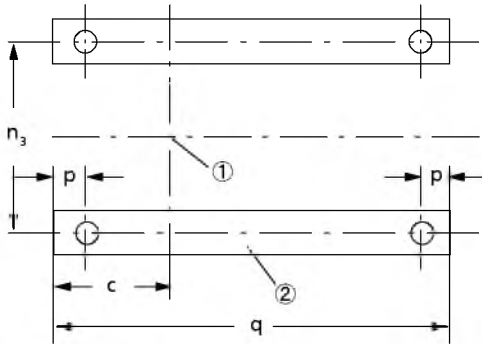
1M.1	Pressure gauge	13B	Oil drain / oil level gauge
6B	Casing drain	13D	Oil dip stick / vent
6D	Vent	639	Oil level gauge

Pump connections depending on the pump size

Size	1M.1	6B	6D	13B	13D	639
065-040-0250	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
065-050-0200	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
065-050-0201	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
080-040-0315	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
080-065-0200	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
080-065-0201	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
080-065-0313	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
080-065-0315	G 1/2	G 3/4	G 1/2	G 1/4	G 1/2	G 1/4
100-080-0250	G 1	G 3/4	G 1	G 1/4	G 1/2	G 1/4
100-080-0251	G 1	G 3/4	G 1	G 1/4	G 1/2	G 1/4
100-080-0311	G 1	G 3/4	G 1	G 1/4	G 1/2	G 1/4
100-080-0315	G 1	G 3/4	G 1	G 1/4	G 1/2	G 1/4
125-100-0250	G 1	G 1	G 1	G 1/4	G 1/2	G 1/4
125-100-0251	G 1	G 1	G 1	G 1/4	G 1/2	G 1/4
125-100-0253	G 1	G 1	G 1	G 1/4	G 1/2	G 1/4
125-100-0315	G 1	G 1	G 1	G 1/4	G 1/2	G 1/4

Accessories

Foundation rail



Foundation rail dimensions

①	Pump centre
②	U80 DIN 1026, overall height 45 mm

Foundation rail⁸⁾

Size	Motor										c [mm]	n ₃ [mm]	p [mm]	q [mm]	[kg]
	90S	90L	100L	112M	132S	132M	160M	160L	180M	180L					
065-040-0250	X	X	X	X	-	-	-	-	-	-	163	250	50	550	10
	-	-	-	-	X	X	X	X	X	X	183	274	60	850	15
065-050-0200	X	X	X	X	-	-	-	-	-	-	150	212	50	550	10
	-	-	-	-	X	X	X	X	X	X	170	236	60	850	15
065-050-0201	X	X	X	X	-	-	-	-	-	-	150	212	50	550	10
	-	-	-	-	X	X	X	X	X	X	170	236	60	850	15
080-040-0315	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
080-065-0200	X	X	X	X	-	-	-	-	-	-	163	250	50	550	10
	-	-	-	-	X	X	X	X	X	X	183	274	60	850	15
080-065-0201	X	X	X	X	-	-	-	-	-	-	163	250	50	550	10
	-	-	-	-	X	X	X	X	X	X	183	274	60	850	15
080-065-0313	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
080-065-0315	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
100-080-0250	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
100-080-0251	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
100-080-0311	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
100-080-0315	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
125-100-0250	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
125-100-0251	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
125-100-0253	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15
125-100-0315	X	X	X	X	-	-	-	-	-	-	200	315	50	550	10
	-	-	-	-	X	X	X	X	X	X	200	315	60	850	15

⁸⁾ For motors 132S, 132M, 160M, 160L, 180M, 180L foundation rails or mounting plates are required and included in the scope of supply. For all other combinations foundation rails can be supplied as an option.

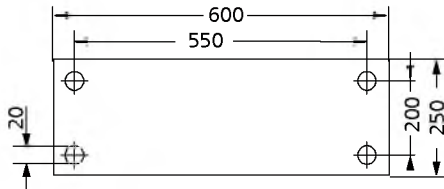
Foundation bolts

Foundation bolts

Size	Foundation bolt	Expanding anchor bolt
065-040-0250	M 16 \times 200 MU	-
065-050-0200		
065-050-0201		
080-065-0200		
080-065-0201		
080-040-0315	M 16 \times 200 MU	F1/18-60 \varnothing 18 \times 160
080-065-0313		
080-065-0315		
100-080-0250		
100-080-0251		
100-080-0311		
100-080-0315		
125-100-0250		
125-100-0251		
125-100-0253		
125-100-0315		

Mounting plate

Mounting plate dimensions and weight

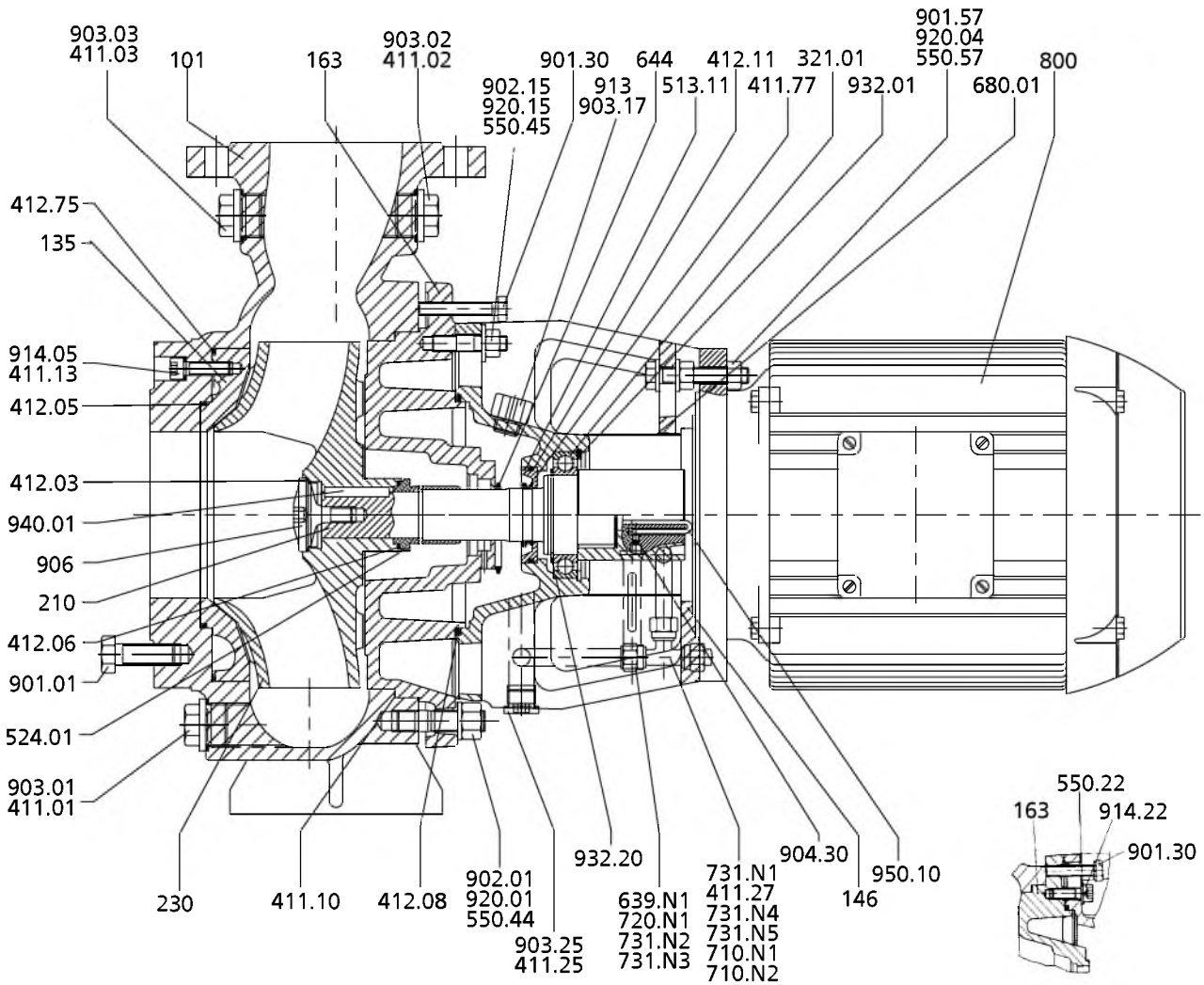


Mounting plate dimensions

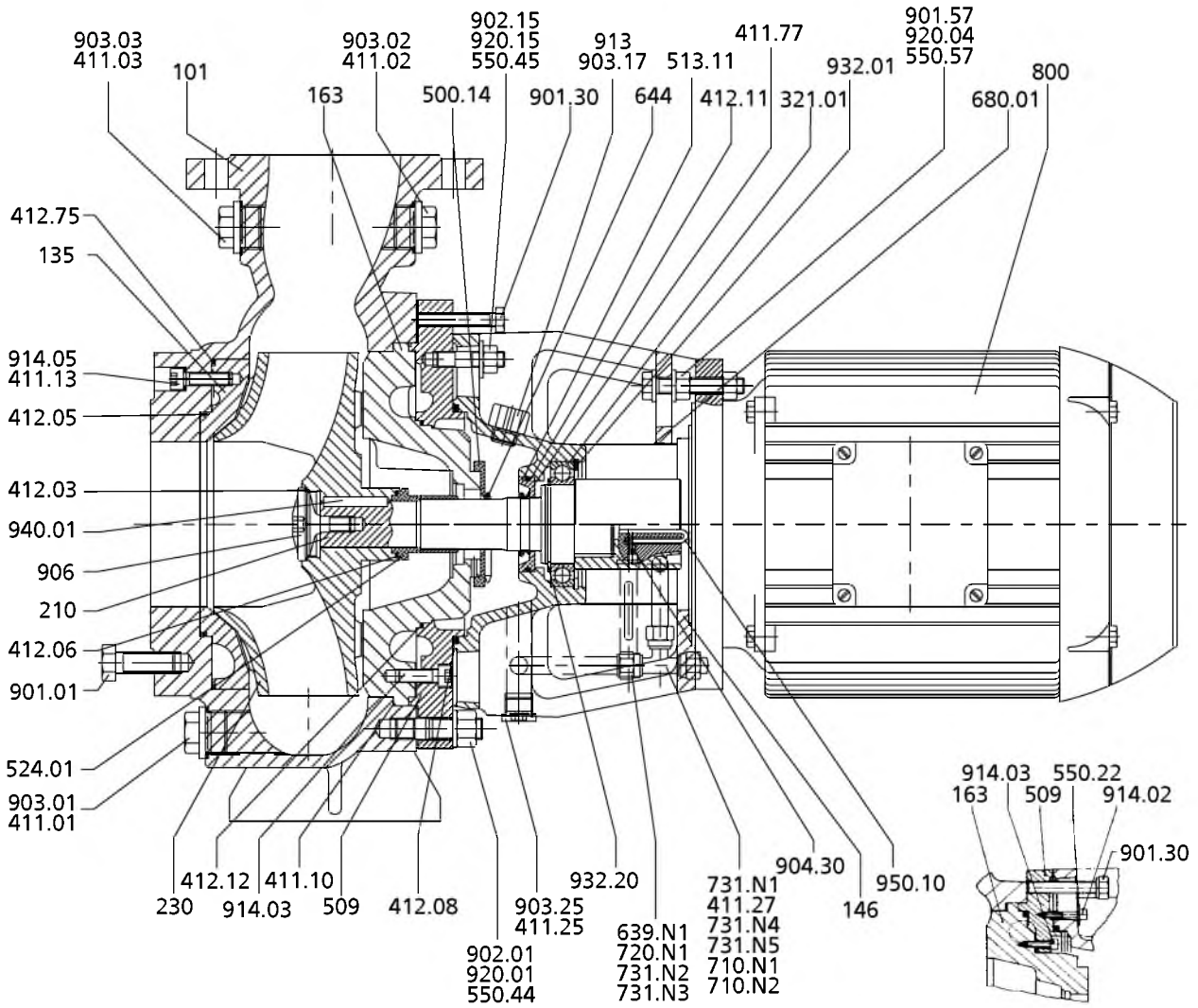
The mounting plate weighs 24 kg. The mounting plate is 25 mm high.

General assembly drawing with list of components

Horizontal installation

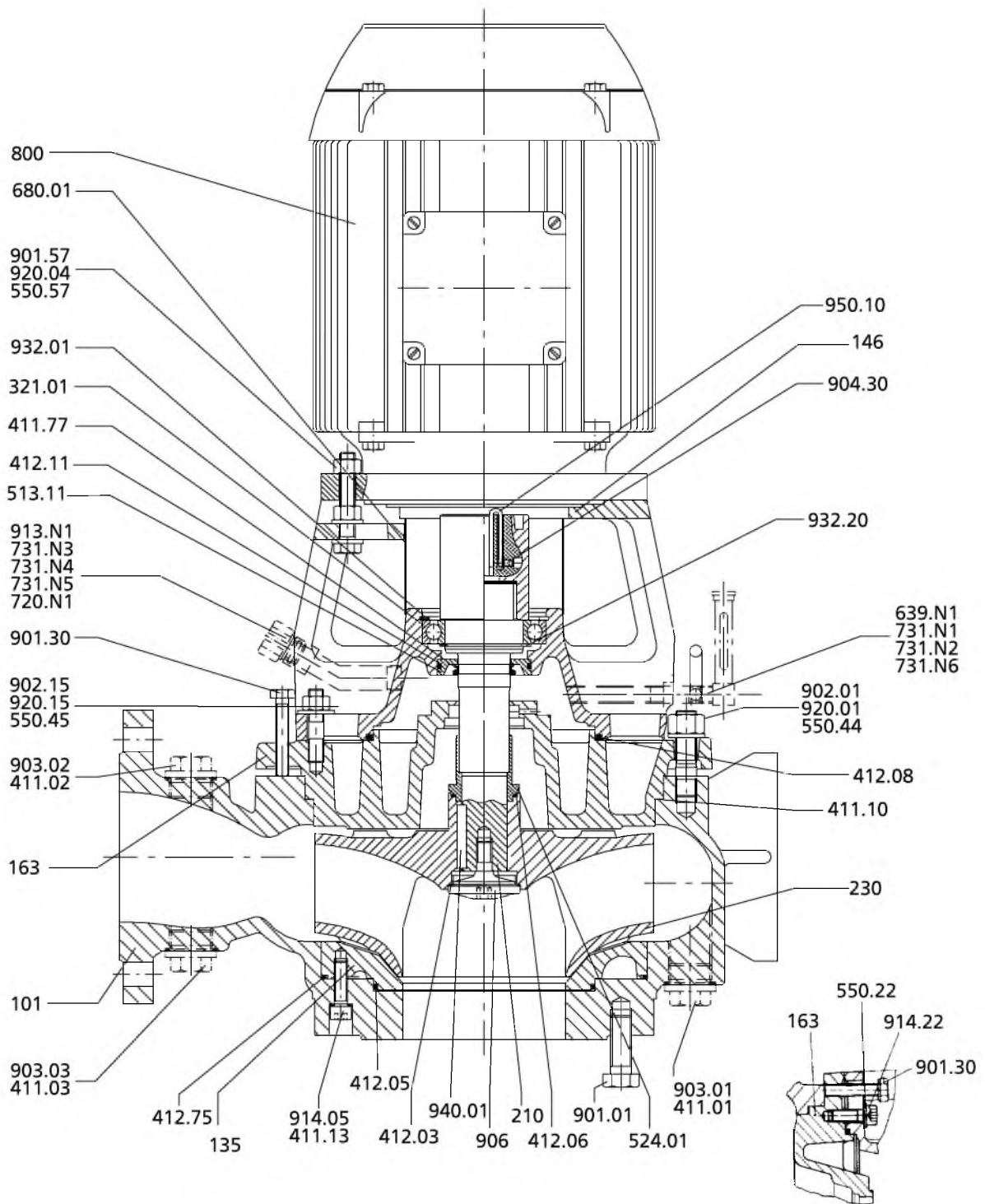


General assembly drawing of variants GNNG, GDNG

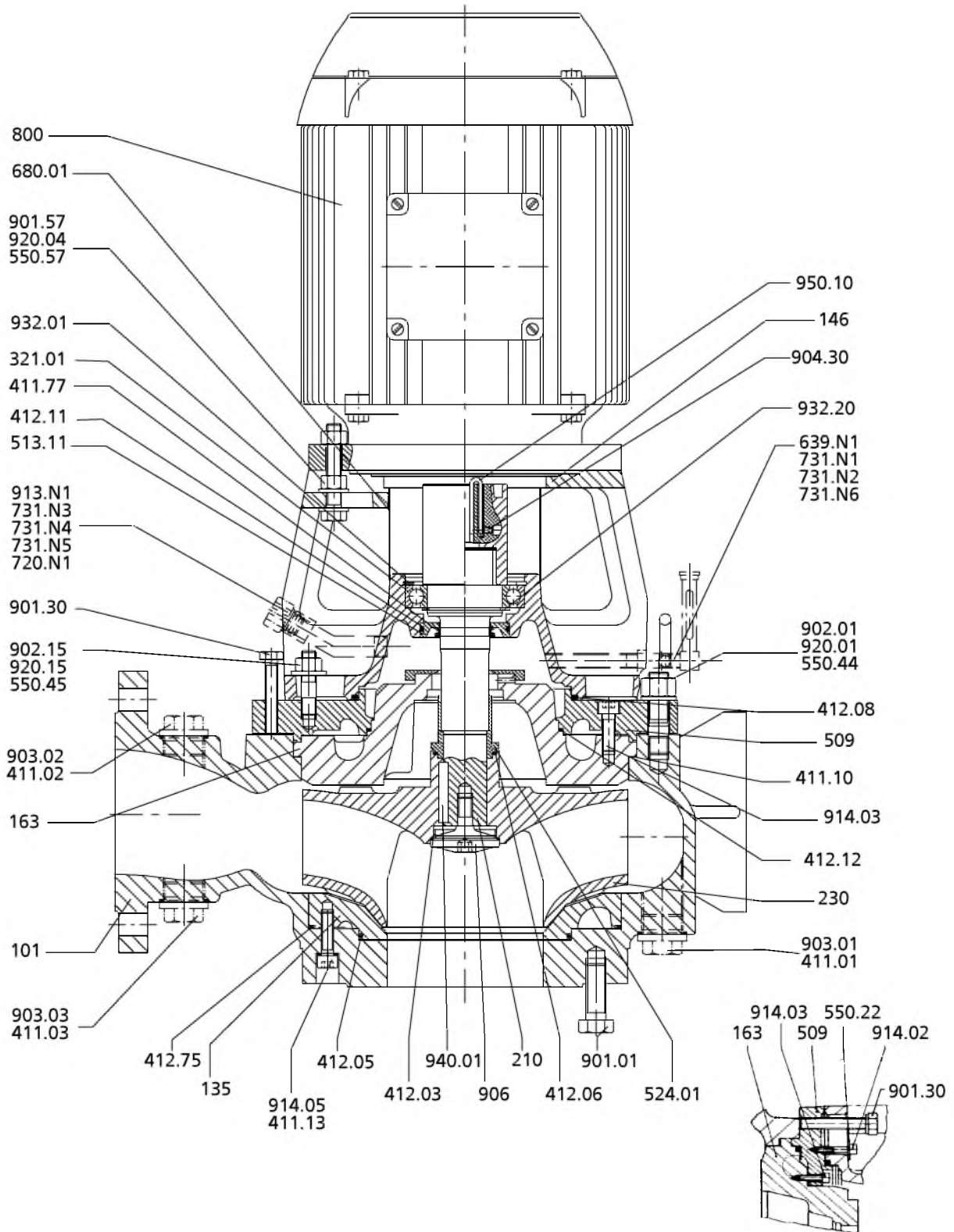


General assembly drawing of variant DDDD

Vertical installation

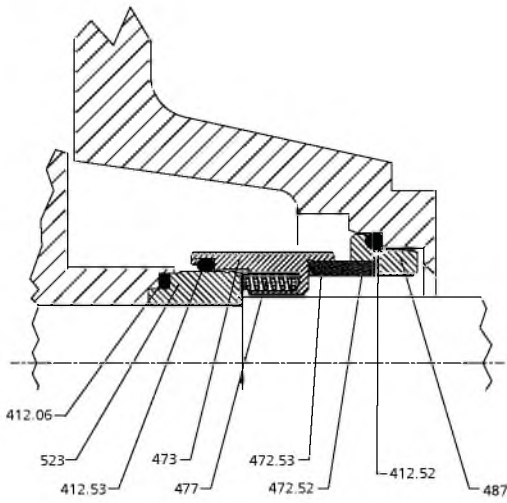


General assembly drawing of variants GNNG, GDNG



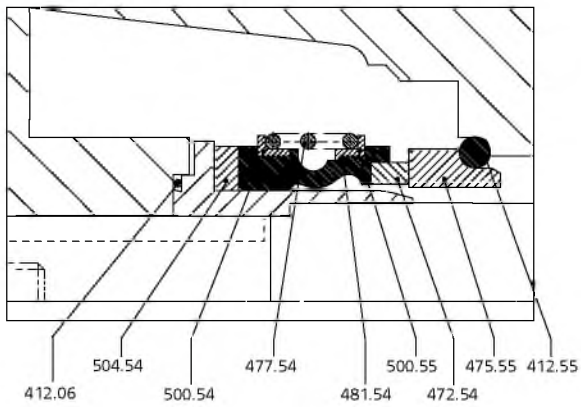
General assembly drawing of variant DDDD

Mechanical seal
Mechanical seal KSB 4KBL



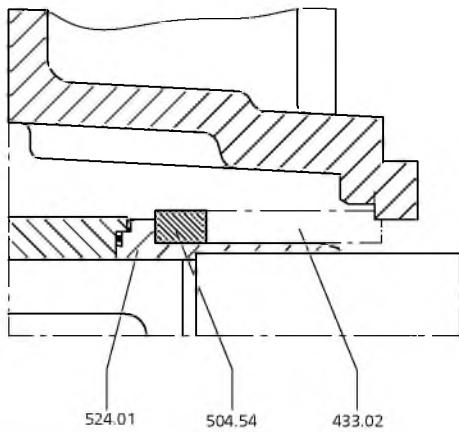
Mechanical seal KSB 4KBL

Mechanical seal, Burgmann MG1-G6



Mechanical seal, Burgmann MG1-G6

Mechanical seal, John Crane 2100



Mechanical seal, John Crane 2100

List of components

List of components⁹⁾

Part No.	Comprising	Scope of supply
101	101	Pump casing
	411.01 ¹⁰⁾ /02 ¹⁰⁾ /03 ¹⁰⁾ /10	Joint ring
	550.44	Disc
	901.01	Hexagon head bolt
	902.01	Stud
	903.01 ¹⁰⁾ /02 ¹⁰⁾ /03 ¹⁰⁾	Screw plug
	920.01	Hexagon nut
135	135	Wear plate
	411.13	Joint ring
	412.05/75	O-ring
	914.05	Hexagon socket head cap screw
146	146	Intermediate lantern
	550.57	Disc
	913	Vent plug
	901.57	Hexagon head bolt
	903.17/25/26	Screw plug
	920.04	Hexagon nut
	932.01	Circlip
163	163	Discharge cover
	412.08	O-ring
	550.45/22	Disc
	901.30	Hexagon head bolt
	902.15	Stud
	920.15	Hexagon nut
	914.22	Hexagon socket head cap screw
	500.14	Ring
210	210	Shaft
	904.30	Grub screw
	932.20	Circlip
	940.01	Key
	950.10	Spring
230	230	Impeller
321.01	321.01	Deep groove ball bearing
411.77	411.77	Joint ring
504.54 ¹¹⁾	504.54	Spacer ring
509	509	Intermediate ring
	412.12	O-ring
	914.02/03	Hexagon socket head cap screw
513.11	513.11	Insert ring
	412.11	O-ring
524.01	524.01 ¹²⁾	Shaft protecting sleeve
	412.06	O-ring
639 ¹³⁾	411.25/27	Joint ring
	639.N1	Oil level gauge, complete
	644	Lubricating ring
	710.N1/N2	Pipe
	720/731.N1	Barrel nipple
	731.N6	Pipe union
	731.N2/N3/N4/N5	Angle
	903.25	Screw plug
680.01	680.01	Guard
800	800	Motor, complete
906	906	Impeller screw
	412.03	O-ring

⁹⁾ Depending on the design

¹⁰⁾ If any

¹¹⁾ On pumps with standardised mechanical seal only

¹²⁾ This is part of mechanical seal 4KBL

¹³⁾ On pumps with oil reservoir only

Part No.	Comprising	Scope of supply
99-9	99-9	Set of sealing elements
	411.01/.02/.03/.10/.12/.13/.16/.17/.77	Joint ring
	412.03/.05/.06/.08/.11/.75	O-ring

List of components for mechanical seal 4KBL

Part No.	Comprising	Scope of supply
433	412.52/.53	O-ring
	472.53	Primary ring
	472.52	Mating ring
	473	Primary ring carrier
	477	Spring
	487	Mating ring carrier
	523	Shaft protecting sleeve

List of components for mechanical seal MG1-G6

Part No.	Comprising	Scope of supply
433	412.55	O-ring
	472.54	Primary ring
	475.55	Mating ring
	477.54	Spring
	481.54	Bellows
	500.54	Ring
	500.55	Ring

Detailed designation

Designation example

Position																																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
K	W	P	F	1	2	5	-	1	0	0	-	0	2	5	0		G	D	N	G	1	0	A				B	H		7			4
See name plate and data sheet																						See data sheet											

Position 1-3: designation

Code	Description
KWP	Type series

Position 30-32: motor rating

Code	Description
7	7 kW

Position 4: impeller

Code	Description
K	Channel impeller
O	Open impeller ¹⁴⁾
F	Free-flow impeller

Position 33: number of poles

Code	Description
2	2 poles
4	4 poles
6	6 poles

Position 5-17: size

Code	Description
125	Nominal suction nozzle diameter [mm]
100	Nominal discharge nozzle diameter [mm]
0250	Nominal impeller diameter [mm]

Position 18: casing material

Code	Description
G	EN-GJL-250
D	Noridur 1.4593

Position 19: impeller material

Code	Description
D	Noridur 1.4593
N	ERN

Position 20: wear plate / wear ring material

Code	Description
D	Noridur 1.4593
N	ERN

Position 21: discharge cover material

Code	Description
D	Noridur 1.4593
G	EN-GJL-250

Position 22-23: design version

Code	Description
10	Version

Position 24-25: shaft seal operating mode

Code	Description
A	Single mechanical seal in A-type cover

Position 26: standard

Code	Description
X	One or several non-standard components

Position 27-29: type of installation

Code	Description
0	Figure 0
BH	Close-coupled, horizontal
BV	Close-coupled, vertical

¹⁴⁾ Available on request only

Process Pump

RPHb

API 610/11th Edition

Type Series Booklet



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Centrifugal Pumps with Shaft Seal

Process Pumps

RPHb



Main applications

Pump for handling the large variety of petroleum products in refineries as well as in the chemical and petrochemical industry.

- Refineries

Design details

Design

- Pump to API 610, 11th edition (type BB2)
- Volute casing pump
- Horizontal installation
- 2 stages
- Single-entry
- Between-bearings design

Pump casing

- Volute casing with integrally cast pump feet
- Centreline pump feet
- Radially split volute casing
- Suction nozzle and discharge nozzle in top-top arrangement
- Volute casing and casing cover with replaceable casing wear rings
- Casing sealed by spiral wound gasket
- Various flange designs
 - ASME B16.5 Class 600, RF
 - ASME B16.5 Class 300, RF
 - EN 1092-1 PN100
 - EN 1092-1 PN40

Impeller type

- Closed radial impeller
- Impellers with replaceable impeller wear rings on the suction side

- Chemical industry
- Petrochemical industry
- Onshore and offshore processes

Operating data

Operating properties

Characteristic		Value	
		50 Hz	60 Hz
Flow rate	Q [m ³ /h]	≤ 730	≤ 875
	Q [Usgpm]	≤ 3215	≤ 3855
Head	H [m]	≤ 450	≤ 650
	H [ft]	≤ 1475	≤ 2130
Operating temperature	T [°C]	-80 to +450	
	T [°F]	-112 to +842	
Operating pressure	p [bar]	≤ 100	
	p [psi]	≤ 1450	

Designation

Example: RPHb S6 150-350/2

Designation key

Code	Description
RPHb	Type series
S6	Material variant to API 610
150	Nominal discharge nozzle diameter [mm]
350	Nominal impeller diameter [mm]
2	Two stages

- Impellers in back-to-back arrangement
- Diffuser design

Shaft seal

- Cartridge seal to API 682 (KSB or other make)
- **Optional:** coolable / heatable shaft seal housing

Bearing assembly

- Bearings:
 - Drive end: cylindrical roller bearing
 - Non-drive end: paired angular contact ball bearings
- Lubrication
 - Oil ring lubrication
 - Optional: oil mist lubrication
- Bearing bracket cooling
 - Air cooling by integrated cooling fins
 - Optional:
 - Additional fan cooling
 - Water cooling
- Bearing bracket sealing
 - Labyrinth seals (KSB or other make)

Design options per type of lubrication

Type of lubrication	Design options
Oil ring lubrication	With cooling fins only (standard)
	With additional fan cooling
	Water cooling
	Water cooling with additional fan cooling
Oil mist lubrication	With cooling fins only (standard)
	With additional fan cooling

Bearing bracket designation

Example: BD120

Bearing bracket designation

Designation	Description
BD	Bearing diameter
120	Outer bearing diameter in mm

Standard bearing assembly

Size	Bearing bracket	Rolling element bearings	
		Non-drive end	Drive end
80-330/2	BD120	NU311E	2 x 7311B-MUA
80-351/2			
80-360/2			
100-290/2			
100-350/2			
150-290/2			
150-350/2	BD130	NU312E	2 x 7312B-MUA
200-290/2			

Bearing life

Minimum calculated bearing life:

- 25,000 h to API 610, 11th edition

Materials

Overview of available materials (Europe)

Part No.	Description	Variant							
		S5	S6	S8	C6	A8	D1	D2	
102	Volute casing	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A	
161	Casing cover	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A	
171/173	Diffuser/diffuser plate	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF3M	A743 Gr CA6NM	A743 Gr CF3M	A890 Gr 1B	A890 Gr 5A	
210	Shaft	1.4021		1.4462	1.4021	1.4462	1.4462	1.4501	
230	Impeller	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF3M	A743 Gr CA6NM	A743 Gr CF3M	A890 Gr 1B	A890 Gr 5A	
330	Bearing bracket	A216 Gr WCB							
411.x	Spiral wound gasket	CRNI/graphite					Duplex/graphite	Super duplex/graphite	
441	Shaft seal housing ¹⁾	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A	
502	Casing wear ring	VG434		1.4404 +Stellite	VG434	1.4404 +Stellite	1.4462 +Stellite	1.4501 +Stellite	
503	Impeller wear ring	1.4027+QT		1.4404 +Stellite	1.4027+QT	1.4404 +Stellite	1.4462 +Stellite	1.4501 +Stellite	
542	Throttling bush	VG434		1.4404 +Stellite	VG434	1.4404 +Stellite	1.4462 +Stellite	1.4501 +Stellite	
525.01	Spacer sleeve (stage)	1.4122 HV500+80		1.4404 +Stellite	1.4122 HV500+80	1.4404 +Stellite	1.4462 +Stellite	1.4501 +Stellite	
902	Stud	1.7225			1.6772				
-	Fasteners in contact with fluid handled				1.4571			1.4462	1.4501

Overview of available materials (Asia)

Part No.	Description	Variant						
		S5	S6	S8	C6	A8	D1	D2
102	Volute casing	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A
161	Casing cover	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A
171/173	Diffuser/diffuser plate	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF3M	A743 Gr CA6NM	A743 Gr CF3M	A890 Gr 1B	A890 Gr 5A
210	Shaft	A276 Type 410 Condition H		1.4462 / UNS - S31803	A276 Type 410 Condition H	1.4462 / UNS - S31803	1.4462 / UNS - S31803	UNS - S32760
				A276 Type 316		A276 Gr Type 316		
230	Impeller	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF3M	A743 Gr CA6NM	A743 Gr CF3M	A890 Gr 1B	A890 Gr 5A
330	Bearing bracket	A216 Gr WCB						
411.x	Spiral wound gasket	CRNI/graphite					Duplex/graphite	Super duplex/graphite
441	Shaft seal housing	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF3M	A995 Gr 1B	A995 Gr 5A
502	Casing wear ring	Chrome hard 400		CF3M +Colmonoy	Chrome hard 400	CF3M +Colmonoy	A890 Gr 1B +Stellite	A890 Gr 5A +Stellite

1) For sizes 80-360/2, 80-351/2, 80-330/2 only

Part No.	Description	Variant						
		S5	S6	S8	C6	A8	D1	D2
503	Impeller wear ring	1.4024.19		CF3M	1.4024.19	CF3M	A890 Gr 1B	A890 Gr 5A
542	Throttling bush	A276 Type 410 Hard		A276 Type 316L +Colmonoy	A276 Type 410 Hard	A276 Type 316L +Colmonoy	1.4462 +Stellite	1.4501 +Stellite
525.01	Spacer sleeve (stage)	A276 Type 410A		A276 Type 316L	A276 Type 410A	A276 Type 316L	1.4462	1.4501
902	Stud	A193 B7			A540 B24			
-	Fasteners in contact with fluid handled	A193 B8M				A276-S31803		A276-S32760

Overview of materials available (South America)

Part No.	Description	Variant						
		S5	S6	S8	C6	A8	D1	D2
102	Volute casing	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF8M	A995 Gr 1B	A995 Gr 5A
161	Casing cover	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF8M	A995 Gr 1B	A995 Gr 5A
171/173	Diffuser/diffuser plate	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF8M	A743 Gr CA6NM	A743 Gr CF8M	A890 Gr 1B	A890 Gr 5A
210	Shaft	A434 Type 4140		1.4462 / UNS - S31803 A276 Type 316	A276 Type 420	1.4462 / UNS - S31803 A276 Type 316	1.4462 / UNS - S31803	UNS - S32760
230	Impeller	A216 Gr WCB	A743 Gr CA6NM	A743 Gr CF8M	A743 Gr CA6NM	A743 Gr CF8M	A890 Gr 1B	A890 Gr 5A
330	Bearing bracket	A216 Gr WCB						
411.x	Spiral wound gasket	CRNI/graphite					Duplex/graphite	Super duplex/ graphite
441	Shaft seal housing	A216 Gr WCB			A487 Gr CA6NM	A351 Gr CF8M	A995 Gr 1B	A995 Gr 5A
502	Casing wear ring	AISI 420 hardened		AISI 316L +Colmonoy	AISI 420 hardened	AISI 316L +Colmonoy	1.4462	1.4501
503	Impeller wear ring	AISI 420 hardened		AISI 316L +Colmonoy	AISI 420 hardened	AISI 316L +Colmonoy	1.4462	1.4501
542	Throttling bush	AISI 420 hardened		AISI 316L +Colmonoy	AISI 420 hardened	AISI 316L +Colmonoy	1.4462	1.4501
525.01	Spacer sleeve (stage)	AISI 420 hardened		AISI 316L +Colmonoy	AISI 420 hardened	AISI 316L +Colmonoy	1.4462	1.4501
902	Stud	A193 B7			A540 B24			
-	Fasteners in contact with fluid handled	A193 B8M				A276-S31803		A276-S32760

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- The process pump in heavy-duty design meets the toughest of requirements to API 610 for high temperatures and pressures.
- Low operating costs due to reduced energy consumption, optimised spare parts concept and hard-wearing, service-friendly design
- With a comprehensive selection chart and a broad range of materials, mechanical seals, flange designs, bearing lubrication and bearing cooling options the pump can be ideally matched to the fluid handled and the operating conditions.
- The diffuser design and back-to-back arrangement of the impellers enable a reduction of radial and axial forces and extend the bearing life.
- Shaft deflection is reduced by the reinforced optimised shaft design, which increases the service life of mechanical seals and bearings, reduces wear and lowers the vibration level.
- The seal chamber to API 610 accommodates all mechanical seals to API.

- The coolable/heatable seal housing enables reliable operation of the mechanical seal also for critical applications or fluids.
- Bearing brackets made of cast steel with integrated cooling fins enable higher fluid temperatures and reduce bearing temperatures.
- If the (optional) fan impeller is used, no cooling water supply is required for high temperatures.
- "Top-top" flange arrangement makes monitoring and servicing easy.
- The modular design system reduces spare parts stock.

Acceptance tests and warranty

- Materials testing
 - Material test report 2.2 on request
 - Material test report 3.1 on request
- Hydraulic test
 - Performance test to ISO 9906
 - Performance test to API (API 610)
 - NPSH test
- Final acceptance
 - Inspection certificate 3.1 to EN 10204 on request

Other tests (e.g. vibrations, bearing temperature) on request.

Pressure and temperature limits (ASME Class 600)

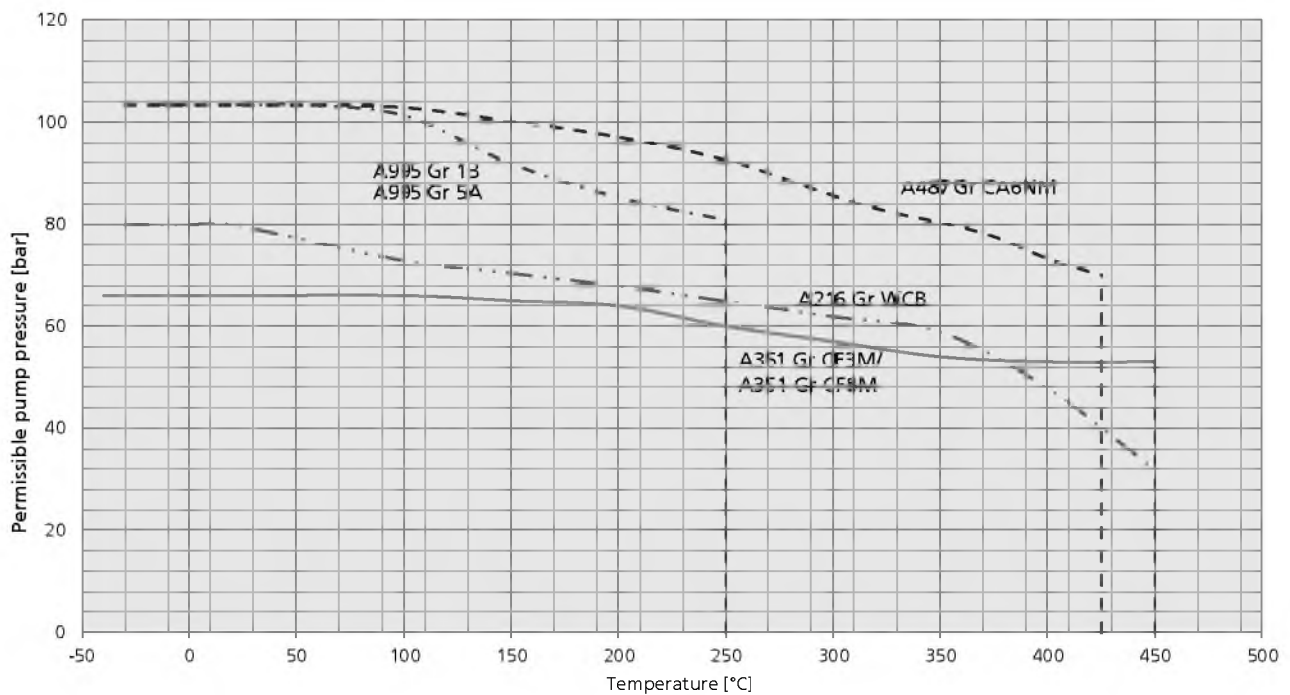


Fig. 1: Pressure limits and temperature limits of the pump

The values indicated are average values based on ASME Class 600 pumps. The actual values may differ, depending on the flange design.

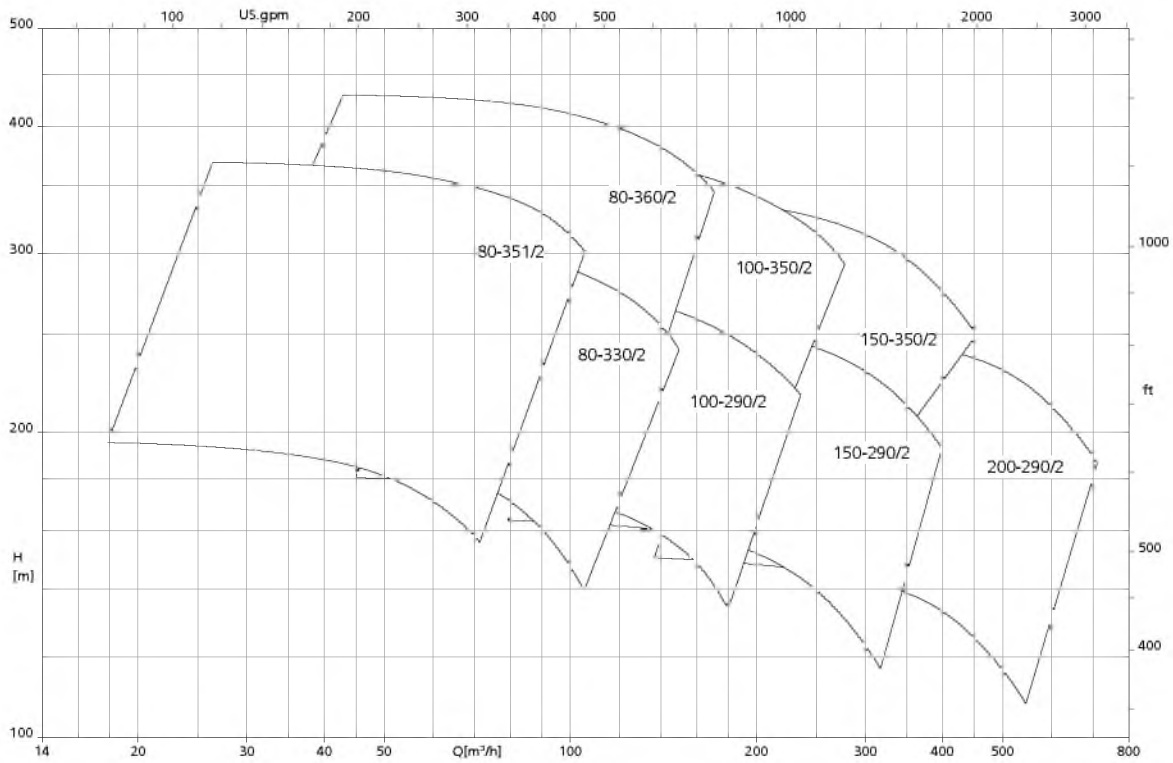
Technical data

Technical data

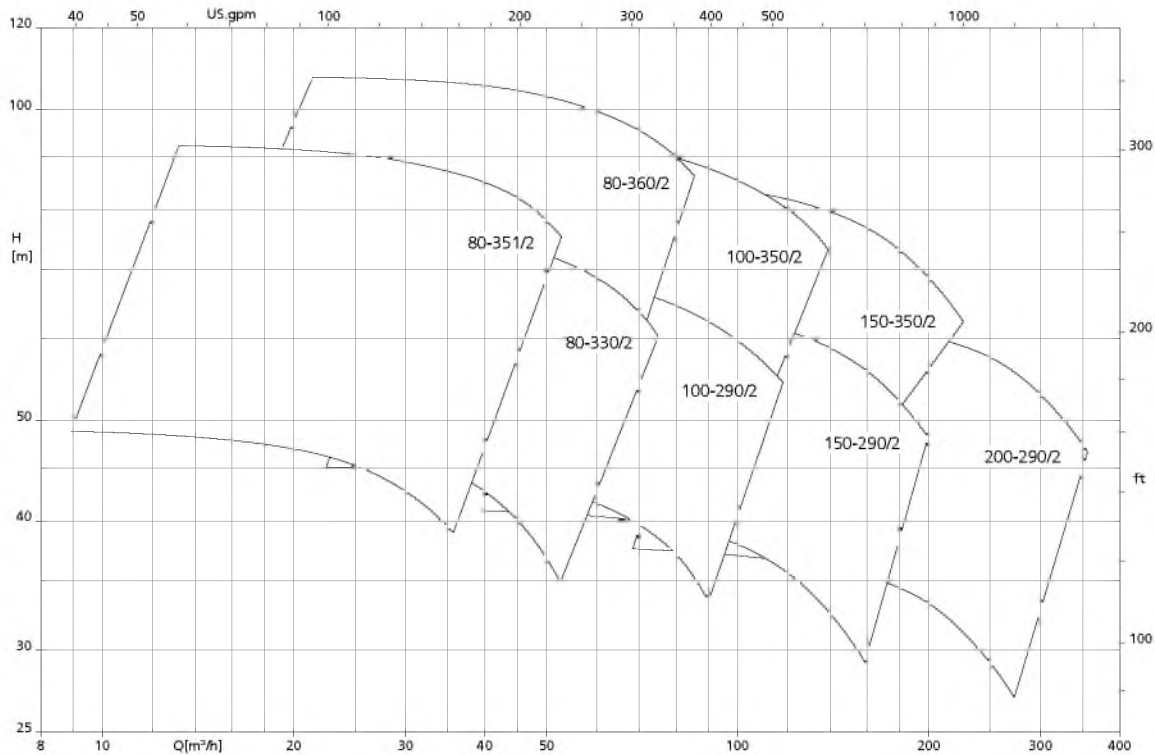
Size	Impeller				Shaft diameter					Pump weight [kg]
	Impeller outlet width [mm]	Impeller inlet diameter [mm]	Impeller diameter		In seal chamber [mm]	At bearings		At coupling [mm]		
			Max.	Min.		Pump end	Drive end			
			[mm]	[mm]		[mm]	[mm]			
80-330/2	12	130	326	260	70	55	55	48	750	
80-351/2	10	121	352	270	70	55	55	48	780	
80-360/2	12	130	380	300	70	55	55	48	850	
100-290/2	14	160	312	256	70	55	55	48	890	
100-350/2	14	160	352	290	70	55	55	48	960	
150-290/2	21	174	306	250	70	55	55	48	990	
150-350/2	21	174	346	290	70	55	55	48	1100	
200-290/2	35	206	306	245	80	60	60	55	1090	

Selection charts

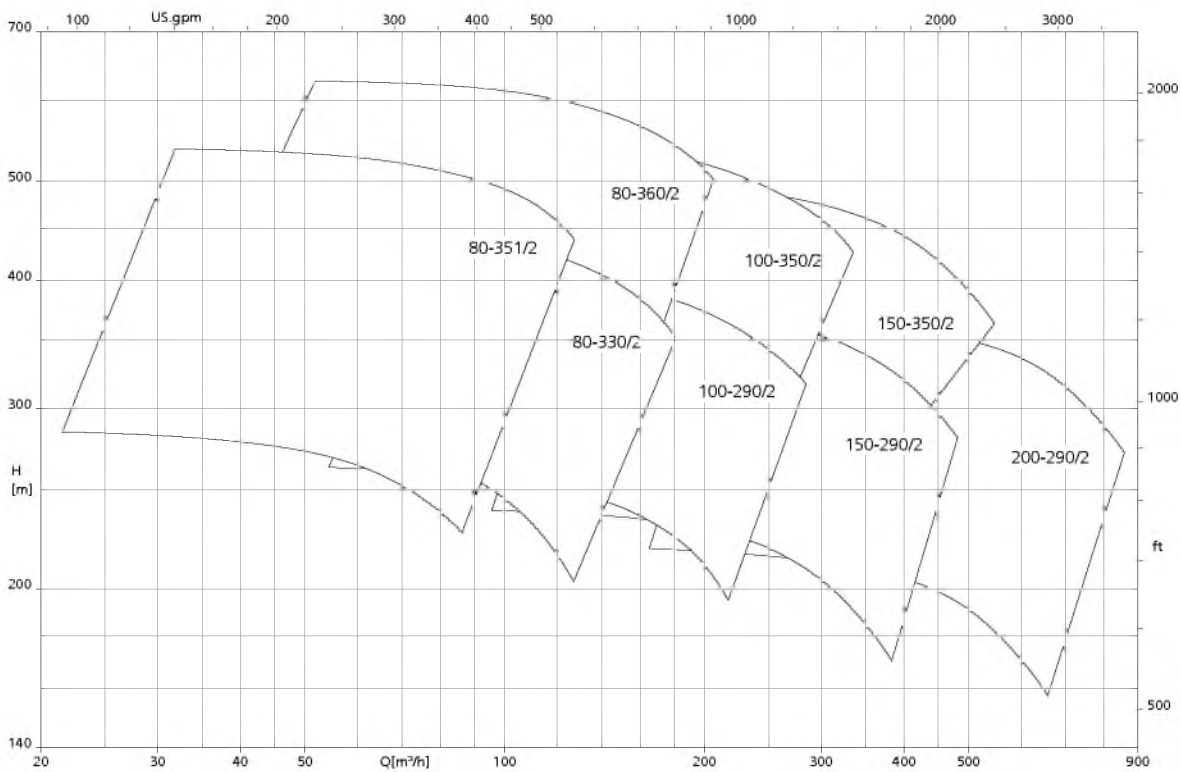
RPHb, n = 2900 rpm



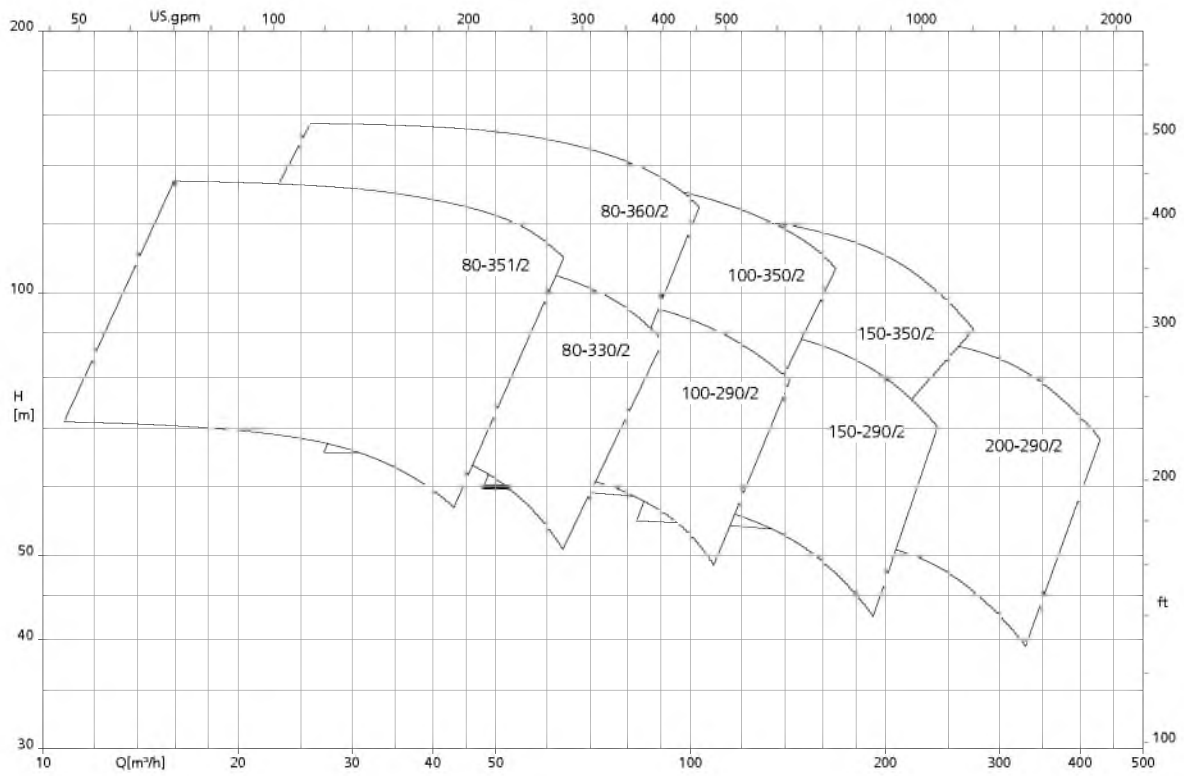
RPHb, n = 1450 rpm



RPHb, n = 3500 rpm



RPHb, n = 1750 rpm



Dimensions and connections

Dimensions

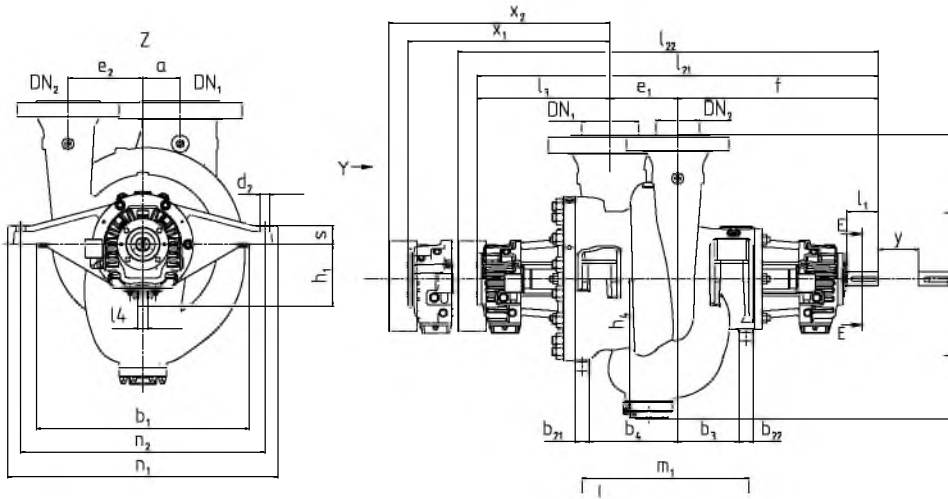


Fig. 2: Pump dimensions

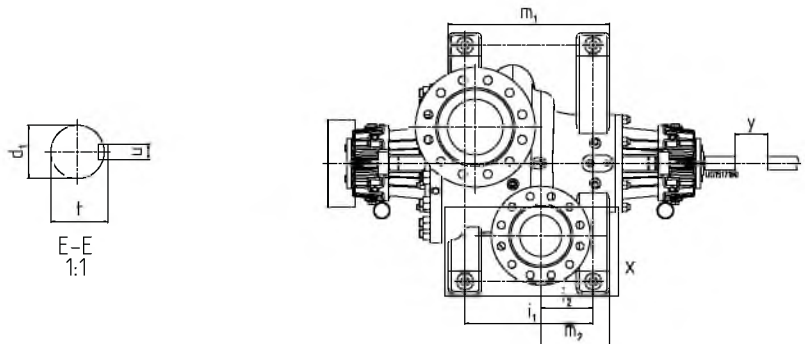
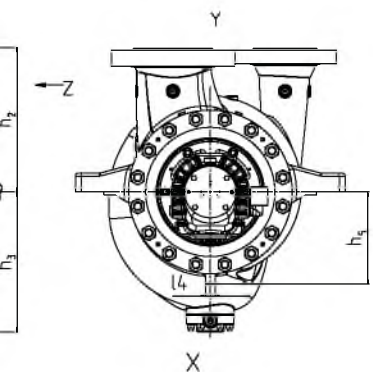
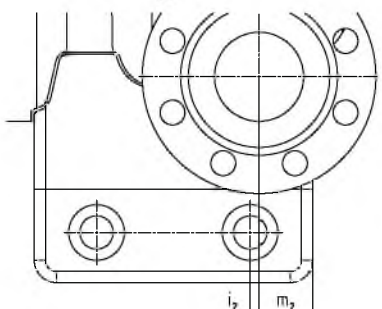


Fig. 3: Dimensions of shaft end and foot bolts



80-360/2
80-351/2
80-330/2



Pump dimensions

Size	Bearing bracket	DN1	DN2	a	b ₁	b ₂₁	b ₂₂	b ₃	b ₄	e ₁	e ₂	f	h ₁	h ₂	h ₃	h ₄	h ₅	l ₂₁	l ₂₂	l ₃	l ₄	m ₁	m ₂	n ₁	x ₁	x ₂
80-330/2	BD120	100	80	200	650	30	30	149	222	157	200	648	210	400	428	390	301	1256	1324	451	35	220	27	800	1296	1364
80-351/2	BD120	100	80	200	650	30	30	152	225	154	200	651	210	400	423	385	310	1256	1324	451	35	220	33	800	1296	1364
80-360/2	BD120	100	80	120	720	40	40	114	217	160	260	651	340	421	428	390	350	1256	1324	445	35	250	48	890	1296	1364
100-290/2	BD120	150	100	250	650	30	30	192	290	224	205	653	210	400	488	450	315	1320	1388	443	35	510	205	850	1360	1428
100-350/2	BD120	150	100	250	650	30	30	192	309	224	205	653	210	400	468	430	330	1320	1388	443	35	510	213	850	1360	1428
150-290/2	BD120	200	150	250	740	50	51	205	315	245	230	690	215	450	476	438	295	1395	1463	460	35	580	240	940	1435	1503
150-350/2	BD120	200	150	130	740	50	51	213	307	235	260	698	215	500	487	449	320	1395	1463	462	35	580	248	940	1435	1503
200-290/2	BD130	250	200	285	730	40	40	239,5	355	285	245	718	235	550	491	453	290	1463	1531	460	35	625	277,5	930	1503	1571

Dimensions of shaft end and foot bolts

Size	Foot bolts					Shaft end				
	d ₂	i ₁	i ₂	n ₂	s	d ₁	l ₁	t	u	y
80-330/2	30	120	20	700	65	48	110	51,5	14	250
80-351/2	30	120	17	700	65	48	110	51,5	14	250
80-360/2	30	150	2	800	65	48	110	51,5	14	250
100-290/2	30	390	145	760	65	48	110	51,5	14	250
100-350/2	30	390	153	770	65	48	110	51,5	14	250
150-290/2	33	460	180	850	65	48	110	51,5	14	250
150-350/2	33	460	188	850	65	48	110	51,5	14	250
200-290/2	33	505	217,5	840	75	55	110	58,5	14	250

Connections

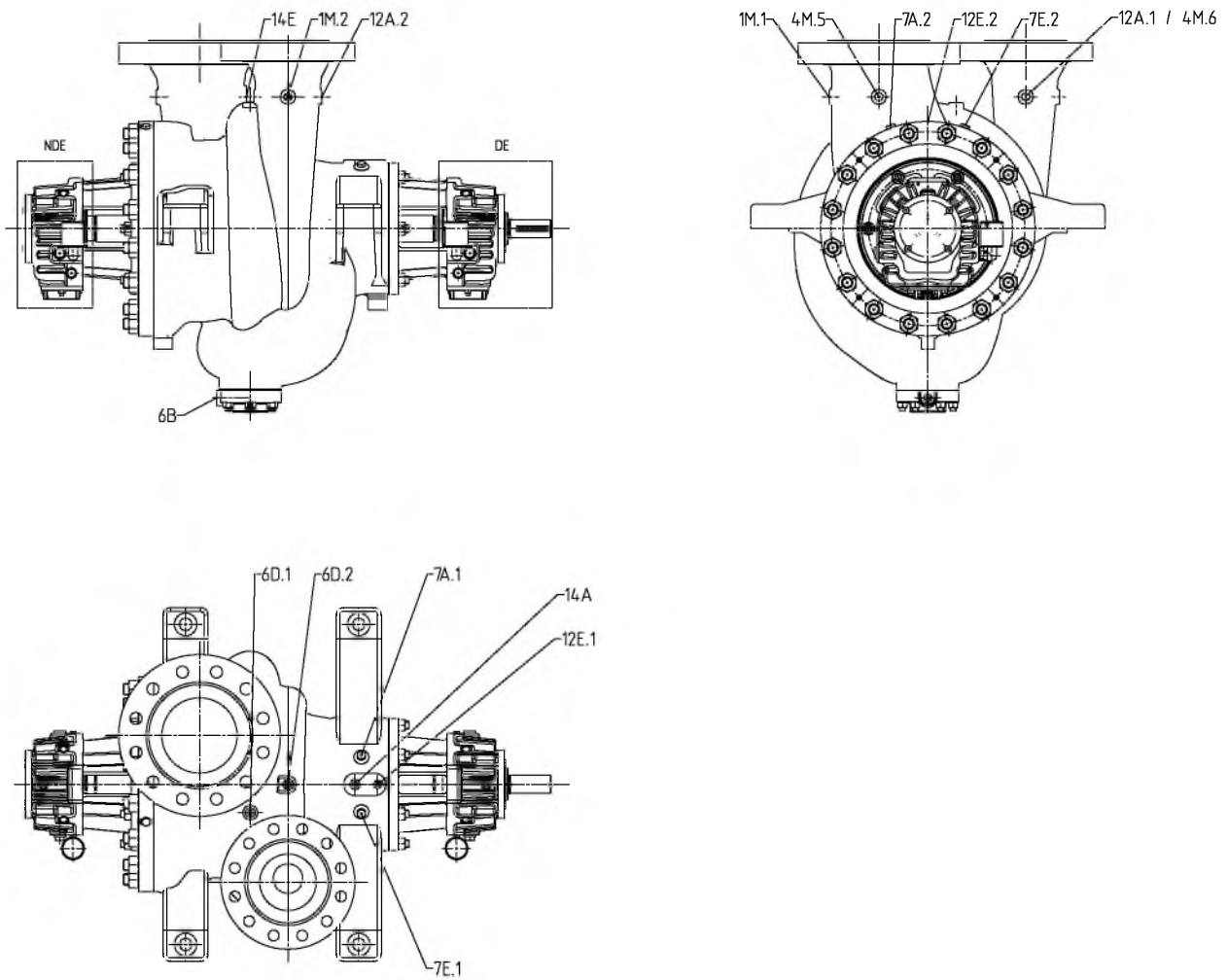


Fig. 4: Connections at the pump casing

Connections at the pump casing

Connection	Flange, welded	Thread (optional)	Designation
1M.1/ 1M.2	NPS 1/2 "	NPT 1/2 "	Pressure gauge (optional)
6D.1/ 6D.2	NPS 3/4 "	NPT 1/2 "	Vent (optional)
6B	NPS 3/4 "	NPT 3/4 "	Drain
7E.1/ 7E.2	-	NPT 1/2 "	Seal chamber cooling liquid IN (optional)
7A.1/ 7A.2	-	NPT 1/2 "	Seal chamber cooling liquid OUT (optional)
12E.1/ 12E.2	NPS 1/2 "	NPT 1/2 "	Circulation liquid IN (optional)
12A.1/ 12A.2	NPS 1/2 "	NPT 1/2 "	Circulation liquid OUT (optional)
14A	NPS 3/4 "	NPT 1/2 "	Balancing liquid OUT (optional)
14E	NPS 3/4 "	NPT 1/2 "	Balancing liquid IN (optional)
4M.5/ 4M.6	NPS 1/2 "	NPT 1/2 "	Temperature measurement (optional)

Bearing bracket connections - version with oil ring lubrication

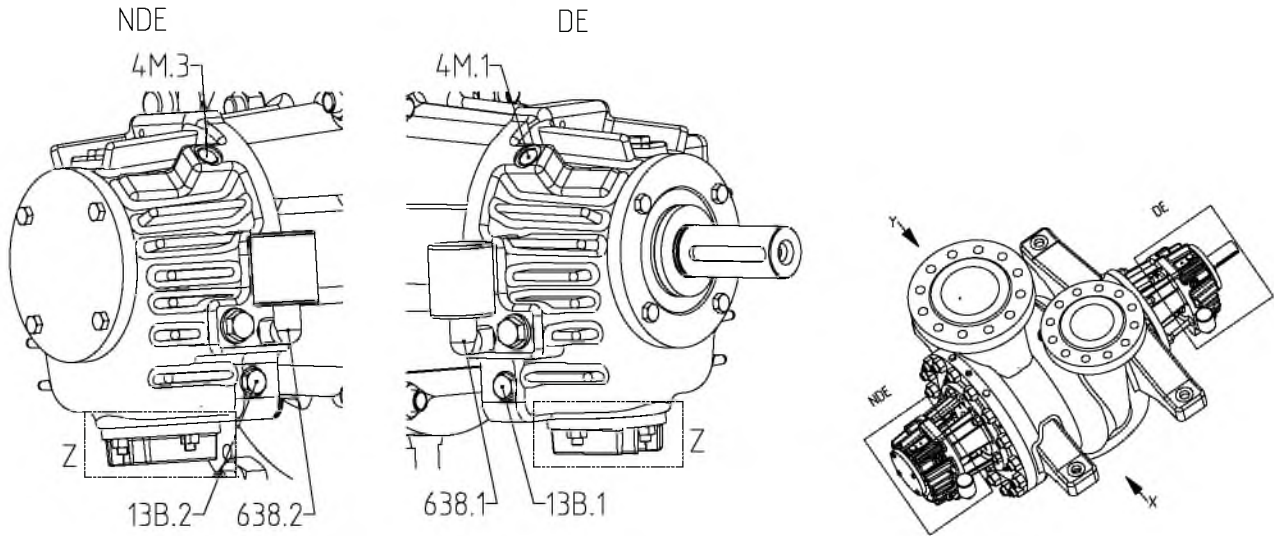


Fig. 5: Bearing bracket connections - version with oil ring lubrication, view X

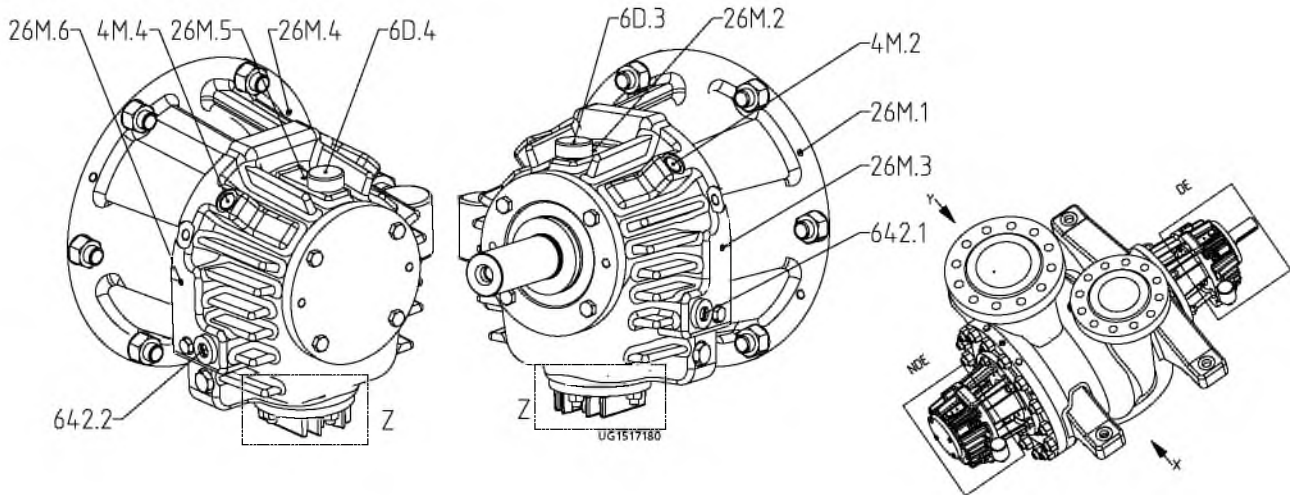


Fig. 6: Bearing bracket connections - version with oil ring lubrication, view Y

Bearing bracket connections - version with oil ring lubrication

Connection	Thread	Designation
6D.3/ 6D.4	NPT 1/2 "	Vent
4M.1/ 4M.2/ 4M.3/ 4M.4	NPT 1/2 " / G 1/2 "	Bearing temperature (optional)
13B.1/ 13B.2	NPT 1/2 "	Bearing bracket drain
26M.1/ 26M.2/ 26M.3/ 26M.4/ 26M.5/ 26M.6	M8	Vibration measurement (optional)
638.1/ 638.2	NPT 1/4 "	Constant level oiler
642.1/ 642.2	G 3/4 "	Oil sight glass

Bearing bracket connections - version with water cooling of oil ring lubrication

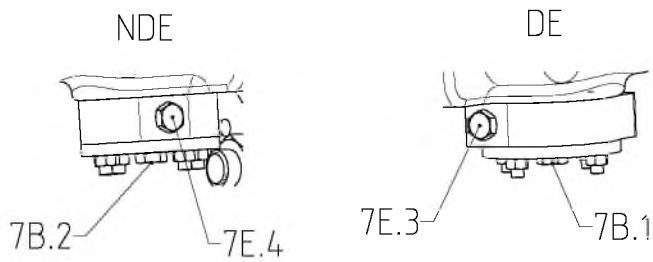


Fig. 7: Bearing bracket connections - version with water cooling of oil ring lubrication, view X

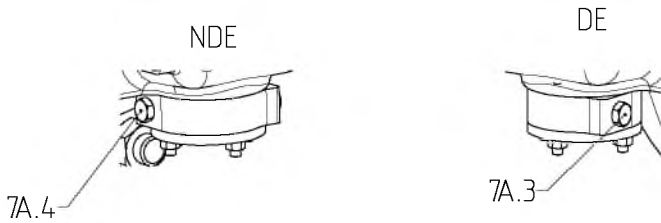


Fig. 8: Bearing bracket connections - version with water cooling of oil ring lubrication, view Y

Bearing bracket connections - version with water cooling of oil ring lubrication (optional)

Connection	Thread	Designation
7B.1/ 7B.2	NPT 1/2"	Cooling cover insert drain
7E.3/ 7E.4	NPT 1/2"	Cooling liquid IN
7A.3/ 7A.4	NPT 1/2"	Cooling liquid OUT

Bearing bracket connections - version with oil mist lubrication (optional)

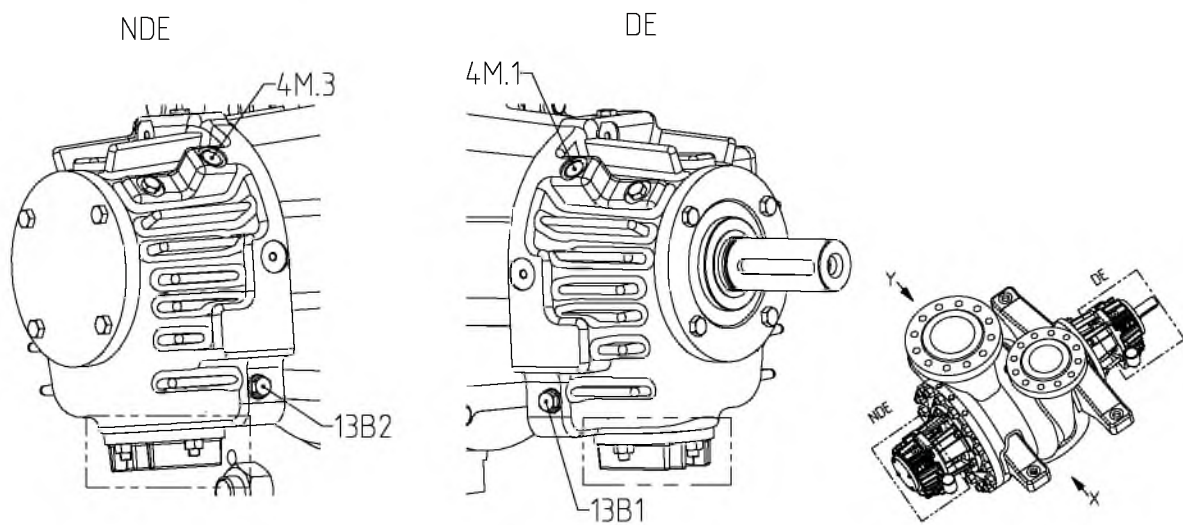


Fig. 9: Bearing bracket connections - version with oil mist lubrication, view X

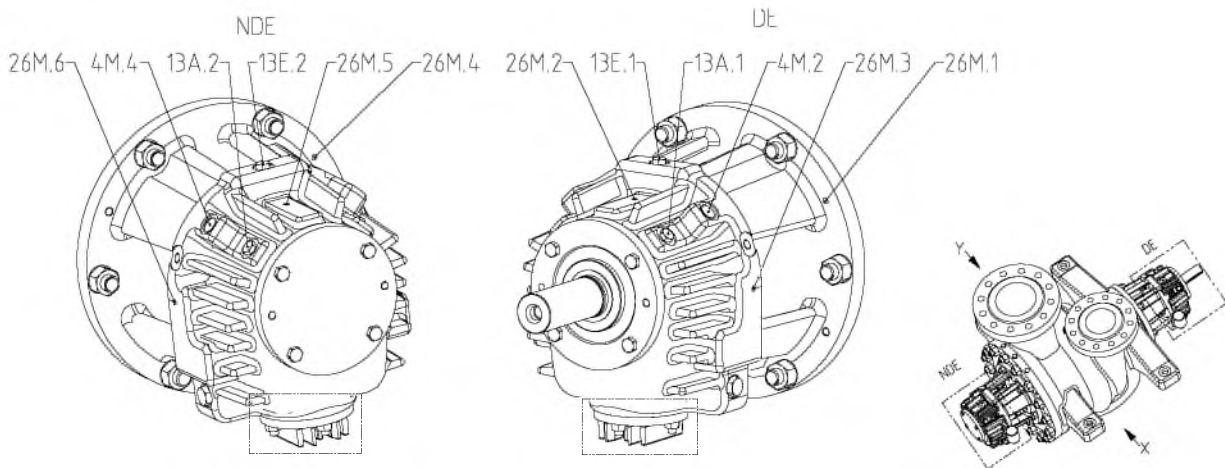


Fig. 10: Bearing bracket connections - version with oil mist lubrication, view Y

Bearing bracket connections - version with oil mist lubrication

Connection	Thread	Designation
13E.1/ 13E.2	NPT 1/4"	Oil mist IN
13A.1/ 13A.2	NPT 1/4"	Oil mist OUT
13B.1/ 13B.2	NPT 1/2"	Bearing bracket drain
26M.1/ 26M.2/ 26M.3/ 26M.4/ 26M.5/ 26M.6	M8	Vibration measurement (optional)
4M.1/ 4M.2/ 4M.3/ 4M.4	NPT 1/2" / G 1/2"	Bearing temperature (optional)

General assembly drawings

General assembly drawing of pump with integrated shaft seal housings

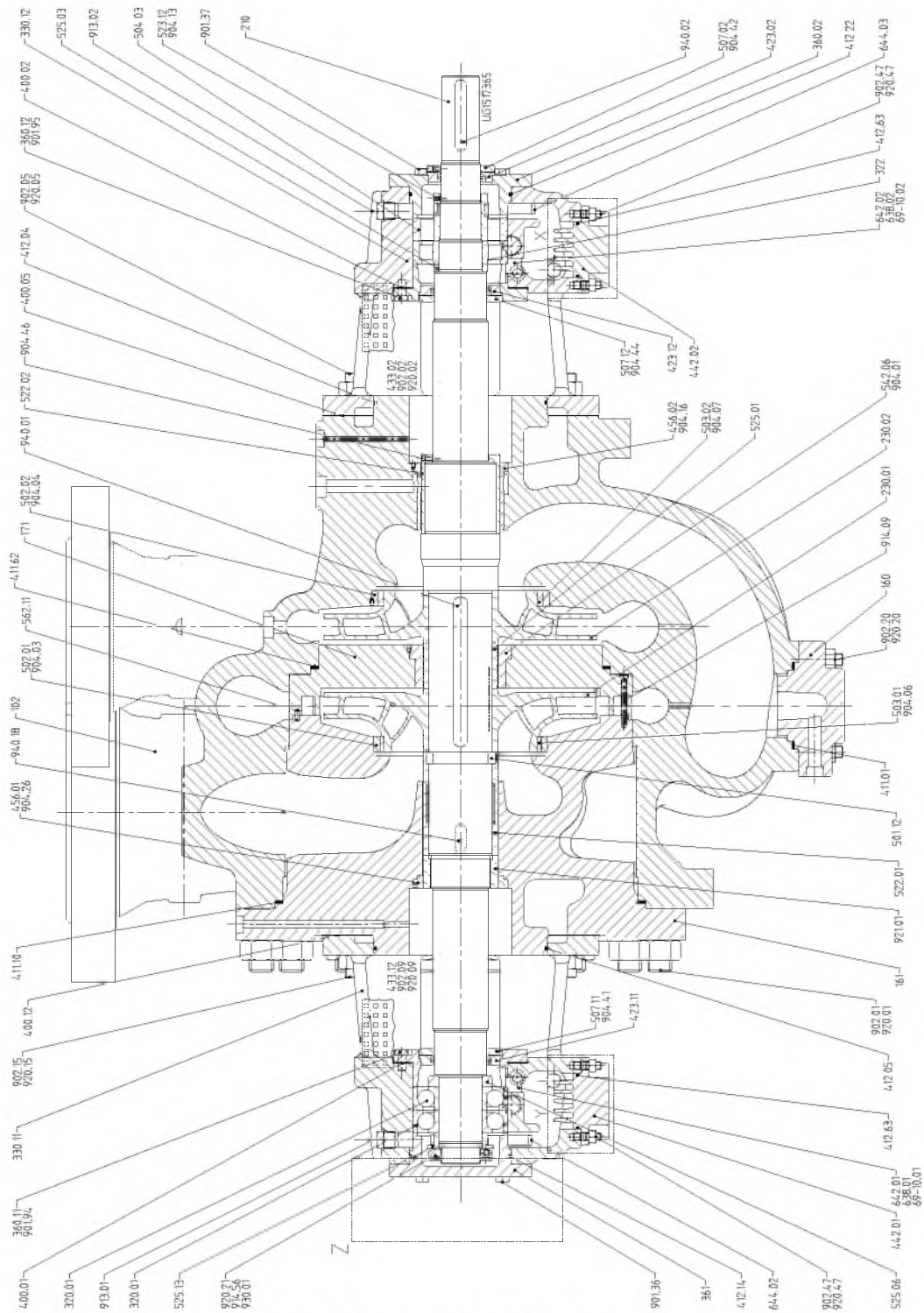
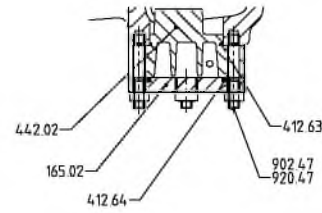
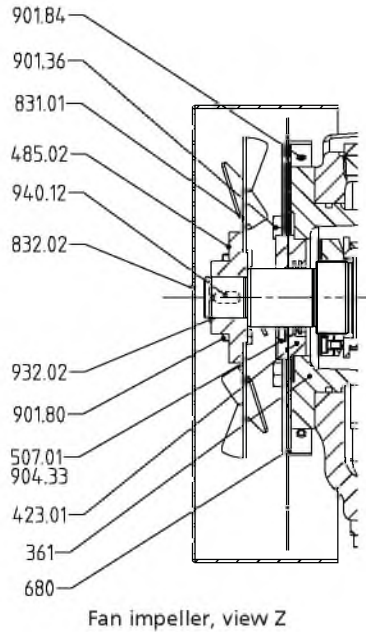
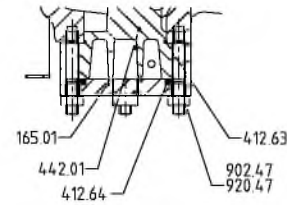


Fig. 11: General assembly drawing of pump with integrated shaft seal housings

Detailed views



Water cooling of oil ring lubrication, view X



Water cooling of oil ring lubrication, view Y

List of components

List of components

Part No.	Description	Part No.	Description
102	Volute casing	504.03	Spacer ring
160	Cover	507.01/.02/.12	Thrower
161	Casing cover	522.01/.02	Throttling sleeve
165.01/.02	Cooling chamber cover	523.12	Shaft sleeve
171	Diffuser	525.01/.03/.06/.13	Spacer sleeve
173.01 ²⁾ /.02 ²⁾	Diffuser plate	542.06	Throttling bush
210	Shaft	550.74	Disc
230.01/.02	Impeller	562.01/.02/.11	Parallel pin
320.01	Rolling element bearing	638.01	Constant level oiler
322	Radial roller bearing	642.01	Oil level sight glass
330.11/.12	Bearing bracket	644.02/.03	Lubricating ring
360.02/.11/.12	Bearing cover	680/.11	Guard
361	Non-drive end bearing cover	69-10.01	Protective housing
400.01/.02/.05/.12	Gasket	831.01	Fan impeller
411.01/.10/.57 ³⁾ /.58 ³⁾ /.62/.63 ²⁾	Joint ring	832.02	Fan hood
412.04/.05/.14/.22/.63/.64	O-ring	901.14/.36/.37/.80/.84/.94/.95	Hexagon head bolt
423.01/.02/.11/.12	Labyrinth ring	902.01/.02/.05/.09/.15/.20/.22 ²⁾ /.47	Stud
433.02/.12	Mechanical seal	904.01/.03/.04/.06/.07/.13/.16/.26/.33/.41/.42/.43/.44/.46	Grub screw
441.01 ³⁾ /.02 ³⁾	Shaft seal housing	913.01	Vent plug
442.01/.02	Cooling insert	914.09/.10 ²⁾ /.56	Hexagon socket head cap screw
456.01/.02	Neck bush	920.01/.02/.05/.09/.15/.22 ²⁾ /.47	Nut
485.02	Torque-transmitting element	921.01	Shaft nut
501.12	Segmental ring	930.01	Safety device
502.01/.02	Casing wear ring	932.02	Circlip
503.01/.02	Impeller wear ring	940.01/.02/.12/.18	Key

2) For sizes 80-360/2, 80-351/2, 80-330/2, 100-290/2, 100-350/2 only.

3) For sizes 80-360/2, 80-351/2, 80-330/2 only.

Axially Split Volute Casing Pump

RDLO / RDLO V

Type Series Booklet



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Water Supply

Axially Split Volute Casing Pump

RDLO / RDLO V



Main applications

- Waterworks
- Desalination plants
- Pressure boosting
- Water transport
- Service water and cooling water for power stations and industry
- Irrigation pump stations and drainage pump stations
- Fire-fighting systems
- Shipbuilding
- District heating systems and district cooling systems

Fluids handled

RDLO / RDLO V pumps are designed for pumping water and other fluids with a low solids content. The pumps are very versatile and can be used for the following fluids, for example:

- Brackish water
- River water, lake and groundwater
- Stormwater
- Service water
- Fire-fighting water
- Cooling water
- Condensate
- Heating water
- Drinking water

Operating data

Operating properties

Characteristic	Value	
Sizes	DN [mm]	350-700
	DN ["]	14-28
Flow rate ¹⁾	Q [m ³ /h]	≤ 10000
	Q [US.gpm]	≤ 44030
Head ¹⁾²⁾	H [m]	≤ 290
	H [ft]	≤ 951
Operating pressure ²⁾	p [bar]	≤ 30
	p [psi]	≤ 435
Fluid temperature ³⁾	T [°C]	0 to 140
	T [°F]	32 to 284

Designation

Example: RDLO V 350-690 A GB P M

Designation key

Code	Description	
RDLO	Type series	
V	Design	
	4)	Horizontal installation
	V	Vertical installation
350	Nominal discharge nozzle diameter [mm]	
690	Nominal impeller diameter [mm]	
A	Impeller type	
	A, B	
GB	Material variant (⇒ Page 6)	
	GB	Grey cast iron / bronze
	GC	Grey cast iron / chrome steel
	SB	Nodular cast iron / bronze
	SC	Nodular cast iron / chrome steel
	DD ₃₅	Duplex stainless steel / duplex stainless steel
P	Shaft seal	
	P	Gland packing
	G	Mechanical seal
M	Bearing lubrication	
	F	Grease
	M	Fluid handled
	O	Oil lubrication

1) Larger flow rates and higher heads are available on request.

2) Depending on the material and size

3) Standard design up to 80 °C [176 °F] max.

4) Blank

Design details

Design

- Volute casing pump
- Horizontal/vertical installation
- Single-stage
- Nominal discharge nozzle diameters: 350 mm – 700 mm [14" – 28"]

Pump casing

- Axially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings
- Mating dimensions to EN or ASME

Impeller type

- Double-entry radial impeller⁵⁾

Pump shaft

Variants with rolling element bearing:

- Completely dry shaft
- Shaft protecting sleeves in the seal area

Shaft seal

- Gland packing
- Balanced mechanical seal

Bearings

For horizontal installation:

- Grease-packed rolling element bearings
- Oil-lubricated rolling element bearings

For vertical installation:

- Grease-packed rolling element bearings
- Bottom: product-lubricated rubber plain bearing / Top: grease-packed rolling element bearing

5) Optionally with impeller wear rings

Materials

Overview of material variants

Part No.	Description	Material variant				
		GB	GC	SB	SC	DD ₃₅ ⁶⁾
All pump sets						
102	Volute casing	Grey cast iron	Grey cast iron	Nodular cast iron	Nodular cast iron	Duplex stainless steel
211	Pump shaft	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
234	Impeller	Bronze	Stainless steel	Bronze	Stainless steel	Duplex stainless steel
350.01	Bearing housing	Grey cast iron	Grey cast iron	Grey cast iron	Grey cast iron	Grey cast iron
360.01	Bearing cover	Steel	Steel	Steel	Steel	Steel
441	Shaft seal housing	Grey cast iron	Grey cast iron	Grey cast iron	Grey cast iron	Duplex stainless steel
502	Casing wear ring	Bronze	Stainless steel	Bronze	Stainless steel	Duplex stainless steel
503	Impeller wear ring (optional)	Bronze	Stainless steel	Bronze	Stainless steel	Duplex stainless steel
525.01	Spacer sleeve	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel
For pump sets with ball bearings on both sides only						
350.02	Bearing housing	Grey cast iron	Grey cast iron	Grey cast iron	Grey cast iron	Grey cast iron
360.02	Bearing cover	Unalloyed steel ⁷⁾	Unalloyed steel ⁷⁾	Unalloyed steel ⁷⁾	Unalloyed steel ⁷⁾	Unalloyed steel ⁷⁾
525.03	Spacer sleeve	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel
For pump sets with product-lubricated plain bearing only						
524.03	Shaft protecting sleeve	Stainless steel	Stainless steel	Stainless steel	Stainless steel	-
525.02	Spacer sleeve	Bronze	Bronze	Bronze	Bronze	-
525.04	Spacer sleeve	Bronze	Bronze	Bronze	Bronze	-
545	Bearing bush	Bronze/rubber	Bronze/rubber	Bronze/rubber	Bronze/rubber	-
550.03	Disc	Stainless steel	Stainless steel	Stainless steel	Stainless steel	-
For pump sets with gland packing only						
452	Gland follower	Nodular cast iron	Nodular cast iron	Nodular cast iron	Nodular cast iron	-
457.01	Neck ring (p < 7 bar [99.5 psi])	Bronze	Bronze	Bronze	Bronze	-
457.03	Neck ring (p ≥ 7 bar [99.5 psi])	Bronze	Bronze	Bronze	Bronze	-
458	Lantern ring	Bronze	Bronze	Bronze	Bronze	-
461	Packing ring	Ramie fibre PTFE-impregnated	Ramie fibre PTFE-impregnated	Ramie fibre PTFE-impregnated	Ramie fibre PTFE-impregnated	-
524.01	Shaft protecting sleeve	Stainless steel	Stainless steel	Stainless steel	Stainless steel	-
For pump sets with mechanical seal only						
433	Balanced mechanical seal	Carbon/silicon carbide	Carbon/silicon carbide	Carbon/silicon carbide	Carbon/silicon carbide	Carbon/silicon carbide
457.02	Neck ring	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel
471	Seal cover	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Duplex stainless steel
524.02	Shaft protecting sleeve	Bronze	Bronze	Bronze	Bronze	Duplex stainless steel

6) PREN ≤ 35 only applies to the main cast components (volute casing, impeller, shaft seal housing). Duplex stainless steels with special PREN values available on request.

7) For RDLO V only

Coating and preservation

Coating for indoor installation

Coating type	Material variant					Casing			Base frame
	GB	GC	SB	SC	DD ₃₅	Exterior	Interior	Bearing housing	
A1 ⁸⁾	X	X	X	X	–	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	Epoxy resin base primer, colour at our discretion	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾
A1-E ⁸⁾¹⁰⁾	X	X	X	X	–	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	Epoxy resin base paint, colour RAL 5015 (sky blue) ¹¹⁾	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾
B1-E ⁸⁾	–	–	–	–	X	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	None; sand-blasted SA 2 ½	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾	Epoxy resin base paint, colour RAL 5002 (ultramarine blue) ⁹⁾

Coating for outdoor installation

Coating type	Material variant					Casing			Base frame
	GB	GC	SB	SC	DD ₃₅	Exterior	Interior	Bearing housing	
A2	X	X	X	X	–	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	Epoxy resin base primer, colour at our discretion	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾
A2-E ⁸⁾¹⁰⁾	X	X	X	X	–	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	Epoxy resin base paint, colour RAL 5015 (sky blue) ¹¹⁾	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾
B2-E ⁸⁾	–	–	–	–	X	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	None; sand-blasted SA 2 ½	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾	Polyurethane base paint, colour RAL 5002 (ultramarine blue) ¹²⁾

8) Only permissible for fluid temperatures ≤ 80 °C [176 °F]

9) For indoor use in industry and in a marine atmosphere; other colours only in coating variants A2, B2 and on request.

10) Extra charge

11) Approved for drinking water (KTW, DVGW, ACS). The impeller and rotor components are not coated. No other colours available. Max. permissible temperature for drinking water approved coating 60 °C [140 °F]. Only approved for drinking water up to 25 °C [77 °F] max.

12) For indoor use and outdoor use in industry and in a marine atmosphere; other colours are available on request.

Product benefits

- Low maintenance costs:
 - Fast and easy to install thanks to self-centring components (upper casing part, rotor, casing cover)
 - Materials resistant to corrosion and abrasion
 - Smooth operation with low vibration levels
 - Replacement and spare parts fit several pump sizes
- Long service life:
 - Sealed and dry shaft
 - Short bearing distances and a short shaft
 - Protected rolling element bearings greased for life
 - Optional impeller wear rings
 - Replaceable shaft protecting sleeve
- High operating reliability:
 - Rigid shaft without threads between the bearings
 - Generously sized bearings ($L_{h_{10}} = 100,000$ hours)
 - Reliable sealing thanks to solid casing split flange
 - Double-entry impeller for axial thrust balancing
 - Double volute design
- High flexibility:
 - Drive can be positioned to the left or right of the pump
 - Shaft sealed by gland packing or mechanical seals
 - Various horizontal and vertical installation options
 - Flanges to DIN or ASME
- Excellent efficiencies and NPSH values:
 - Computer-optimised impellers
 - Large impeller inlet diameters for optimum suction behaviour
 - Cost-effective replacing of casing and impeller wear rings
 - Vortex-free intake elbow with low energy losses
 - Impeller trimmed to match the specified duty point
 - Several hydraulic systems per pump size

Acceptance inspections/tests

- Functional and acceptance tests
 - For information on acceptance tests and inspections refer to the QCPs (see KSB Standard ZN56555-2A ZN56555-2B ZN56555-2C)
- Quality assurance system
 - DIN ISO 9001 / EN 29001

Selection information

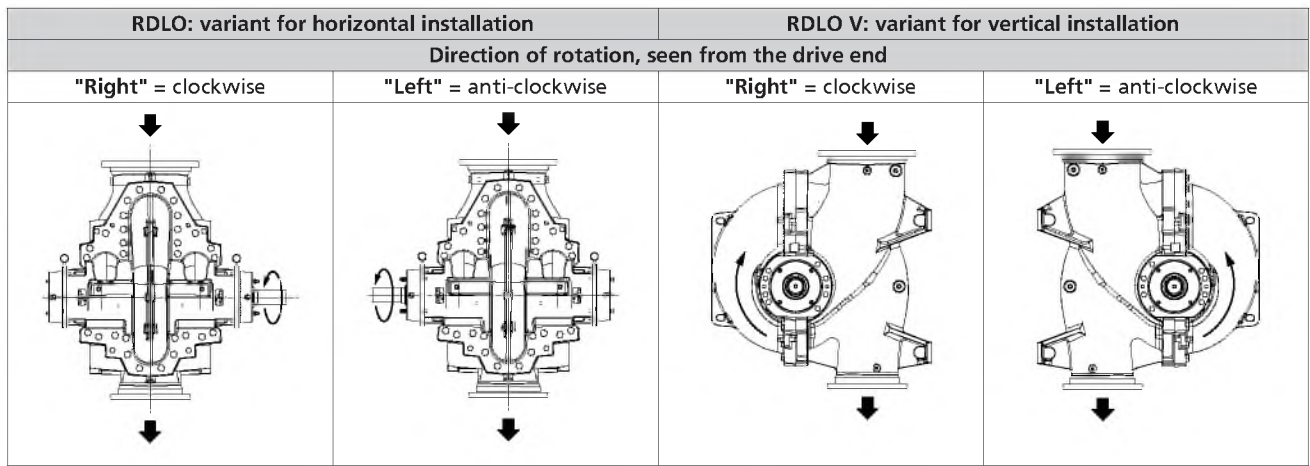
Solids content

Solids content by shaft seal and material variant in [ppm] or [mg/l]

Shaft seal	Material variant					
	Max. permissible solids content for variants with barrier and flushing water line without cyclone separator			Max. permissible solids content for variants with barrier and flushing water line with cyclone separator ¹³⁾		
	GB/GC	SB/SC	DD ₃₅	GB/GC	SB/SC	DD ₃₅
Gland packing	50	50	50	100	100	100
Balanced mechanical seal	50	50	50	100	100	100

Directions of rotation and flow

Directions of rotation and flow



13) Higher solids contents on request

Overview of product features
Symbols key

Symbol	Description
●	Standard design
■	Standard variant ¹⁴⁾
○	Special design ¹⁴⁾
□	On request ¹⁴⁾
-	Selection unavailable

General overview (valid for standard design)¹⁵⁾

Features		Material variant					Installation type					
		GB	GC	SB	SC	DD ₃₅	RDLO			RDLO V		
							Fig. 0	2E	3E	4E	DP	DJ
Acceptance inspections/tests ¹⁶⁾												
Hydraulic acceptance test to KSB standard DIN ISO 9906 - 2B (equivalent to ANSI HI 14.6-2011/2B)	Non-witnessed	■	■	■	■	■	■	■	■	■	■	■
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Hydraulic acceptance test to DIN ISO 9906 - 1B (equivalent to ANSI HI 14.6-2011/1B)	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Hydraulic acceptance test to DIN ISO 9906 - 1U (equivalent to ANSI HI 14.6-2011/1U and Hydraulic Institute A)	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
NPSH test (to DIN ISO 9906 or Hydraulic Institute)	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Sound measurement	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Vibration test	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Bearing temperature measurement	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Visual inspection after test run (strip test)	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Hydrostatic test	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Impeller balancing test	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Coating inspection	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Dimensional inspection	Non-witnessed	○	○	○	○	○	○	○	○	○	○	○
	Witnessed	○	○	○	○	○	○	○	○	○	○	○
Coating												
Coating for indoor installation (KSB blue / RAL 5002)		●	●	●	●	●	●	●	●	●	●	●
Coating for outdoor installation (KSB blue / RAL 5002)		○	○	○	○	○	○	○	○	○	○	○
Coating approved for drinking water ¹⁷⁾		○	○	○	○	○	○	○	○	○	○	○
Coating for outdoor installation (special paint)		○	○	○	○	○	○	○	○	○	○	○
Special coating (coating system / coating composition to customer specifications)		□	□	□	□	□	□	□	□	□	□	□
Installation parts												
Without installation parts		●	●	●	●	●	-	-	-	-	-	-
Base frame for pump and motor, including foundation bolts		○	○	○	○	○	-	○	○	○	-	-

14) The selection of standard variants or special designs will determine whether surcharges or longer delivery times apply.

15) Maximum fluid temperature 80 °C [176 °F]

16) Further information see ZN 56555/2A, ZN 56555/2B, ZN 56555/2C.

17) Available for selection for fluid temperatures ≤ 60 °C

Features	Material variant					Installation type					
						RDLO				RDLO V	
	GB	GC	SB	SC	DD ₃₅	Fig. 0	2E	3E	4E	DP	DJ
Special base frame for pump and motor, including foundation bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Pump foundation (foot), including foundation blocks and drive lantern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	<input type="checkbox"/>	-
Special design of pump foundation (foot) including foundation blocks and motor pedestal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	<input type="checkbox"/>	-
Pump foundation (foot), including foundation blocks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-	<input type="checkbox"/>
Pump foundation (foot), including foundation blocks and motor support frame with foundation rails and foundation bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-	<input type="checkbox"/>
Direction of rotation											
"Right": clockwise	●	●	●	●	●	●	●	●	●	●	●
"Left": anti-clockwise	●	●	●	●	●	●	●	●	●	●	●
Replacement parts and spare parts											
Replacement parts and spare parts for 2 years of operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange											
Drilled to DIN EN 1092 – flat face (type A)	●	●	●	●	●	●	●	●	●	●	●
Drilled to DIN EN 1092 – raised face (type B)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drilled to ASME B16 – flat face (type FF)	●	●	●	●	●	●	●	●	●	●	●
Drilled to ASME B16 – raised face (type RF)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special flange	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupling											
Without coupling and coupling guard	●	●	●	●	●	●	●	●	●	-	●
Torsionally flexible 3-piece jaw coupling (coupling guard not tread-proof)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Torsionally flexible 3-piece jaw coupling (coupling guard tread-proof)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Torsion-resistant flexible disc coupling with spacer (coupling guard not tread-proof)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Torsion-resistant flexible disc coupling with spacer (coupling guard tread-proof)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Cardan shaft / coupling with spacer (with/without intermediate bearing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-	<input type="checkbox"/>
Bearings											
Grease-lubricated rolling element bearings at the drive end and non-drive end	●	●	●	●	●	●	●	●	●	●	●
Grease-lubricated rolling element bearing at the drive end, and product-lubricated plain bearing at the non-drive end	●	●	●	●	-	-	-	-	-	●	●
Oil-lubricated rolling element bearings at the drive end and non-drive end	●	●	●	●	●	●	●	●	●	-	-
Motor											
Without motor	●	●	●	●	●	●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low-voltage motor to KSB standard ¹⁸⁾¹⁹⁾	●	●	●	●	●	-	●	●	●	<input type="checkbox"/>	●
Low-voltage motor different from KSB standard ¹⁸⁾¹⁹⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special motor (high-voltage/NEMA/with frequency inverter/etc.) ¹⁸⁾¹⁹⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wear rings											
Casing with wear rings / impeller without wear rings	●	●	●	●	●	●	●	●	●	●	●
Casing with wear rings / impeller with wear rings	■	■	■	■	■	■	■	■	■	■	■
Piping											
Barrier fluid line / flushing water line made of flexible PTFE (malleable cast iron)	●	●	●	●	●	●	●	●	●	●	●
Barrier fluid line / flushing water line made of flexible PTFE (stainless steel)	■	■	■	■	-	■	■	■	■	■	■
Barrier fluid line / flushing water line made of flexible PTFE (duplex stainless steel)	-	-	-	-	■	■	■	■	■	■	■
Barrier fluid line / flushing water line, rigid pipe (stainless steel)	■	■	■	■	-	■	■	■	■	■	■
Barrier fluid line / flushing water line, rigid pipe (duplex/Monel)	-	-	-	-	■	■	■	■	■	■	■
Special piping (to customer requirements)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shaft seal											
Gland packing	●	●	●	●	-	●	●	●	●	●	●
Single mechanical seal (unbalanced)	-	-	-	-	-	-	-	-	-	-	-
Single mechanical seal (balanced)	■	■	■	■	■	■	■	■	■	■	■

18) The motor can be supplied and mounted by the customer. Motors supplied by KSB can also be mounted by the customer.
 19) On request, customer-supplied motors can be mounted by KSB Service.

Features		Material variant					Installation type					
							RDLO				RDLO V	
		GB	GC	SB	SC	DD ₃₅	Fig. 0	2E	3E	4E	DP	DJ
Special shaft seal (make/design different from KSB specifications)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Material certificates to EN 10204												
Volute casing (102)	Certificate type 2.2	■	■	■	■	■	■	■	■	■	■	■
	Certificate type 3.1	○	○	○	○	○	○	○	○	○	○	○
Pump shafts (211)	Certificate type 2.2	■	■	■	■	■	■	■	■	■	■	■
	Certificate type 3.1	○	○	○	○	○	○	○	○	○	○	○
Impeller (234)	Certificate type 2.2	■	■	■	■	■	■	■	■	■	■	■
	Certificate type 3.1	○	○	○	○	○	○	○	○	○	○	○
Casing wear ring (502)	Certificate type 2.2	■	■	■	■	■	■	■	■	■	■	■
	Certificate type 3.1	○	○	○	○	○	○	○	○	○	○	○
Impeller wear ring (503)	Certificate type 2.2	■	■	■	■	■	■	■	■	■	■	■
	Certificate type 3.1	○	○	○	○	○	○	○	○	○	○	○
Accessories												
Cyclone separator		■	■	■	■	-	■	■	■	■	■	■
Manually actuated vent valve (without additional piping) ²⁰⁾		■	■	■	■	■	■	■	■	■	■	■
Automatically actuated vent valve (without additional piping) ²⁰⁾		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manually actuated drain valves (without additional piping) ²⁰⁾		■	■	■	■	■	■	■	■	■	■	■
PumpMeter		■	■	■	■	■	■	■	■	■	■	■
Temperature sensor Pt100 resistance thermometer ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Limit switch for Pt100 resistance thermometer ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Transmitter for Pt100 resistance thermometer ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Measuring nipple (SPM) for manual vibration measurement ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Vibration sensor including vibration monitoring device ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Pressure gauge nominal diameter 100, including valves (without attenuation) ²⁰⁾²¹⁾		■	■	■	■	-	■	■	■	■	■	■
Pressure gauge nominal diameter 100, including valves (with attenuation) ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■
Pressure gauge nominal diameter 160, including valves (with attenuation) ²⁰⁾²¹⁾		■	■	■	■	■	■	■	■	■	■	■

Specifications required for enquiries/orders

Pump:

- Designation of the pump
- Maximum and minimum inlet pressure
- Flow rate Q, head H_{total}
- Flange design
- Shaft seal
- Type of fluid handled and fluid temperature
- Solids content
- Direction of rotation / motor position
- Accessories required
- Special inspections and acceptance tests
- Quantity and language of operating manuals

Drive (selected by KSB):

- Type of construction
- Enclosure
- Voltage, frequency, starting method
- Ambient temperature
- Thermal class
- Accessories required

Drive (selected by customer):

- Binding data sheet with motor dimensions and effective speed

20) If no valve or measuring equipment is selected as accessory the corresponding connection is closed with a plug.

21) The measuring equipment is supplied with the pump but not fitted. It has to be connected at the time of commissioning of the pump. This connection is closed with a plug when the pump is supplied.

Selection charts

RDLO / RDLO V, n = 1480 rpm

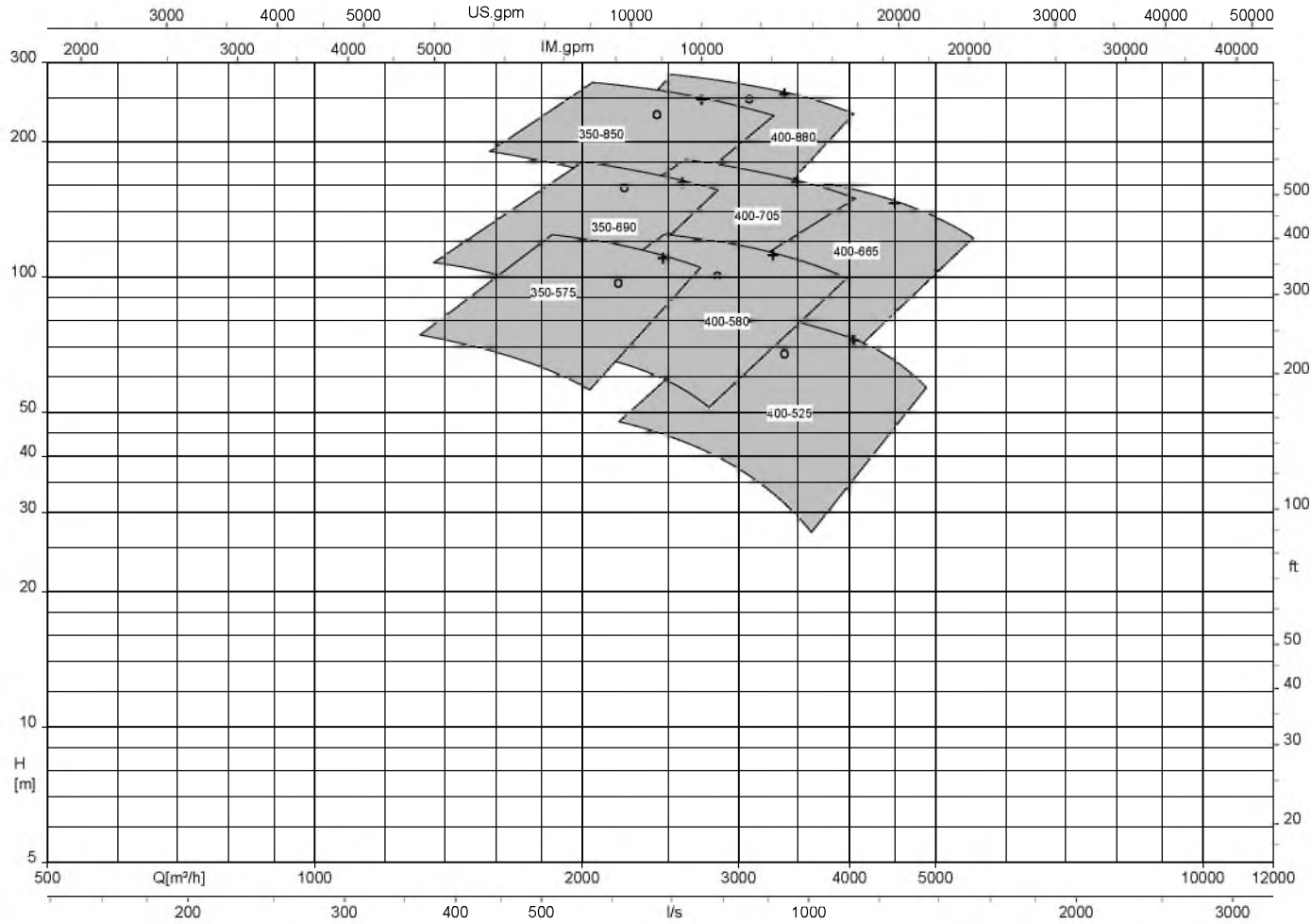


Fig. 1: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 985 rpm

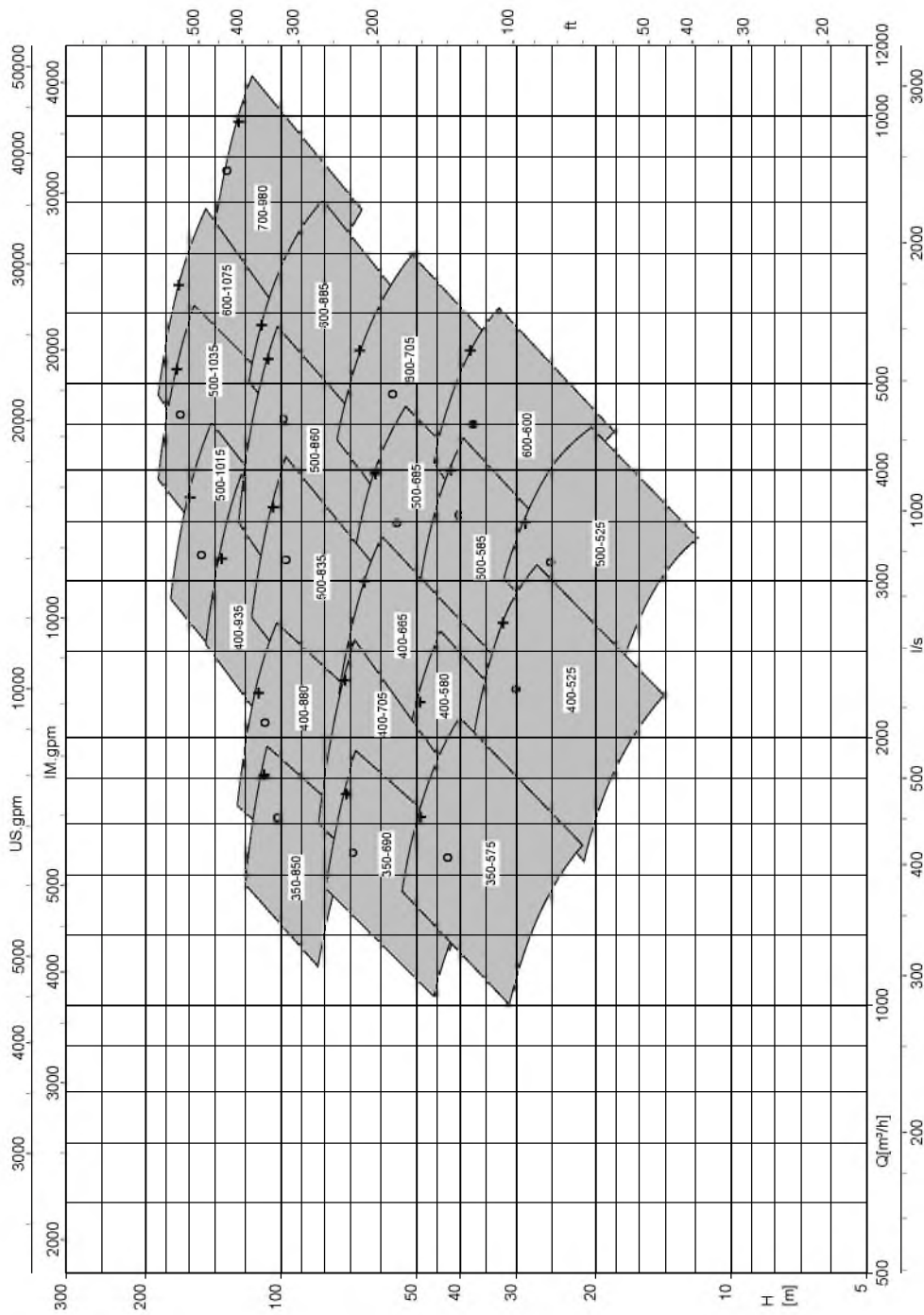


Fig. 2: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 740 rpm

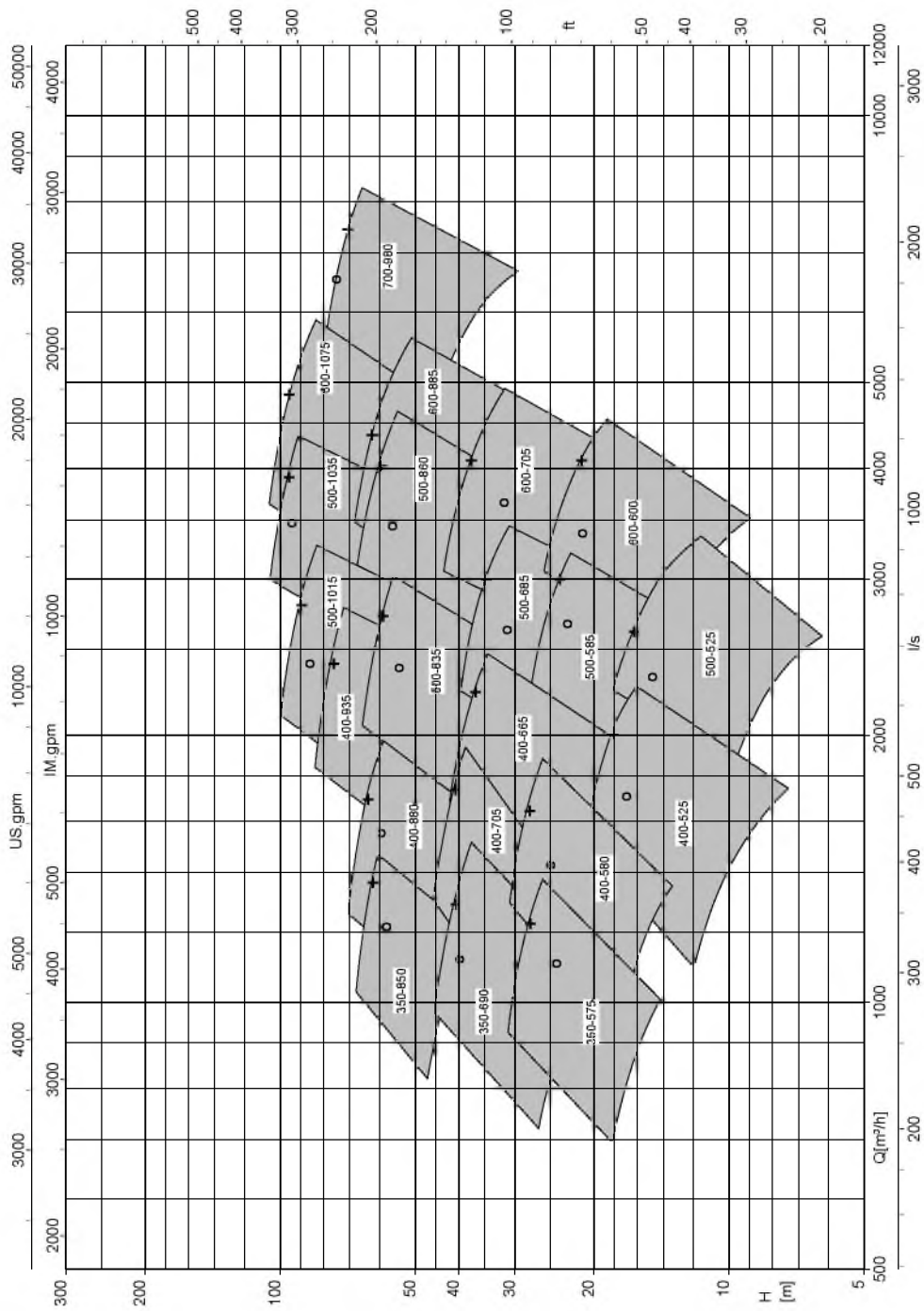


Fig. 3: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 1780 rpm

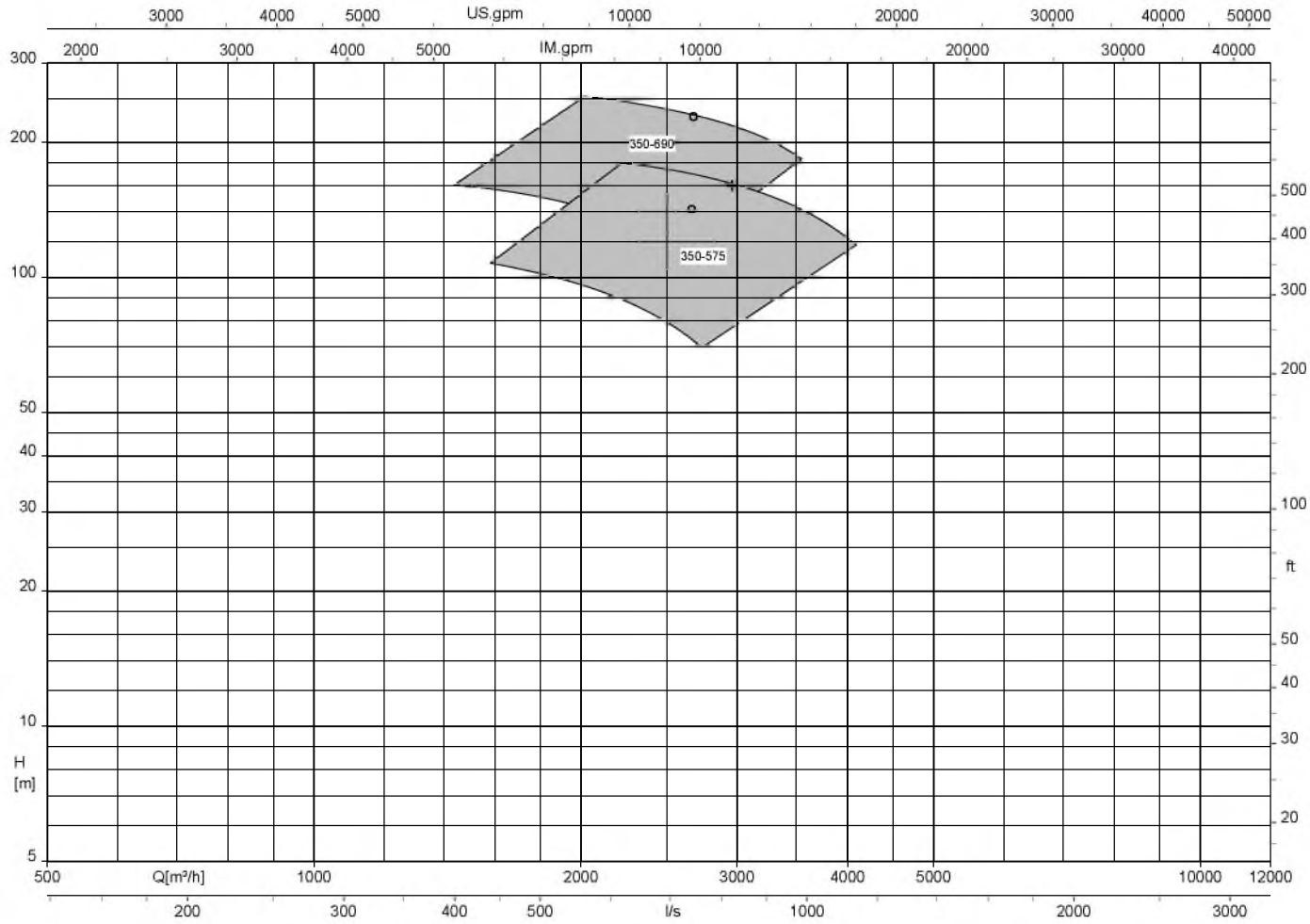


Fig. 4: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 1180 rpm

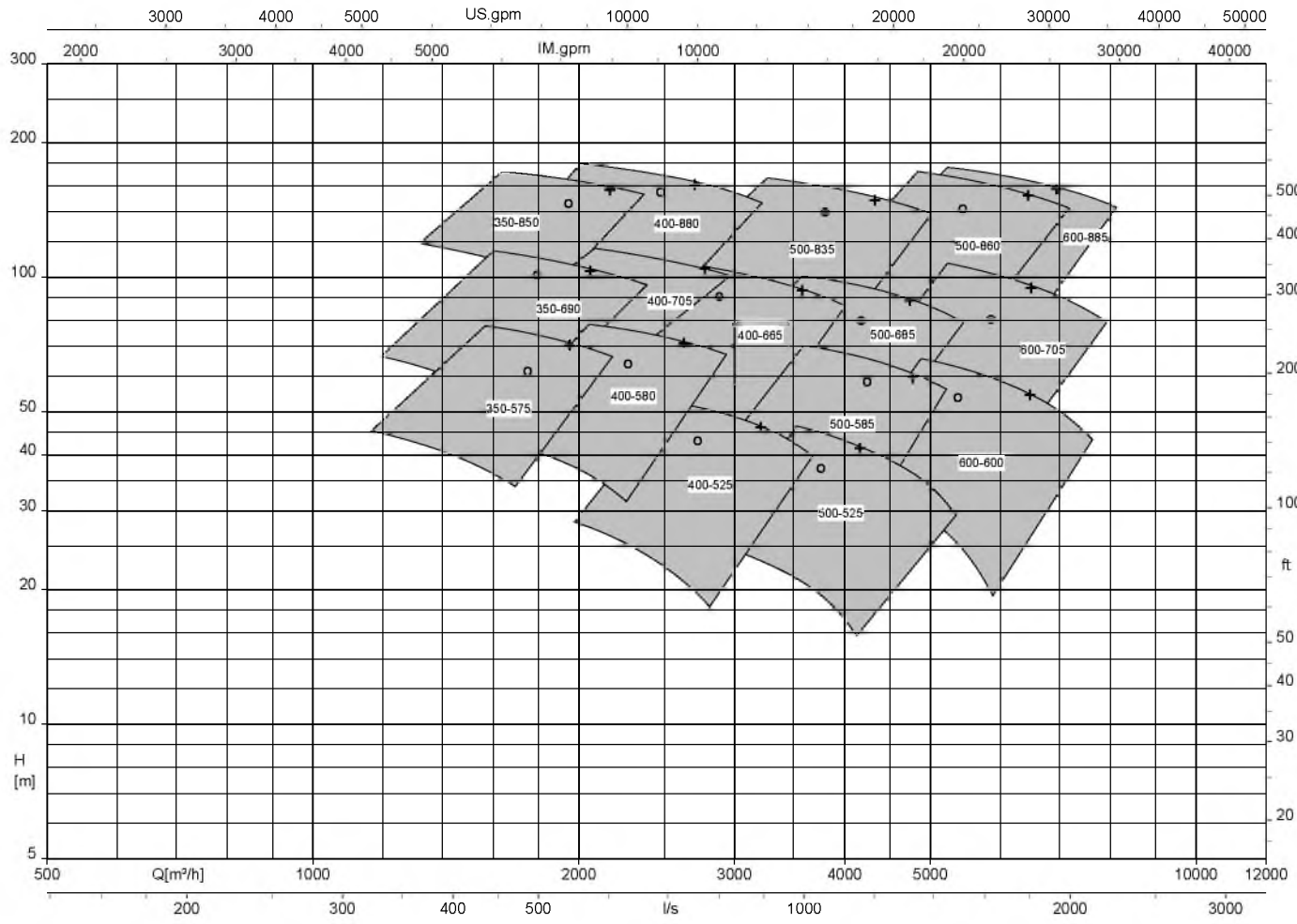


Fig. 5: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 890 rpm

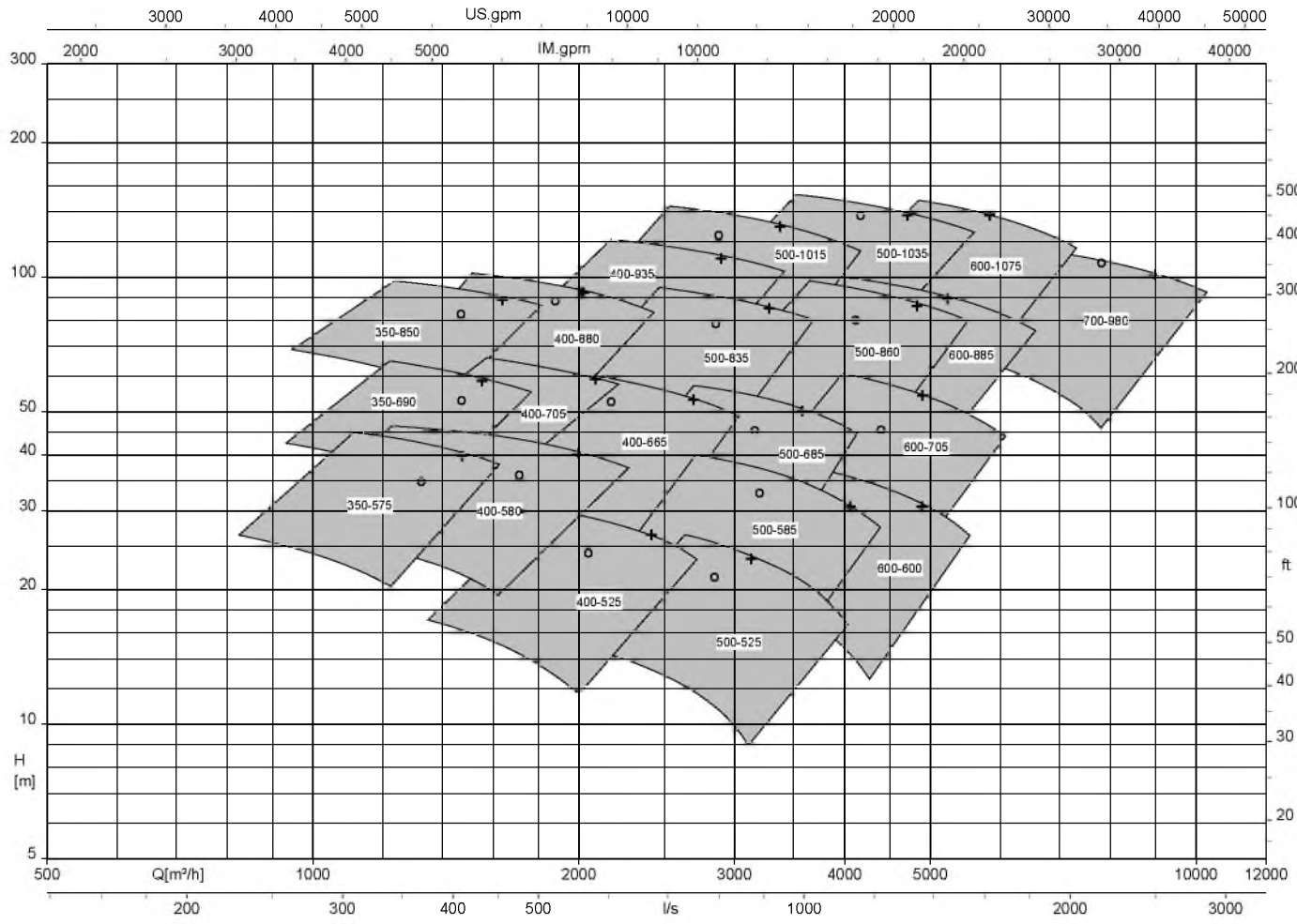


Fig. 6: + = η_{opt} A impeller / o = η_{opt} B impeller

RDLO / RDLO V, n = 715 rpm

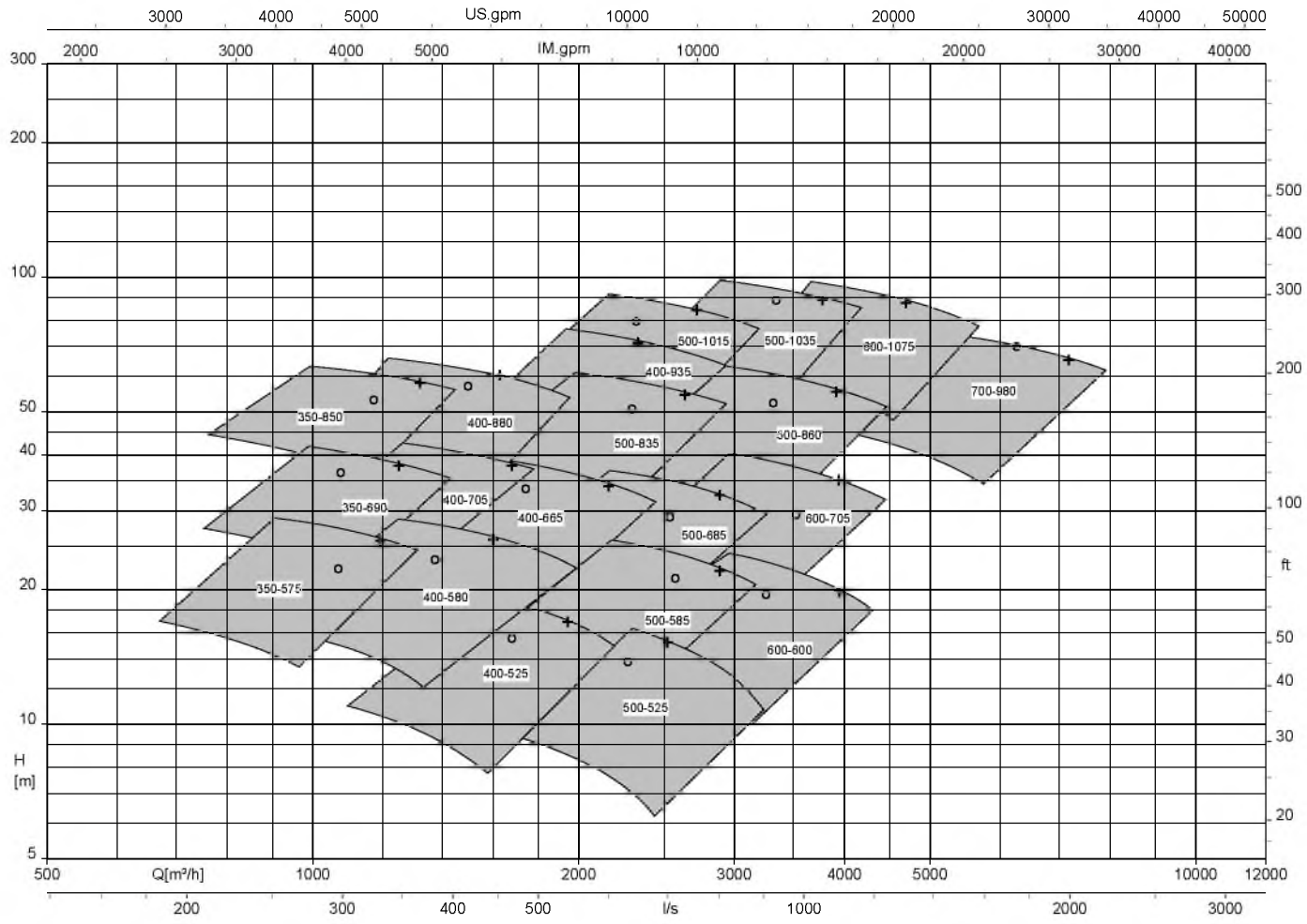


Fig. 7: + = η_{opt} A impeller / o = η_{opt} B impeller

Installation types

Fig.0

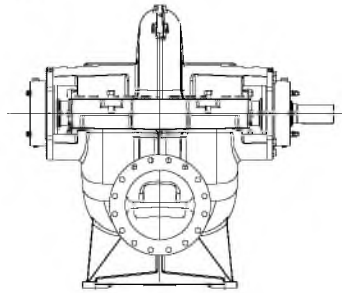


Fig. 8: Fig.0: Bare shaft pump

Options of installation parts:

- No optional equipment

Coupling options:

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling

Coupling guard options:

- Light-duty design, not tread-proof

Delivery/transport:

- Pump

2E

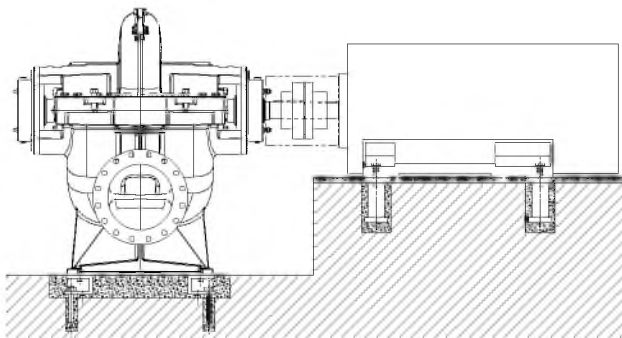


Fig. 9: 2E: Pump and motor on foundation rails

Options of installation parts:

- Foundation rails for the pump, including foundation bolts, and foundation blocks for the motor
- Foundation rails for the pump, including foundation bolts

Coupling options:

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling with spacer

Coupling guard options:

- Light-duty design, not tread-proof

Delivery/transport:

- Pump and motor are supplied as separate units.

3E

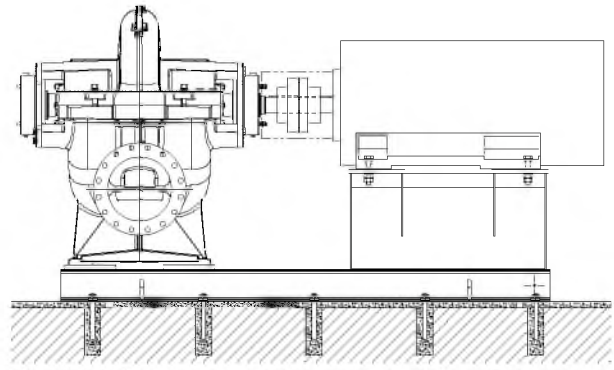


Fig. 10: 3E: Pump and motor on a common base frame

Options of installation parts:

- Base frame for pump and motor, including foundation bolts
- Special base frame for pump and motor, including foundation bolts

Coupling options:

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling with spacer²²⁾

Coupling guard options:

- Light-duty design, not tread-proof
- Heavy-duty design, tread-proof

Delivery/transport:

- Pump, motor and base frame are supplied as separate units.

22) On request only

4E

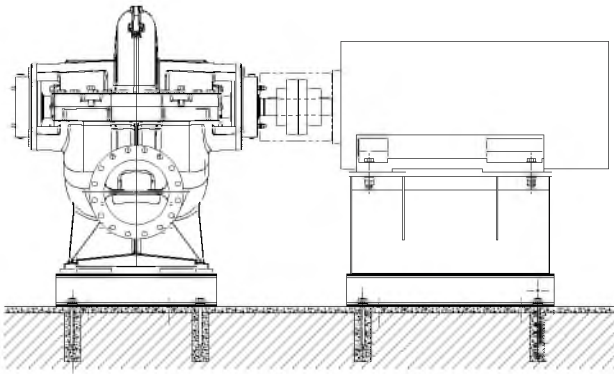


Fig. 11: 4E: Pump and motor on separate base frames

Options of installation parts:

- Base frame for the pump and base frame for the motor, including foundation bolts (without drip tray)
- Base frame for the pump, including foundation bolts (without drip tray)

Coupling options:

- Torsionally flexible 3-piece jaw coupling
- Torsion-resistant flexible disc coupling with spacer

Coupling guard options:

- Light-duty design, not tread-proof

Delivery/transport:

- Pump, motor and base frame are supplied as separate units.

DJ

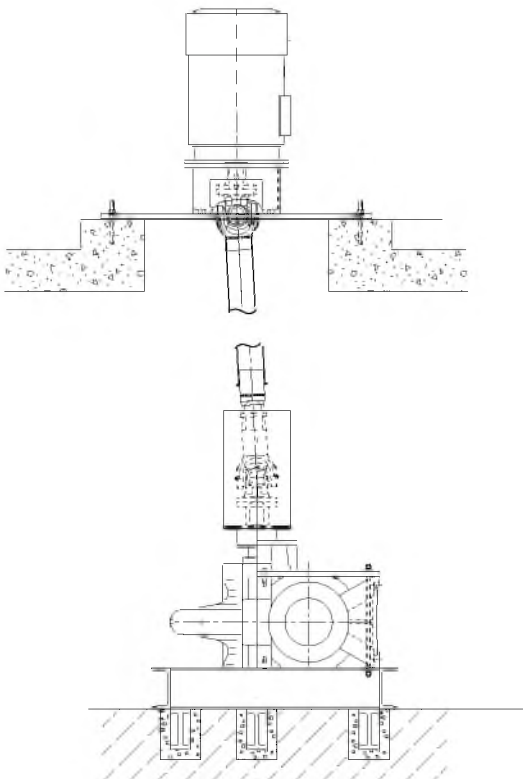


Fig. 12: DJ: Pump and motor on separate levels

Options of installation parts:

- Pump base frame (pump foot) including foundation bolts
- Pump base frame (pump foot) including foundation bolts, motor support frame, foundation rails and foundation bolts²³⁾

Coupling options:

- Cardan shaft²³⁾
- Coupling with spacer²³⁾

Coupling guard options:

- Light-duty design, not tread-proof

Delivery / transport:

- Pump on corresponding pump base frame (pump foot), motor and motor support frame are supplied as separate units.

DP

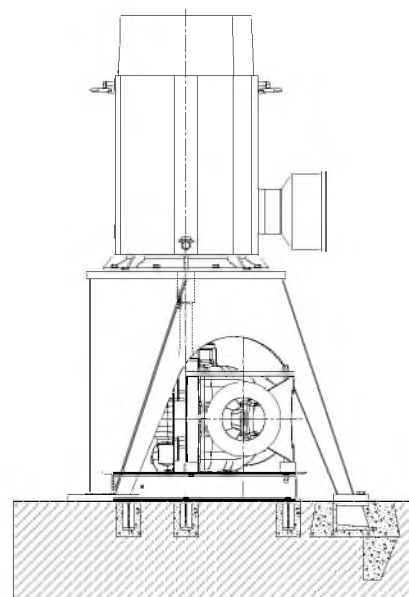


Fig. 13: DP: Motor on separate drive lantern

Options of installation parts:

- Pump base frame (pump foot) including foundation bolts, and drive lantern (including foundation rails and foundation bolts)

Coupling options:

- Torsion-resistant flexible disc coupling with spacer

Coupling guard options:

- Light-duty design, not tread-proof

Delivery/transport:

- Pump with pump base frame (pump foot), motor and drive lantern supplied as individual units

23) On request only

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump
- Drive
- Baseplate
- Coupling and coupling guard
- Universal-joint shaft
- Fasteners for pump and base frame

Optional accessories:

- Vibration monitoring
- Pt100 temperature sensor
- Constant level oiler
- Pressure gauge
- Measuring nipple for shock pulse measurement
- Cyclone

General assembly drawings with list of components

Horizontal installation (example)

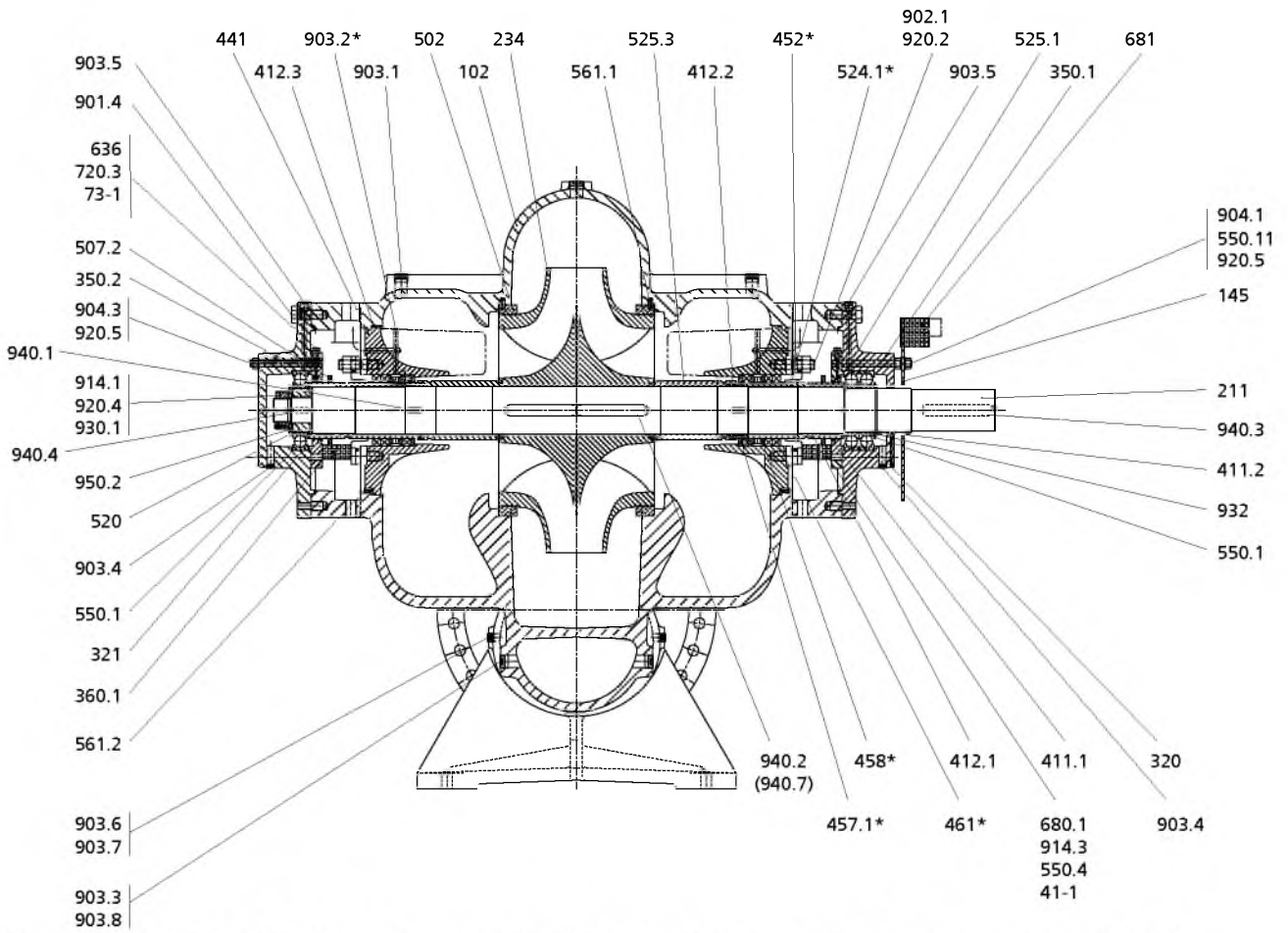
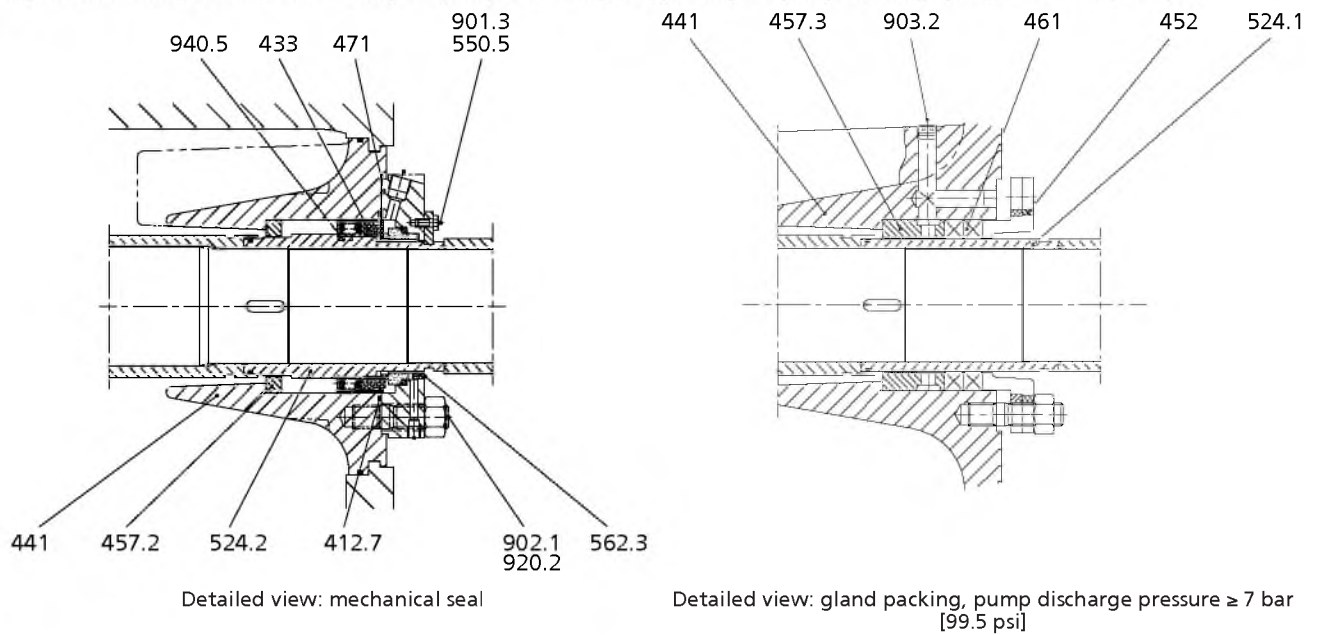
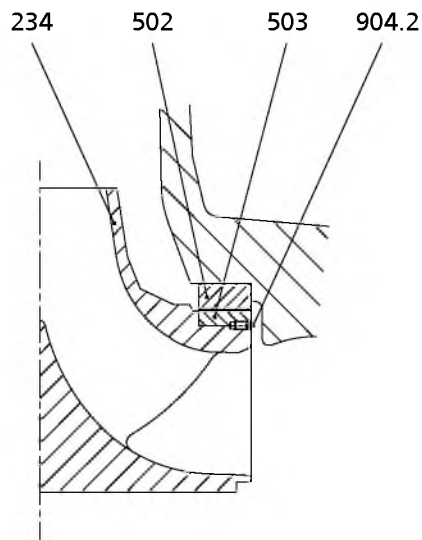
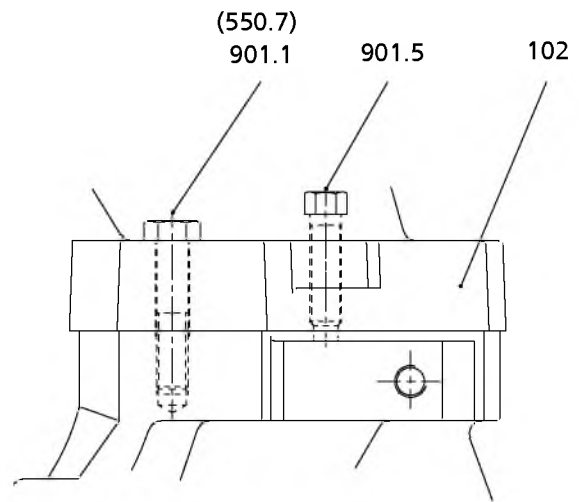


Fig. 14: Horizontal installation: * = only for pump sets with gland packing for pump discharge pressure < 7 bar [99.5 psi]





Detailed view: impeller with impeller wear ring



Detailed view: screwed connection of the casing split flange

List of components

Part No.	Description	Part No.	Description
102	Volute casing	520	Sleeve
145	Adapter	524.1/2	Shaft protecting sleeve
211	Pump shaft	525.1/3	Spacer sleeve
234	Impeller	550.1/4/5/7/11	Disc
320	Rolling element bearing	561.1/2	Grooved pin
321	Radial ball bearing	562.3	Parallel pin
350.1/2	Bearing housing	636	Lubricating nipple
360.1	Bearing cover	680.1	Guard
41-1	Sealing washer	681	Coupling guard
411.1/2	Joint ring	73-1	Socket
412.1/2/3/7	O-ring	720.3	Spacer
433	Mechanical seal	901.1/3/4/5	Hexagon head bolt
441	Shaft seal housing	902.1	Stud
452	Gland follower	903.1/2/3/4/5/6/7/8	Screw plug
457.1/2/3	Neck ring	904.1/2/3	Grub screw
458	Lantern ring	914.1/3	Hexagon socket head cap screw
461	Gland packing	920.2/4/5	Nut
471	Seal cover	930.1	Safety device
502	Casing wear ring	932	Circlip
503	Impeller wear ring	940.1/2/3/4/5/7	Key
507.2	Thrower	950.2	Spring

Vertical installation (example)

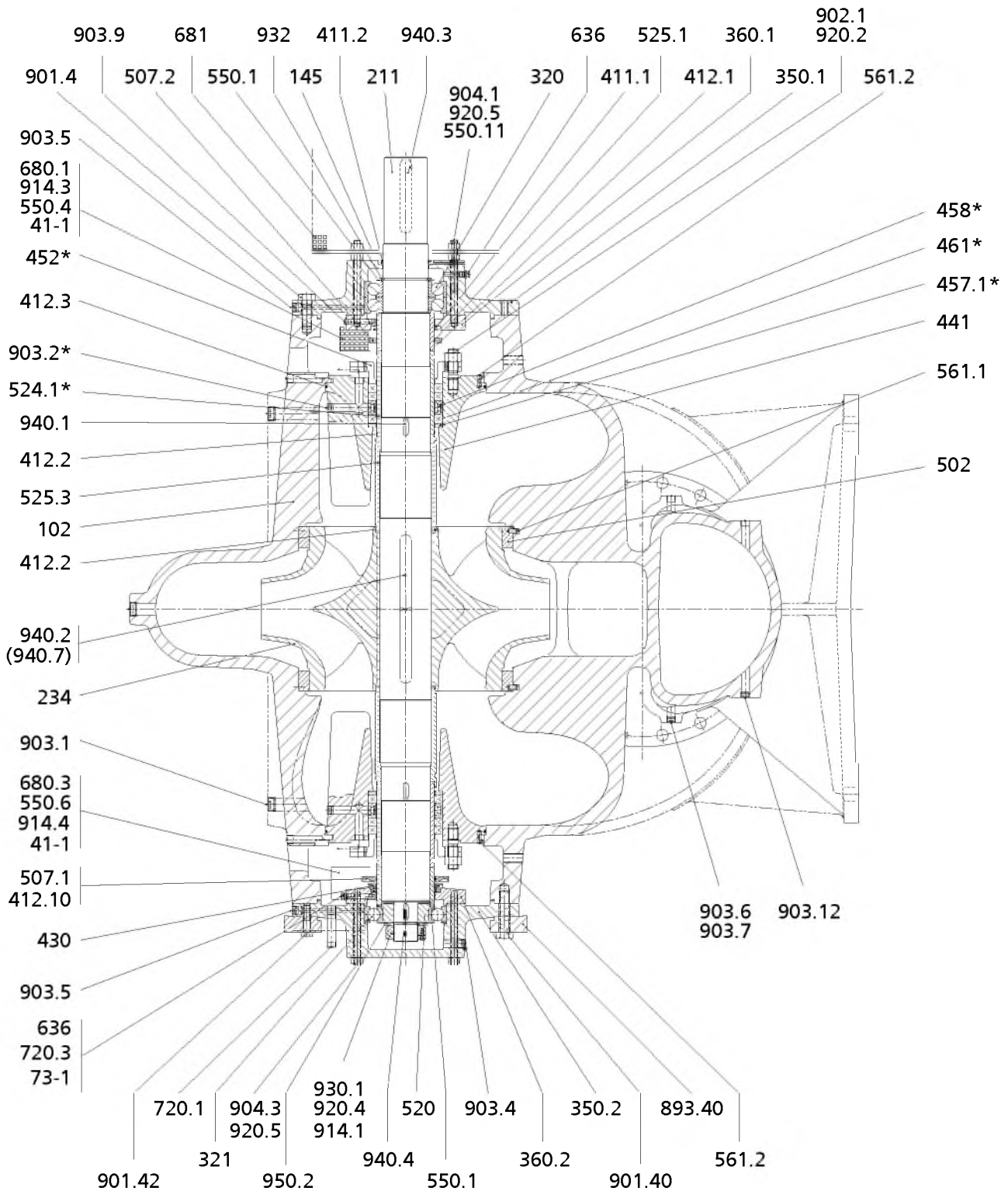
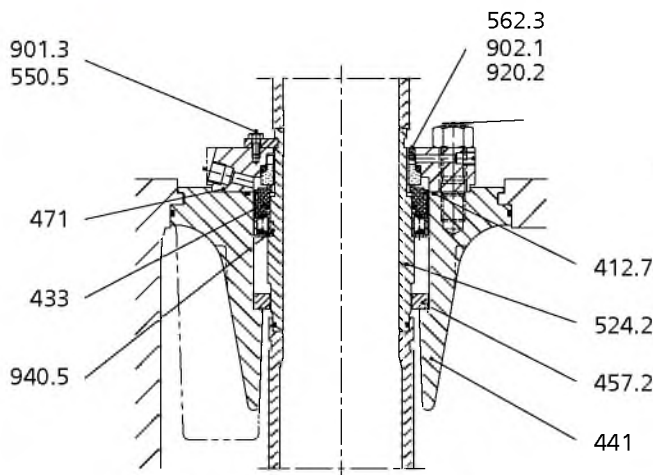
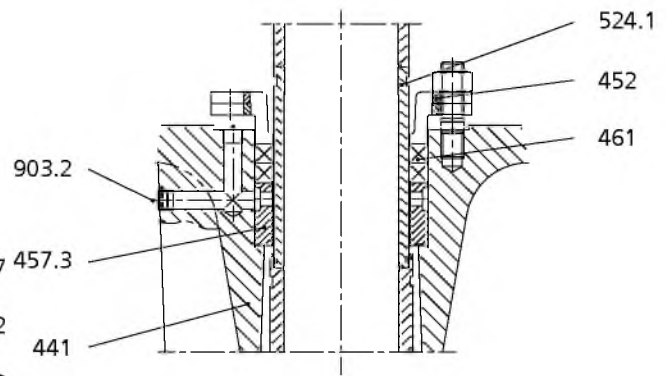


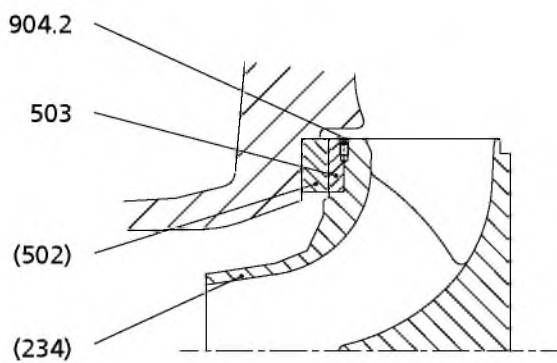
Fig. 15: Vertical installation: * = only for pump sets with gland packing for pump discharge pressure < 7 bar [99.5 psi]



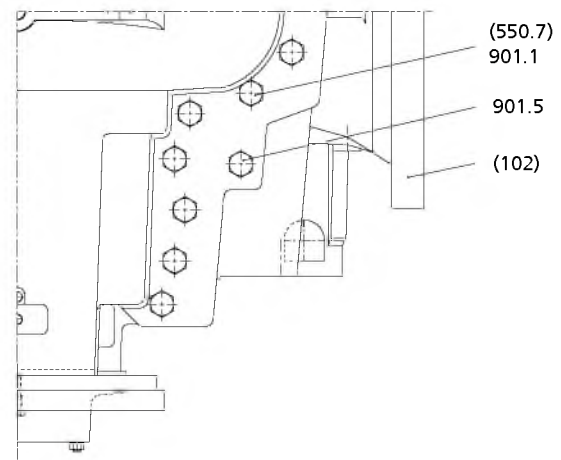
Detailed view: mechanical seal



Detailed view: gland packing, pump discharge pressure ≥ 7 bar [99.5 psi]



Detailed view: impeller with impeller wear ring



Detailed view: connecting elements of the volute casing

List of components

Part No.	Description	Part No.	Description
102	Volute casing	520	Sleeve
145	Adapter	524.1/2	Shaft protecting sleeve
211	Pump shaft	525.1/3	Spacer sleeve
234	Impeller	550.1/4/5/6/7/11	Disc
320	Rolling element bearing	561.1/2	Grooved pin
321	Radial ball bearing	562.3	Parallel pin
350.1/2	Bearing housing	636	Lubricating nipple
360.1/2	Bearing cover	680.1/3	Guard
41-1	Sealing washer	681	Coupling guard
411.1/2	Joint ring	73-1	Socket
412.1/2/3/7/10	O-ring	720.1/3	Spacer
430	Shaft seal	893.40	Soleplate
433	Mechanical seal	901.1/3/4/5/40/42	Hexagon head bolt
441	Shaft seal housing	902.1	Stud
452	Gland follower	903.1/2/4/5/6/7/9/12	Screw plug
457.1/2/3	Neck ring	904.1/2/3	Grub screw
458	Lantern ring	914.1/3/4	Hexagon socket head cap screw
461	Gland packing	920.2/4/5	Nut
471	Seal cover	930.1	Safety device
502	Casing wear ring	932	Circlip
503	Impeller wear ring	940.1/2/3/4/5/7	Key
507.1/2	Thrower	950.2	Spring

Self-priming Pump

Vitaprime

Type Series Booklet



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Self-priming Pump

Hygienic Pump

Vitaprime



Main applications

- Beverage industry and food industry
- Chemical industry/Fine chemicals
- Pharmaceutical industry
- Further industrial applications

Fluids handled

- Pure liquids not mechanically or chemically aggressive to the pump
- Liquids containing gas or vapour

Further information on fluids handled

(⇒ Page 6)

Operating data

Operating properties

Characteristic		Value	
		50 Hz	60 Hz
Flow rate	Q [m ³ /h]	≤ 58	≤ 60
Head	H [m]	≤ 45	≤ 65
Operating pressure	p [bar]	10	
Inlet pressure	p [bar]	≤ 3	
Operating temperature	T [°C]	≤ 100	
Sterilisation temperature	T [°C]	≤ 140	
Connection sizes	DN	40 - 80	

Designation

Example: VP 80-240-110404KBQT82MECCO

Designation key

Code	Description
VP	Type series VP Vitaprime
80	Nominal nozzle diameter [mm]
240	Nominal impeller diameter [mm]
11	Load range
040	Motor rating 040 4 kW (power in kW × 10)
4	Number of poles 4 4 poles
K	Mounting arrangement K 3-point or 4-point ball feet
BQ	Mechanical seal design BQ External flushing (quench)
T82	Shaft seal code T82 BQ1EGG
M	Piping connection M Threaded connection to DIN 11851
E	O-ring material variant E EPDM 70 (FDA, USP Class VI, 3A)
C	Casing material variant C 1.4409
C	Impeller material variant C 1.4409
O	Motor shroud O Without shroud

Further information on the designation

(⇒ Page 22)

Design details

Design

- Standard design with materials to Regulation (EC) No 1935/2004
- Design to ATEX

Design

- Side channel pump
- Horizontal installation
- One or two stages
- Self-priming

Pump casing

- Casing with transfer passages

Impeller type

- Open star impeller

Bearings

- Grease-packed deep groove ball bearing

Shaft seal

- Single mechanical seal to EN 12756
 - Seal type T¹⁾: pump-end seal with non-encapsulated spring surrounded by fluid handled, uni-directional
- Double mechanical seal to EN 12756
 - Seal type Q: back-to-back arrangement (pressurised barrier fluid)

Drive

- Efficiency class IE3 to IEC 60034-30

Standard design:

- KSB surface-cooled IEC frame three-phase current squirrel-cage motor
- 50 Hz winding, 220-240 V/380-420 V ≤ 2.20 kW
- 50 Hz winding, 380-420 V/660-725 V ≥ 3.00 kW
- 60 Hz winding, 440-480 V ≤ 2.60 kW
- 60 Hz winding, 440-480 V ≥ 3.60 kW
- Type of construction IM V1 ≤ 4.00 kW
- Type of construction IM V1 ≥ 5.50 kW
- IP55 enclosure
- Duty cycle: continuous duty S1
- Thermal class F with temperature sensor, 3 PTC thermistors

Explosion-proof version:

- KSB surface-cooled IEC frame three-phase current squirrel-cage motor
- 50 Hz winding, 220-240 V/380-420 V ≤ 1.85 kW
- 50 Hz winding, 380-420 V/660-725 V ≥ 2.50 kW
- Type of construction IM V1 ≤ 3.30 kW
- Type of construction IM V15 ≥ 4.60 kW
- Enclosure IP55 or IP54
- Duty cycle: continuous duty S1
- Type of protection EExe II
- Temperature class T3

Automation

Automation options:

- PumpDrive

Connections

- Axial suction nozzle, tangential discharge nozzle.

Types of connection:

- Threaded connection to DIN 11851
- Threaded connection to DIN 11853
- Threaded connection to DIN 11864-1-GS-A
- Threaded connection to SMS standard
- Threaded connection to IDF standard
- Threaded connection to RJT standard
- Tri-Clamp/Tri-Clover fitting
- Clamped connection to DIN 11864-3-NKS-A
- Clamped connection to DIN 32676-A
- Clamped connection to ISO 2852

- Flange to EN 1092-1
- Flange to DIN 11864-2-NF-A
- Flange to ASA ASME 150
- APV flange
- Varivent flange
- Other connection types on request

Materials

Pump section	Material
Pump casing ²⁾	1.4409 (AISI CF3M)
Impeller ²⁾	1.4409 (AISI CF3M)
Impeller nut ²⁾	1.4404 (AISI 316L)
Shaft ²⁾	1.4404 (AISI 316L)
Drive lantern	1.4308 (AISI 304)
Bearing assembly	Cast iron, nickel-plated or painted
Motor housing	Motor size ≤ 160 aluminium Motor size ≥ 180 grey cast iron
Motor shroud	1.4301 (AISI 304)
Ball feet	1.4308 (AISI 304)
Elastomers ²⁾	EPDM, FPM, FFP, FFKM

All materials that will be in contact with the fluid handled conform with Regulation (EC) No. 1935/2004.

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Side channel pump for good and fast self-priming and for transporting fluids containing gas.
- Easy to clean due to little dead volume and excellent flushability
- Service-friendly design, easy and fast to dismantle
- Stub shaft allows combination with all commercial standardised motors
- Corrosion-resistant by using high-quality stainless steel
- A large variety of materials, sealing elements and connections are available to optimally match the pump to its application.
- Highly suitable for CIP/SIP cleaning processes

Certifications

Overview

Label	Effective in:	Note
	All countries	Certified quality management to ISO 9001
	All countries	Elastomers FDA, 3A, USP class VI certified

1) Hygienic design
2) Wetted component

Acceptance tests and warranty

- Materials testing
 - Material test report 2.2 on request
 - Material test report 3.1 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test against surcharge
 - To ISO 9906/2B or ISO 9906/3B
 - NPSH test
- Other tests
Other tests (e.g. vibrations, strength, noise characteristics) on request.
- Warranties
Warranties are given within the scope of the valid terms and conditions of sale and delivery.

Overview of fluids handled

Table of fluids handled and associated material combinations
 X = standard

Fluid handled	Temperature		Seal code											Operating mode	Comment
	Min.	Max.	T19	T64	T66	T80	T81	T82	T83	T84	Q71	Q72	Q79		
	[°C]														
Alcohol, butanol															
Butanol	0	60	-	-	-	-	-	X	-	-	-	-	-	I	-
Isobutanol	0	60	-	-	-	-	-	X	-	-	-	-	-	I	-
Alcohol, ethanol															
- ³⁾	0	60	-	-	-	-	-	X	-	-	-	-	-	I	-
Alcohol, methanol															
-	0	60	-	-	-	-	-	X	-	-	X	-	-	I, BQ, DB	Provide water quench for indoor application (toxicity).
Alcohol, propanol															
1-propanol	0	60	-	-	-	-	-	X	-	-	-	-	-	I	-
2-propanol	0	60	-	-	-	-	-	X	-	-	-	-	-	I	-
Beer															
Beer mash	0	100	-	X	-	-	-	-	-	-	-	-	X	-	BQ, DB Use suitable water as liquid quench.
Beer wort	0	100	-	X	-	-	-	-	-	-	-	-	X	-	BQ, DB Use suitable water as liquid quench.
Brewer's yeast	0	30	-	X	-	-	-	-	-	-	-	-	-	B, I	
Hops	0	100	-	X	-	-	-	-	-	-	-	-	X	-	BQ, DB Use suitable water as liquid quench.
Trub (brewery)	0	90	-	X	-	-	-	-	-	-	-	-	-	B, I	
Cleaning-in-place (CIP)	0	85	-	-	-	-	-	X	-	-	-	-	-	B, I	After cleaning, flush with hot water of 90 °C max.
Beverages, alcoholic															
Spirits (40 % ethanol)	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	Brandy 40 %
Beer	0	70	-	-	-	-	-	X	-	-	-	-	-	B, I	Beer after primary fermentation
Fruit liqueur	0	60	-	X	-	-	-	-	-	-	-	-	X	BQ, DB	Use suitable water as liquid quench.
Must	0	60	-	X	-	-	-	-	-	-	-	-	-	B, I	
Pernod	0	40	-	-	-	-	-	X	-	-	-	-	-	B, I	
Grappa	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Whiskey	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Wine (cider)	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Liqueur with egg yolks	0	50	-	-	-	-	-	X	-	-	-	-	-	B, I	
Herbal liqueur, alcohol content ≤ 50 %	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Sparkling wine	0	50	-	-	-	-	-	X	-	-	-	-	-	B, I	
Sap (juice) with 24 % ethanol	0	50	-	-	-	-	-	X	-	-	-	-	-	B, I	
Beverages, non-alcoholic															
Coke	0	20	-	-	-	-	-	X	-	-	-	-	-	B, I	≤ 12°Bx
Coke concentrate	0	20	-	X	-	-	-	-	-	-	-	-	-	B, I	≤ 65°Bx
Coffee	0	60	-	-	-	-	X	-	-	-	-	-	-	B, I	Coffee extract
Lemonade	0	90	-	X	-	-	-	-	-	-	-	-	-	B, I	≤ 65°Bx
Caffeine crystals (liquid)	20	100	-	X	-	-	-	-	-	-	-	-	-	B, I	max. 5 % caffeine
Glucose															
Unsaturated aqueous solution	0	50	-	X	-	-	-	-	-	-	-	-	X	B, BQ, DB	Observe the melting point or crystallisation point. If required, heat up the casing cover prior to commissioning/start-up. Use suitable hot water as quench liquid. Concentration < 65°Bx single mechanical seal w/o flushing is ok.

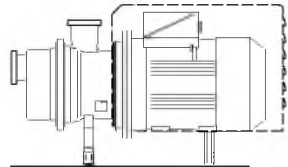
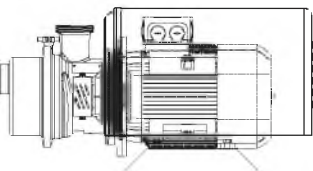
3) No details specified


Fluid handled	Temperature		Seal code											Operating mode	Comment
	Min. [°C]	Max.	T19	T64	T66	T80	T81	T82	T83	T84	Q71	Q72	Q79		
Glycerine															
Concentration ≤ 40 %	0	100	-	-	-	-	-	X	-	-	-	-	-	B, I	
Glycol (pure)															
Diethylene glycol	0	60	-	-	-	-	-	X	-	-	-	X	-	B, I, DB	Provide water quench for indoor application (toxicity).
Ethylene glycol	0	60	-	-	-	-	-	X	-	-	-	X	-	B, I, BQ	Glycol Provide water quench for indoor application (toxicity).
Urea (carbamide)															
Concentration ≤ 35%	0	80	-	-	X	-	-	-	-	-	-	-	X	BQ, DB	Use suitable water as cooling liquid.
Foodstuff (liquid)															
Egg (liquid)	0	20	-	-	-	-	-	-	-	-	-	X	-	BQ, DB	If containing sugar, use Q72 (U2U2EGG).
Foodstuff (aqueous)															
Malt	0	100	-	X	-	-	-	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Dairy products															
Chocolate milk	0	90	-	-	-	X	-	-	-	-	-	-	-	B, I	
Sweetened condensed milk	0	90	-	-	-	-	X	-	-	-	-	-	-	B, I	
Skimmed milk (fresh, sour)	0	90	-	-	-	X	-	-	-	-	-	-	-	B, I	
Milk	0	90	-	-	-	X	-	-	-	-	-	-	-	B, I	
Cream (sweet, sour)	0	90	-	-	-	X	-	-	-	-	-	-	-	B, I	
Sweet permeate (milk)	0	90	-	-	-	X	-	-	-	-	-	-	-	B, I	
Sodium hydroxide															
Concentration 0 to 50 %	0	80	-	-	-	-	-	X	-	-	-	-	-	B, I	Observe the melting point or crystallisation point. If required, heat up the casing cover prior to commissioning/start-up. Use suitable hot water as continuous quench liquid.
Fruit pulp															
Apricot purée with 40 % water	0	20	-	-	-	-	-	-	-	-	-	X	-	BQ, DB	Use suitable water as liquid quench.
Oil, vegetable oil															
Anise oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Cotton seed oil	5	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Peanut oil	5	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Lavender oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Linseed oil	0	60	-	-	-	X	-	-	-	-	-	-	-	B, I	
Linseed oil with ≤ 3% H ₂ SO ₄	0	20	-	-	-	X	-	-	-	-	-	-	-	B, I	
Corn oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Olive oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Palm oil	45	100	-	-	-	X	-	-	-	-	-	-	-	B, I	Melting point = +27 °C to +42 °C T85 (Q1U2VGG) recommended for temperatures above 70 °C.
Rapeseed oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Castor oil	26	100	-	-	-	X	-	-	-	-	-	-	-	B, I	Info: viscosity = 700 mm ² /s at 25 °C
Soybean oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Sunflower oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Edible oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	Non-heatable pumps can be used if the melting point < ambient temperature. Check the melting point and viscosity with the customer.
Walnut oil	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Juice (fruit and sugar solutions)															
Fruit juice	0	60	-	X	-	-	-	-	-	-	-	-	-	B, I	Apple juice
Vegetable juice	0	100	-	X	-	-	-	-	-	-	-	-	-	B, I	
Orange juice	0	60	-	X	-	-	-	-	-	-	-	-	-	B, I	
Pressed sap	0	50	-	X	-	-	-	-	-	-	-	-	-	B, I	
Sugar solutions	0	100	-	X	-	-	-	-	-	-	-	-	-	B, I	Sugar solution > 65 Bx (for single seal)
	0	95	-	X	-	-	-	-	-	-	-	X	-	DB, BQ	Use suitable water as barrier fluid, concentration > 65°Bx.
Acid, malic acid															
Unsaturated aqueous solution	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	Solubility = 65 % at 40 °C and 72.8 % at 60 °C
Acid, citric acid															

Fluid handled	Temperature		Seal code											Operating mode	Comment
	Min. [°C]	Max.	T19	T64	T66	T80	T81	T82	T83	T84	Q71	Q72	Q79		
Concentration 1 to 50 %	0	80	-	-	-	-	-	X	-	-	-	-	-	B, I	
Acid, acetic acid															
Concentration 1 to 25 %	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	Vinegar
Concentration ≤ 30%	0	20	-	-	-	-	-	X	-	-	X	-	-	BQ, DB	Use suitable water as liquid quench.
Concentration ≤ 50%	0	20	-	-	-	-	-	X	-	-	X	-	-	BQ, DB	Use suitable water as liquid quench.
Acid															
Unsaturated aqueous solution	0	100	-	-	-	X	-	-	-	-	-	-	-	B, I	
Acid, tannic acid															
Concentration 1 to 50%	0	100	-	-	-	-	-	X	-	-	-	-	-	B, I	
Acid, lactic acid															
Concentration 1 to 50%	0	60	-	-	-	X	-	-	-	-	-	-	-	B, I	
Acid, oxalic acid															
Concentration ≤ 5%	0	20	-	-	-	-	-	X	-	-	X	-	-	BQ, DB	Use suitable water as liquid quench.
Acid, tartaric acid															
Concentration ≤ 8%	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Concentration ≤ 50%	0	60	-	-	-	-	-	X	-	-	-	-	-	B, I	
Sorbitol (solution)															
Unsaturated aqueous solution	0	80	X	-	-	-	-	-	-	-	-	-	X	DB, BQ	Mechanical seal for solutions up to 40 % max. Use suitable water as liquid quench.
Water, desalinated															
De-ionised water	0	110	-	-	-	-	-	X	-	-	-	-	-	B, I	Water quality: conductivity > 10 µS/cm < 250 µS/cm, SiO ₂ content < 10 mg/l, solids content 5 mg/l max.
Drinking water															
Mash, schnapps	0	110	-	-	-	-	-	X	-	-	-	-	-	B, I	
Ice water (brewery)	0	110	-	-	-	-	-	X	-	-	-	-	-	B, I	
Tap water	0	110	-	-	-	-	-	X	-	-	-	-	-	B, I	
Hot water (brewery)	0	110	-	-	-	-	-	X	-	-	-	-	-	I	
Water															
Pure water	0	110	-	-	-	-	-	X	-	-	-	-	-	B, I	

Mounting arrangements

Mounting arrangement

Mounting arrangement	Illustration	Description
K		Horizontal installation, close-coupled pump set <ul style="list-style-type: none"> ▪ Axial suction nozzle, tangential discharge nozzle ▪ Mounted on 3-point ball feet up to a drive rating of 4 kW. ▪ Mounted on 4-point ball feet for drive ratings from 5.5 to 22 kW. ▪ Alternatively mounted on round base feet
M		Horizontal installation, close-coupled pump set <ul style="list-style-type: none"> ▪ Axial suction nozzle, tangential discharge nozzle ▪ Mounted on a motor foot for drive ratings from 0.33 to 22 kW.

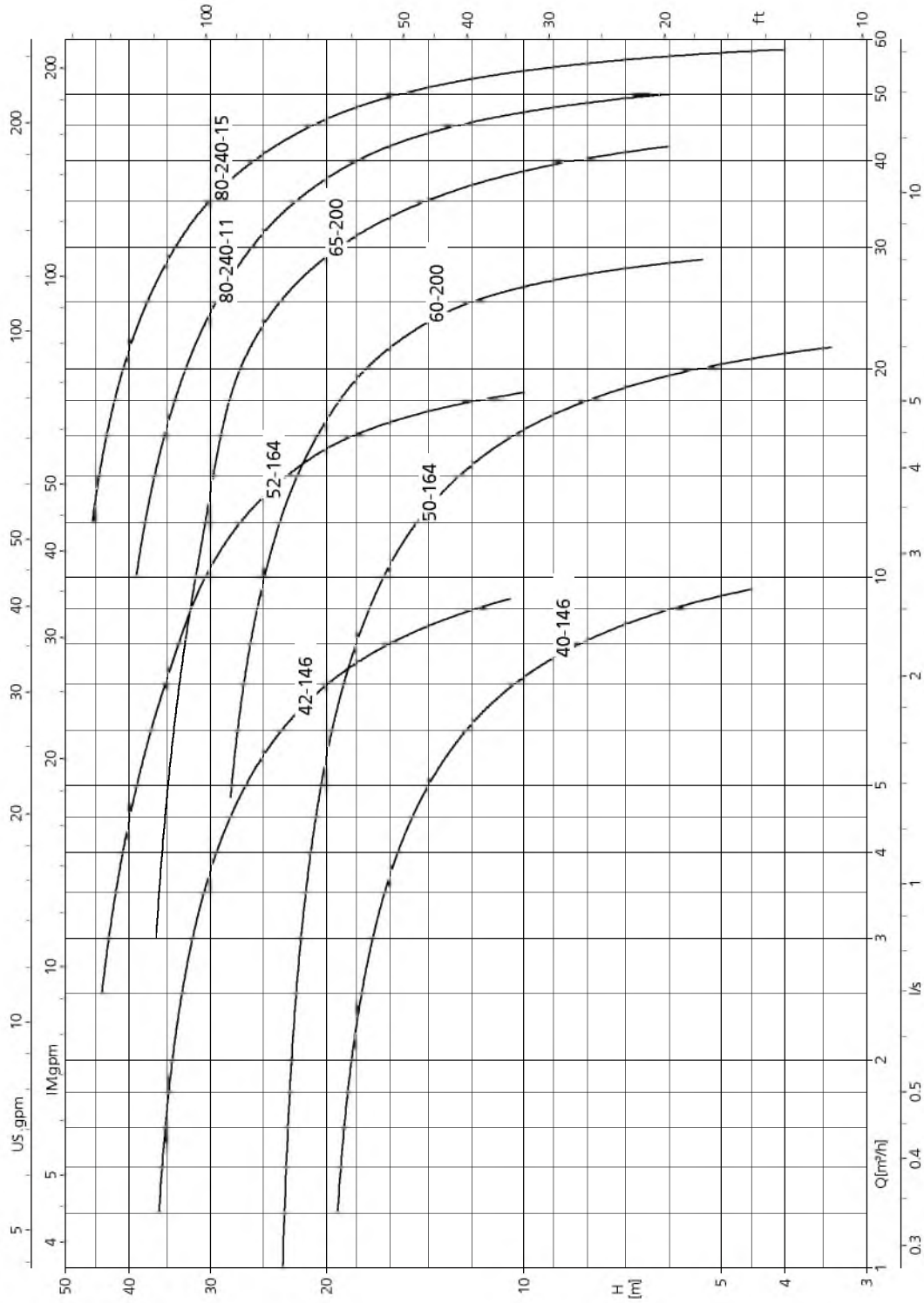
 Vertical installation requires a mechanical seal with flushing system.

Mounting arrangements per pump size

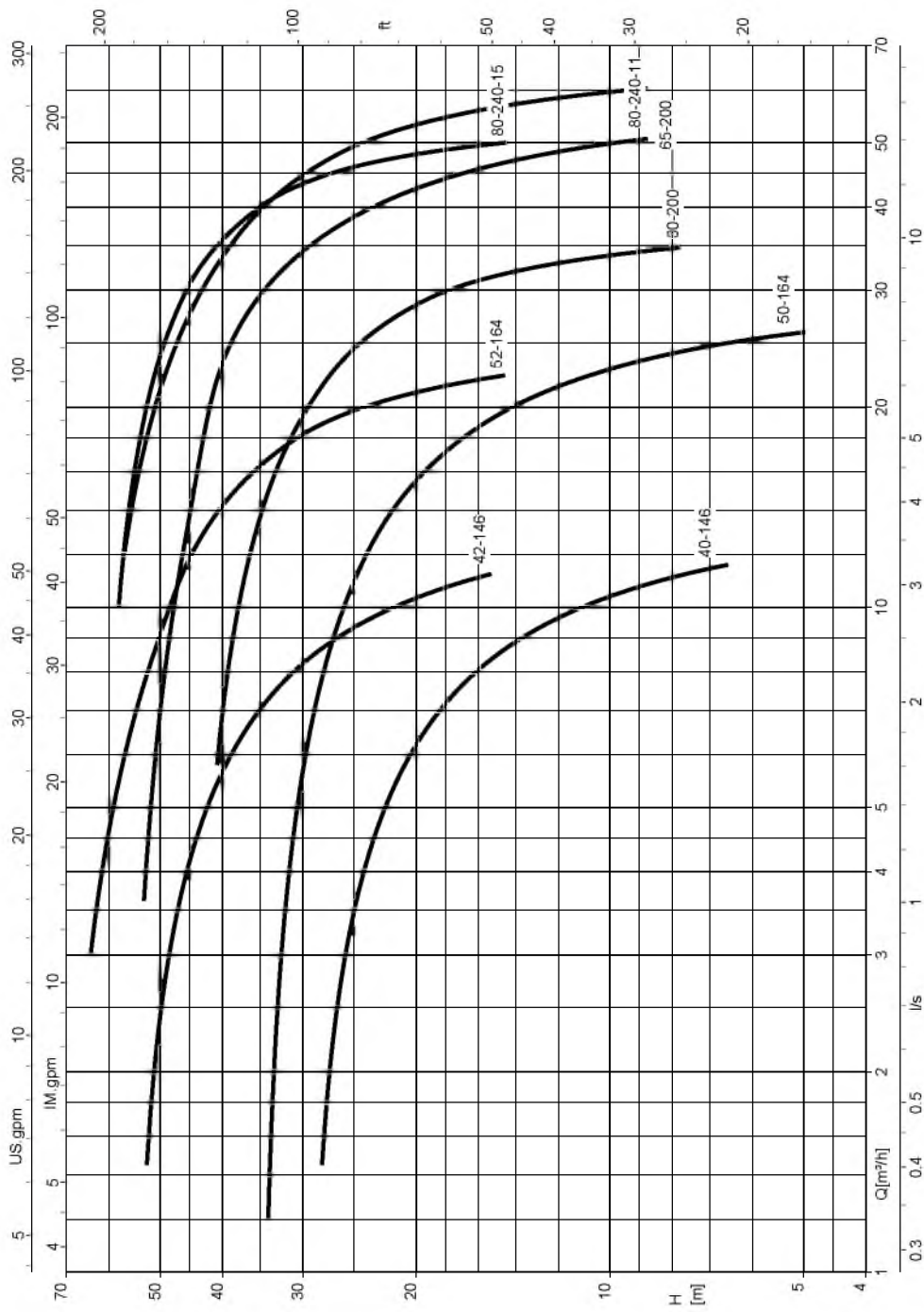
Size	Ball feet	Round base feet	Motor feet
40 - 146	X	X	X
42 - 146	X	X	X
50 - 164	X	X	X
52 - 164	X	X	X
60 - 200	X	X	X
65 - 200	X	X	X
80 - 240 - 11	X	X	X
80 - 240 - 15	X	X	X

Selection charts

Vitaprime, n = 1450 rpm



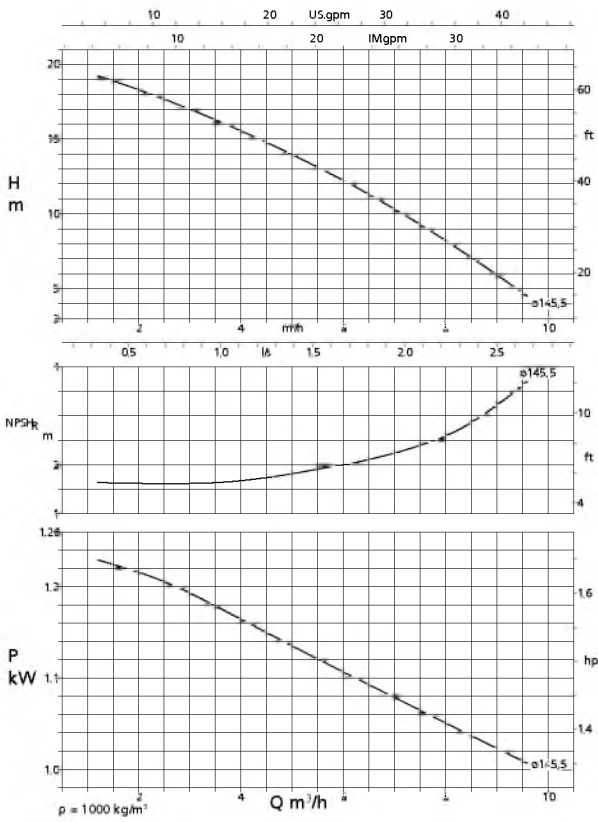
Vitaprime, n = 1750 rpm



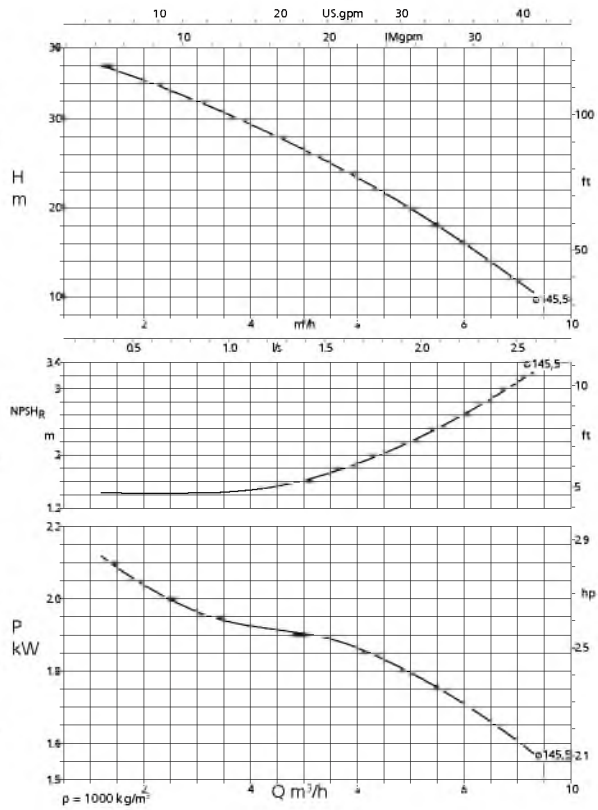
Characteristic curves

Vitaprime, n = 1450 rpm

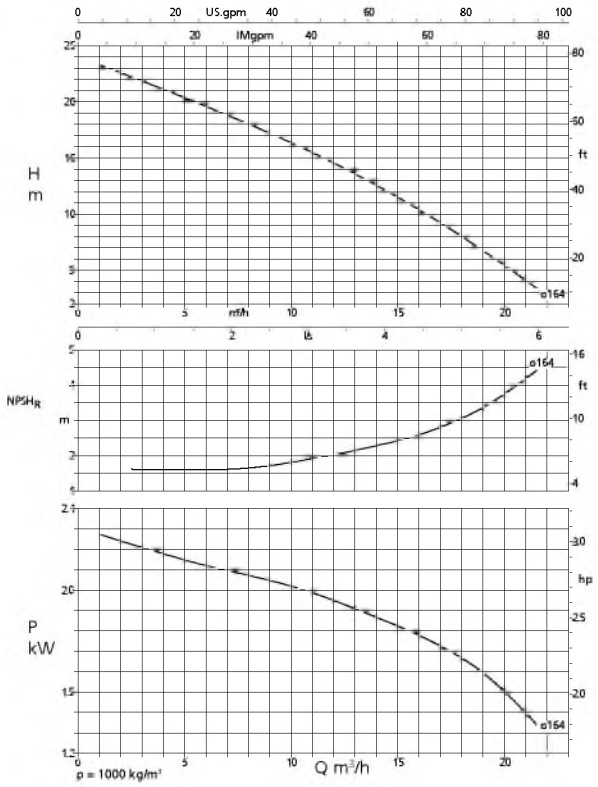
Vitaprime 40-146



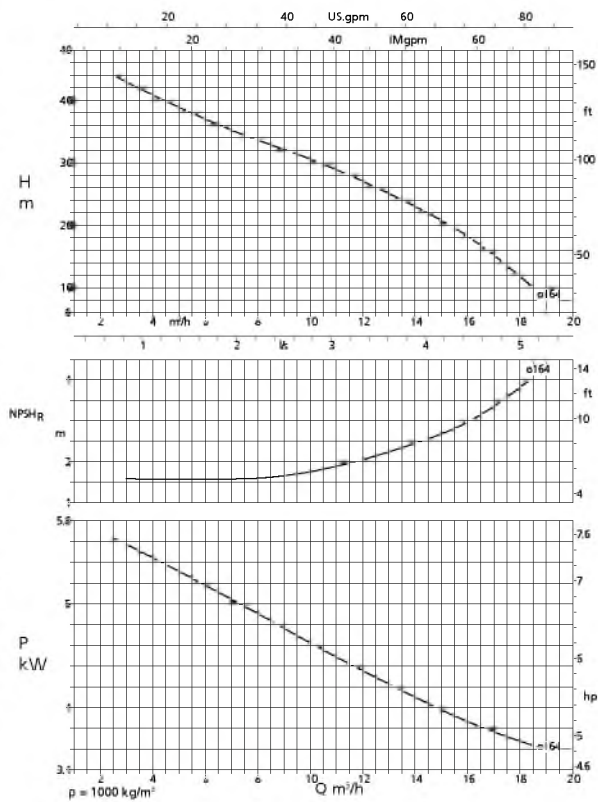
Vitaprime 42-146



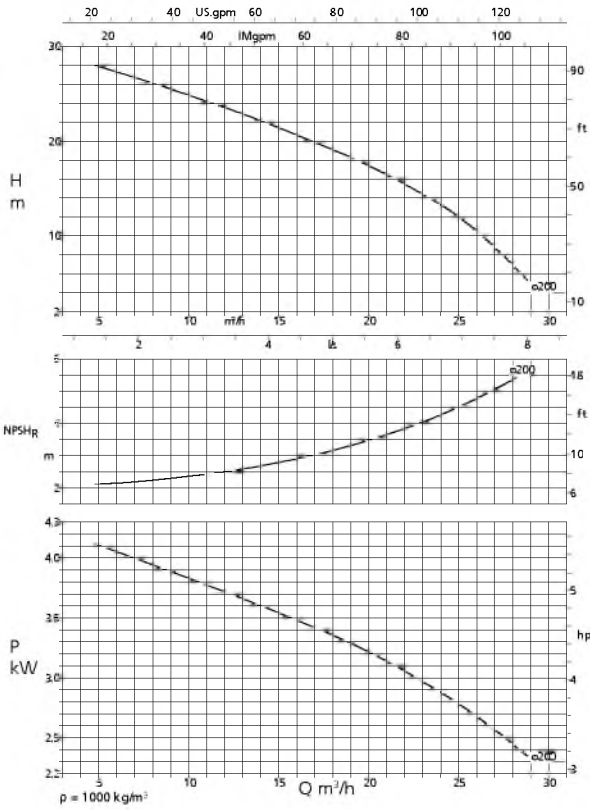
Vitaprime 50-164



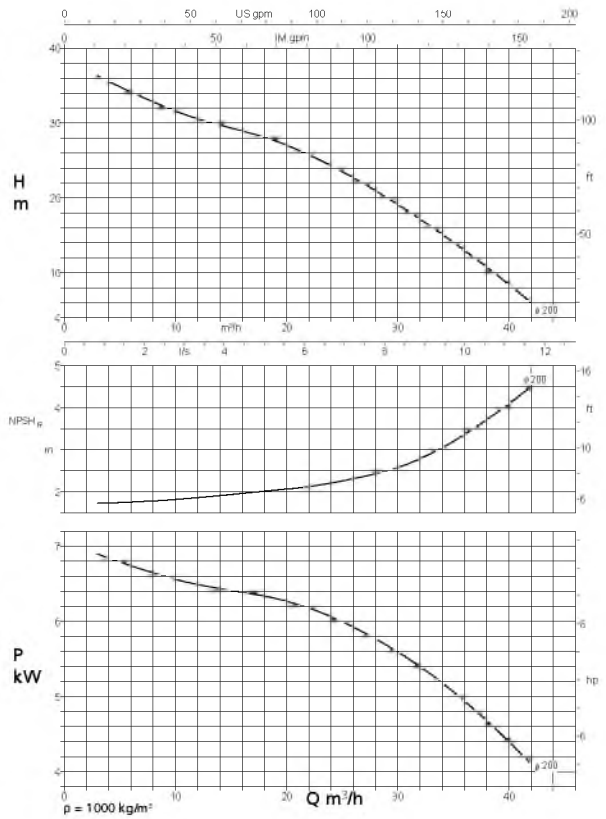
Vitaprime 52-164



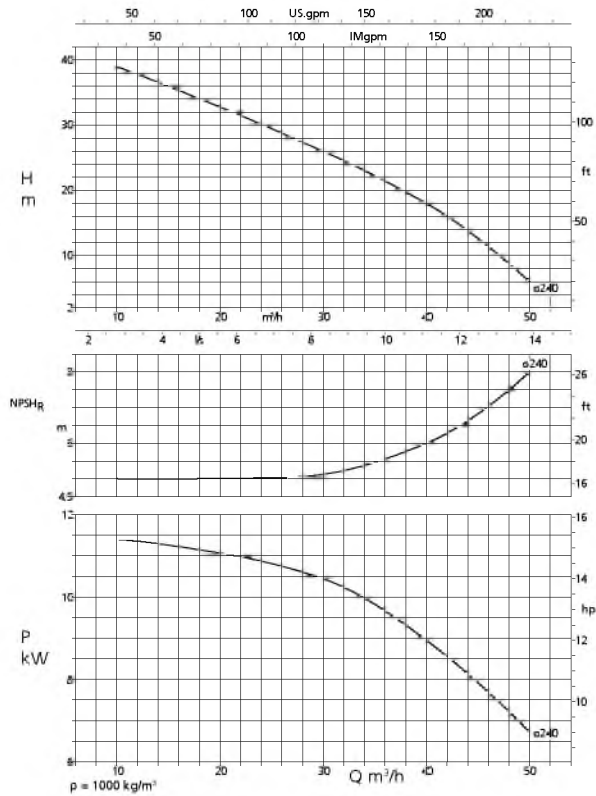
Vitaprime 60-200



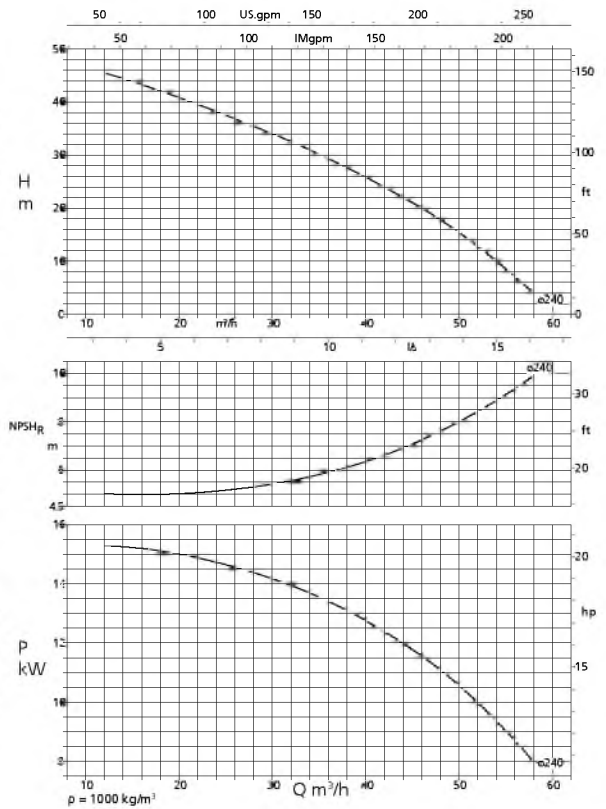
Vitaprime 65-200



Vitaprime 80-240-11

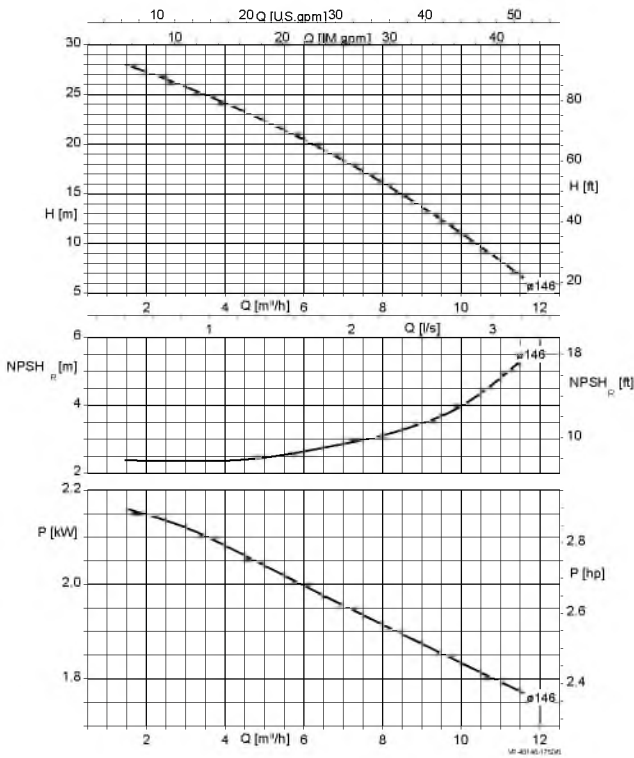


Vitaprime 80-240-15

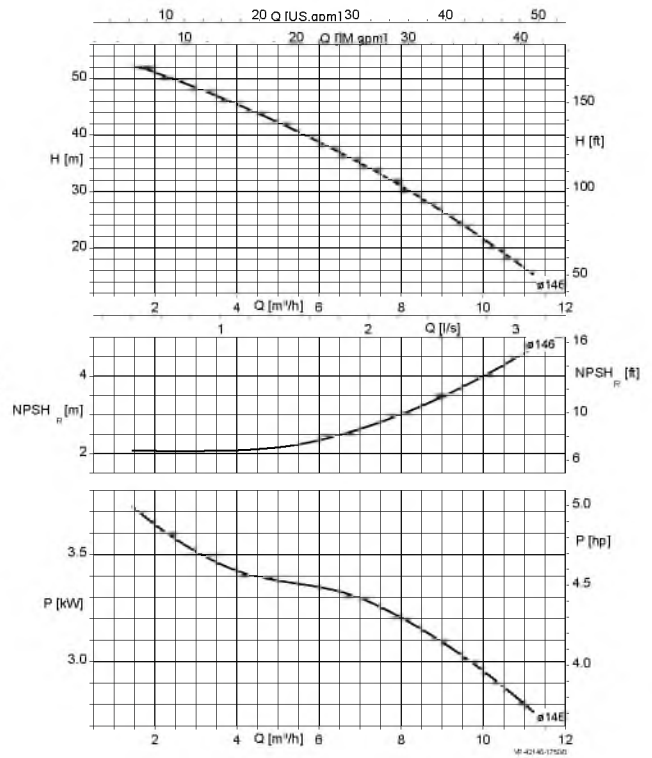


Vitaprime, n = 1750 rpm

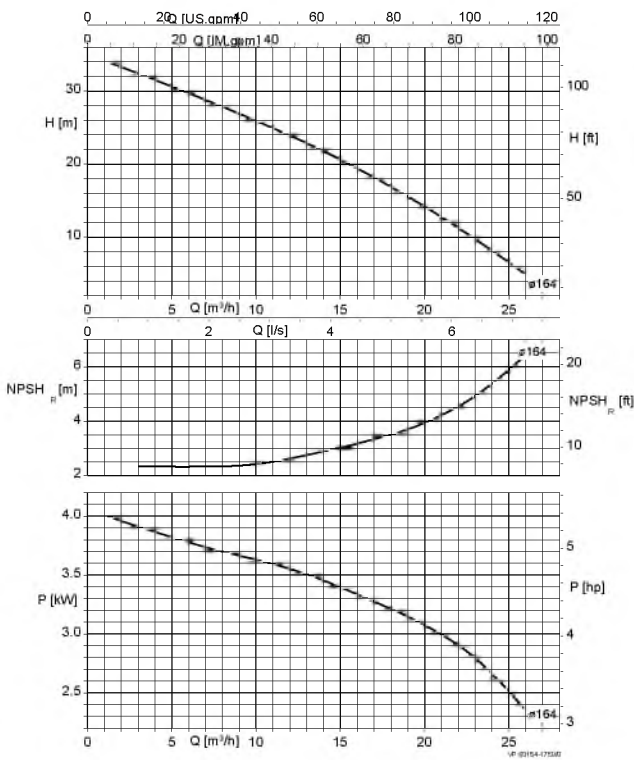
Vitaprime 40-146



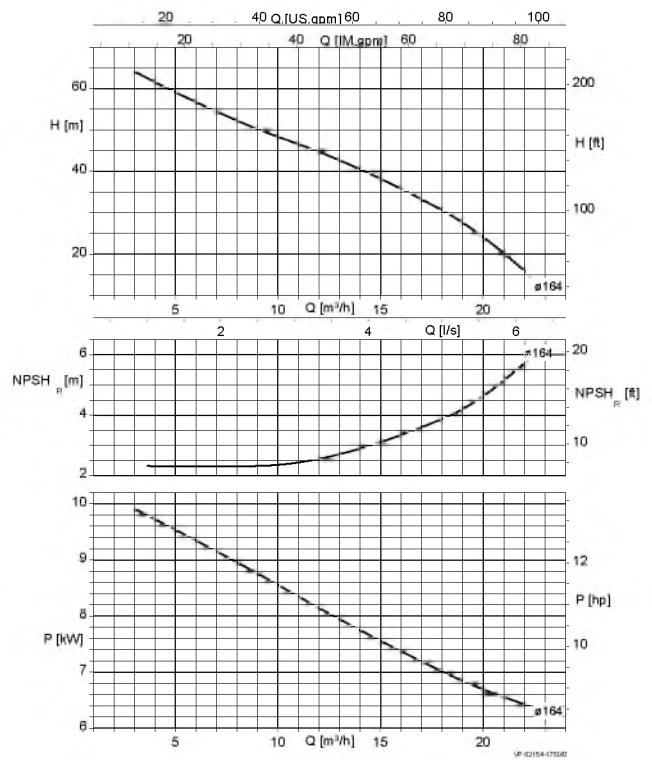
Vitaprime 42-146



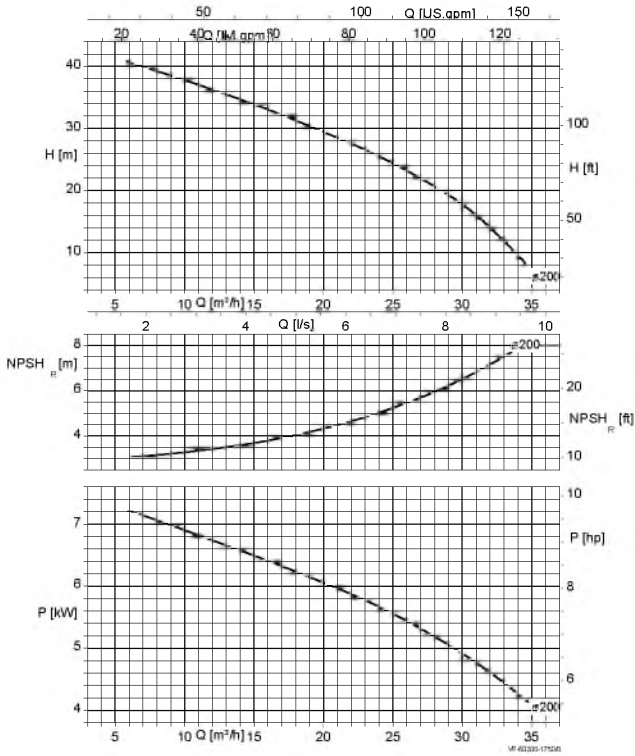
Vitaprime 50-164



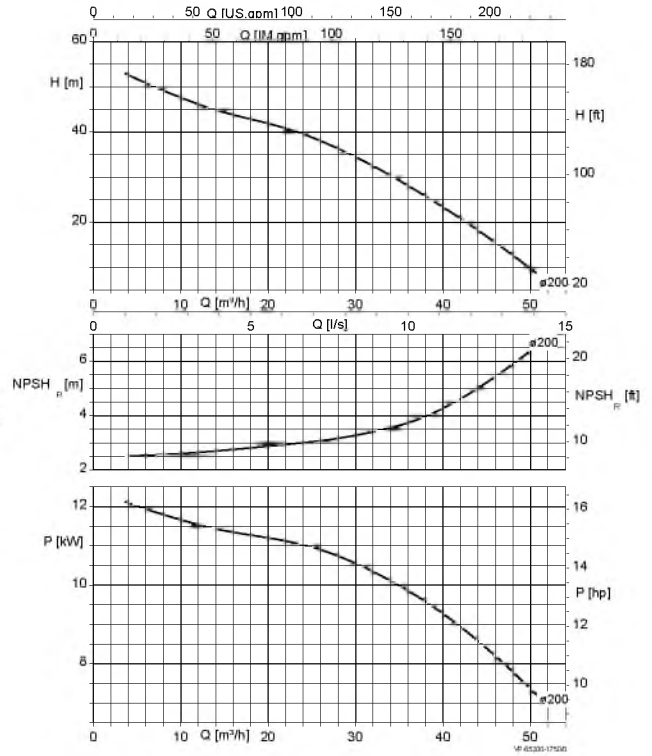
Vitaprime 52-164



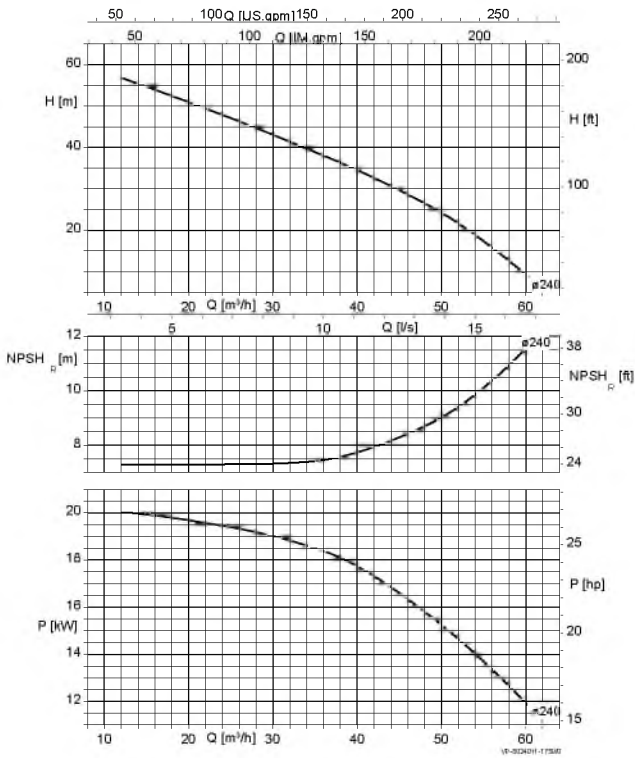
Vitaprime 60-200



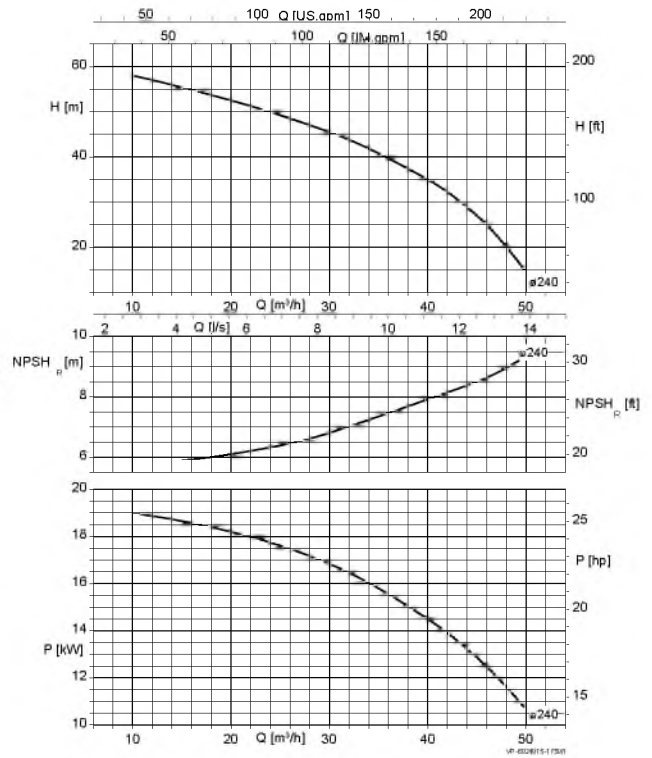
Vitaprime 65-200



Vitaprime 80-240-11



Vitaprime 80-240-15



Dimensions

Single-stage pumps

Pump set with motor shroud, with 3-point ball feet

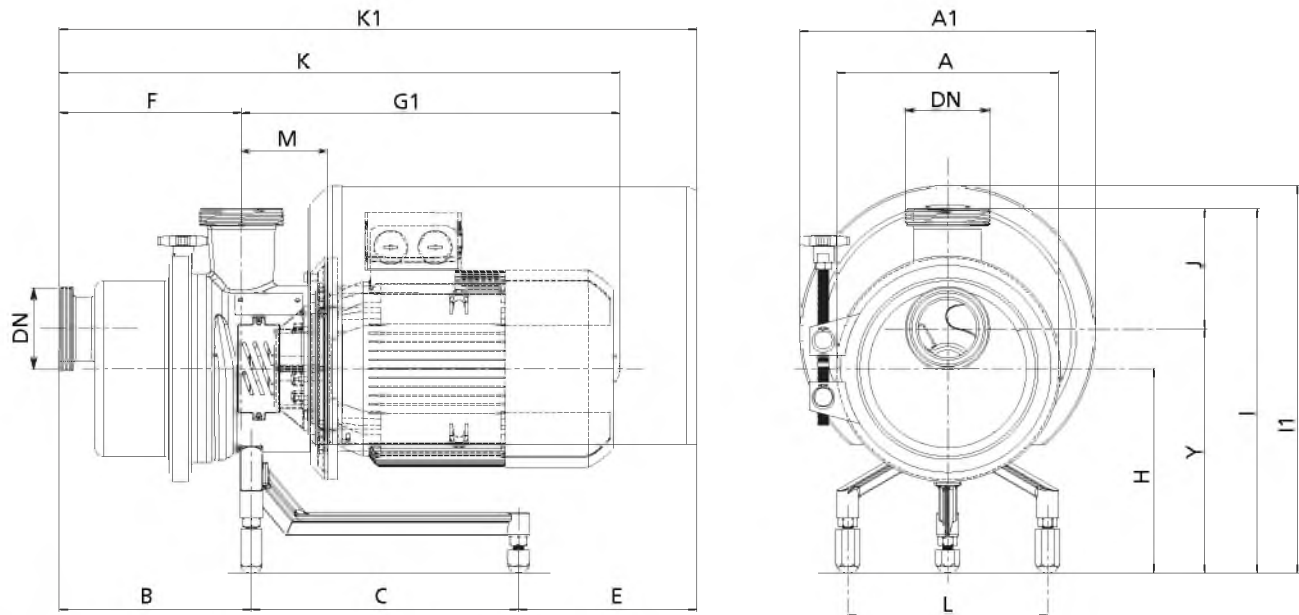


Fig. 1: Pump set with motor shroud, with 3-point ball feet

Dimensions

Size	Motor	[kW]	DN	[mm]															
				A	A1	B	C	E	F	G1	K1	K	H	J	I	I1	Y	L	M
40-146	90S	1,1	40	200	302	176	190	224	150	394,5	590	544,5	162	110	307	346	197	178	97,5
40-146	90L	1,5	40	200	302	176	190	224	150	434,5	590	584,5	162	110	307	346	197	178	97,5
40-146	100L	2,2	40	250	330	176	301	183	150	474,0	670	624	190	110	335	335	225	225	103,5
40-146	100L	3,0	40	250	330	176	301	183	150	474,0	670	624	190	110	335	335	225	225	103,5
42-146	100L	2,2	40	250	330	234	301	183	208	474,0	728	682	190	110	335	335	225	225	103,5
42-146	100L	3,0	40	250	330	234	301	183	208	474,0	728	682	190	110	335	335	225	225	103,5
42-146	112M	4,0	40	250	330	234	301	183	208	457,5	728	665,5	190	110	335	335	225	225	103,5
50-164	100L	2,2	50	250	330	196	301	202	175	477,0	698	652	228	114	378	433	264	225	106,5
50-164	100L	3,0	50	250	330	196	301	202	175	477,0	698	652	228	114	378	433	264	225	106,5
50-164	112M	4,0	50	250	330	196	301	202	175	460,5	698	635,5	228	114	378	433	264	225	106,5
60-200	112M	4,0	65	250	330	215	301	202	211	451,0	718	662	228	135	408	433	273	225	97

Pump set with motor shroud, with 4-point ball feet

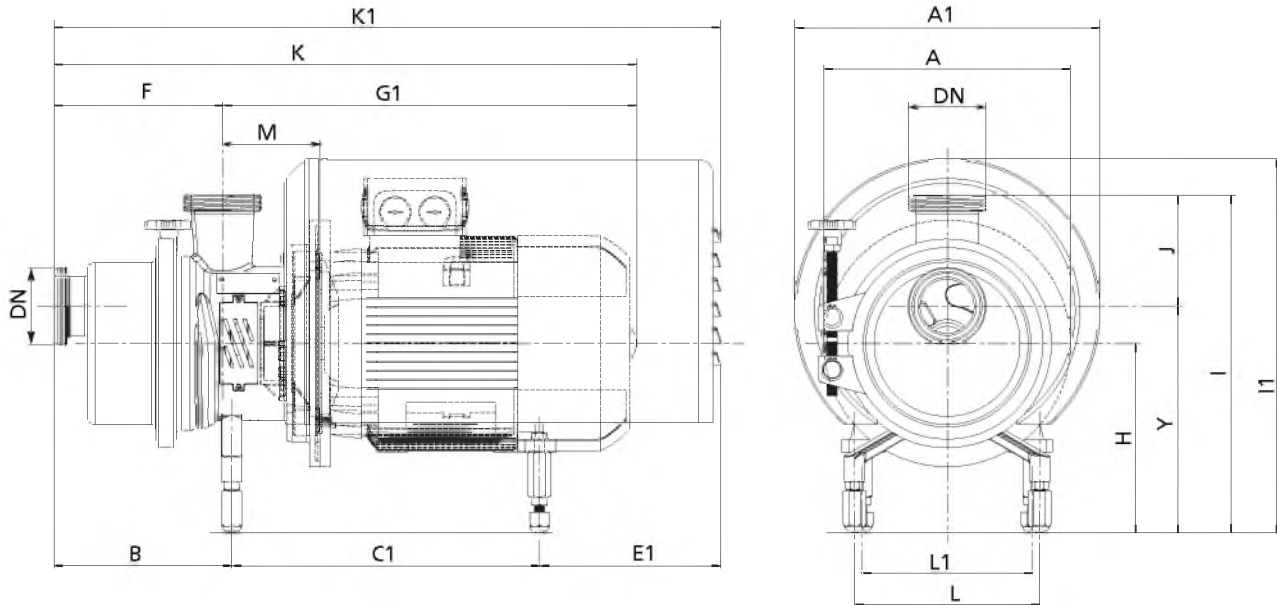


Fig. 2: Pump set with motor shroud, with 4-point ball feet

Dimensions

Size	Motor	[kW]	DN	[mm]																
				A	A1	B	C1	E1	F	G1	K1	K	H	J	I	I1	Y	L	L1	M
50-164	132S	5,5	50	300	370	196	336	227	175	513	797	688	228	114	378	450	264	225	216	128
50-164	132M	7,5	50	300	370	196	374	265	175	563	797	738	228	114	378	450	264	225	216	128
52-164	132S	5,5	50	300	370	258	336	227	237	513	859	750	228	114	378	450	264	225	216	128
52-164	132M	7,5	50	300	370	258	374	265	237	553,5	859	800	228	114	378	450	264	225	216	128
60-200	132S	5,5	65	300	370	215	337	226	211	503,5	816	714,5	228	135	408	450	273	225	216	118,5
60-200	132M	7,5	65	300	370	215	375	264	211	657	816	764,5	228	135	408	450	273	225	216	118,5
60-200	160M	11	65	350	480	215	470	337	211	717	1022	868	228	135	408	523	273	225	254	163
60-200	160L	15	65	350	480	215	514	293	211	553,5	1022	928	228	135	408	523	273	225	254	163
65-200	132S	5,5	65	300	370	215	337	226	211	503,5	816	714,5	228	135	408	450	273	225	216	118,5
65-200	132M	7,5	65	300	370	215	375	264	211	657	816	764,5	228	135	408	450	273	225	216	118,5
65-200	160M	11	65	350	480	215	470	337	211	717	1022	868	228	135	408	523	273	225	254	163
65-200	160L	15	65	350	480	215	514	293	211	692,5	1022	928	228	135	408	523	273	225	254	163
80-240-11	160M	11	80	350	480	267	498	334	245	752,5	1099	937,5	228	160	446	523	286	225	254	198,5
80-240-11	160L	15	80	350	480	267	542	290	245	752,5	1099	997,5	228	160	446	523	286	225	254	198,5
80-240-15	160L	15	80	350	480	267	542	290	245	782,5	1099	997,5	228	160	446	523	286	225	254	198,5
80-240-15	180M	18,5	80	350	400	267	576	254	245	752,5	1097	1027,5	230	160	448	588	288	225	279	194,5
80-240-15	180L	22	80	350	400	267	576	254	245	752,5	1097	997,5	230	160	448	588	288	225	279	194,5

Pump set with motor shroud, on motor feet

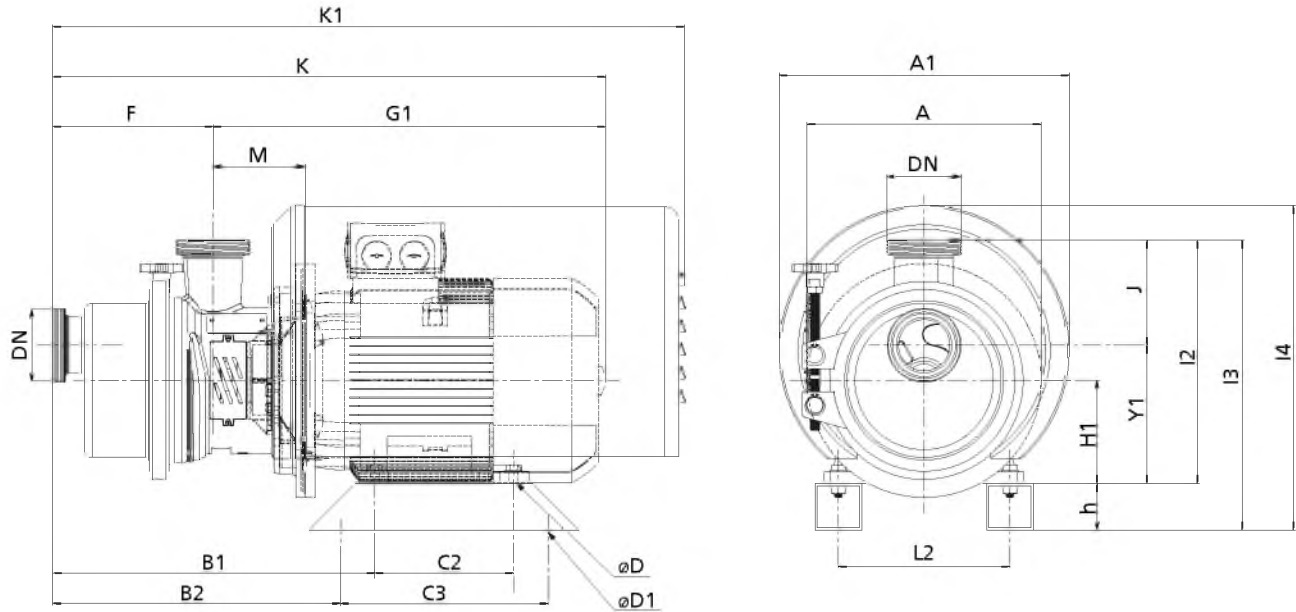


Fig. 3: Pump set with motor shroud, on motor feet

Dimensions

Size	Motor	[kW]	DN	[mm]																				
				A	A1	B1	B2	C2	C3	D	D1	F	G1	K1	K	h	H1	J	I2	I3	I4	Y1	L2	M
40-146	90S	1,1	40	200	302	306	269	100	200	10	10	150	394,5	590	544,5	40	90	110	235	275	314	125	140	97,5
40-146	90L	1,5	40	200	302	306	269	125	200	10	10	150	434,5	590	584,5	40	90	110	235	275	314	125	140	97,5
40-146	100L	2,2	40	250	330	313	268	140	230	12	12	150	474	670	624	50	100	110	245	295	355	135	160	103,5
40-146	100L	3	40	250	330	313	268	140	230	12	12	150	474	670	624	50	100	110	245	295	355	135	160	103,5
42-146	100L	2,2	40	250	330	371	326	140	230	12	12	208	474	728	682	50	100	110	245	295	355	135	160	103,5
42-146	100L	3	40	250	330	371	326	140	230	12	12	208	474	728	682	50	100	110	245	295	355	135	160	103,5
42-146	112M	4	40	250	330	378	333	140	230	12	12	208	457,5	728	665,5	50	112	110	257	307	367	147	160	103,5
50-164	100L	2,2	50	250	330	344	299	140	230	12	12	175	477	698	652	50	100	114	250	300	355	136	160	106,5
50-164	100L	3	50	250	330	344	299	140	230	12	12	175	477	698	652	50	100	114	250	300	355	136	160	106,5
50-164	112M	4	50	250	330	351	306	140	230	12	12	175	460,5	698	635,5	50	112	114	262	312	367	148	190	106,5
50-164	132S	5,5	50	300	370	392	346	140	266	12	12	175	513	797	688	60	132	114	282	342	414	168	216	128
50-164	132M	7,5	50	300	370	392	346	178	266	12	12	175	563	797	738	60	132	114	282	342	414	168	216	128
52-164	132S	5,5	50	300	370	454	408	140	266	12	12	237	513	859	750	60	132	114	282	342	414	168	216	128
52-164	132M	7,5	50	300	370	454	408	178	266	12	12	237	563	859	800	60	132	114	282	342	414	168	216	128
60-200	112M	4	65	250	330	371	326	140	230	12	12	211	451	718	662	50	112	135	292	342	367	157	190	97
60-200	132S	5,5	65	300	370	412	368	140	266	12	12	211	503,5	816	714,5	60	132	135	312	372	414	177	216	118,5
60-200	132M	7,5	65	300	370	412	368	178	266	12	12	211	553,5	816	764,5	60	132	135	312	372	414	177	216	118,5
60-200	160M	11	65	350	480	475	430	210	330	15	14	211	657	1022	868	60	160	135	340	400	483	205	254	163
60-200	160L	15	65	350	480	475	430	254	330	15	14	211	717	1022	928	60	160	135	340	400	483	205	254	163
65-200	132S	5,5	65	300	370	412	368	140	266	12	12	211	503,5	816	714,5	60	132	135	312	372	414	177	216	118,5
65-200	132M	7,5	65	300	370	412	368	178	266	12	12	211	553,5	816	764,5	60	132	135	312	372	414	177	216	118,5
65-200	160M	11	65	350	480	475	430	210	330	15	14	211	657	1022	868	60	160	135	340	400	483	205	254	163
65-200	160L	15	65	350	480	475	430	254	330	15	14	211	717	1022	928	60	160	135	340	400	483	205	254	163
80-240-11	160M	11	80	350	480	552	507	210	330	15	14	245	692,5	1099	937,5	60	160	160	378	438	483	218	254	198,5
80-240-11	160L	15	80	350	480	552	507	254	330	15	14	245	752,5	1099	997,5	60	160	160	378	438	483	218	254	198,5
80-240-15	160L	15	80	350	480	552	507	254	330	15	14	245	752,5	1099	997,5	60	160	160	378	438	483	218	254	198,5
80-240-15	180M	18,5	80	350	400	561	506	241	387	15	15	245	782,5	1097	1027,5	60	180	160	398	458	585	218	279	194,5
80-240-15	180L	22	80	350	400	561	506	241	387	15	15	245	752,5	1097	997,5	60	180	160	398	458	585	218	279	194,5

Two-stage pumps

Pump set with motor shroud, on 3-point ball feet

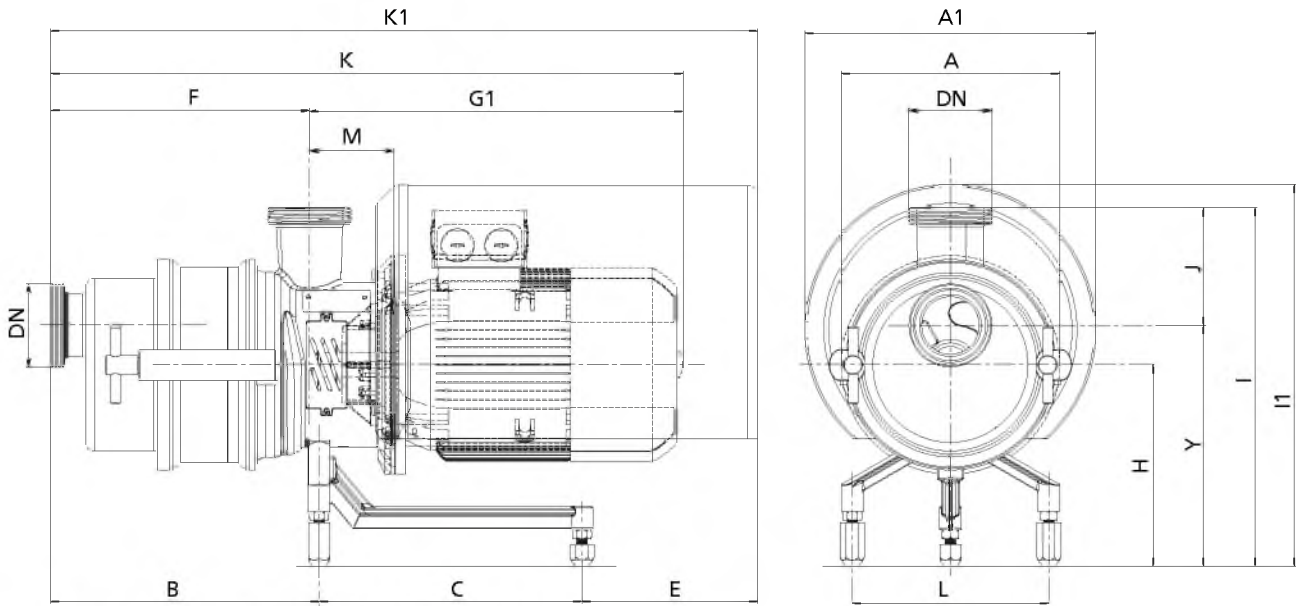


Fig. 4: Pump set with motor shroud, on 3-point ball feet

Dimensions

Size	Motor	[kW]	DN	[mm]															
				A	A1	B	C	E	F	G1	K1	K	H	J	I	I1	Y	L	M
42-146	100L	2,2	40	250	330	234	301	183	208	474	728	682	190	110	335	335	225	225	103,5
42-146	100L	3,0	40	250	330	234	301	183	208	474	728	682	190	110	335	335	225	225	103,5
42-146	112M	4,0	40	250	330	234	301	183	208	457,5	728	665,5	190	110	335	335	225	225	103,5

Pump set with motor shroud, on 4-point ball feet

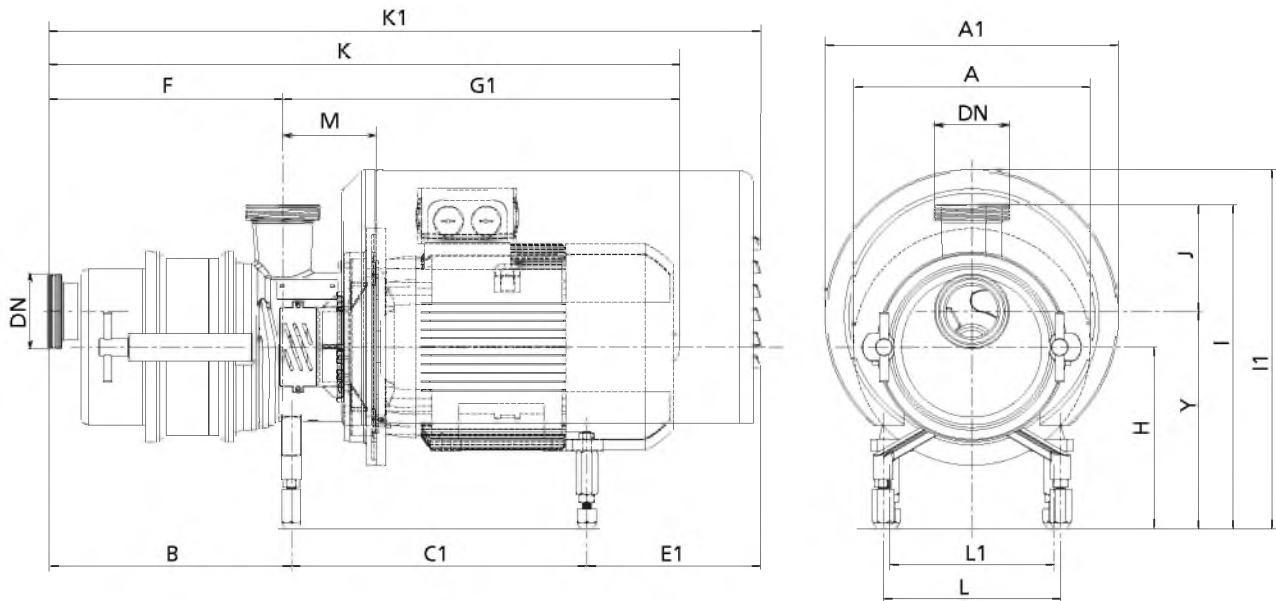


Fig. 5: Pump set with motor shroud, on 4-point ball feet

Dimensions

Size	Motor	[kW]	DN	A	A1	B	C1	E1	F	G1	K1	[mm]									
														K	H	J	I	I1	Y	L	L1	M
52-164	132S	5,5	50	300	370	258	336	227	237	513	859	750	228	114	378	450	264	225	216	128	
52-164	132M	7,5	50	300	370	258	374	265	237	563	859	800	228	114	378	450	264	225	216	128	

Pump set with motor shroud, on motor feet

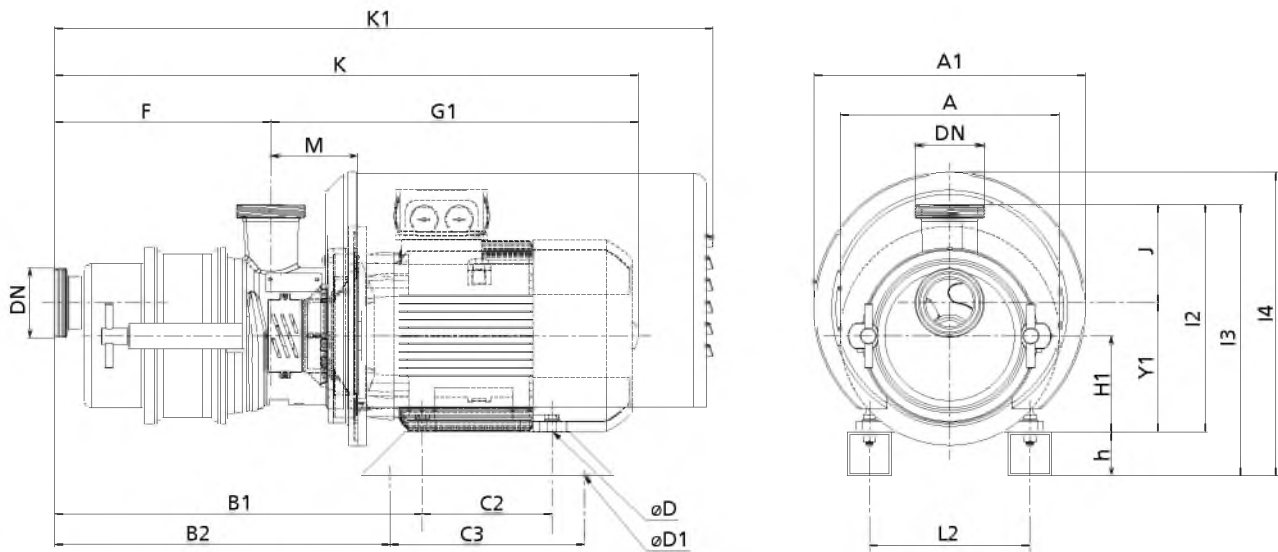


Fig. 6: Pump set with motor shroud, on motor feet

Dimensions

Size	Motor	[kW]	DN	[mm]																				
				A	A1	B1	B2	C2	C3	D	D1	F	G1	K1	K	h	H1	J	I2	I3	I4	Y1	L2	M
42-146	100L	2,2	40	250	330	371	326	140	230	12	12	208	474	728	682	50	100	110	245	295	355	135	160	103,5
42-146	100L	3,0	40	250	330	371	326	140	230	12	12	208	474	728	682	50	100	110	245	295	355	135	160	103,5
42-146	112M	4,0	40	250	330	378	333	140	230	12	12	208	457,5	728	665,5	50	112	110	257	307	367	147	160	103,5
52-164	132S	5,5	50	300	370	454	408	140	266	12	12	237	513	859	750	60	132	114	282	342	414	168	216	128
52-164	132M	7,5	50	300	370	454	408	178	266	12	12	237	563	859	800	60	132	114	282	342	414	168	216	128

Pump accessories

- Motor shroud made of stainless steel
- Vertically adjustable ball feet or machine mounts
- Residual drainage of pump casing
- Noise reduction valve
- Mounted on a trolley, with switch and power cable
- System for supplying the mechanical seal

Detailed designation

Designation example

Position																														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
V	P			8	0	-	2	4	0	-	1	1	0	4	0	4	K	B	Q	T	8	2	M	E	C	C	O		O	A
See name plate and data sheet																												See data sheet		

Designation key

Position	Code	Description
1-4	Pump type	
	V P	Vitaprime
5-13	Size	
	80	Nominal nozzle diameter [mm]
	240	Nominal impeller diameter [mm]
	11	Load range
14-16	Motor rating	
	0 0 7	0.7 kW
	0 4 0	4 kW
	1 8 5	18.5 kW
17	Number of poles	
	4	4 poles
18	Mounting arrangement	
	K	Ball feet
	T	Round base feet
	M	Motor foot
	V	Trolley
	B	Motor plate
19-20	Seal code	
	B Q	External flushing (quench)
	B	Dead end, without flushing system
	D B	Double mechanical seal
21-23	Seal code	
	T 1 8	U2U2VGG
	T 1 9	U2U2EGG
	T 6 4	U2Q1EGG
	T 6 9	BQ1M3GG
	T 6 6	Q1Q1M3GG
	T 6 8	U2Q1VGG
	T 8 0	BQ1VGG
	T 8 1	Q1Q1VGG
	T 8 2	BQ1EGG
	T 8 3	Q1Q1EGG
	T 8 4	Q1U2EGG
	T 8 5	Q1U2VGG
	H 0	BGEGG
	H 0 D	BGVGG
	H 1	BQ1EGG
	H 1 D	BQ1VGG
	H 2	Q1U2EGG
	H 2 D	Q1U2VGG
	H 3	Q1Q1EGG
	H 3 D	Q1Q1VGG
	H 4	U2U2EGG
	H 5	QQEGG**
	H A	U2U2EGG
	H 7	U2U2VGG*
	H 8	U2U2VGG
	H 9	BQ1VGG*
	Q 7 0	BGEGG
Q 7 1	BU2EGG	

Position	Code	Description
21-23	Q 7 2	U2U2EGG
	Q 7 4	U2U2VGG
	Q 7 8	U2U2VGG
	Q 7 9	U2U2M3GG
24	Piping connection	
	M	Threaded connection to DIN 11851
	E	Threaded connection to DIN 11853
	B	Threaded connection to DIN 11864-1-GS-A
	S	Threaded connection to SMS standard
	I	Threaded connection to IDF standard
	F	Threaded connection to RJT standard
	U	Tri-Clamp fitting
	D	Clamped connection to DIN 11864-3A
	T	Clamped connection to DIN 32676-A
	V	Clamped connection to ISO 2852
	L	Flange to EN 1092-1
	C	Flange to DIN 11864-2A
	Z	Flange to ASA ASME 150
A	APV flange	
G	Varivent flange	
25	O-ring material (casing/impeller)	
	E	EPDM 70 (FDA, USP Class VI, 3A)
	V	FPM 75 (FDA, USP Class VI, 3A)
	P	PTFE (FDA)
	M	FEP (encapsulated) (FDA)
K	Kalrez (FFKM) (FDA)	
26	Casing material	
	C	1.4409
27	Impeller material	
	C	1.4409
28	Motor shroud	
	S	With shroud
	O	Without shroud
29	Special design	
	⁴⁾	Standard
	X	Special design, incl. ATEX
30	Drain	
	O	No drain
	P	Casing drain via pipeline
	V	Casing drain via valve
D	Casing drain with plug	
31	Generation	
	A	Generation A, current

4) Blank

Dry-installed Volute Casing Pump

KWP

Type Series Booklet



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 Detailed designation 38

Centrifugal Pumps with Shaft Seal

Dry-installed Volute Casing Pump

KWP



Main applications

Pump for handling pre-treated sewage, waste water, all types of slurries without stringy material and pulps up to 5 % bone dry with a maximum density of 2000 kg/m³.

- Paper and cellulose industry
- Sugar industry
- Food and beverages industry
- Fossil-fuelled power stations
- Chemical industry
- Petrochemical industry
- Flue gas desulphurisation
- Coal upgrading plants
- Industrial effluent treatment systems
- Seawater desalination/reverse osmosis

Operating data

Operating properties

Characteristic		Value
Nominal discharge nozzle diameter	DN [mm]	40 - 900
Flow rate	Q [m ³ /h]	≤ 15,000 ¹⁾
Head	H [m]	≤ 100 ¹⁾
Operating temperature	T [°C]	-40 to +140 ¹⁾
Operating pressure	p [bar]	≤ 10 ¹⁾

¹⁾ Higher values on request

Designation

Example: KWPK125-100-0250 GDNG10

Key to the designation

Code	Description	
KWP	Type series	
K	Impeller type	
	K	Channel impeller
	O	Open multi-channel impeller
F	Free-flow impeller	
125	Nominal suction nozzle diameter [mm]	
100	Nominal discharge nozzle diameter [mm]	
250	Nominal impeller diameter [mm]	
GDNG	Material code (⇒ Page 7)	
10	Design variant	

Further information on the designation

(⇒ Page 38)

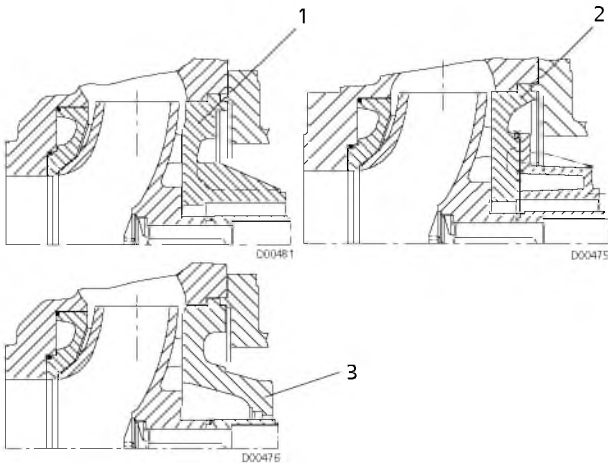
Design details

Design

- Volute casing pump
- Back pull-out design
- Horizontal installation
- Single-stage
- Single-entry

Pump casing

- Radially split volute casing
- Volute casing with integrally cast pump feet
- Pump casing fitted with a wear plate
- Discharge cover available in the following versions:



Impeller type

- Back vanes reduce axial thrust.
- Various, application-based impeller types

Discharge cover versions

1	Discharge cover with integrally cast stuffing box housing (cylindrical cover); material variants: GNNG, GDNG, DDDD	2	Discharge cover with bolted stuffing box housing (cylindrical cover, split); material variants: GHHH, HHHH and all sizes on bearing brackets P08sx, P10ax, P12sx for all available materials.
3	For mechanical seal: discharge cover with conical seal chamber (A-type cover); material variants: GNNG, GDNG, DDDD, DKKM, GHHH, HHHH		

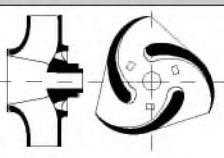
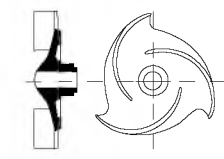
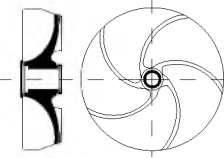
Flanges

- Suction flange
 - Up to DN 350 plus 400-400-500, 600-600-824/-825 and 700-700-923/-929: tapped blind hole 1.25 x ϕ d, mating dimensions to DIN 2501, PN10 /16 (DN 40 - DN 150), PN10 (DN 200 - DN 350)
 - From DN 400 plus 350-350-500: through-holes to EN 1092-2, PN10
- Discharge flange
 - DN 40 to DN 150: through-holes to EN 1092-2, PN10/16
 - DN 200 and above: through-holes to EN 1092-2, PN10
 - Tapped through-holes DIN 2501, PN10 for 600-600-824/-825, 700-700-923/-929, 700-700-953/-959, 800-800-934/-935/-939, 800-900-883, 900-900-1133/-1134/-1138/-1139

Suction side versions

- Wear plate
 - 065-040-250 to 600-600-669
- Casing wear ring
 - 250-250-315
 - 300-300-400
 - 350-350-400
 - 400-400-500
- Suction cover from 400-400-533

Applications of impeller types

Impeller type	Suitable for the following fluids
 <p>Closed channel impeller (K impeller)</p>	Contaminated, solids-laden fluids not containing stringy material and containing no or very little entrapped gas
 <p>Open multi-vane impeller (O impeller)</p>	For uncontaminated or slightly contaminated fluids as well as fluids liable to form deposits and bunch, with little entrapped gas.
 <p>Open free-flow impeller (F impeller)</p>	Fluids containing larger solids and stringy material as well as fluids with entrapped air or gas

Bearings

- Oil-lubricated rolling element bearings
- Back pull-out design with axially adjustable bearing bracket to adjust the clearance between impeller and wear plate

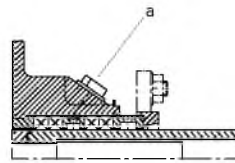
Bearings used

Standard bearings

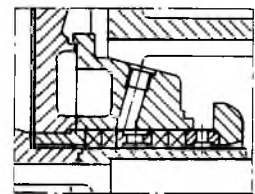
Bearing bracket	Rolling element bearing	
	Pump end ²⁾	Drive end ³⁾
P03ax	NU 409	2 x 7309 B-UA
P04ax	NU 411	2 x 7311 B-UA
P05ax	NU 413	2 x 7313 B-UA
P06x	NU 413	2 x 7313 B-UA
P08sx	NU 416	2 x 7319 B-UA
P10ax	NU 324	2 x 7224 B-UA
P12sx	NU 324	2 x 7224 B-UA
P16ax	NU 232 EC3	NU 232 EC3 ²⁾ QJ 328-N2
P20sx	NU 240 E	NJ 238 E ²⁾ 29340-E1 ⁴⁾

Shaft seal

- Shaft fitted with a replaceable shaft protecting sleeve in the shaft seal area
- Gland packing

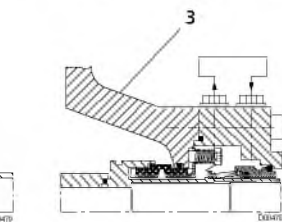
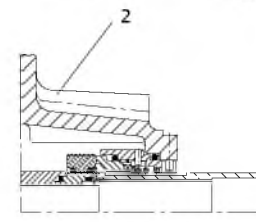
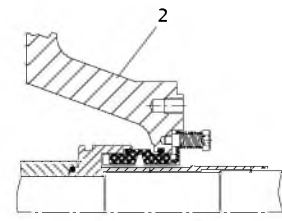
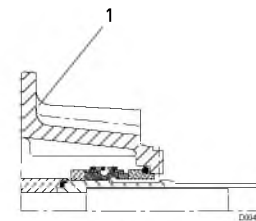


Uncooled gland packing with a) connection for barrier fluid or flushing liquid (connections 10 A.1 and 10 E.1)



Cooled gland packing

- Commercial single and double mechanical seals



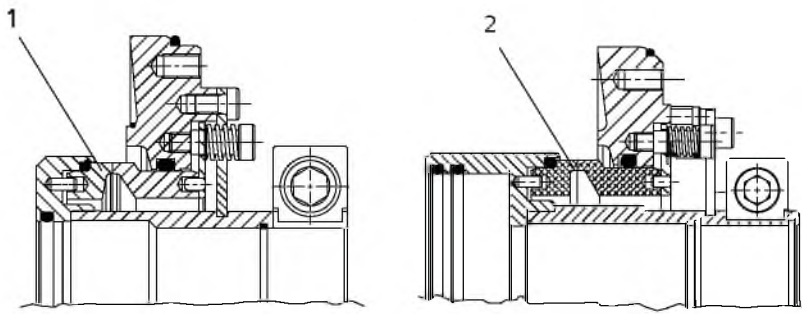
Mechanical seals in conical seal chamber (A-type)

1	Single mechanical seal, unbalanced	2	Single mechanical seal with spring-loaded stationary assembly
3	Mechanical seal in tandem arrangement, with quench		

2) To DIN 5412

3) To DIN 628

4) To DIN 728



Mechanical seals in conical seal chamber (A-type)

1	Single mechanical seal, balanced, with spring-loaded stationary assembly, bi-directional, for P16ax/P20sx V10	2	Single mechanical seal, with spring-loaded stationary assembly, balanced, bi-directional, for P20sx V11
---	---	---	---

Drive

- Electric motor connected to the pump via a coupling or belt drive.

Sizes

Size combinations

Discharge nozzle	Nominal impeller diameter																					
	201	200	251	250 253	311	313 315 320	400 403	500 501 503 504 505	533 583	544	630 633 634 635 637	710 713	663 669 710 753	803 813 814	824 825 873 923	923 929 953 959	934 935 939	883 1133 1134 1138 1139				
	Impeller type																					
	F	K	O	F	K	O	F	K	O	K	O	K	O	K	K	K	K	K	K	K	K	K
040	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
050	X	X	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
065	X	X	X	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-
080	-	-	-	X	X	X	X	X	-	X	X	X	-	-	-	-	-	-	-	-	-	-
100	-	-	-	X	X	X	-	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-
125	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-
150	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	X	-	X	X	X	-	-	-	-	-	-	-	-	-	-
250	-	-	-	-	-	-	-	X	-	X	-	X	X	-	-	X	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	X	-	X	-	-	-	X	-	-	-	-	-	-	-
400	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-
500	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-
600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-
700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-
800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-
900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X

Automation

Automation options:

- Hyamaster
- hyatronic
- PumpDrive

Material code

Example of material code: DMKM

Key to material code

Code	Description	
D	Casing material	
	G	GJL-250
	D	NORIDUR 1.4593
	H	NORIHARD NH 15 3
	K	GJS-400-18-LT/ CeramikoPolySiC ⁵⁾
M	Impeller material	

5) ≥ 600-600-0824

Code	Description	
	N	ERN
	D	NORIDUR 1.4593
	U	NORIDUR 1.4593 DAS
	H	NORIHARD NH 15 3
	K	CeramikPolySiC®
	M	NORICROM 1.4475
K	Wear plate material	
	N	ERN
	D	NORIDUR 1.4593
	U	NORIDUR 1.4593 DAS
	H	NORIHARD NH 15 3
	K ⁶⁾	CeramikPolySiC®
M	Discharge cover material	
	G	GJL-250
	D	NORIDUR 1.4593
	H	NORIHARD NH 15 3
	K	CeramikPolySiC®
	M	NORICROM 1.4475

⁶⁾ K defines a suction cover in JS-400-18-LT/ CeramikPolySiC for pumps without a separate wear plate

Material variants

Materials

Part No.	Description	Material variant									
		GNNG	GDNG	DDDD	GHHH	HHHH	DUUD	DMKM	DKKM	KUKK	KKKK
101	Pump casing	GJL-250		NORIDUR 1.4593	GJL-250	NORIHARD ⁷⁾	NORIDUR 1.4593 ⁷⁾			GJS-400-18-LT/ CeramikPolySiC ⁷⁾	
135.01	Wear plate, suction side	ERN		NORIDUR 1.4593	NORIHARD		NORIDUR 1.4593/ DAS	CeramikPolySiC			
162	Suction cover	GJL-250		NORIDUR 1.4593	GJL-250	NORIHARD	NORIDUR 1.4593			GJS-400-18-LT/ CeramikPolySiC	
163	Discharge cover	GJL-250		NORIDUR 1.4593	NORIHARD		NORIDUR 1.4593	NORICROM		GJS-400-18-LT/ CeramikPolySiC ⁷⁾	
210	Shaft	C45+N									
230	Impeller	ERN	NORIDUR 1.4593		NORIHARD		NORIDUR 1.4593/ DAS	NORICROM	CeramikPolySiC	1.4593/DAS	CeramikPolySiC
330	Bearing bracket	GJL-250									
344	Bearing bracket lantern	GJL-250									
451.01	Stuffing box housing	GJL-250		NORIDUR 1.4593	GJL-250		NORIDUR 1.4593				
524.01	Shaft protecting sleeve (gland packing)	1.4122 HV500+80		1.4539	1.4122 HV500+80		1.4539				
524.01	Shaft protecting sleeve (mechanical seal)	1.4539									
906	Impeller screw ⁸⁾	C35E+N		NORIDUR 1.4593	C35E+N		NORIDUR 1.4593				

7) Without auxiliary connection bores (drain hole and pressure gauge connection)

8) Bearing bracket P08sx and above: impeller hub cap 260

Technical data

Technical data of hydraulic system

Sizes	Bearing bracket	Impeller type K			Impeller type O			Impeller type F		
		Free passage	Impeller diameter		Free passage	Impeller diameter		Free passage	Impeller diameter	
			max.	min.		max.	min.		max.	min.
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
065-040-0250	P03ax	15	260	170	-	-	-	-	-	-
065-050-0200	P03ax	34	209	120	30	209	160	-	-	-
065-050-0201	P03ax	-	-	-	-	-	-	45	209	130
080-065-0200	P03ax	46	209	145	30	209	160	-	-	-
080-065-0201	P03ax	-	-	-	-	-	-	55	209	145
080-040-0315	P04ax	15	320	230	-	-	-	-	-	-
080-050-0400	P04ax	15	408	330	-	-	-	-	-	-
080-065-0315	P04ax	42	320	230	25	320	230	-	-	-
080-065-0313	P04ax	15	320	230	-	-	-	-	-	-
080-065-0400	P04ax	34	408	330	-	-	-	-	-	-
100-080-0250	P03ax	50	260	170	36	260	170	-	-	-
100-080-0251	P03ax	-	-	-	-	-	-	60	260	170
100-080-0311	P04ax	-	-	-	-	-	-	50	320	260
100-080-0315	P04ax	44	320	260	-	-	-	-	-	-
100-080-0400	P05ax	46	404	280	28	404	280	-	-	-
100-080-0403	P05ax	16	404	280	-	-	-	-	-	-
125-080-0500	P06x	20	504	380	-	-	-	-	-	-
125-100-0250	P04ax	60	260	180	50	260	180	-	-	-
125-100-0251	P04ax	-	-	-	-	-	-	50	260	180
125-100-0253	P04ax	28	260	180	-	-	-	-	-	-
125-100-0315	P04ax	54	320	230	-	-	-	-	-	-
125-100-0400	P05ax	50	404	280	35	404	280	-	-	-
125-100-0403	P05ax	20	404	280	-	-	-	-	-	-
150-125-0500	P06x	50	504	350	-	-	-	-	-	-
150-125-0503	P06x	21	509	350	-	-	-	-	-	-
150-150-0311	P05ax	-	-	-	-	-	-	90	320	260
150-150-0315	P05ax	88	320	260	65	320	260	-	-	-
150-150-0400	P05ax	64	404	320	-	-	-	-	-	-
150-150-0403	P05ax	41	404	320	-	-	-	-	-	-
200-200-0320	P05ax	75	320	257	-	-	-	-	-	-
200-200-0400	P06x	80	403	320	78	404	320	-	-	-
200-200-0403	P06x	40	404	320	-	-	-	-	-	-
200-200-0500	P08xs, P10ax, P12sx	75	504	400	-	-	-	-	-	-
200-200-0501	P08xs, P10ax, P12sx	75	504	400	-	-	-	-	-	-
200-200-0503	P08xs, P10ax, P12sx	40	504	400	-	-	-	-	-	-
250-250-0315	P06x	70	324	285	-	-	-	-	-	-
250-250-0400	P08xs, P10ax	80	409	338	-	-	-	-	-	-
250-250-0403	P08xs, P10ax	44	409	340	-	-	-	-	-	-
250-250-0500	P08xs, P10ax, P12sx	85	504	400	70	504	400	-	-	-
250-250-0503	P08xs, P10ax, P12sx	48	504	400	-	-	-	-	-	-
250-250-0505	P08xs, P10ax, P12sx	70	504	436	-	-	-	-	-	-
250-250-0630	P08xs, P10ax, P12sx	86	630	500	-	-	-	-	-	-
250-250-0634	P08xs, P10ax, P12sx	41	630	480	-	-	-	-	-	-
300-300-0400	P08xs, P10ax	85	409	320	-	-	-	-	-	-
300-300-0500	P08xs, P10ax, P12sx	89	504	400	-	-	-	-	-	-
300-300-0503	P08xs, P10ax, P12sx	50	504	420	-	-	-	-	-	-
350-350-0400	P08xs, P10ax	110	408	330	-	-	-	-	-	-
350-350-0500	P08xs, P10ax, P12sx	110	508	390	-	-	-	-	-	-
350-350-0503	P08xs, P10ax, P12sx	65	508	472	-	-	-	-	-	-
350-350-0504	P08xs, P10ax, P12sx	55	507	460	-	-	-	-	-	-
350-350-0630	P08xs, P10ax, P12sx	135	630	500	-	-	-	-	-	-
350-350-0633	P08xs, P10ax, P12sx	75	630	500	-	-	-	-	-	-
400-400-0500	P08xs, P10ax, P12sx	123	508	430	-	-	-	-	-	-
400-400-0503	P08xs, P10ax, P12sx	90	508	445	-	-	-	-	-	-
400-400-0533	P10ax, P12sx	90	538	496	-	-	-	-	-	-

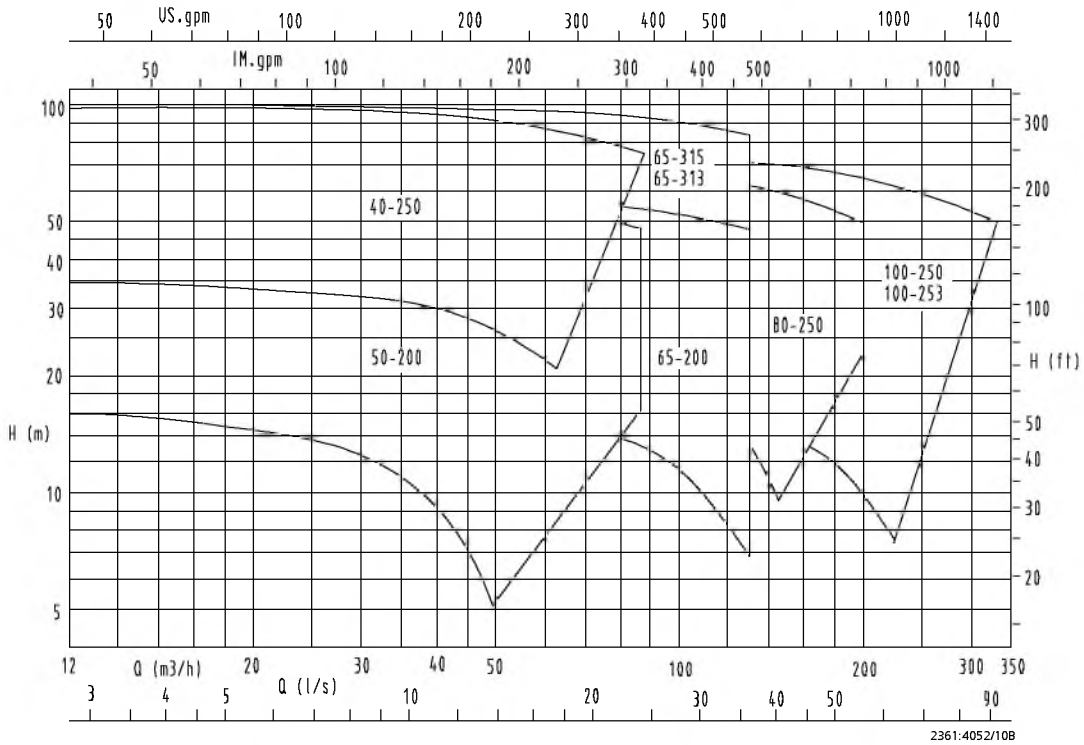
Sizes	Bearing bracket	Impeller type K			Impeller type O			Impeller type F		
		Free passage	Impeller diameter		Free passage	Impeller diameter		Free passage	Impeller diameter	
			max.	min.		max.	min.		max.	min.
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
400-400-0583	P10ax, P12sx	90	600	550	-	-	-	-	-	-
500-400-0710	P10ax, P12sx, P16ax	160	730	630	-	-	-	-	-	-
500-400-0713	P10ax, P12sx, P16ax	65	730	630	-	-	-	-	-	-
500-500-0544	P10ax, P12sx	75	572	495	-	-	-	-	-	-
500-500-0630	P10ax, P12sx, P16ax	142	636	528	-	-	-	-	-	-
500-500-0633	P10ax, P12sx, P16ax	90	636	534	-	-	-	-	-	-
500-500-0634	P10ax, P12sx, P16ax	85	636	554	-	-	-	-	-	-
500-500-0635	P10ax, P12sx, P16ax	75	636	565	-	-	-	-	-	-
500-500-0637	P10ax, P12sx, P16ax	85	636	540	-	-	-	-	-	-
600-600-0663	P12sx	80	700	620	-	-	-	-	-	-
600-600-0669	P12sx	80	700	630	-	-	-	-	-	-
600-600-0710	P12sx, P16ax	165	716	650	-	-	-	-	-	-
600-600-0753	P16ax	112	750	675	-	-	-	-	-	-
600-600-0803	P16ax	100	780	718	-	-	-	-	-	-
600-600-0813	P16ax	95	830	710	-	-	-	-	-	-
600-600-0824	P16ax	95	794	720	-	-	-	-	-	-
600-600-0825	P16ax	95	800	709	-	-	-	-	-	-
600-600-0873	P16ax	97	880	800	-	-	-	-	-	-
600-600-0923	P20sx	113	930	840	-	-	-	-	-	-
700-700-0923	P20sx	115	870	765	-	-	-	-	-	-
700-700-0929	P20sx	100	870	780	-	-	-	-	-	-
800-700-0953	P20sx	110	940	834	-	-	-	-	-	-
800-700-0959	P20sx	105	940	820	-	-	-	-	-	-
800-800-0934	P20sx	115	950	845	-	-	-	-	-	-
800-800-0935	P20sx	155	940	850	-	-	-	-	-	-
800-800-0939	P20sx	86	950	854	-	-	-	-	-	-
800-900-0883	P20sx	155	855	750	-	-	-	-	-	-
900-900-1133	P20sx	140	1120	1018	-	-	-	-	-	-
900-900-1134	P20sx	150	1120	1008	-	-	-	-	-	-
900-900-1138	P20sx	120	1122	1006	-	-	-	-	-	-
900-900-1139	P20sx	110	1120	980	-	-	-	-	-	-

9) Values on request

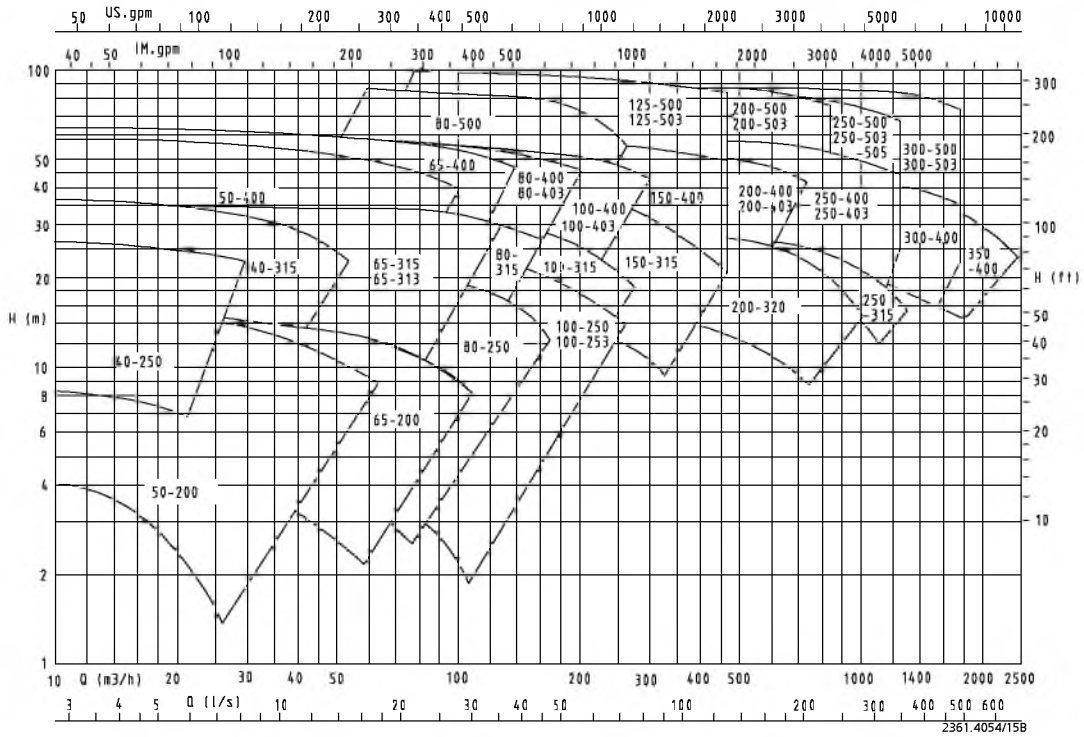
12 KWP

Selection charts

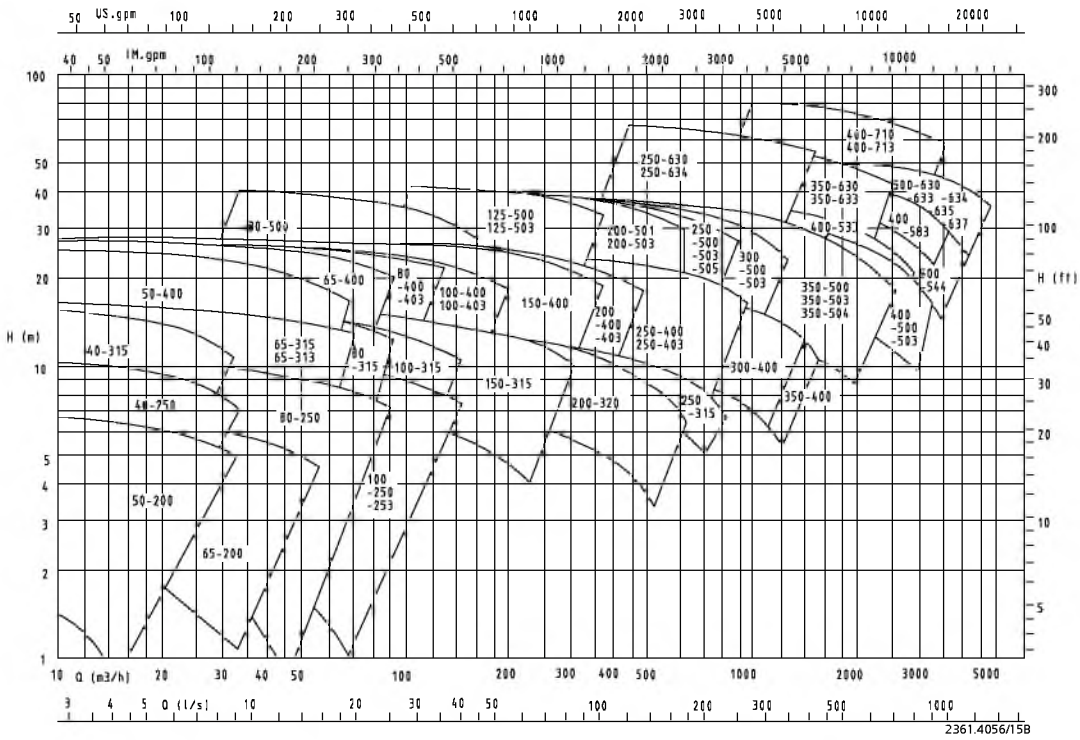
KWP, K impeller, n=2900 rpm



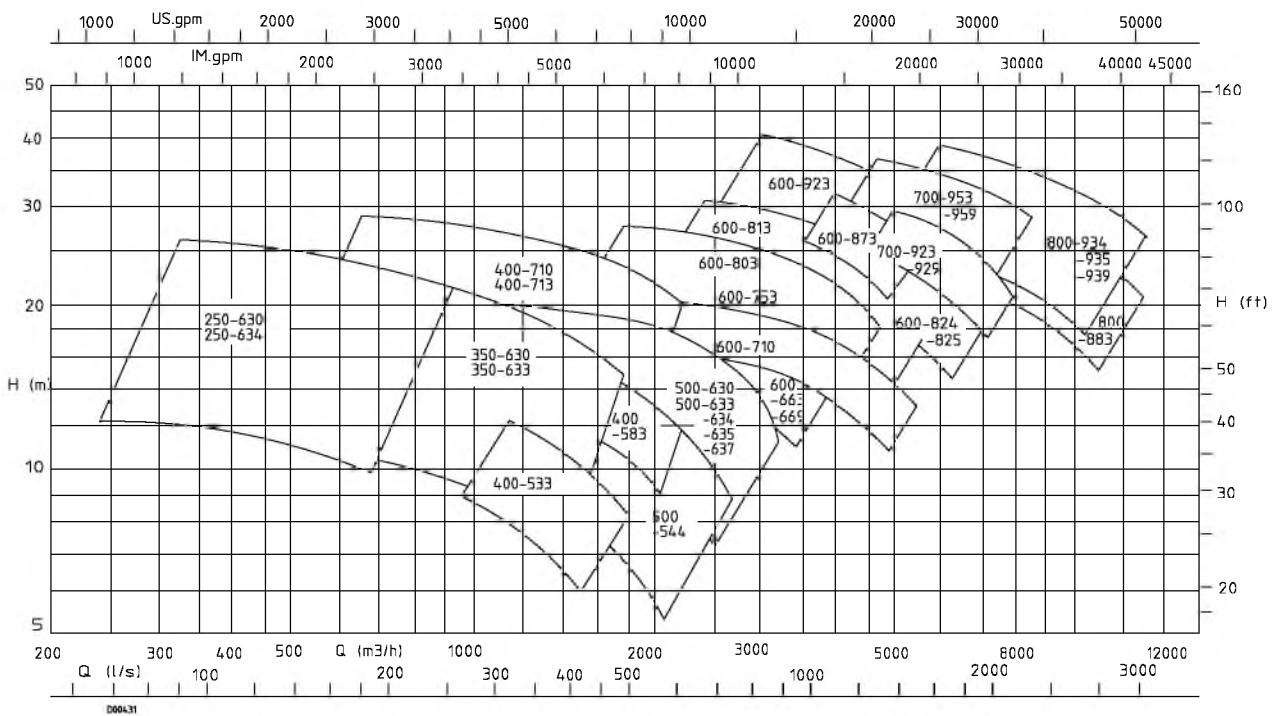
KWP, K impeller, n=1450 rpm



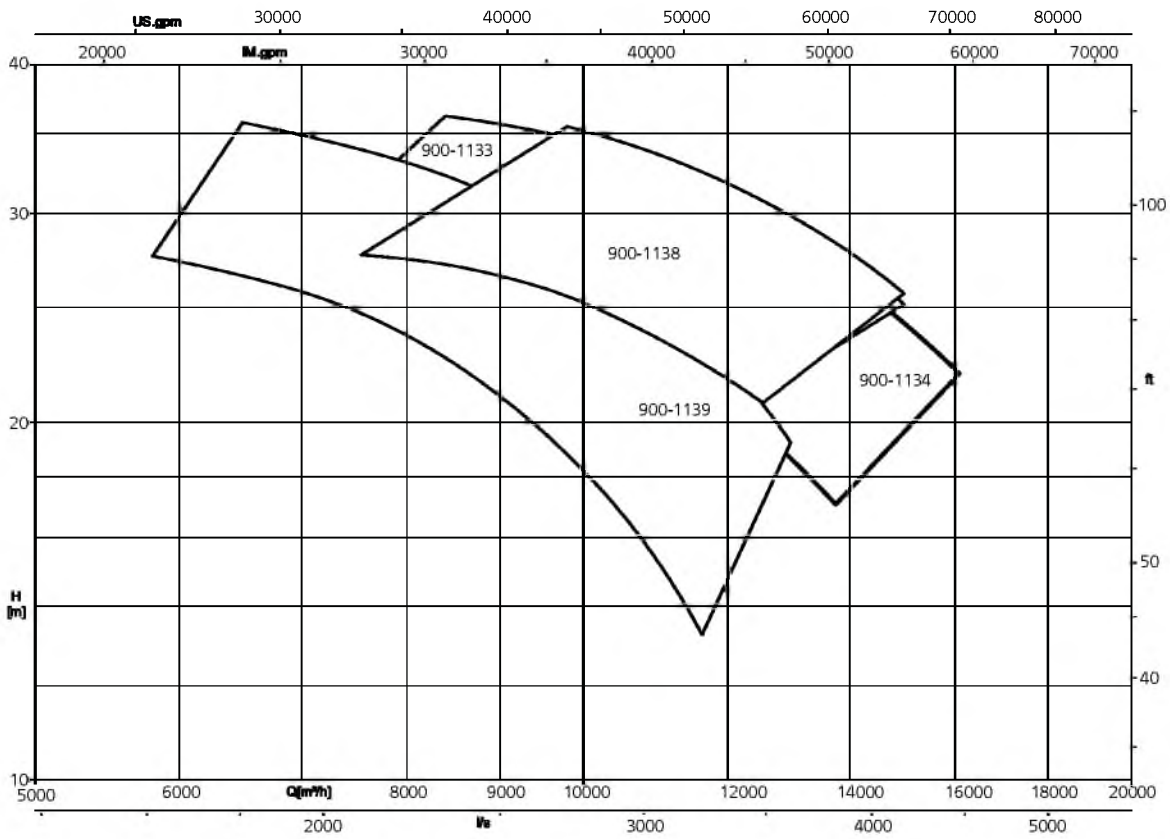
KWP, K impeller, n=960 rpm



KWP, K impeller, n=580 rpm

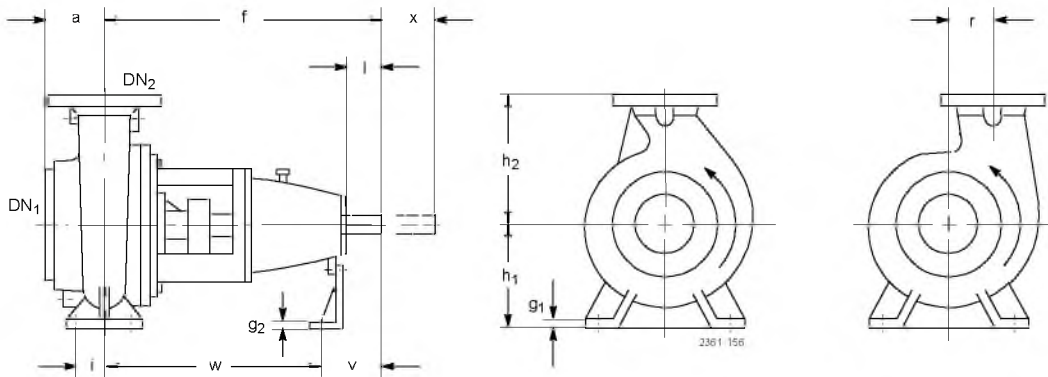


KWP, K impeller, n=480 rpm

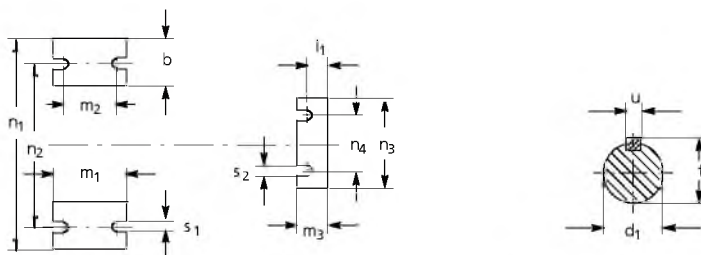


Dimensions and connections

Bearing brackets P03ax to P06x



Pump dimensions (P03ax to P06x)



Dimensions of pump feet and shaft end (P03ax to P06x)

Pump dimensions (P03ax to P06x)

Size	Bearing bracket	DN ₁	DN ₂	a	b	f	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹⁰⁾
065-040-0250	P03ax	65	40	100	65	500	16	4	180	225	-	125	48	320	160	100
065-050-0200	P03ax	65	50	112	50	500	14	4	160	200	-	100	48	265	160	100
065-050-0201	P03ax	65	50	112	50	500	14	4	160	200	-	100	48	265	160	100
080-040-0315	P04ax	80	40	125	80	530	18	6	225	250	-	160	48	400	160	140
080-050-0400	P04ax	80	50	120	80	530	18	6	280	325	-	160	48	435	160	140
080-065-0200	P03ax	80	65	125	65	500	16	4	180	225	-	125	48	320	160	100
080-065-0201	P03ax	80	65	125	65	500	16	4	180	225	-	125	48	320	160	100
080-065-0311	P04ax	80	65	140	80	530	18	6	225	280	-	160	48	400	160	120
080-065-0313	P04ax	80	65	140	80	530	18	6	225	280	-	160	48	400	160	120
080-065-0315	P04ax	80	65	140	80	530	18	6	225	280	-	160	48	400	160	120
080-065-0400	P04ax	80	65	140	80	530	18	6	280	355	-	160	48	435	160	120
100-080-0250	P03ax	100	80	125	80	500	18	6	225	280	-	160	48	400	160	120
100-080-0251	P03ax	100	80	125	80	500	18	6	225	280	-	160	48	400	160	120
100-080-0311	P04ax	100	80	140	80	530	18	6	225	280	-	160	48	400	160	120
100-080-0315	P04ax	100	80	140	80	530	18	6	225	280	-	160	48	400	160	120
100-080-0400	P05ax	100	80	140	80	670	18	12	280	355	-	160	60	435	200	120
100-080-0403	P05ax	100	80	140	80	670	18	12	280	355	-	160	60	435	200	120
125-080-0500	P06x	125	80	140	100	720	24	12	355	450	-	200	60	550	200	160
125-100-0250	P04ax	125	100	140	80	530	18	6	225	280	-	160	48	400	160	140
125-100-0251	P04ax	125	100	140	80	530	18	6	225	280	-	160	48	400	160	140
125-100-0253	P04ax	125	100	140	80	530	18	6	225	280	-	160	48	400	160	140
125-100-0315	P04ax	125	100	140	80	530	18	6	250	315	-	180	48	400	160	140
125-100-0400	P05ax	125	100	140	100	670	20	12	280	355	-	200	60	500	200	160

¹⁰⁾ x = back pull-out clearance (without removing the motor)

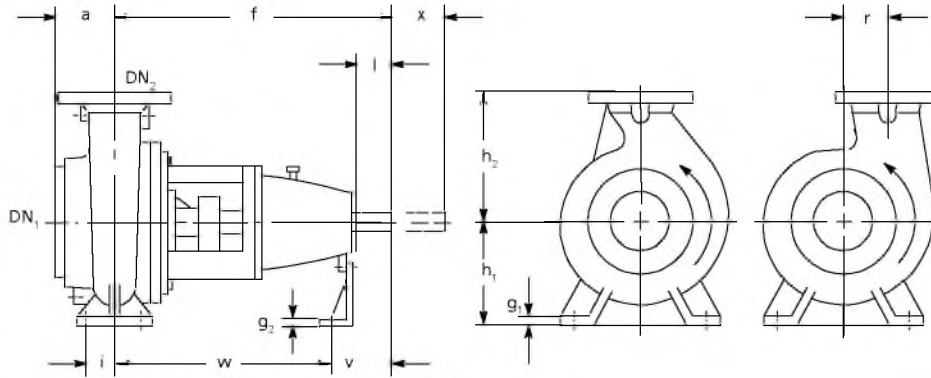
	Size	Bearing bracket	DN ₁	DN ₂	a	b	f	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹⁰⁾
125-100-0403	P05ax		125	100	140	100	670	20	12	280	355	-	200	60	500	200	160
150-125-0500	P06x		150	125	160	100	720	24	12	355	450	-	200	60	550	200	160
150-125-0503	P06x		150	125	160	100	720	24	12	355	450	-	200	60	550	200	160
150-150-0311	P05ax		150	150	180	100	670	22	12	315	400	-	200	60	550	200	160
150-150-0315	P05ax		150	150	180	100	670	22	12	315	400	-	200	60	550	200	160
150-150-0400	P05ax		150	150	160	100	670	22	12	315	450	-	200	60	550	200	160
150-150-0403	P05ax		150	150	160	100	670	22	12	315	450	-	200	60	550	200	160
200-200-0320	P05ax		200	200	200	100	697	22	12	355	450	-	200	60	550	200	160
200-200-0400	P06x		200	200	180	100	720	24	12	355	500	-	200	60	550	200	160
200-200-0403	P06x		200	200	180	100	720	24	12	355	500	-	200	60	550	200	160
250-250-0315	P06x		250	250	215	130	720	26	12	500	400	315	260	60	800	200	160

Dimensions of shaft end and pump feet (P03ax to P06x)

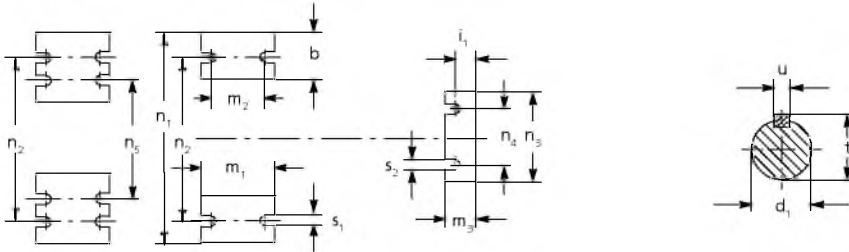
Bearing bracket	Size	Shaft end				Pump feet									
		d ₁	l	t	u	i	i ₁	m ₂	n ₂	n ₄	s ₁	s ₂	v	w	
P03ax	065-040-0250	32	80	35,3	10	47,5	30	95	250	110	16	14	130	370	
P03ax	065-050-0200	32	80	35,3	10	35	30	70	212	110	14	14	130	370	
P03ax	065-050-0201	32	80	35,3	10	35	30	70	212	110	14	14	130	370	
P03ax	080-065-0200	32	80	35,3	10	47,5	30	95	250	110	14	14	130	370	
P03ax	080-065-0201	32	80	35,3	10	47,5	30	95	250	110	14	14	130	370	
P03ax	100-080-0250	32	80	35,3	10	60	30	120	315	110	18	14	130	370	
P03ax	100-080-0251	32	80	35,3	10	60	30	120	315	110	18	14	130	370	
P04ax	080-040-0315	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	080-050-0400	42	110	45,1	12	60	33	120	355	110	19	14	160	370	
P04ax	080-065-0311	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	080-065-0313	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	080-065-0315	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	080-065-0400	42	110	45,1	12	60	33	120	355	110	19	14	160	370	
P04ax	100-080-0311	42	110	45,1	12	60	33	120	315	110	19	14	160	370	
P04ax	100-080-0315	42	110	45,1	12	60	33	120	315	110	19	14	160	370	
P04ax	125-100-0250	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	125-100-0251	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	125-100-0253	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P04ax	125-100-0315	42	110	45,1	12	60	33	120	315	110	18	14	160	370	
P05ax	100-080-0400	48	110	51,5	14	60	39	120	355	140	18	18	170	500	
P05ax	100-080-0403	48	110	51,5	14	60	39	120	355	140	18	18	170	500	
P05ax	125-100-0400	48	110	51,5	14	75	39	150	400	140	23	18	170	500	
P05ax	125-100-0403	48	110	51,5	14	75	39	150	400	140	23	18	170	500	
P05ax	150-150-0311	48	110	51,5	14	75	39	150	450	140	23	18	170	500	
P05ax	150-150-0315	48	110	51,5	14	75	39	150	450	140	23	18	170	500	
P05ax	150-150-0400	48	110	51,5	14	75	39	150	450	140	23	18	170	500	
P05ax	150-150-0403	48	110	51,5	14	75	39	150	450	140	23	18	170	500	
P05ax	200-200-0320	48	110	51,5	14	75	39	150	450	140	22	18	170	527	
P06x	125-080-0500	60	140	64,2	18	75	39	150	450	140	23	18	205	515	
P06x	150-125-0500	60	140	64,2	18	75	39	150	450	140	23	18	205	515	
P06x	150-125-0503	60	140	64,2	18	75	39	150	450	140	23	18	205	515	
P06x	200-200-0400	60	140	64,2	18	75	39	150	450	140	23	18	205	515	
P06x	200-200-0403	60	140	64,2	18	75	39	150	450	140	23	18	205	515	
P06x	250-250-0315	60	140	64,2	18	95	39	190	670	140	26	18	205	515	

¹⁰⁾ x = back pull-out clearance (without removing the motor)

Bearing brackets P08sx to P12sx



Pump dimensions (P08sx to P12sx)



Dimensions of pump feet and shaft end (P08sx to P12sx)

Pump dimensions (P08sx to P12sx)

Size	Bearing bracket	DN ₁	DN ₂	a	b	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹¹⁾
200-200-0500	P08sx/P10ax/P12sx	200	200	200	120	24	12	375	560	-	200	60	700	200	250
200-200-0501	P08sx/P10ax/P12sx	200	200	200	120	24	12	375	560	-	200	60	700	200	250
200-200-0503	P08sx/P10ax/P12sx	200	200	200	120	24	12	375	560	-	200	60	700	200	250
250-250-0400	P08sx/P10ax	250	250	180	130	26	12	425	375	300	260	60	800	200	315
250-250-0403	P08sx/P10ax	250	250	180	130	26	12	425	375	300	260	60	800	200	315
250-250-0500	P08sx/P10ax/P12sx	250	250	200	130	26	12	425	400	315	260	60	800	200	315
250-250-0503	P08sx/P10ax/P12sx	250	250	200	130	26	12	425	400	315	260	60	800	200	315
250-250-0505	P08sx/P10ax/P12sx	250	250	200	130	26	12	425	400	315	260	60	800	200	315
250-250-0630	P08sx/P10ax/P12sx	250	250	200	150	32	12	500	450	400	260	60	900	200	315
250-250-0634	P08sx/P10ax/P12sx	250	250	200	150	32	12	500	450	400	260	60	900	200	315
300-300-0400	P08sx/P10ax	300	300	180	180	32	12	500	400	390	360	60	900	200	315
300-300-0500	P08sx/P10ax/P12sx	300	300	200	130	26	12	450	450	315	260	60	800	200	315
300-300-0503	P08sx/P10ax/P12sx	300	300	200	130	26	12	450	450	315	260	60	800	200	315
350-350-0400	P08sx/P10ax	350	350	200	225	32	12	560	450	395	400	60	1080	200	315
350-350-0500 ¹²⁾	P08sx/P10ax/P12sx	350	350	290	225	32	12	560	500	415	400	60	1080	200	315
350-350-0503 ¹²⁾	P08sx/P10ax/P12sx	350	350	290	225	32	12	560	500	415	400	60	1080	200	315
350-350-0504 ¹²⁾	P08sx/P10ax/P12sx	350	350	290	225	32	12	560	500	415	400	60	1080	200	315
350-350-0630	P08sx/P10ax/P12sx	350	350	250	150	32	12	560	560	400	360	60	900	200	350
350-350-0633	P08sx/P10ax/P12sx	350	350	250	150	32	12	560	560	400	360	60	900	200	350
400-400-0500	P08sx/P10ax/P12sx	400	400	260	250	40	16	670	500	490	400	85	1150	216	400
400-400-0503	P08sx/P10ax/P12sx	400	400	260	250	40	16	670	500	490	400	85	1150	216	400
400-400-0533 ¹²⁾	P10ax/P12sx	400	400	350	250	40	16	630	525	475	360	70	1150	200	400
400-400-0583 ¹²⁾	P10ax/P12sx	400	400	390	250	40	16	700	540	510	400	110	1150	216	400
500-400-0710 ¹²⁾	P10ax/P12sx	500	400	350	250	40	16	670	600	480	400	65	1150	216	350

11) x = back pull-out clearance (without removing the motor)

12) No block flange but standard flange with through-holes

	Size	Bearing bracket	DN ₁	DN ₂	a	b	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹¹⁾
500-400-0713 ¹²⁾	P10ax/P12sx		500	400	350	250	40	16	670	600	480	400	65	1150	216	350
500-500-0544 ¹²⁾	P10ax/P12sx		500	500	425	250	40	30	800	630	585	400	90	1400	600	450
500-500-0630 ¹²⁾	P10ax/P12sx		500	500	375	250	40	16	750	630	575	400	100	1400	216	400
500-500-0633 ¹²⁾	P10ax/P12sx		500	500	375	250	40	16	750	630	575	400	100	1400	216	400
500-500-0634 ¹²⁾	P10ax/P12sx		500	500	375	250	40	16	750	630	575	400	100	1400	216	400
500-500-0635 ¹²⁾	P10ax/P12sx		500	500	375	250	40	16	750	630	575	400	100	1400	216	400
500-500-0637 ¹²⁾	P10ax/P12sx		500	500	375	250	40	16	750	630	575	400	100	1400	216	400
600-600-0663 ¹²⁾	P12sx		600	600	400	250	40	16	800	630	615	400	125	1400	200	500
600-600-0669 ¹²⁾	P12sx		600	600	400	250	40	16	800	630	615	400	125	1400	200	500
600-600-0710 ¹²⁾	P12sx		600	600	500	250	40	18	900	750	680	400	70	1600	200	500

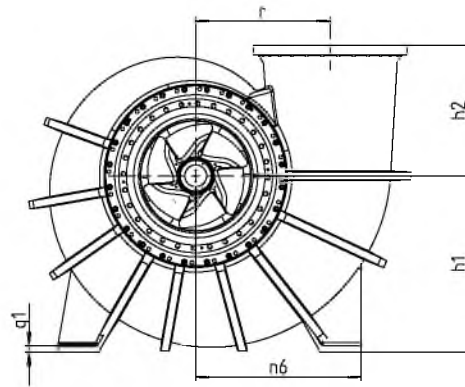
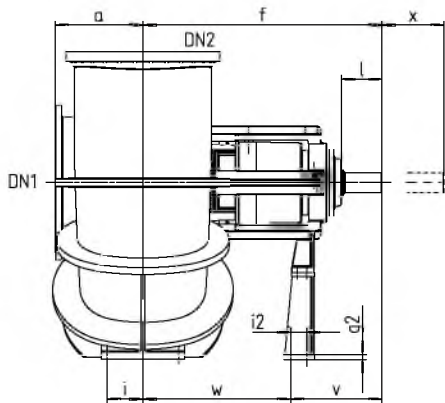
Dimensions of shaft end and pump feet (P08sx to P12sx)

Bearing bracket	Size	Shaft end [mm]				Pump feet [mm]										
		d ₁	l	t	u	i	i ₁	m ₂	n ₂	n ₄	n ₅	s ₁	s ₂	f	v	w
P08sx	200-200-0500	75	150	97,7	20	75	39	150	560	140	-	23	18	970	220	750
P08sx	200-200-0501	75	150	97,7	20	75	39	150	560	140	-	23	18	970	220	750
P08sx	200-200-0503	75	150	97,7	20	75	39	150	560	140	-	23	18	970	220	750
P08sx	250-250-0400	75	150	97,7	20	95	39	190	670	140	-	26	18	1000	220	780
P08sx	250-250-0403	75	150	97,7	20	95	39	190	670	140	-	26	18	1000	220	780
P08sx	250-250-0500	75	150	97,7	20	95	39	190	670	140	-	28	18	1000	220	780
P08sx	250-250-0503	75	150	97,7	20	95	39	190	670	140	-	28	18	1000	220	780
P08sx	250-250-0505	75	150	97,7	20	95	39	190	670	140	-	28	18	1000	220	780
P08sx	250-250-0630	75	150	97,7	20	95	39	190	750	140	-	26	18	1000	220	780
P08sx	250-250-0634	75	150	97,7	20	95	39	190	750	140	-	26	18	1000	220	780
P08sx	300-300-0400	75	150	97,7	20	125	39	250	750	140	-	28	18	1000	220	780
P08sx	300-300-0500	75	150	97,7	20	95	39	190	670	140	-	28	18	1000	220	780
P08sx	300-300-0503	75	150	97,7	20	95	39	190	670	140	-	28	18	1000	220	780
P08sx	350-350-0400	75	150	97,7	20	150	39	300	1000	140	750	28	18	1000	220	780
P08sx	350-350-0500	75	150	97,7	20	150	39	300	1000	140	750	28	18	1000	220	780
P08sx	350-350-0503	75	150	97,7	20	150	39	300	1000	140	750	28	18	1000	220	780
P08sx	350-350-0504	75	150	97,7	20	150	39	300	1000	140	750	28	18	1000	220	780
P08sx	350-350-0630	75	150	97,7	20	125	39	250	750	140	-	28	18	1000	220	780
P08sx	350-350-0633	75	150	97,7	20	125	39	250	750	140	-	28	18	1000	220	780
P08sx	400-400-0500	75	150	97,7	20	150	59	300	1040	140	800	39	18	1000	220	780
P08sx	400-400-0503	75	150	97,7	20	150	59	300	1040	140	800	39	18	1000	220	780
P10ax	200-200-0500	95	220	100,2	25	75	39	150	560	140	-	23	18	1160	410	750
P10ax	200-200-0501	95	220	100,2	25	75	39	150	560	140	-	23	18	1160	410	750
P10ax	200-200-0503	95	220	100,2	25	75	39	150	560	140	-	23	18	1160	410	750
P10ax	250-250-0400	95	220	100,2	25	95	39	190	670	140	-	26	18	1190	410	780
P10ax	250-250-0403	95	220	100,2	25	95	39	190	670	140	-	26	18	1190	410	780
P10ax	250-250-0500	95	220	100,2	25	95	39	190	670	140	-	28	18	1190	410	780
P10ax	250-250-0503	95	220	100,2	25	95	39	190	670	140	-	28	18	1190	410	780
P10ax	250-250-0505	95	220	100,2	25	95	39	190	670	140	-	28	18	1190	410	780
P10ax	250-250-0630	95	220	100,2	25	95	39	190	750	140	-	26	18	1190	410	780
P10ax	250-250-0634	95	220	100,2	25	95	39	190	750	140	-	26	18	1190	410	780
P10ax	300-300-0400	95	220	100,2	25	125	39	250	750	140	-	28	18	1190	410	780
P10ax	300-300-0500	95	220	100,2	25	95	39	190	670	140	-	28	18	1190	410	780
P10ax	300-300-0503	95	220	100,2	25	95	39	190	670	140	-	28	18	1190	410	780
P10ax	350-350-0400	95	220	100,2	25	150	39	300	1000	140	750	28	18	1190	410	780
P10ax	350-350-0500	95	220	100,2	25	150	39	300	1000	140	750	28	18	1190	410	780
P10ax	350-350-0503	95	220	100,2	25	150	39	300	1000	140	750	28	18	1190	410	780

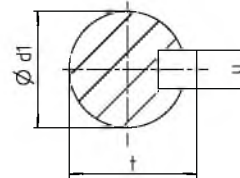
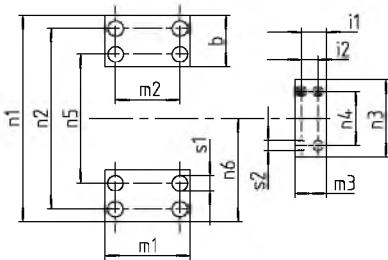
11) x = back pull-out clearance (without removing the motor)

Bearing bracket	Size	Shaft end [mm]				Pump feet [mm]											
		d ₁	l	t	u	i	i ₁	m ₂	n ₂	n ₄	n ₅	s ₁	s ₂	f	v	w	
P10ax	350-350-0504	95	220	100,2	25	150	39	300	1000	140	750	28	18	1190	410	780	
P10ax	350-350-0630	95	220	100,2	25	125	39	250	750	140	-	28	18	1190	410	780	
P10ax	350-350-0633	95	220	100,2	25	125	39	250	750	140	-	28	18	1190	410	780	
P10ax	400-400-0500	95	220	100,2	25	150	59	300	1040	140	800	39	18	1190	410	790	
P10ax	400-400-0503	95	220	100,2	25	150	59	300	1040	140	800	39	18	1190	410	790	
P10ax	400-400-0533	95	220	100,2	25	125	50	250	1040	140	800	40	18	1175	450	725	
P10ax	400-400-0583	95	220	100,2	25	150	50	300	1040	140	800	40	18	1180	450	730	
P10ax	500-400-0710	95	220	100,2	25	150	59	300	1040	140	800	38	18	1205	425	780	
P10ax	500-400-0713	95	220	100,2	25	150	59	300	1040	140	800	38	18	1205	425	780	
P10ax	500-500-0544	95	220	100,2	25	150	60	300	1290	520	1050	38	18	1190	435	755	
P10ax	500-500-0630	95	220	100,2	25	150	50	300	1290	140	1050	38	18	1190	410	780	
P10ax	500-500-0633	95	220	100,2	25	150	50	300	1290	140	1050	38	18	1190	410	780	
P10ax	500-500-0634	95	220	100,2	25	150	50	300	1290	140	1050	38	18	1190	410	780	
P10ax	500-500-0635	95	220	100,2	25	150	50	300	1290	140	1050	38	18	1190	410	780	
P10ax	500-500-0637	95	220	100,2	25	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	200-200-0500	110	220	116,2	28	75	39	150	560	140	-	23	18	1160	410	750	
P12sx	200-200-0501	110	220	116,2	28	75	39	150	560	140	-	23	18	1160	410	750	
P12sx	200-200-0503	110	220	116,2	28	75	39	150	560	140	-	23	18	1160	410	750	
P12sx	250-250-0500	110	220	116,2	28	95	39	190	670	140	-	28	18	1190	410	780	
P12sx	250-250-0503	110	220	116,2	28	95	39	190	670	140	-	28	18	1190	410	780	
P12sx	250-250-0505	110	220	116,2	28	95	39	190	670	140	-	28	18	1190	410	780	
P12sx	250-250-0630	110	220	116,2	28	95	39	190	750	140	-	26	18	1190	410	780	
P12sx	250-250-0634	110	220	116,2	28	95	39	190	750	140	-	26	18	1190	410	780	
P12sx	300-300-0500	110	220	116,2	28	95	39	190	670	140	-	28	18	1190	410	780	
P12sx	300-300-0503	110	220	116,2	28	95	39	190	670	140	-	28	18	1190	410	780	
P12sx	350-350-0500	110	220	116,2	28	150	39	300	1000	140	750	28	18	1190	410	780	
P12sx	350-350-0503	110	220	116,2	28	150	39	300	1000	140	140	28	18	1190	410	780	
P12sx	350-350-0504	110	220	116,2	28	150	39	300	1000	140	140	28	18	1190	410	780	
P12sx	350-350-0630	110	220	116,2	28	125	39	250	750	140	-	28	18	1190	410	780	
P12sx	350-350-0633	110	220	116,2	28	125	39	250	750	140	-	28	18	1190	410	780	
P12sx	400-400-0500	110	220	116,2	28	150	59	300	1040	140	800	39	18	1190	410	790	
P12sx	400-400-0503	110	220	116,2	28	150	59	300	1040	140	800	39	18	1190	410	790	
P12sx	400-400-0533	110	220	116,2	28	125	50	250	1040	140	800	40	18	1175	450	725	
P12sx	400-400-0583	110	220	116,2	28	150	50	300	1040	140	800	40	18	1180	450	730	
P12sx	500-400-0710	110	220	116,2	28	150	59	300	1040	140	800	38	18	1205	425	780	
P12sx	500-400-0713	110	220	116,2	28	150	59	300	1040	140	800	38	18	1205	425	780	
P12sx	500-500-0544	110	220	116,2	28	150	60	300	1290	520	1050	38	18	1190	435	755	
P12sx	500-500-0630	110	220	116,2	28	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	500-500-0633	110	220	116,2	28	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	500-500-0634	110	220	116,2	28	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	500-500-0635	110	220	116,2	28	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	500-500-0637	110	220	116,2	28	150	50	300	1290	140	1050	38	18	1190	410	780	
P12sx	600-600-0663	110	220	116,2	28	150	60	300	1310	140	1150	39	18	1238	457	781	
P12sx	600-600-0669	110	220	116,2	28	150	60	300	1310	140	1150	39	18	1238	457	781	
P12sx	600-600-0710	110	220	116,2	28	150	55	300	1490	140	1250	38	18	1240	450	790	

Bearing brackets P16ax and P20sx



Pump dimensions (P16ax and P20sx)



Dimensions of pump feet and shaft end (P16ax and P20sx)

Pump dimensions (P16ax and P20sx)

Size	Version	Bearing bracket	DN ₁	DN ₂	a	b	f	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹³⁾
500-400-0710	10	P16ax	500	400	350	250	1306	40	16	670	600	480	400	180	1150	216	350
500-400-0713	10	P16ax	500	400	350	250	1306	40	16	670	600	480	400	180	1150	216	350
500-500-0630	10	P16ax	500	500	375	250	1190	40	¹⁴⁾	750	630	575	400	¹⁴⁾	1400	¹⁴⁾	400
500-500-0633	10	P16ax	500	500	375	250	1190	40	¹⁴⁾	750	630	575	400	¹⁴⁾	1400	¹⁴⁾	400
500-500-0634	10	P16ax	500	500	375	250	1190	40	¹⁴⁾	750	630	575	400	¹⁴⁾	1400	¹⁴⁾	400
500-500-0635	10	P16ax	500	500	375	250	1190	40	¹⁴⁾	750	630	575	400	¹⁴⁾	1400	¹⁴⁾	400
500-500-0637	10	P16ax	500	500	375	250	1190	40	¹⁴⁾	750	630	575	400	¹⁴⁾	1400	¹⁴⁾	400
600-600-0710	10	P16ax	600	600	500	250	¹⁴⁾	40	¹⁴⁾	900	750	680	400	¹⁴⁾	1600	¹⁴⁾	500
600-600-0753	10	P16ax	600	600	450	240	1296	40	25	900	680	690	400	180	1600	350	450
600-600-0803	10	P16sx	600	600	450	250	1318	40	25	880	800	675	400	180	1600	350	460
600-600-0813	10	P16sx	600	600	500	250	1296	40	25	900	900	730	400	180	1560	350	450
600-600-0824	10	P16ax	600	600	445	250	1363	40	25	950	750	715	400	180	1560	350	500
600-600-0825	10	P16ax	600	600	445	250	1363	40	25	950	750	715	400	180	1560	350	500
600-600-0873	10	P16ax	600	600	470	240	1300	40	25	970	770	700	400	180	1650	350	470
600-600-0923	10	P20sx	600	600	500	250	1642	40	25	900	840	730	400	210	1560	450	450
700-700-0923	11	P20sx	700	700	490	250	1724	40	25	1050	690	770	500	210	1670	450	560
700-700-0929	11	P20sx	700	700	490	250	1724	40	25	1050	690	770	500	210	1670	450	560
800-700-0953	11	P20sx	800	700	550	210	1691,5	50	25	1100	720	770	500	210	1740	450	590
800-700-0959	11	P20sx	800	700	550	210	1691,5	50	25	1100	720	770	500	210	1740	450	590

¹³⁾ x = back pull-out clearance (without removing the motor)

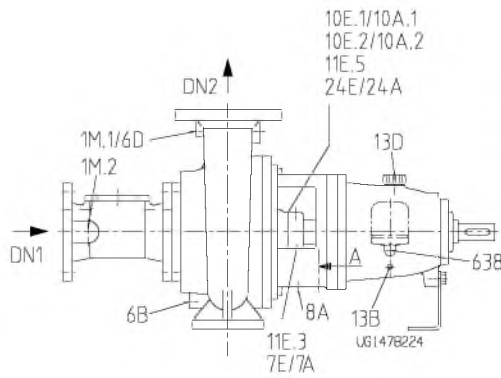
¹⁴⁾ Dimensions on request

	Size	Version	Bearing bracket	DN ₁	DN ₂	a	b	f	g ₁	g ₂	h ₁	h ₂	r	m ₁	m ₃	n ₁	n ₃	x ¹³⁾
800-900-0883	10	P20sx		800	900	622	300	1784	50	25	1250	950	925	600	210	2250	450	660
800-800-0934	11	P20sx		800	800	500	240	1711,5	50	25	1080	760	832	500	210	1840	450	610
800-800-0939	11	P20sx		800	800	500	240	1711,5	50	25	1080	760	832	500	210	1840	450	610
900-900-1133	11	P20sx		900	900	492	300	1732,5	50	25	1280	950	975	600	210	2200	450	695
900-900-1134	11	P20sx		900	900	492	300	1732,5	50	25	1280	950	975	600	210	2200	450	695
900-900-1138	11	P20sx		900	900	492	300	1732,5	50	25	1280	950	975	600	210	2200	450	695
900-900-1139	11	P20sx		900	900	492	300	1732,5	50	25	1280	950	975	600	210	2200	450	695

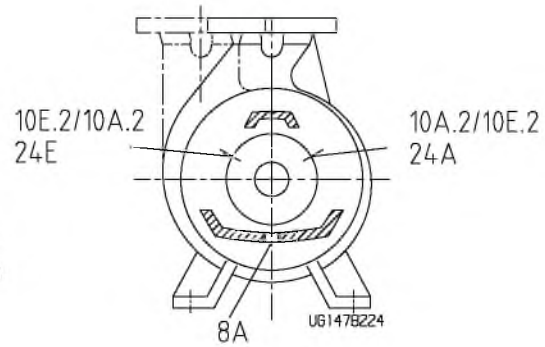
Dimensions of shaft end and pump feet (P16ax to P20sx)

Bearing bracket	Size	Version	Shaft end [mm]				Pump feet [mm]											
			d ₁	l	t	u	i	i ₁	i ₂	m ₂	n ₂	n ₄	n ₅	n ₆	s ₁	s ₂	v	w
P16ax	500-400-0710	10	120	210	127,2	32	150	130	85	300	1040	250	800	575	38	18	476	830
P16ax	500-400-0713	10	120	210	127,2	32	150	130	85	300	1040	250	800	575	38	18	476	830
P16ax	500-500-0630	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1290	¹⁴⁾	1050	700	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	500-500-0633	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1290	¹⁴⁾	1050	700	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	500-500-0634	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1290	¹⁴⁾	1050	700	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	500-500-0635	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1290	¹⁴⁾	1050	700	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	500-500-0637	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1290	¹⁴⁾	1050	700	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	600-600-0710	10	120	210	127,2	32	150	¹⁴⁾	¹⁴⁾	300	1490	¹⁴⁾	1250	800	38	¹⁴⁾	¹⁴⁾	¹⁴⁾
P16ax	600-600-0753	10	120	210	127,2	32	150	130	85	300	1490	250	1250	800	39	17,5	476	820
P16ax	600-600-0803	10	120	210	127,2	32	150	130	85	300	1490	250	1250	800	40	18	476	842
P16ax	600-600-0813	10	120	210	127,2	32	150	130	85	300	1450	250	1250	780	39	17,5	476	820
P16ax	600-600-0824	10	120	210	127,2	32	150	130	85	300	1450	250	1250	800	39	18	476	887
P16ax	600-600-0825	10	120	210	127,2	32	150	130	85	300	1450	250	1250	800	39	18	476	887
P16ax	600-600-0873	10	120	210	127,2	32	150	130	85	300	1540	250	1300	825	39	18	476	824
P20sx	600-600-0923	10	145	270	153	36	150	165	110	300	1450	350	1250	800	39	17,5	658,5	983,5
P20sx	700-700-0923	11	145	270	153	36	200	165	110	400	1550	350	1330	850	39	17,5	658,5	1065,5
P20sx	700-700-0929	11	145	270	153	36	200	165	110	400	1550	350	1330	850	39	17,5	658,5	1065,5
P20sx	800-700-0953	11	145	270	153	36	200	165	110	400	1640	350	1460	870	39	17,5	658,5	1033,5
P20sx	800-700-0959	11	145	270	153	36	200	165	110	400	1640	350	1460	870	39	17,5	658,5	1033,5
P20sx	800-800-0934	11	145	270	153	36	200	165	110	400	1740	350	1500	920	39	17,5	658,5	1053
P20sx	800-800-0939	11	145	270	153	36	200	165	110	400	1740	350	1500	920	39	17,5	658,5	1053
P20sx	800-900-0883	10	145	270	153	36	200	165	110	400	2140	350	1860	1270	39	17,5	658,5	1125
P20sx	900-900-1133	11	145	270	153	36	250	165	110	500	2040	350	1800	1200	39	17,5	658,5	1075
P20sx	900-900-1134	11	145	270	153	36	250	165	110	500	2040	350	1800	1200	39	17,5	658,5	1075
P20sx	900-900-1138	11	145	270	153	36	250	165	110	500	2040	350	1800	1200	39	17,5	658,5	1075
P20sx	900-900-1139	11	145	270	153	36	250	165	110	500	2040	350	1800	1200	39	17,5	658,5	1075

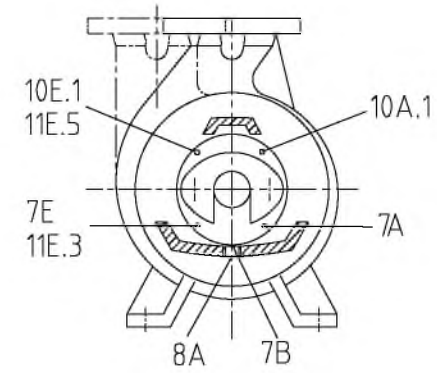
¹³⁾ x = back pull-out clearance (without removing the motor)

Connections


Pump connections



Mechanical seal connections



Gland packing connections

Designation	Use	Designation	Use
1M.1/2	Pressure gauge	10E.1/A.1	Barrier fluid inlet/outlet (gland packing)
6B	Casing drain	10E.2	Barrier fluid inlet (mechanical seal), discharge cover
6D	Venting	10A.2	Barrier fluid outlet (mechanical seal), seal cover
7E/A	Cooling liquid IN/OUT	10E.2/A.2	Barrier fluid inlet/outlet (mechanical seal), seal cover
7B	Cooling chamber drain	10E.2/A.2	Barrier fluid inlet/outlet (mechanical seal) ¹⁵⁾
8A	Leakage drain	13B	Oil drain
11E.3	Gap flush, outboard (stuffing box housing)	13D	Vent plug
11E.5	Flushing liquid inlet (gland packing)	24E/A	Quench liquid IN/OUT, seal cover ¹⁶⁾
638	Constant level oiler	24E/A	Quench liquid IN/OUT, seal cover (mechanical seal 4K)

15) Mechanical seal type Cartex DN P03ax to P10ax

16) Mechanical seal type TA (MG1-G6/M3 - HRZ/M3 - 587SP-D/M3)

Connections

Size	1M.1	1M.2	6B	6D	7E/A	7B	8A		10E.1/A.1	10E.2 (mechanical seal), discharge cover	10A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal) ¹⁷⁾	11E.3	11E.5	13B	13D	24E/A, seal cover ¹⁸⁾ 24E/A	Mechanical seal (type 4K), seal cover	638
065-040-250	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
065-050-200	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
065-050-201	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-065-200	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-065-201	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-065-313	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-040-315	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-050-400	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-065-315	G 1/2	G 1/2	G 3/4	G 1/2	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
080-065-400	G 1	G 1/2	G 1	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-250	G 1	G 1/2	G 3/4	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-251	G 1	G 1/2	G 3/4	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-311	G 1	G 1/2	G 3/4	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-315	G 1	G 1/2	G 3/4	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-400	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
100-080-403	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-080-500	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-250	G 1	G 1/2	G 1	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-251	G 1	G 1/2	G 1	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-253	G 1	G 1/2	G 1	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-315	G 1	G 1/2	G 1	G 1	G 1/4	G 1/8	R 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	NPT 3/8	G 1/4	G 1/4	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-400	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
125-100-403	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-150-311	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-150-315	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-150-400	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-150-403	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-125-500	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
150-125-503	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
200-200-320	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
200-200-400	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
200-200-403	G 1	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
200-200-500	G 1	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	
200-200-501	G 1	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	
200-200-503	G 1	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	
250-250-315	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/8	R 1/2	G 3/8	G 3/8	G 1/4	G 1/4	G 1/4	NPT 3/8	G 3/8	G 3/8	G 1/4	Ø 20	G 1/4	G 1/4	R 1/4
250-250-400	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	
250-250-403	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	
250-250-500	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4	

17) Mechanical seal type Cartex DN P03ax to P10ax
 18) Mechanical seal type TA (MG1-G6/M3 - HRZ/M3 - 587SP-D/M3)
 19) Bearing bracket P08sx/P10ax = G 1/4

Size	1M.1	1M.2	6B	6D	7E/A	7B	8A		10E.1/A.1	10E.2 (mechanical seal), discharge cover	10A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal) ¹⁷⁾	11E.3	11E.5	13B	13D	24E/A, seal cover ¹⁸⁾	24E/A (mechanical seal type 4K), seal cover	638
250-250-503	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
250-250-505	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
250-250-630	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
250-250-634	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
300-300-400	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
300-300-500	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
300-300-503	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-400	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-500	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-503	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-504	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-630	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
350-350-633	G 1/2	G 1/2	G 1	G 1	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
400-400-500	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4 ²⁰⁾	R 1/4
400-400-503	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4 ²⁰⁾	R 1/4
400-400-533	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4 ²⁰⁾	R 1/4
400-400-583	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4 ²⁰⁾	R 1/4
500-400-710	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-400-713	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-500-544	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
500-500-630	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-500-633	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-500-634	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-500-635	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
500-500-637	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8 ²⁰⁾	-	-	-	G 1/2 ¹⁹⁾²⁰⁾	NPT 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 3/8 ²⁰⁾	G 1/2	Ø 20	G 1/2 ¹⁹⁾²⁰⁾	G 1/4 ²⁰⁾	R 1/4
600-600-663	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
600-600-669	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
600-600-710	G 1/2	G 1/2	G 1 1/2	G 2	G 3/8	G 1/4	R 1/2	G 3/8	-	-	-	G 1/2 ¹⁹⁾	NPT 3/8	G 3/8	G 3/8	G 1/2	Ø 20	G 1/2 ¹⁹⁾	G 1/4	R 1/4
600-600-753	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-803	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-813	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-824	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-825	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-873	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
600-600-923	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
700-700-923	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4

17) Mechanical seal type Cartex DN P03ax to P10ax
18) Mechanical seal type TA (MG1-G6/M3 - HRZ/M3 - 587SP-D/M3)
20) Not provided on this size with bearing bracket P16ax

Size	1M.1	1M.2	6B	6D	7E/A	7B	8A	10E.1/A.1	10E.2 (mechanical seal), discharge cover	10A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal), seal cover	10E.2/A.2 (mechanical seal) ¹⁷⁾	11E.3	11E.5	13B	13D	24E/A, seal cover ¹⁸⁾	24E/A (mechanical seal type 4K), seal cover	638
700-700-929	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
700-700-953	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
700-700-959	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
800-800-934	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
800-800-935	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
800-800-939	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
800-900-883	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
900-900-1133	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
900-900-1134	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
900-900-1138	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4
900-900-1139	-	-	-	-	-	-	R 1 1/2	-	-	-	-	-	-	-	G 1/2	Ø 20	-	-	R 1/4

17) Mechanical seal type Cartex DN P03ax to P10ax
 18) Mechanical seal type TA (MG1-G6/M3 - HRZ/M3 - 587SP-D/M3)

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Easy to service thanks to back pull-out design
- Safe design: all pressure-retaining components cast with extra corrosion/wear allowance.
- Standard pump with suction-side wear plate in wear-resistant diagonal gap design
- High levels of efficiency with channel-type impeller; impeller with front vanes and diagonal gap; back vanes reduce axial thrust
- Dry shaft: no special materials required
- Bearing assembly in reinforced, adjustable design
- Mechanical seal fitted in conical shaft seal chamber for optimum circulation around the mechanical seal, venting and drainage of the shaft seal chamber

Acceptance tests / Warranties

- Materials testing
 - Test report 2.2 on request
- Final inspection
 - Inspection certificate 3.1 to EN 10204 on request
- Hydraulic test

The duty point of each pump is guaranteed according to ISO 9906.

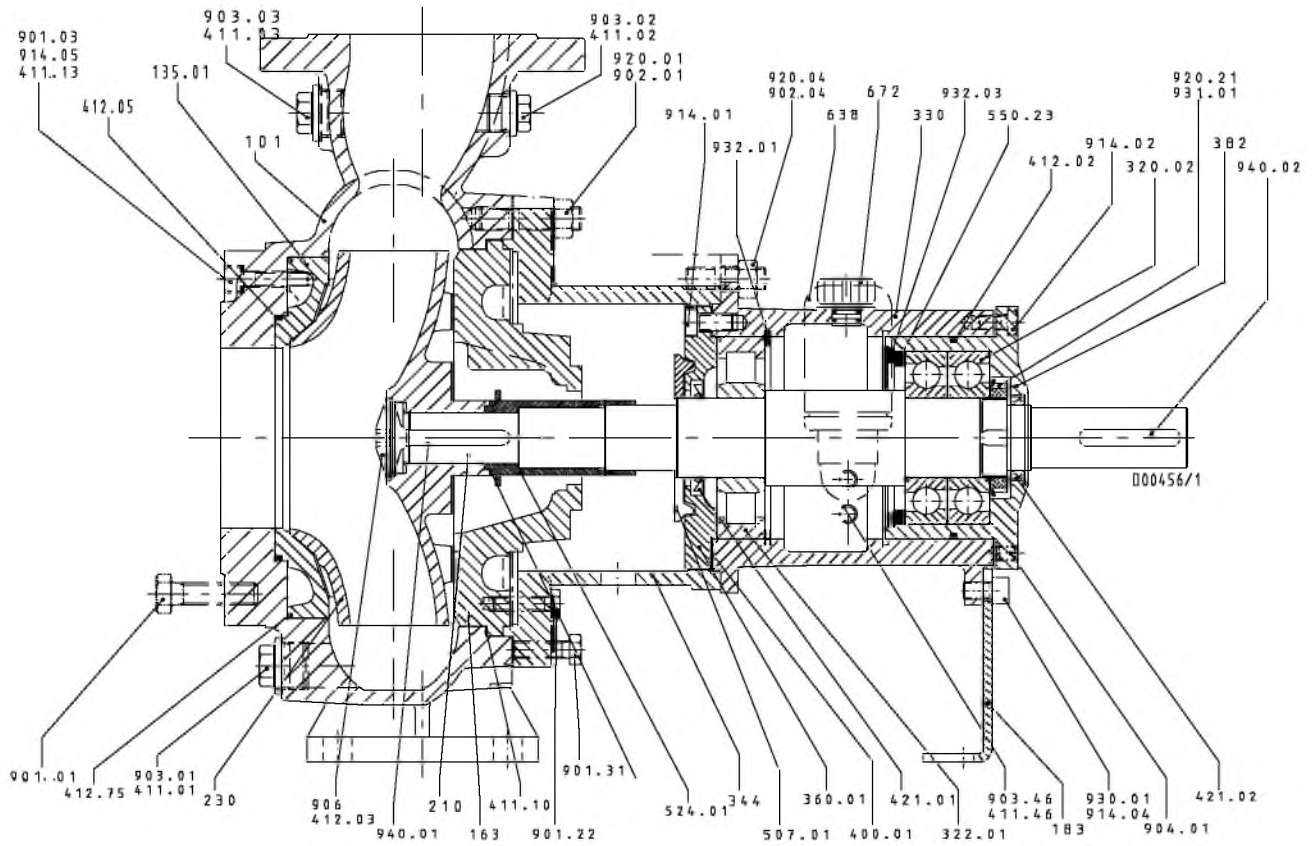
The following acceptance tests can be performed and certified at extra charge:

- Performance test to ISO 9906
- NPSH test
- Other tests (e.g. vibrations, strength) on request.
- Warranties

Warranties are given within the scope of the valid delivery conditions.

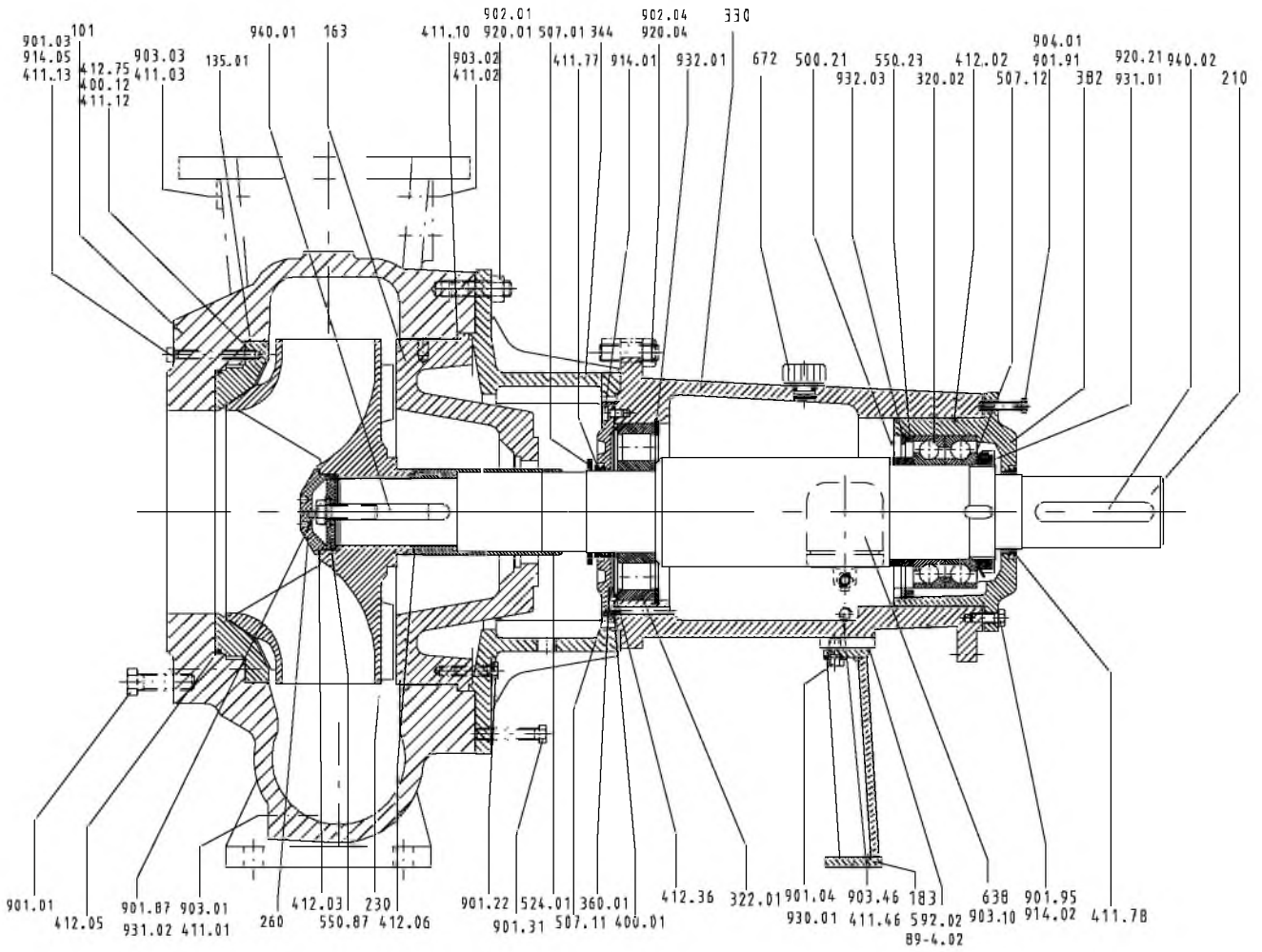
General assembly drawings with list of components

Bearing brackets P03ax to P06x

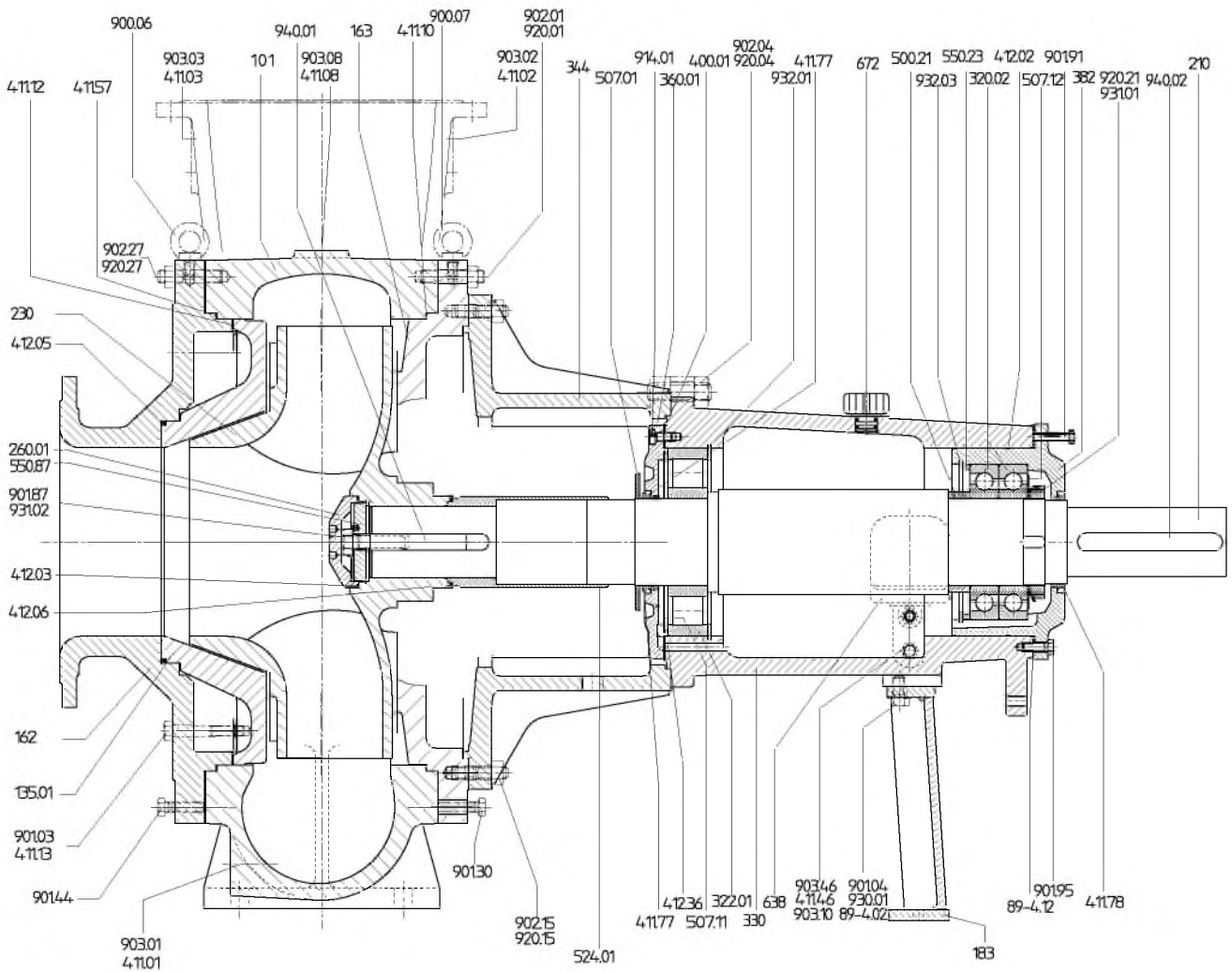


Bearing brackets P03ax to P06x

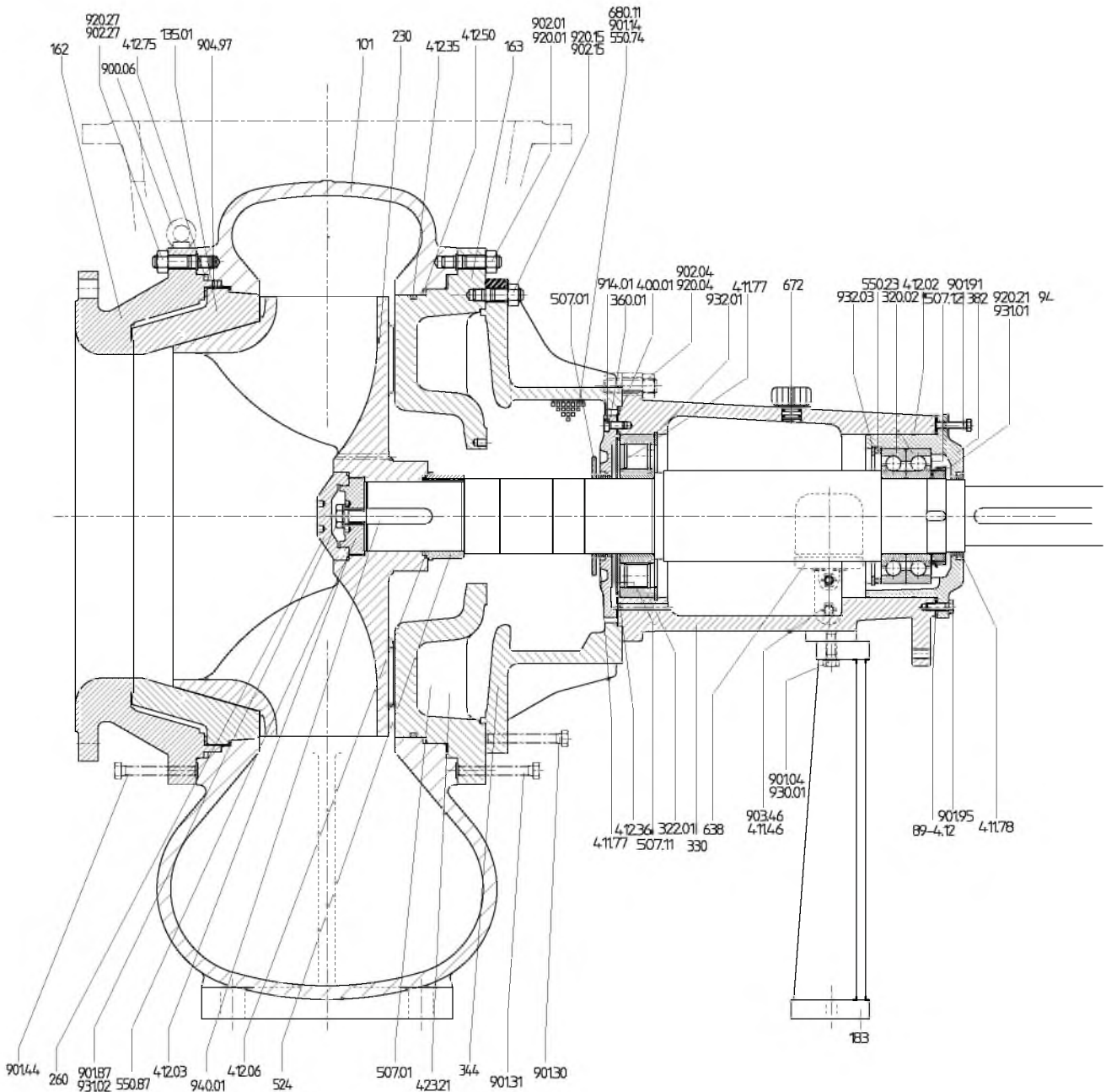
Bearing brackets P08sx to P12sx



Bearing brackets P08sx to P12sx

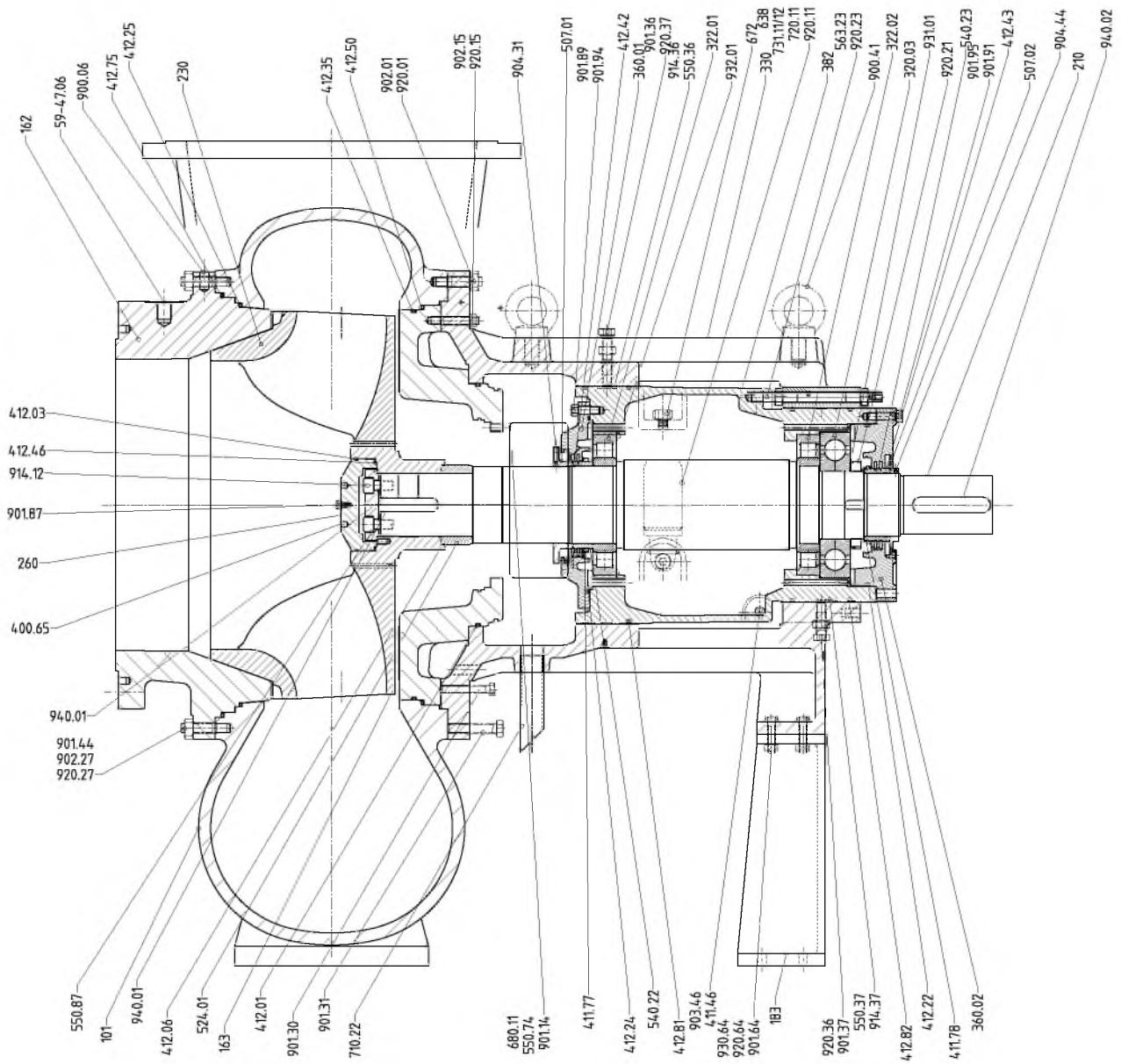


Bearing brackets P10ax to P12sx: sizes 500-400-710 and 500-400-713

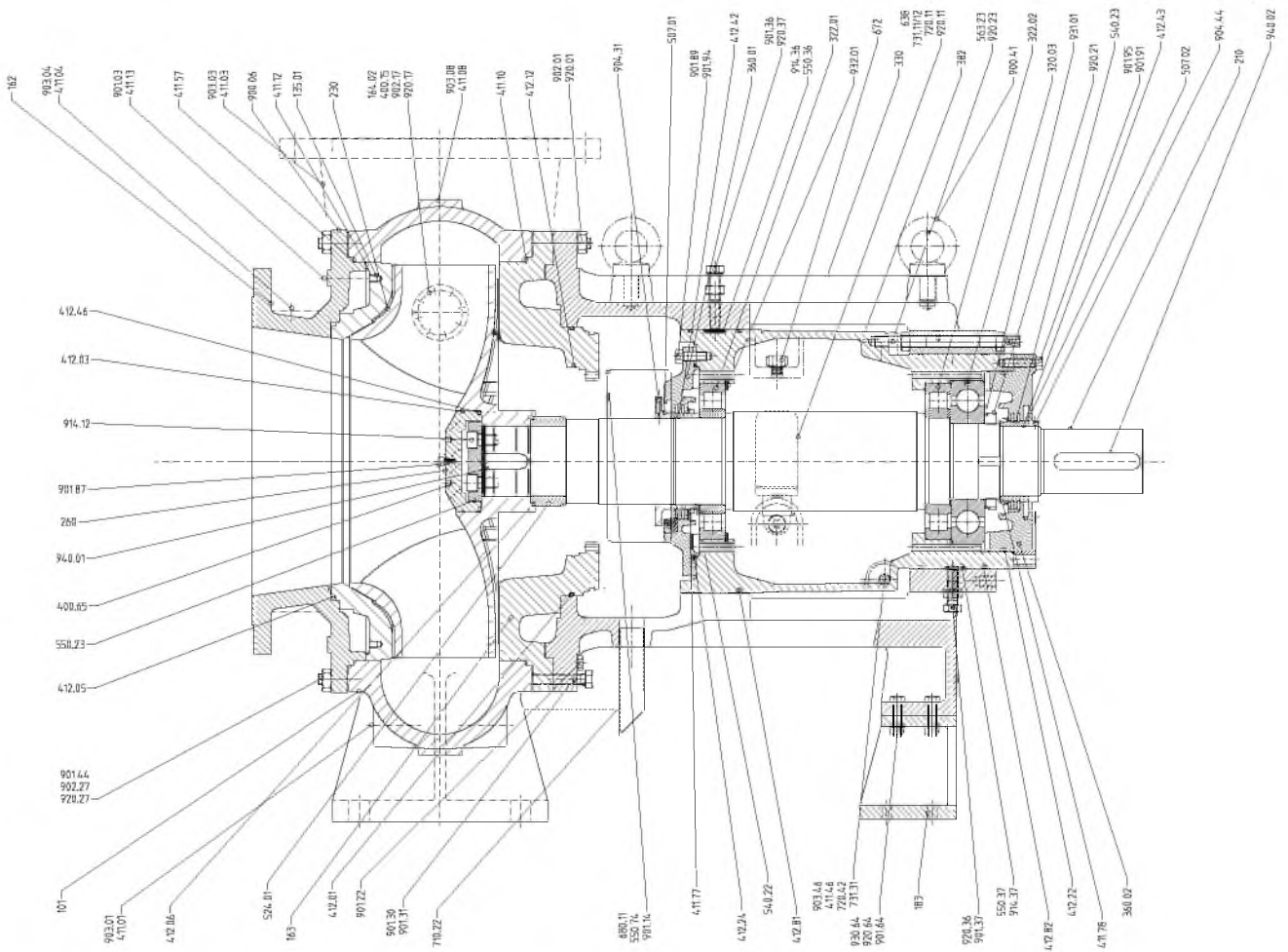


Bearing bracket P12sx: sizes 500-500-544, 600-660-663 and 600-600-669

Bearing bracket P16ax V10

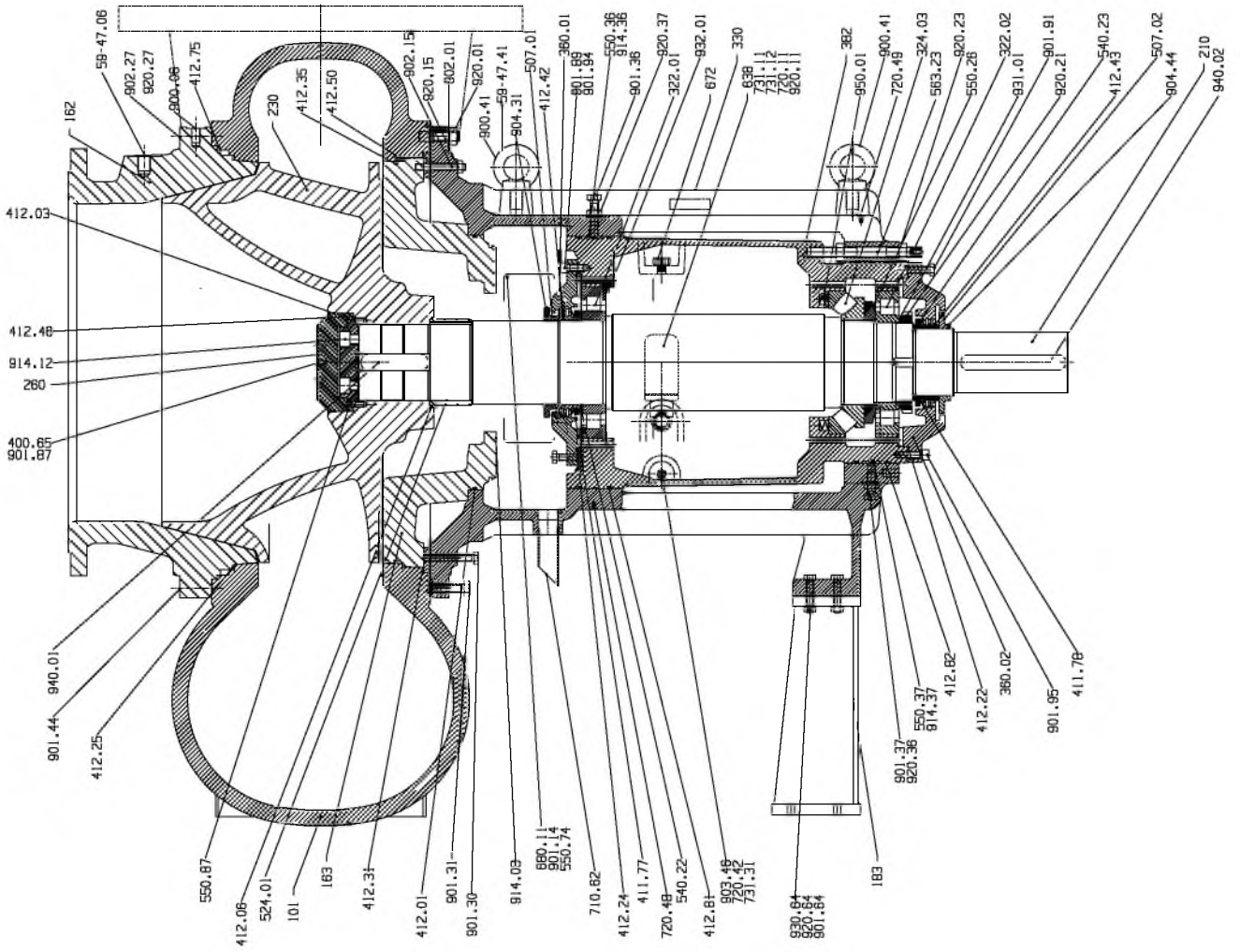


General assembly drawing of pump set with bearing bracket P16ax V10



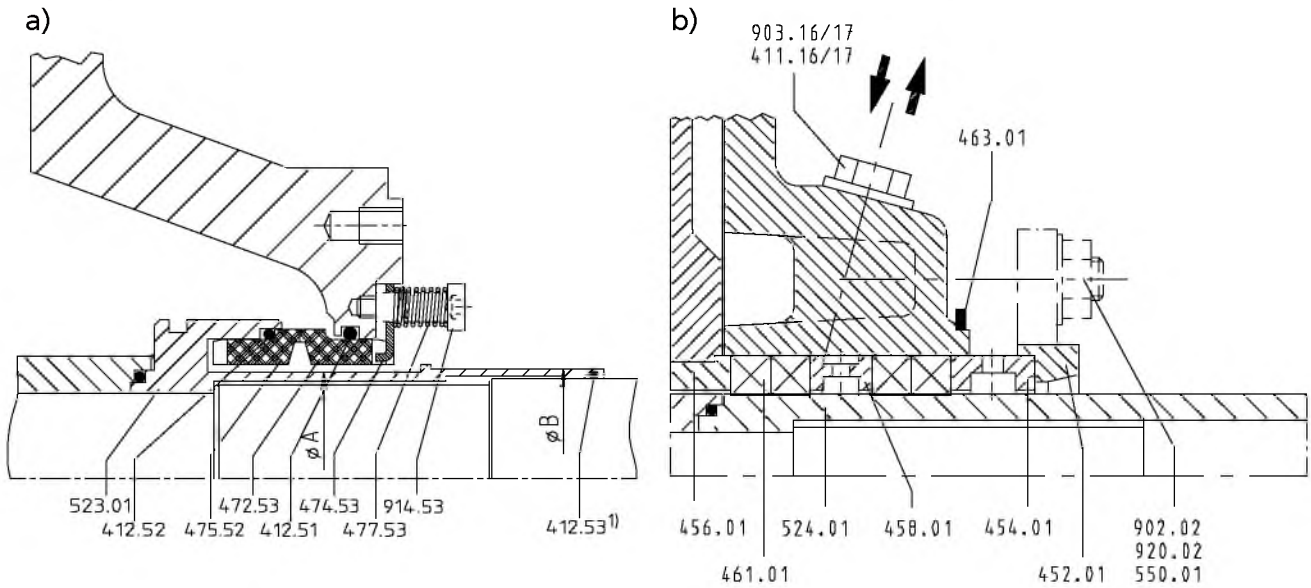
General assembly drawing of pump set with bearing bracket P16ax V10 (500-400-710, 500-400-713, 500-500-633, 500-500-637)

Bearing bracket P20sx

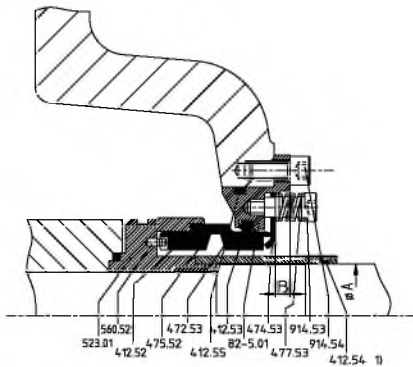


General assembly drawing of pump set with bearing bracket P20sx V10

Shaft seals



Shaft seals P03ax to P12sx: a) 4K mechanical seal; b) coolable gland packing



4K-120M mechanical seal²¹⁾

List of components

List of components²²⁾

Part No.	Comprising	Description
101	101	Pump casing
	411.01/.02/.03/.10 ²³⁾	Joint ring
	901.01	Hexagon head bolt
	902.01/.27	Stud
	903.01/.02/.03 ²³⁾	Screw plugs
	920.01/.27	Hexagon nut
135.01 ²⁴⁾	135.01	Wear plate
	411.12/.13/.57	Joint ring
	412.05/.75	O-ring
	901.03	Hexagon head bolt
	902.08/.90	Stud
	920.08/.90	Hexagon nut
162	914.05	Hexagon socket head cap screw
	162	Suction cover
	900.06	Eyebolt

²¹⁾ Only for sizes 600-600-663 or 600-600-669

²²⁾ Depending on the design

²³⁾ If fitted

²⁴⁾ Sizes 250-250-0315, 300-300-0400, 350-350-0400 and 400-400-0500: casing wear ring 502.01 instead of wear plate

Part No.	Comprising	Description
	901.44	Forcing screw
	904.97	Grub screw
163	163	Discharge cover (A-type cover)
	412.35/.50	O-ring
	900.07	Eyebolt
	901.22/.30/.31	Forcing screw
	902.15	Stud
	920.15	Hexagon nut
163	163	Discharge cover with integrally cast stuffing box housing
	411.16/.17	Joint ring
	463.01	Drip plate
	550.01	Disc
	901.22	Hexagon head bolt
	902.02	Stud
	903.16/.17	Screw plug
	920.02	Nut
163	163	Discharge cover (with bolted stuffing box housing)
	400.05	Gasket
	411.26	Joint ring
	901.22	Hexagon head bolt
183	183	Support foot
	592.02	Base
	901.04	Hexagon head bolt
	914.04	Hexagon socket head cap screw
	930.01	Spring washer
	89-4.02	Shims
210	210	Shaft
	500.21	Ring
	920.21	Slotted round nut
	931.01	Lock washer
	940.01/.02	Key
230	230	Impeller
260	260	Impeller hub cap
	412.03	O-ring
	550.87	Disc
	901.87	Hexagon head bolt
	931.02	Lock washer
320.02	320.02	Angular contact ball bearing
322.01	322.01	Cylindrical roller bearing
330	330	Bearing bracket
330	330	Bearing bracket, complete
	360.01	Bearing cover
	382	Bearing carrier
	400.01	Gasket
	411.46	Joint ring
	411.77/.78	V-ring
	412.02/.36	O-ring
	421.01/.02	Lip seal
	507.01/.12	Thrower
	550.23	Support disc
	638	Constant level oiler
	672	Vent plug
	901.91/.95	Hexagon head bolt
	903.10/.46	Screw plug
	914.01/.02	Hexagon socket head cap screw
	932.01/.02/.03	Circlip
344	344	Bearing bracket lantern
	901.31	Forcing screw
	902.04	Stud
	920.04	Hexagon nut
	901.22	Hexagon head bolt
360.01	360.01	Bearing cover
	400.01	Gasket
	914.01	Hexagon socket head cap screw
	507.11	Thrower

Part No.	Comprising	Description
	412.36	O-ring
382	382	Bearing carrier
	412.02	O-ring
	89-4.12	Shims
411.77/78	411.77/78	V-ring
433.02	82-5.01	Adapter
	412.51/52/53	O-ring
	433.02	Mechanical seal, type 4K
	471	Seal cover
	472.51	Primary ring
	474.53	Thrust ring
	475.52	Mating ring
	477.53	Spring
	523.01	Shaft sleeve
	560.52	Pin
	914.53/54	Hexagon socket head cap screw
451.01	451.01	Stuffing box housing
	400.05	Gasket
	411.16/17/18/19/26	Joint ring
	463.01	Drip plate
	550.01	Disc
	902.02	Stud
	903.16/17/18/19	Screw plug
	920.01	Hexagon nut
452.01	452.01	Gland follower
454.01	454.01	Stuffing box ring, split
456.01	456.01	Neck bush
458.01	458.01	Lantern ring, split
461.01	461.01	Gland packing
59-47.06/08/41	59-47.06/08/41	Lifting lug
502.01	502.01	Casing wear ring
507.01/11/12	507.01/11/12	Thrower
524.01	524.01	Shaft protecting sleeve
	412.06	O-ring
900.06/07/41	900.06/07/41	Eyebolt
906	906	Impeller screw
	412.03	O-ring
99-9	99-9	Set of sealing elements
	400.01	Gasket
	411.01/02/03/10/12/13/46/57	Joint ring
	412.02/03/05/06/35/50/75	O-ring

Detailed designation

Product code example

Position																																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
K	W	P	F	1	2	5	-	1	0	0	-	0	2	5	0		G	N	N	G	1	0	P	4	X	3	N	H		5	5	4
See name plate and data sheet																							See data sheet									

Key to the designation

Position	Code	Description
1-3	Pump type	
	KWP	Type series
4	Impeller	
	K	Channel impeller
	O	Open impeller
	F	Free-flow impeller
	R	Worm-type impeller
5-17	Size	
	125	Nominal suction nozzle diameter [mm]
	100	Nominal discharge nozzle diameter [mm]

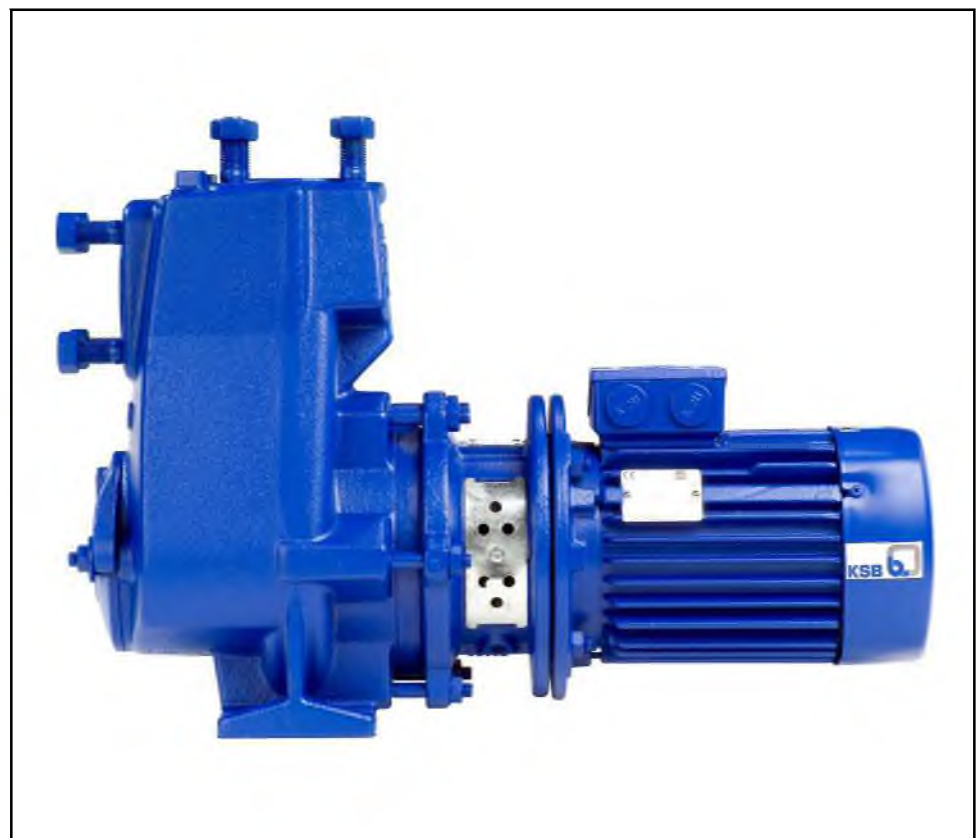
Position	Code	Description
	250	Nominal impeller diameter [mm]
18	Casing material	
	G	GJL-250
	D	NORIDUR 1.4593
	H	NORIHARD NH 15 3
19	Impeller material	
	K	GJS-400-18-LT/ CeramikPolySiC
	N	ERN
	D	NORIDUR 1.4593
	U	NORIDUR 1.4593 DAS
20	Wear plate material	
	H	NORIHARD NH 15 3
	K	CeramikPolySiC
	M	NORICROM 1.4475
	N	ERN
	D	NORIDUR 1.4593
21	Discharge cover material	
	U	NORIDUR 1.4593 DAS
	H	NORIHARD NH 15 3
	M	NORICROM 1.4475
	K	CeramikPolySiC
22-23	Design variant	
	10	
24-25	Shaft seal operating mode	
	P3	Gland packing (arrangement I = 2/1/2) for barrier fluid
	P6	Gland packing (arrangement II = 1/1/3) for barrier fluid
	P4	Gland packing (arrangement IIa = -/1/3) for flushing liquid
	A	Single mechanical seal in A-type cover
	TA	Double mechanical seal in A-type cover, unpressurised
	TS	Double mechanical seal in A-type cover, with barrier fluid
	DR	Double mechanical seal in cylindrical cover, with barrier fluid
26	Special design	
	X	Special design
	-	Standard
27-29	Installation type	
	0	Figure 0
	3N	Fig. 3E, baseplate, non-spacer-type coupling
	3NH	Fig. 3E, baseplate, spacer-type coupling
	BH	Close-coupled, horizontal
30-32	Motor rating	
	1 3 2	132 kW
	5 5	55 kW
33	Number of poles	
	2	2-pole
	4	4-pole
	6	6-pole

²⁵⁾ K defines a suction cover in GJS-400-18-LT/ CeramikPolySiC for pumps without a separate wear plate

Self-priming Pump

Etaprime B

Type Series Booklet



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Self-priming Pump in Close-coupled Design

Volute Casing Pumps

Etaprime B



Main applications

- Spray irrigation systems
- Service water supply systems
- Drainage
- Drainage systems
- Fire-fighting systems
- Lowering groundwater levels
- Domestic water supply
- Air-conditioning systems
- Cooling circuits
- Swimming pools
- Water supply systems

Fluids handled

- Drinking water
- Swimming pool water (0.4 to 1.4 mg/l free chlorine, max. 0.6 mg/l combined chlorine, pH value 6.9 to 7.7, water hardness 10 to 30 °dH, max. salt content 7 g/l)
- Fire-fighting water
- Seawater
- River, lake and groundwater
- Brackish water
- Condensate
- Brine
- Oil

- Service water
- Cleaning agents
- Cooling water

Operating data

Operating properties

Characteristic	Value	Value	
		50 Hz	60 Hz
Flow rate	Q [m³/h]	≤ 130	≤ 150
	Q [l/s]	≤ 36	≤ 42
Head	H [m]	≤ 70	≤ 100
Fluid temperature	T [°C]	-30 to +90	
Operating pressure	p [bar]	≤ 10	
Static head	H _{Geo} [m]	≤ 9	

Designation

Example: ETPB080-080-200 GCXI10D3

Designation key

Code	Description
ETPB	Type series
	ETPB | Etaprime B
080	Nominal suction nozzle diameter [mm]
080	Nominal discharge nozzle diameter [mm]
200	Nominal impeller diameter [mm]
G	Casing material
	C | Stainless steel
	G | Grey cast iron
C	Impeller material if different from casing material
	C | Stainless steel
	G | Grey cast iron
X	Design
	- | Standard
	X | Special design
I	Sealing system
	I | Single mechanical seal
	D | Double mechanical seal in back-to-back arrangement
	T | Double mechanical seal in tandem arrangement
10	Seal code
	01 | Q1Q1VGG
	08 | AQ1VGG ¹⁾
	09 | U3U3VGG
	10 | Q1Q1X4GG
	11 | BQ1EGG
D	Scope of supply
	D | Pump with motor
3	Shaft unit
	1 | SU 17
	2 | SU 25
	3 | SU 35

Further information on the designation

(⇒ Page 23)

1) BQVGG for shaft unit 17

Design details

Design

- Volute casing pump
- Back pull-out design (from size 40-40-140)
- Horizontal installation
- Self-priming
- Single-stage
- Single-entry
- Pump and motor with stub shaft

Pump casing

- Radially split volute casing
- Volute casing with integrally cast pump feet (from pump size 40-40-140)

Impeller type

- Open multi-channel impeller

Shaft seal

- The shaft is fitted with a replaceable shaft sleeve in the shaft seal area (from pump size 40-40-140).
- Single and double mechanical seals to EN 12756

Drive

- KSB IEC frame standardised IE3 motor (from 0.75 kW)
- Type of construction B34 \leq 1.1 kW
- Type of construction V1 1.1 to 4 kW
- Type of construction V15 > 4 kW

- 230/400 V up to 2.2 kW and 400/690 V from 3 kW
- IP55 enclosure
- Thermal class F
- 3 PTC thermistors

Product benefits

- Maintenance-free mechanical seal ensures operating reliability
- Easy to dismantle due to back pull-out design; no need to remove the pump casing from the piping
- Good suction performance, self-priming up to 9 m suction lift, also suitable for applications with relatively poor inlet conditions (i.e. low or negative inlet pressure) and for handling fluids with entrained gas.
- Optimised hydraulic components for high efficiency help reduce energy consumption

Certifications

Overview

Label	Effective in:	Note
	All countries	Certified quality management to ISO 9001

Overview of fluids handled

Table of fluids handled and associated material combinations
X ≈ standard

Fluid handled	Temperature [°C]	Materials			Shaft seal						Mechanical seal design code	Comments	
		Casing / impeller			Mechanical seal								
		Grey cast iron/grey cast iron	Grey cast iron/ Cr-Ni-Mo cast steel	CrNiMo cast steel/ CrNiMo cast steel	Q1Q1VGG	AQ1VGG ²⁾ BQVGG ³⁾	U3U3VGG	Q1Q1X4GG	BQ1EGG ²⁾	Q12Q1M1GG			
													Design code
G	GC	C	01	8	9	10	11	70 ⁴⁾					
Water													
Industrial waste water													Analysis of the fluid handled required
Ammonia water (ammonia solution)	\leq 40; conc. \leq 10 %	X							X				Tandem seal Q1Q1EGG required. Quench liquid: use suitable water.
Brackish water	\leq 25			X				X			10		
Fire-fighting water ⁵⁾	\leq 60		X					X			10		
Condensate ²⁾	\leq 90	X							X		11		
Condensate, not conditioned	\leq 90			X					X		11		

2) Treatment to VdTÜV 1466; additional requirement: O₂ \leq 0.02 mg/l

3) Only applies to shaft unit 17.

4) Special mechanical seal design

5) General criteria for results of water analysis: pH value \geq 7; chloride content (Cl) \leq 250 mg/kg. Chlorine (Cl₂) \leq 0.6 mg/kg.

Fluid handled	Temperature	Materials			Shaft seal						Mechanical seal design code	Comments
		Casing / impeller			Mechanical seal							
		Grey cast iron/grey cast iron	Grey cast iron/ Cr-Ni-Mo cast steel	CrNiMo cast steel/ CrNiMo cast steel	Q1Q1VGG	AQ1VGG ²⁾ BQVGG ³⁾	U3U3VGG	Q1Q1X4GG	BQ1EGG ²⁾	Q12Q1M1GG		
[°C]	G	GC	C	01	8	9	10	11	70 ⁴⁾			
Cooling water (without antifreeze) ⁵⁾	≤ 60	X					X				10	Open circuit: CL 10 required
Cooling water pH ≥ 7.5 (with antifreeze) ⁵⁾⁶⁾	≥ -30 p ≤ 10 bar ≤ 90	X							X		11	Open circuit: CL 11 required
Slightly contaminated water ⁵⁾	≤ 60	X					X				10	
Seawater	≤ 25			X			X				10	
Surface water ⁵⁾	≤ 40	X				X					8	Analysis of the fluids handled required
Pure water ⁷⁾	≤ 60	X							X		11	
Untreated water ⁵⁾	≤ 60	X					X				10	
Swimming pool water (fresh water) ⁵⁾	≤ 60	X					X				10	Also applies to requirements as per DIN 19643
Dam water ⁵⁾	≤ 60	X					X				10	If solids are contained, contact KSB.
Drinking water	≤ 60			X							11	
Partly desalinated water ²⁾	≤ 90	X							X		11	
Fully desalinated water	≤ 90			X					X		11	Requirements for ultra-pure water cannot be met.
Fully desalinated water as boiler feed water ²⁾	≤ 90	X							X		11	
Refrigerants, cooling brines												
Cooling brine; inorganic, pH value > 7.5, inhibited	≥ -30 ≤ 25	X							X		11	
Water with antifreeze, pH value > 7.5 ⁵⁾⁶⁾	≥ -30 ≤ 90	X							X		11	
Oils/emulsions												
Drilling/grinding emulsion	≤ 60	X					X				9	
Oil-water emulsion	≤ 60	X					X				9	
Cleaning agents												
Lyes for bottle rinsers ⁸⁾	≤ 90	X								X	10	EPDM only if oil-free
Acids												
Acetic acid	≤ 60; conc. ≤ 5 % ≤ 60; conc. ≤ 10 %			X					X		11	
Alum, potassium aluminium sulphate up to 3 %	≤ 80			X	X						01	

Overview of type series

Available sizes and designs

Size	Shaft unit	Etaprime L		Etaprime B	
		G	GC, C	G	GC, C
032-032-100	17	S / T	-	S / T	-
032-032-120	17	S / T	S / T	S / T	S / T

2) Treatment to VdTÜV 1466; additional requirement: O₂ ≤ 0.02 mg/l

3) Only applies to shaft unit 17.

4) Special mechanical seal design

6) Antifreeze on ethylene glycol basis with inhibitors. Content: 20 % to 50 % (e.g. Antifrogen N)

7) No ultra-pure water! Conductivity at 25 °C: ≤ 800 μS/cm

8) With 2 % sodium hydroxide

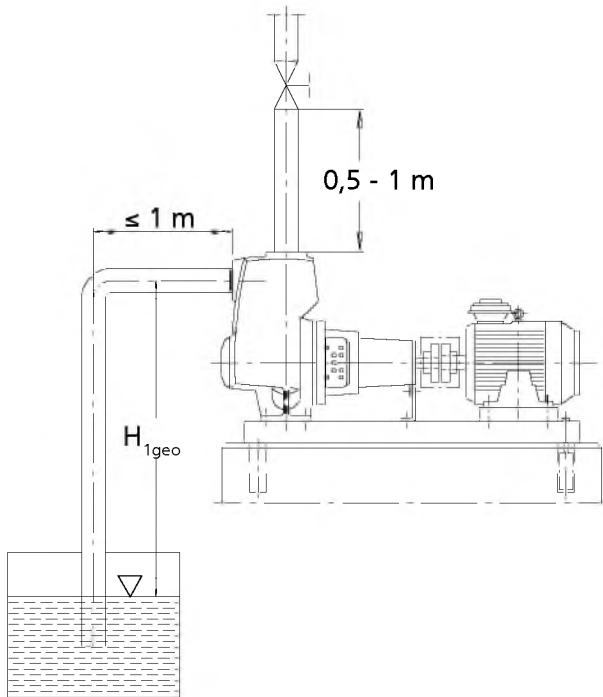
Size	Shaft unit	Etaprime L		Etaprime B	
		G	GC, C	G	GC, C
040-040-110	17	S/T	S/T	S/T	S/T
040-040-140	25	S/T/B	S/T/B	S/T/B	S/T/B
050-050-130	25	S/T/B	S/T/B	S/T/B	S/T/B
050-050-160	25	S/T/B	S/T/B	S/T/B	S/T/B
065-065-150	25	S/T/B	S/T/B	S/T/B	S/T/B
065-065-180	35	S/T/B	S/T/B	S/T/B	S/T/B
080-080-170	35	S/T/B	S/T/B	S/T/B	S/T/B
080-080-190	35	S/T/B	-	S/T/B	-
080-080-200	35	S/T/B	S/T/B	S/T/B	S/T/B
100-100-240.1	35	S/T/B	-	S/T/B	-
100-100-240	35	S/T/B	-	-	-
125-125-260	35	S/T/B	-	-	-

- E = Single mechanical seal (standard design)
- T = Available with double mechanical seal in tandem arrangement
- B = Available with double mechanical seal in back-to-back arrangement
- = Size not available

Priming time

For a 1-metre horizontal length of the suction line and DN suction line = DN pump, the priming times are as follows.

When handling gaseous fluids, fluids which tend to froth or water with a temperature $T > 60\text{ °C}$, the pump will not be self-priming. In such cases, a check valve must be installed in the suction line.



Distances of suction line and discharge line

Size ⁹⁾	Shaft unit	Priming time [sec]					
		at a speed $n = 2900\text{ rpm}$					
		at a static suction lift H_{1geo} of ... m					
		2 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	40	145	415	-	-	-
032-032-120		30	90	135	190	255	360
040-040-110		60	100	215	420	-	-
040-040-140	25	30	70	125	220	355	600
050-050-130		50	120	195	260	345	440
050-050-160		30	70	105	170	265	430
065-065-150	35	60	120	165	260	375	570
065-065-180		30	50	75	100	145	200
080-080-170		50	100	135	180	225	310
080-080-190		40	70	105	160	185	240
080-080-200		30	50	75	105	155	200
100-100-240.1		30	70	95	120	150	190
100-100-240		35	70	85	110	160	-
125-125-260	35	80	105	130	160	190	

Size ⁹⁾	Shaft unit	Priming time [sec]					
		at a speed $n = 3500\text{ rpm}$					
		at a static suction lift H_{1geo} of ... m					
		2 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	30	85	135	-	-	-
032-032-120		20	60	105	140	175	250
040-040-110		30	85	125	200	265	470
040-040-140	25	25	50	85	120	145	230
050-050-130		30	90	140	190	245	300
050-050-160		25	55	75	150	215	280
065-065-150	35	40	80	125	170	225	370
065-065-180		20	40	65	90	105	150
080-080-170		30	80	105	130	165	220
080-080-190		30	55	75	100	125	160
080-080-200		25	40	55	80	125	160
100-100-240.1		25	60	85	115	145	180
100-100-240		25	70	85	100	155	360

⁹⁾ Stainless steel variant not available for all pump sizes.

Size 9)	Shaft unit	Priming time [sec] at a speed n = 1450 rpm at a static suction lift H _{1geo} of ... m							
		1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m
		025-025-100	17	130	-	-	-	-	-
032-032-120		100	210	-	-	-	-	-	-
040-040-110		120	-	-	-	-	-	-	-
040-040-140	25	130	-	-	-	-	-	-	-
050-050-130		210	410	-	-	-	-	-	-
050-050-160		210	430	-	-	-	-	-	-
065-065-150		190	350	540	-	-	-	-	-
065-065-180	35	90	140	220	370	-	-	-	-
080-080-170		110	180	280	480	-	-	-	-
080-080-190		100	110	200	310	-	-	-	-
080-080-200		70	110	190	270	320	420	-	-
100-100-240.1		130	150	220	300	440	-	-	-
100-100-240		110	160	270	480	-	-	-	-
125-125-260		60	70	110	160	200	330	430	610

Size 9)	Shaft unit	Priming time [sec] at a speed n = 1750 rpm at a static suction lift H _{1geo} of ... m							
		1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m
		025-025-100	17	70	170	-	-	-	-
032-032-120		80	150	260	-	-	-	-	-
040-040-110		90	180	-	-	-	-	-	-
040-040-140	25	80	150	200	-	-	-	-	-
050-050-130		130	240	380	-	-	-	-	-
050-050-160		130	260	480	-	-	-	-	-
065-065-150		140	260	350	430	-	-	-	-
065-065-180	35	80	110	170	220	330	-	-	-
080-080-170		90	130	200	320	480	-	-	-
080-080-190		80	100	130	160	210	390	-	-
080-080-200		60	100	160	230	280	350	-	-
100-100-240.1		90	110	140	210	260	400	-	-
100-100-240		80	100	140	200	300	-	-	-
125-125-260		50	60	80	115	170	220	300	400

Materials

A1 = default material variant
A2 = optional material variant

Part No.	Description	Material variants			
		G	GC	C	
102	Volute casing	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1
161	Casing cover	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1
210	Shaft seal for shaft units 25 and 35	Tempered steel C45+N	A1	A1	-
	Shaft for shaft unit 17	Stainless steel 1.4571	A2	A2	A1
230	Impeller	Grey cast iron EN-GJL-250	A1	-	-
		Stainless steel 1.4408	-	A1	A1
341	Drive lantern for shaft units 25 and 35	Grey cast iron EN-GJL-250	A1	A1	A1
	Drive lantern for shaft unit 17	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1

Rated power requirement

Size	Motor code	IEC frame size	50 Hz [kW]	60 Hz [kW]	50 Hz / 60 Hz ~ 400 V [A] ¹⁰⁾
All	.../054	80	0,6	0,6	1,4
	.../154	90L	1,5	1,7	3,4
	.../224	100L	2,2	2,5	4,9
	.../304	100L	3,0	3,4	6,3
	.../404	112M	4,0	4,6	8,3
	.../112	80	1,1	1,3	2,6
	.../222	90L	2,2	2,5	4,6
	.../302	100L	3,0	3,4	6,3
	.../402	112M	4,0	4,6	8,3
	.../552	132S	5,5	6,3	11,0
	.../752	132S	7,5	8,6	14,6
	.../1102	160M	11,0	12,6	20,7
	.../1502	160M	15,0	17,3	28,0
	.../1852	160L	18,5	21,3	33,0
	.../2202	180M	22,0	24,5	40,0
	.../3002	200L	30,0	34,5	54,0

Pressure limits

Size	Discharge pressure p ₂ ¹¹⁾ [bar]	Test pressure ¹²⁾ [bar]
All sizes	10,0	15,0

¹⁰⁾ The currents indicated are for orientation only. For the exact currents refer to the motor name plate.

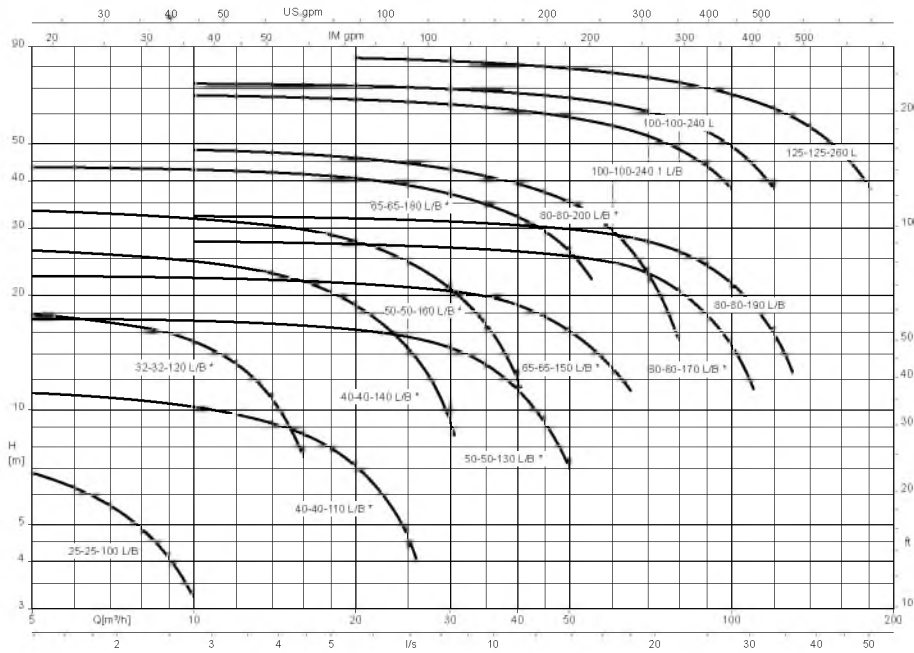
¹¹⁾ The sum of inlet pressure and shut-off head must not exceed the values indicated.

¹²⁾ The casing components are checked for leakage by means of internal pressure tests to ZN 1650 with water.

Part No.	Description	Material variants		
		G	GC	C
412	O-ring	EPDM 80 peroxide ¹³⁾	A1	A1
523	Shaft sleeve (not for shaft unit 17)	Stainless steel 1.4571	A1	A1

Selection charts

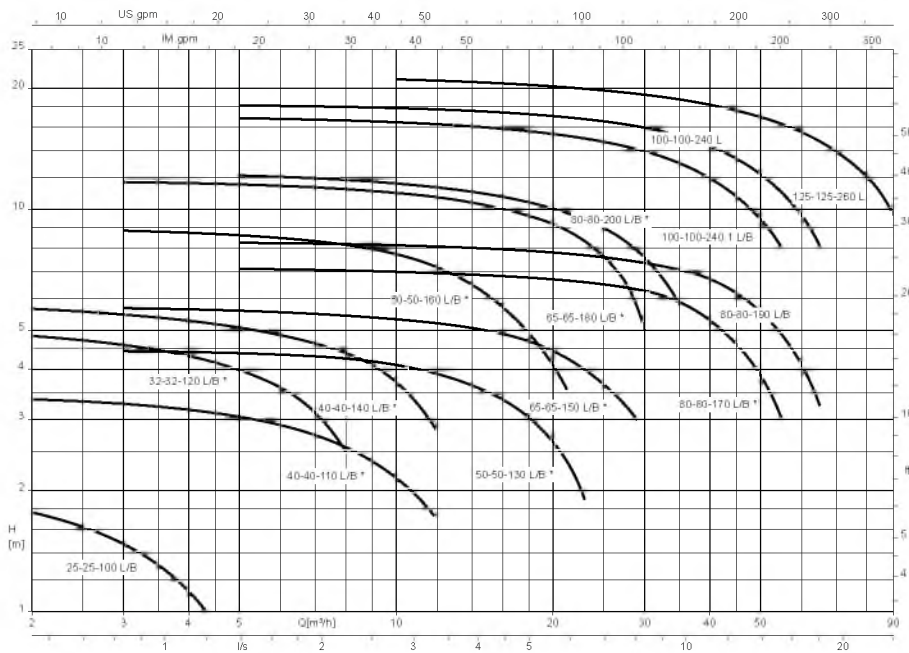
Etaprime L/B, n = 2900 rpm



* Also available in stainless steel material variant

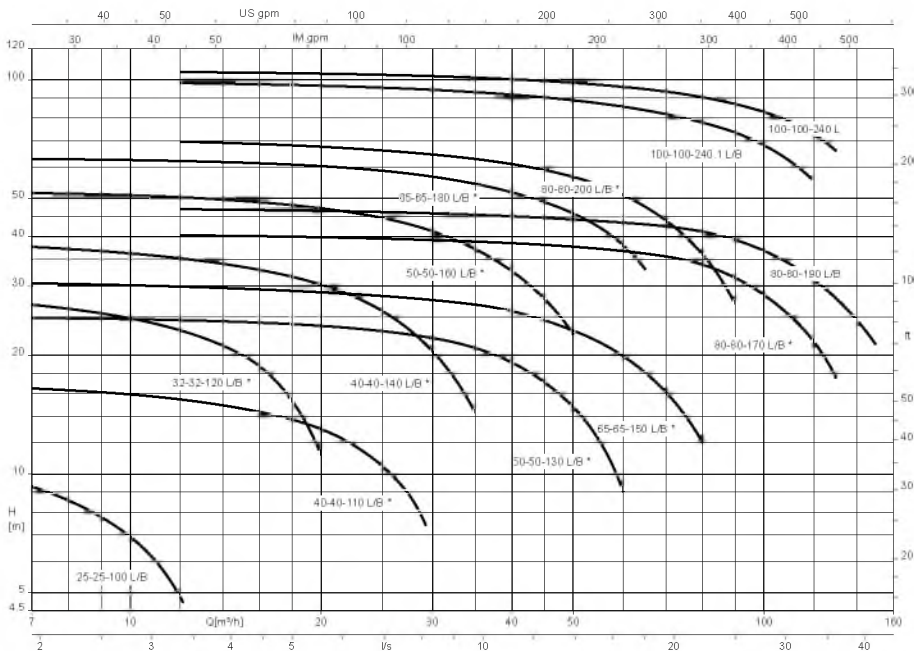
¹³⁾ FKM 80 on request

Etaprime L/B, n = 1450 rpm



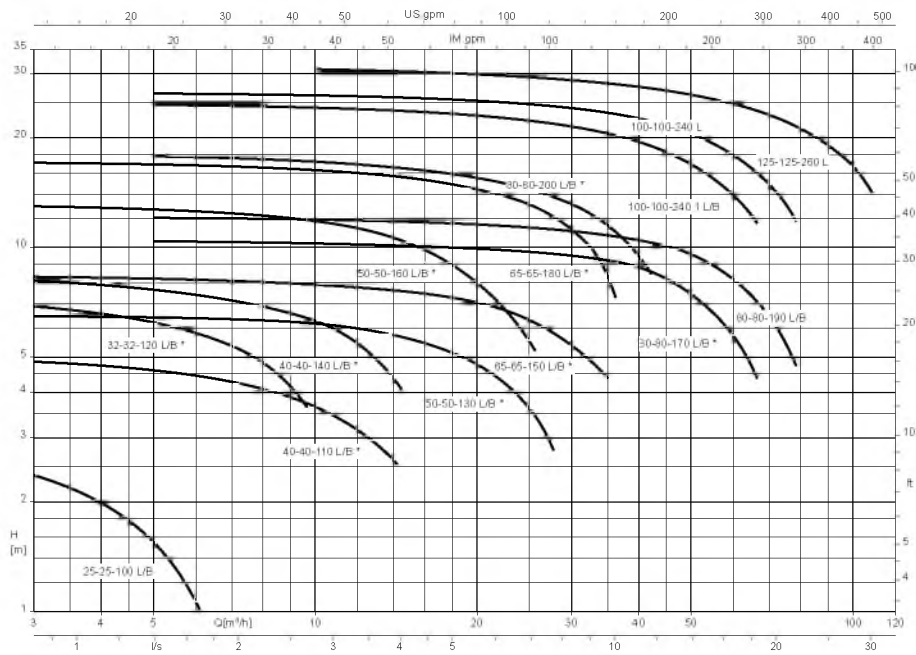
* Also available in stainless steel material variant

Etaprime L/B, n = 3500 rpm



* Also available in stainless steel material variant

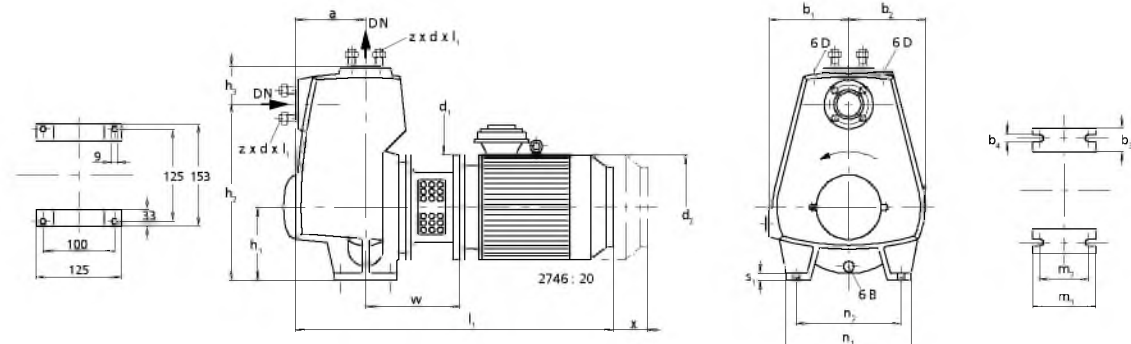
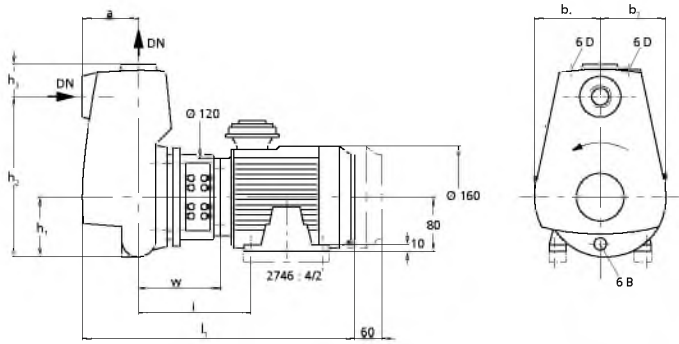
Etaprime L/B, n = 1750 rpm



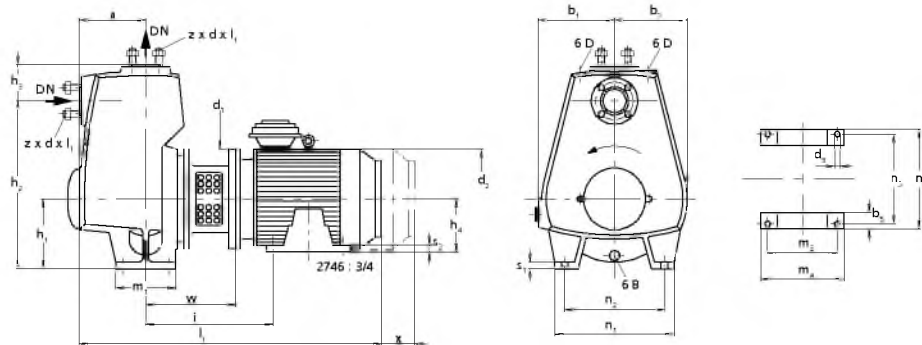
* Also available in stainless steel material variant

Dimensions and connections

Sizes 025-025-100 to 100-100-240.1



Dimensions of sizes 025-100 to 040-110, with motor foot



Dimensions of sizes 040-140 to 100-240.1, with pump foot (up to 4 kW)

Dimensions of sizes 040-140 to 100-240.1, with motor foot (for 5.5 kW and above)

6B		Fluid drain		6D		Fluid priming and venting	
Connections				Connections			
Size	6B ¹⁴⁾	6D ¹⁴⁾	Size	6B	6D ¹⁴⁾		
025-025-100	G 1/8	G 3/8	050-050-160	G 3/8	G 3/8		
032-032-120	G 1/8	G 3/8	065-065-150	G 3/8	G 3/8		
040-040-110	G 1/8	G 3/8	065-065-180	G 3/8	G 3/8		
040-040-140	G 3/8	G 3/8	080-080-170	G 1/2	G 1/2		
050-050-130	G 3/8	G 3/8	080-080-190	G 1/2	G 1/2		

14) G = ISO 228/1

Size	6B ¹⁴⁾	6D ¹⁴⁾
080-080-200	G 1/2	G 1/2

Size	6B	6D ¹⁴⁾
100-100-240.1	G 1/2	G 1/2

Flange dimensions (025-100 to 040-110)

Size	Connection	
	Standard	Optional
	DN ¹⁵⁾	DN ¹⁶⁾
025-025-100	Rp 1	NPT 1
032-032-120	Rp 1 1/4	NPT 1 1/4
040-040-110	Rp 1 1/2	NPT 1 1/2

Flange dimensions (040-140 to 100-240.1) [mm]

Flanged connection	DN	Bolt circle diameter	z	d	l ₁
Standard: <ul style="list-style-type: none"> Drilled to EN 1092-1 (material variant C) Drilled to EN 1092-2 (material variant G / GC) 	40	110	4	M16	40
	50	125	4	M16	40
	65	145	4	M16	40
	80	160	8	M16	45
	100	180	8	M16	45
Optional: <ul style="list-style-type: none"> Drilled to ASME B16.1 (material variant G / GC) Drilled to ASME B16.5 (material variant C) 	NPS 1 1/2	98,6	4	UNC 1/2-13	40
	NPS 2	120,7	4	UNC 5/8-11	40
	NPS 2 1/2	139,7	4	UNC 5/8-11	40
	NPS 3	152,4	4	UNC 5/8-11	40
	NPS 4	190,5	8	UNC 5/8-11	45

Dimensions [mm]

Size	n				P _N [kW]	DN	Pump																											
	1450	1750	2900	3500			a	b ₁	b ₂	b ₃	b ₄	b ₅	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	i ₁₇₎	l ₁₇₎	m ₁	m ₂	m ₃	m ₄	n ₁	n ₂	n ₃	n ₄	s ₁	s ₂	w ₁₇₎	x	
	[rpm]						(approx.)	(approx.)																										
025-025-100 ¹⁸⁾	X	X	-	-	0,55	25	70	104	95	-	-	-	-	-	87	227	38	-	152	441	-	-	-	-	-	-	-	-	-	-	-	-	102	-
025-025-100 ¹⁸⁾	-	-	X	X	1,10	25	70	104	95	-	-	-	-	-	87	227	38	-	152	473	-	-	-	-	-	-	-	-	-	-	-	-	102	-

14) G = ISO 228/1

15) Standard connection to ISO 7/1

16) Optional connection to ASME B1.20.1

17) Dimensions for versions with a single mechanical seal

18) On this size, the motor feet must be shimmed (30 mm).

Size	n				P _N [kW]	DN	Pump																											
	1450	1750	2900	3500			a	b ₁	b ₂	b ₃	b ₄	b ₅	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	i ₁₇₎	l ₁₇₎	m ₁	m ₂	m ₃	m ₄	n ₁	n ₂	n ₃	n ₄	s ₁	s ₂	w ₁₇₎	x	
	[rpm]						(appr ox.)																											
032-032-120 ¹⁸⁾	X	X	-	-	0,55	32	95	118	95	-	-	-	-	-	-	90	239	46	-	149	463	-	-	-	-	-	-	-	-	-	-	-	99	-
032-032-120 ¹⁸⁾	-	-	X	-	1,10	32	95	118	95	-	-	-	-	-	90	239	46	-	149	495	-	-	-	-	-	-	-	-	-	-	-	-	99	-
040-040-110 ¹⁸⁾	X	X	-	-	0,55	40	105	118	110	-	-	-	-	-	101	256	55	-	154	478	-	-	-	-	-	-	-	-	-	-	-	-	104	-
040-040-110 ¹⁸⁾	-	-	X	X	1,10	40	105	118	110	-	-	-	-	-	101	256	55	-	154	510	-	-	-	-	-	-	-	-	-	-	-	-	104	-
040-040-140	X	-	-	-	0,55	40	115	128	115	57	16	-	200	162	-	112	284	73	-	-	550	100	70	-	-	220	160	-	-	13	-	166	100	
040-040-140	-	X	-	-	1,50	40	115	128	115	57	16	-	200	190	-	112	284	73	-	-	635	100	70	-	-	220	160	-	-	13	-	166	100	
040-040-140	-	-	X	-	2,20	40	115	128	115	57	16	-	200	190	-	112	284	73	-	-	635	100	70	-	-	220	160	-	-	13	-	166	100	
040-040-140	-	-	X	-	3,00	40	115	128	115	57	16	-	250	213	-	112	284	73	-	-	685	100	70	-	-	220	160	-	-	13	-	180	100	
040-040-140	-	-	-	X	4,00	40	115	128	115	57	16	-	250	235	-	112	284	73	-	-	667	100	70	-	-	220	160	-	-	13	-	180	100	
040-040-140 ¹⁹⁾	-	-	-	X	5,50	40	115	128	115	57	16	55	300	274	12	112	284	73	132	292	731	100	70	140	220	220	160	216	270	13	12	203	100	
050-050-130	X	-	-	-	0,55	50	130	138	128	55	16	-	200	162	-	132	317	78	-	-	565	100	70	-	-	250	190	-	-	17	-	166	100	
050-050-130	-	X	-	-	1,50	50	130	138	128	55	16	-	200	190	-	132	317	78	-	-	650	100	70	-	-	250	190	-	-	17	-	166	100	
050-050-130	-	-	X	-	2,20	50	130	138	128	55	16	-	200	190	-	132	317	78	-	-	650	100	70	-	-	250	190	-	-	17	-	166	100	
050-050-130	-	-	X	-	3,00	50	130	138	128	55	16	-	250	213	-	132	317	78	-	-	700	100	70	-	-	250	190	-	-	17	-	180	100	
050-050-130	-	-	-	X	4,00	50	130	138	128	55	16	-	250	235	-	132	317	78	-	-	682	100	70	-	-	250	190	-	-	17	-	180	100	
050-050-130 ²⁰⁾	-	-	-	X	5,50	50	130	138	128	55	16	55	300	274	12	132	317	78	132	292	746	100	70	140	220	250	190	216	270	17	12	203	100	
050-050-160	X	-	-	-	0,55	50	130	145	126	55	16	-	200	162	-	132	327	75	-	-	565	100	70	-	-	250	190	-	-	17	-	166	100	
050-050-160	-	X	-	-	1,50	50	130	145	126	55	16	-	200	190	-	132	327	75	-	-	650	100	70	-	-	250	190	-	-	17	-	166	100	
050-050-160	-	-	X	-	4,00	50	130	145	126	55	16	-	250	235	-	132	327	75	-	-	682	100	70	-	-	250	190	-	-	17	-	180	100	
050-050-160 ²⁰⁾	-	-	X	X	5,50	50	130	145	126	55	16	55	300	274	12	132	327	75	132	292	746	100	70	140	220	250	190	216	270	17	12	203	100	
050-050-160 ²⁰⁾	-	-	-	X	7,50	50	130	145	126	55	16	55	300	274	12	132	327	75	132	292	790	100	70	140	220	250	190	216	270	17	12	203	100	
065-065-150	X	-	-	-	0,55	65	140	155	149	55	16	-	200	162	-	160	370	85	-	-	575	125	95	-	-	270	212	-	-	20	-	166	100	
065-065-150	-	X	-	-	1,50	65	140	155	149	55	16	-	200	190	-	160	370	85	-	-	660	125	95	-	-	270	212	-	-	20	-	166	100	
065-065-150	-	-	X	-	4,00	65	140	155	149	55	16	-	250	235	-	160	370	85	-	-	692	125	95	-	-	270	212	-	-	20	-	180	100	
065-065-150 ¹⁹⁾²⁰⁾	-	-	X	X	5,50	65	140	155	149	55	16	55	300	274	12	160	370	85	132	292	756	125	95	140	220	270	212	216	270	20	12	203	100	
065-065-150 ¹⁹⁾²⁰⁾	-	-	-	X	7,50	65	140	155	149	55	16	55	300	274	12	160	370	85	132	292	800	125	95	140	220	270	212	216	270	20	12	203	100	
065-065-180	X	X	-	-	2,20	65	140	158	138	55	16	-	250	213	-	160	376	89	-	-	740	125	95	-	-	270	212	-	-	18	-	210	140	

17) Dimensions for versions with a single mechanical seal
 19) On this size, the motor feet (h₁>h₄) or pump feet (h₁<h₄) must be shimmed.
 20) h₁ ≥ h₄

Size	n				P _N [kW]	DN	Pump																										
	1450	1750	2900	3500			a	b ₁	b ₂	b ₃	b ₄	b ₅	d ₁	d ₂	d ₃	h ₁	h ₂	h ₃	h ₄	i ₁₇₎	l ₁₇₎	m ₁	m ₂	m ₃	m ₄	n ₁	n ₂	n ₃	n ₄	s ₁	s ₂	w ₁₇₎	x
	[rpm]						(approx.)																										
065-065-180 ¹⁹⁾²⁰⁾	-	-	✗	-	5,50	65	140	158	138	55	16	55	300	274	12	160	376	89	132	322	786	125	95	140	220	270	212	216	270	18	12	233	140
065-065-180 ¹⁹⁾²⁰⁾	-	-	✗	-	7,50	65	140	158	138	55	16	55	300	274	12	160	376	89	132	322	830	125	95	140	220	270	212	216	270	18	12	233	140
065-065-180 ²⁰⁾	-	-	-	✗	11,00	65	140	158	138	55	16	70	350	325	15	160	376	89	160	374	952	125	95	210	310	270	212	254	323	18	15	266	140
080-080-170	✗	✗	-	-	2,20	80	156	173	168	65	18	-	250	213	-	160	380	104	-	-	756	140	106	-	-	310	240	-	-	18	-	210	140
080-080-170 ¹⁹⁾²⁰⁾	-	-	✗	-	7,50	80	156	173	168	65	18	55	300	274	12	160	380	104	132	322	846	140	106	140	220	310	240	216	270	18	12	233	140
080-080-170 ²⁰⁾	-	-	-	✗	15,00	80	156	173	168	65	18	70	350	325	15	160	380	104	160	374	968	140	106	210	310	310	240	254	323	18	15	266	140
080-080-190	✗	✗	-	-	2,20	80	170	188	181	65	20	-	250	213	-	180	420	107	-	-	770	160	120	-	-	345	280	-	-	22	-	210	140
080-080-190 ¹⁹⁾²⁰⁾	-	-	-	✗	11,00	80	170	188	181	65	20	70	350	325	15	180	420	107	160	374	982	160	120	210	310	345	280	254	323	22	15	266	140
080-080-190 ¹⁹⁾²⁰⁾	-	-	-	✗	18,50	80	170	188	181	65	20	70	350	325	15	180	420	107	160	374	1018	160	120	254	314	345	280	254	323	22	15	266	140
080-080-200	✗	✗	-	-	2,20	80	154	172	152	65	20	-	250	213	-	160	378	107	-	-	754	140	100	-	-	285	220	-	-	22	-	210	140
080-080-200 ²⁰⁾	-	-	✗	-	11,00	80	154	172	152	65	20	70	350	325	15	160	378	107	160	374	966	140	100	210	310	285	220	254	323	22	15	266	140
080-080-200 ²⁰⁾	-	-	-	✗	15,00	80	154	172	152	65	20	70	350	325	15	160	378	107	160	374	966	140	100	210	310	285	220	254	323	22	15	266	140
100-100-240.1	✗	-	-	-	2,20	100	182	203	178	68	20	-	250	213	-	200	457	127	-	-	771	140	100	-	-	330	260	-	-	18	-	199	140
100-100-240.1	✗	✗	-	-	3,00	100	182	203	178	68	20	-	250	213	-	200	457	127	-	-	771	140	100	-	-	330	260	-	-	18	-	199	140
100-100-240.1	-	✗	-	-	4,00	100	182	203	178	68	20	-	250	235	-	200	457	127	-	-	753	140	100	-	-	330	260	-	-	18	-	199	140
100-100-240.1 ¹⁹⁾²⁰⁾	-	-	✗	-	18,50	100	182	203	178	68	20	70	350	325	15	200	457	127	160	363	1019	140	100	254	314	330	260	254	323	18	15	255	140
100-100-240.1 ²⁰⁾	-	-	-	✗	30,00	100	182	203	178	68	20	85	400	422	19	200	457	127	200	388	1106	140	100	305	388	330	260	318	404	18	19	255	140

17) Dimensions for versions with a single mechanical seal

Flange connections

Threaded connections, shaft unit 17

Size	Shaft unit	Material variant			
		G/G/C			
		Connection pipe thread to			
		ISO 7-1 PN10		ASME B1.20.1 PN10	
025-025-100	17	Rp 1	X	NPT 1	o
032-032-120		Rp 1 1/4	X	NPT 1 1/4	o
040-040-110		Rp 1 1/2	X	NPT 1 1/2	o

Flange connections²¹⁾ shaft unit 25, 35

Size	Shaft unit	Nominal diameter to		Material variant			
				G/GC		C	
				Flange dimensions to			
		EN 1092-2		EN 1092-1			
		Drilled to				EN 1092-2 PN16	ASME B16.1 CL125	EN 1092-1 PN16	ASME B16.5 CL150
040-040-110	25	DN 40	NPS 1 1/2	X	o	X	o
050-050-130		DN 50	NPS 2	X	o	X	o
050-050-160		DN 50	NPS 2	X	o	X	o
065-065-150		DN 65	NPS 2 1/2	X	o	X	o
065-065-180	35	DN 65	NPS 2 1/2	X	o	X	o
080-080-170		DN 80	NPS 3	X	o	X	o
080-080-190		DN 80	NPS 3	X	o	-	-
080-080-200		DN 80	NPS 3	X	o	X	o
100-100-240.1		DN 100	NPS 4	X	o	-	-

Symbols key

Symbol	Description
X	Standard
o	Option

²¹⁾ Type RF (Raised Face)

Interchangeability of Etaprime B and Etaprime L pump components

Components featuring the same number in a column are interchangeable.

Interchangeability of Etaprime B and Etaprime L pump components and interchangeability of components among each other

Size	Shaft unit	Description					
		Volute casing	Casing cover	Shaft	Impeller	Mechanical seal	Shaft sleeve
		Part No.					
		102	161	210	230	433	523
025-025-100	17	○*	✗	1	○*	1*	✗
032-032-120		○*	✗	1	○*	1*	✗
040-040-110		○*	✗	1	○*	1*	✗
040-040-140	25	○*	○*	2	○*	2*	1*
050-050-130		○*	○*	2	○*	2*	1*
050-050-160		○*	1*	2	○*	2*	1*
065-065-150		○*	1*	2	○*	2*	1*
065-065-180	35	○*	○*	3	○*	3*	2*
080-080-170		○*	○*	3	○*	3*	2*
080-080-190		○*	○*	3	○*	3*	2*
080-080-200		○*	○*	3	○*	3*	2*
100-100-240.1		○*	○*	3	○*	3*	2*

Symbols key

Symbol	Description
*	Component interchangeable with Etaprime L
○	Components differ
✗	Component not fitted

- Pump

Drive

- Surface-cooled IEC frame three-phase squirrel-cage motor

Contact guard

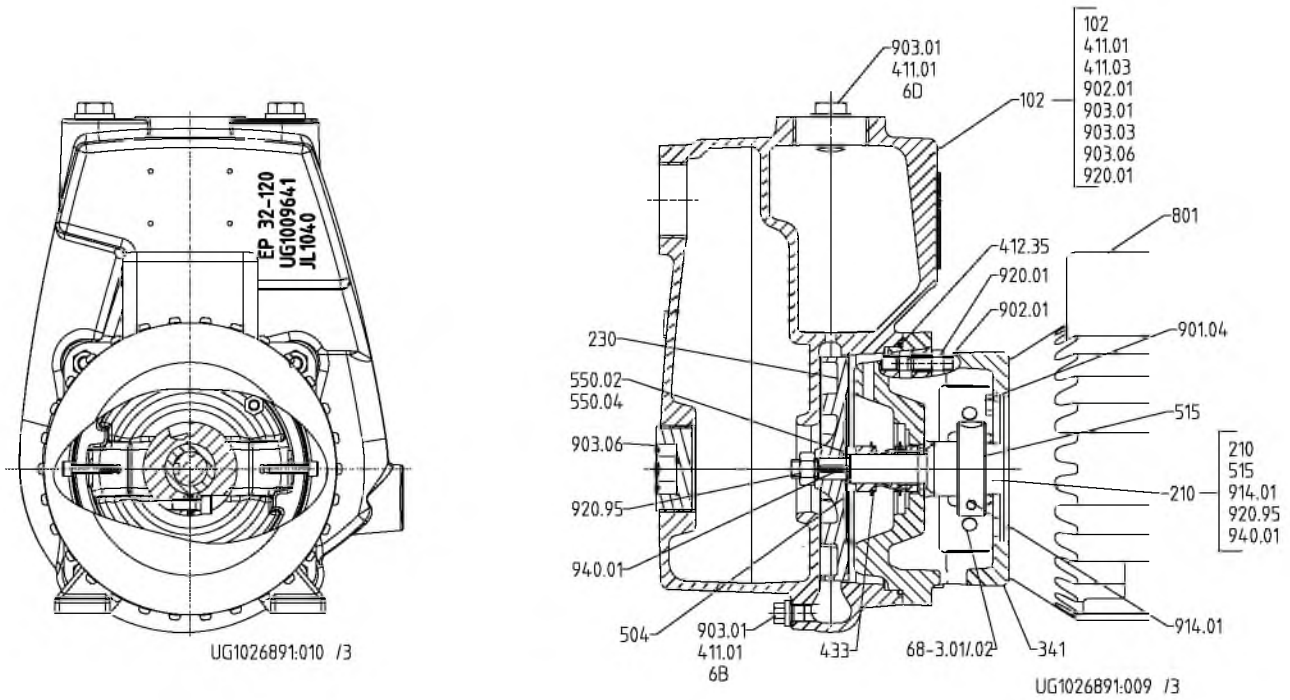
- Cover plates on drive lantern to EN 294

Scope of supply

Depending on the model, the following items are included in the scope of supply:

Sectional drawing and list of components

Etaprime B and C with threaded connection (SU 17)

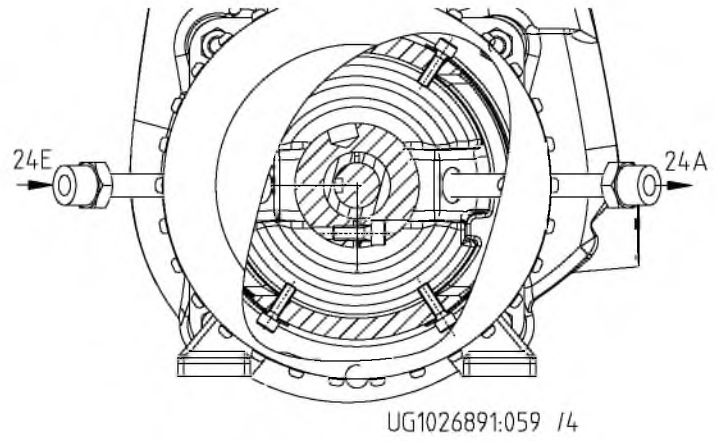
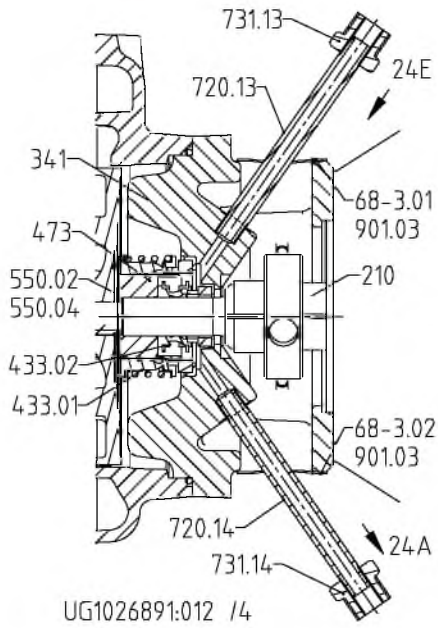


Model with single mechanical seal

[Supplied in packaging units only

List of components

Part No.	Description	Part No.	Description
102	Volute casing	801	Flanged motor
210	Shaft	901.04	Hexagon head bolt
230	Impeller	902.01	Stud
341	Drive lantern	903.01/03/06	Screw plug
4.11.01/03	Joint ring	914.01	Hexagon socket head cap screw
4.12.35	O-ring	920.01/95	Nut
433	Mechanical seal	940.01	Key
504	Spacer ring		
515	Locking ring	Auxiliary connections	
550.02/04	Disc	6 B	Fluid drain
68-3.01/02	Cover plate	6 D	Fluid priming and venting

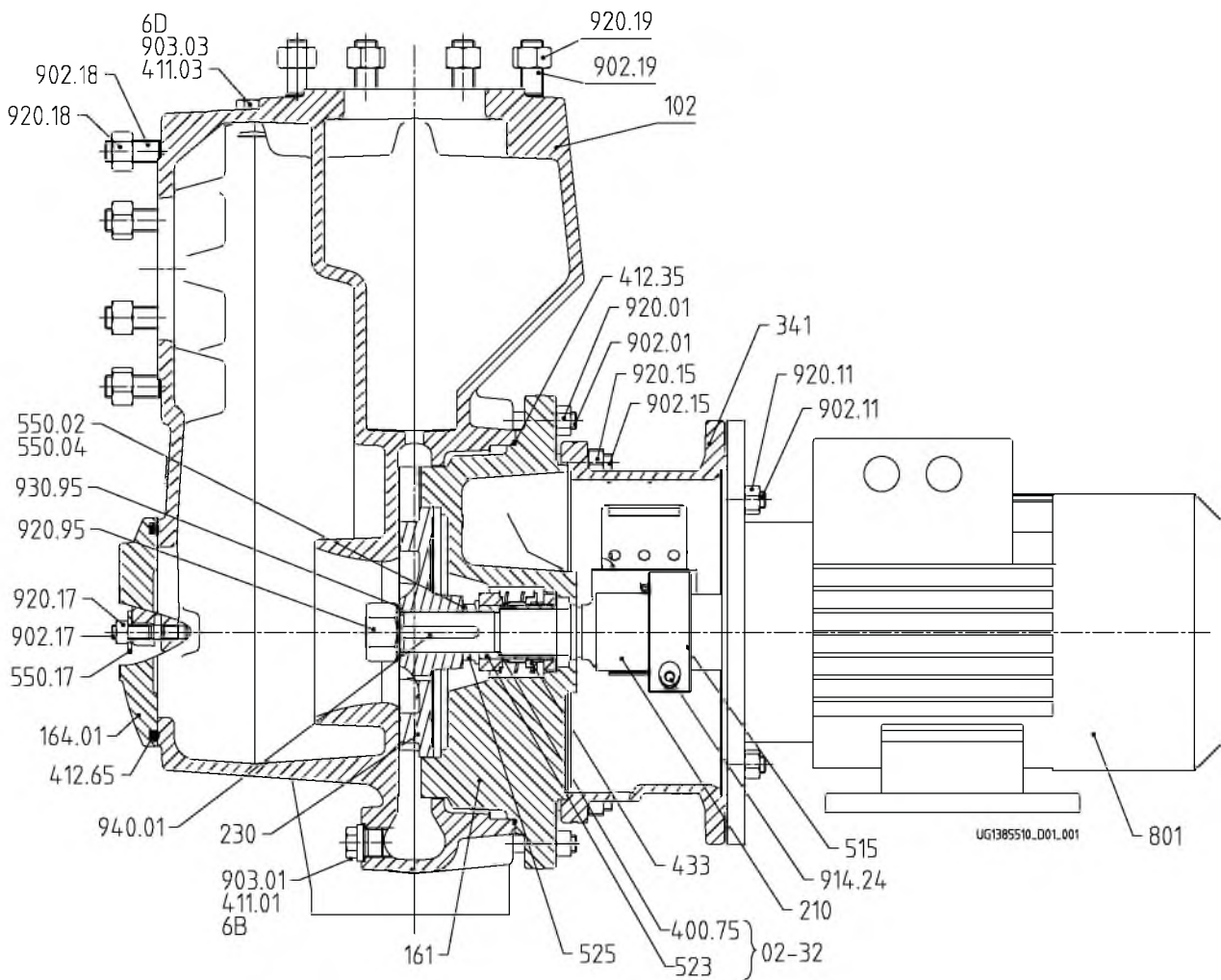


Variant with double mechanical seal in tandem arrangement

List of components

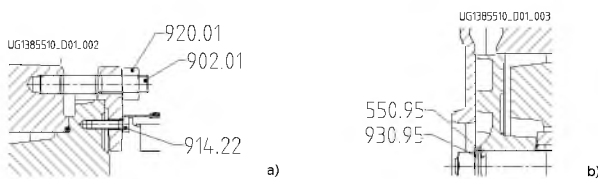
Part No.	Description	Part No.	Description
210	Shaft	720.13/.14	Fitting
341	Drive lantern	731.13/.14	Reducing nipple
433.01	Mechanical seal (inboard)	901.03	Hexagon head bolt
433.02	Mechanical seal (outboard)		
473	Primary ring carrier	Auxiliary connections	
550.02/.04	Disc	24 A	Quench liquid outlet
68-3.01/.02	Cover plate	24 E	Quench liquid inlet

Etaprime G and C with flanged connection (SU 25 and SU 35)



Model with single mechanical seal

[Supplied in packaging units only



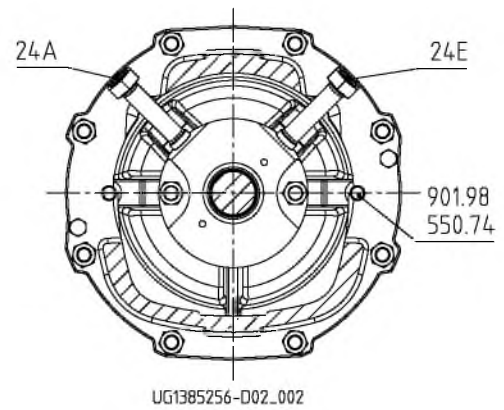
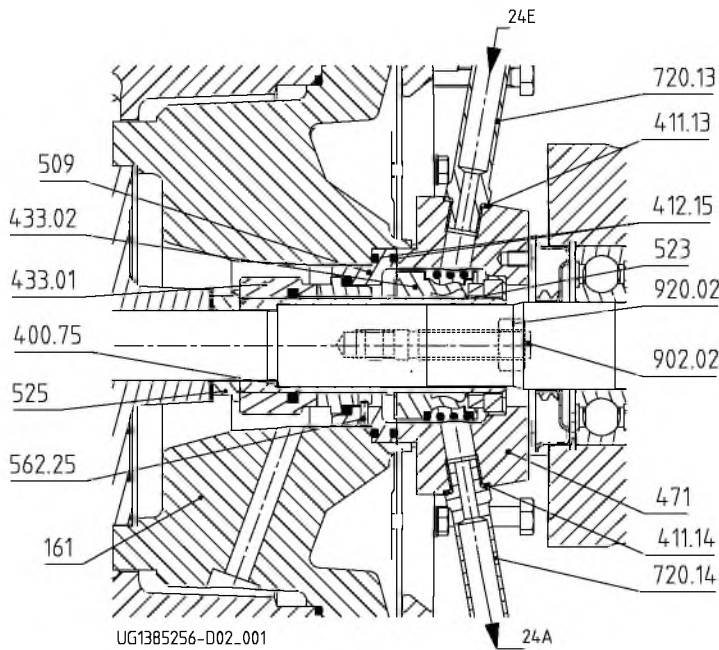
a) Clamped casing cover, b) impeller fastening elements for shaft unit 25

List of components

Part No.	Description	Part No.	Description
102	Volute casing	550.95 ²²⁾	Disc
161	Casing cover	68-3.01/02	Cover plate
164.01	Inspection cover	801	Flanged motor
210	Shaft	902.01/.11/.15/.17/.18/.19	Stud
230	Impeller	903.01/.03	Screw plug
341	Drive lantern	914.22/.24	Hexagon socket head cap screw
400.75	Gasket	920.01/.05/.11/.15/.17/.18/.19/.95	Nut
411.01/.03	Joint ring	930.95	Safety device

22) For shaft unit 25 only; shaft unit see data sheet.

Part No.	Description	Part No.	Description
412.35/.65	O-ring	940.01	Key
433	Mechanical seal		
515	Locking ring	Auxiliary connections	
523	Shaft sleeve	6 B	Fluid drain
525 ²³⁾	Spacer sleeve	6 D	Fluid priming and venting
550.02/.04/.17	Disc		

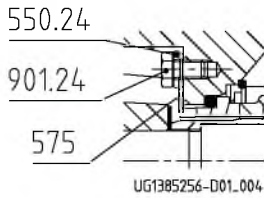
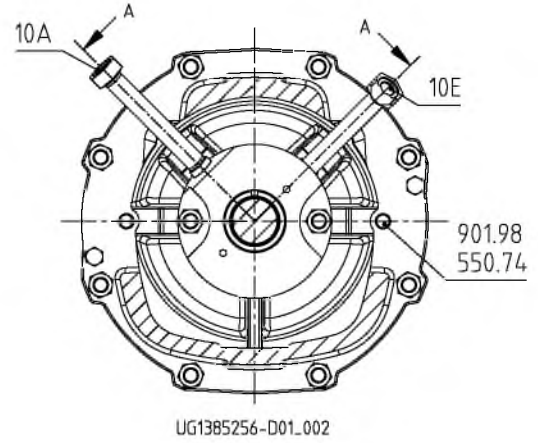
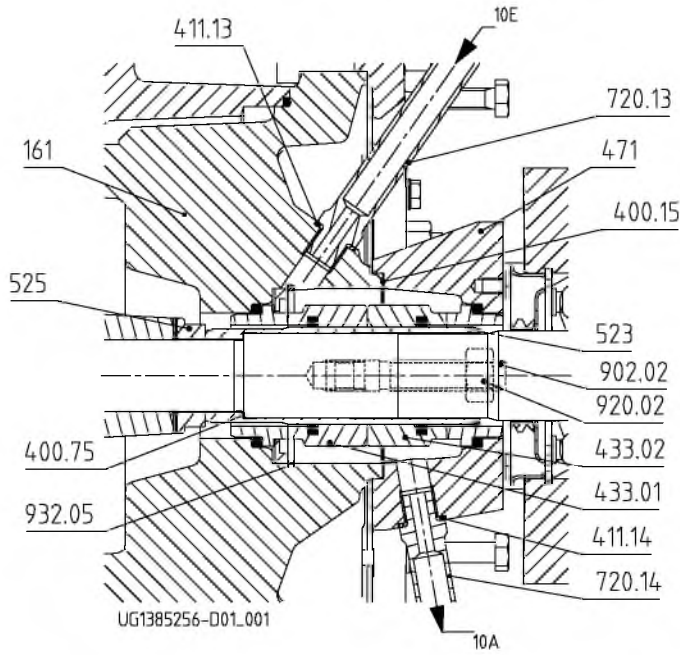


Variant with double mechanical seal in tandem arrangement

Part No.	Description	Part No.	Description
161	Casing cover	525 ²⁴⁾	Spacer sleeve
400.75	Gasket	562.25	Parallel pin
411.13/.14	Joint ring	720.13/.14	Fitting
412.15	O-ring	902.02	Stud
433.01	Mechanical seal (inboard)	920.02	Nut
433.02	Mechanical seal (outboard)		
471	Seal cover	Auxiliary connections	
509	Intermediate ring	24 A	Quench liquid outlet
523	Shaft sleeve	24 E	Quench liquid inlet

²³⁾ For shaft unit 35 only; shaft unit see data sheet.

²⁴⁾ For shaft unit 35 only; shaft unit see data sheet.



Variant with double mechanical seal in back-to-back arrangement

Part No.	Description	Part No.	Description
161	Casing cover	720.13/.14	Fitting
400.15 ²⁵⁾ /.75	Gasket	901.24	Hexagon head bolt
411.13/.14	Joint ring	902.02	Stud
433.01	Mechanical seal (inboard)	920.02	Nut
433.02	Mechanical seal (outboard)	932.05	Circlip
471	Seal cover		
523	Shaft sleeve	Auxiliary connections	
525 ²⁶⁾	Spacer sleeve	10 A	Barrier fluid outlet
550.24	Disc	10 E	Barrier fluid inlet
575	Lug		

²⁵⁾ Only for shaft unit 25 joint ring 411.15

²⁶⁾ For shaft unit 35 only; shaft unit see data sheet.

Detailed designation

Designation example

Position																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
E	T	P	B	0	8	0	-	0	8	0	-	2	0	0		G	C	X	I	1	0	D	3	0	1	8	5	2			B
See name plate and data sheet																						See data sheet									

Designation key

Position	Code	Description
1-4	Pump type	
	ETPB	Etaprime bloc
5-16	Size	
	080	Nominal suction nozzle diameter [mm]
	080	Nominal discharge nozzle diameter [mm]
	200	Nominal impeller diameter [mm]
17	Pump casing material	
	G	Cast iron
	C	Stainless steel
18	Impeller material if different from casing material	
	G	Cast iron
	C	Stainless steel
19	Special design	
	₂₇₎	Standard
	X	Special design
20	Seal options	
	I	Single mechanical seal
	D	Double mechanical seal in back-to-back arrangement
	T	Double mechanical seal in tandem arrangement
21-22	Seal code	
	01	Q1Q1VGG
	08	AQ1VGG ²⁸⁾
	09	U3U3VGG
	10	Q1Q1X4GG
	11	BQ1EGG
23	Scope of supply	
	D	Pump with motor
24	Shaft unit	
	1	Shaft unit 17
	2	Shaft unit 25
	3	Shaft unit 35
25-28	Motor rating	
	0011	1.1 kW
	0075	7.5 kW
	0185	18.5 kW
29	Number of poles	
	2	2 poles
	4	4 poles
30-31	Explosion protection	
	₂₇₎	Without explosion-proof motor
	ex	Explosion-proof motor
32	Product generation	
	B	Product generation Global Etaprime

²⁷⁾ Blank

²⁸⁾ BQVGG for shaft unit 17

Self-priming Pump

Etaprime L

Type Series Booklet



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Self-priming Pump

Volute Casing Pumps

Etaprime L



Main applications

- Spray irrigation systems
- Service water supply systems
- Drainage
- Drainage systems
- Fire-fighting systems
- Lowering groundwater levels
- Domestic water supply
- Air-conditioning systems
- Cooling circuits
- Swimming pools
- Water supply systems

Fluids handled

- Drinking water
- Swimming pool water (0.4 to 1.4 mg/l free chlorine, max. 0.6 mg/l combined chlorine, pH value 6.9 to 7.7, water hardness 10 to 30 °dH, max. salt content 7 g/l)
- Fire-fighting water
- Seawater
- River, lake and groundwater
- Brackish water
- Condensate
- Brine
- Oil
- Service water

- Cleaning agents
- Cooling water

Operating data

Operating properties

Characteristic	Value	
	50 Hz	60 Hz
Flow rate	Q [m³/h]	≤ 180
	Q [l/s]	≤ 50
Head	H [m]	≤ 85
Fluid temperature	T [°C]	-30 to +90
Operating pressure	p [bar]	≤ 10
Static suction lift	H _{Geo} [m]	≤ 9

Designation

Example: ETPL080-080-200 GCXI10D3

Designation key

Code	Description	
ETPL	Type series	
	ETPL | Etaprime L	
080	Nominal suction nozzle diameter [mm]	
080	Nominal discharge nozzle diameter [mm]	
200	Nominal impeller diameter [mm]	
G	Casing material	
	C	Stainless steel
	G	Grey cast iron
C	Impeller material if different from casing material	
	C	Stainless steel
	G	Grey cast iron
X	Design	
	-	Standard
	X	Special design
I	Sealing system	
	I	Single mechanical seal
	D	Double mechanical seal in back-to-back arrangement
	T	Double mechanical seal in tandem arrangement
10	Seal code	
	01	Q1Q1VGG
	08	AQ1VGG ¹⁾
	09	U3U3VGG
	10	Q1Q1X4GG
	11	BQ1EGG
D	Scope of supply	
	A	Pump (without motor)
	B	Pump with baseplate
	C	Pump with baseplate, coupling and coupling guard
	D	Pump with baseplate, coupling, coupling guard and motor
3	Shaft unit	
	1	SU 17
	2	SU 25
	3	SU 35

1) BQVGG for shaft unit 17

Further information on the designation

(⇒ Page 28)

Design details

Design

- Volute casing pump
- Back pull-out design (from size 40-40-140)
- Horizontal installation
- Self-priming
- Single-stage
- Single-entry

Pump casing

- Radially split volute casing
- Volute casing with integrally cast pump feet (from pump size 40-40-140)

Impeller type

- Open multi-channel impeller

Bearings

- Floating bearings: deep groove ball bearings

Shaft seal

- The shaft is fitted with a replaceable shaft sleeve in the shaft seal area (from pump size 40-40-140).
- Single and double mechanical seals to EN 12756

Bearings used

Standard bearings

Version	Bearing bracket	Rolling element bearing	
		Pump end	Drive end
Standard bearings (grease lubrication)	SU 17	3203 C3	6203 2RS
	SU 25	6305 2Z C3	6305 2Z C3
	SU 35	6307 2Z C3	6307 2Z C3
Standard bearings (oil lubrication)	SU 17	-	-
	SU 25	6305 C3	6305 C3
	SU 35	6307 C3	6307 C3

Lubrication:

- Grease lubrication
- Oil lubrication

Drive


- KSB IEC frame standardised IE3 motor (from 0.75 kW)
- 230/400 V up to 2.2 kW and 400/690 V from 3 kW
- 60 Hz winding, 440 - 480 V
- Type of construction B3
- IP55 enclosure
- Thermal class F with temperature sensor, 3 PTC thermistors
- Mode of operation: continuous operation S1

Product benefits

- Maintenance-free mechanical seal ensures operating reliability
- Easy to dismantle due to back pull-out design; no need to remove the pump casing from the piping
- Good suction performance, self-priming up to 9 m suction lift, also suitable for applications with relatively poor inlet conditions (i.e. low or negative inlet pressure) and for handling fluids with entrained gas.
- Optimised hydraulic components for high efficiency help reduce energy consumption

Certifications

Overview

Label	Effective in:	Note
	All countries	Certified quality management to ISO 9001

Overview of fluids handled

Table of fluids handled and associated material combinations
X ≈ standard

Fluid handled	Temperature [°C]	Materials			Shaft seal							Mechanical seal design code	Comments
		Casing / impeller			Mechanical seal								
		Grey cast iron/grey cast iron	Grey cast iron/ Cr-Ni-Mo cast steel	CrNiMo cast steel/ CrNiMo cast steel	Q1Q1VGG	AQ1VGG ²⁾	BQVGG ³⁾	U3U3VGG	Q1Q1X4GG	BQ1EGG ²⁾	Q12Q1M1GG		
G	GC	C	01	8	9	10	11	70 ⁴⁾					
Water													
Industrial waste water													Analysis of the fluid handled required
Ammonia water (ammonia solution)	≤ 40; conc. ≤ 10 %	X							X				Tandem seal Q1Q1EGG required. Quench liquid: used suitable water.
Brackish water	≤ 25			X				X			10		
Fire-fighting water ⁵⁾	≤ 60		X					X			10		
Condensate ²⁾	≤ 90	X							X		11		
Condensate, not conditioned	≤ 90			X					X		11		
Cooling water (without antifreeze) ⁵⁾	≤ 60	X						X			10		Open circuit: CL 10 required
Cooling water pH ≥ 7.5 (with antifreeze) ⁵⁾⁶⁾	≥ -30 p ≤ 10 bar ≤ 90	X							X		11		Open circuit: CL 11 required
Slightly contaminated water ⁵⁾	≤ 60	X						X			10		
Seawater	≤ 25			X				X			10		
Surface water ⁵⁾	≤ 40	X				X					8		Analysis of the fluids handled required
Pure water ⁷⁾	≤ 60	X							X		11		
Untreated water ⁵⁾	≤ 60	X						X			10		
Swimming pool water (fresh water) ⁵⁾	≤ 60	X						X			10		Also applies to requirements as per DIN 19643
Dam water ⁵⁾	≤ 60	X						X			10		If solids are contained, contact KSB.
Drinking water	≤ 60			X							11		
Partly desalinated water ²⁾	≤ 90	X							X		11		
Fully desalinated water	≤ 90			X					X		11		Requirements for ultra-pure water cannot be met.
Fully desalinated water as boiler feed water ²⁾	≤ 90	X							X		11		
Refrigerants, cooling brines													
Cooling brine; inorganic, pH value > 7.5, inhibited	≥ -30 ≤ 25	X							X		11		
Water with antifreeze, pH value > 7.5 ⁵⁾⁶⁾	≥ -30 ≤ 90	X							X		11		
Oils/emulsions													
Drilling/grinding emulsion	≤ 60	X						X			9		
Oil-water emulsion	≤ 60	X						X			9		
Cleaning agents													
Lyes for bottle rinsers ⁸⁾	≤ 90	X								X	10		EPDM only if oil-free

2) Treatment to VdTÜV 1466; additional requirement: O2 ≤ 0.02 mg/l

3) Only applies to shaft unit 17.

4) Special mechanical seal design

5) General criteria for results of water analysis: pH value ≥ 7; chloride content (Cl) ≤ 250 mg/kg. Chlorine (Cl2) ≤ 0.6 mg/kg.

6) Antifreeze on ethylene glycol basis with inhibitors. Content: 20 % to 50 % (e.g. Antifrogen N)

7) No ultra-pure water! Conductivity at 25 °C: ≤ 800 μS/cm

Fluid handled	Temperature	Materials			Shaft seal						Mechanical seal design code	Comments	
		Casing / impeller			Mechanical seal								
		Grey cast iron/grey cast iron	Grey cast iron/ Cr-Ni-Mo cast steel	CrNiMo cast steel/ CrNiMo cast steel	Q1Q1VGG	AQ1VGG ²⁾ BQVGG ³⁾	U3U3VGG	Q1Q1X4GG	BQ1EGG ²⁾	Q12Q1M1GG			
													Design code
[°C]	G	GC	C	01	8	9	10	11	70 ⁴⁾				
Acids													
Acetic acid	≤ 60; conc. ≤ 5 % ≤ 60; conc. ≤ 10 %			X					X			11	
Alum, potassium aluminium sulphate up to 3 %	≤ 80			X	X							01	

Overview of type series

Available sizes and designs

Size	Shaft unit	Etaprime L		Etaprime B	
		G	GC, C	G	GC, C
032-032-100	17	S / T	-	S / T	-
032-032-120	17	S / T	S / T	S / T	S / T
040-040-110	17	S / T	S / T	S / T	S / T
040-040-140	25	S / T / B	S / T / B	S / T / B	S / T / B
050-050-130	25	S / T / B	S / T / B	S / T / B	S / T / B
050-050-160	25	S / T / B	S / T / B	S / T / B	S / T / B
065-065-150	25	S / T / B	S / T / B	S / T / B	S / T / B
065-065-180	35	S / T / B	S / T / B	S / T / B	S / T / B
080-080-170	35	S / T / B	S / T / B	S / T / B	S / T / B
080-080-190	35	S / T / B	-	S / T / B	-
080-080-200	35	S / T / B	S / T / B	S / T / B	S / T / B
100-100-240.1	35	S / T / B	-	S / T / B	-
100-100-240	35	S / T / B	-	-	-
125-125-260	35	S / T / B	-	-	-

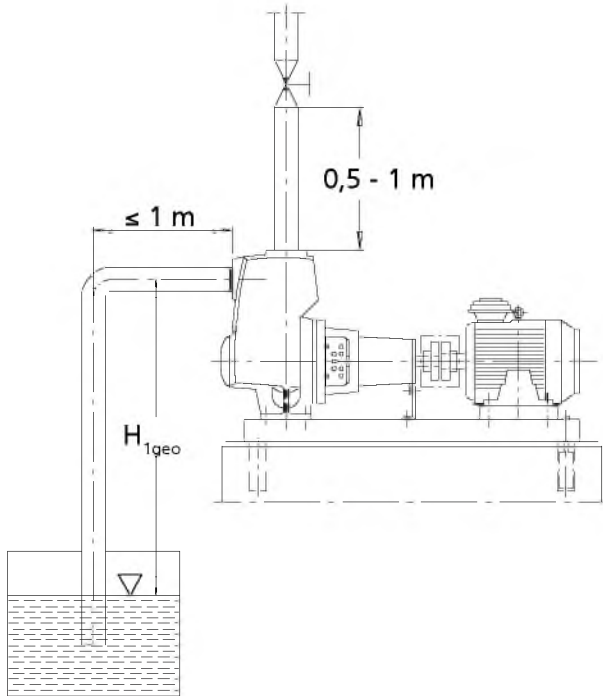
- E = Single mechanical seal (standard design)
- T = Available with double mechanical seal in tandem arrangement
- B = Available with double mechanical seal in back-to-back arrangement
- = Size not available

Priming time

For a 1-metre horizontal length of the suction line and DN suction line = DN pump, the priming times are as follows.

When handling gaseous fluids, fluids which tend to froth or water with a temperature $T > 60\text{ °C}$, the pump will not be self-priming. In such cases, a check valve must be installed in the suction line.

- 2) Treatment to VdTÜV 1466; additional requirement: $O_2 \leq 0.02\text{ mg/l}$
- 3) Only applies to shaft unit 17.
- 4) Special mechanical seal design
- 8) With 2 % sodium hydroxide



Distances of suction line and discharge line

Size ⁹⁾	Shaft unit	Priming time [sec] at a speed $n = 2900$ rpm at a static suction lift $H_{1\text{geo}}$ of ... m					
		2 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	40	145	415	-	-	-
032-032-120		30	90	135	190	255	360
040-040-110		60	100	215	420	-	-
040-040-140	25	30	70	125	220	355	600
050-050-130		50	120	195	260	345	440
050-050-160		30	70	105	170	265	430
065-065-150	35	60	120	165	260	375	570
065-065-180		30	50	75	100	145	200
080-080-170		50	100	135	180	225	310
080-080-190		40	70	105	160	185	240
080-080-200		30	50	75	105	155	200
100-100-240.1		30	70	95	120	150	190
100-100-240		35	70	85	110	160	-
125-125-260	35	80	105	130	160	190	

Size ⁹⁾	Shaft unit	Priming time [sec] at a speed $n = 3500$ rpm at a static suction lift $H_{1\text{geo}}$ of ... m					
		2 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	30	85	135	-	-	-
032-032-120		20	60	105	140	175	250
040-040-110		30	85	125	200	265	470
040-040-140	25	25	50	85	120	145	230
050-050-130		30	90	140	190	245	300
050-050-160		25	55	75	150	215	280
065-065-150	40	80	125	170	225	370	

Size ⁹⁾	Shaft unit	Priming time [sec] at a speed $n = 3500$ rpm at a static suction lift $H_{1\text{geo}}$ of ... m					
		2 m	4 m	5 m	6 m	7 m	8 m
065-065-180	35	20	40	65	90	105	150
080-080-170		30	80	105	130	165	220
080-080-190		30	55	75	100	125	160
080-080-200		25	40	55	80	125	160
100-100-240.1		25	60	85	115	145	180
100-100-240		25	70	85	100	155	360

Size ⁹⁾	Shaft unit	Priming time [sec] at a speed $n = 1450$ rpm at a static suction lift $H_{1\text{geo}}$ of ... m							
		1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	130	-	-	-	-	-	-	-
032-032-120		100	210	-	-	-	-	-	-
040-040-110		120	-	-	-	-	-	-	-
040-040-140	25	130	-	-	-	-	-	-	-
050-050-130		210	410	-	-	-	-	-	-
050-050-160		210	430	-	-	-	-	-	-
065-065-150	35	190	350	540	-	-	-	-	-
065-065-180		90	140	220	370	-	-	-	-
080-080-170		110	180	280	480	-	-	-	-
080-080-190		100	110	200	310	-	-	-	-
080-080-200		70	110	190	270	320	420	-	-
100-100-240.1		130	150	220	300	440	-	-	-
100-100-240		110	160	270	480	-	-	-	-
125-125-260	60	70	110	160	200	330	430	610	

Size ⁹⁾	Shaft unit	Priming time [sec] at a speed $n = 1750$ rpm at a static suction lift $H_{1\text{geo}}$ of ... m							
		1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m
025-025-100	17	70	170	-	-	-	-	-	-
032-032-120		80	150	260	-	-	-	-	-
040-040-110		90	180	-	-	-	-	-	-
040-040-140	25	80	150	200	-	-	-	-	-
050-050-130		130	240	380	-	-	-	-	-
050-050-160		130	260	480	-	-	-	-	-
065-065-150	35	140	260	350	430	-	-	-	-
065-065-180		80	110	170	220	330	-	-	-
080-080-170		90	130	200	320	480	-	-	-
080-080-190		80	100	130	160	210	390	-	-
080-080-200		60	100	160	230	280	350	-	-
100-100-240.1		90	110	140	210	260	400	-	-
100-100-240		80	100	140	200	300	-	-	-
125-125-260	50	60	80	115	170	220	300	400	

Pressure limits

Size	Discharge pressure p_2 ¹⁰⁾ [bar]	Test pressure ¹¹⁾ [bar]
All sizes	10,0	15,0

9) Stainless steel variant not available for all pump sizes.

10) The sum of inlet pressure and shut-off head must not exceed the values indicated.

11) The casing components are checked for leakage by means of internal pressure tests to ZN 1650 with water.

Materials

A1 = default material variant

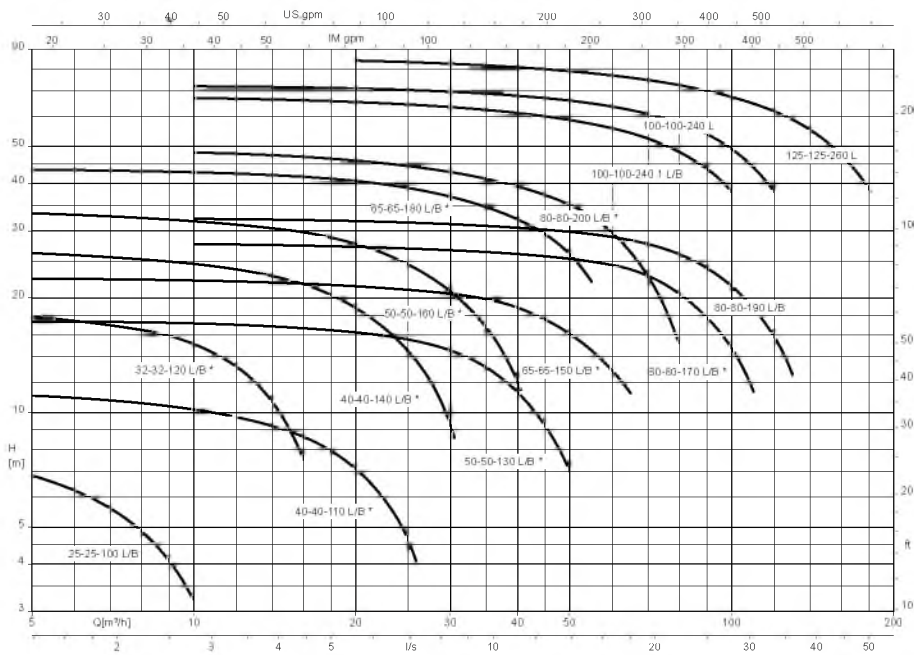
A2 = optional material variant

Part No.	Description	Material variants			
		G	GC	C	
102	Volute casing	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1
161	Casing cover	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1
210	Shaft for shaft units 25 and 35	Tempered steel C45+N	A1	A1	-
		Duplex stainless steel 1.4462	A2	A2	A1
	Shaft for shaft unit 17	Stainless steel 1.4571	A1	A1	A1
230	Impeller	Grey cast iron EN-GJL-250	A1	-	-
		Stainless steel 1.4408	-	A1	A1
330	Bearing bracket for shaft units 25 and 35	Grey cast iron EN-GJL-250	A1	A1	A1
350	Bearing housing for shaft unit 17	Grey cast iron EN-GJL-250	A1	A1	-
		Stainless steel 1.4408	-	-	A1
412	O-ring	EPDM 80 peroxide ¹²⁾	A1	A1	A1
523	Shaft sleeve (not for shaft unit 17)	Stainless steel 1.4571	A1	A1	A1

¹²⁾ FKM 80 on request

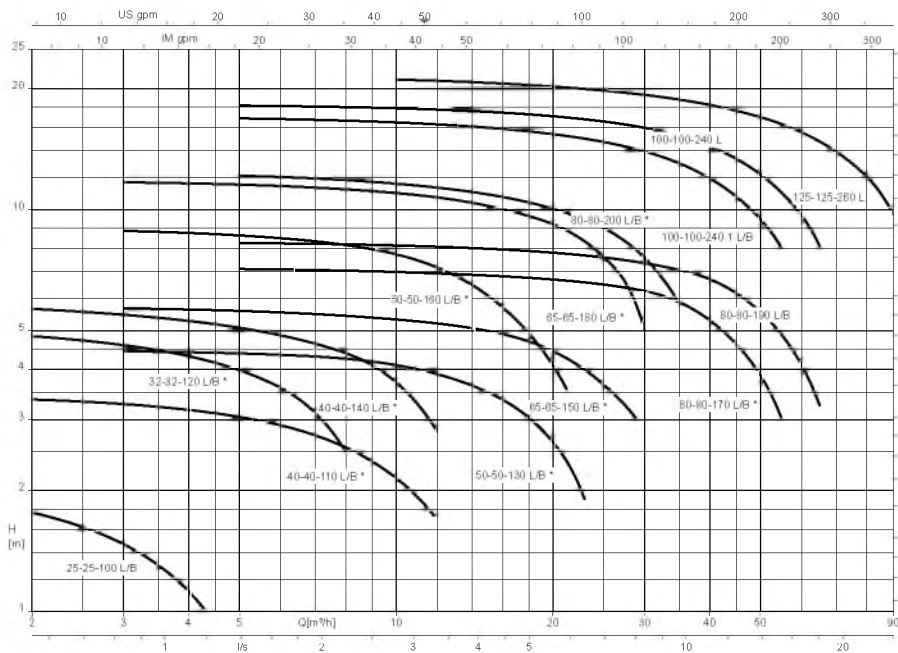
Selection charts

Etaprime L/B, n = 2900 rpm



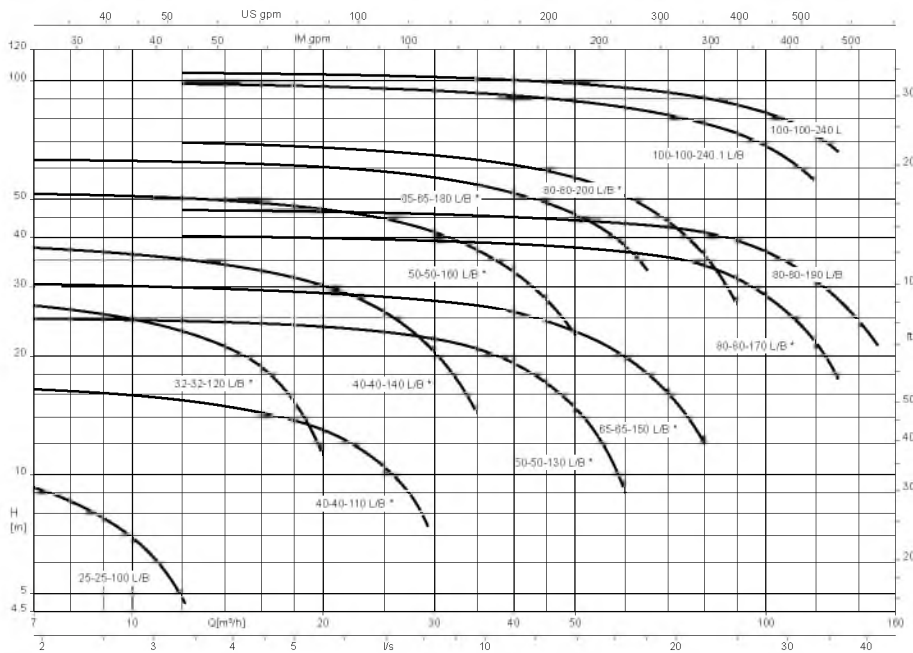
* Also available in stainless steel material variant

Etaprime L/B, n = 1450 rpm



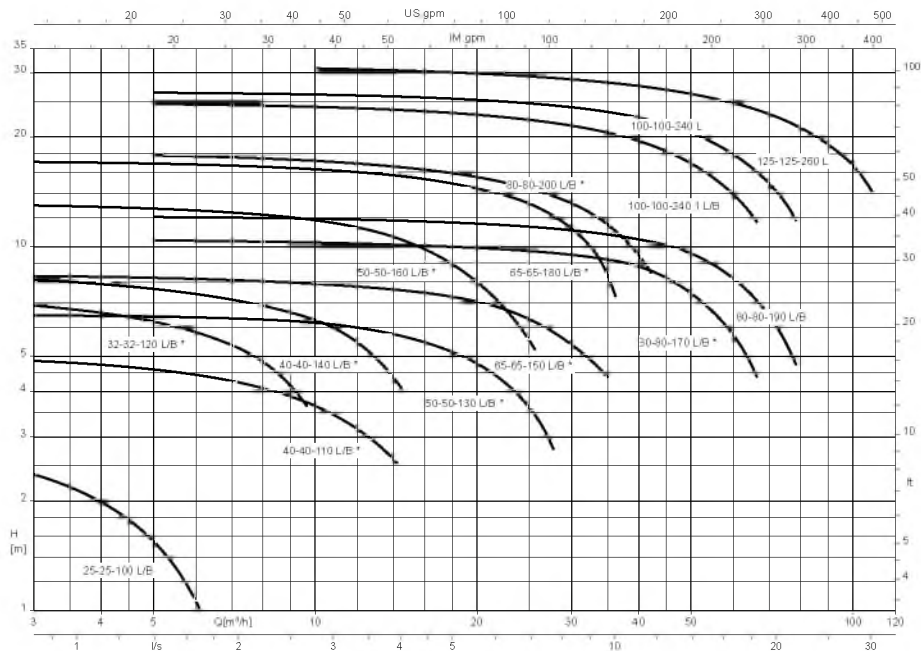
* Also available in stainless steel material variant

Etaprime L/B, n = 3500 rpm



* Also available in stainless steel material variant

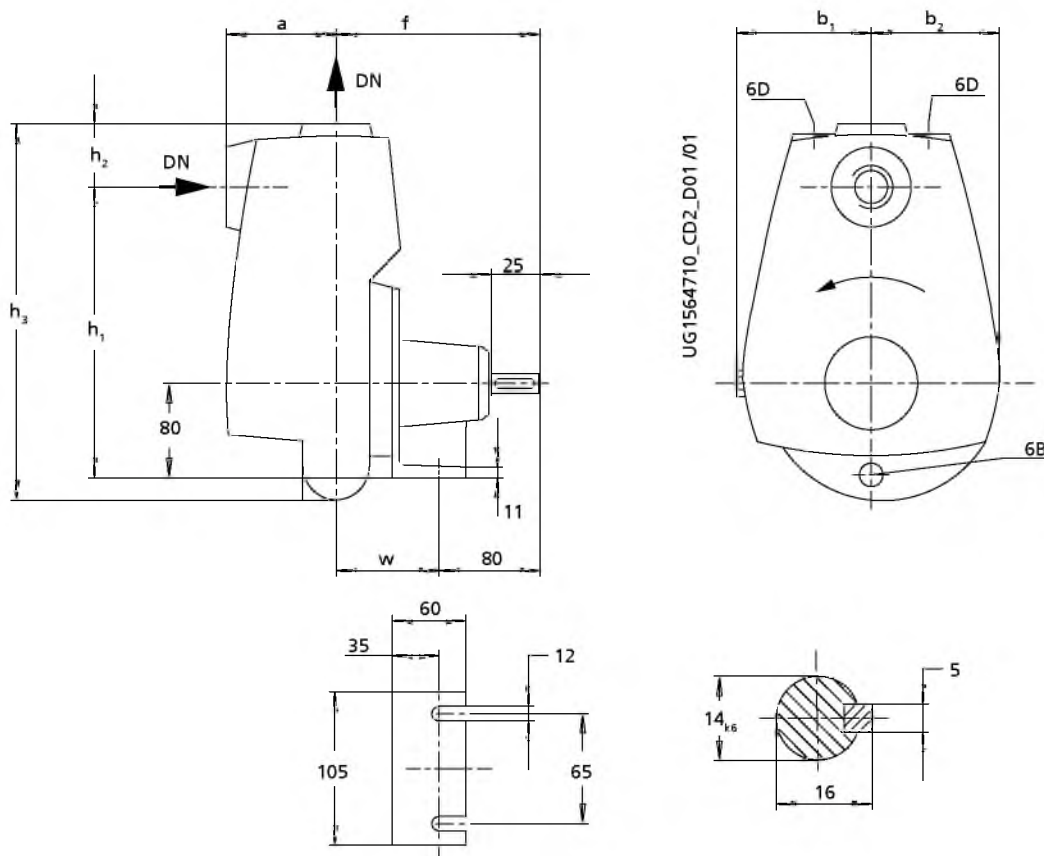
Etaprime L/B, n = 1750 rpm



* Also available in stainless steel material variant

Dimensions and connections

Sizes 025-025-100 to 040-040-110 (shaft unit 17) – pump



Dimensions of sizes 025-025-100 to 040-040-110 (shaft unit 17) – pump

6B	Fluid drain	6D	Fluid priming and venting
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Connections

Size	6 B ¹³⁾	6D ¹³⁾
025-025-100	G 1/8	G 3/8
032-032-120	G 1/8	G 3/8
040-040-110	G 1/8	G 3/8

Pump dimensions [mm]

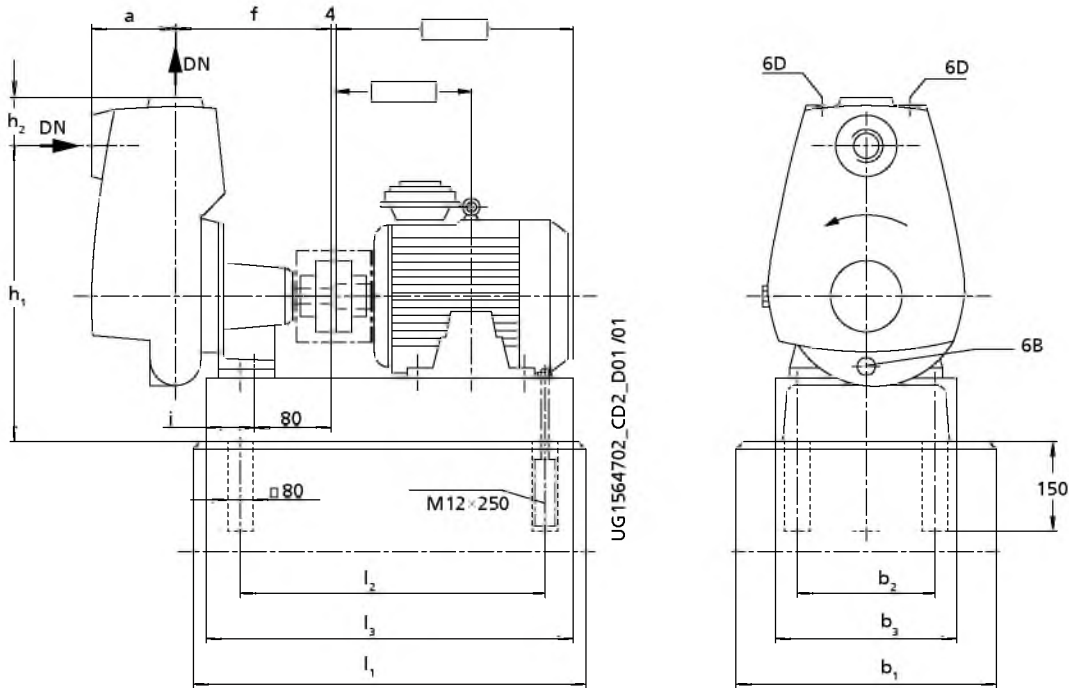
Size	Connection		Pump							
	Standard	Optional	a	b ₁	b ₂	f	h ₁	h ₂	h ₃	w
	DN ¹⁴⁾	DN ¹⁵⁾								
020-025-100	Rp 1	NPT 1	70	104	95	169	220	38	265	89
032-032-120	Rp 1 1/4	NPT 1 1/4	95	118	95	165	229	46	286	85
040-040-110	Rp 1 1/2	NPT 1 1/2	105	118	110	171	235	55	312	91

¹³⁾ G = ISO 228/1

¹⁴⁾ Standard connection to ISO 7/1

¹⁵⁾ Optional connection to ASME B1.20.1

Sizes 025-025-100 to 040-040-110 (shaft unit 17) – pump set



Dimensions of sizes 025-025-100 to 040-040-110 (shaft unit 17) – pump set

6B	Fluid drain	6D	Fluid priming and venting
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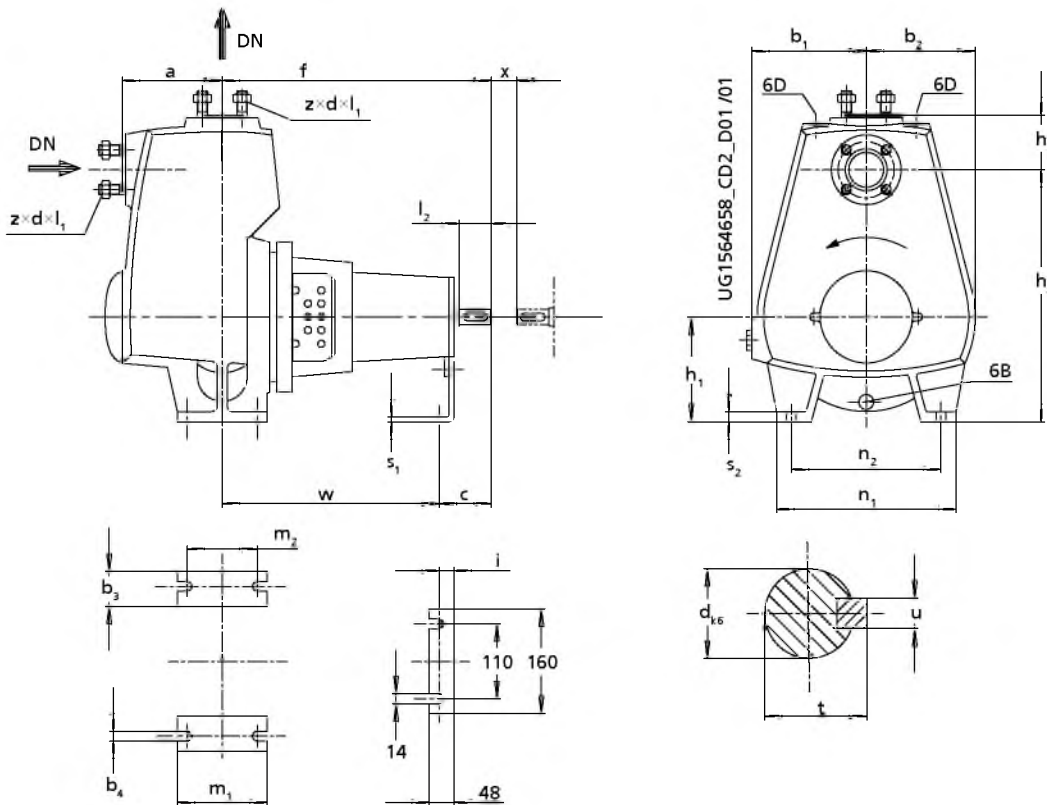
Pump set dimensions [mm]

Size	n				P _N	IEC motor	Connection		Pump set										
	1450	1750	2900	3500			Standard	Optional	a	f	h ₁	h ₂	b ₁	b ₂	b ₃	i	l ₁	l ₂	l ₃
	[rpm]																			[kW]		DN^{16)}	DN^{17)}
025-025-100	X	X	-	-	0,37	71	Rp 1	NPT 1	70	169	295	38	350	160	200	41,5	570	360	420
025-025-100	X	X	-	-	0,55	80M	Rp 1	NPT 1	70	169	295	38	350	160	200	41,5	570	360	420
025-025-100	-	-	X	-	0,55	71	Rp 1	NPT 1	70	169	295	38	350	160	200	41,5	570	360	420
025-025-100	-	-	-	X	0,75	80M	Rp 1	NPT 1	70	169	295	38	350	160	200	41,5	570	360	420
025-025-100	-	-	-	X	1,10	80M	Rp 1	NPT 1	70	169	295	38	350	160	200	41,5	570	360	420
032-032-120	X	X	-	-	0,37	71	R 1 1/4	NPT 1 1/4	95	165	304	46	350	160	200	41,5	570	360	420
032-032-120	X	X	-	-	0,55	80M	R 1 1/4	NPT 1 1/4	95	165	304	46	350	160	200	41,5	570	360	420
032-032-120	-	-	X	-	1,10	80M	R 1 1/4	NPT 1 1/4	95	165	304	46	350	160	200	41,5	570	360	420
032-032-120	-	-	-	X	2,20	90L	R 1 1/4	NPT 1 1/4	95	165	314	46	350	160	200	41,5	570	360	420
040-040-110	X	X	-	-	0,37	71	Rp 1 1/2	NPT 1 1/2	105	171	310	55	350	160	200	41,5	570	360	420
040-040-110	X	X	-	-	0,55	80M	Rp 1 1/2	NPT 1 1/2	105	171	310	55	350	160	200	41,5	570	360	420
040-040-110	-	-	X	-	1,10	80M	Rp 1 1/2	NPT 1 1/2	105	171	310	55	350	160	200	41,5	570	360	420
040-040-110	-	-	-	X	1,50	90S	Rp 1 1/2	NPT 1 1/2	105	171	320	55	350	160	200	41,5	570	360	420

¹⁶⁾ Standard connection to ISO 7/1

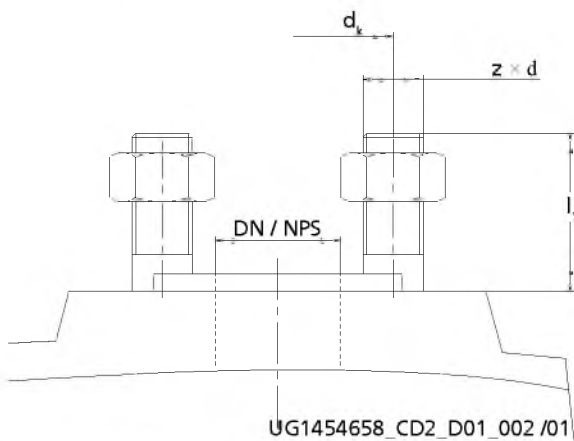
¹⁷⁾ Optional connection to ASME B1.20.1

Sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump



Dimensions of sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump

6B	Fluid drain	6D	Fluid priming and venting
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Flange dimensions

Flange dimensions [mm]

Flanged connection	DN	d_k	z	d	l_1
Standard:	40	110	4	M16	40
• Drilled to EN 1092-1 (material variant C)	50	125	4	M16	40
• Drilled to EN 1092-2 (material variant G / GC)	65	145	4	M16	40
	80	160	8	M16	45
	100	180	8	M16	45

Connections

Size	6B ¹⁸⁾	6D ¹⁸⁾
040-040-140	G 3/8	G 3/8
050-050-130	G 3/8	G 3/8
050-050-160	G 3/8	G 3/8
065-065-150	G 3/8	G 3/8
065-065-180	G 3/8	G 3/8
080-080-170	G 1/2	G 1/2
080-080-190	G 1/2	G 1/2
080-080-200	G 1/2	G 1/2
100-100-240.1	G 1/2	G 1/2
100-100-240	G 1/2	G 1/2
125-125-260	G 1/2	G 1/2

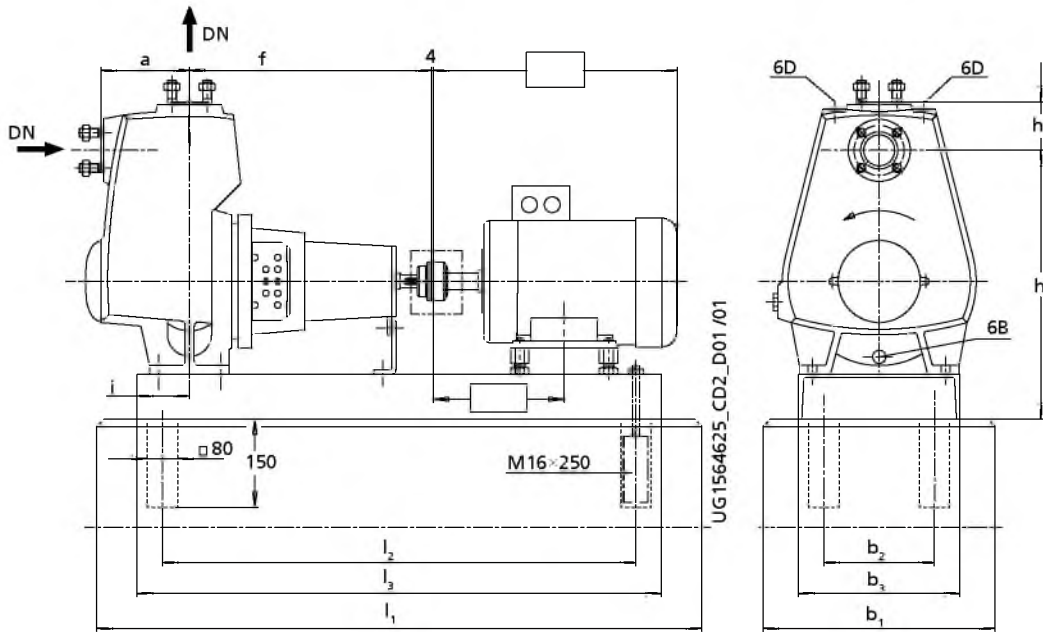
¹⁸⁾ G = ISO 228/1

Flanged connection	DN	d _k	z	d	l ₁
	125	210	8	M16	45
Optional:	NPS 1 1/2	98,6	4	UNC 1/2-13	40
▪ Drilled to ASME B16.1 (material variant G / GC)	NPS 2	120,7	4	UNC 5/8-11	40
▪ Drilled to ASME B16.5 (material variant C)	NPS 2 1/2	139,7	4	UNC 5/8-11	40
	NPS 3	152,4	4	UNC 5/8-11	40
	NPS 4	190,5	8	UNC 5/8-11	45
	NPS 5	215,9	8	UNC 3/4-10	45

Pump dimensions [mm]

Size	Pump																						
	DN	a	b ₁	b ₂	b ₃	b ₄	c	d _{K6}	f	h ₁	h ₂	h ₃	i	l ₂	m ₁	m ₂	n ₁	n ₂	s ₁	s ₂	t	u	w
040-040-140	40	115	115	128	57	16	100	24	370	112	284	73	23	50	100	70	220	160	4	13	27	8	270
050-050-130	50	130	138	128	55	16	100	24	370	132	317	78	23	50	100	70	250	190	4	17	27	8	270
050-050-160	50	130	145	126	55	16	100	24	370	132	327	75	23	50	100	70	250	190	4	17	27	8	270
065-065-150	65	140	155	149	55	16	100	24	370	160	370	85	25	50	125	95	270	212	6	20	27	8	270
065-065-180	65	140	158	138	55	16	130	32	490	160	376	89	23	80	125	95	270	212	4	18	35	10	360
080-080-170	80	156	173	168	65	18	130	32	490	160	380	104	23	80	140	106	310	240	4	18	35	10	360
080-080-190	80	170	188	181	65	20	130	32	490	180	420	107	24	80	160	120	345	280	6	22	35	10	360
080-080-200	80	154	172	152	65	20	130	32	490	160	378	107	24	80	140	100	285	220	4	22	35	10	360
100-100-240.1	100	182	203	178	68	20	130	32	478	200	457	127	24	80	140	100	330	260	6	18	35	10	348
100-100-240	100	182	203	178	68	20	130	32	478	200	457	127	24	80	140	100	330	260	6	18	35	10	348
125-125-260	125	204	227	197	70	20	130	32	478	200	486	142	24	80	140	100	340	270	6	18	35	10	348

Sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump set with coupling



Dimensions of sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump set with coupling

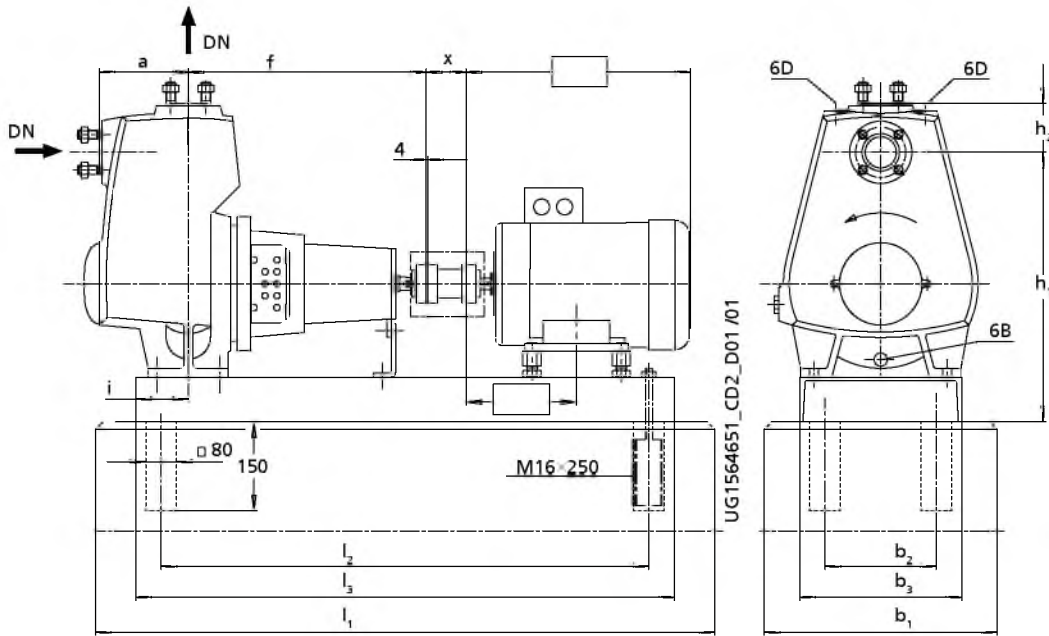
6B	Fluid drain	6D	Fluid priming and venting
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Pump set dimensions [mm]

Size	n				P _N	Motor	Pump set											
	1450	1750	2900	3500			DN	a	f	h ₁	h ₂	b ₁	b ₂	b ₃	i	l ₁	l ₂	l ₃
	[rpm]				[kW]													
040-040-140	X	X	-	-	1,50	90L	40	115	370	384	73	450	240	300	100	950	740	800
040-040-140	-	-	X	-	2,20	90L	40	115	370	384	73	450	240	300	100	950	740	800
040-040-140	-	-	X	-	3,00	100L	40	115	370	384	73	450	240	300	100	950	740	800
040-040-140	-	-	-	X	4,00	112M	40	115	370	384	73	450	240	300	100	1050	840	900
040-040-140	-	-	-	X	5,50	132S	40	115	370	404	73	450	240	300	100	1050	840	900
050-050-130	X	X	-	-	1,50	90L	50	130	370	417	78	450	240	300	100	950	740	800
050-050-130	-	-	X	-	2,20	90L	50	130	370	417	78	450	240	300	100	950	740	800
050-050-130	-	-	X	-	3,00	100L	50	130	370	417	78	450	240	300	100	950	740	800
050-050-130	-	-	-	X	4,00	112M	50	130	370	417	78	450	240	300	100	1050	840	900
050-050-160	X	X	-	-	1,50	90L	50	130	370	427	75	450	240	300	112	950	740	800
050-050-160	-	-	X	-	4,00	112M	50	130	370	427	75	450	240	300	112	1050	840	900
050-050-160	-	-	X	X	5,50	132S	50	130	370	427	75	450	240	300	112	1150	940	1000
050-050-160	-	-	-	X	7,50	132S	50	130	370	427	75	450	240	300	112	1150	940	1000
065-065-150	X	X	-	-	1,50	90L	65	140	370	470	85	450	240	300	112	950	740	800
065-065-150	-	-	X	-	4,00	112M	65	140	370	470	85	450	240	300	112	1050	840	900
065-065-150	-	-	X	X	5,50	132S	65	140	370	470	85	450	240	300	112	1150	940	1000
065-065-150	-	-	-	X	7,50	132S	65	140	370	470	85	450	240	300	112	1150	940	1000
065-065-180	X	X	-	-	2,20	100L	65	140	490	476	89	500	280	350	112	1270	1060	1120
065-065-180	-	-	X	-	5,50	132S	65	140	490	476	89	500	280	350	112	1270	1060	1120
065-065-180	-	-	X	-	7,50	132S	65	140	490	476	89	500	280	350	112	1270	1060	1120
065-065-180	-	-	-	X	11,00	160M	65	140	490	476	89	500	280	350	112	1270	1060	1120
080-080-170	X	X	-	-	2,20	100L	80	156	490	480	104	500	280	350	120	1270	1060	1120
080-080-170	-	-	X	-	7,50	132S	80	156	490	480	104	500	280	350	120	1270	1060	1120

Size	n				P _N [kW]	Motor	Pump set											
	1450	1750	2900	3500			DN	a	f	h ₁	h ₂	b ₁	b ₂	b ₃	i	l ₁	l ₂	l ₃
	[rpm]																	
080-080-170	-	-	-	X	11,00	160M	80	156	490	480	104	500	280	350	120	1270	1060	1120
080-080-170	-	-	-	X	15,00	160M	80	156	490	480	104	500	280	350	120	1270	1060	1120
080-080-190	X	X	-	-	2,20	100L	80	170	490	520	107	500	280	350	130	1270	1060	1120
080-080-190	X	X	-	-	3,00	100L	80	170	490	520	107	500	280	350	130	1270	1060	1120
080-080-190	-	-	X	-	11,00	160M	80	170	490	520	107	500	280	350	130	1400	1190	1250
080-080-190	-	-	-	X	15,00	160M	80	170	490	520	107	500	280	350	130	1400	1190	1250
080-080-190	-	-	-	X	18,50	160L	80	170	490	520	107	500	280	350	130	1400	1190	1250
080-080-200	X	X	-	-	2,20	100L	80	154	490	478	107	500	280	350	120	1270	1060	1120
080-080-200	-	-	X	-	11,00	160M	80	154	490	478	107	500	280	350	120	1400	1190	1250
080-080-200	-	-	-	X	15,00	160M	80	154	490	478	107	500	280	350	120	1400	1190	1250
080-080-200	-	-	-	X	18,50	160L	80	154	490	478	107	500	280	350	120	1400	1190	1250
100-100-240.1	X	X	-	-	2,20	100L	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240.1	X	X	-	-	3,00	100L	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240.1	X	X	-	-	4,00	112M	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240.1	-	-	X	-	15,00	160M	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240.1	-	-	-	X	18,50	160L	100	182	478	557	127	500	280	350	120	1400	1190	1250
100-100-240.1	-	-	-	X	22,00	180M	100	182	478	567	127	550	320	400	120	1400	1190	1250
100-100-240.1	-	-	-	X	30,00	200L	100	182	478	567	127	550	320	400	120	1400	1190	1250
100-100-240	X	X	-	-	3,00	100L	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240	X	X	-	-	4,00	112M	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240	X	X	-	-	5,50	132S	100	182	478	557	127	500	280	350	120	1270	1060	1120
100-100-240	-	-	X	-	22,00	180M	100	182	478	567	127	550	320	400	120	1400	1190	1250
100-100-240	-	-	-	X	30,00	200L	100	182	478	567	127	550	320	400	120	1400	1190	1250
100-100-240	-	-	-	X	37,00	200L	100	182	478	567	127	550	320	400	120	1400	1190	1250
125-125-260	X	X	-	-	5,50	132S	125	204	478	586	142	500	280	350	120	1270	1060	1120
125-125-260	X	X	-	-	7,50	132M	125	204	478	586	142	500	280	350	120	1270	1060	1120
125-125-260	X	X	-	-	11,00	160M	125	204	478	596	142	550	320	400	120	1400	1190	1250
125-125-260	-	-	X	-	30,00	200L	125	204	478	596	142	550	320	400	120	1400	1190	1250
125-125-260	-	-	-	X	37,00	200L	125	204	478	596	142	550	320	400	120	1400	1190	1250

Sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump set with spacer-type coupling



Dimensions of sizes 040-040-140 to 125-125-260 (shaft unit 25 / 35) – pump set with spacer-type coupling

6B	Fluid drain	6D	Fluid priming and venting
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Pump set dimensions [mm]

Size	n				P _N	Motor	Pump set												
	1450	1750	2900	3500			DN	a	f	h ₁	h ₂	b ₁	b ₂	b ₃	i	l ₁	l ₂	l ₃	x
	[rpm]				[kW]														
040-040-140	X	X	-	-	1,50	90L	40	115	370	384	73	450	240	300	100	1050	840	900	100
040-040-140	-	-	X	-	2,20	90L	40	115	370	384	73	450	240	300	100	1050	840	900	100
040-040-140	-	-	X	-	3,00	100L	40	115	370	384	73	450	240	300	100	1050	840	900	100
040-040-140	-	-	-	X	4,00	112M	40	115	370	384	73	450	240	300	100	1150	940	1000	100
040-040-140	-	-	-	X	5,50	132S	40	115	370	404	73	450	240	300	100	1150	940	1000	100
050-050-130	X	X	-	-	1,50	90L	50	130	370	417	78	450	240	300	100	1050	840	900	100
050-050-130	-	-	X	-	2,20	90L	50	130	370	417	78	450	240	300	100	1050	840	900	100
050-050-130	-	-	X	-	3,00	100L	50	130	370	417	78	450	240	300	100	1050	840	900	100
050-050-130	-	-	-	X	4,00	112M	50	130	370	417	78	450	240	300	100	1150	940	1000	100
050-050-160	X	X	-	-	1,50	90L	50	130	370	427	75	450	240	300	112	1050	840	900	100
050-050-160	-	-	X	-	4,00	112M	50	130	370	427	75	450	240	300	112	1150	940	1000	100
050-050-160	-	-	X	X	5,50	132S	50	130	370	427	75	500	280	350	112	1270	1060	1120	100
050-050-160	-	-	-	X	7,50	132S	50	130	370	427	75	500	280	350	112	1270	1060	1120	100
065-065-150	X	X	-	-	1,50	90L	65	140	370	470	85	450	240	300	112	1050	840	900	100
065-065-150	-	-	X	-	4,00	112M	65	140	370	470	85	450	240	300	112	1150	940	1000	100
065-065-150	-	-	X	X	5,50	132S	65	140	370	470	85	500	280	350	112	1270	1060	1120	100
065-065-150	-	-	-	X	7,50	132S	65	140	370	470	85	500	280	350	112	1270	1060	1120	100
065-065-180	X	X	-	-	2,20	100L	65	140	490	476	89	500	280	350	112	1400	1190	1250	140
065-065-180	-	-	X	-	5,50	132S	65	140	490	476	89	500	280	350	112	1400	1190	1250	140
065-065-180	-	-	X	-	7,50	132S	65	140	490	476	89	500	280	350	112	1400	1190	1250	140
065-065-180	-	-	-	X	11,00	160M	65	140	490	476	89	500	280	350	112	1400	1190	1250	140
080-080-170	X	X	-	-	2,20	100L	80	156	490	480	104	500	280	350	120	1400	1190	1250	140
080-080-170	-	-	X	-	7,50	132S	80	156	490	480	104	500	280	350	120	1400	1190	1250	140

Size	n				P _N [kW]	Motor	Pump set												
	1450	1750	2900	3500			DN	a	f	h ₁	h ₂	b ₁	b ₂	b ₃	i	l ₁	l ₂	l ₃	x
	[rpm]																		
080-080-170	-	-	-	X	11,00	160M	80	156	490	480	104	500	280	350	120	1400	1190	1250	140
080-080-170	-	-	-	X	15,00	160M	80	156	490	480	104	500	280	350	120	1400	1190	1250	140
080-080-190	X	X	-	-	2,20	100L	80	170	490	520	107	550	280	350	120	1400	1190	1250	140
080-080-190	X	X	-	-	3,00	100L	80	170	490	520	107	550	280	350	120	1400	1190	1250	140
080-080-190	-	-	X	-	11,00	160M	80	170	490	530	107	550	320	400	130	1570	1360	1420	140
080-080-190	-	-	-	X	15,00	160M	80	170	490	530	107	550	320	400	130	1570	1360	1420	140
080-080-190	-	-	-	X	18,50	160L	80	170	490	530	107	550	320	400	130	1570	1360	1420	140
080-080-200	X	X	-	-	2,20	100L	80	154	490	478	107	500	280	350	120	1400	1190	1250	140
080-080-200	-	-	X	-	11,00	160M	80	154	490	488	107	550	320	400	120	1570	1360	1420	140
080-080-200	-	-	-	X	15,00	160M	80	154	490	488	107	550	320	400	120	1570	1360	1420	140
080-080-200	-	-	-	X	18,50	160L	80	154	490	488	107	550	320	400	120	1570	1360	1420	140
100-100-240.1	X	X	-	-	2,20	100L	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240.1	X	X	-	-	3,00	100L	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240.1	X	X	-	-	4,00	112M	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240.1	-	-	X	-	15,00	160M	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240.1	-	-	X	-	18,50	160L	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
100-100-240.1	-	-	-	X	22,00	180M	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
100-100-240.1	-	-	-	X	30,00	200L	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
100-100-240	X	X	-	-	3,00	100L	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240	X	X	-	-	4,00	112M	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240	X	X	-	-	5,50	132S	100	182	478	557	127	500	280	350	120	1400	1190	1250	140
100-100-240	-	-	X	-	22,00	180M	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
100-100-240	-	-	X	-	30,00	200L	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
100-100-240	-	-	-	X	37,00	200L	100	182	478	567	127	550	320	400	120	1570	1360	1420	140
125-125-260	X	X	-	-	5,50	132S	125	204	478	596	142	550	320	400	120	1570	1360	1420	140
125-125-260	X	X	-	-	7,50	132M	125	204	478	596	142	550	320	400	120	1570	1360	1420	140
125-125-260	X	X	-	-	11,00	160M	125	204	478	596	142	550	320	400	120	1570	1360	1420	140
125-125-260	-	-	X	-	30,00	200L	125	204	478	596	142	550	320	400	120	1570	1360	1420	140
125-125-260	-	-	X	-	37,00	200L	125	204	478	596	142	550	320	400	120	1570	1360	1420	140

Flange connections

Threaded connections, shaft unit 17

Size	Shaft unit	Material variant			
		G/G/C			
		Connection pipe thread to			
		ISO 7-1 PN10		ASME B1.20.1 PN10	
025-025-100	17	Rp 1	X	NPT 1	o
032-032-120		Rp 1 1/4	X	NPT 1 1/4	o
040-040-110		Rp 1 1/2	X	NPT 1 1/2	o

 Flanged connections¹⁹⁾ shaft units 25, 35

Size	Shaft unit	Nominal size to		Material variant			
				G/GC		C	
				Flange dimensions to			
		EN 1092-2		EN 1092-1			
		Drilled to				EN 1092-2 PN16	ASME B16.1 CL125	EN 1092-1 PN16	ASME B16.5 CL150
040-040-110	25	DN 40	NPS 1 1/2	X	o	X	o
050-050-130		DN 50	NPS 2	X	o	X	o
050-050-160		DN 50	NPS 2	X	o	X	o
065-065-150		DN 65	NPS 2 1/2	X	o	X	o
065-065-180	35	DN 65	NPS 2 1/2	X	o	X	o
080-080-170		DN 80	NPS 3	X	o	X	o
080-080-190		DN 80	NPS 3	X	o	-	-
080-080-200		DN 80	NPS 3	X	o	X	o
100-100-240.1		DN 100	NPS 4	X	o	-	-
100-100-240		DN 100	NPS 4	X	o	-	-
125-125-260		DN 125	NPS 5	X	o	-	-

Symbols key

Symbol	Description
X	Standard
o	Option

¹⁹⁾ Type RF (Raised Face)

Interchangeability of Etaprime L and Etaprime B pump components

Components featuring the same number in a column are interchangeable.

Interchangeability of Etaprime L and Etaprime B pump components and interchangeability of components among each other

Size	Shaft unit	Description								
		Volute casing	Casing cover	Shaft	Impeller	Radial ball bearing	Radial ball bearing	Bearing housing	Mechanical seal	Shaft sleeve
		Part No.								
		102	161	210	230	321.01	321.02	350	433.01	523
025-025-100	17	○*	✗	1	○*	1	2	1	1*	✗
032-032-120		○*	✗	1	○*	1	2	1	1*	✗
040-040-110		○*	✗	1	○*	1	2	1	1*	✗
040-040-140	25	○*	○*	2	○*	✗	3	✗	2*	1*
050-050-130		○*	○*	2	○*	✗	3	✗	2*	1*
050-050-160		○*	1*	2	○*	✗	3	✗	2*	1*
065-065-150	35	○*	1*	2	○*	✗	3	✗	2*	1*
065-065-180		○*	○*	3	○*	✗	4	✗	3*	2*
080-080-170		○*	○*	3	○*	✗	4	✗	3*	2*
080-080-190		○*	○*	3	○*	✗	4	✗	3*	2*
080-080-200		○*	○*	3	○*	✗	4	✗	3*	2*
100-100-240.1		1*	○*	3	○*	✗	4	✗	3*	2*
100-100-240 ²⁰⁾		1	○	3	○	✗	4	✗	3	2
125-125-260 ²⁰⁾		○	○	3	○	✗	4	✗	3	2

Symbols key

Symbol	Description
*	Component interchangeable with Etaprime B
○	Components differ
✗	Component not fitted

Scope of supply

Depending on the model, the following items are included in the scope of supply:

- Pump

Drive

- Electric motor

Coupling

- Flexible coupling with or without spacer

Contact guard

- Coupling guard

Baseplate

- Channel section steel or folded steel plate

Optional:

- Cast baseplate (to ISO 3661)

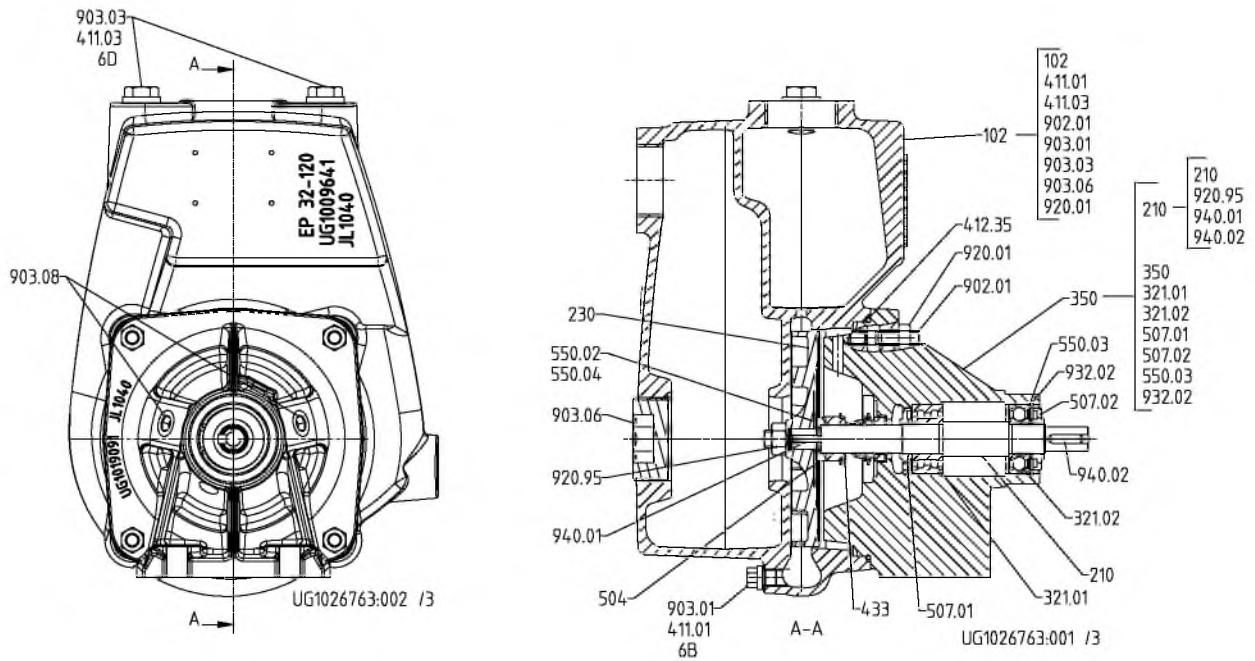
Special accessories

- As required

²⁰⁾ Not available as Etaprime B

Sectional drawing and list of components

Etaprime G and C, threaded connection, with bearing housing (SU 17)

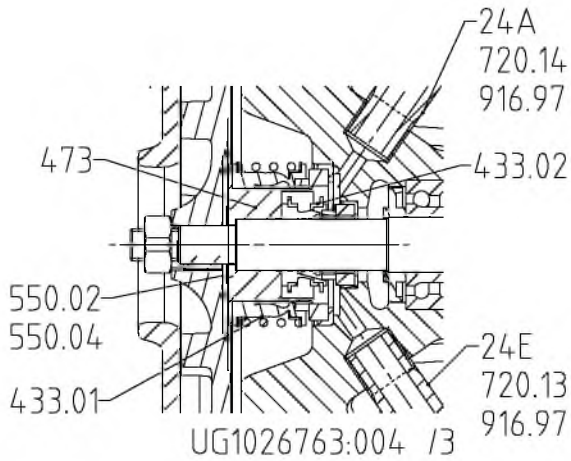


Model with single mechanical seal

[Supplied in packaging units only]

List of components

Part No.	Description
102	Volute casing
210	Shaft
230	Impeller
321.01/02	Radial ball bearing
350	Bearing housing
411.01/03	Joint ring
412.35	O-ring
433	Mechanical seal
504	Spacer ring
507.01/02	Thrower
550.02/03/04	Disc
902.01	Stud
903.01/03/06/08	Screw plug
920.01/95	Nut
932.02	Circlip
940.01/02	Key
Auxiliary connections:	
6 B	Fluid drain
6 D	Fluid priming and venting

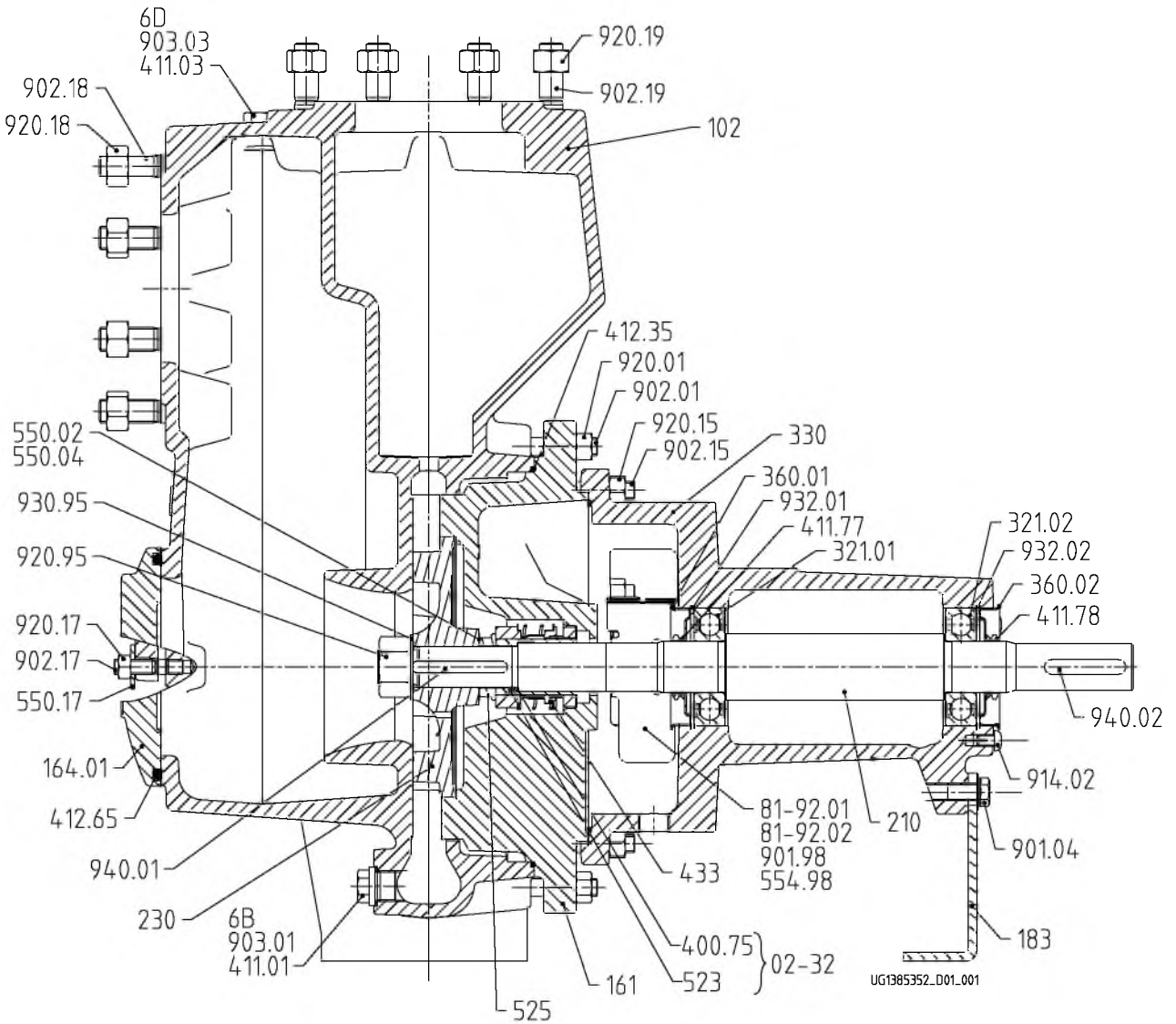


Model with double mechanical seal in tandem arrangement (SU 17)

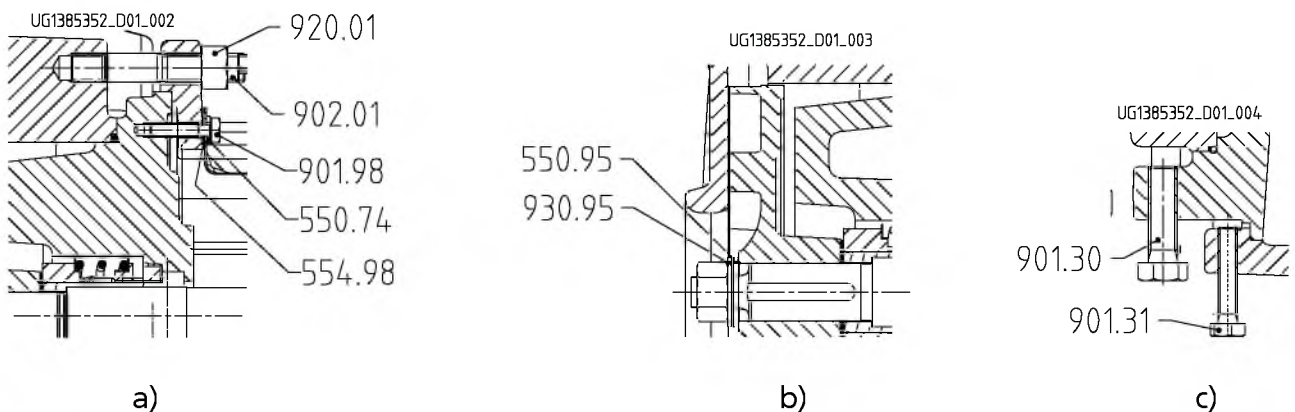
List of components

Part number	Description
433.01/02	Mechanical seal
473	Primary ring carrier
550.02/04	Disc
720.13/14	Barrel nipple
916.97	Plug
Auxiliary connections:	
24A	Quench liquid outlet
24E	Quench liquid inlet

Etaprime G and C, flanged connection, with bearing bracket/grease lubrication (SU 25 and SU 35)



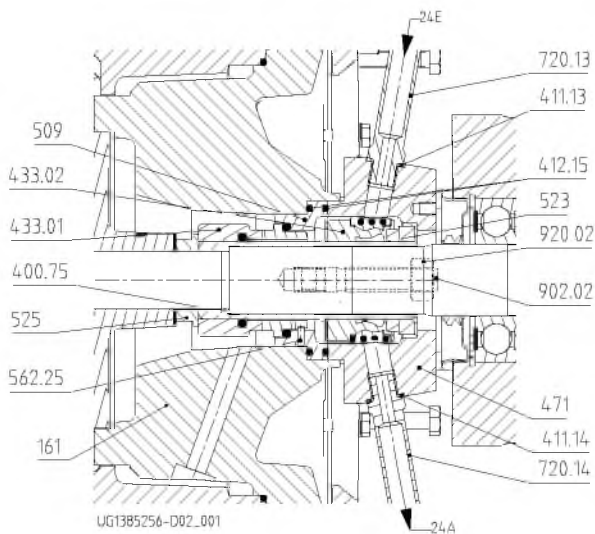
Model with single mechanical seal



a) Clamped casing cover, b) impeller fastening elements for shaft unit 25, c) position of forcing screws

List of components

Part number	Description	Part number	Description
102	Volute casing	550.95 ²¹⁾	Disc
161	Casing cover	554.98	Lock washer
164.01	Inspection cover	81-92.01/02	Cover plate
183	Support foot	901.04/30/31/98	Hexagon head bolt
210	Shaft	902.01/15/17/18/19	Stud
230	Impeller	903.01/03	Screw plug
321.01/02	Radial ball bearing	914.02	Pan head screw
330	Bearing bracket	920.01/05/15/17/18/19/95	Nut
360.01/02	Bearing cover	930.95	Safety device
400.75	Gasket	932.01/02	Circlip
411.01/03/77/78	Joint ring	940.01/02	Key
412.35/65	O-ring		
433	Mechanical seal		
523	Shaft sleeve	Auxiliary connections:	
525 ²²⁾	Spacer sleeve	6B	Fluid drain
550.02/04/17/74	Disc	6D	Fluid priming and venting



Model with double mechanical seal in tandem arrangement (SU 25/35)

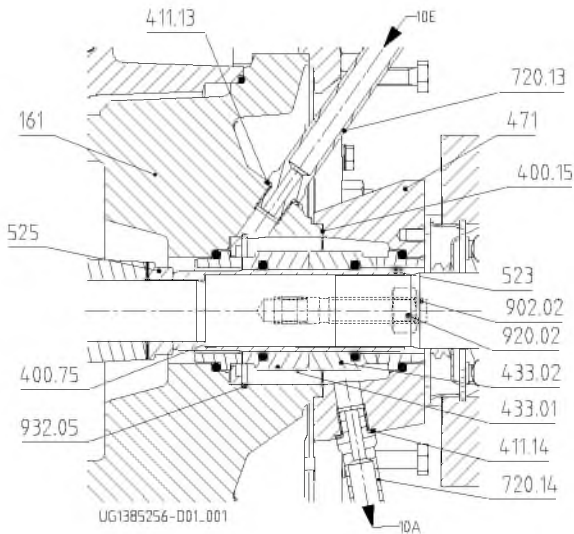
List of components

Part number	Description
161	Casing cover
400.75	Gasket
412.15	O-ring
411.13/14	Joint ring
433.01/02	Mechanical seal
471	Seal cover
509	Intermediate ring
523	Shaft sleeve
525 ²⁴⁾	Spacer sleeve
562.25	Parallel pin
720.13/14	Fitting
902.02	Stud
920.02	Hexagon nut
Auxiliary connections:	

21) For SU 25 only; shaft unit see data sheet.

22) For SU 35 only; shaft unit see data sheet.

Part number	Description
24A	Quench liquid outlet
24E	Quench liquid inlet



Model with double mechanical seal in back-to-back arrangement (SU 25/35)

List of components

Part No.	Description
161	Casing cover
400.15 ²³⁾ /.75	Gasket
411.13/.14	Joint ring
433.01/.02	Mechanical seal
471	Seal cover
523	Shaft sleeve
525 ²⁴⁾	Spacer sleeve
720.13/.14	Fitting
902.02	Stud
920.02	Hexagon nut
932.05	Circlip
Auxiliary connections:	
10A	Barrier fluid outlet
10E	Barrier fluid inlet

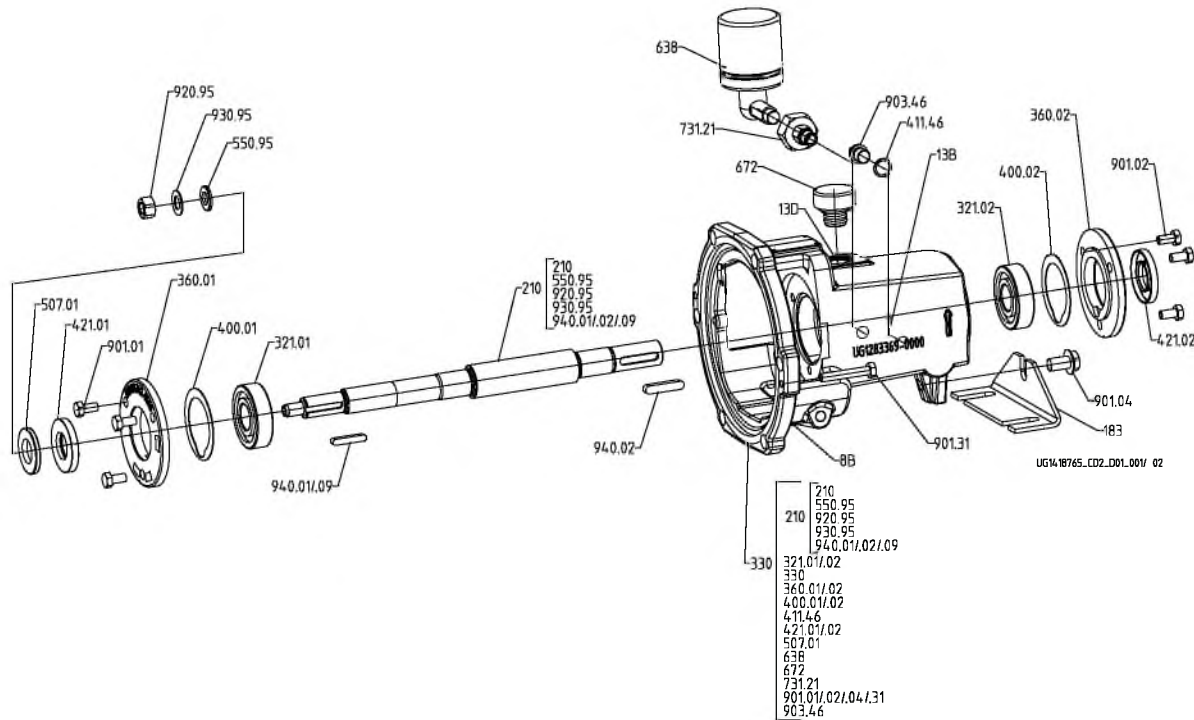
²³⁾ For shaft unit 25: joint ring 411.15 (shaft unit see data sheet)

²⁴⁾ For SU 35 only; shaft unit see data sheet.

Etaprime G and C, flanged connection, with bearing bracket/oil lubrication (SU 25 and SU 35)

Design of pump and mechanical seal as described in (→Page 24).

Difference: oil-lubricated bearing bracket instead of grease-lubricated bearing bracket.



Model with oil lubrication and constant level oiler

[Supplied in packaging units only]

List of components²⁵⁾

Part No.	Description	Part No.	Description
183	Support foot	672	Vent
210	Shaft	731.21	Pipe union
330	Bearing bracket	901.01/02/04/31	Hexagon head bolt
321.01/02	Deep groove ball bearing	903.46	Screw plug
360.01/02	Bearing cover	920.95	Hexagon nut
400.01/02	Gasket	930.95	Spring washer
411.46	Joint ring	940.01/02/09 ²⁶⁾	Key
421.01/02	Lip seal	Connections:	
507.01	Thrower	8B	Leakage drain
550.95 ²⁷⁾	Disc	13B	Oil drain
638	Constant level oiler	13D	Oil filling and venting

²⁵⁾ Some individual components might not be applicable, depending on the size and shaft material.

²⁶⁾ For shaft units 55 and 60 only

²⁷⁾ For shaft unit 25 only

Detailed designation

Designation example

Position																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
E	T	P	L	0	8	0	-	0	8	0	-	2	0	0		G	C	X	I	1	0	D	3	0	1	8	5	2			B
See name plate and data sheet																						See data sheet									

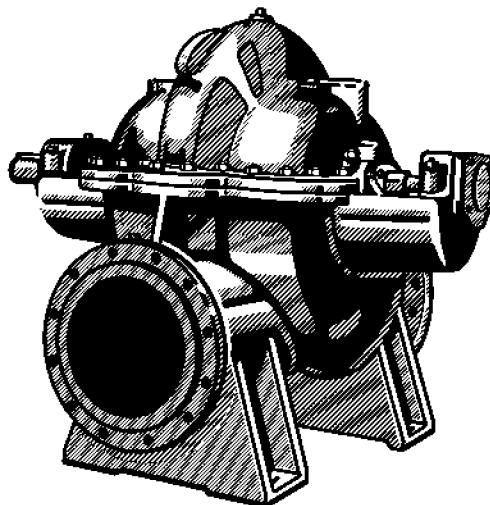
Designation key

Position	Code	Description
1-4	Pump type	
	ETPL	Etaprime with bearing bracket
5-16	Size	
	080	Nominal suction nozzle diameter [mm]
	080	Nominal discharge nozzle diameter [mm]
	200	Nominal impeller diameter [mm]
17	Pump casing material	
	G	Cast iron
	C	Stainless steel
18	Impeller material if different from casing material	
	G	Cast iron
	C	Stainless steel
19	Special design	
	.28)	Standard
	X	Special design
20	Seal options	
	I	Single mechanical seal
	D	Double mechanical seal in back-to-back arrangement
	T	Double mechanical seal in tandem arrangement
21-22	Seal code	
	01	Q1Q1VGG
	08	AQ1VGG ²⁹⁾
	09	U3U3VGG
	10	Q1Q1X4GG
	11	BQ1EGG
23	Scope of supply	
	A	Pump only (Fig. 0)
	B	Pump, baseplate
	C	Pump, baseplate, coupling, coupling guard
	D	Pump, baseplate, coupling, coupling guard, motor
24	Shaft unit	
	1	Shaft unit 17
	2	Shaft unit 25
	3	Shaft unit 35
25-28	Motor rating	
	0011	1,1 kW
	0075	7,5 kW
	0185	18,5 kW
29	Number of poles	
	2	2 poles
	4	4 poles
30-31	Explosion protection	
	.28)	Without explosion-proof motor
	ex	Explosion-proof motor
32	Product generation	
	B	Product generation Global Etaprime

²⁸⁾ Blank

²⁹⁾ BQVGG for shaft unit 17

Axially split volute casing pumps



Applications

Waterworks, irrigation and drainage pumping stations, power stations, industrial water supply systems, fire fighting systems, marine applications as well as general applications in refineries.

Operating data

Pump sizes	DN 500	up to	800
Capacities	Q	up to	3000 l/s
Total head	H	up to	150 m
Operating pressure	p	up to	25 bar
Operating temperature	t	up to	+ 105 °C

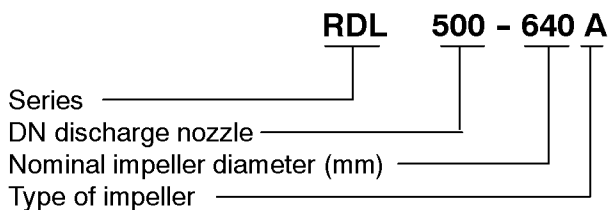
Design

Horizontal single stage axially split volute casing pump with double entry radial impeller

Drive shaft end of the pump can be fitted either on the left hand or right hand side

Flanges acc. to ISO, DIN, BS or ANSI

Designation



Bearings

Grease lubricated or optional oil lubricated, anti-friction bearings which can be re-lubricated

Shaft seal

Stuffing box packing or mechanical seal

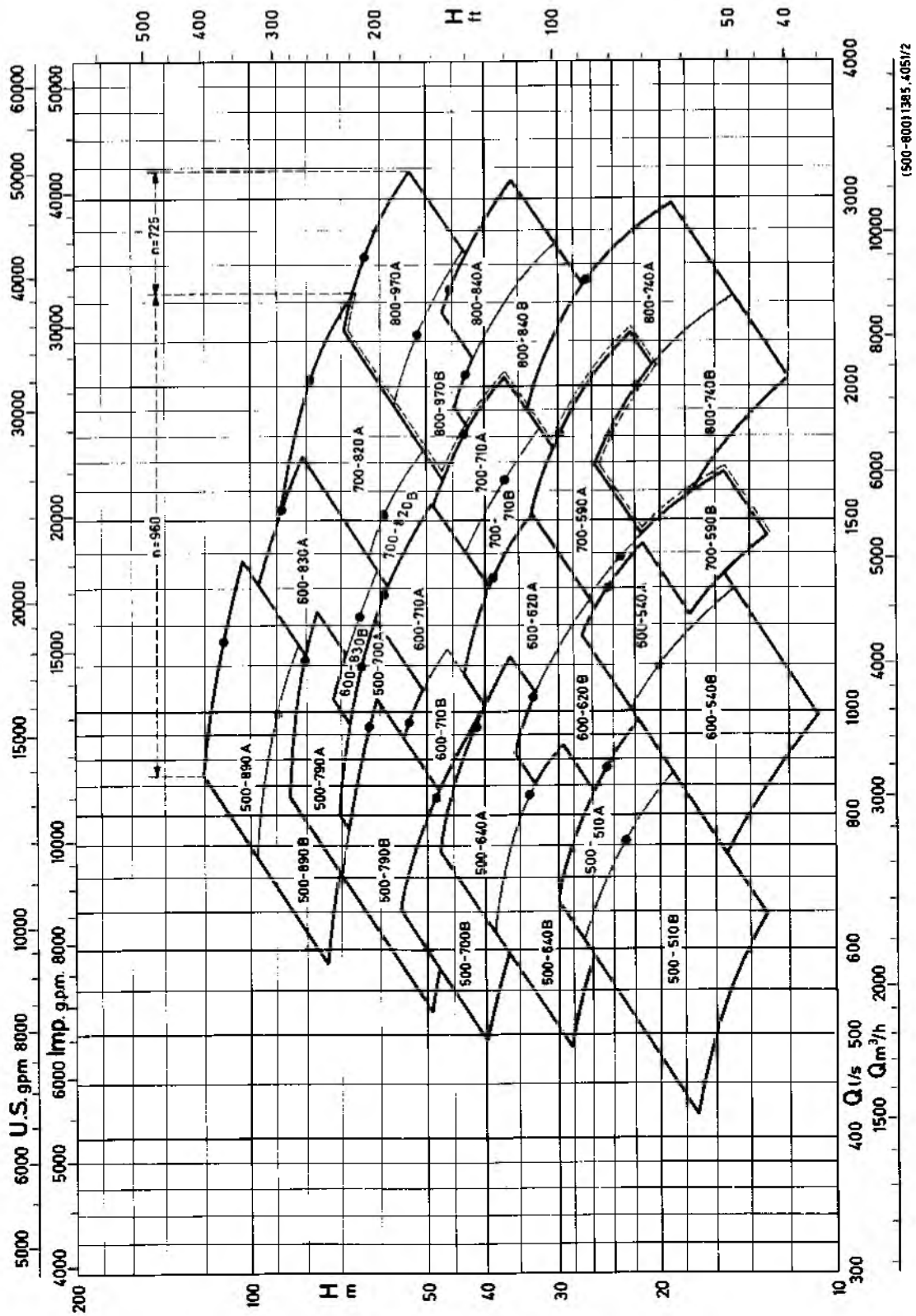
Materials

	ASTM	similar to DIN
Volute casing upper part	A48 class 35	GG-25
	A536 class 604018	GGG-40
Volute casing lower part	A48 class 30	GG-20
	A536 class 604018	GGG-40
Shaft	SAE 1045	C45N
	AISI 420	1.4021
Impeller	B 584-90500	G-CuSn10
	A743 CA6NM	1.4313.95
	A743CF8M	1.4408
Shaft protecting sleeve	AISI 420	1.4021
Casing wear ring	B584-90500	G-CuSn10
	A743CA6NM	1.4313.95
Impeller wear ring	B584-90500	G-CuSn10
	A743CA6NM	1.4313.95

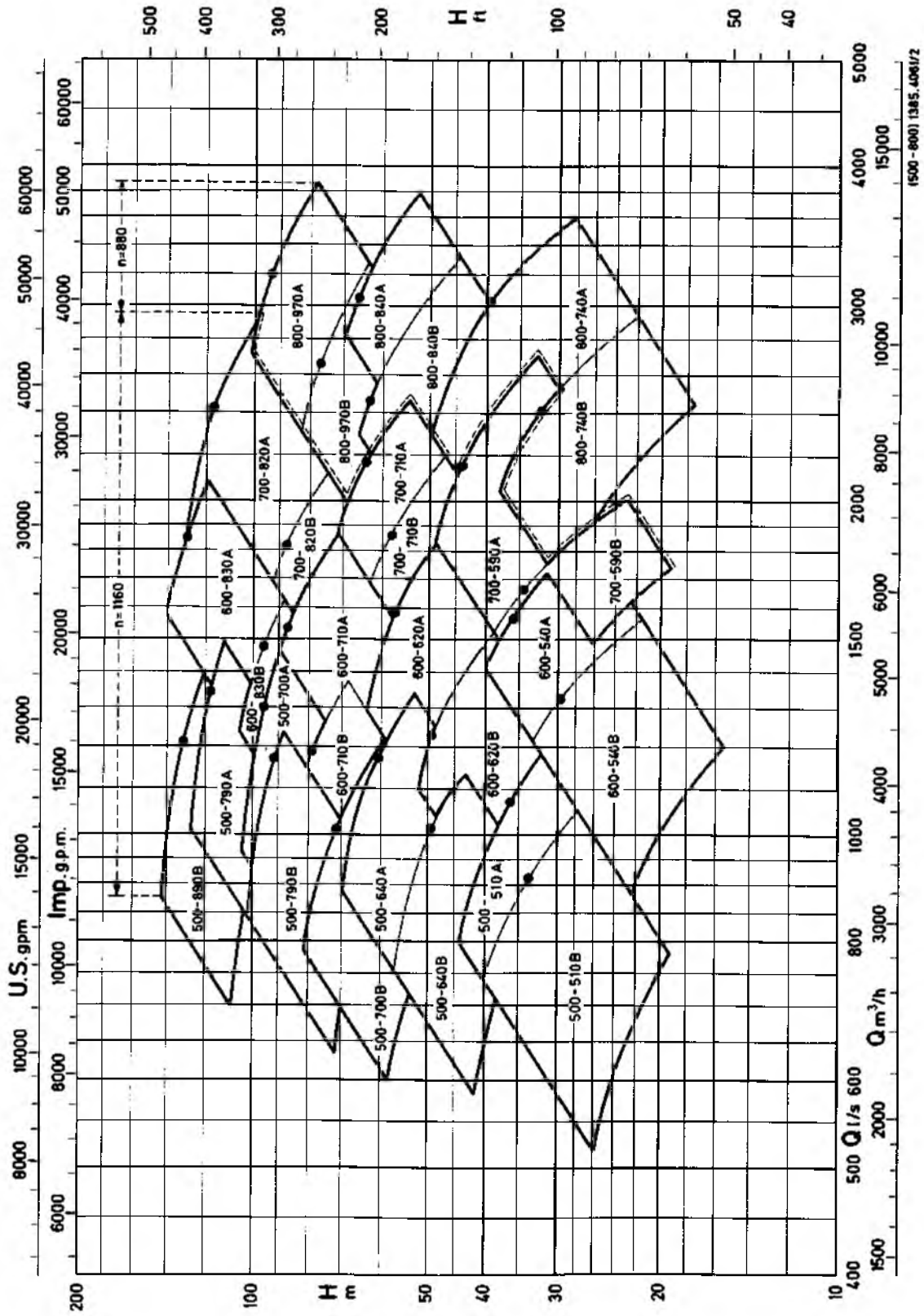
Table of content

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Dimension table for type of installation 4E	page 18 + 19
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Selection chart 50 Hz



Selection chart 60 Hz



Scope of supply

Pump with bare shaft end, horizontal design, with primer coating, soft packed stuffing box or mechanical seal.

Extra charges for:

- oil lubricated antifriction bearings,
- potable water quality coating / top coat
- horizontal base frame for pump and motor,
- motor mounting,
- material tests

Available accessories:
(see page 21 for details)

- coupling and coupling guard,
- vibration sensor SPM-Nippel,
- set pressure gauges,
- cyclone separator with piping,
- venting valve,
- temperature sensor for antifriction bearing (PT 100)
- signal transmitter for PT 100
- assembly device / lifting device

Guarantee, testing and quality control

Every pump undergoes a functional test and the operating data is guaranteed **without** acceptance test.

Acceptance tests can be performed in accordance with ISO 2548 C, DIN 1944/III or other comparable international testing standards.

The quality of the RDL products is ensured by a tested and certified quality assurance system according to DIN ISO 9001 / EN 29001.

Order data

- pump :

- description of the pump according to "Designation"- capacity Q
- total head H (H_{geo} and plant losses)
- material combination
- flange design
- shaft seal as soft packed stuffing box or mechanical seal
- grease or oil lubricated bearings
- liquid handled and liquid temperature
- direction of rotation / arrangement of the motor
- accessories required
- number and language of operating manual

- motor :

(choice by KSB)

- type of construction
- protection
- voltage, frequency, method of starting
- ambient temperature
- insulation class
- accessories required

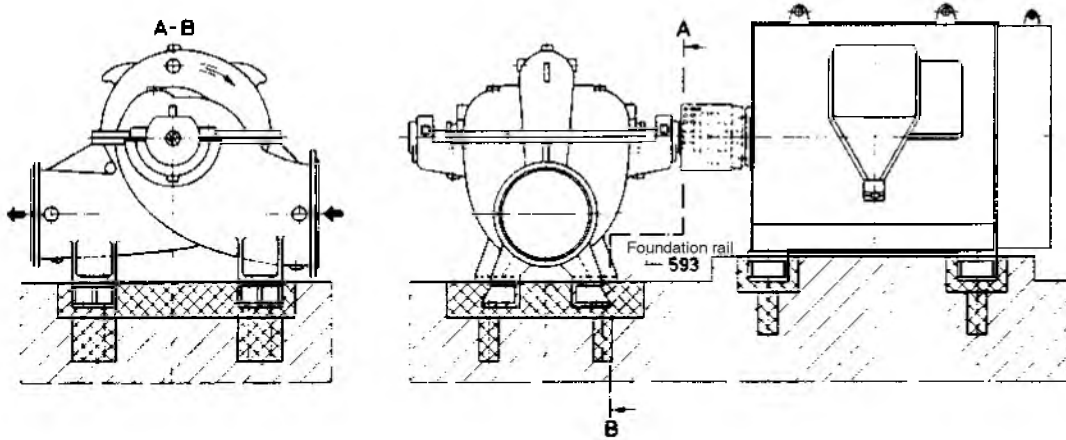
- motor :

(motor provided by the client)

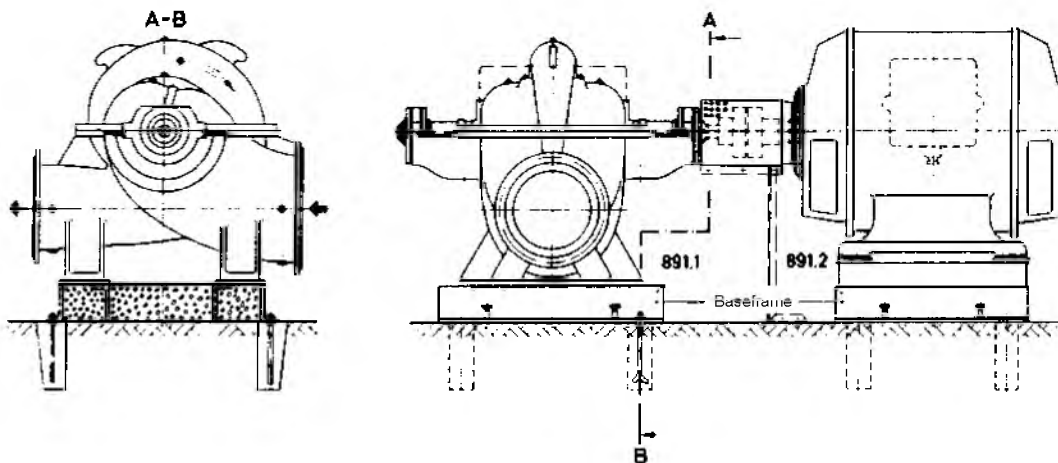
binding motor dimension table and data sheet with specification of the effective speed to be given with the order

Types of installation

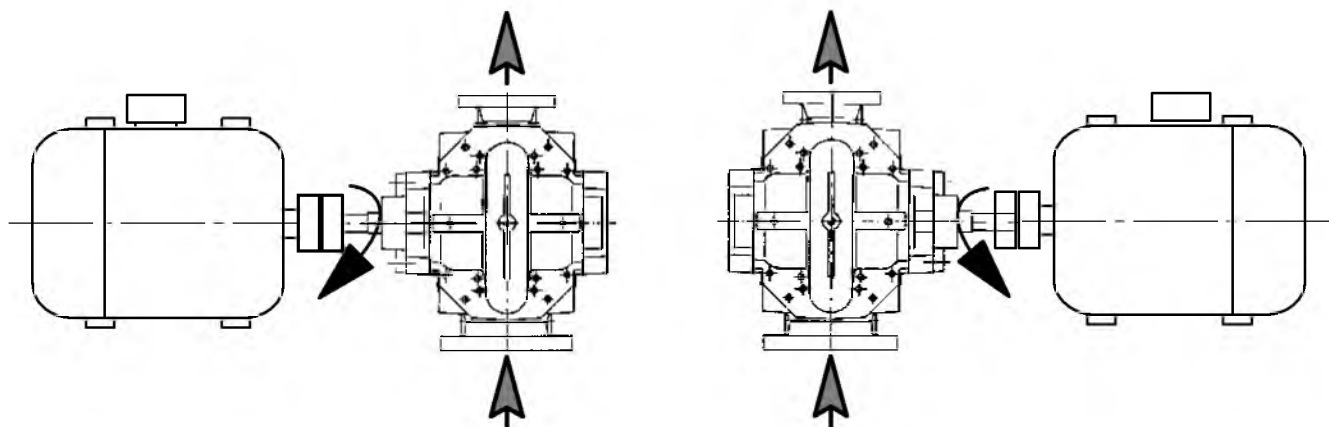
2E Pump and driver separate on foundation rails



4E Pump and driver on separate baseframe



Direction of rotation and flow direction



Direction of rotation, clockwise, viewed from the drive end

Direction of rotation, anticlockwise, viewed from the drive end

Material combinations

Part no.	Designation	ASTM - Materials / Similar to DIN					
		01	11	02	21	03	31
105.2	Volute casing, upper part	A 48 class 35 GG-25	A 536 class 604018 GGG-40	A 48 class 35 GG-25	A 536 class 604018 GGG-40	A 48 class 35 GG-25	A 536 class 604018 GGG-40
105.1	Volute casing, lower part	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40
211	Shaft	SAE 1045 or AISI 420 C 45 N or 1.4021					
234	Impeller	B 584-90500 G-CuSn10		A 743 CA 6 NM 1.4313.95		A 743 CF 8 M 1.4408	
330	Bearing bracket	A 48 class 30 GG-20					
350	Bearing housing						
360	Bearing cover						
361	Bearing end plate						
452	Gland	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40	A 48 class 30 GG-20	A 536 class 604018 GGG-40
457	Neck ring	B 584-90500 G-CuSn10				A 743 CA 6 NM 1.4313.95	
458	Lantern ring						
471	Seal cover (mech. seal)	A 48 class 30 GG-20					
502	Casing wear ring	B 584-90500 G-CuSn10				A 743 CA 6 NM 1.4313.95	
503	Impeller wear ring						
524	Shaft protecting sleeve	AISI 420 1.4021					
525	Spacer sleeve						
921	Shaft nut	SAE 1020 8.8				AISI 316 A4	

Casing test pressures, flange ratings, shaft details

Pump sizes	Casing materials				Shaft material		Moments of inertia J kgm ² (without coupling)		Casing with double volute
	A48 class 30 (GG-20)	A536 class 604018 (GGG-40)	A48 class 30 (GG-20)	A536 class 604018 (GGG-40)	SAE 1045 (C45N)	AISI 420 (1.4021)	without-water	with water	
	Max. test pressure (bar)		Max. flange rating to DIN (bar)		permissible shaft loading P / n kW / 1/min				
500-510	11	18	10	16	0,582	0,945	3,45	4,875	-
500-640	15	25	10	25	1,19	1,93	7,5	10,35	-
500-700	18	28	16	25	1,61	2,61	10,075	13,95	x
500-790	25	35	25	25	2,11	3,43	13,375	20,825	x
500-890	28	36	25	25	3,45	5,6	23,15	31,25	x
600-540	11	20	10	16	0,582	0,945	5,15	7,275	-
600-620	13,5	22	10	16	0,836	1,36	8,5	11,6	-
600-710	18	27	16	25	1,61	2,61	13,7	18,2	-
600-830	18	27	16	25	2,11	3,43	22,325	30,25	x
700-590	10	18	10	16	1,19	1,93	10,05	12,875	-
700-710	12	20	10	16	1,61	2,61	17,5	23,5	-
700-820	18	24	16	16	1,76	4,48	31,5	35,25	x
800-740	10	16	10	16	1,61	2,61	25,5	31,75	-
800-840	11	17	10	16	2,11	3,43	37,25	46,25	-
800-970	13	20	10	16	3,45	5,6	61,75	72,25	-

Fig. 5

Flanges

- When selecting casing flanges to DIN take the following into consideration:
Nominal pressure of flanges \geq max. operating pressure. Minimum possible nominal pressure is 10 bar (PN 10), for max. nominal pressure see Fig. 5.
- If the suction and discharge flanges have different ratings then the difference must not exceed 1 rating stage (e.G. suction nozzle PN 16 and discharge nozzle PN 25).

Standard test pressure

- $1,2 \cdot (\text{Shut off head} + \text{suction pressure})$ or
 $1,5 \cdot (\text{Head at duty point} + \text{suction pressure})$
 The higher value to be used

Technical data

Impeller dimensions, Shaft diameter, stuffing box packing


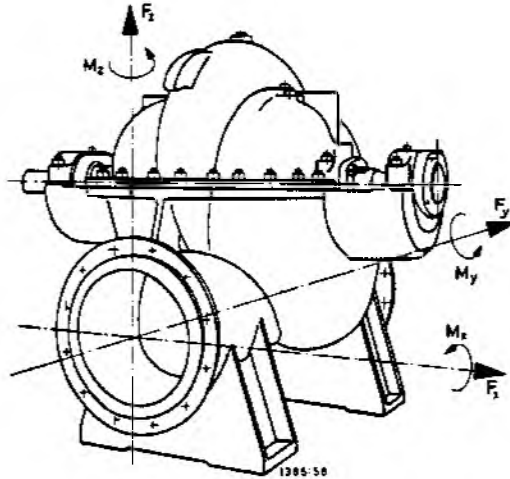
Impeller outlet width Pump sizes	Impeller dimensions [mm]				Shaft diameter d_w [mm]			Stuffing box [mm]	
	A	B	A	B	in stuffing box housing	in mechanical seal (without shaft sleeve)	at coupling	Box dimensions D/d/l 	Packing ring section 5 rings
	Impeller rating b_2		Max. impeller-						
500-510	136	105	500/530	515/505	110	90	75	150/110/150	20x20
500-640	100	108	640	580	130	110	95	170/130/150	20x20
500-170	116	100	708	660	140	130	105	180/140/150	20x20
500-790	100	104	790	710	150	140	115	200/150/180	25x25
500-890	90	88	920	840	180	160	135	230/180/180	25x25
600-540	153	143	570	531/516	110	90	75	150/110/150	20x20
600-620	146	138	620	578/564	120	100	85	160/120/150	20x20
600-710	130	120	715	690	140	130	105	180/140/150	20x20
600-830	115	103	870	770	150	140	115	200/150/180	25x25
700-590	131	148	565	586/555	130	110	95	170/130/150	20x20
700-710	165	157	706/694	648/632	150	140	105	200/150/180	25x25
700-820	134	128	835	735	160	140	125	210/160/180	25x25
800-740	210	190	790/770	720/700	160	150	105	210/160/180	25x25
800-840	206	193	885	840	160	150	115	210/160/180	25x25
800-970	174	160	980	910	180	170	135	230/180/180	25x25

Fig. 4

Forces and moments

The forces and moments specified are mean values for simultaneous loading in 3 planes. Please contact the manufacturer if the forces and moments in one particular direction exceed the stipulated values. The figures in the table do not apply to reaction forces of unbraced expansion joints.

Material: A48 class 30
GG-20



Pump sizes	Nozzle in N			Moments in Nm		
	Fx	Fy	Fz	Mx	My	Mz
500-510	6000	6000	6000	4000	4000	4000
500-640						
500-700						
500-790						
500-890						
600-540	8000	8000	8000	5000	5000	5000
600-620						
600-710	10000	10000	10000	8000	8000	8000
600-830						
700-590						
700-710						
700-820	11000	11000	11000	9000	9000	9000
800-740						
800-840	12000	12000	12000	9000	9000	9000
800-970						

Speeds

For higher speeds consult KSB also stipulating the pump operating range as per selection chart.

Vibrations

Vibration values of the pump according to VDI-Rules 2056, Group G, "good" up to "acceptable", ($V_{eff} < 4,5$ mm/s), in the operating range from 0,8 up to $1,2 \times Q_{Opt}$.

Coating

A) Standard coating for material combination 01 up to 031: non-potable water coating (potable water approval not available!)

without extra charge		Inside	Outside
	Pretreatment	Derusting St 2 DIN 55928 T4	
	Primer	1-Component antirust primer red	
	Top coat	-without-	1-component-coat, thickness 0,06 mm RAL 5002 ultramarinblau (blue)

B) Special coating for material combination 01 up to 031: approved for potable water

against extra charge see on list top coat inside+outside		Inside	Outside
	Pretreatment	Derusting St 2 DIN 55928 T4	
	Primer	1-Component antirust primer red	
	Top coat	2-component-epoxy resin based coat, thickness 0,125 mm, black RAL 9005, approved for potable water	1-component-coat, thickness 0,06 mm RAL 5002 ultramarinblau (blue)

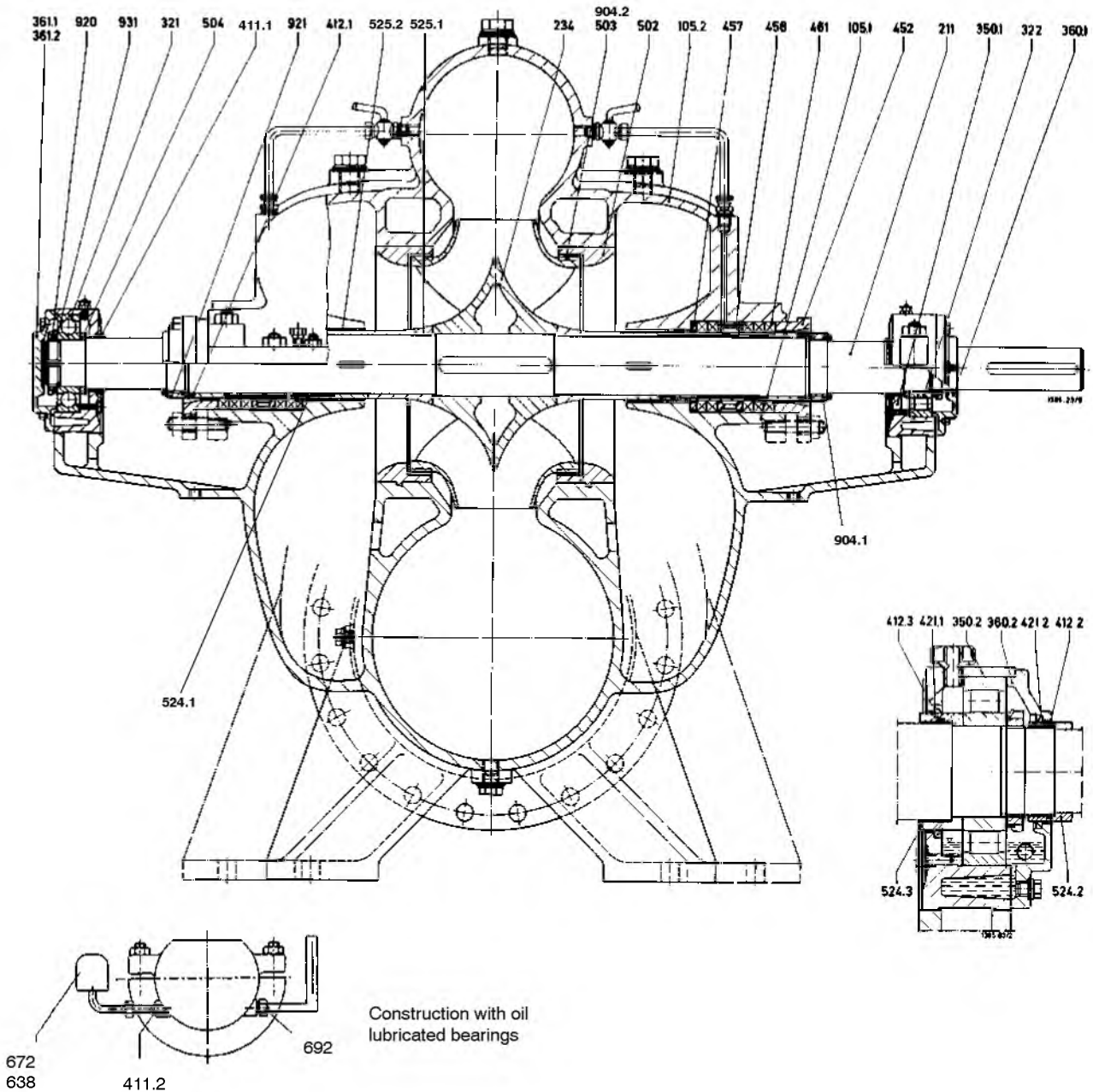
C) Special coating for material combination 01 up to 031: approved for potable water

against extra charge dependent on individual project		Inside	Outside
	Pretreatment	Blasting SA 2 1/2, DIN 55928 T4	
	Primer	2-Component epoxy resin based zinc dust paint, grey, thickness 0,04 mm ¹⁾	
	Top coat	2-component-epoxy resin based coat, thickness 0,125 mm, black RAL 9005, approved for potable water	coating according to customer's specification or by customer itself

¹⁾ Primer suitable for various top coats

Sectional drawing

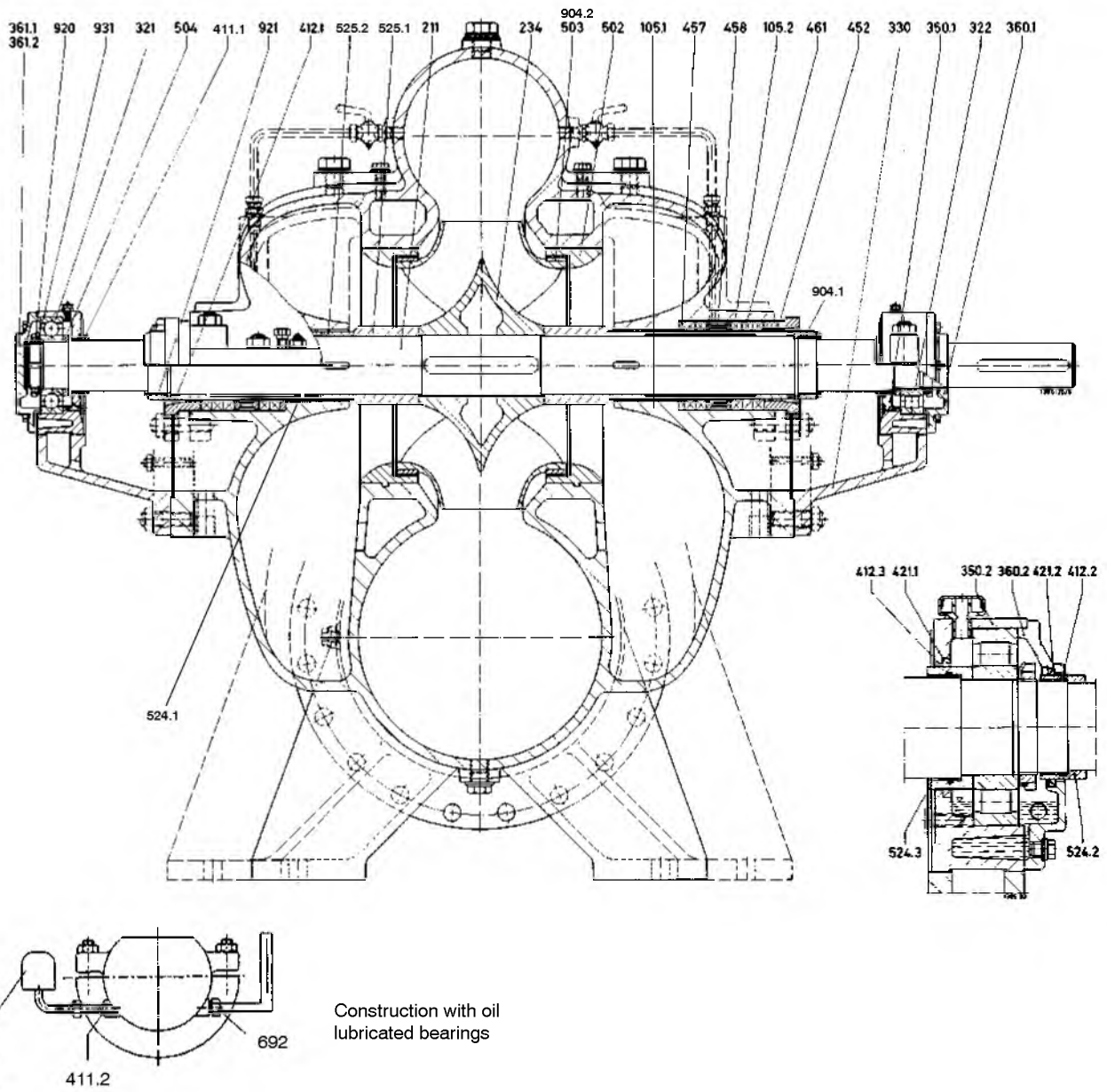
Pump sizes 500-510 up to 500-890



Part no.	Part designation	Part no.	Part designation
105.1-.2	Casing half	458	Lantern ring
211	Pump shaft	461	Gland packing
234	Double entry impeller	502	Casing wear ring
321	Radial ball bearing	503	Impeller wear ring
322	Radial roller bearing	504	Spacer ring
350.1-.2	Bearing housing	524.1-.3	Shaft protecting sleeve
360.1-.2	Bearing cover	525.1-.2	Spacer sleeve
361.1-.2	Bearing end cover	638	Constant level oiler
411.1	Joint ring	672	Venting device
411.2	Joint ring	692	Temperature measuring instrument
412.1-.3	O-ring	904.1-.2	Grub screw
421.1-.2	Radial shaft seal ring	920	Nut
452	Gland	921	Shaft nut
457	Neck ring	931	Lock washer

Sectional drawing

Pump sizes 600-540 up to 800-970



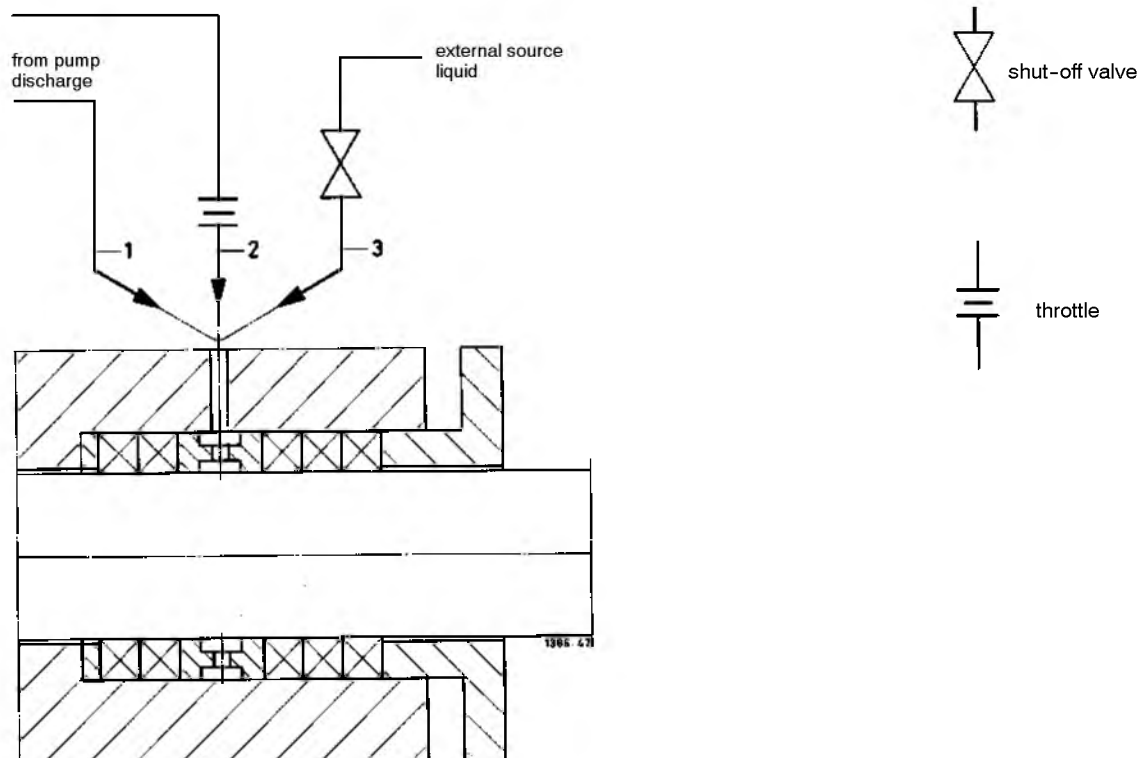
Part no.	Part designation	Part no.	Part designation
105.1-.2	Casing half	457	Neck ring
211	Pump shaft	458	Lantern ring
234	Double entry impeller	461	Gland packing
321	Radial ball bearing	502	Casing wear ring
322	Radial roller bearing	503	Impeller wear ring
330	Bearing bracket	504	Spacer ring
350.1-.2	Bearing housing	524.1-.3	Shaft protecting sleeve
360.1-.2	Bearing cover	525.1-.2	Spacer sleeve
361.1-.2	Bearing end cover	638	Constant level oiler
411.1	Joint ring	672	Venting device
411.2	Joint ring	692	Temperature measuring instrument
412.1-.3	O-ring	904.1-.2	Grub screw
421.1-.2	Radial shaft seal ring	920	Nut
452	Gland	921	Shaft nut
		931	Lock washer

Shaft seal

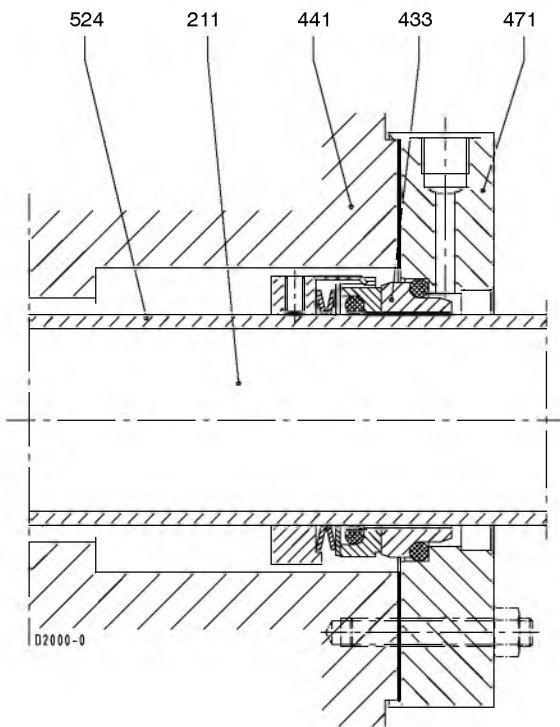
Uncooled soft-packed stuffing box or uncooled single acting, unbalanced mechanical seal, acc. to DIN 24960, independent of direction of rotation.

For operating pressure > 16 bar: balanced mechanical seal.

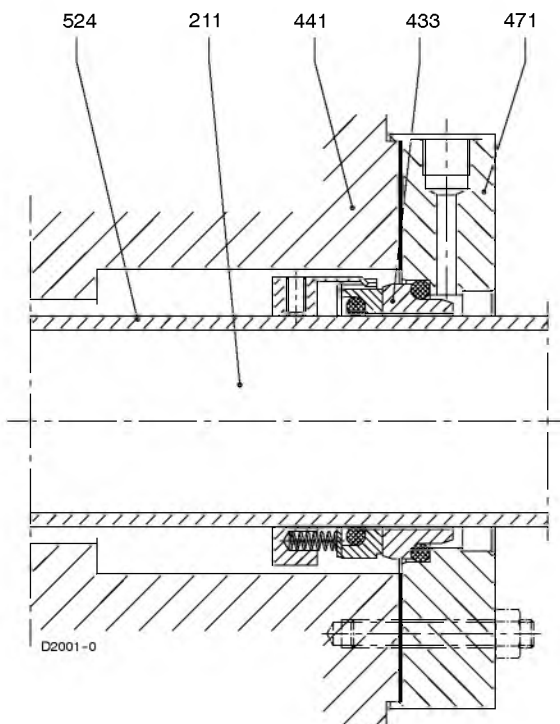
Stuffing box packing



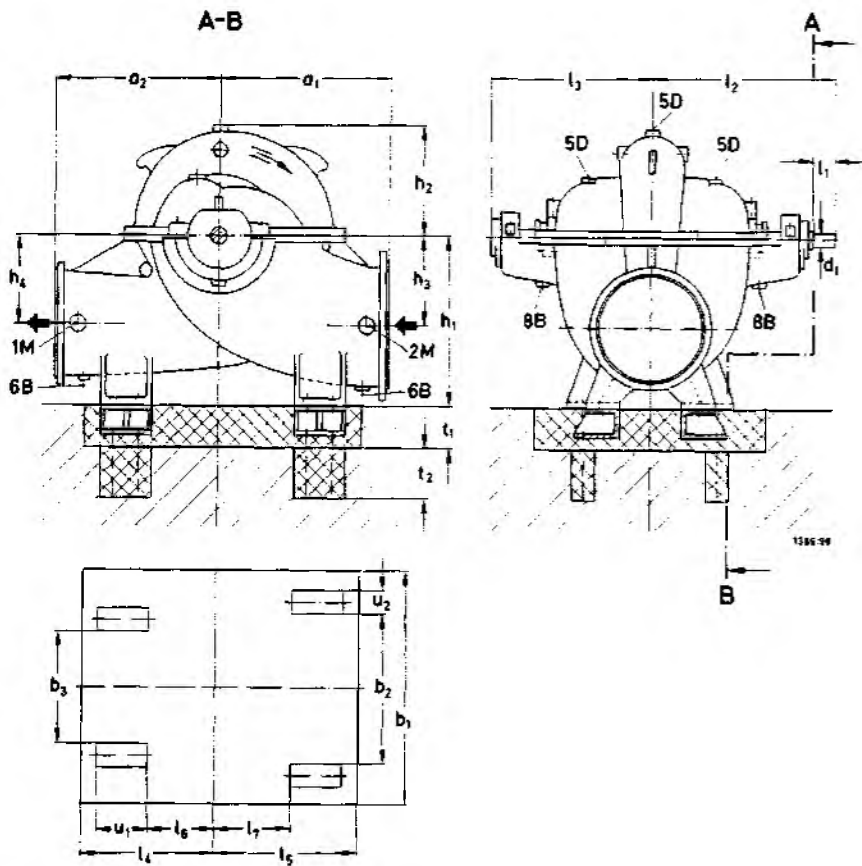
**Standard mechanical seal acc. to DIN 24960
for shaft seal diameter up to 100 mm
(Pump sizes 500-510 and 600-540)**



**Mechanical seal
Shaft seal for shaft seal diameter from 110 mm**



Part no.	Part designation
211	Shaft
433	Mechanical seal
441	Shaft seal housing
471	Seal cover
524	Shaft protecting sleeve

Dimension table for type of installation 2 E

Permissible deviations of dimensions for:

Height of centre	DIN 747
Dimensions without indication of tolerances average to	DIN 7168
Cast iron parts	DIN 1686 GTB 18
Spheroidal graphite cast iron parts	DIN 1685 GTB 18
Cast steel parts	DIN 1683 GTB 18

R = B.S.P.

Key and keyway to DIN 6885

 Shaft diameter: fit h_6 to DIN 7155

Connections

		from RDL 500-510	from RDL 700-590
1 M	Pressure gauge	R 1/2	R 1/2
2 M	Vacuum gauge	R 1/2	R 1/2
5 D	Vent	R 1	R 1 1/2
6 B	Drain	R 1	R 1 1/2
8 B	Dripping water	R 1	R 1


Pump sizes	Flanges		Pump dimensions									Shaft end		Weight of pump [kg]
	suction DN ₁	discharge DN ₂	a ₁	a ₂	h ₁	h ₂	h ₃	h ₄	l ₂	l ₃	d ₁	l ₁ *)		
500-510	600	500	850	550	900	560	475	475	1025	820	75	190	1528	
500-640	600	500	850	800	920	600	495	495	1115	900	95	210	2301	
500-700	600	500	1050	850	1000	620	550	620	1085	855	105	230	2967	
500-790	600	500	1000	900	1050	660	600	600	1175	900	115	250	3483	
500-890	600	500	1050	950	1100	710	650	650	1210	920	135	290	4659	
600-540	700	600	1100	900	1100	750	610	610	1080	885	75	190	2725	
600-620	700	600	1000	1000	1050	650	545	545	1060	840	85	225	2961	
600-710	700	600	1000	1100	1050	650	545	545	1160	930	105	230	3427	
600-830	700	600	1100	1200	1100	760	580	580	1275	1000	115	250	4700	
700-590	800	700	1300	800	1150	720	600	600	1300	1090	95	210	4043	
700-710	800	700	1200	1150	1170	750	620	620	1360	1130	105	230	5329	
700-820	800	700	1250	1250	1200	850	650	650	1440	1160	125	305	6075	
800-740	900	800	1400	950	1380	920	770	770	1410	1180	105	230	6557	
800-840	900	800	1400	1125	1360	900	770	770	1500	1180	115	310	6624	
800-970	900	800	1400	1300	1370	850	760	760	1580	1270	135	310	7809	

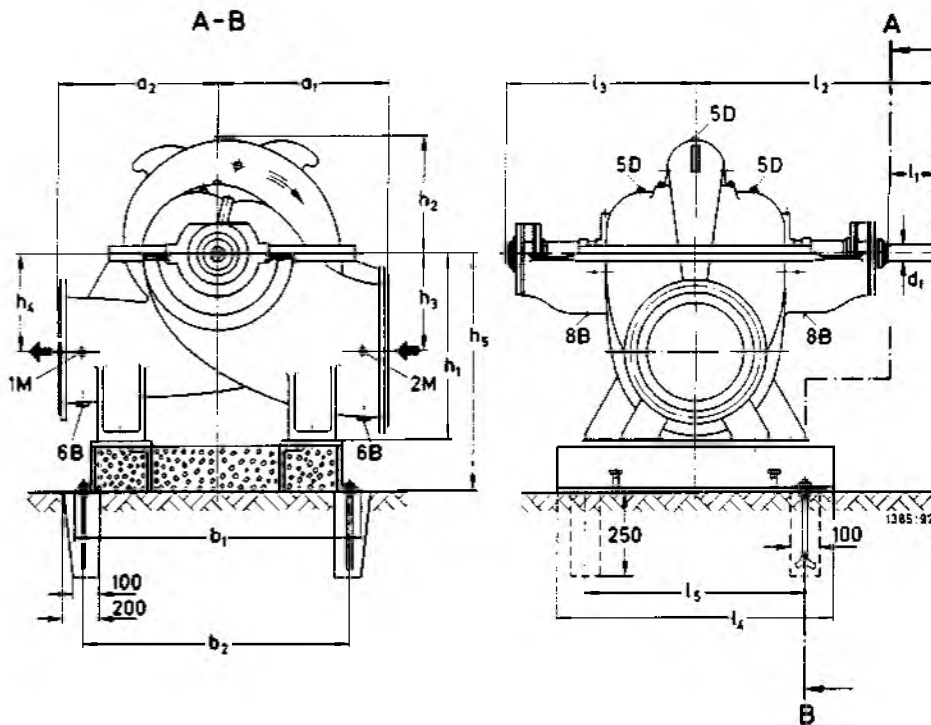
Pump sizes	Foundation dimensions											Max. flange rating to DIN [bar]	
	b ₁	b ₂	b ₃	l ₄	l ₅	l ₆	l ₇	t ₁	t ₂	u ₁	u ₂	Casing material	
												GG-20 A48 class 30	GGG-40 A536 class 604018
500-510	1440	1000	700	460	610	140	290	220	300	220	120	10	16
500-640	1440	1000	700	660	660	340	340	220	300	220	120	10	25
500-700	1540	1100	700	710	810	390	490	220	300	220	120	16	25
500-790	1540	1100	725	760	860	440	540	220	300	220	120	25	25
500-890	1440	1000	750	810	910	490	590	220	300	220	120	25	25
600-540	1450	950	650	800	900	400	500	220	300	300	150	10	16
600-620	1450	950	650	900	900	500	500	220	300	300	150	10	16
600-710	1550	1050	750	900	900	500	500	220	300	300	150	16	25
600-830	1550	1050	750	1000	900	600	500	220	300	300	150	16	25
700-590	1440	940	640	700	1000	250	550	250	300	350	150	10	16
700-710	1440	940	640	1000	1000	550	55	250	300	350	150	10	16
700-820	1440	940	640	1050	1050	600	600	250	300	350	150	16	16
800-740	1540	1040	740	850	1000	350	500	250	300	400	150	10	16
800-840	1540	1040	740	1000	1050	500	550	250	300	400	150	10	16
800-970	1540	1040	740	1000	1100	600	600	250	300	400	150	10	16

Dimensions in mm, non-certified

 *) Dimensions are for pumps with grease-lubricated bearings, with oil lubricated bearings shorten l₁ by 20 mm

We reserve the right to make technical changes

				Pos.-no.	Enclosure	
				Dimension Table RDL -		
				Project-no. / Works-no.	No.	
Date	Name	Change				

Dimension table for type of installation 4 E


The base frame must be grouted in after alignment with self-hardening mortar.

Permissible deviations of dimensions for:

Height of centre	DIN 747
Dimensions without indication of tolerances average to	
Cast iron parts	DIN 1686 GTB 18
Spheroidal graphite cast iron parts	DIN 1685 GTB 18
Cast steel parts	DIN 1683 GTB 18

R = B.S.P.

Key and keyway to DIN 6885
 Shaft diameter: fit h_6 to DIN 7155
 DIN 7168

Connections

		from RDL 500-510	from RDL 700-590
1 M	Pressure gauge	R 1/2	R 1/2
2 M	Vacuum gauge	R 1/2	R 1/2
5 D	Vent	R 1	R 1 1/2
6 B	Drain	R 1	R 1 1/2
8 B	Dripping water	R 1	R 1

Pump size	Flanges		Pump dimensions								Shaft end		Weight of pump [kg]
	suction DN ₁	discharge DN ₂	a ₁	a ₂	h ₁	h ₂	h ₃	h ₄	l ₂	l ₃	d ₁	l ₁ *)	
500-510	600	500	850	550	900	560	475	475	1025	820	75	190	1528
500-640	600	500	850	800	920	600	495	495	1115	900	95	210	2301
500-700	600	500	1050	850	1000	620	550	620	1085	855	105	230	2967
500-790	600	500	1000	900	1050	660	600	600	1175	900	115	250	3483
500-890	600	500	1050	950	1100	710	650	650	1210	920	135	290	4659
600-540	700	600	1100	900	1100	750	610	610	1080	885	75	190	2725
600-620	700	600	1000	1000	1050	650	545	545	1060	840	85	225	2961
600-710	700	600	1000	1100	1050	650	545	545	1160	930	105	230	3427
600-830	700	600	1100	1200	1100	760	580	580	1275	1000	115	250	4700
700-590	800	700	1300	800	1150	720	600	600	1300	1090	95	210	4043
700-710	800	700	1200	1150	1170	750	620	620	1360	1130	105	230	5329
700-820	800	700	1250	1250	1200	850	650	650	1440	1160	125	305	6075
800-740	900	800	1400	950	1380	920	770	770	1410	1180	105	230	6557
800-840	900	800	1400	1125	1360	900	770	770	1500	1180	115	310	6624
800-970	900	800	1400	1300	1370	850	760	760	1580	1270	135	310	7809

Pump size	Baseframe dimensions					Max. flange rating to DIN [bar]	
						Casing material	
	b ₁	b ₂	h ₅	l ₄	l ₅	GG-20 A48 class 30	GGG-40 A536 class 604018
500-510	1300	1220	1100	1150	850	10	16
500-640	1400	1320	1130	1150	850	10	25
500-700	1700	1620	1210	1250	950	16	25
500-790	1800	1720	1260	1250	950	25	25
500-890	1900	1820	1310	1150	850	25	25
600-540	1800	1720	1310	1150	850	10	16
600-620	1800	1720	1260	1150	850	10	16
600-710	1800	1720	1260	1250	950	16	25
600-830	2000	1920	1310	1250	950	16	25
700-590	2000	1920	1360	1250	950	10	16
700-710	2000	1920	1380	1250	950	10	16
700-820	2100	2020	1410	1250	950	16	16
800-740	2000	1920	1590	1350	1050	10	16
800-840	2100	2020	1570	1350	1050	10	16
800-970	2200	2120	1580	1350	1050	10	16

Dimensions in mm, non-certified

 *) Dimensions are for pumps with grease-lubricated bearings, with oil lubricated bearings shorten l₁ by 20 mm

We reserve the right to make technical changes

				Pos.-no.	Enclosure
				Dimension Table RDL -	
				Project-no. / Works-no.	No.
Date	Name	Change			

Spare parts

Proposals for Spare Parts for 2 - Years Operation (8000 hours per year)

Pump with soft packed Stuffing Box

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 920 921 940	Shaft, with Nut Shaft nut Key	-	-	-	1	1	1	2	3
234	Impeller	-	-	-	1	1	1	2	3
321 / 322	Set Bearings	1	1	1	2	2	3	4	5
452	Set Gland	-	-	-	1	1	1	2	3
411.1 412.1 - 3 421.1/2	Set Joint-Ring O-Ring Radial shaft seal ring	1	2	3	4	5	6	8	10
461	Set Gland packing	4	8	12	16	20	24	32	40
457	Set neck rings	-	-	-	1	1	1	2	3
458	Set lantern rings	-	-	-	1	1	1	2	3
502	Set casing wear rings	1	1	1	2	2	3	4	5
503 904.2	Set impeller wear rings Grub screw	1	1	1	2	2	3	4	5
524.1 - 3	Set shaft protec. sleeves	1	1	1	2	2	3	4	5
525.1-2	Distance sleeve	1	1	1	2	2	3	4	5

Pump with Mechanical Seal

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 920 921 940	Shaft, with Nut Shaft nut Key	-	-	-	1	1	1	2	3
234	Impeller	-	-	-	1	1	1	2	3
321 / 322	Set Bearings	1	1	1	2	2	3	4	5
411.1 412.1 - 3 421.1/2	Set Joint-Ring O-Ring Radial shaft seal ring	1	2	3	4	5	6	8	10
433	Set mechanical seals	1	1	1	2	2	3	4	5
502	Set casing wear rings	1	1	1	2	2	3	4	5
503 904.2	Set impeller wear rings Grub screw	1	1	1	2	2	3	4	5
524.1 - 3	Set shaft protec. sleeves	1	1	1	2	2	3	4	5
525.1-2	Distance sleeve	1	1	1	2	2	3	4	5

Proposals for Spare Parts for 5 - Years Operation (8000 hours per year)
Pump with soft packed Stuffing Box

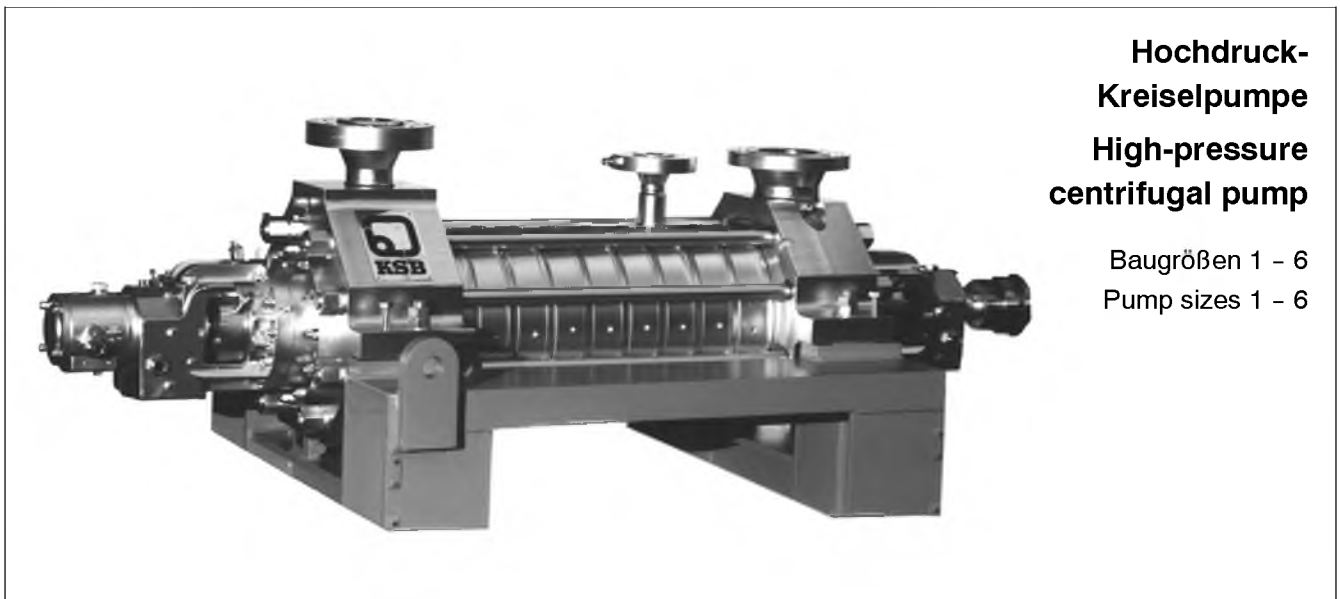
Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 920 921 940	Shaft, with Nut Shaft nut Key	1	1	1	2	2	2	4	6
234	Impeller	1	1	1	2	2	2	4	6
321 / 322	Set Bearings	2	2	2	4	4	6	8	10
452	Set Gland	1	1	1	2	2	2	4	6
411.1 412.1 - 3 421.1/2	Set Joint-Ring O-Ring Radial shaft seal ring	2	2	6	8	8	12	16	20
461	Set Gland packing	10	20	30	40	50	60	80	100
457	Set neck rings	1	1	1	2	2	2	4	6
458	Set lantern rings	1	1	1	2	2	2	4	6
502	Set casing wear rings	2	2	2	4	4	6	8	10
503 904.2	Set impeller wear rings Grub screw	2	2	2	4	4	6	8	10
524.1 - 3	Set shaft protec. sleeves	2	2	2	4	4	6	8	10
525.1-2	Distance sleeve	2	2	2	4	4	6	8	10

Pump with Mechanical Seal

Part No.	Part Designation	No. of Pumps including Stand-By Pumps							
		1	2	3	4	5	6	8	10 and more
		No. of Spare Parts							
211 920 921 940	Shaft, with Nut Shaft nut Key	1	1	1	2	2	2	4	6
234	Impeller	1	1	1	2	2	2	4	6
321 / 322	Set Bearings	2	2	2	4	4	6	8	10
411.1 412.1 - 3 421.1/2	Set Joint-Ring O-Ring Radial shaft seal ring	2	2	6	8	8	12	16	20
433	Set mechanical seals	2	2	2	4	4	6	8	10
502	Set casing wear rings	2	2	2	4	4	6	8	10
503 904.2	Set impeller wear rings Grub screw	2	2	2	4	4	6	8	10
524.1 - 3	Set shaft protec. sleeves	2	2	2	4	4	6	8	10
525.1-2	Distance sleeve	2	2	2	4	4	6	8	10

Accessories

- 1 shock pulse monitoring stud
- 1 set seal pipe with 1 cyclone separator (for handling contaminated fluids)
including:
 - cyclone separator plastic
 - flow indicator of stainless steel
 - shut-off valve of stainless steel
 - connectors + piping of stainless steel
- 1 vent valve, manually operated of stainless steel
including:
 - connectors
- 1 temperature monitoring devise for antifriction bearings
for each bearing consisting of:
 - 1 resistance thermometer PT 100,
2-wire system, with 2m connection cable
 - 1 adaptor of stainless steel
- 1 signal transmitter for PT 100 control room mounting
 - output signal 0-20 mA, voltage optional AC 110 V or 220 V
- 1 set pressure gauges acc. to DIN 16064
consisting of:
 - 1 pressure gauge BSP 1/2, 100 mm, grade of quality 1,0
 - 1 pressure-vacuum gauge BSP 1/2, 100 mm, grade of quality 1,0
 - 2 pressure gauge cocks BSP 1/2 incl. brackets



**Hochdruck-
Kreiselpumpe**
**High-pressure
centrifugal pump**

Baugrößen 1 - 6
Pump sizes 1 - 6

Einsatzgebiete

- Speisewasser- und Kondensatförderung in Kraftwerken und Industrieanlagen
- Druckwassererzeugung, z.B. für Press-, Entrindungs-, Entzunderungsanlagen und Schneekanonen

Fields of Application

- Handling feed water and condensate in power stations and industrial plants
- Generation of pressurized water, e.g. for presses, decorticator, descaling plants and snow generators

Betriebsdaten

Förderstrom bei max. Drehzahl	Q bis	400 l/s
Förderhöhen	H bis	4200 m
Förderguttemperatur	T bis	200 °C
Pumpenzulaufdruck	p_s bis	30 bar
Pumpenenddruck	p_d bis	420 bar
Drehzahlen	n bis	7000 min ⁻¹

Operating Data

Capacity at max. speed	Q up to	400 l/s
Heads	H up to	4200 m
Temperature of medium handled	T up to	200 °C
Pump suction pressure	p_s up to	30 bar
Pump discharge pressure	p_d up to	420 bar
Speeds	n up to	7000 min ⁻¹

Bauart

Horizontale, quergeteilte Gliederpumpe mit Radialrädern, ein- oder zweiströmig, mehrstufig. Die Gehäuse sind untereinander mit O-Ringen oder metallisch an den Stirnflächen abgedichtet und durch Verbindungsschrauben verspannt.

Design

Horizontal, radially split, ring-section pump with radial impellers, single or double-flow entry, multistage. The stages are sealed against each other by O-rings or by metallic sealing faces and fastened by tie bolts.

Pumpenfüße

	Ort / Stellung
HG 1	1. Stufengehäuse und Druckgehäuse / unten
HG 2	1. Stufengehäuse und Druckgehäuse / unten
HG 2	1. Stufengehäuse und Druckgehäuse / Achsmitte
HG 3	1. Stufengehäuse und Druckgehäuse / Achsmitte
HG 3	Sauggehäuse und Druckgehäuse / Achsmitte
HG 3-6	Sauggehäuse und Druckgehäuse / Achsmitte

Radiallager, Schmierung

Wälzlager ungekühlt, Ringschmierung
 Wälzlager gekühlt, Ringschmierung
 Gleitlager ungekühlt, Ringschmierung
 Gleitlager gekühlt, Ringschmierung
 Gleitlager, Druckölschmierung

Axiallager, Schmierung

Wälzlager gekühlt, Ringschmierung (HG 1-3)
 Gleitlager, Druckölschmierung (HG 1-6)

Entlastungseinrichtung

Axialschubausgleich durch die hydraulische Entlastungseinrichtung an der Druckseite. Entlastung durch Scheibe oder Doppelkolben.

Wellendichtung

Packungsstopfbuchse ungekühlt oder gekühlt.
 Gleitringdichtung ungekühlt, mit Mantelkühlung, Gegenringkühlung, Injektion oder Zirkulation.
 Die Welle ist im Bereich der Dichtung mit auswechselbarer Wellenhülse versehen.

Stutzenstellung

Saugstutzen: Radial, senkrecht nach oben oder unten
 Druckstutzen: Radial, senkrecht nach oben
 Anzapfung: Radial, in allen Stufengehäusen, in verschiedenen Richtungen, auf Anfrage.

Flansche

Anschlussmaße nach EN oder ASME.

Antrieb

Direkt durch E-Motor, Turbine oder Verbrennungsmotor oder indirekt über Getriebe, hydraulische Regelkupplung oder Getrieberegelnkupplung.

Pump Feet

HG 1	1st stage casing and discharge casing / bottom
HG 2	1st stage casing and discharge casing / bottom
HG 2	1st stage casing and discharge casing / centerline
HG 3	1st stage casing and discharge casing / centerline
HG 3	Suction casing and discharge casing / centerline
HG 3-6	Suction casing and discharge casing / centerline

Radial Bearing, Lubrication

Rolling element bearing uncooled, oil ring lubrication
 Rolling element bearing cooled, oil ring lubrication
 Plain bearing uncooled, oil ring lubrication
 Plain bearing cooled, oil ring lubrication
 Plain bearing, forced oil lubrication

Thrust Bearing, Lubrication

Rolling element bearing cooled, oil ring lubrication (HG 1-3)
 Plain bearing, forced oil lubrication (HG 1-6)

Balancing Device

Thrust compensation by the hydraulic balancing device located at the discharge side. Balancing by disc or double piston.

Shaft Seal

Packed stuffing box uncooled or cooled.
 Mechanical seal uncooled, with jacket cooling, seat ring cooling, injection or circulation.
 The shaft is provided with exchangeable shaft sleeve in the shaft seal area.

Nozzle Orientation

Suction nozzle: radially, vertically upwards or vertically downwards
 Discharge nozzle: radially, vertically upwards
 Tapping nozzle: radially, in all stage casings, in various directions, upon request.

Flanges

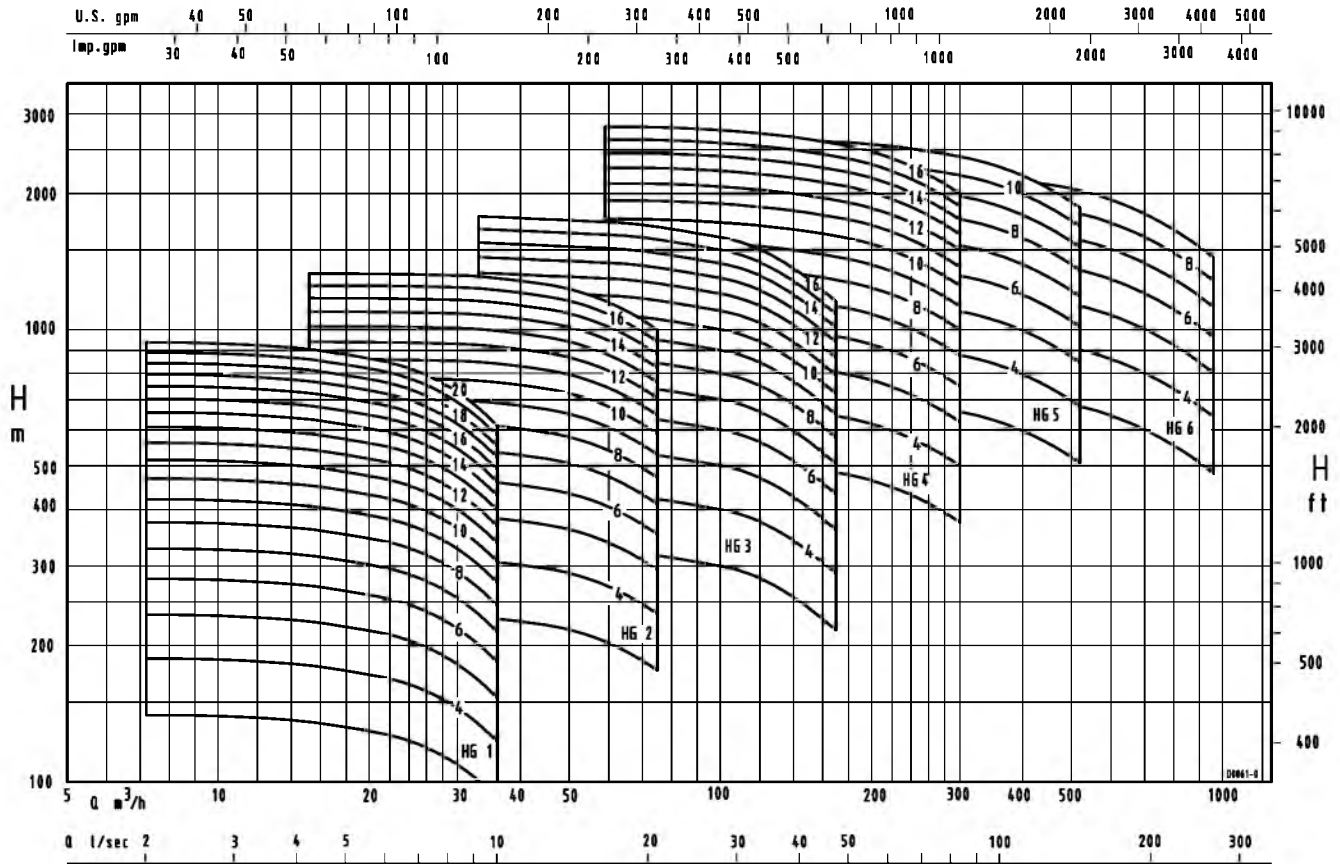
Connection dimensions according to EN or ASME.

Drive

Direct by electric motor, turbine or combustion engine, or indirect through a gearbox, hydraulic coupling or variable speed coupling.

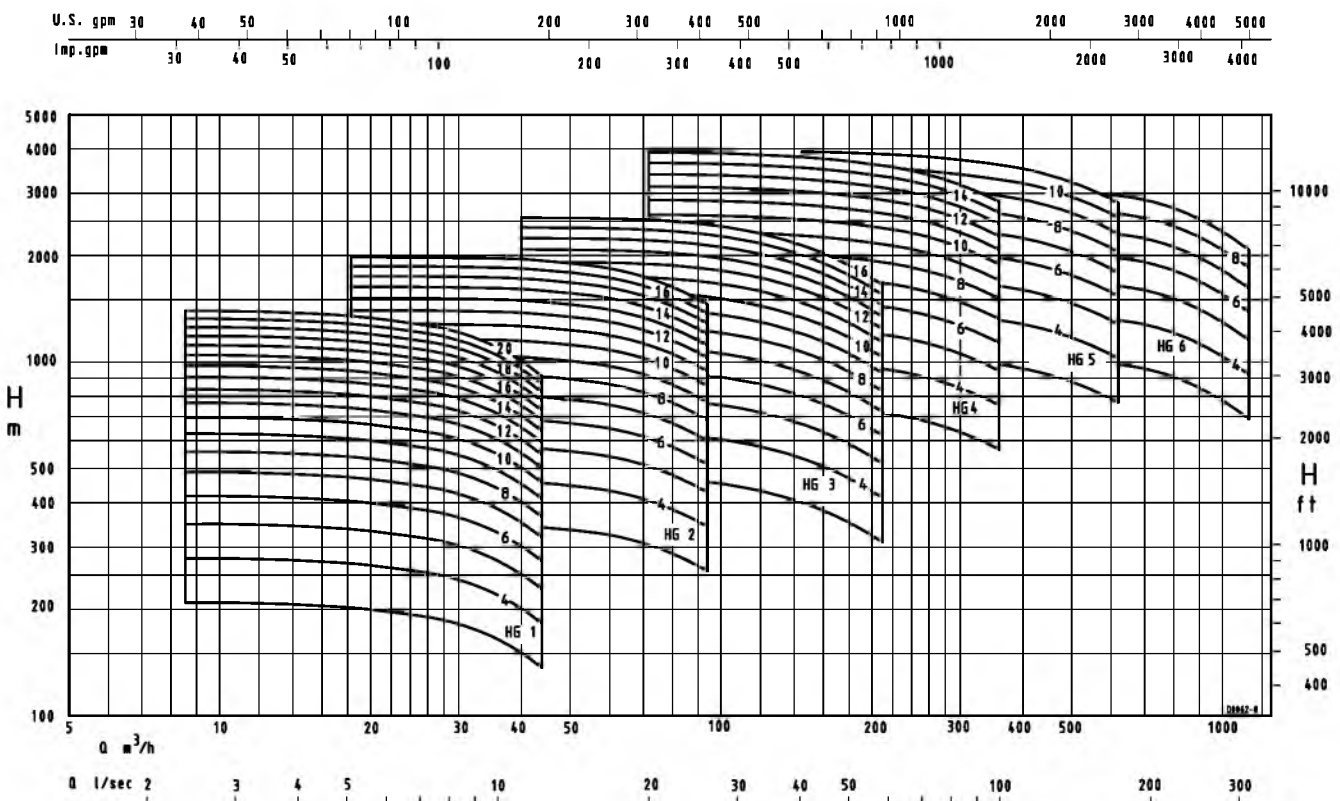
Sammelkennfeld 50 Hz $n = 2950 \text{ min}^{-1}$

Selection Chart 50 Hz

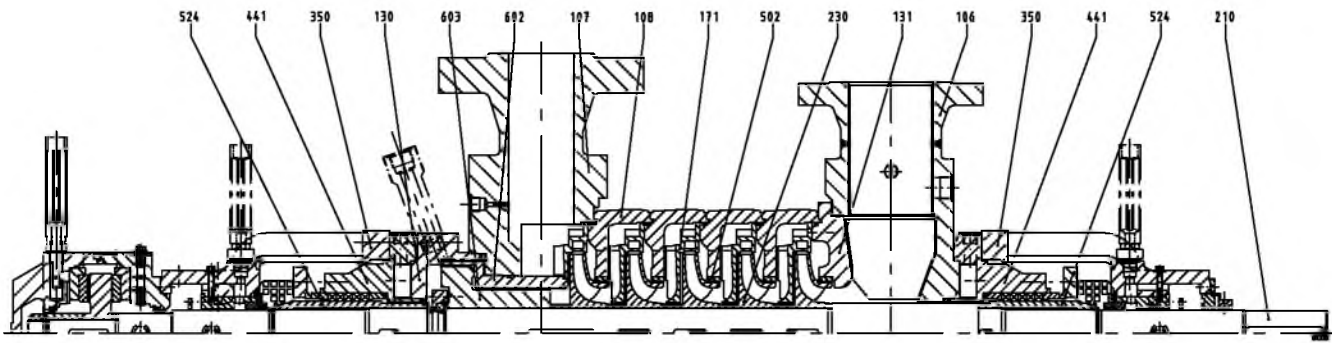


Sammelkennfeld 60 Hz $n = 3550 \text{ min}^{-1}$

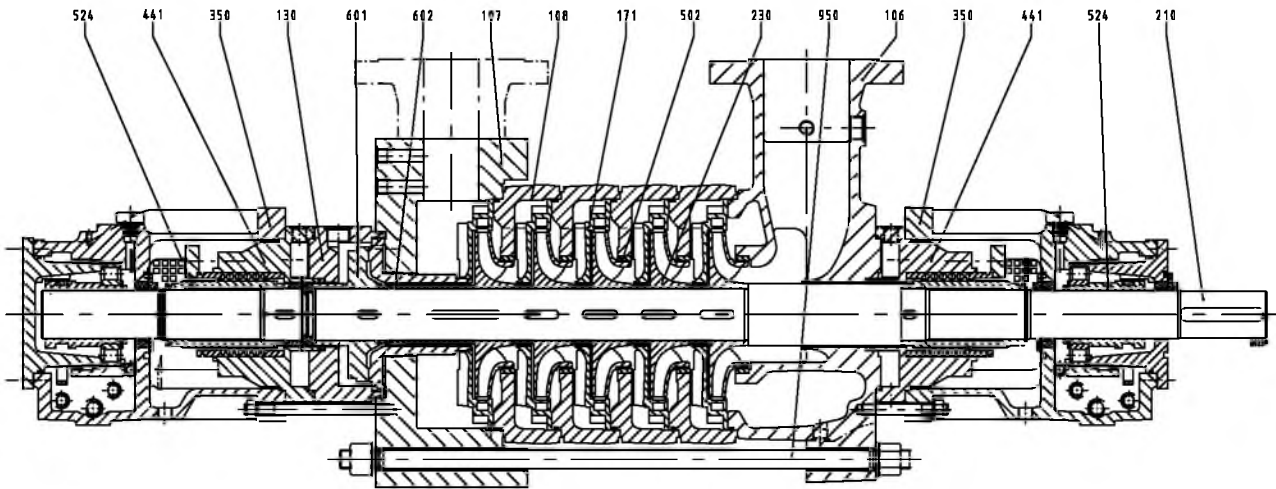
Selection Chart 60 Hz



Teilverzeichnis / List of Components



Beispiel: Gleitlager, Entlastungskolben, Packung gekühlt, Sauggehäuse Stahl, Druckgehäuse mit Vorschweißflansch,
 Example: Plain bearing, Balance drum, Packed stuffing box cooled, Suction casing forged, Discharge casing with welding neck flange,



Beispiel: Wälzlager, Entlastungsscheibe, Packung gekühlt, Sauggehäuse Guß, Druckgehäuse mit Blockflansch,
 Example: Rolling element bearing, Balance disc, Packed stuffing box cooled, Suction casing cast, Discharge casing with integral flange

Werkstoffe / Materials

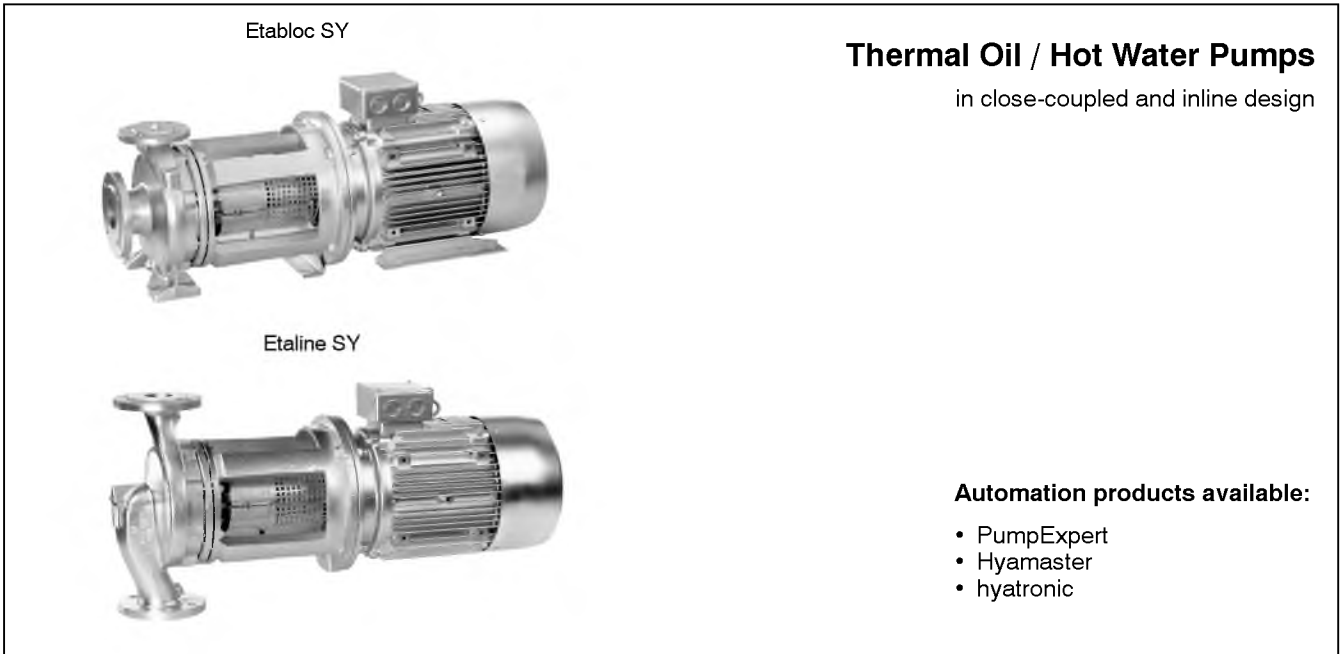
Teile-Nr. Part No.	Benennung Designation	Werkstoffauswahl / Material Selection	
		HGB	HGC
106	Sauggehäuse - suction casing	C-Stahl / C-steel	C-Stahl plattiert, Cr-Stahl / C-steel plated, Cr-steel
107	Druckgehäuse - discharge casing	C-Stahl / C-steel	C-Stahl plattiert, Cr-Stahl / C-steel plated, Cr-steel
108	Stufengehäuse - stage casing	C-Stahl / C-steel	Cr-Stahl / Cr-steel
130	Gehäuseteil - casing part	C-Stahl / C-steel	Cr-Stahl / Cr-steel
131	Einlaufring - inlet ring	C-Stahl, Cr-Stahl / C-steel, C-steel, Cr-steel	
171	Leitrad - diffuser	Grauguß, Cr-Stahl / Cast iron, Cr-steel	
210	Welle - shaft	C-Stahl, Cr-Stahl / C-steel, C-steel, Cr-steel	
230	Laufrad - impeller	Grauguß, Cr-Stahlguß / Cast iron, Cr-steel casting	
350	Lagergehäuse - bearing housing	Grauguß / Cast iron	
441	Gehäuse für Dichtung - shaft seal housing	C-Stahl, Cr-Stahl / C-steel, Cr-steel	
502	Spaltring - casing wear ring	Cr-Stahl / Cr-steel	
524	Wellenschutzhülse - shaft protecting sleeve	Cr-Stahl / Cr-steel	
601	Entlastungsscheibe - balance disc	Cr-Stahl / Cr-steel	
602	Entlastungsgegenscheibe - balance disc seat	Cr-Stahl / Cr-steel	
603	Entlastungskolben - balance drum	Cr-Stahl / Cr-steel	
905	Verbindungsschraube - tie bolt	Vergütungsstahl / quenched and tempered steel	

Technische Änderungen bleiben vorbehalten.
Subject to technical modifications

XBS

05.10

1850.1/08-90



Thermal Oil / Hot Water Pumps

in close-coupled and inline design

Automation products available:

- PumpExpert
- Hyamaster
- hyatronic

Fields of Application

Etabloc SY, Etaline SY pumps are used in heat transfer systems (DIN 4754) or in hot water circulation systems.

Operating Data

	50 Hz		60 Hz	
	Thermal oil	Hot water	Thermal oil	Hot water
Q	up to 280 m ³ /h, 78l/s		up to 325 m ³ /h, 90l/s	
H	up to 67 m		up to 97 m	
t	-30 up to +350 °C	up to +180 °C	-30 up to +350 °C	up to +180 °C
p ₂ ¹⁾	up to 16 bar		up to 16 bar	

1) see pressure/temperature limits given on page 5 of type series booklet 1170.5-10

Design

Volute casing pump, single-stage, with standardized motor. Pump and motor shaft rigidly connected.

Etabloc SY: close-coupled pump

Etaline SY: close-coupled pump in in-line design

Bearings

Product-lubricated plain bearings

Shaft Seal

Mechanical seal to EN 12 756.

Materials

Volute casing	Nodular cast iron JS1025 ²⁾
Discharge cover	Nodular cast iron JS1025 ²⁾
Shaft	Chrome steel 1.4021.05 HRC 55
Impeller	Grey cast iron JL1040 ³⁾
Casing wear rings	Grey cast iron GG
Drive lantern	Grey cast iron JL1040 ³⁾
Bearing housing	Nodular cast iron JS1025 ²⁾

2) to EN 1563: GJS-400-18-LT

3) to EN 1561: GJL-250

Drive

Surface-cooled KSB IEC three-phase squirrel cage motor

Winding: 50 Hz up to 2,2 kW 220-240 V/380-420 V
for 3 kW 380-420 V/660-725 V
60 Hz up to 2,6 kW 440-480 V
for 3,6 kW 440-480 V

Design: IM V1

Enclosure: IP 55

Thermal class: F with temperature sensors:
3 PTC thermistors

Operating mode: continuous operation S1
or

surface-cooled three-phase squirrel cage motor as described above, but West European brand to KSB's choice.

Contact Guard

Guard in drive lantern to EN 294.

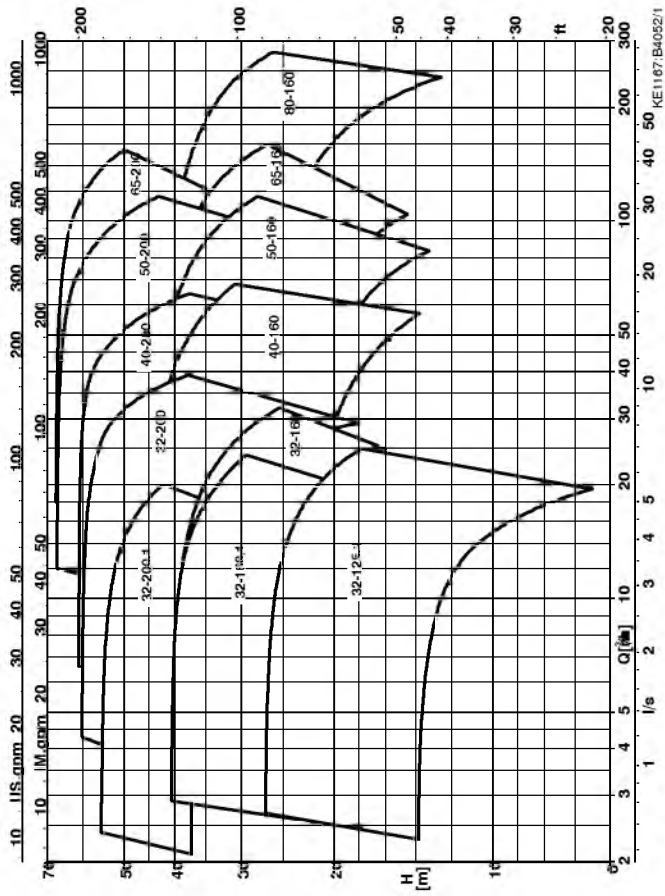
Designation

Etabloc 80 - 160 / 150 2 S Y
 Type series, e.g. _____
 Pump size, e.g. _____
 Nominal impeller diameter in mm _____
 Motor rating: kW x 10 (example 15 kW) _____
 Number of motor poles _____
 Casing material nodular cast iron JS1025²⁾ _____
 Thermal oil/Hot water variant _____

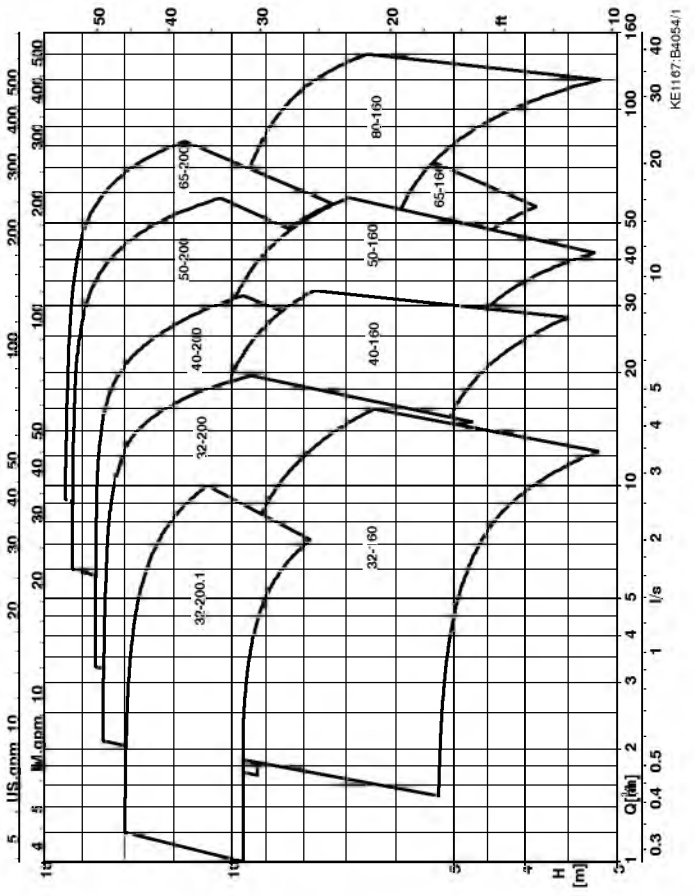
Certification

Certified quality management ISO 9001.

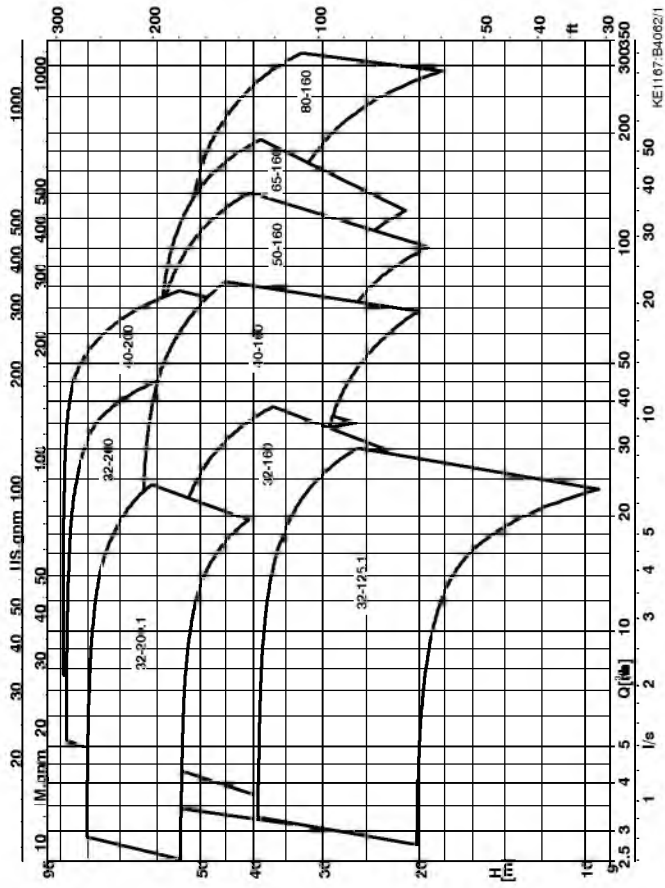
Etabloc SY
 $n \approx 2900$ 1/min



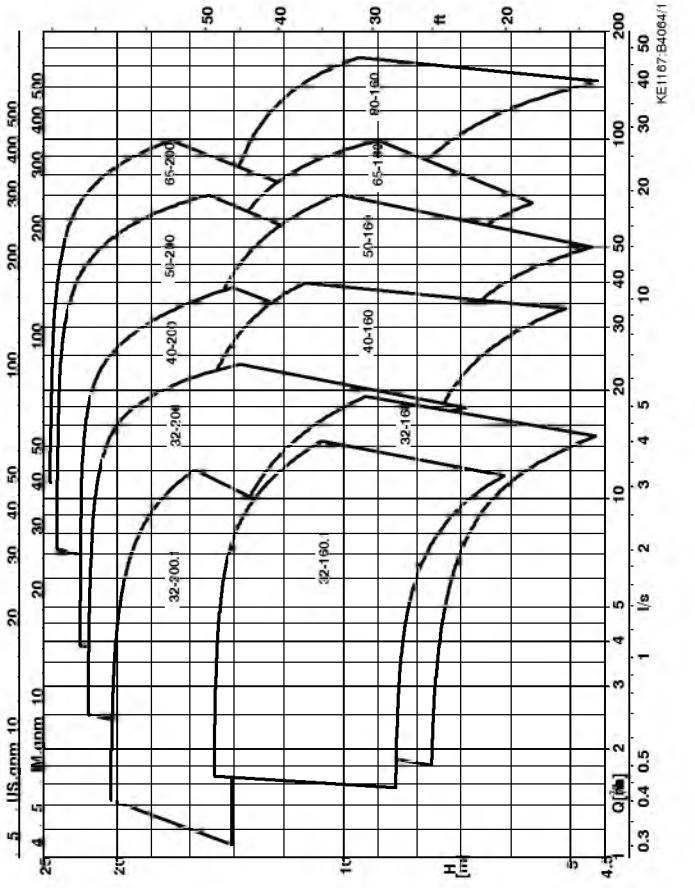
$n \approx 1450$ 1/min



$n \approx 3500$ 1/min

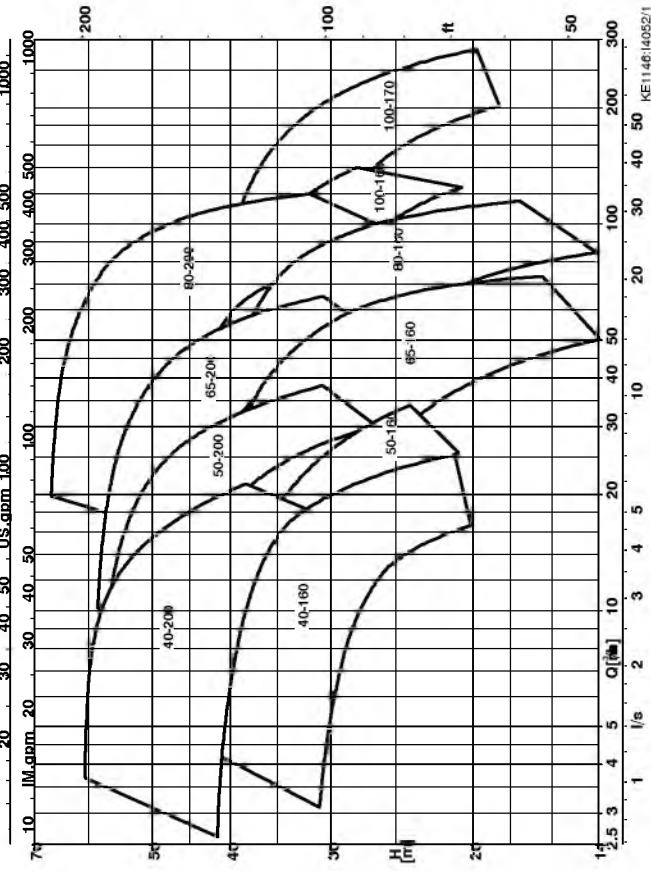


$n \approx 1750$ 1/min

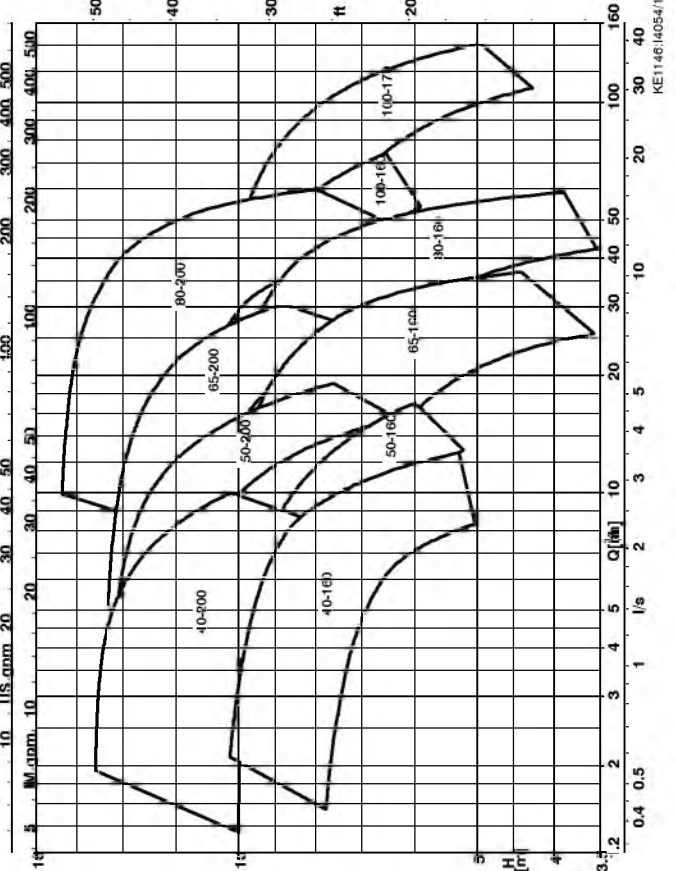


Etaline SY

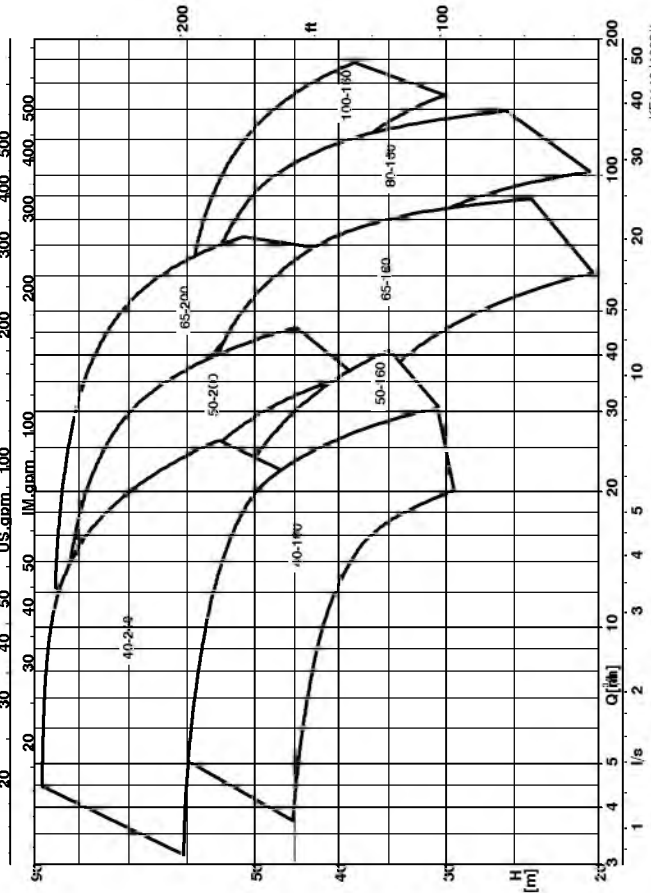
$n \approx 2900$ 1/min



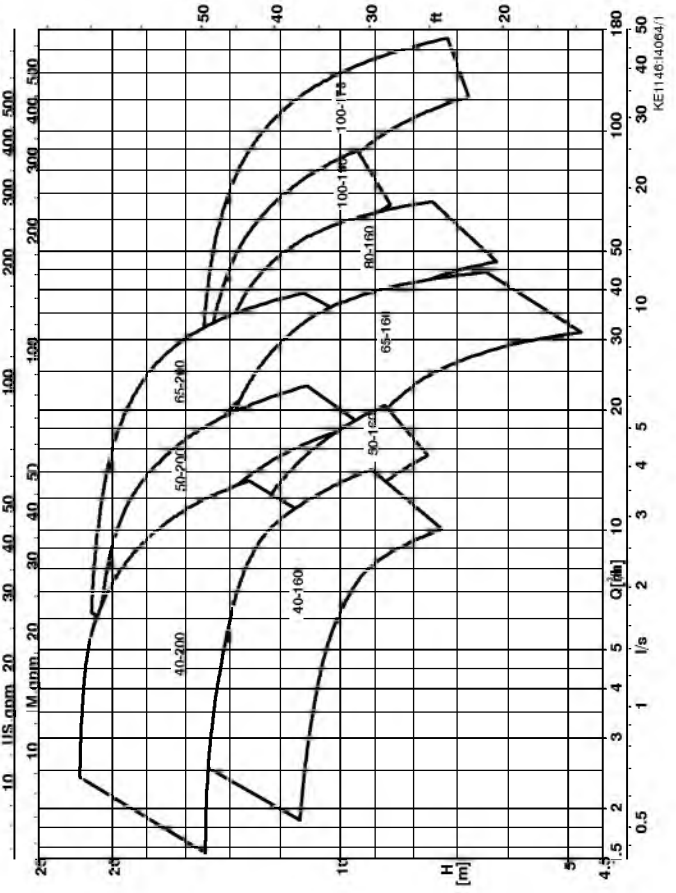
$n \approx 1450$ 1/min



$n \approx 3500$ 1/min



$n \approx 1750$ 1/min



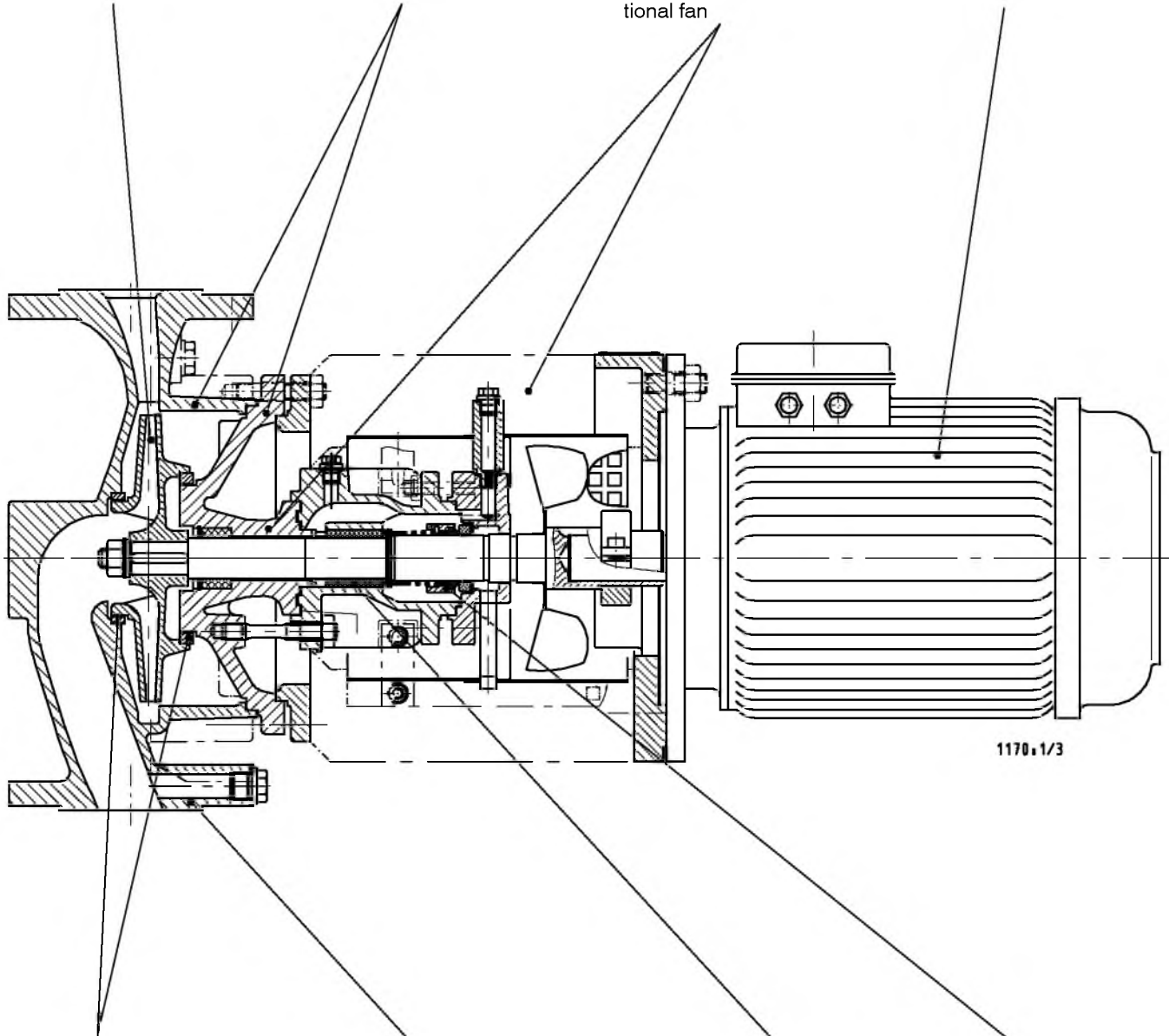
Etaline SY

Impeller with optimized hydraulics, excellent efficiencies

Pressure boundary designed for 16 bar, made of nodular cast iron

No cooling water required, long cooling-down distances, large cooling fins, with additional fan

Service-friendly, robust KSB IEC three-phase motor



Casing wear rings service-friendly, no wear on the casing/impeller

Inline design simplifies installation and piping layout, insensitive to external nozzle forces and moments

Product-lubricated anti-seize **carbon bearing**, high operating reliability

Reliable **standardized mechanical seal**

Subject to technical modification without prior notice.

1.3.2006

1170.1/6-10

BOAVENT-SVA

Three function automatic air valve for sewage

PN 16
DN 50 - 200



Benefits at a glance

- Available from 2" with compact design
- Large lower body with strongly sloped walls to avoid deposits
- Mobile block double guided
- Air release system in AISI 316 (pat. pending)
- Drain port for maintenance and inspection
- Upper cap to protect the air release mechanism against spurts and projections during rapid filling operations

Applications

- For waste water and raw sewage
- Version in stainless steel model SCS available for industry
- Other applications on request

Operating data

- Maximum permissible pressure: 16 bar
- Minimum working pressure: 0.3 bar
- Maximum permissible temperature: 70° C

Materials

- Body/Cover: ductile iron GS 400-15 epoxy coated
- Float, rod, upper guide : AISI 316
- Obturator: solid polypropylene

Design

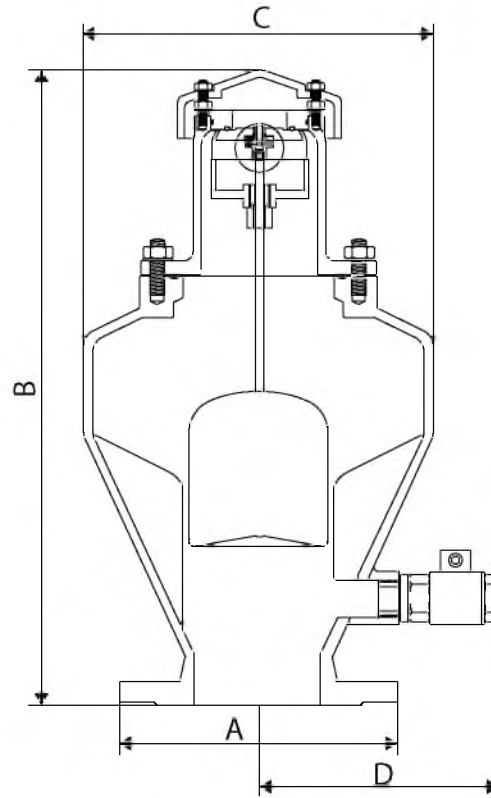
- Maintenance can be performed without removing the air valve from the conduct
- The air valve will guarantee the proper operation of sewage lines allowing the entrance of large quantity during pipe bursting or draining phases, the release of air pockets during working conditions and the discharge during pipe filling phases
- Antihammer solution on request

Standard variants

- Body and cover in stainless steel on request
- Solution for low pressure values (0,15 bar) available on request

Other DN's, materials, variants,? Please contact us for your personal quotation

Overall dimensions

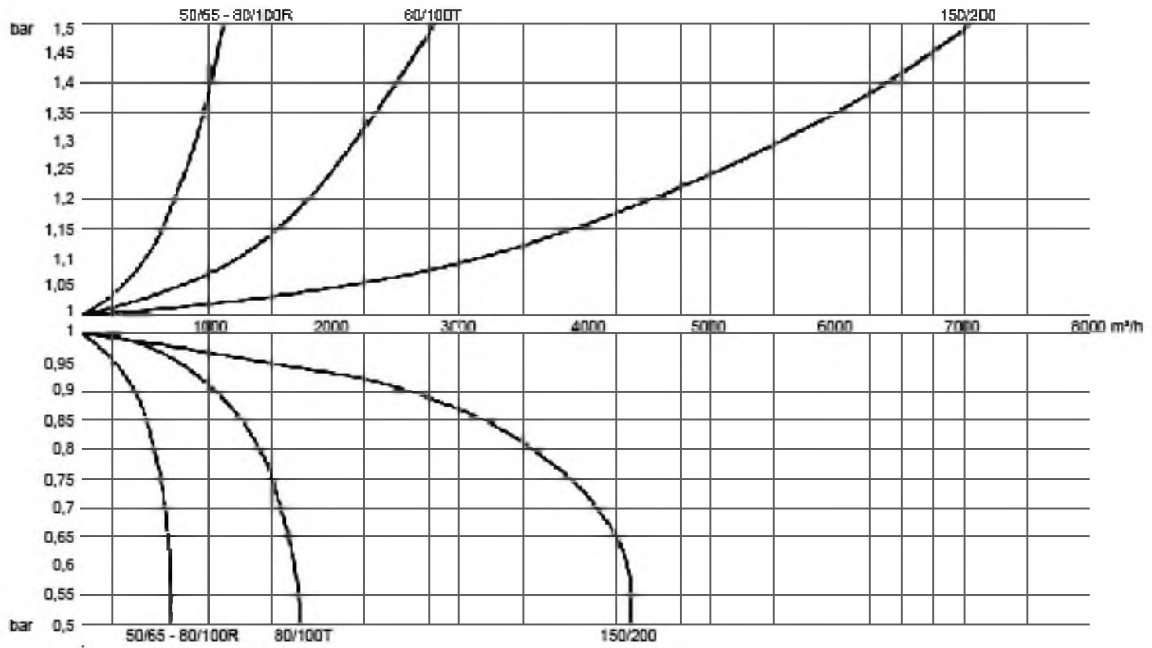


Standard model

DN	PN	Dimensions (mm)				Weight (kg)
		A	B	C	D	
50/65	16	185	550	300	202	29.0
80/100R		220	546	300	208	31.0
80/100T		220	600	350	190	40.0
150		285	850	488	243	78.0
200		340	850	488	243	82.0

Air discharge/intake during filling/emptying the plant

Air discharge during filling the plant



Air intake during emptying the plant

BOAVENT-AVF

Automatic air release valve
with double float

PN 16
DN 50 - 300



Benefits at a glance

- Approved for drinking water applications (rubber and painting WRAS certified)

Applications

- For water distribution system
- For clean water
- Other applications on request

Operating data

- Maximum permissible pressure: 16 bar
- Minimum working pressure: 0,3 bar
- Maximum permissible temperature: 120 °C

Materials

- Body: ductile iron GGG50, EN-GJS-500-7, epoxy coated
- Ball: ABS
- Bolts: A4-70

Design

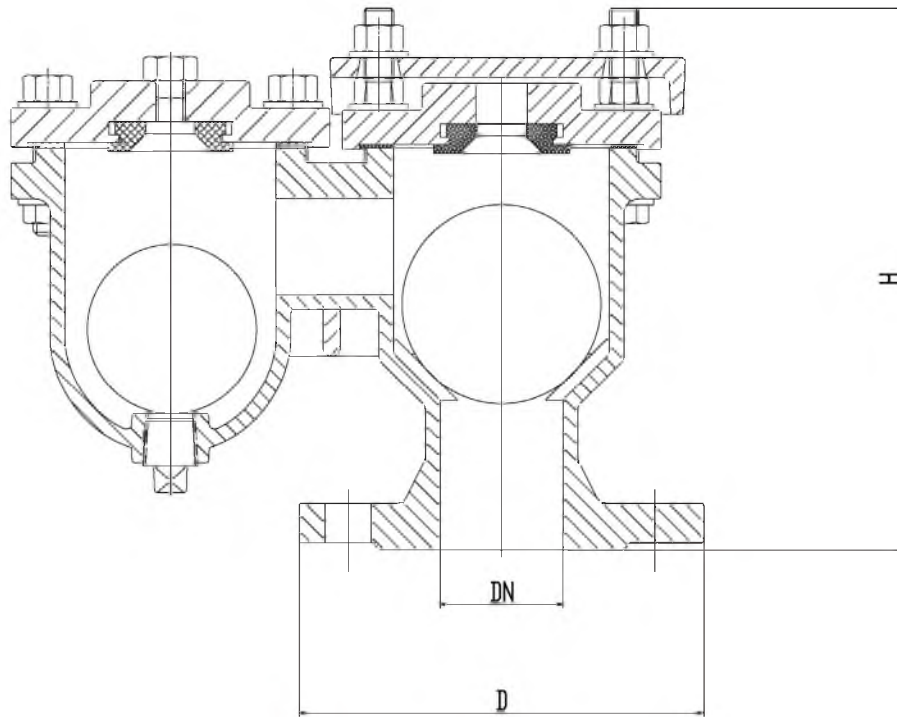
- Flange drilled acc. EN 1092-2
- Three functions for air entrance, discharge and release during working conditions

Standard variants

- Ball: SS 316

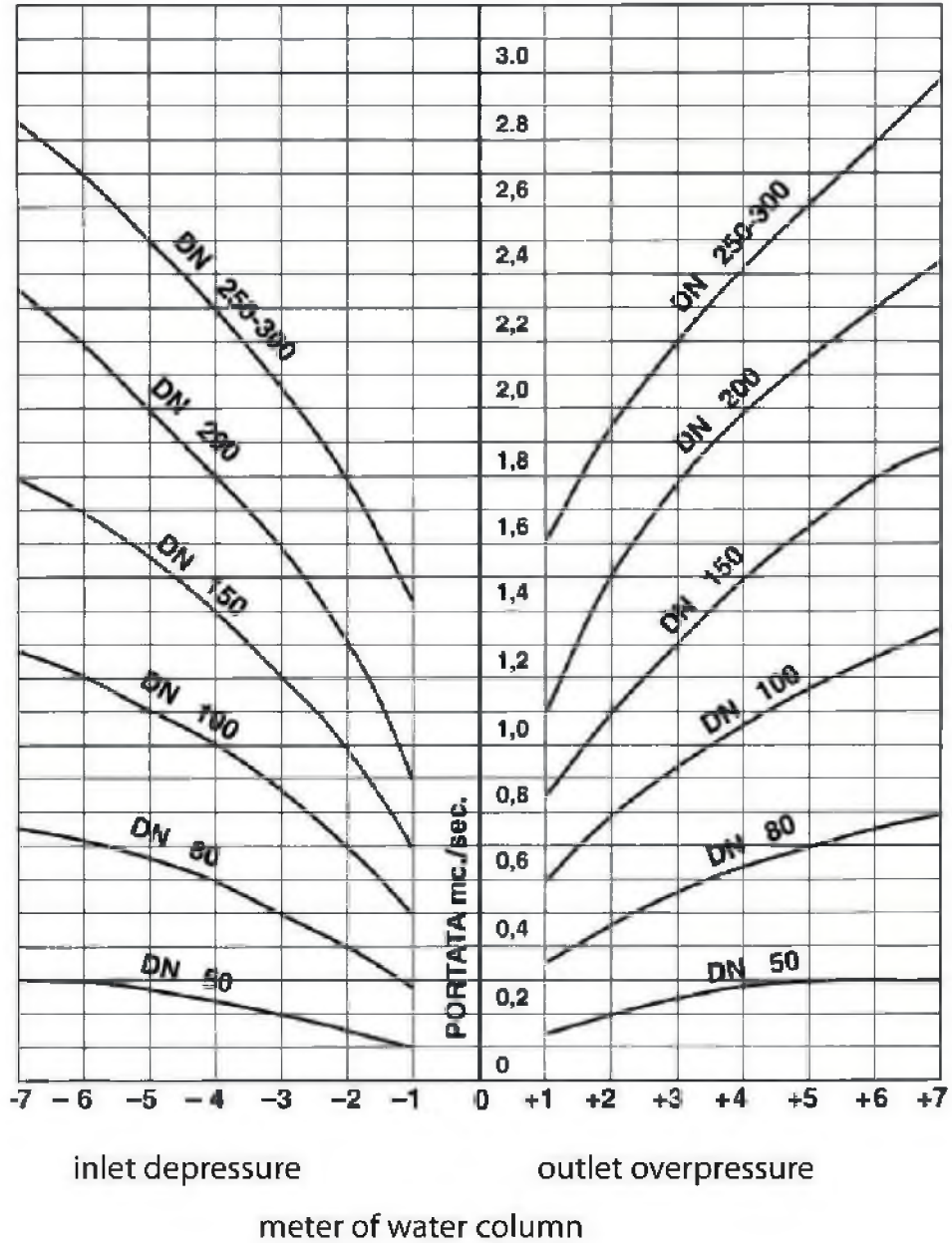
Other DN's, materials, variants,? Please contact us for your personal quotation

Overall dimensions



Standard model

DN	PN	Dimensions (mm)		Weight (kg)
		D	H	
50	16	165	213	15
80		200	250	20
100		220	265	25
150		285	323	38
200		340	405	55
250		405	450	110
300		460	510	130



Multistage High-pressure Immersion Centrifugal Pump

Movitec VCI

Type Series Booklet



Legal information/Copyright

Type Series Booklet Movitec VCI

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 Movitec VCI; 6 B; n = 2900 rpm 17

 Movitec VCI; 10 B; n = 2900 rpm 18

 Movitec VCI; 15 B; n = 2900 rpm 19

 n = 3500 rpm 20

 Movitec VCI; 2 B; n = 3500 rpm 20

 Movitec VCI; 4 B; n = 3500 rpm 21

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 Movitec VCI 4B, n = 2900 rpm 27

 Movitec VCI 4B, n = 3500 rpm 28

 Movitec VCI 6B, n = 2900 rpm 29

 Movitec VCI 6B, n = 3500 rpm 30

 Movitec VCI 10B, n = 2900 rpm 31

 Movitec VCI 10B, n = 3500 rpm 32

 Movitec VCI 15B, n = 2900 rpm 33

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Centrifugal Pumps

Multistage High-pressure Immersion Centrifugal Pumps

Movitec VCI



Main applications

- Machine tools
- Industrial washing plants
- Condensate transport

Fluids handled

- Condensate
- Cooling lubricants
- Emulsions
- Lyes
- Oil

Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m ³ /h]	≤ 22.5
Head	H [m]	≤ 249
Fluid temperature	T [°C]	-10 to +120
Operating pressure	p [bar]	≤ 25

Designation

Example: Movitec VCI 6/12-16 B

Designation key

Code	Description
Movitec VCI	Type series
6	Size, flow rate [m ³ /h] at BEP
12	Number of impellers
-16	Number of stages (incl. blind stages)
B	Generation

Design details

Design

- Multistage high-pressure immersion centrifugal pump

Optional:

- Blind stages

Installation type

- Vertical installation

Drive

- Surface-cooled KSB squirrel-cage motor
- Thermal class F to IEC 34-1
- Efficiency class IE3 to IEC 60034-30 (≥ 0.75 kW)
- IP55 enclosure
- Frequency 50/60 Hz
- Thermal class F

Optional:

- Harting connector, type HAN 10E

Bearings

- Plain bearings

Shaft seal

- Uncooled, maintenance-free mechanical seal in cartridge design to EN 12756

Materials

Overview of materials available for pump components

Part No.	Description	Material
106	Suction casing	EN-GJL-250
108	Stage casing	1.4301
160	Discharge cover	1.4301
210	Shaft	1.4057
230	Impeller	1.4301
341	Drive lantern	EN-GJL-250
412	O-ring	EPDM
525	Spacer sleeve	1.4301
529	Bearing sleeve	Tungsten carbide / aluminium oxide
905	Tie bolt	1.4057
920	Nut	1.4301
932	Circlip	1.4571

Shaft seal materials as a function of pressure and temperature

Seal type	Designation to EN 12756	Seal code	Material		T		p
			Mechanical seal	Pump elastomer	Min.	Max.	Max.
					[°C]	[°C]	[bar]
RMG12-G606	Q1 B E GG-WRAS ¹⁾	13	SiC / Ca / EPDM	EPDM WRAS / ACS	- 20	+ 100	25
RMG12-G606	Q1 B V GG ¹⁾	14	SiC / Ca / FPM	FPM	- 20	+ 120	25
RMG12-G606	U3 U3 X4 GG	15	TuC / TuC / HNBR	HNBR	- 20	+ 120	25
RMG12-G606	U3 U3 V GG	16	TuC / TuC / FPM	FPM	- 20	+ 120	25
RMG12-G606	U3 B E GG	18	TuC / Ca / EPDM	EPDM 559236	- 20	+ 120	25
RMG12-G606	Q1 B E GG ¹⁾	23	SiC / Ca / EPDM	EPDM	- 20	+ 100	25
MG12-G60	Q1 Q1 V GG	24	SiC / SiC / FPM	FPM	- 20	+ 100	10

Product benefits

- Top quality pump thanks to advanced high-precision production technology and resistant high-grade materials
- Excellent reliability, enabled by compact, easy-to-replace cartridge seal and automatic return of small amounts of leakage into the tank
- An energy-saving, state-of-the-art pump solution characterised by high efficiency levels, optimum flow passage, the use of high-efficiency motors, and precision engineering of all hydraulic components
- Flexible use due to modular design, optional blind stages and versatile seal materials for a wide variety of applications, as well as numerous motor options
- Easily interchangeable with competitor products due to comparable dimensions
- High energy efficiency as well as low investment and maintenance costs make for low life cycle costs

FluidFuture energy efficiency concept developed by KSB



1) Not suitable for fluids containing solids. This also applies to fluids which may contain particles developing as a result of salt crystallisation at low fluid temperatures.

Selection information

Blind stages can be provided, depending on the immersion depth required.

Minimum installation height

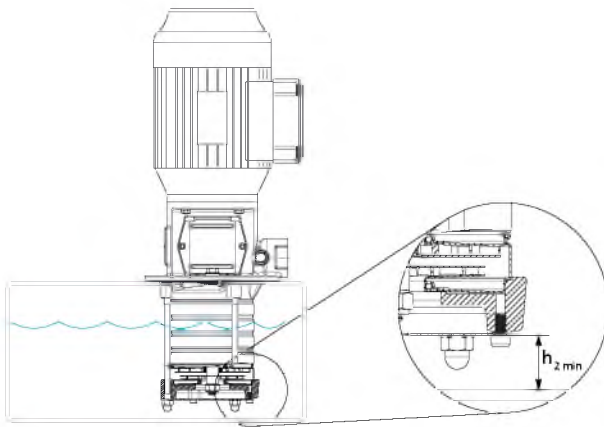


Fig. 1: Minimum installation height

Minimum installation height ($h_{2\ min}$)

Size	$h_{2\ min}$
	[mm]
2	25
4	25
6	25
10	40
15	40

Fluid handled

The actual operating conditions must always be checked (concentration, temperature, solids content). Penetration of air into the system must be avoided by all means.

If the fluid handled contains solids such as steel chips or steel chip dust, check the permissible particle concentration with KSB.

Temperature of the fluid handled

- Permissible temperature range: -10 °C to +90 °C

Minimum level of fluid handled

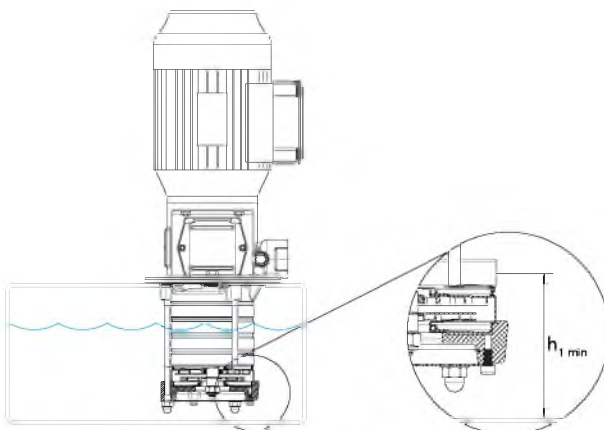


Fig. 2: Minimum level of fluid handled

Minimum level of fluid handled ($h_{1\ min}$)

Size	$h_{1\ min}$
	[mm]
2	61
4	61
6	61
10	82
15	82

Minimum flow rate

Minimum flow rate (Q_{min}) at a fluid temperature $\leq 20\ ^\circ\text{C}$

Size	Q_{min}	
	50 Hz [m ³ /h]	60 Hz [m ³ /h]
2	0,2	0,2
4	0,4	0,5
6	0,6	0,8
10	1,1	1,3
15	1,6	2,0

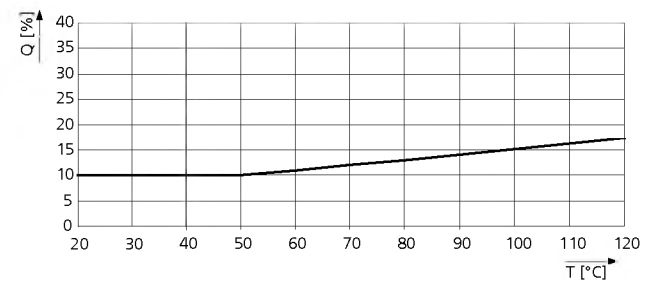


Fig. 3: Minimum flow rate required as a function of fluid temperature at a fluid temperature $> +20\ ^\circ\text{C}$

Permissible fluids

If the operating conditions differ from the data given (e.g. mixed products) or if the fluids handled are not included in the table below, please contact KSB.

Programme overview / selection tables

Table of fluids handled

The data refer to the chemical resistance of the materials. The relevant regulations / standards governing individual pump applications have to be complied with.

If the operating conditions differ from the data given (e.g. mixed products) or if the fluids handled are not included in the table below, contact KSB.

- **Temperature ranges:**
 - Reference temperature: +20 °C
 - For temperatures <0 °C: contact KSB.
 - For temperatures > 50 °C: check and observe the vapour pressure of the fluid handled.
 - Max. temperature = +120 °C, unless indicated otherwise.
- Max. concentration = 100 % unless indicated otherwise.
- Mechanical seal silicon carbide / carbon (Q1B): not suitable for fluids containing solid substances. This rule also covers particles developing as a result of salt crystallisation at low fluid temperatures.
- Mechanical seal tungsten carbide / tungsten carbide (U3U3): solids content max. 20 ppm (depending on particle size), with the exception of corrosive fluids. Fluids with a higher solids content are not permitted (ppm = 1 mg/kg).
- Caution: High temperatures will increase corrosion (reference temperature = +20 °C).
- The density and/or viscosity may vary. This leads to different operating conditions and affects the motor rating required.

Mechanical seal selection depending on the fluid to be handled

Substance contained	Max. percentage [%]	T _{max.} [°C]	Seal code						
			13	14	15	16	18	23	
Alum, acid-free	≤ 3	+80	-	-	-	-	-	-	
Alkaline solution, bottle rinsing, max. 2% sodium hydroxide	≤ 100	+40	-	-	X	-	-	-	
Alcohol									
▪ Butanol	≤ 100	+60	X	-	-	-	-	X	
▪ Ethanol	≤ 100	+60	X	-	-	-	-	X	
▪ Propanol	≤ 100	80	X	-	-	-	-	X	
Ammonium bicarbonate	≤ 10	+40	X	-	-	-	-	X	
Ammonium hydroxide	≤ 20	+20	X	-	X	-	-	X	
Calcium acetate, acid-free	≤ 10	+60	X	-	-	-	-	X	
Calcium hydroxide, saturated solution	≤ 10	+50	-	-	-	X	-	-	
Water-oil emulsion (95 %, 5 %), free of solids	≤ 100	+80	-	X	-	-	-	-	
Ethylene glycol base anti-freeze, inhibited, closed system	≤ 20	+110	X ²⁾	X	-	X	-	X	
	≤ 25	+110	X ²⁾	X	-	X	-	X	
	≤ 30	+110	X ²⁾	X	-	X	-	X	
	≤ 35	+110	X ²⁾	X	-	X	-	X	
	≤ 40	+110	X ²⁾	X	-	X	-	X	
	≤ 45	+110	X ²⁾	X	-	X	-	X	
	≤ 50	+110	X ²⁾	X	-	X	-	X	
Water-based cooling lubricant	≤ 100	+90	X	X	-	X	-	-	
Glycerine	≤ 40	+80	X	X	-	-	-	X	
Glycols (pure)	≤ 100	+100	-	-	-	-	-	-	
Propylene glycol	≤ 50	+90	X	X	-	X	-	X	
Diethylene glycol	≤ 100	+100	X	X	-	-	-	X	
Ethylene glycol	≤ 100	+100	X	X	-	-	-	X	
Potassium hydroxide	≤ 5	+40	-	-	X	-	-	-	
Potassium nitrate, acid-free	≤ 5	+30	-	-	X	-	-	-	
Potassium sulphate, acid-free	≤ 3	+20	-	X	-	-	-	-	
Potassium carbonate	≤ 20	+50	X	-	-	-	-	X	
Potassium formate	≤ 20	+50	-	-	X	-	-	-	
Sodium carbonate	≤ 6	+60	X	-	-	-	-	X	
Sodium hydroxide	≤ 5	+60	-	-	X	-	-	-	
Sodium nitrate, acid-free	≤ 10	+30	X	-	-	-	-	X	

2) ≤ 100 °C

Substance contained	Max. percentage [%]	T _{max.} [°C]	Seal code						
			13	14	15	16	18	23	
Sodium nitrate, acid-free	≤ 10	+60	X	-	-	-	-	-	
Oil									
▪ Cutting oil	≤ 100	+90	-	X	-	X	-	-	
▪ Silicone oil	≤ 100	-	-	X	-	-	-	-	
▪ Olive oil	≤ 100	+80	-	X	-	X	-	-	
▪ Peanut oil	≤ 100	+90	-	X	-	-	-	-	
▪ Linseed oil	≤ 100	+60	-	X	-	-	-	-	
▪ Corn oil	≤ 100	+100	-	X	-	-	-	-	
▪ Rapeseed oil	≤ 100	+100	-	X	-	-	-	-	
▪ Soybean oil	≤ 100	+80	-	X	-	X	-	-	
Trisodium phosphate	≤ 4	+80	-	X	-	-	-	-	
Water									
▪ Fire-fighting water	≤ 100	+60	-	X	-	-	X	-	
▪ Heating water in accordance with VDI 2035	≤ 100	+100	X	-	-	-	X	X	
▪ Hot water treated in accordance with VdTÜV 1466	≤ 100	+120	X	-	-	-	X	X	
▪ Boiler feed water to VdTÜV 1466	≤ 100	+120	X	-	-	-	X	X	
▪ Condensate treated in accordance with VdTÜV 1466	≤ 100	+120	X	-	-	-	X	X	
▪ Vapour condensate (brewery)	≤ 100	+120	X	-	-	-	X	X	
▪ Cooling water	≤ 100	+100	-	-	-	X	-	-	
▪ Tap water	≤ 100	+60	X	-	-	-	-	-	
▪ Brewing water	≤ 100	+60	X	-	-	-	-	-	
▪ Ice water (brewery)	≤ 100	+60	X	-	-	-	-	-	
▪ Hot water (brewery)	≤ 100	+60	X	-	-	-	-	-	
▪ Clean water	≤ 100	+60	X	X	X	X	X	X	
▪ Raw water	≤ 100	+60	-	-	X	-	-	-	
▪ Grey water, slightly contaminated water	≤ 100	+60	-	-	X	-	-	-	
▪ River water	≤ 100	+60	-	-	X	-	-	-	
▪ Seawater	≤ 100	+60	-	-	X	-	-	-	
▪ Dam water	≤ 100	+60	-	-	X	-	-	-	
▪ Surface water	≤ 100	+60	-	-	X	-	-	-	
▪ Fresh water	≤ 100	+60	-	X	-	-	-	-	
▪ Barrier water	≤ 100	+70	-	-	-	X	-	-	
▪ Rinsing water	≤ 100	+70	-	-	-	X	-	-	
▪ Rainwater, with strainer	≥ 20	+60	-	-	-	X	-	-	
▪ Water containing lime	≤ 100	+90	-	-	X	-	-	-	
▪ Water containing oil	≤ 100	+90	-	X	-	X	-	-	
▪ Water-glycol mixture	≤ 100	+100	-	-	-	-	-	-	

Technical data

Movitec VCI B, n = 2900 rpm

14 = Mechanical seal code Q1BVG

Technical data, 50 Hz

Movitec VCI	P _N	I _N	I _N	14	
	P _N ≥ 0,75 kW = IE3	3~230/400 V	3~400/690 V	Mat. No.	[kg]
	[kW]	[A]	[A]		
02/02-02 B	0,37	1,64/0,94	-	48239986	15,6
02/03-03 B	0,37	1,64/0,94	-	48239987	15,9
02/04-04 B	0,37	1,64/0,94	-	48239988	16,2
02/05-05 B	0,37	1,64/0,94	-	48239989	16,5
02/06-06 B	0,55	2,31/1,33	-	48239990	17,7
02/07-07 B	0,55	2,31/1,33	-	48239991	18
02/08-08 B	0,55	2,31/1,33	-	48239992	18,3
02/09-09 B	0,75	2,92/1,68	-	48239993	21,8
02/10-10 B	0,75	2,92/1,68	-	48239994	22,2
02/11-11 B	1,10	4,17/2,40	-	48239995	25,1
02/12-12 B	1,10	4,17/2,40	-	48239996	25,4
02/14-14 B	1,10	4,17/2,40	-	48239997	26,3
02/16-16 B	1,50	5,08/2,92	-	48239998	30,2
02/18-18 B	1,50	5,08/2,92	-	48239999	30,8
02/20-20 B	1,50	5,08/2,92	-	48240000	31,1
02/22-22 B	2,20	7,22/4,15	-	48240001	36
02/24-24 B	2,20	7,22/4,15	-	48240002	36,6
02/26-26 B	2,20	7,22/4,15	-	48240003	37,2
02/28-28 B	2,20	7,22/4,15	-	48240004	37,8
02/30-30 B	2,20	7,22/4,15	-	48240005	38,4
04/02-02 B	0,37	1,64/0,94	-	48240006	15,6
04/03-03 B	0,55	2,31/1,33	-	48240007	16,8
04/04-04 B	0,55	2,31/1,33	-	48240008	17,1
04/05-05 B	0,75	2,92/1,68	-	48240009	20,7
04/06-06 B	1,10	4,17/2,40	-	48240010	23,6
04/07-07 B	1,10	4,17/2,40	-	48240011	23,9
04/08-08 B	1,50	5,08/2,92	-	48240012	27,6
04/09-09 B	1,50	5,08/2,92	-	48240013	27,9
04/10-10 B	1,50	5,08/2,92	-	48240014	28,3
04/11-11 B	2,20	7,22/4,15	-	48240015	30,9
04/12-12 B	2,20	7,22/4,15	-	48240016	31,2
04/14-14 B	2,20	7,22/4,15	-	48240017	32,1
04/16-16 B	3,00	-	5,59/3,24	48240018	41,5
04/18-18 B	3,00	-	5,59/3,24	48240019	42,1
04/20-20 B	3,00	-	5,59/3,24	48240020	43,2
04/22-22 B	4,00	-	7,45/4,32	48240021	48,8
04/24-24 B	4,00	-	7,45/4,32	48240022	49,4
04/26-26 B	4,00	-	7,45/4,32	48240023	66
04/26-28 B	4,00	-	7,45/4,32	48240024	68,1
04/26-30 B	4,00	-	7,45/4,32	48240025	68,2
06/02-02 B	0,37	1,64/0,94	-	48240026	15,7
06/03-03 B	0,75	2,92/1,68	-	48240027	20,1
06/04-04 B	1,10	4,17/2,40	-	48240028	23,1
06/05-05 B	1,10	4,17/2,40	-	48240029	23,5
06/06-06 B	1,50	5,08/2,92	-	48240030	27,2
06/07-07 B	1,50	5,08/2,92	-	48240031	27,6
06/08-08 B	2,20	7,22/4,15	-	48240032	30,3
06/09-09 B	2,20	7,22/4,15	-	48240033	30,6
06/10-10 B	2,20	7,22/4,15	-	48240034	31
06/11-11 B	3,00	-	5,59/3,24	48240035	40,5
06/12-12 B	3,00	-	5,59/3,24	48240036	40,8

Movitec VCI	P _N	I _N	I _N	14	
	P _N ≥ 0,75 kW = IE3	3~230/400 V	3~400/690 V	Mat. No.	[kg]
	[kW]	[A]	[A]		
06/14-14 B	3,00	-	5,59/3,24	48240037	41,5
06/16-16 B	4,00	-	7,45/4,32	48240038	63,5
06/18-18 B	4,00	-	7,45/4,32	48240039	64,2
06/20-20 B	5,50	-	10,00/5,80	48240040	91,7
06/22-22 B	5,50	-	10,00/5,80	48240041	92
06/24-24 B	5,50	-	10,00/5,80	48240042	93,4
06/26-26 B	5,50	-	10,00/5,80	48240043	93,8
06/28-28 B	5,50	-	10,00/5,80	48240044	94,1
06/26-30 B	5,50	-	10,00/5,80	48240045	94,4
10/01-02 B	0,75	2,92/1,68	-	48240106	18,9
10/02-02 B	0,75	2,92/1,68	-	48240107	18,8
10/03-03 B	1,10	4,17/2,40	-	48240108	22,5
10/04-04 B	1,50	5,08/2,92	-	48240109	33,8
10/05-05 B	2,20	7,22/4,15	-	48240110	37,4
10/06-06 B	2,20	7,22/4,15	-	48240111	38
10/07-07 B	3,00	-	5,59/3,24	48240112	46,5
10/08-08 B	3,00	-	5,59/3,24	48240113	47,2
10/09-09 B	4,00	-	7,45/4,32	48240114	52,8
10/10-10 B	4,00	-	7,45/4,32	48240115	53,7
10/11-11 B	4,00	-	7,45/4,32	48240116	54,3
10/13-13 B	5,50	-	10,00/5,80	48240117	95,6
10/15-15 B	5,50	-	10,00/5,80	48240118	96,9
10/17-17 B	7,50	-	13,40/7,74	48240119	106,9
10/19-19 B	7,50	-	13,40/7,74	48240120	108,4
10/21-21 B	7,50	-	13,40/7,74	48240121	109,7
15/01-02 B	1,10	4,17/2,40	-	48240138	21,6
15/02-02 B	2,20	7,22/4,15	-	48240139	34,4
15/03-03 B	3,00	-	5,59/3,24	48240140	43,7
15/04-04 B	4,00	-	7,45/4,32	48240141	49,5
15/05-05 B	5,50	-	10,00/5,80	48240142	89,6
15/06-06 B	5,50	-	10,00/5,80	48240143	90,4
15/07-07 B	7,50	-	13,40/7,74	48240144	97,4
15/08-08 B	7,50	-	13,40/7,74	48240145	98,1
15/09-09 B	11,00	-	19,30/11,20	48240146	196,6
15/10-10 B	11,00	-	19,30/11,20	48240147	197,4
15/11-11 B	11,00	-	19,30/11,20	48240148	198,1
15/13-13 B	15,00	-	26,20/15,20	48240149	206,5
15/15-15 B	15,00	-	26,20/15,20	48240150	208
15/17-17 B	15,00	-	26,20/15,20	48240151	213,1
15/17-19 B	15,00	-	26,20/15,20	48240152	213,7
15/17-21 B	15,00	-	26,20/15,20	48240153	214,4

Movitec VCI B, n = 3500 rpm

14 = Mechanical seal code Q1BVG

Technical data, 60 Hz

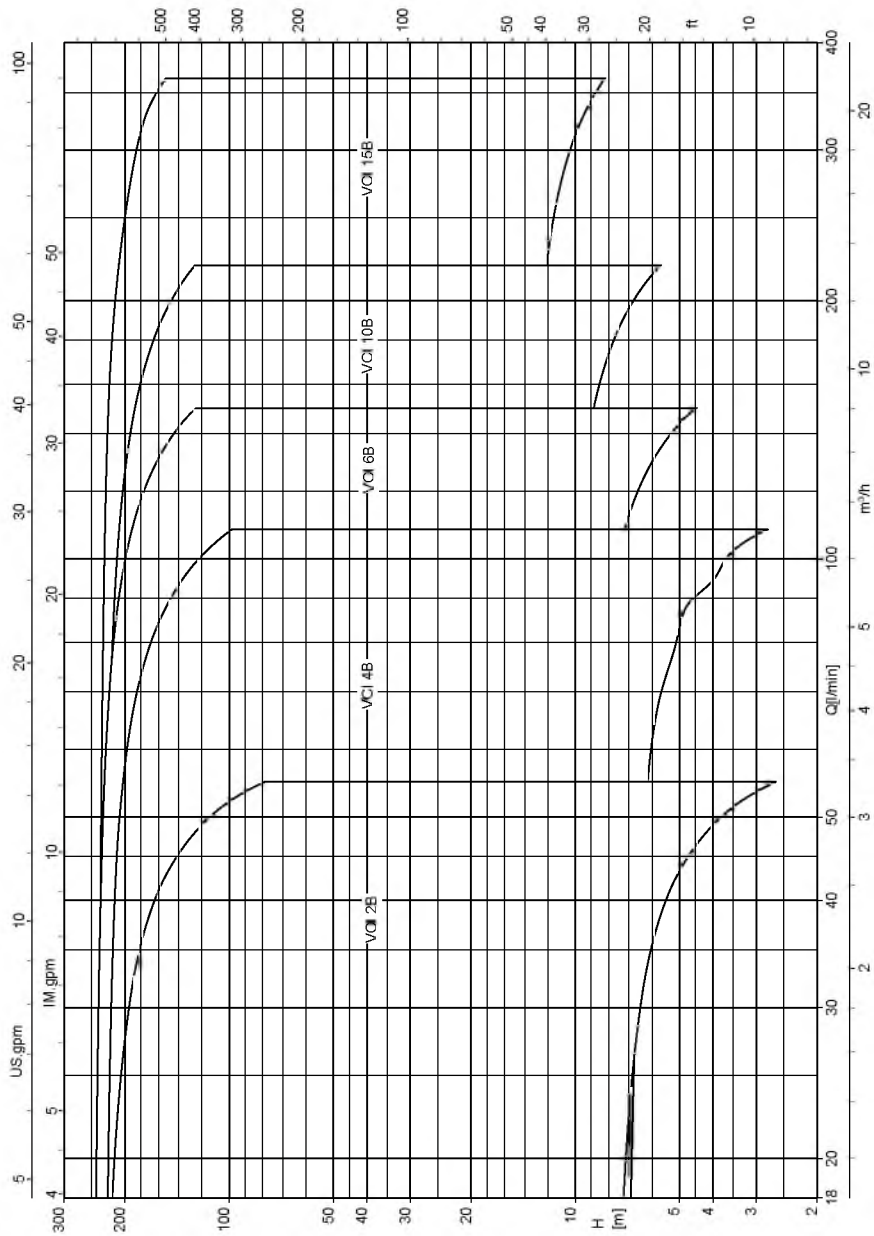
Movitec VCI	P _N	I _N	14	
	P _N ≥ 0,75 kW = IE3	3~230/400 V	Mat. No.	[kg]
	[kW]	[A]		
02/02-02 B	0,37	1,54/0,89	48240046	15,6
02/03-03 B	0,37	1,54/0,89	48240047	15,9
02/04-04 B	0,55	2,29/1,32	48240048	17
02/05-05 B	0,75	2,87/1,65	48240049	20,6
02/06-06 B	0,75	2,87/1,65	48240050	20,9
02/07-07 B	1,10	4,11/2,36	48240051	23,8
02/08-08 B	1,10	4,11/2,36	48240052	24,1
02/09-09 B	1,10	4,11/2,36	48240053	24,4

Movitec VCI	P_N	I_N	14	
	$P_N \geq 0,75 \text{ kW} = \text{IE3}$	3~230/400 V	Mat. No.	[kg]
	[kW]	[A]		
02/10-10 B	1,50	5,01/2,88	48240054	28,1
02/11-11 B	1,50	5,01/2,88	48240055	28,4
02/12-12 B	1,50	5,01/2,88	48240056	28,7
02/14-14 B	2,20	7,12/4,09	48240057	31,9
02/16-16 B	2,20	7,12/4,09	48240058	32,7
02/18-18 B	2,20	7,12/4,09	48240059	33,1
02/20-20 B	3,00	9,57/5,51	48240060	44,6
02/22-22 B	3,00	9,57/5,51	48240061	45,2
02/22-24 B	3,00	9,57/5,51	48240062	45,5
02/22-26 B	3,00	9,57/5,51	48240063	45,8
02/22-28 B	3,00	9,57/5,51	48240064	46,1
02/22-30 B	3,00	9,57/5,51	48240065	63,6
04/02-02 B	0,55	2,29/1,32	48240066	16,4
04/03-03 B	0,75	2,87/1,65	48240067	19,9
04/04-04 B	1,10	4,11/2,36	48240068	22,8
04/05-05 B	1,50	5,01/2,88	48240069	26,6
04/06-06 B	1,50	5,01/2,88	48240070	26,9
04/07-07 B	2,20	7,12/4,09	48240071	29,5
04/08-08 B	2,20	7,12/4,09	48240072	29,9
04/09-09 B	3,00	9,57/5,51	48240073	41,1
04/10-10 B	3,00	9,57/5,51	48240074	39,8
04/11-11 B	3,00	9,57/5,51	48240075	41,7
04/12-12 B	4,00	12,80/7,34	48240076	45,3
04/14-14 B	4,00	12,80/7,34	48240077	45,9
04/16-16 B	5,50	17,10/9,86	48240078	63,8
04/18-18 B	5,50	17,10/9,86	48240079	80,5
04/18-20 B	5,50	17,10/9,86	48240080	78,8
04/18-22 B	5,50	17,10/9,86	48240081	83,8
04/18-24 B	5,50	17,10/9,86	48240082	84
04/18-26 B	5,50	17,10/9,86	48240083	84,7
04/18-28 B	5,50	17,10/9,86	48240084	85,2
04/18-30 B	5,50	17,10/9,86	48240085	85,5
06/02-02 B	0,75	2,87/1,65	48240086	19,7
06/03-03 B	1,10	4,11/2,36	48240087	22,7
06/04-04 B	1,50	5,01/2,88	48240088	26,5
06/05-05 B	2,20	7,12/4,09	48240089	29,1
06/06-06 B	2,20	7,12/4,09	48240090	29,5
06/07-07 B	3,00	9,57/5,51	48240091	40,5
06/08-08 B	3,00	9,57/5,51	48240092	41,1
06/09-09 B	4,00	12,80/7,34	48240093	44,8
06/10-10 B	4,00	12,80/7,34	48240094	45,1
06/11-11 B	4,00	12,80/7,34	48240095	45,5
06/12-12 B	5,50	17,10/9,86	48240096	79,2
06/14-14 B	5,50	17,10/9,86	48240097	79,9
06/16-16 B	7,50	22,90/13,20	48240098	95,8
06/18-18 B	7,50	22,90/13,20	48240099	96,5
06/18-20 B	7,50	22,90/13,20	48240100	96,8
06/18-22 B	7,50	22,90/13,20	48240101	97,1
06/18-24 B	7,50	22,90/13,20	48240102	97,4
06/18-26 B	7,50	22,90/13,20	48240103	97,8
06/18-28 B	7,50	22,90/13,20	48240104	98,1
06/18-30 B	7,50	22,90/13,20	48240105	98,4
10/01-02 B	0,75	2,87/1,65	48240122	18,9
10/02-02 B	1,50	5,01/2,88	48240123	32
10/03-03 B	2,20	7,12/4,09	48240124	35,4
10/04-04 B	3,00	9,57/5,51	48240125	46

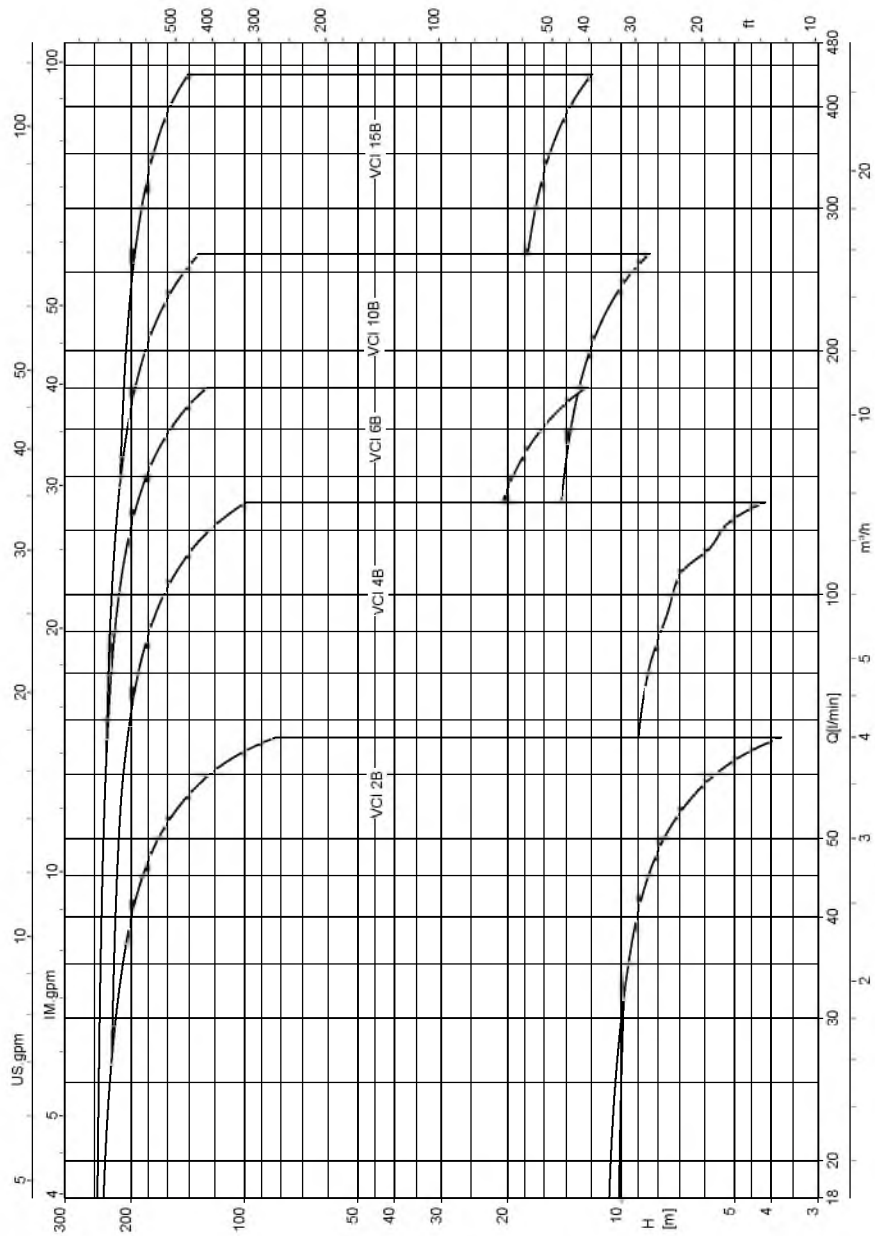
Movitec VCI	P_N	I_N	14	
	$P_N \geq 0,75 \text{ kW} = \text{IE3}$	3~230/400 V	Mat. No.	[kg]
	[kW]	[A]		
10/05-05 B	4,00	12,80/7,34	48240126	49,9
10/06-06 B	4,00	12,80/7,34	48240127	50,6
10/07-07 B	5,50	17,10/9,86	48240128	84,2
10/08-08 B	5,50	17,10/9,86	48240129	84,8
10/09-09 B	7,50	22,90/13,20	48240130	98,3
10/10-10 B	7,50	22,90/13,20	48240131	99,1
10/11-11 B	7,50	22,90/13,20	48240132	99,8
10/13-13 B	11,00	33,20/19,10	48240133	198,9
10/15-15 B	11,00	33,20/19,10	48240134	200,2
10/15-17 B	11,00	33,20/19,10	48240135	204,4
10/15-19 B	11,00	33,20/19,10	48240136	205,2
10/15-21 B	11,00	33,20/19,10	48240137	205,8
15/01-02 B	2,20	7,12/4,09	48240154	34,5
15/02-02 B	3,00	9,57/5,51	48240155	44,1
15/03-03 B	5,50	17,10/9,86	48240156	81,6
15/04-04 B	7,50	22,90/13,20	48240157	94,3
15/05-05 B	7,50	22,90/13,20	48240158	95,1
15/06-06 B	11,00	33,20/19,10	48240159	194,4
15/07-07 B	11,00	33,20/19,10	48240160	195,2
15/08-08 B	15,00	44,90/25,80	48240161	202,9
15/09-09 B	15,00	44,90/25,80	48240162	203,6
15/10-10 B	15,00	44,90/25,80	48240163	204,4
15/11-11 B	18,50	54,50/31,30	48240164	231,1
15/11-13 B	18,50	54,50/31,30	48240165	235,4
15/11-15 B	18,50	54,50/31,30	48240166	236
15/11-17 B	18,50	54,50/31,30	48240167	236,7
15/11-19 B	18,50	54,50/31,30	48240168	237,1
15/11-21 B	18,50	54,50/31,30	48240169	238

Selection chart

Movitec VCI B; n = 2900 rpm



Movitec VCI B; n = 3500 rpm



Characteristic curves

n = 2900 rpm

Movitec VCI; 2 B; n = 2900 rpm

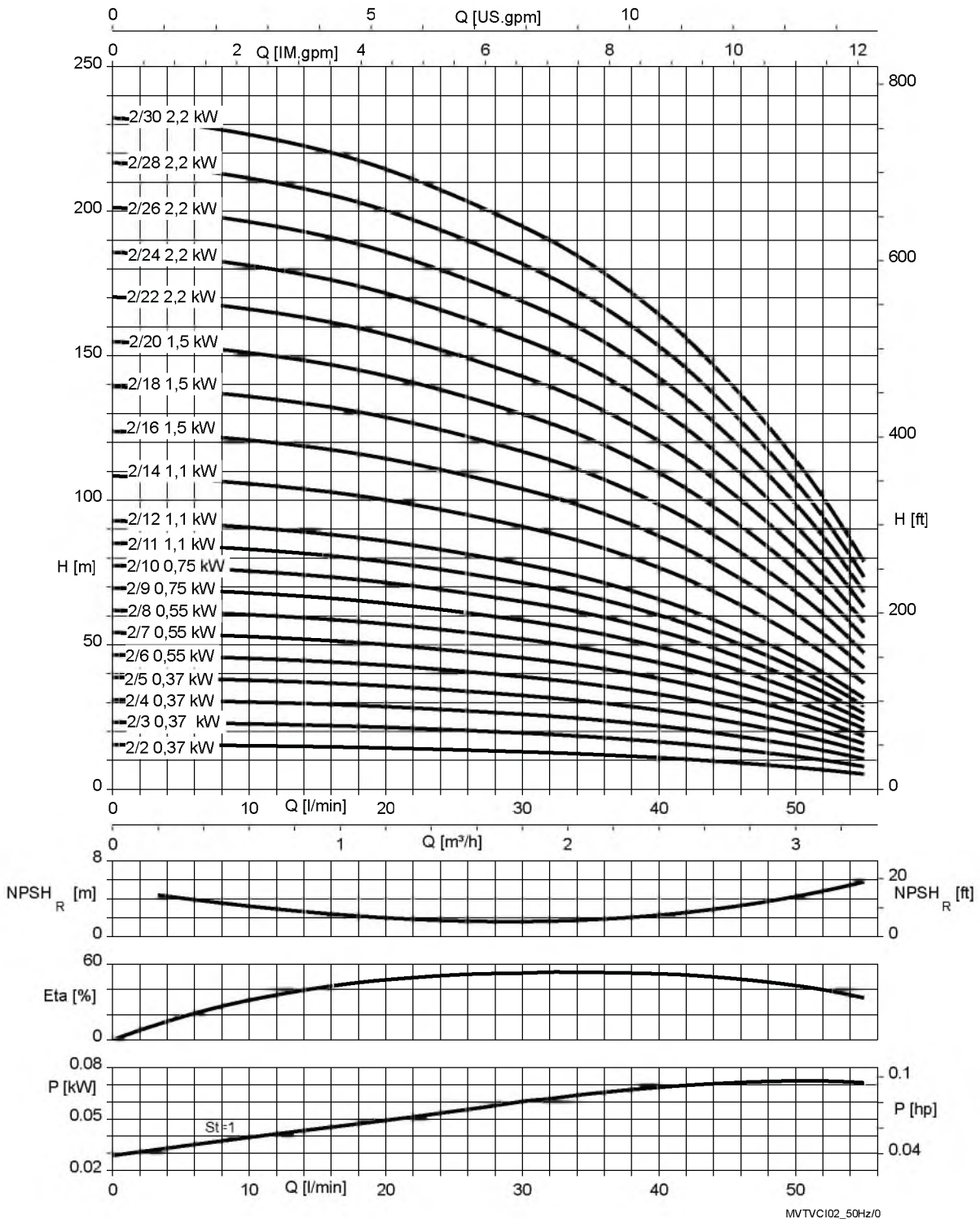


Fig. 4: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 4 B; n = 2900 rpm

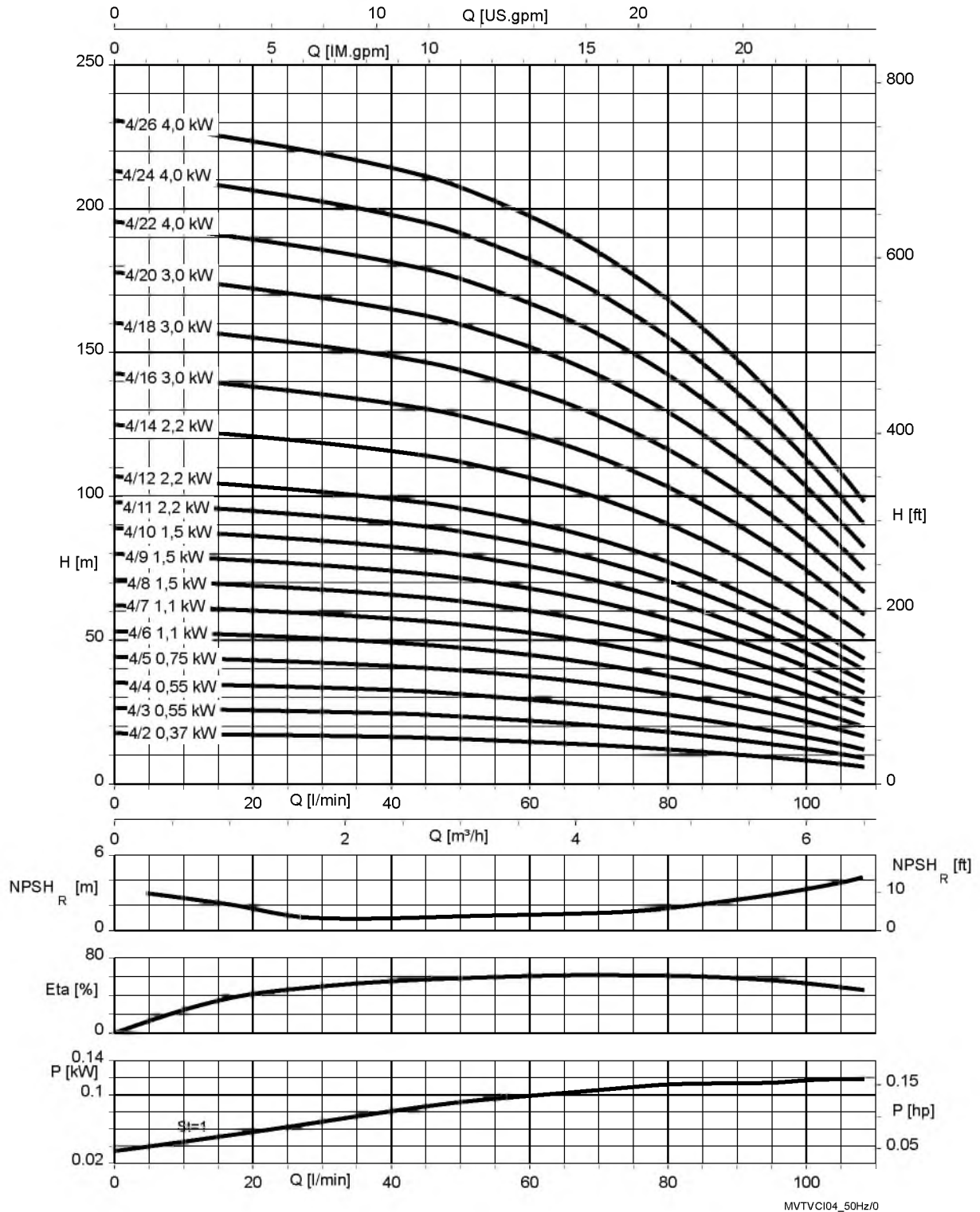


Fig. 5: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 6 B; n = 2900 rpm

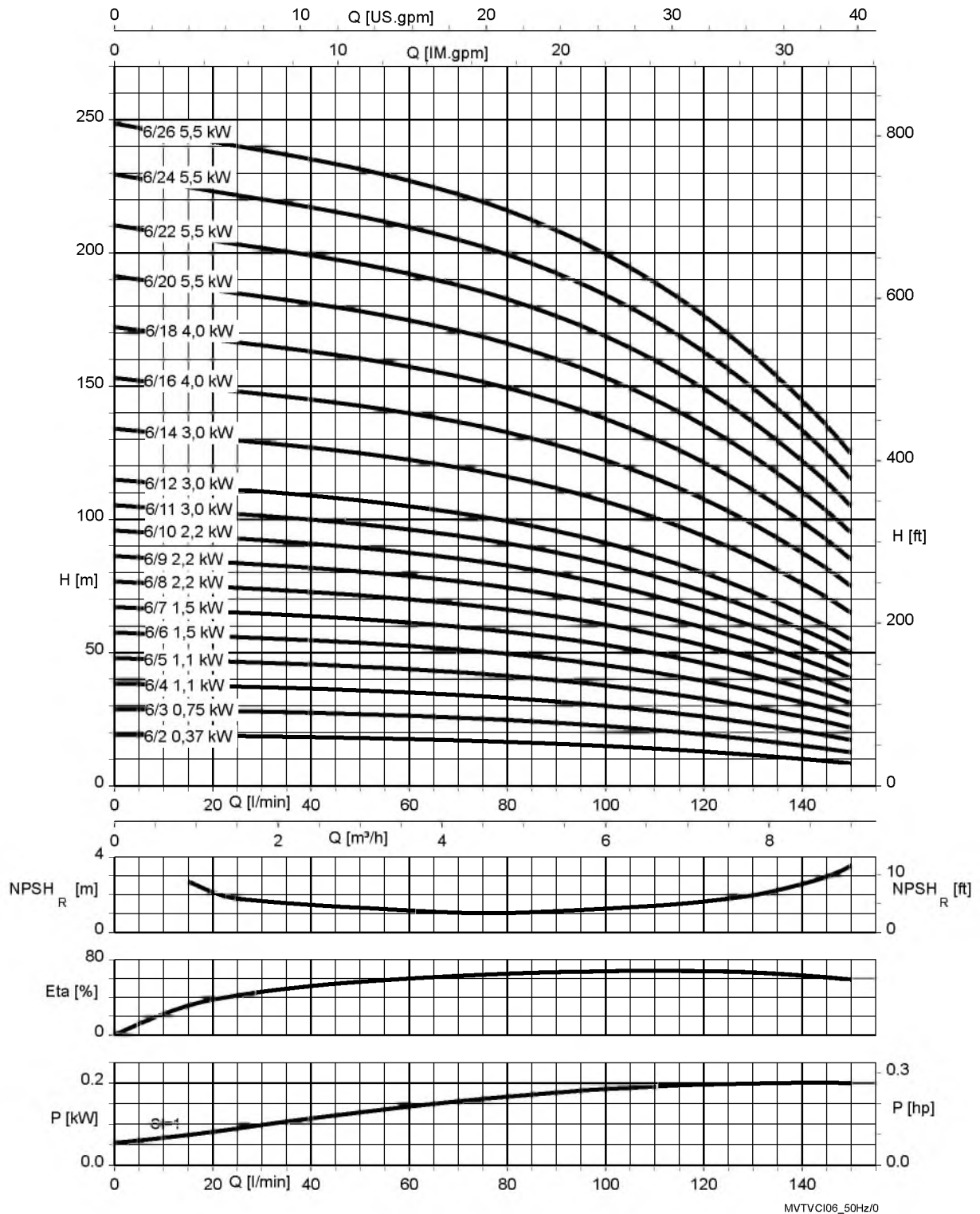


Fig. 6: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 10 B; n = 2900 rpm

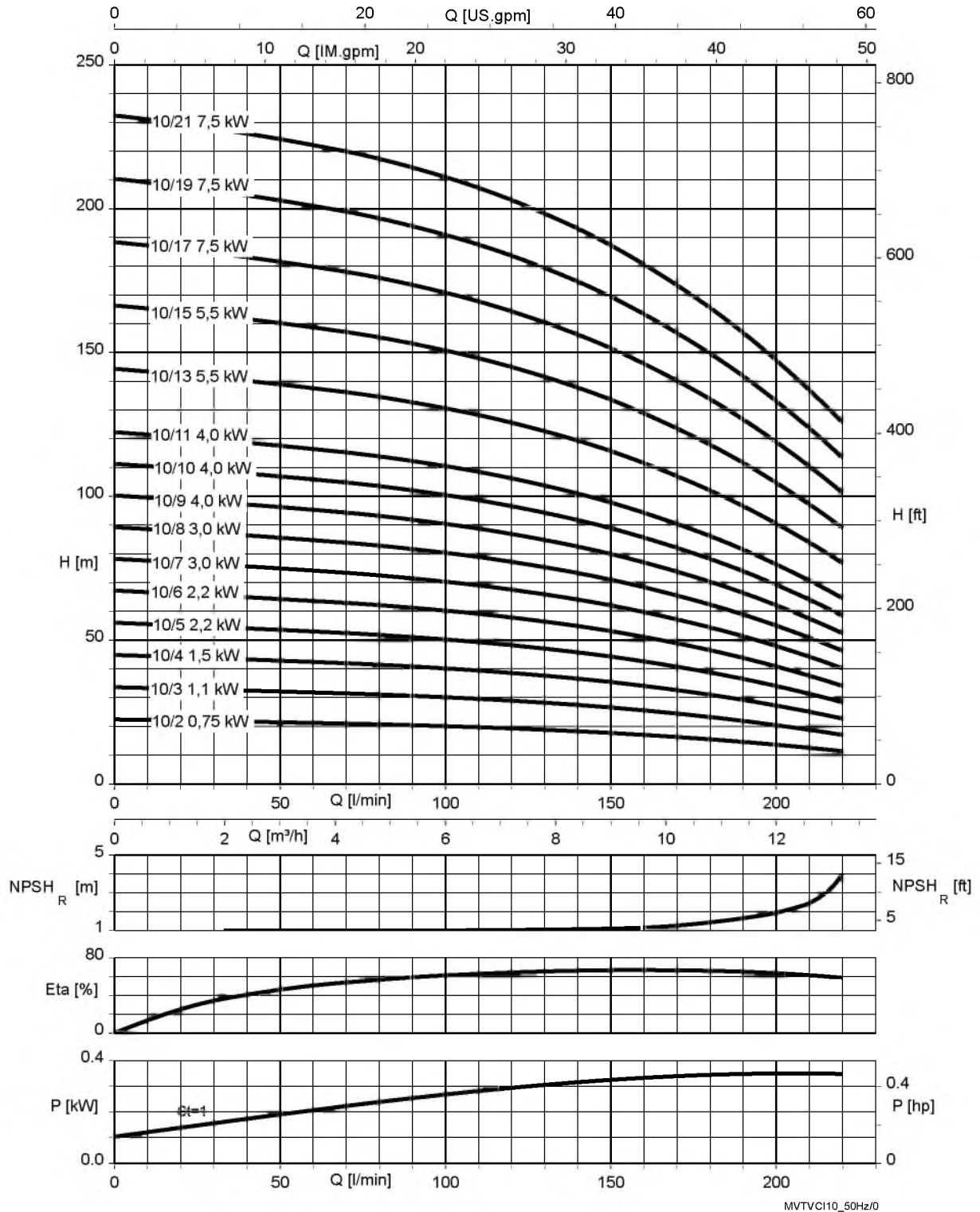


Fig. 7: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 15 B; n = 2900 rpm

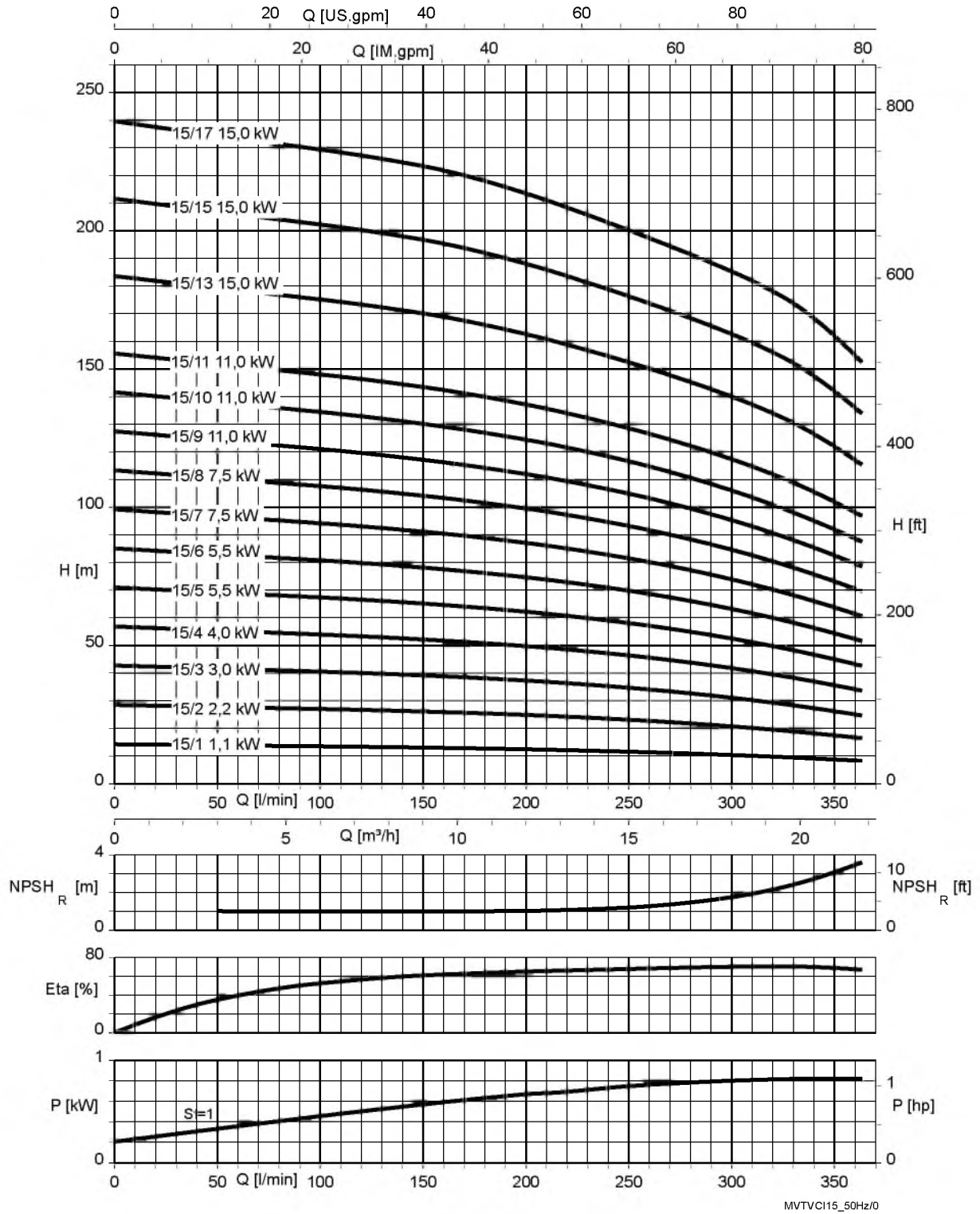


Fig. 8: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

n = 3500 rpm

Movitec VCI; 2 B; n = 3500 rpm

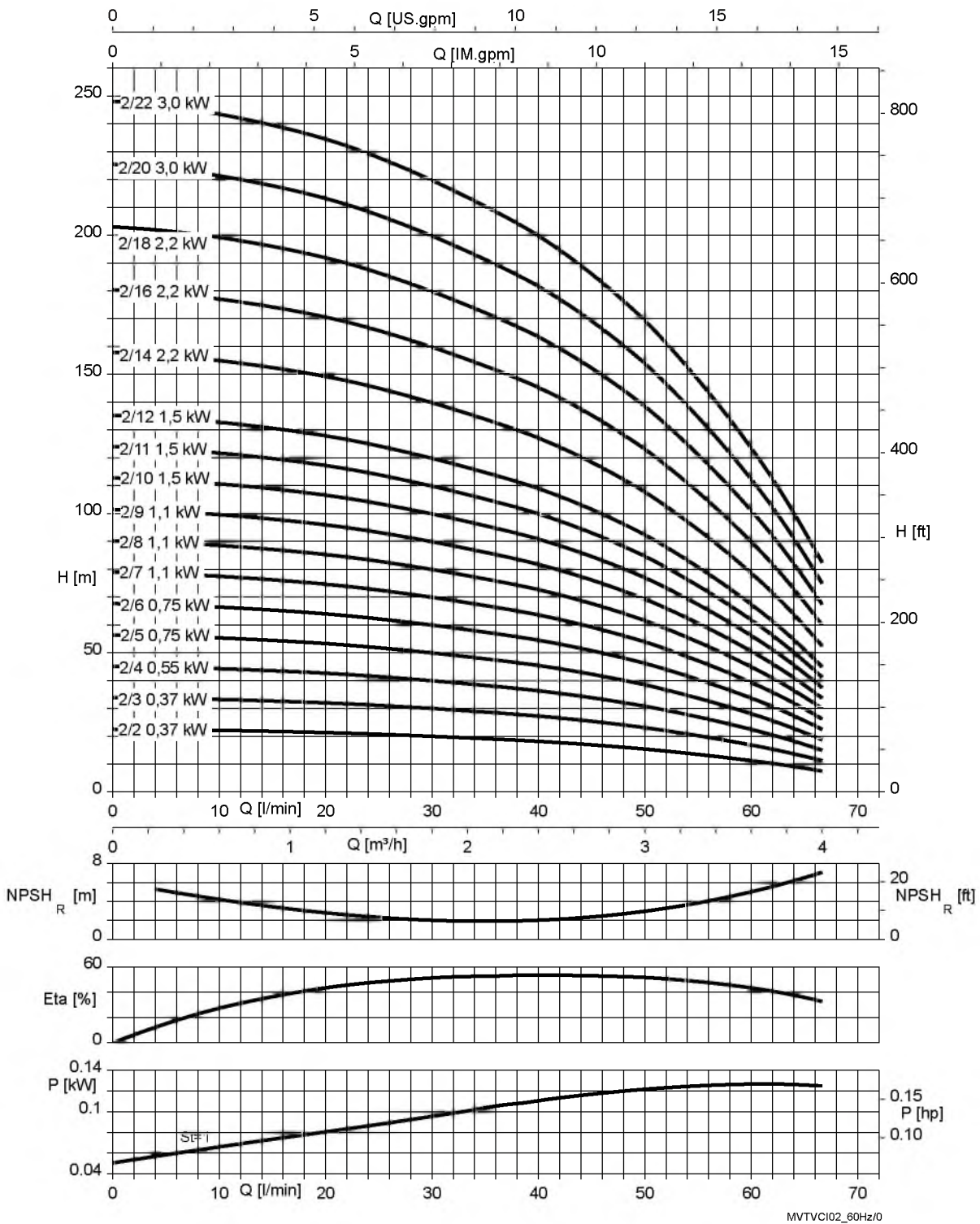


Fig. 9: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 4 B; n = 3500 rpm

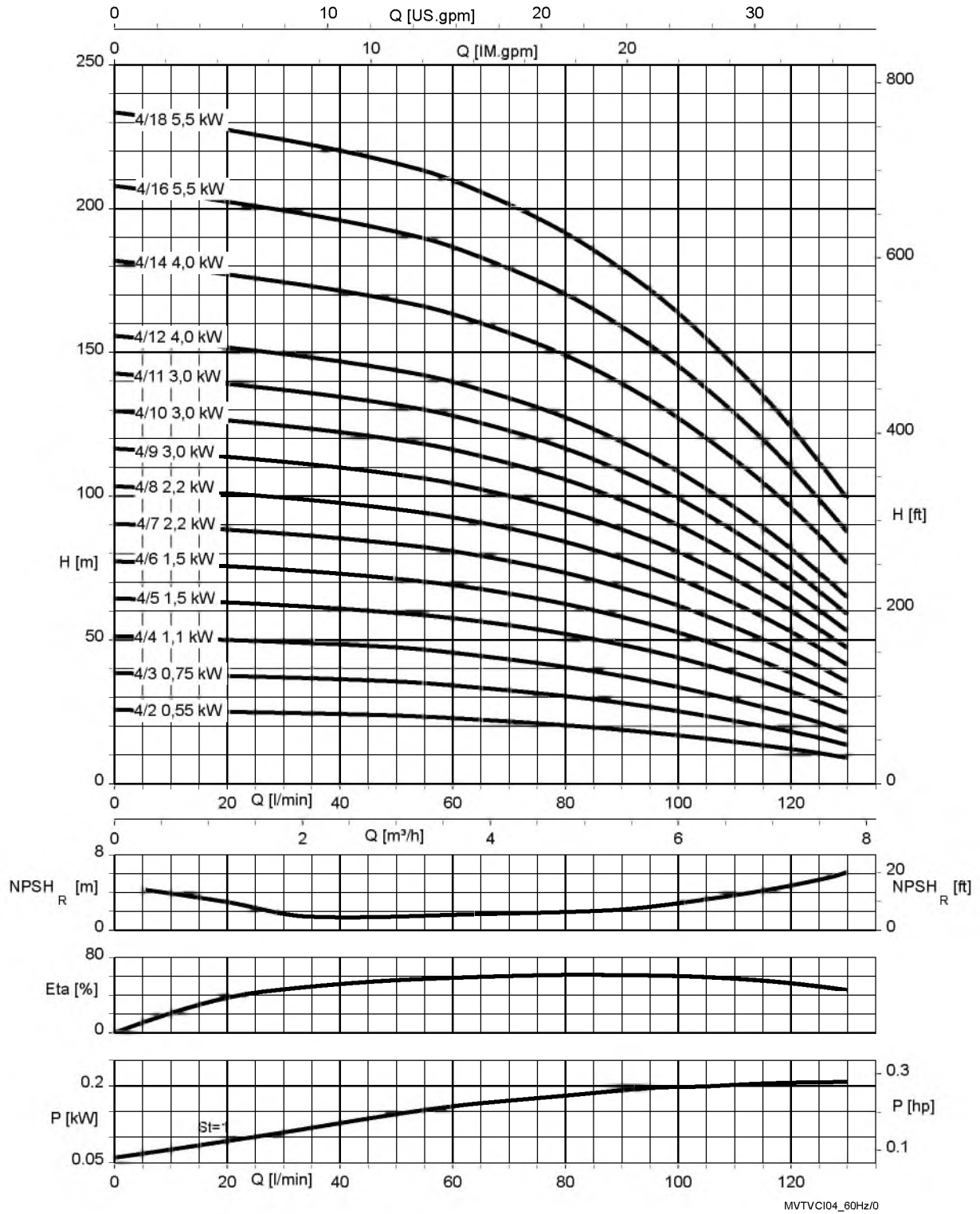


Fig. 10: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 6 B; n = 3500 rpm

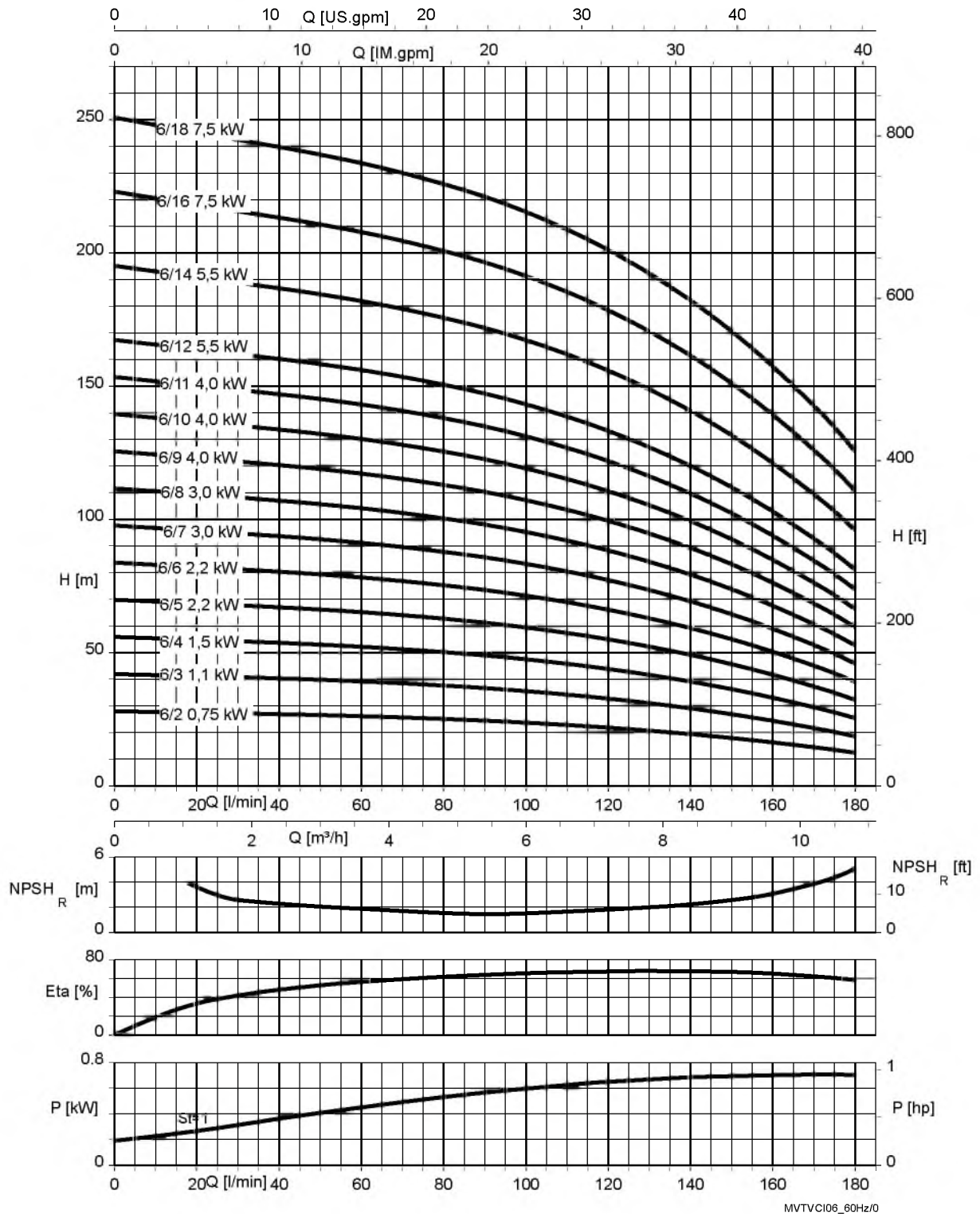


Fig. 11: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 10 B; n = 3500 rpm

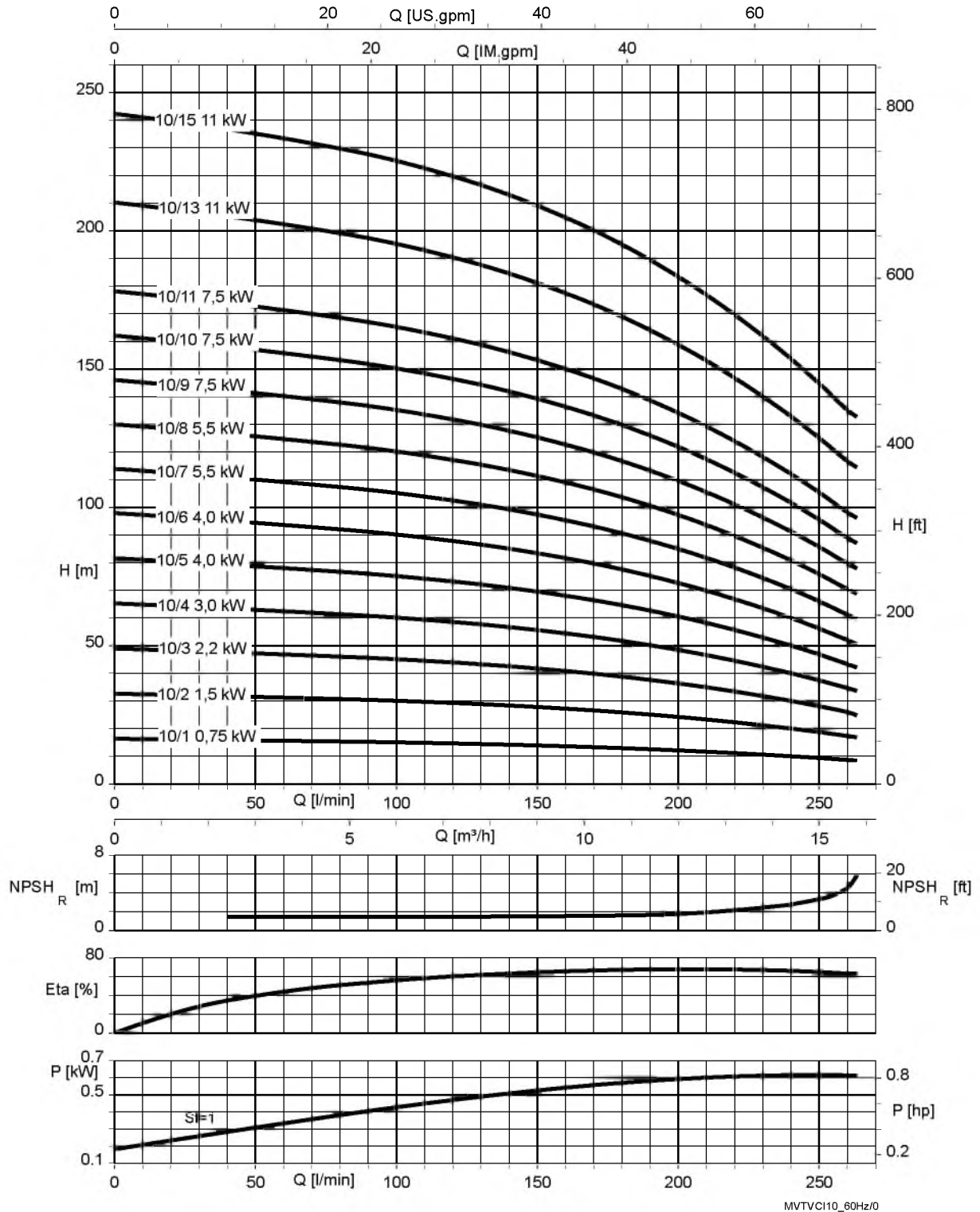


Fig. 12: $\rho = 1000 \text{ kg/m}^3$

St = 1 | P per stage

Movitec VCI; 15 B; n = 3500 rpm

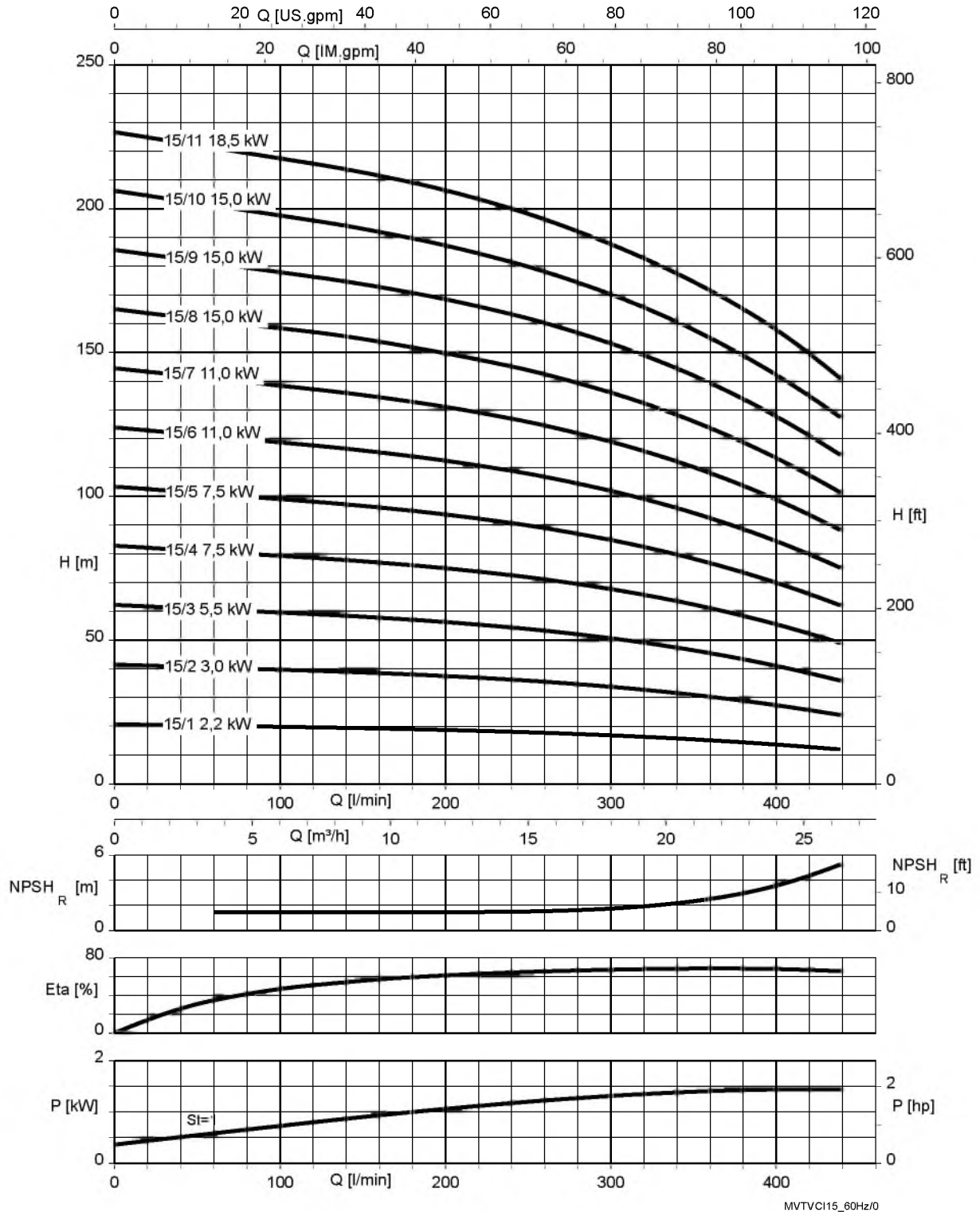


Fig. 13: $\rho = 1000 \text{ kg/m}^3$

St = 1 P per stage

Dimensions and connections

Movitec VCI 2B, n = 2900 rpm

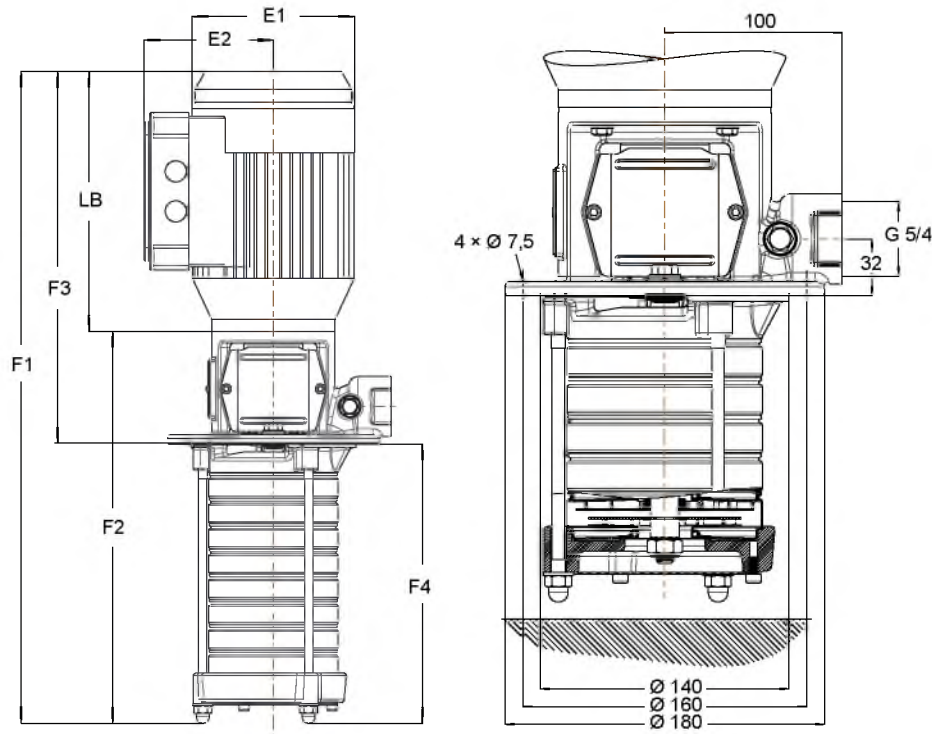


Fig. 14: Dimensions / connections Movitec VCI 2B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇔ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇔ Page 4)

Example: Movitec VCI 2/16-22: F3 = 373 mm, F4 = 560 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
02/02-02 B	138	109	221	447	226	317	130
02/03-03 B	138	109	221	468	247	317	151
02/04-04 B	138	109	221	490	269	317	173
02/05-05 B	138	109	221	511	290	317	194
02/06-06 B	138	109	221	533	312	317	216
02/07-07 B	138	109	221	554	333	317	237
02/08-08 B	138	109	221	576	355	317	259
02/09-09 B	157	133	257	643	386	363	280
02/10-10 B	157	133	257	665	408	363	302
02/11-11 B	157	133	257	686	429	363	323
02/12-12 B	157	133	257	708	451	363	345
02/14-14 B	157	133	257	751	494	363	388
02/16-16 B	180	145	257	804	547	373	431
02/18-18 B	180	145	257	847	590	373	474
02/20-20 B	180	145	257	890	633	373	517
02/22-22 B	180	145	310	986	676	426	560
02/24-24 B	180	145	310	1029	719	426	603
02/26-26 B	180	145	310	1072	762	426	646
02/28-28 B	180	145	310	1115	805	426	689
02/30-30 B	180	145	310	1158	848	426	732

Movitec VCI 2B, n = 3500 rpm

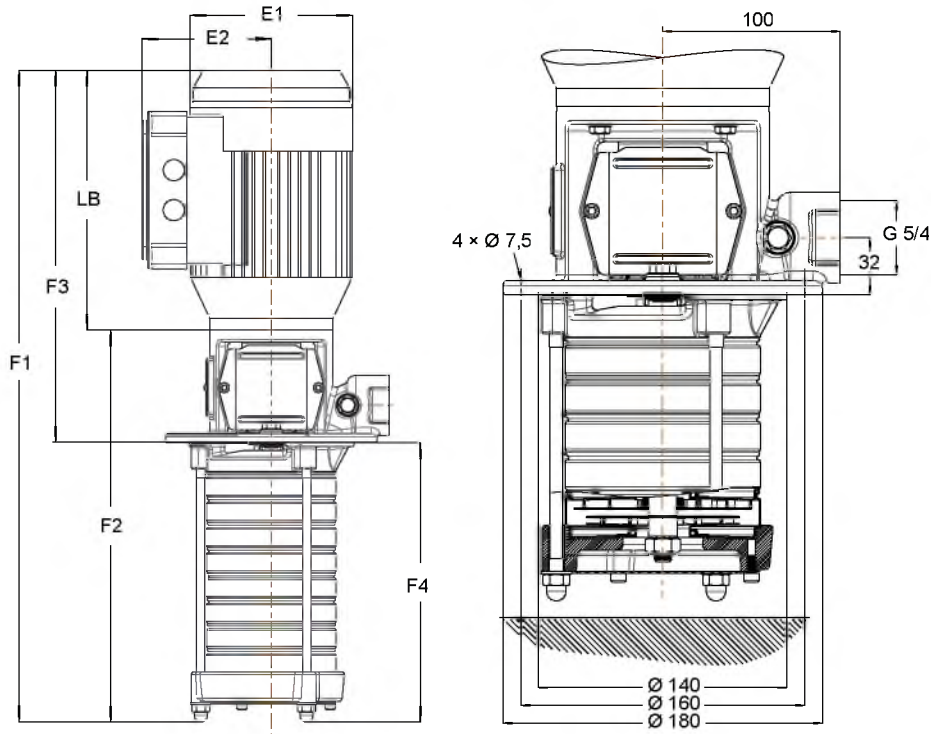


Fig. 15: Dimensions / connections Movitec VCI 2B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 2/16-22: F3 = 426 mm, F4 = 560 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
02/02-02 B	138	109	221	447	226	317	130
02/03-03 B	138	109	221	468	247	317	151
02/04-04 B	138	109	221	490	269	317	173
02/05-05 B	157	133	257	557	300	363	194
02/06-06 B	157	133	257	579	322	363	216
02/07-07 B	157	133	257	600	343	363	237
02/08-08 B	157	133	257	622	365	363	259
02/09-09 B	180	145	257	643	386	363	280
02/10-10 B	180	145	257	675	418	373	302
02/11-11 B	180	145	257	696	439	373	323
02/12-12 B	180	145	257	718	461	373	345
02/14-14 B	180	145	310	814	504	426	388
02/16-16 B	180	145	310	857	547	426	431
02/18-18 B	180	145	310	900	590	426	474
02/20-20 B	200	155	318	961	643	444	517
02/22-22 B	200	155	318	1004	686	444	560
02/22-24 B	200	155	318	1047	729	444	603
02/22-26 B	200	155	318	1090	772	444	646
02/22-28 B	200	155	318	1133	815	444	689
02/22-30 B	200	155	318	1176	856	444	732

Movitec VCI 4B, n = 2900 rpm

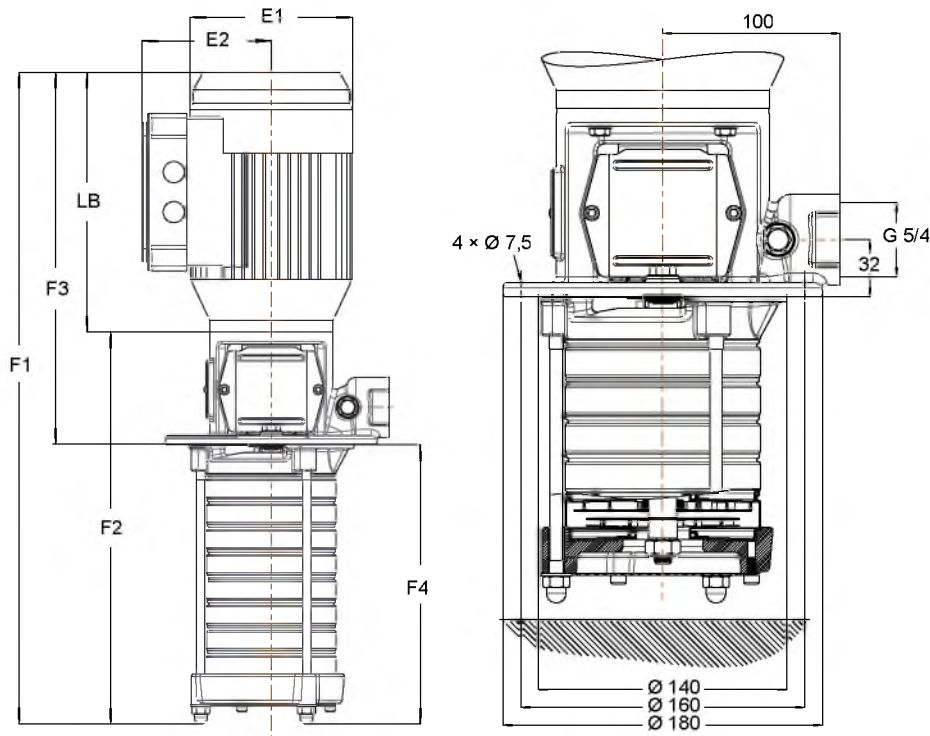


Fig. 16: Dimensions / connections Movitec VCI 4B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 4/16-22: F3 = 444 mm, F4 = 560 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
04/02-02 B	138	109	221	447	226	317	130
04/03-03 B	138	109	221	468	247	317	151
04/04-04 B	138	109	221	490	269	317	173
04/05-05 B	157	133	257	557	300	363	194
04/06-06 B	157	133	257	579	322	363	216
04/07-07 B	157	133	257	600	343	363	237
04/08-08 B	180	145	257	632	375	373	259
04/09-09 B	180	145	257	653	396	373	280
04/10-10 B	180	145	257	675	418	373	302
04/11-11 B	180	145	310	749	439	426	323
04/12-12 B	180	145	310	771	461	426	345
04/14-14 B	180	145	310	814	504	426	388
04/16-16 B	200	155	318	875	557	444	431
04/18-18 B	200	155	318	918	600	444	474
04/20-20 B	200	155	318	961	643	444	517
04/22-22 B	223	166	325	1011	686	451	560
04/24-24 B	223	166	325	1054	729	451	603
04/26-26 B	223	166	325	1097	772	451	646
04/26-28 B	223	166	325	1140	815	451	689
04/26-30 B	223	166	325	1183	858	451	732

Movitec VCI 4B, n = 3500 rpm

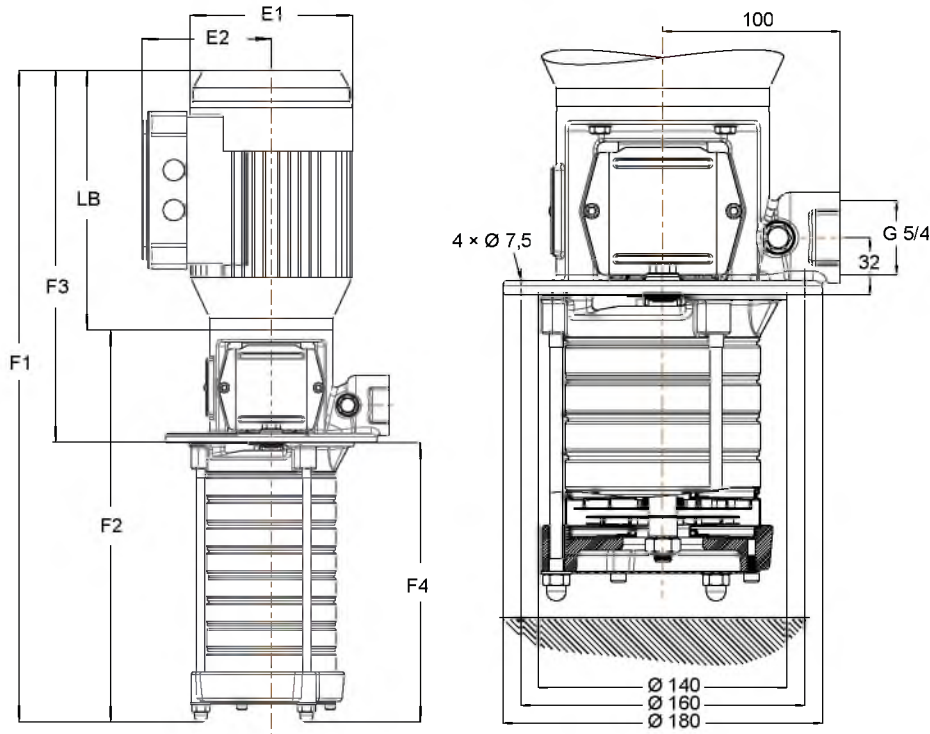


Fig. 17: Dimensions / connections Movitec VCI 4B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 4/16-22: F3 = 552 mm, F4 = 560 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
04/02-02 B	138	109	221	447	226	317	130
04/03-03 B	157	133	257	514	257	363	151
04/04-04 B	157	133	257	536	279	363	173
04/05-05 B	180	145	257	567	310	373	194
04/06-06 B	180	145	257	589	332	373	216
04/07-07 B	180	145	310	663	353	426	237
04/08-08 B	180	145	310	685	375	426	259
04/09-09 B	200	155	318	724	406	444	280
04/10-10 B	200	155	318	746	428	444	302
04/11-11 B	200	155	318	767	449	444	323
04/12-12 B	223	166	325	796	471	451	345
04/14-14 B	223	166	325	839	514	451	388
04/16-16 B	260	190	350	983	633	552	431
04/18-18 B	260	190	350	1026	676	552	474
04/18-20 B	260	190	350	1069	719	552	517
04/18-22 B	260	190	350	1112	762	552	560
04/18-24 B	260	190	350	1155	805	552	603
04/18-26 B	260	190	350	1198	848	552	646
04/18-28 B	260	190	350	1241	891	552	689
04/18-30 B	260	190	350	1284	934	552	732

Movitec VCI 6B, n = 2900 rpm

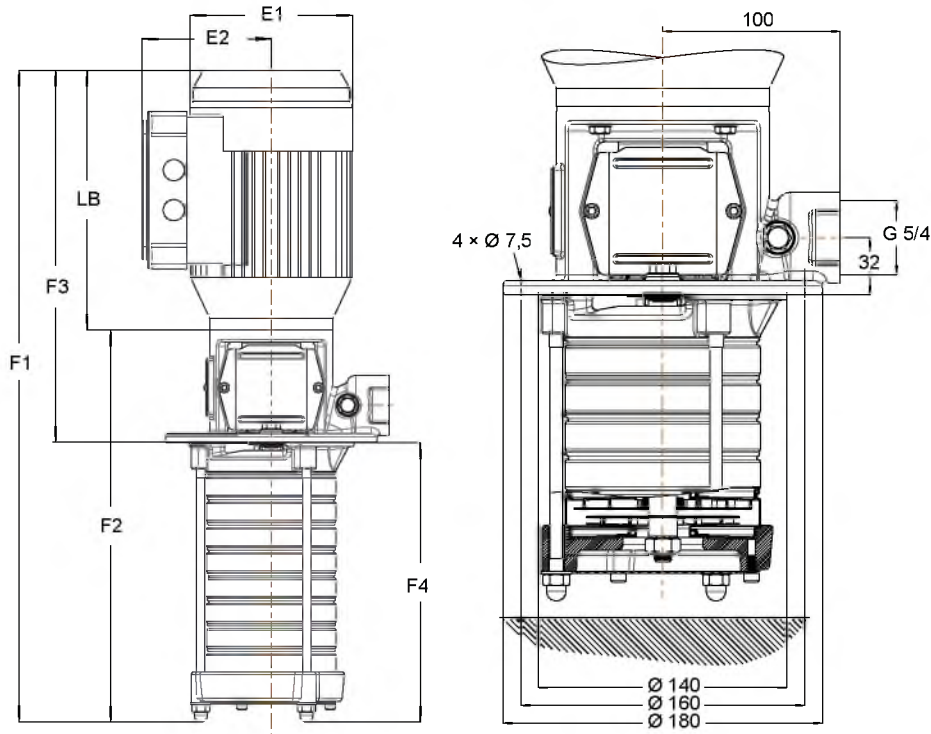


Fig. 18: Dimensions / connections Movitec VCI 6B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 6/16-22: F3 = 451 mm, F4 = 640 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
06/02-02 B	138	109	221	457	236	317	140
06/03-03 B	157	133	257	528	271	363	165
06/04-04 B	157	133	257	553	296	363	190
06/05-05 B	157	133	257	578	321	363	215
06/06-06 B	180	145	257	613	356	373	240
06/07-07 B	180	145	257	638	381	373	265
06/08-08 B	180	145	310	716	406	426	290
06/09-09 B	180	145	310	741	431	426	315
06/10-10 B	180	145	310	766	456	426	340
06/11-11 B	200	155	318	809	491	444	365
06/12-12 B	200	155	318	834	516	444	390
06/14-14 B	200	155	318	884	566	444	440
06/16-16 B	223	166	325	941	616	451	490
06/18-18 B	223	166	325	991	666	451	540
06/20-20 B	260	190	350	1142	792	552	590
06/22-22 B	260	190	350	1192	842	552	640
06/24-24 B	260	190	350	1242	892	552	690
06/26-26 B	260	190	350	1292	942	552	740
06/28-28 B	260	190	350	1342	992	552	790
06/26-30 B	260	190	350	1392	1042	552	840

Movitec VCI 6B, n = 3500 rpm

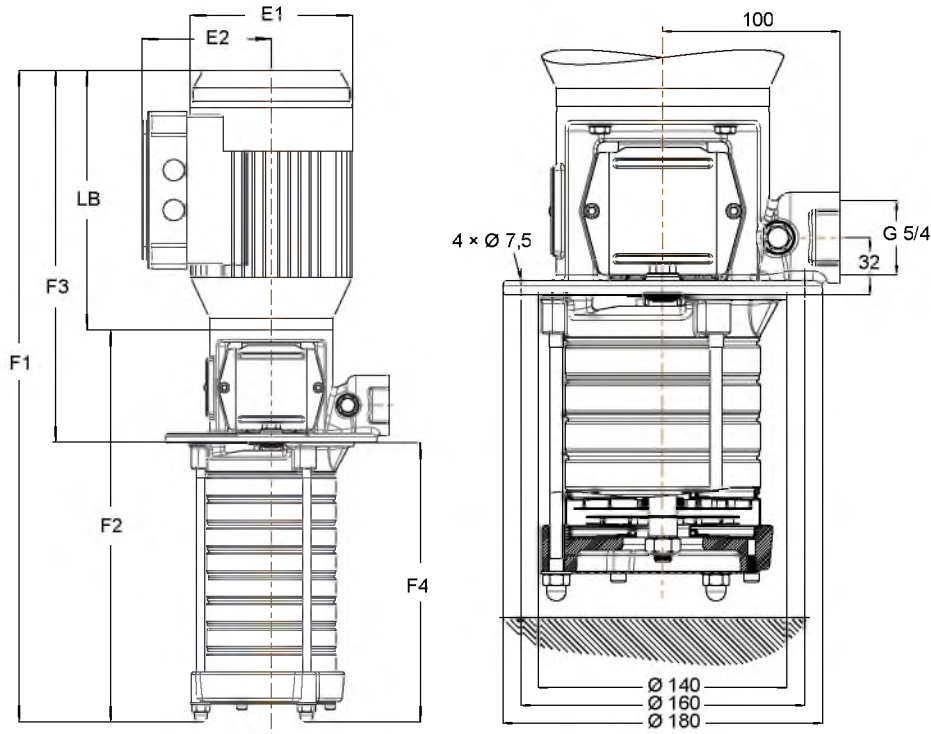


Fig. 19: Dimensions / connections Movitec VCI 6B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 6/16-22: F3 = 589 mm, F4 = 640 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
06/02-02 B	157	133	257	503	246	363	140
06/03-03 B	157	133	257	528	271	363	165
06/04-04 B	180	145	257	563	306	373	190
06/05-05 B	180	145	310	641	331	426	215
06/06-06 B	180	145	310	666	356	426	240
06/07-07 B	200	155	318	709	391	444	265
06/08-08 B	200	155	318	734	416	444	290
06/09-09 B	223	166	325	766	441	451	315
06/10-10 B	223	166	325	791	466	451	340
06/11-11 B	223	166	325	816	491	451	365
06/12-12 B	260	190	350	942	592	552	390
06/14-14 B	260	190	350	992	642	552	440
06/16-16 B	260	190	387	1079	692	589	490
06/18-18 B	260	190	387	1129	742	589	540
06/18-20 B	260	190	387	1179	792	589	590
06/18-22 B	260	190	387	1229	842	589	640
06/18-24 B	260	190	387	1279	892	589	690
06/18-26 B	260	190	387	1329	942	589	740
06/18-28 B	260	190	387	1379	992	589	790
06/18-30 B	260	190	387	1429	1042	589	840

Movitec VCI 10B, n = 2900 rpm

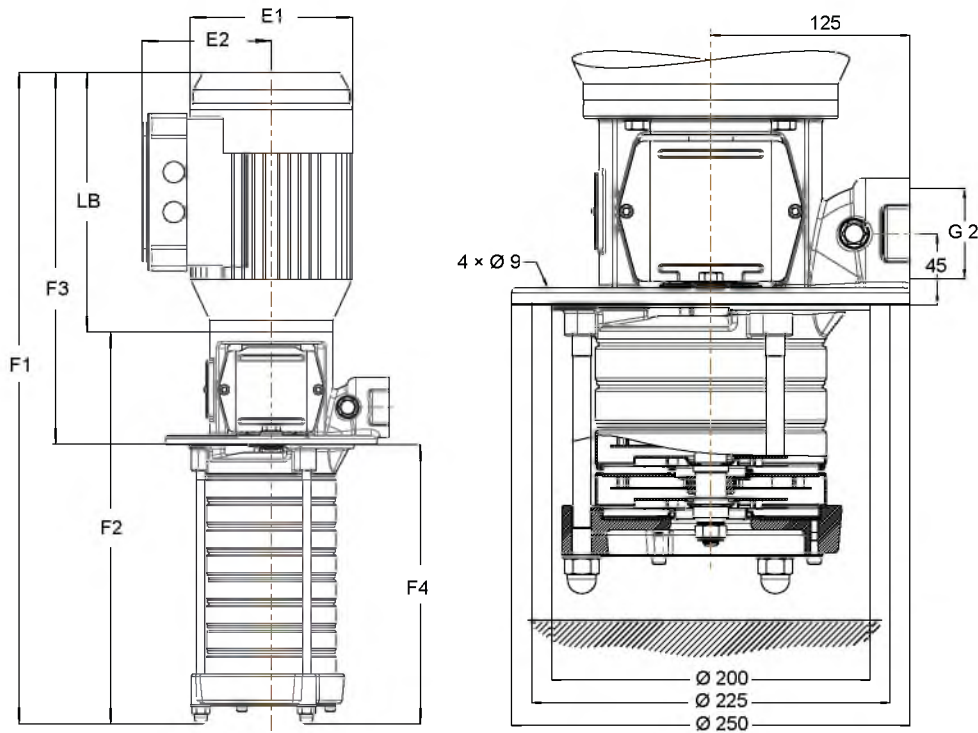


Fig. 20: Dimensions / connections Movitec VCI 10B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 10/15-21: F3 = 597 mm, F4 = 657 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
10/01-02 B	157	133	257	520	263	366	154
10/02-02 B	157	133	257	520	263	366	154
10/03-03 B	157	133	257	547	290	366	181
10/04-04 B	180	145	257	583	326	376	207
10/05-05 B	180	145	310	663	353	429	234
10/06-06 B	180	145	310	716	406	429	260
10/07-07 B	200	155	318	734	416	447	287
10/08-08 B	200	155	318	760	442	447	313
10/09-09 B	223	166	325	793	468	454	339
10/10-10 B	223	166	325	820	495	454	366
10/11-11 B	223	166	325	846	521	454	392
10/13-13 B	260	190	350	1005	655	560	445
10/15-15 B	260	190	350	1058	708	560	498
10/17-17 B	260	190	387	1148	761	597	551
10/19-19 B	260	190	387	1201	814	597	604
10/21-21 B	260	190	387	1254	867	597	657

Movitec VCI 10B, n = 3500 rpm

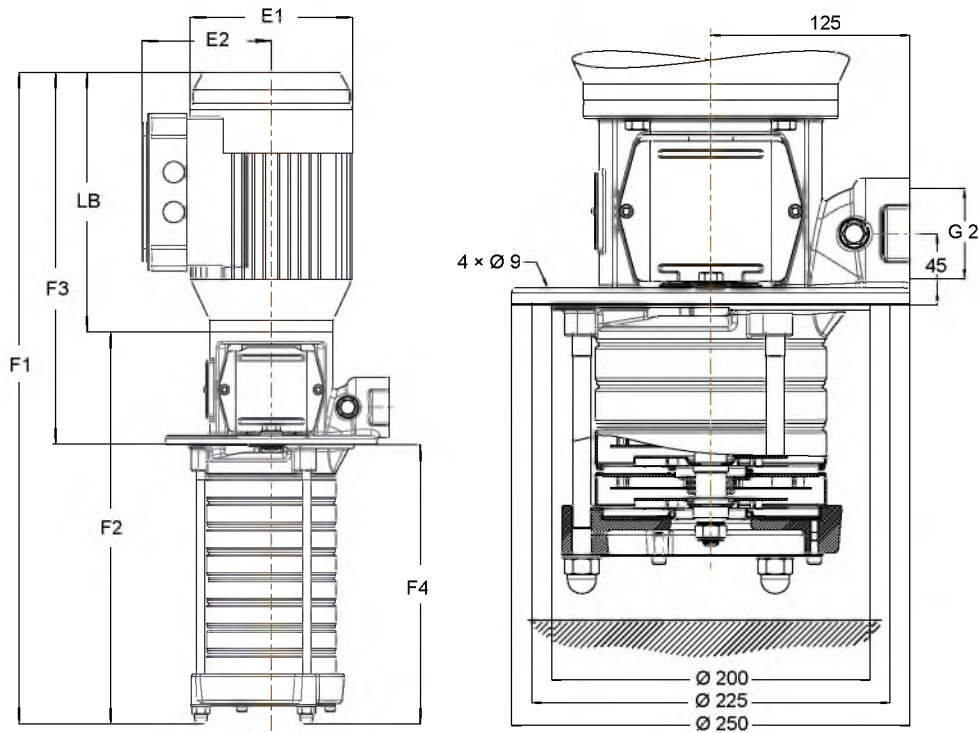


Fig. 21: Dimensions / connections Movitec VCI 10B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 10/15-21: F3 = 744 mm, F4 = 657 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
10/01-02 B	157	133	257	520	263	366	154
10/02-02 B	180	145	257	530	272	376	154
10/03-03 B	180	145	310	610	300	429	181
10/04-04 B	200	155	318	654	336	447	207
10/05-05 B	223	166	325	688	363	454	234
10/06-06 B	223	166	325	741	416	454	260
10/07-07 B	260	190	350	847	497	560	287
10/08-08 B	260	190	350	873	523	560	313
10/09-09 B	260	190	387	938	549	597	339
10/10-10 B	260	190	387	963	576	597	366
10/11-11 B	260	190	387	989	602	597	392
10/13-13 B	315	260	504	1189	685	744	445
10/15-15 B	315	260	504	1242	738	744	498
10/15-17 B	315	260	504	1295	791	744	551
10/15-19 B	315	260	504	1348	844	744	604
10/15-21 B	315	260	504	1401	897	744	657

Movitec VCI 15B, n = 2900 rpm

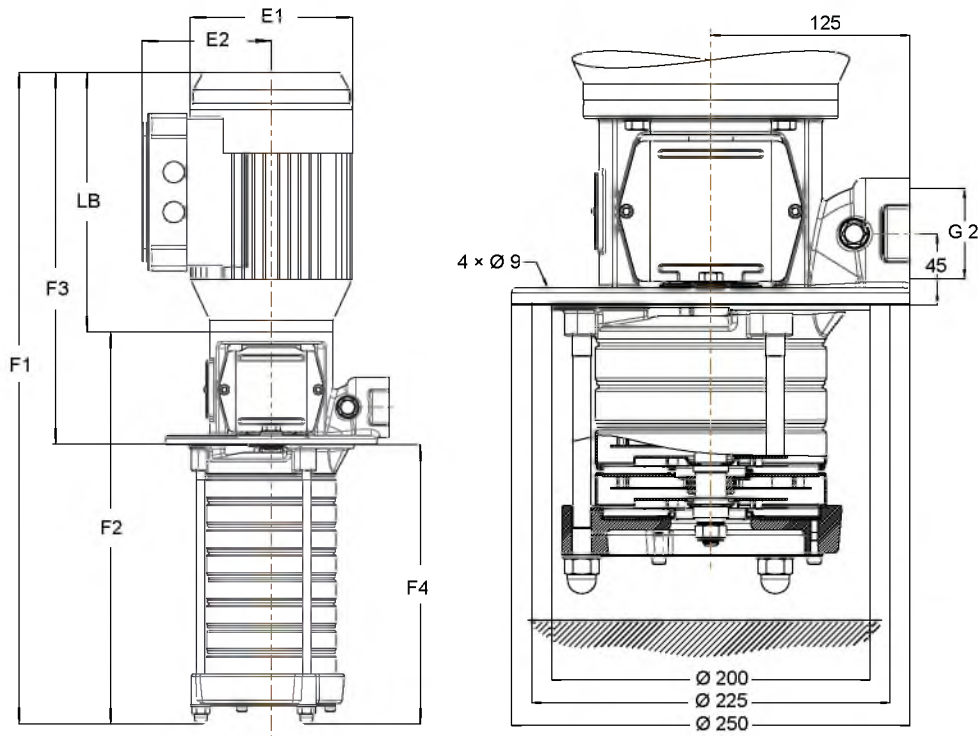


Fig. 22: Dimensions / connections Movitec VCI 15B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 15/17-21: F3 = 744 mm, F4 = 657 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
15/01-02 B	157	133	257	527	263	366	154
15/02-02 B	180	145	310	553	273	429	154
15/03-03 B	200	155	318	626	310	447	181
15/04-04 B	223	166	325	660	336	454	207
15/05-05 B	260	190	350	773	444	560	234
15/06-06 B	260	190	350	799	470	560	260
15/07-07 B	260	190	387	874	497	597	287
15/08-08 B	260	190	387	900	523	597	313
15/09-09 B	315	260	504	1077	579	744	339
15/10-10 B	315	260	504	1104	606	744	366
15/11-11 B	315	260	504	1130	632	744	392
15/13-13 B	315	260	504	1183	685	744	445
15/15-15 B	315	260	504	1236	738	744	498
15/17-17 B	315	260	504	1289	791	744	551
15/17-19 B	315	260	504	1342	844	744	604
15/17-21 B	315	260	504	1395	897	744	657

Movitec VCI 15B, n = 3500 rpm

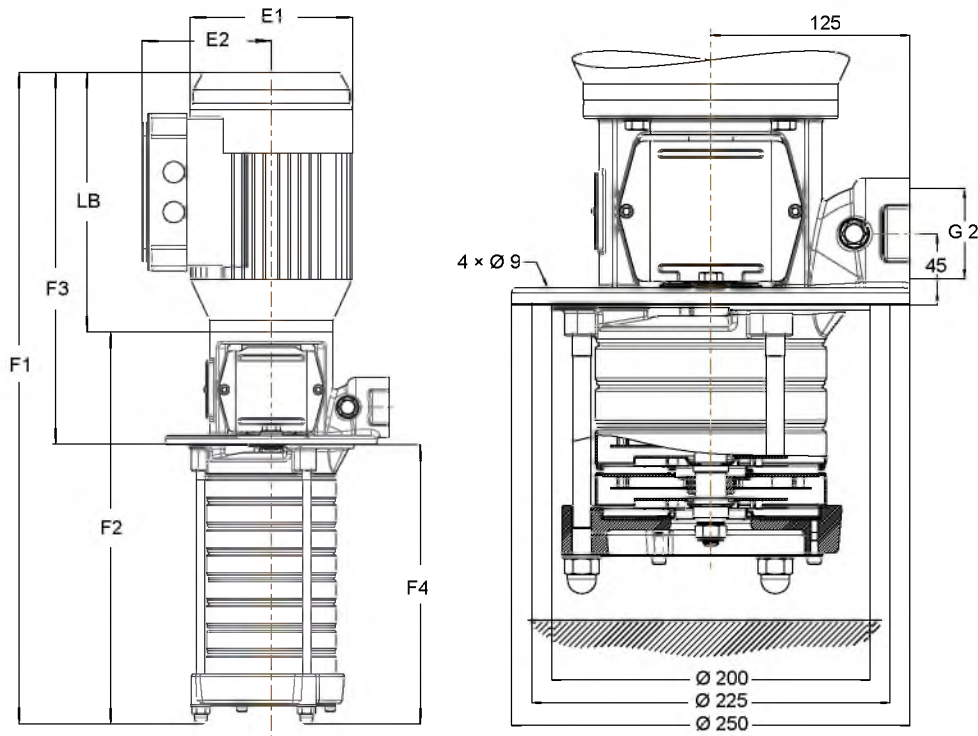


Fig. 23: Dimensions / connections Movitec VCI 15B

Calculation of pump (set) length

Feature	Pump length	Pump set length
Pump without blind stage	F1	F2
Pump with blind stage	F3 + F4	F3 + F4 - LB

- F3 [mm]: depends on number of impellers (⇒ Page 4)
- F4 [mm]: depends on the number of stages (incl. blind stages) (⇒ Page 4)

Example: Movitec VCI 15/17-21: F3 = 788 mm, F4 = 657 mm

Dimensions [mm]

Movitec VCI	E1	E2	LB	F1	F2	F3	F4
15/01-02 B	180	145	310	553	273	429	154
15/02-02 B	200	155	318	599	283	447	154
15/03-03 B	260	190	350	720	391	560	181
15/04-04 B	260	190	387	794	417	597	207
15/05-05 B	260	190	387	821	444	597	234
15/06-06 B	315	260	504	998	500	744	260
15/07-07 B	315	260	504	1025	527	744	287
15/08-08 B	315	260	504	1051	553	744	313
15/09-09 B	315	260	504	1077	579	744	339
15/10-10 B	315	260	504	1104	606	744	366
15/11-11 B	315	265	548	1212	632	788	392
15/11-13 B	315	265	548	1265	685	788	445
15/11-15 B	315	265	548	1318	738	788	498
15/11-17 B	315	265	548	1371	791	788	551
15/11-19 B	315	265	548	1424	844	788	604
15/11-21 B	315	265	548	1477	897	788	657

General assembly drawing with list of components

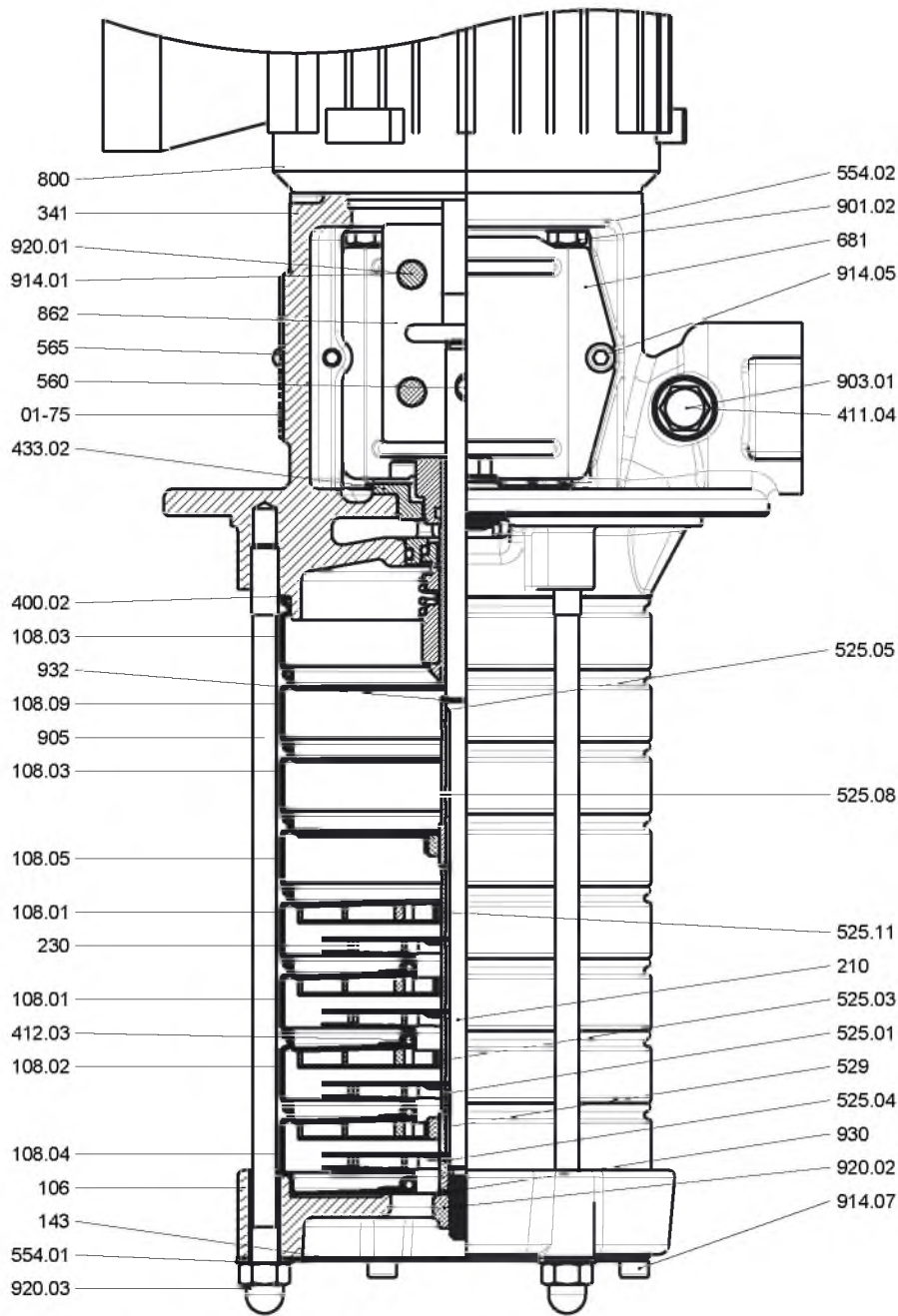


Fig. 24: General assembly drawing

List of components

Part No.	Description	Part No.	Description
01-75	Name plate	554.01/.02	Washer
106	Suction casing	560	Pin
108.01/.02/.03/ .04/.05/.09	Stage casing	565	Rivet
143	Suction strainer	681	Coupling guard
210	Shaft	800	Motor
230	Impeller	862	Coupling shell
341	Drive lantern	901.02	Hexagon head bolt
400.02	Gasket	903.01	Screw plug
411.04	Joint ring	905	Tie bolt
412.03	O-ring	914.01/.05/.07	Hexagon socket head cap screw

Part No.	Description	Part No.	Description
433.02	Mechanical seal	920.01/.03	Nut
525.01/.03/.04/ .05/.08/.11	Spacer sleeve	930.02	Safety device
529	Bearing sleeve	932	Circlip

Detailed designation

Designation example

Position																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
M	o	v	i	t	e	c	V	C	I	0	6	/	1	2	-	1	8	A	A	1	3	C	S	0	7	1	A	5	C	A	
See name plate and data sheet																See data sheet															

Position 1-7: designation

Code	Description
Movitec	Movitec

Position 8-9: design

Code	Description
VC	EN-GJL-250
V	304 - 304

Position 10: connection type

Code	Description
I	Internal thread

Position 11-12: size

Code	Description
02	Size 2
04	Size 4
06	Size 6
10	Size 10
15	Size 15

Position 14-15: number of impellers

Code	Description
01	1
02	2
03	3
04	4
05	5
06	6
07	7
08	8
09	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
24	24

Code	Description
26	26
28	28
30	30

Position 17-18: number of stages (incl. blind stages)

Code	Description
01	1 stage
02	2 stages
03	3 stages
04	4 stages
05	5 stages
06	6 stages
07	7 stages
08	8 stages
09	9 stages
10	10 stages
11	11 stages
12	12 stages
13	13 stages
14	14 stages
15	15 stages
16	16 stages
17	17 stages
18	18 stages
19	19 stages
20	20 stages
21	21 stages
22	22 stages
24	24 stages
26	26 stages
28	28 stages
30	30 stages

Position 19: standard of connection

Code	Description
A	Internal thread / EN ISO 228-1

Position 20: generation

Code	Description
A	Generation A for VCI design

Position 21-22: seal code

Code	Description
13	Q1 B E G G
14	Q1 B V G G
15	U3 U3 X4 G G
16	U3 U3 V G G

Code	Description
17	U3 B E G G
20	Q1 A E G G
21	Q1 A V G G
22	Q1 A X4 G G
XX	Special design

Position 23: mechanical seal design

Code	Description
C	Cartridge design

Position 24: drive

Code	Description
0	Without motor
2	With PumpDrive 2
E	With PumpDrive 2 Eco
S	Standard IEC

Position 25-27: motor size

Code	Description
071	IEC 071
080	IEC 080
090	IEC 090
100	IEC 100
112	IEC 112
132	IEC 132
160	IEC 160

Position 28: pressure class

Code	Description
A	PN16 / PN25
B	PN25

Position 29: mains frequency

Code	Description
5	50 Hz, 2-pole
6	60 Hz, 2-pole
7	50 Hz, 4-pole
8	60 Hz, 4-pole

Position 30: motor specification

Code	Description
C	230/400 V - IE2
D	400/690 V - IE2
K	EXM IEC, Movitec
M	230 V, single-phase
O	0.37/0.55 kW, without IE classification
U	230/400 V - IE3
V	400/690 V - IE3
W	230/400 V - IE4 (KSB SuPremE)
X	400/690 V - IE4 (KSB SuPremE)

Position 31: PumpMeter

Code	Description
A	With PumpMeter
W	Without PumpMeter

Position 32: standard

Code	Description
X	One or several non-standard components

Globe Valve

BOACHEM-ZXA

PN 10-40
DN 15-300
Gland Packing
Flanged Ends

Type Series Booklet



Legal information/Copyright

Type Series Booklet BOACHEM-ZXA

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Globe Valves

Globe valves to DIN/EN with gland packing

BOACHEM-ZXA



Main applications

- Food and beverages industry
- Petrochemical industry
- Process engineering
- Sugar industry

Fluids handled

- Aggressive fluids
- Steam
- Explosive fluids
- Flammable fluids
- Fluids containing gas
- Gas
- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fluids containing mineral oils
- Oil
- Polymerising/crystallising fluids
- Feed water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10 - 40
Nominal size	DN 15 - 300

Characteristic	Value
Max. permissible pressure	40 bar
Min. permissible temperature	-10 °C
Max. permissible temperature	+400 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

Body materials

Overview of available materials

Material	Material number	Temperature limit
GX5CrNiMo19-11-2	1.4408	Up to 400 °C

Design details

Design

- Straight-way pattern
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Balanced plug from:
 - PN 10 DN 250
 - PN 16 DN 200
 - PN 25 DN 150
 - PN 40 DN 125
- Rotating stem
- Rising handwheel
- Back seat
- Fully confined bonnet gasket
- Stem sealed by gland packing
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Throttling plug from DN 125
- Balanced plug
- Position indicator
- Valve disc with PTFE gasket (up to 200 °C)
- Oil and grease-free
- Serrated gasket (PTFE-coated)
- PTFE packing
- Applications down to -60 °C
- Heating jacket made of 1.4541/1.4301 or 1.4571/1.4404
- Other flange designs

Product benefits

- Long service life and high functional reliability of the gland packing due to stem with burnished shank.
- Reliable sealing: bonnet gasket fully confined to prevent creep.
- Additional safety and blow-out protection by standard back seat

Related documents

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ BOACHEM-ZXAB bellows-type globe valve, see type series booklet 8150.1. ▪ BOACHEM-ZYAB bellows-type Y-pattern globe valve, see type series booklet 8151.1. ▪ BOACHEM-ZYA Y-pattern globe valve with gland packing, see type series booklet 8148.1. ▪ BOACHEM-RXA non-return valve, see type series booklet 8147.1. ▪ BOACHEM-FSA Y-pattern strainer, see type series booklet 8146.1. ▪ Operating manual 8115.8 | <ol style="list-style-type: none"> 2. Nominal pressure 3. Nominal size 4. Operating pressure 5. Differential pressure 6. Operating temperature 7. Fluid handled 8. Pipe connection 9. Variants 10. Number of type series booklet |
|--|---|

On all enquiries/orders please specify

1. Type

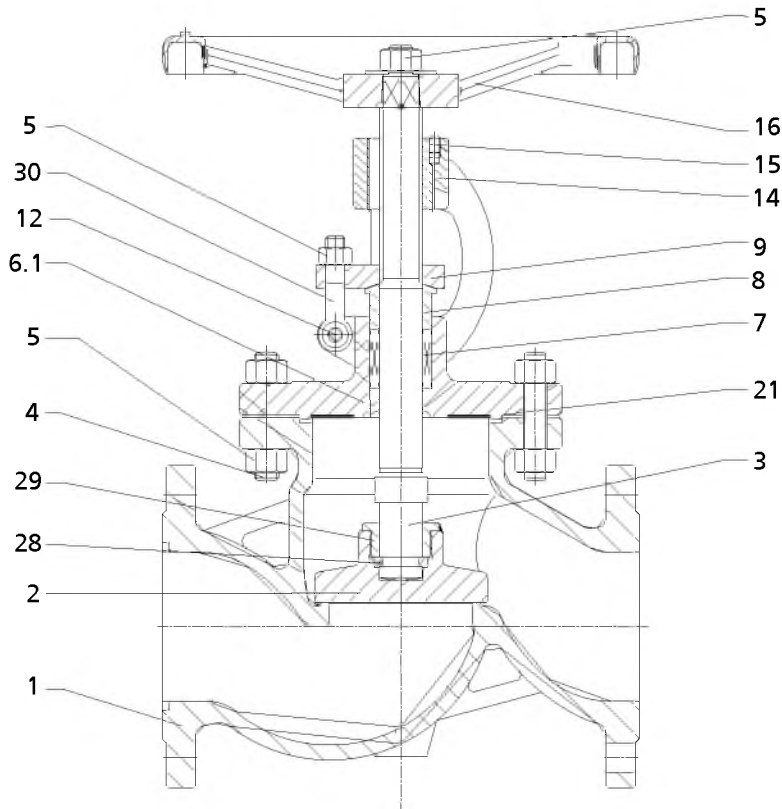
Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to EN 1092-1)¹⁾

Nominal pressure PN	Material	20	100	150	200	250	300	350	400
10	1.4408	10	10	9	8,4	7,9	7,4	7,1	6,8
16		16	16	14,5	13,4	12,7	11,8	11,4	10,9
25		25	25	22,7	21	19,8	18,5	17,8	17,1
40		40	40	36,3	33,7	31,8	28,5	28,5	27,4

¹⁾ The valves are suitable for temperatures down to -10 °C.

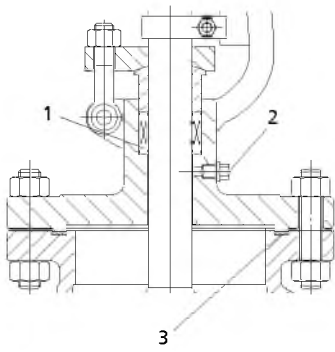
Materials



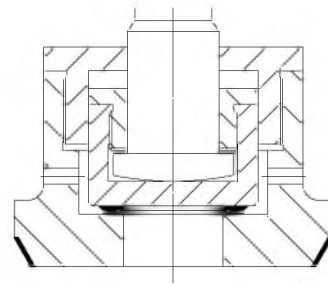
Parts list

Part No.	Description	Material	Material number
1	Body	G X 5 CrNiMo 19-11-2	1.4408
2	Valve disc	X5 CrNiMo 18-10	1.4401
3	Stem	X6 CrNiMoTi 17-12-2	1.4571
4	Bolt	A4-70	
5	Nut	A4-70	
6.1	Bonnet	G X 5 CrNiMo 19-11-2	1.4408
7	Packing	Graphite	
8	Thrust insert	X5 CrNiMo 18-10	1.4401
9	Gland follower	G X 5 CrNiMo 19-11-2	1.4408
12	Pin	X5 CrNiMo 18-10	1.4401
14	Threaded bush	Bronze	
15	Pin	ASTM A439 D2	
16	Handwheel	EN-GJL-200	5.1300
21	Gasket	CrNiSt/graphite	
28	Retaining ring	X5 CrNiMo 18-10	1.4401
29	Threaded sleeve	G-X6 CrNi 18 9	1.4308
30	Eyebolt	A4-70	

Variants

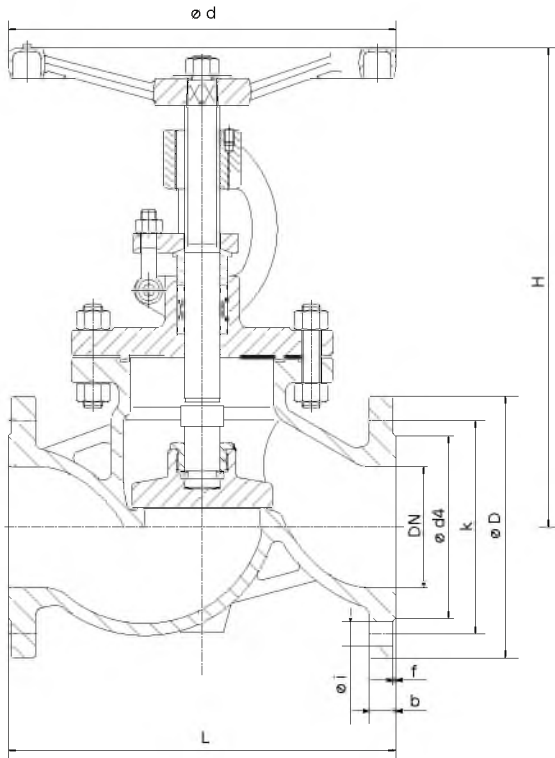


- 1) PTFE packing
- 2) Leakage detection hole
- 3) Serrated gasket



Balanced plug

Dimensions



Dimensions in mm

PN	DN	L	Ø D	k	No. of bolt holes z	Ø i	Ø d ₄ x f	b	H (closed)	H (open)	Ø d	[kg]
10-40	15	130	95	65	4	14	45 x 2	16	205	220	120	6,6
	20	150	105	75	4	14	58 x 2	18	210	235	140	7,7
	25	160	115	85	4	14	68 x 2	18	245	280	160	9,9
	32	180	140	100	4	18	78 x 2	18	265	295	160	13,2
	40	200	150	110	4	18	88 x 3	18	280	295	200	15,4
10/16	50	230	165	125	4	18	102 x 3	18	300	320	220	20,9
	65	290	185	145	4	18	122 x 3	22	320	345	260	27,3
	80	310	200	160	8	18	138 x 3	24	370	395	280	37
	100	350	220	180	8	18	158 x 3	24	410	435	300	50,4
	125	400	250	210	8	18	188 x 3	26	462	507	350	75,9
10	150	480	285	240	8	22	212 x 3	28	520	580	400	100
	200	600	340	295	8	22	268 x 3	24	650	700	450	152
16	200	600	340	295	12	22	268 x 3	26	650	700	450	152
	250	730	405	355	12	26	320 x 3	28	655	735	500	290
	300	850	460	410	12	26	378 x 4	26	685	765	600	496
25/40	65	290	185	145	8	18	122 x 3	22	320	345	260	30,8
	80	310	200	160	8	18	138 x 3	24	370	395	280	38,5
	100	350	235	190	8	22	162 x 3	24	410	435	300	59,4
	125	400	270	220	8	26	188 x 3	26	462	507	350	75,9
	150	480	300	250	8	26	218 x 3	26	520	580	400	105,6
25	200	600	360	310	12	26	278 x 3	30	650	700	450	190
	250	730	425	370	12	30	335 x 3	32	655	735	500	340
	300	850	485	430	16	30	395 x 4	34	685	765	600	567
40	200	600	375	320	12	30	285 x 3	34	650	700	450	202
	250	730	450	385	12	33	345 x 3	38	655	735	500	361
	300	850	515	450	16	33	410 x 4	42	685	765	600	678


Mating dimensions – Standards

Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092-1, ISO 7005
 Flange facing: DIN EN 1092-1, type B1

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

Installation instructions

 Shut-off globe valves must be installed in the line so as to ensure that the fluid enters the valve beneath the valve disc and flows out above the valve disc. They can also be installed

in lines with alternating flow. If the max. permissible differential pressures for shut-off are exceeded for valves from DN 125 to 200, a balanced plug design is required. In this case the valve must be installed in such a way that the pressure to be sealed off lies above the valve disc. The balanced plug works on the bypass principle and can only serve its purpose if backpressure builds up after opening, so that the max. permissible differential pressures for shut-off (see table) are not exceeded.

Differential pressures in bar

DN	125	150	200
Δp bar	33	21	12

Automated Globe Valves

BOA-H Mat P

PN 16/25
DN 20-150

Type Series Booklet



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 BOA-H Mat P 4

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Control and Measurement Valves

Automated Globe Valves to DIN/EN

BOA-H Mat P



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Process engineering
- Heat recovery systems
- Sugar industry

Fluids handled

- High-temperature hot water
- Saturated steam
- Thermal oil
- Liquids not chemically or mechanically aggressive to the valve materials

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16/25
Nominal size	DN 20 - 150
Max. permissible pressure [bar]	25
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+350

Selection as per pressure/temperature ratings (⇒ Page 5)

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Design details

Design

- Straight-way pattern with horizontal seat
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Spring-loaded PTFE V-packing up to 250 °C
- Graphite gland packing up to 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage rate A
- Exterior coating: blue RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EC (PED) for fluids in Groups 1 and 2.

Actuators (technical data refers to basic configuration):

- Spring-to-close or air-to-close design (on request)
Max. control pressure: 6 bar
Mechanical or inductive limit switches

Variants

Globe valve:

- Valve disc with PTFE gasket (up to 200 °C)
- Other flange designs
- High-temperature resistant paint (grey aluminium)
- Certification to customer specification

Product benefits

- Internal parts made of high-grade stainless steel for long service life and high chemical resistance.
- Risk of leakage minimised by fully confined bonnet gasket.
- Available with two types of stem seal: maintenance-free PTFE V-packing (< 250 °C) or adjustable graphite gland packing (350 °C).
- Pneumatic actuator with 3/2 directional control valve and either inductive or mechanical limit switches. Actuating forces of up to 11 kN with spring-to-close design or up to 26 kN with air-to-close design.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7135.4
Operating manual	7525.81

Pressure/temperature ratings

Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ¹⁾²⁾					
		With water		[°C]					
		Tests P10 and P11 to DIN EN 12266-1	Test P12, leakage rate A to DIN EN 12266-1						
		[bar]	[bar]	-10 to +120	200	250	300	350	
16	EN-GJS-400-18-LT	24	Δp	16	14,7	13,9	12,8	11,2	
25	EN-GJS-400-18-LT	37,5	Δp	25	23	21,8	20	17,5	

Maximum permissible closing pressures

Fluid approaches the valve disc in closing direction; p₂ = 0 bar

Values [bar]

DN	Actuator:		PA-N300		PA-N540	
	Spring range [bar]:		1,6 - 2,8		2,0 - 3,7	
	Control pressure required [bar]:		2,9		3,8	
	Stem seal:		Graphite gland packing	PTFE V-packing	Graphite gland packing	PTFE V-packing
	Stroke [mm]	Kvs value [m ³ /h]				
20	7,5	8,3	25,0	25,0	-	-
25	7,5	13,0	25,0	25,0	-	-
32	11,0	19,9	25,0	25,0	-	-
40	12,0	27,1	25,0	25,0	-	-
50	13,5	42,0	17,4	19,0	25,0	25,0
65	17,0	75,1	10,0	11,2	25,0	25,0
80	20,5	116,7	6,5	7,3	17,5	18,2
100	25,5	172,3	4,1	4,6	11,2	11,7
125	33,0	270,0	-	-	7,0	7,4
150	38,0	393,0	-	-	4,8	5,1

Technical data

Technical data of globe valve

Technical data of BOA-H Mat P

Characteristic	Value
Nominal pressure	PN 16, PN 25
Valve characteristic	Open/Close
Leakage class	Leakage rate A to DIN EN 12266-1, test P12
Permissible pressure	16 bar, 25 bar
Flanged ends	PN 16 and PN 25 to DIN EN 1092-2
Fluid temperature	-10 to +350 °C

Technical data of actuators

Actuators

Characteristic	Actuator type	
	PA-N300	PA-N540
Diaphragm area [cm ²]	300	540
Max. control pressure [bar]	6	6
Stroke [mm]	32	50
Total volume [l]	1,0	3,7

1) Intermediate temperatures can be derived by linear interpolation.

2) Static load

Characteristic	Actuator type	
	PA-N300	PA-N540
Stroke volume [l]	0,6	2,2
Air supply connection	NPT 1/4	NPT 1/2
Weight without handwheel [kg]	13	32
Weight with handwheel [kg]	16	51
Ambient temperature	-30 to +80 °C ³⁾	
Function	Either spring-to-close or spring-to-open	

The maximum operating pressure of the actuators is 6 bar.

For trouble-free operation, the control air (6 bar max.) required for actuation must meet the following requirements:

- Instrument air quality to DIN ISO 8573.1 with a maximum particle size of 5 µm, a maximum particulate concentration of 5 mg/m³ and Quality Class 3.
- Water content: max. dew point 2 °C (Quality Class 4); a different dew point applies if the actuator is operated at a high-altitude site or at low ambient temperatures.
- Oil content: max. 25 mg of oil in 1 m³ of air (Quality Class 5) to DIN ISO 8573.1. If the actuator is operated at temperatures below 0 °C, dry control air must be used.

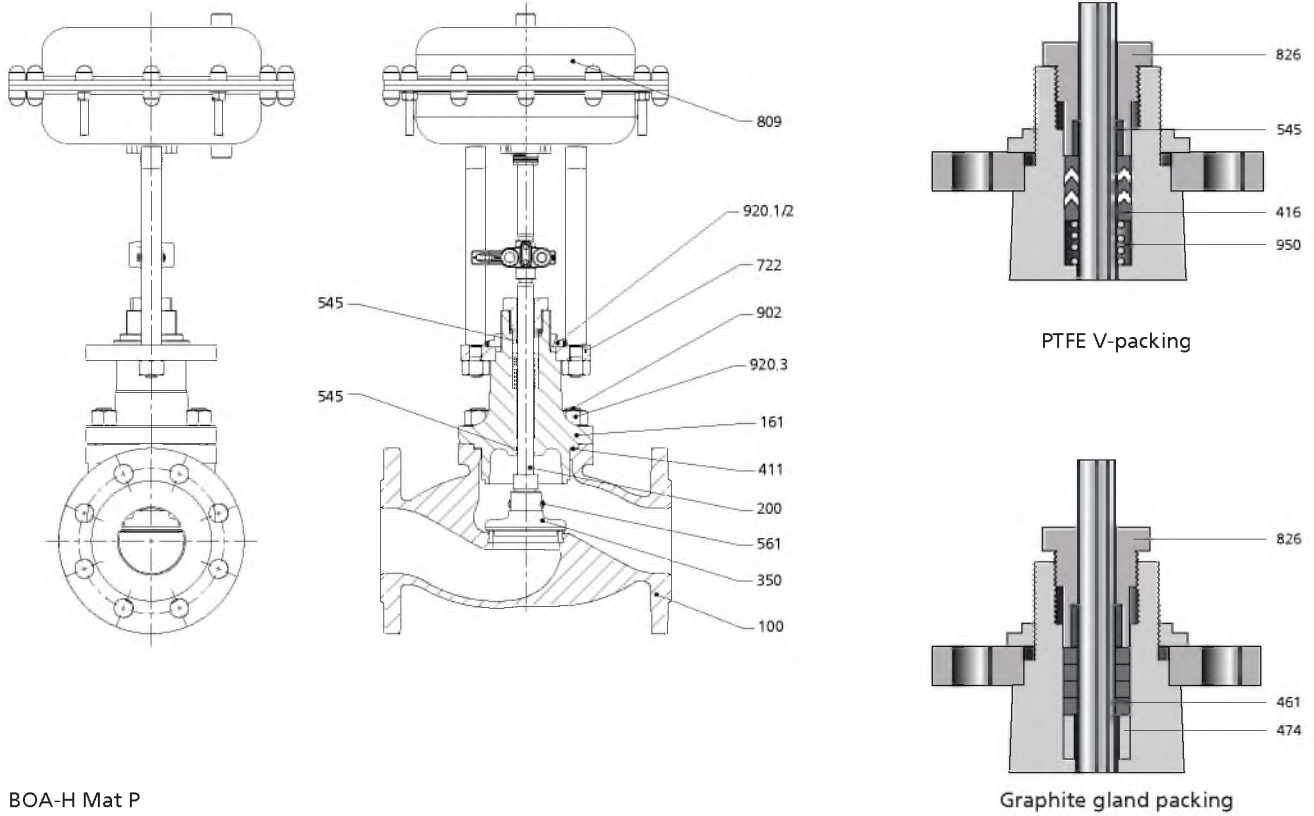
Contact the manufacturer if other control air qualities or special control media are to be used.

Requirements on ambient air:

- The actuators comply with Category C2 of DIN EN 12944-2.
- Contact the manufacturer if the actuators are to be used in an aggressive ambient atmosphere.

³⁾ The temperature is limited by the materials of the diaphragm and sealing elements.

Materials



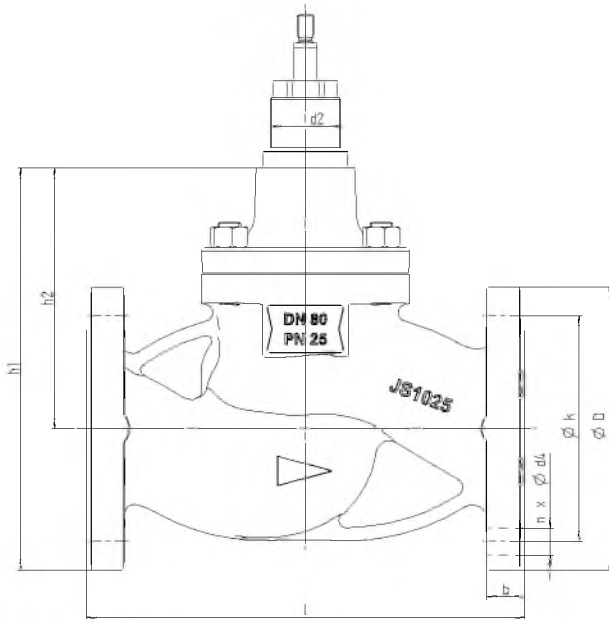
BOA-H Mat P

Parts list

Part No.	Description	Material	Material number
100	Body	EN-GJS-400-18-LT	5.3103
161	Body bonnet	EN-GJS-400-18-LT	5.3103
200	Stem	X20Cr13	1.4021+QT
350	Valve disc	X20Cr13	1.4021+QT
411	Bonnet gasket	CrNiSt/graphite	-
416	V-packing	Carbon PTFE	-
452	Gland follower	X5CrNi18-10	1.4301
461	Gland packing	Graphite	-
474	Thrust ring	X5CrNi18-10	1.4301
545	Bearing bush	Sint A50	-
722	Top flange	Steel	-
809	Actuator	-	-
902	Stud	CK 35 V	-
920.1	Hexagon nut	Galvanised steel	-
920.2	Slotted round nut	Galvanised steel	-
920.3	Hexagon nut	C35	-
950	Spring	X5CrNi18-10	1.4301

Dimensions and weights

Dimensions and weights of BOA-H Mat P globe valve



BOA-H Mat P

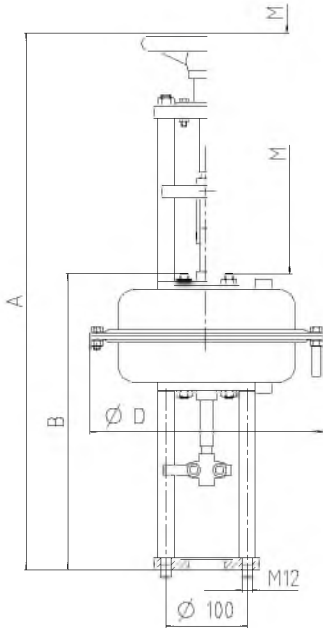
Dimensions [mm] and weights [kg]

PN	DN	l	h ₁	h ₂	d ₂	D	b	k	n	d ₆	[kg]
16	20	150	153,5	101,0	M39	105	16	75	4	14	6,3
	25	160	164,5	107,0	M39	115	16	85	4	14	6,9
	32	180	216,0	146,0	M39	140	18	100	4	19	10,4
	40	200	226,0	151,0	M39	150	18	110	4	19	11,6
	50	230	227,0	144,5	M39	165	20	125	4	19	13,8
	65	290	272,5	180,0	M50	185	20	145	4	19	22,3
	80	310	284,0	184,0	M50	200	22	160	8	19	28,4
	100	350	328,0	218,0	M50	220	24	180	8	19	38,4
	125	400	384,5	259,5	M50	250	26	210	8	19	60,5
25	150	480	403,5	261,0	M50	285	26	240	8	23	83,0
	20	150	153,5	101,0	M39	105	16	75	4	14	6,3
	25	160	164,5	107,0	M39	115	16	85	4	14	6,9
	32	180	216,0	146,0	M39	140	18	100	4	19	10,4
	40	200	226,0	151,0	M39	150	18	110	4	19	11,6
	50	230	227,0	144,5	M39	165	20	125	4	19	13,8
	65	290	272,5	180,0	M50	185	20	145	8	19	22,3
	80	310	284,0	184,0	M50	200	22	160	8	19	32,4
	100	350	335,5	218,0	M50	235	24	190	8	23	42,4
125	400	394,5	259,5	M50	270	26	220	8	28	67,5	
150	480	411,0	261,0	M50	300	26	250	8	28	91,5	

Mating dimensions as per standard

Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21-2
 Flange facing: DIN EN 1092-2, type B

Dimensions and weights of pneumatic actuator types PA-N300 and PA-N540



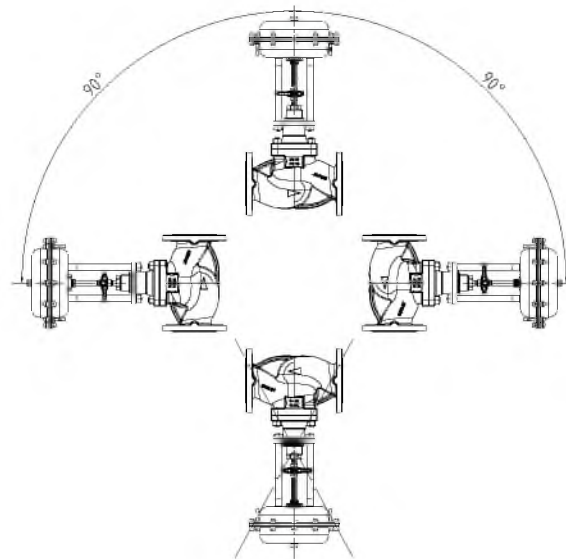
Dimensions [mm] and weights [kg]

Type	A	B	D	M ⁴⁾	[kg]
PA-N300	656	347	284	600	13
PA-N540	865	534	380	600	43

Notes on installation

- Flow through globe valves is in the direction of the embossed arrow on the valve body as standard. An alternating direction of flow is permissible; however, if fluid flow does not comply with the flow direction arrow on the valve body, the actual throughflow will be lower than the maximum throughflow indicated on the name plate.
- Recommendation: A strainer fitted upstream of the globe valve will further enhance the globe valve's functional reliability.

Installation positions:



Actuator installation positions

⁴⁾ Min. clearance for removal

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✗	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water

Fluids handled	
Brackish water ⁵⁾⁶⁾	✗
Service water ⁵⁾⁶⁾	✓
Fire-fighting water ⁵⁾	✓
Chlorinated water ($\leq 0.6 \text{ mg/kg}$) ⁵⁾	✓
Deionised water (demineralised water)	✗
Distilled water	✗
Boiler feed water ⁷⁾	✓
Hot water ⁵⁾	✓
High-temperature hot water ⁷⁾	✓
Condensate ⁷⁾	✓
Oil-free cooling water ⁵⁾	✓
Oil-containing cooling water ⁵⁾	✓
Ozonised water ($\leq 0.5 \text{ mg/kg}$) ⁵⁾	✓
Pure water ⁵⁾	✓
Seawater	✗
Scale-forming water ⁵⁾⁶⁾	○
Raw water ⁵⁾⁶⁾	✓
Partly desalinated water	✗
Fully desalinated water	✗
Municipal waste water ⁶⁾⁸⁾	✓
Industrial waste water ⁶⁾⁹⁾	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✓
Mineral oils	✓
Synthetic oils	✓
Crude oil	✓

Fluids handled	
Petroleum	✓
Light fuel oil	✓
Linseed oil	✓
Oil-water emulsion ⁶⁾	✓
Jet fuel	✓
Petrol	✓
Kerosene	✓

Chemical resistance chart for refrigerants

Fluids handled	
Ammonia water ($\leq 30 \%$, $\leq 25 \text{ }^\circ\text{C}$)	✓
Glycol (ethylene glycol)	✓
Propylene glycol	✓
Water-glycol mixture	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for thermal oils

Fluids handled	
Synthetic thermal oils	✓
Mineral-based thermal oils	✓

Chemical resistance chart for acids

Fluids handled	
Hydrochloric acid	✗
Sulphuric acid (pure, technical, concentrated)	✗
Sulphurous acid	✗
Fatty acid	✗
Nitric acid	✗

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3) $\leq 80 \text{ }^\circ\text{C}$ ⁶⁾	○
Lye for metal cleaning $\leq 80 \text{ }^\circ\text{C}$ ⁶⁾	○

Chemical resistance chart for steam

Fluids handled	
Saturated steam	✓

Chemical resistance chart for other fluids

Fluids handled	
Sodium hydroxide ($< 50 \%$, $\leq 50 \text{ }^\circ\text{C}$)	○
Natural gas	✓
Oil-containing compressed air	✓
Dry chlorine ($\leq 30 \text{ }^\circ\text{C}$)	✓
Ammonia	✓
Butane (liquefied gas)	✓
Aqueous glycerine	✓
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✗

- 5) General limits for water to be handled by valves made of non-alloyed materials: pH 6.5 - 12; chloride ions (Cl) < 150 mg/kg; chlorine (Cl₂) < 0.6 mg/kg.
- 6) Without solids
- 7) Water treatment must be in compliance with the guidelines for feed water (e.g. Vd TÜV 1466, TRD 611, etc.): pH ≥ 9.0 ; O₂ content $\leq 0.02 \text{ mg/l}$
- 8) Biologically treated
- 9) Non-corrosive, non-abrasive

Automated Globe Valves

BOA-H Mat E

PN 16/25
DN 20-150

Type Series Booklet



Contents

Control and Measurement Valves 4

- Automated Globe Valves to DIN/EN 4
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Control and Measurement Valves

Automated Globe Valves to DIN/EN

BOA-H Mat E



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Process engineering
- Heat recovery systems
- Sugar industry

Fluids handled

- High-temperature hot water
- Saturated steam
- Thermal oil
- Liquids not chemically or mechanically aggressive to the valve materials

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16/25
Nominal size	DN 20 - 150
Max. permissible pressure [bar]	25
Min. permissible temperature [°C]	-10
Max. permissible temperature [°C]	+350

Selection as per pressure/temperature ratings (⇒ Page 5)

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Design details

Design

- Straight-way pattern with horizontal seat
- Throttling plug up to DN 100
- On/off disc for DN 125 and above
- Spring-loaded PTFE V-packing up to 250 °C
- Graphite gland packing up to 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage rate A
- Exterior coating: blue RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

Actuators (technical data refers to basic configuration):

- 3-point (Open/Stop/Closed) actuators
Supply voltage: 230 V AC
Actual-position feedback: 2 limit switches (switching via limit switches in closing and opening direction)
Supply voltage: 24 V AC/DC
Actual-position feedback: 0-10 V
- After a power failure, operation is resumed in accordance with the operating data (24 V actuator).

Variants

Globe valve:

- Valve disc with PTFE gasket (up to 200 °C)
- Other flange designs
- High-temperature resistant paint (grey aluminium)
- Certification to customer specification

Actuators:

- Power back-up unit for 24 V actuators
- Heating of the motor space
- Other supply voltages on request
- Other actuators (e.g. AUMA) on request.

Product benefits

- Internal parts made of high-grade stainless steel for long service life and high chemical resistance.
- Risk of leakage minimised by fully confined bonnet gasket.
- Available with two types of stem seal: maintenance-free PTFE V-packing (< 250 °C) or adjustable graphite gland packing (350 °C).
- Electric actuator with 3-point actuation, available in various sizes up to 14 kN.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7150.4
Operating manual	7525.81

Pressure/temperature ratings

Test pressure and operating pressure

PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ¹⁾²⁾						
				With water		[°C]				
				Tests P10 and P11 to DIN EN 12266-1	Test P12, leakage rate A to DIN EN 12266-1	-10 to +120	200	250	300	350
		[bar]	[bar]							
16	EN-GJS-400-18-LT	24	Δp	16	14,7	13,9	12,8	11,2		
25	EN-GJS-400-18-LT	37,5	Δp	25	23	21,8	20	17,5		

Actuating times

Actuating times [s]

DN	Stroke [mm]	Actuator		
		EA-C 20 to 80 24 V/230 V	EA-C 140 230 V	EA-C 140 24 V
20	7,5	15,0	-	-
25	7,5	15,0	-	-
32	11	22,0	-	-
40	12	24,0	-	-
50	13,5	27,0	-	-
65	17	34,0	26,2	37,8
80	20,5	41,0	31,5	45,6
100	25,5	51,0	39,2	56,7
125	33	66,0	50,8	73,3
150	38	76,0	58,5	84,4

Maximum permissible closing pressures

Stem sealed by PTFE V-packing

 Closing pressures if fluid approaches the valve disc from the opposite direction of valve closure; p₂ = 0 bar

Values in bar

DN	Stroke	Kvs value	Actuator (actuating forces)			
			EA-C 20	EA-C40	EA-C80	EAC-140
			[mm]	[m ³ /h]	(2 kN)	(4,5 kN)	(8 kN)	(14 kN)
20	7,5	8,3	25,0	-	-	-
25	7,5	13	25,0	-	-	-
32	11	19,9	16,3	25,0	-	-
40	12	27,1	10,4	25,0	-	-
50	13,5	42	6,6	17,6	25,0	-
65	17	75,1	3,6	10,4	19,8	25,0
80	20,5	116,7	2,2	6,8	13,1	24,1
100	25,5	172,3	-	4,2	8,4	15,5
125	33	270	-	2,6	5,3	9,9
150	38	393	-	1,7	3,6	6,8

- 1) Intermediate temperatures can be derived by linear interpolation.
- 2) Static load

Stem sealed by graphite gland packing

Closing pressures if fluid approaches the valve disc from the opposite direction of valve closure; p₂ = 0 bar
 Values in bar

DN	Stroke [mm]	Kvs value [m ³ /h]	Actuator (actuating forces)			
			EA-C 20	EA-C40	EA-C80	EAC-140
			(2 kN)	(4,5 kN)	(8 kN)	(14 kN)
20	7,5	8,3	25,0	-	-	-
25	7,5	13	20,6	-	-	-
32	11	19,9	12,7	25,0	-	-
40	12	27,1	8,1	24,8	-	-
50	13,5	42	5,0	16,1	25,0	-
65	17	75,1	2,4	9,2	18,7	25,0
80	20,5	116,7	1,4	6,0	12,3	23,3
100	25,5	172,3	-	3,7	7,9	15,0
125	33	270	-	2,2	4,9	9,5
150	38	393	-	1,4	3,3	6,5

Technical data

Technical data of globe valve

Technical data of BOA-H Mat E

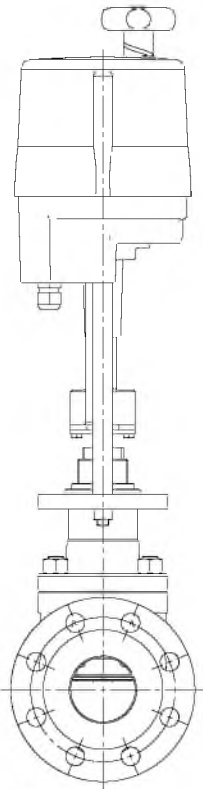
Characteristic	Value
Nominal pressure	PN 16, PN 25
Valve characteristic	Open/Close
Leakage class	Leakage rate A to DIN EN 12266-1, test P12
Permissible pressure	16 bar, 25 bar
Flanged ends	PN 16 and PN 25 to DIN EN 1092-2
Fluid temperature	-10 to +350 °C

Technical data of actuators

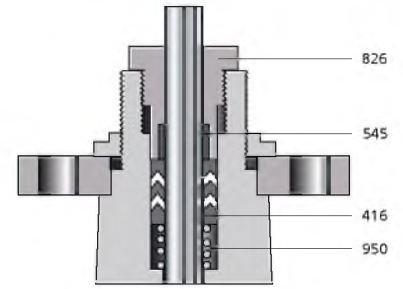
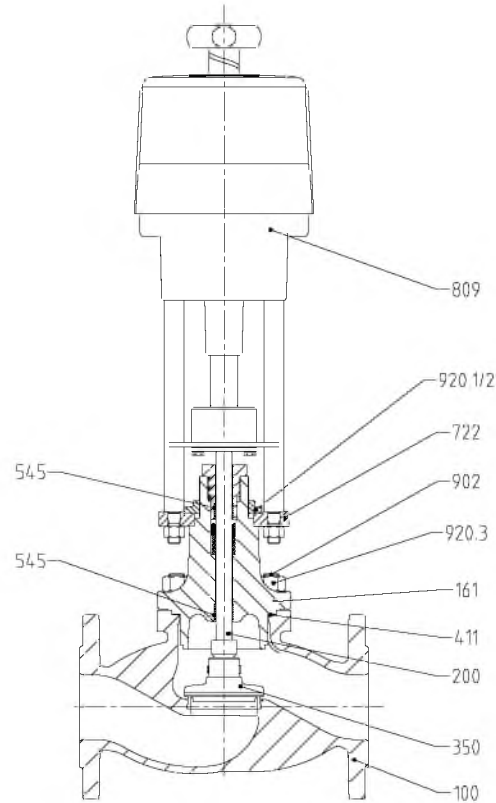
Technical data of 3-point actuators

Characteristic	Value	
Power supply	Supply voltage	230 V AC ± 10 % 24 V AC/DC ± 10 %
	Max. power input	100 VA
Functional data	Max. actuation force	EA-C 20: 2 kN EA-C 40: 4.5 kN EA-C 80: 8 kN EA-C 140: 14 kN
	Actuating speed	EA-C 20 to 80: 0.5 mm/s EA-C 140: 230 V ~ 0.45 mm/s; 24 V ~ 0.65 mm/s
Signal inputs	Binary input	230 V AC/24 V AC
Enclosure to EN 60529		IP65
Ambient conditions	Ambient temperature	-20 to +60 °C
	Storage temperature	-20 to +80 °C
	Humidity	5 to 95 % rH
Dimensions	See (⇔ Page 8)	
Electrical connection		Direct connection to printed circuit board ≤ 2.5 mm ²

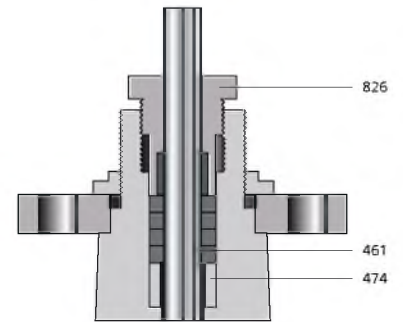
Materials



BOA-H Mat E



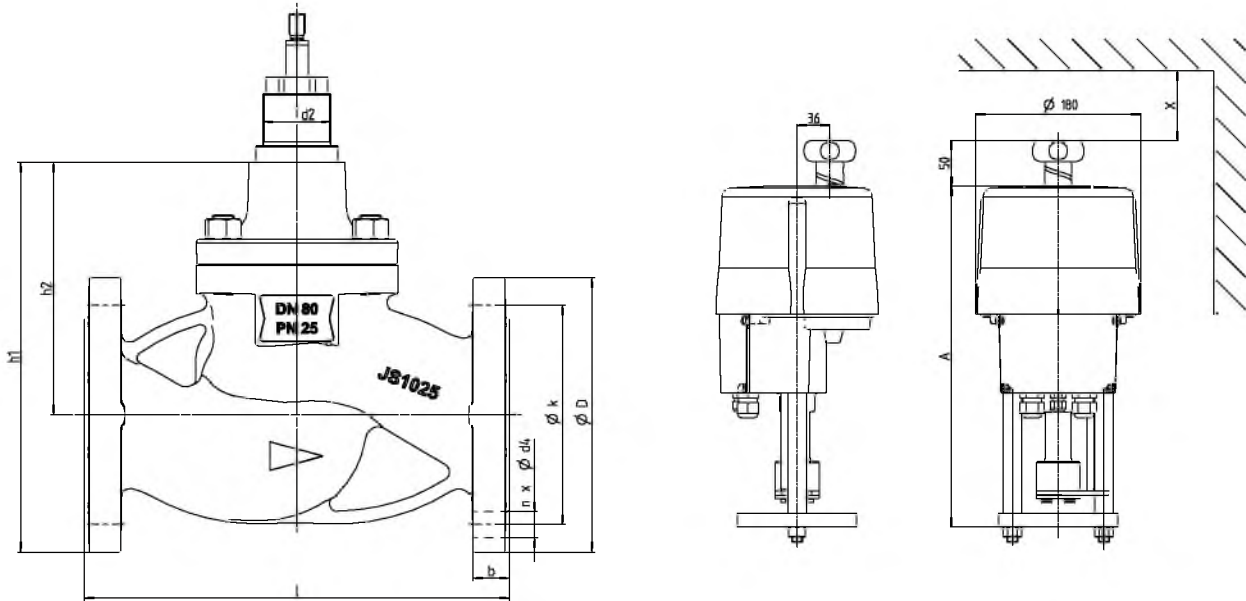
PTFE V-packing



Graphite gland packing

Overview of available materials

Part No.	Description	Material	Material number
100	Body	EN-GJS-400-18-LT	5.3103
161	Body bonnet	EN-GJS-400-18-LT	5.3103
200	Stem	X20Cr13	1.4021+QT
350	Valve disc	X20Cr13	1.4021+QT
411	Bonnet gasket	CrNiSt/graphite	-
416	V-packing	Carbon PTFE	-
452	Gland follower	X5CrNi18-10	1.4301
461	Gland packing	Graphite	-
474	Thrust ring	X5CrNi18-10	1.4301
545	Bearing bush	Sint A50	-
722	Top flange	Steel	-
809	Actuator	-	-
902	Stud	CK 35 V	-
920.1	Hexagon nut	Galvanised steel	-
920.2	Slotted round nut	Galvanised steel	-
920.3	Hexagon nut	C35	-
950	Spring	X5CrNi18-10	1.4301

Dimensions and weights

Dimensions of BOA-H Mat E globe valve

Dimensions [mm] and weights [kg]

PN	DN	l	h ₁	h ₂	d ₂	D	b	k	n	d _e	[kg]
16	20	150	153,5	101,0	M39	105	16	75	4	14	6,3
	25	160	164,5	107,0	M39	115	16	85	4	14	6,9
	32	180	216,0	146,0	M39	140	18	100	4	19	10,4
	40	200	226,0	151,0	M39	150	18	110	4	19	11,6
	50	230	227,0	144,5	M39	165	20	125	4	19	13,8
	65	290	272,5	180,0	M50	185	20	145	4	19	22,3
	80	310	284,0	184,0	M50	200	22	160	8	19	28,4
	100	350	328,0	218,0	M50	220	24	180	8	19	38,4
	125	400	384,5	259,5	M50	250	26	210	8	19	60,5
25	150	480	403,5	261,0	M50	285	26	240	8	23	83,0
	20	150	153,5	101,0	M39	105	16	75	4	14	6,3
	25	160	164,5	107,0	M39	115	16	85	4	14	6,9
	32	180	216,0	146,0	M39	140	18	100	4	19	10,4
	40	200	226,0	151,0	M39	150	18	110	4	19	11,6
	50	230	227,0	144,5	M39	165	20	125	4	19	13,8
	65	290	272,5	180,0	M50	185	20	145	8	19	22,3
	80	310	284,0	184,0	M50	200	22	160	8	19	32,4
	100	350	335,5	218,0	M50	235	24	190	8	23	42,4
125	400	394,5	259,5	M50	270	26	220	8	28	67,5	
150	480	411,0	261,0	M50	300	26	250	8	28	91,5	

Dimensions of electric actuator types EA-C 20 to EA-C 140

Actuator	Actuating force [N]	A [mm]	X [mm]	[kg]	
				3-point 24 V AC	3-point 230 V AC
EA-C 20	2000	425	120	6,0	7,0
EA-C 40	4500	425	120	6,0	7,0
EA-C 80	8000	455	120	9,0	10,0
EA-C 140	14000	520	120	10,0	10,0

Mating dimensions as per standard

Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21-2
 Flange facing: DIN EN 1092-2, type B

Installation instructions

- Flow through globe valves is in the direction of the embossed arrow on the valve body as standard. An alternating direction of flow is permissible; however, if fluid flow does not comply with the flow direction arrow on the valve body, the actual throughflow will be lower than the maximum throughflow indicated on the name plate.
- Recommendation: A strainer fitted upstream of the globe valve will further enhance the globe valve's functional reliability.

Installation positions:

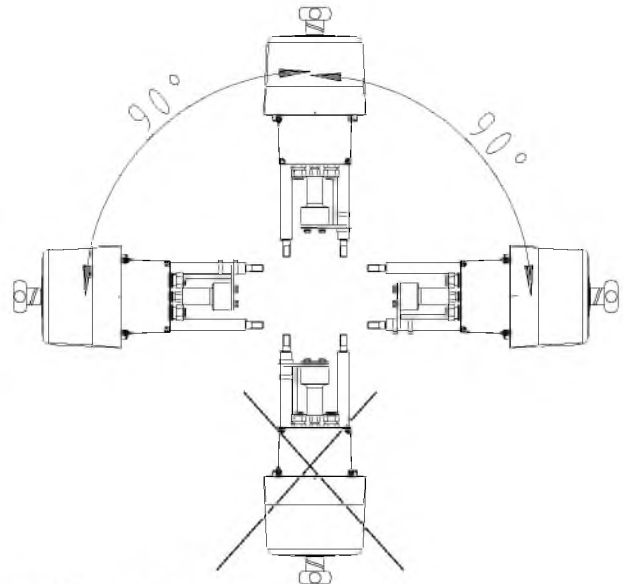


Fig. 1: Actuator installation positions

Wiring diagrams

Terminal configuration EA-C 20 to 140

3-point 24 V AC with terminal box

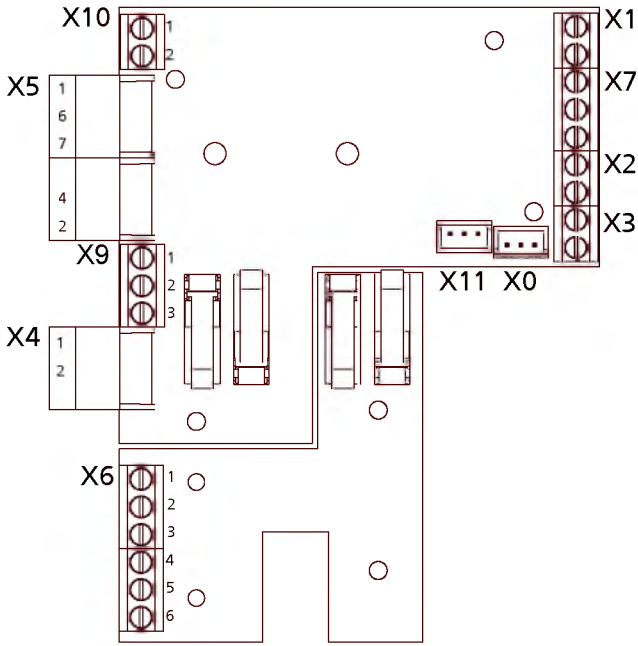
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			RJ-45 TTL	Push-Button	
↑	↑	↑	↓	↓	↓	↑↑	↑↑	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑↑	↑↑	↑↑	↑↑	↑	↑	↑	PE	(Optional)		
+0(2) - 10 V	+0(4) - 20 mA	GND	+0(2) - 10 V	+0(4) - 20 mA	GND		Max. load 100 mA at 24 VDC	L OPEN	N	L CLOSE	L (24 V AC/DC)	N (24 V AC/DC)	21-40 V DC / 100 mA	+0(2) - 10 V	+0(4) - 20 mA	GND	(Optional)	(Optional)	(Optional)	(Optional)	L (see name plate)	N (see name plate)		(Optional)			
								24 V AC/DC <input type="checkbox"/>	115 V AC <input type="checkbox"/>	230 V AC <input type="checkbox"/>																	

i In 3-point (Open/Stop/Closed) configuration, only the terminals in columns ③, ④ and ⑤ are active!

Key

① Setpoint input	⑩ Open
② Active actual-position feedback	⑪ Power supply
③ Volt-free fault message (optional)	⑫ Field bus connection
④ Binary control (standard 24 V AC/DC)	⑬ Communication with PC
⑤ Power failure signal	⑭ Commissioning
⑥ Supply (unregulated, 21 - 40 V DC)	⑮ Galvanically isolated 1 kV
⑦ Actual value	⑯ Process sensor
⑧ Closed	⑰ Limit switch, volt-free contact

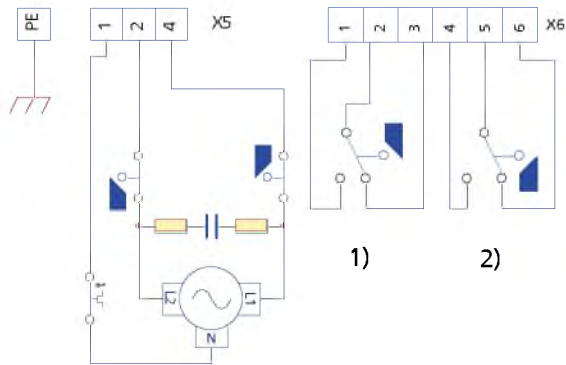
3-point 230 V AC



PE

Fig. 2: Terminal configuration on printed circuit board

X1	Internal wiring
X2	Internal wiring
X3	Internal wiring
X4	Potentiometer 1
X5/1	Neutral
X5/2	Motor phase to open
X5/4	Motor phase to close
X5/6 and X5/7	Thermal circuit breaker as volt-free contact
X6	Additional limit switches
X7	Not used
X8	Heating resistor
X9	Potentiometer 2
PE	Earth connection on housing



Terminal configuration of power supply

Terminal configuration of additional limit switches

1)	Closed	2)	Open
----	--------	----	------

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✗	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water

Fluids handled	
Brackish water ³⁾⁴⁾	✗
Service water ³⁾⁴⁾	✓
Fire-fighting water ³⁾	✓
Chlorinated water ($\leq 0.6 \text{ mg/kg}$) ³⁾	✓
Deionised water (demineralised water)	✗
Distilled water	✗
Boiler feed water ⁵⁾	✓
Hot water ³⁾	✓
High-temperature hot water ⁵⁾	✓
Condensate ⁵⁾	✓
Oil-free cooling water ³⁾	✓
Oil-containing cooling water ³⁾	✓
Ozonised water ($\leq 0.5 \text{ mg/kg}$) ³⁾	✓
Pure water ³⁾	✓
Seawater	✗
Scale-forming water ³⁾⁴⁾	○
Raw water ³⁾⁴⁾	✓
Partly desalinated water	✗
Fully desalinated water	✗
Municipal waste water ⁴⁾⁶⁾	✓
Industrial waste water ⁴⁾⁷⁾	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	
Vegetable oils	✓
Mineral oils	✓
Synthetic oils	✓
Crude oil	✓
Petroleum	✓
Light fuel oil	✓
Linseed oil	✓
Oil-water emulsion ⁴⁾	✓

Fluids handled	
Jet fuel	✓
Petrol	✓
Kerosene	✓

Chemical resistance chart for refrigerants

Fluids handled	
Ammonia water ($\leq 30 \%$, $\leq 25 \text{ }^\circ\text{C}$)	✓
Glycol (ethylene glycol)	✓
Propylene glycol	✓
Water-glycol mixture	✓
Inorganic cooling brine, pH 7.5	✓

Chemical resistance chart for thermal oils

Fluids handled	
Synthetic thermal oils	✓
Mineral-based thermal oils	✓

Chemical resistance chart for acids

Fluids handled	
Hydrochloric acid	✗
Sulphuric acid (pure, technical, concentrated)	✗
Sulphurous acid	✗
Fatty acid	✗
Nitric acid	✗

Chemical resistance chart for cleaning agents

Fluids handled	
Lye for bottle rinsers (e.g. P3) $\leq 80 \text{ }^\circ\text{C}$ ⁴⁾	○
Lye for metal cleaning $\leq 80 \text{ }^\circ\text{C}$ ⁴⁾	○

Chemical resistance chart for steam

Fluids handled	
Saturated steam	✓

Chemical resistance chart for other fluids

Fluids handled	
Sodium hydroxide ($< 50 \%$, $\leq 50 \text{ }^\circ\text{C}$)	○
Natural gas	✓
Oil-containing compressed air	✓
Dry chlorine ($\leq 30 \text{ }^\circ\text{C}$)	✓
Ammonia	✓
Butane (liquefied gas)	✓
Aqueous glycerine	✓
Carbon dioxide (gas)	✓
Carbon dioxide (aqueous solution)	✗

- 3) General limits for water to be handled by valves made of non-alloyed materials: pH 6.5 - 12; chloride ions (Cl) $< 150 \text{ mg/kg}$; chlorine (Cl₂) $< 0.6 \text{ mg/kg}$.
- 4) Without solids
- 5) Water treatment must be in compliance with the guidelines for feed water (e.g. VdTÜV 1466, TRD 611, etc.): pH ≥ 9.0 ; O₂ content $\leq 0.02 \text{ mg/l}$
- 6) Biologically treated
- 7) Non-corrosive, non-abrasive

Globe Valve

ECOLINE GLC 150-600

Class 150-600
NPS 2"-12"
Cast Steel / Stainless Steel
Bolted Bonnet
Flanged Ends

Type Series Booklet



Globe Valves

Globe Valves with Gland Packing to ANSI/ASME

ECOLINE GLC 150-600



Main applications

- Boiler feed applications
- Fossil-fuelled power stations
- Petrochemical industry
- Pipelines and tank farms
- Refineries
- Process engineering

Fluids handled

- Steam
- Fluids containing gas
- Fluids containing mineral oils
- Gas
- Hot water
- Feed water
- Oil

Operating data

Operating properties

Characteristic	Value
Nominal pressure	Class 150 - 600
Nominal size	NPS 2" - 12"
Max. permissible pressure	106 bar / 1500 PSI
Min. permissible temperature	0 °C / 32 °F
Max. permissible temperature	816 °C / 1500 °F

Temperatures < 0 °C on request

Selection as per pressure/temperature ratings (→ Page 5)

Body materials

Overview of available materials

Material	Temperature limit
ASTM A 216 WCB	Up to 427 °C / 800 °F
ASTM A 217 WC6	Up to 593 °C / 1100 °F
ASTM A 217 WC9	Up to 593 °C / 1100 °F
ASTM A 217 C5	Up to 649 °C / 1200 °F
ASTM A 217 C12	Up to 649 °C / 1200 °F
ASTM A 352 LCB	Up to 343 °C / 650 °F
ASTM A 352 LCC	Up to 343 °C / 650 °F
ASTM A 351 CF8	Up to 816 °C / 1500 °F
ASTM A 351 CF8M	Up to 816 °C / 1500 °F

Other materials on request.

Design details

Design

- Globe valve to BS 1873
- Tested to API 598
- Body made of cast steel or stainless steel
- Bolted bonnet
- Outside screw
- Rotating stem
- Non-rotating stem (8" and 10" Class 300/600)
- Rising stem
- Stem with burnished shank
- Solid flat disc (plug-type valve disc for 8" and 10" Class 600)
- Stem sealed by gland packing
- Two-piece self-aligning gland follower
- Stem nut made of nickel steel
- Valve seat made of wear-resistant and corrosion-proof materials
- Back seat
- Hardened back seat bush
- Die-moulded graphite gland packing, packing end rings made of braided graphite
- Stainless steel/graphite gaskets
- Outside yoke
- Yoke head suitable for mounting electric and pneumatic actuators (DIN ISO 5210)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Position indicator
- Position switch(es)
- Locking device
- Throttling plug
- Hard-faced back seat
- Drain plug
- Bypass

- Version in compliance with TA-Luft (German Clean Air Act) to VDI 2440 for temperatures up to 400 °C
 - Version with free stem end and top flange to ISO 5210
 - Gearboxes
 - Electric actuators
 - Non-destructive testing, e.g. radiographic testing
 - Inspections to technical codes such as AD2000 or IBR
 - NACE standard
 - Other flanged end designs or butt weld ends to ASME B16.25
 - Larger nominal sizes and other variants on request
- 10. Actuation frequency
 - 11. Pipe connection
 - 12. Pipe schedule
 - 13. Variants
 - 14. Number of type series booklet

Product benefits

Long gland life and high functional reliability

- Stem with shank burnished to a surface finish of 0.2 µm for reduced friction, lower actuating torque and improved sealing to atmosphere.
- Packing end rings enable higher compressive force by gland follower and prevent extrusion of middle graphite packing rings.
- Two-piece self-aligning gland follower prevents distortion on stem surface caused by improper assembly.

Reliable sealing and longer service life

- Hard-faced body seat and solid disc seat made of wear-resistant and corrosion-proof materials for handling all kinds of corrosive and erosive fluids.
- Male/female joint between body and bonnet prevents excessive compression of fully confined gasket, resulting in longer gasket life and improved sealing performance.

Additional safety and blow-out protection

- Standard metal back seat prevents blow-out of stem and other internal components from the valve body and bonnet as a result of fluid pressure inside the valve body.

Versatile application

- Stem nut made of nickel steel is suitable for numerous applications, particularly fluids which must not come into contact with component materials containing copper.

Extended maintenance-free service life

- Hard-facing applied to valve disc and seat rings by deposit welding provides extra wear allowance and ensures reliable long-term shut-off even with frequent opening/closing cycles.

Related documents

- Operating manual 7362.81

On all enquiries/orders please specify

1. Type
2. Class
3. Nominal size
4. Pressure/temperature rating
5. Operating pressure
6. Operating temperature
7. Differential pressure
8. Material
9. Fluid handled

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to ASME B16.34)

Class	Material	-29 to 38	93	149	204	260	316	343	371	399	427	454	482	510	538	566	593	621	649	677	704	732	760	788	816	
150	A 216 WCB ¹⁾	19,7	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4											
300		51,0	46,9	45,2	43,8	41,7	39,3	37,9	36,5	34,8	28,3	22,1	15,9	9,3	5,9											
600		102,0	93,8	90,3	87,2	83,1	78,3	75,8	73,1	70,0	56,9	44,1	31,7	19,0	11,7											
150	A 217 WC6 ²⁾	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	49,6	47,9	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	22,1	14,8	10,0	6,6									
600		103,4	103,4	99,6	95,5	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	44,1	29,6	20,0	13,1									
150	A 217 WC9	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾									
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	26,5	18,3	12,1	7,6									
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	36,9	24,1	15,2									
150	A 217 C5	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	25,9	19,0	13,8	10,0	6,9	4,1	2,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	51,4	37,9	27,6	20,0	13,8	8,6	4,8							
150	A 217 C12	20,0	17,9	15,9	13,8	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾							
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7	39,3	36,5	35,2	33,4	31,0	25,9	17,6	11,7	7,9	5,2	3,4							
600		103,4	103,4	100,3	97,2	91,7	83,4	81,0	78,3	73,4	70,0	67,2	62,1	52,1	34,8	23,8	15,5	10,3	7,2							
150	A 352 LCB ⁴⁾	18,3	17,6	15,9	13,8	11,7	9,7	8,6																		
300		47,9	45,5	44,1	42,4	40,3	37,9	36,9																		
600		96,2	91,0	87,9	84,8	81,0	76,2	73,4																		
150	A 352 LCC	20,0	17,9	15,9	13,8	11,7	9,7	8,6																		
300		51,7	51,7	50,3	48,6	45,9	41,7	40,7																		
600		103,4	103,4	100,3	96,6	91,7	83,4	81,0																		
150	A 351 CF8 ⁵⁾	19,0	15,9	14,1	13,1	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾	
300		49,6	41,4	37,2	34,1	32,1	30,3	29,6	29,0	28,6	27,9	27,2	26,9	26,2	24,5	22,4	17,6	14,1	11,4	9,3	7,9	6,6	5,2	4,1	2,8	
600		99,3	82,7	74,1	68,6	64,1	61,0	59,6	58,3	56,9	55,8	54,5	53,8	52,7	49,0	44,8	35,5	28,3	22,8	18,3	15,5	12,8	10,3	7,9	5,9	
150	A 351 CF8M ⁵⁾	19,0	16,2	14,8	13,4	11,7	9,7	8,6	7,6	6,6	5,5	4,5	3,4	2,4	1,4	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,4 ³⁾	1,0 ³⁾	
300		49,6	42,7	38,6	35,5	33,1	31,0	30,3	30,0	29,3	29,0	29,0	28,6	26,5	25,2	24,8	21,0	16,2	12,8	10,0	7,9	6,6	5,2	4,1	2,8	
600		99,3	85,5	77,2	70,7	65,8	62,1	61,0	60,0	59,0	58,3	57,6	57,2	53,4	50,0	49,6	42,1	32,8	25,5	20,3	16,2	13,1	10,3	7,9	5,9	

Permissible operating pressures in PSI at temperatures in °F (to ASME B16.34)

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
150	A 216 WCB ¹⁾	285	260	230	200	170	140	125	110	95	80	65	50	35	20											
300		740	680	655	635	605	570	550	530	505	410	320	230	135	85											
600		1480	1360	1310	1265	1205	1135	1100	1060	1015	825	640	460	275	170											
150	A 217 WC6 ²⁾	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾									
300		750	750	720	695	665	605	590	570	530	510	485	450	320	215	145	95									
600		1500	1500	1445	1385	1330	1210	1175	1135	1065	1015	975	900	640	430	290	190									
150	A 217 WC9	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾									
300		750	750	730	705	665	605	590	570	530	510	485	450	385	265	175	110									
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	535	350	220									
150	A 217 C5	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	15 ³⁾							
300		750	750	730	705	665	605	590	570	530	510	485	375	275	200	145	100	60	35							
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	745	550	400	290	200	125	70							
150	A 217 C12	290	260	230	200	170	140	125	110	95	80	65	50	35	20	20 ³⁾	20 ³⁾	20 ³⁾	20 ³⁾							
300		750	750	730	705	665	605	590	570	530	510	485	450	375	255	170	115	75	50							
600		1500	1500	1455	1410	1330	1210	1175	1135	1065	1015	975	900	755	505	345	225	150	105							
150	A 352 LCB ⁴⁾	265	255	230	200	170	140	125																		
300		695	660	640	615	585	550	535																		

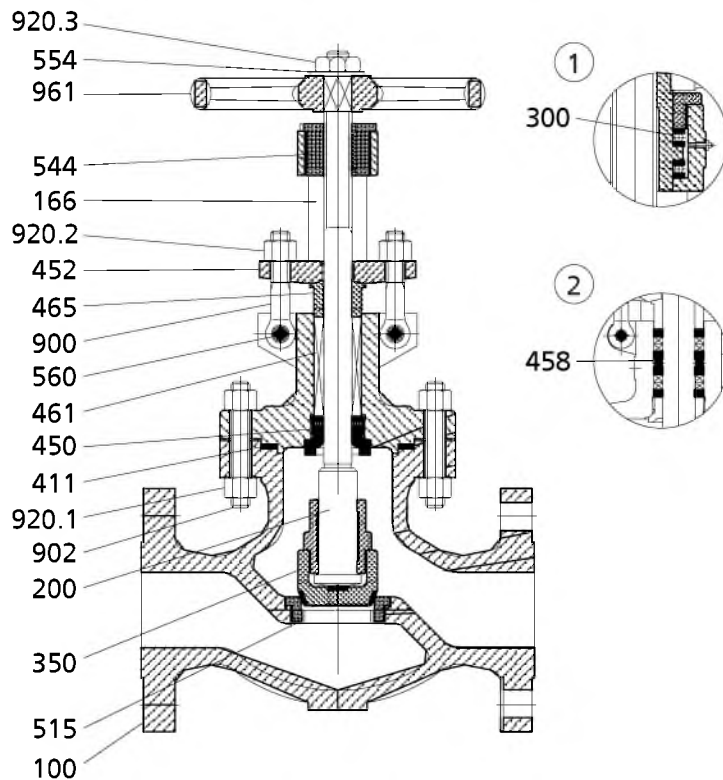
- 1) Permissible but not recommended for prolonged use above 427 °C (800 °F).
- 2) Cannot be used for temperatures above 593 °C (1100 °F).
- 3) For butt weld end valves only. Flanged end ratings terminate at 538 °C (1000 °F).
- 4) Cannot be used for temperatures above 343 °C (650 °F).
- 5) At temperatures over 538 °C (1000 °F), use only when carbon content is 0.04% or higher.

Class	Material	-20 to 100	200	300	400	500	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
600		1395	1320	1275	1230	1175	1105	1065																		
150	A 352 LCC	290	260	230	200	170	140	125																		
300		750	750	730	705	665	605	590																		
600		1500	1500	1455	1405	1330	1210	1175																		
150	A 351 CF8 ⁽³⁾	275	230	205	190	170	140	125	110	95	80	65	50	35	20	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	15 ⁽³⁾
300		720	600	540	495	465	440	430	420	415	405	395	390	380	355	325	255	205	165	135	115	95	75	60	40	
600		1440	1200	1075	995	930	885	865	845	825	810	790	780	765	710	650	515	410	330	265	225	185	150	115	85	
150	A 351 CF8M ⁽⁵⁾	275	235	215	195	170	140	125	110	95	80	65	50	35	20	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	20 ⁽³⁾	15 ⁽³⁾
300		720	620	560	515	480	450	440	435	425	420	420	415	385	365	360	305	235	185	145	115	95	75	60	40	
600		1440	1240	1120	1025	955	900	885	870	855	845	835	830	775	725	720	610	475	370	295	235	190	150	115	85	

Test pressures

Test	Test medium	Class 150		Class 300		Class 600	
		bar	psi	bar	psi	bar	psi
Shell	Water	32	450	78	1125	153	2225
Leak test (back seat)		23	315	56	815	112	1630
Leak test (seat)		23	315	56	815	112	1630

Materials



- ① Bearing (8"-12" Class 300, 6"-12" Class 600)
- ② Lantern ring (optional)

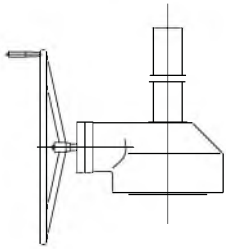
Parts list

Part No.	Description	Material								
		A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A 352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
100	Body	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
166	Yoke	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
350	Lower valve disc section	A 216 WCB	A 217 WC6	A 217 WC9	A 217 C5	A 217 C12	A352 LCB	A 352 LCC	A 351 CF8	A 351 CF8M
515	Seat ring	A 105	A 182 F11	A 182 F22	A 182 F5	A 182 F9	A 182 LF2	A 350 LF2	A 182 F304	A 182 F316
200	Stem	See "Trim materials" table								
450	Back seat bush	See "Trim materials" table								
465	Lower gland section	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	316
452	Gland follower	A 216 WCB	A 216 WCB	A 216 WCB	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8	A 351 CF8
544	Threaded bush	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C	A 439 D2C
902	Stud	A 193 B7	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8
920.1	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8
461	Gland packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
411	Joint ring	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel	Graphite + stainless steel
900	Eyebolt	A 307 B	A 193 B16	A 193 B16	A 193 B16	A 193 B16	A 320 L7	A 320 L7	A 193 B8	A 193 B8
920.2	Nut	A 194 2H	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 7	A 194 Gr. 8	A 194 Gr. 8
560	Pin	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
961	Handwheel	Nodular cast iron or malleable cast iron or cast steel								
920.3	Handwheel nut	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
554	Washer	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
300	Bearing	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
458	Lantern ring	13Cr	13Cr	13Cr	13Cr	13Cr	304	304	304	316

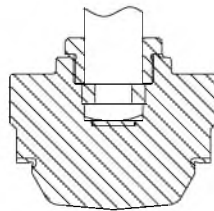
Trim materials

Part No.	Description	Trim 1	Trim 2	Trim 5	Trim 8	Trim 10
		13% chrome steel (Cr) / 13% chrome steel (Cr)	304 / 304	Stellite / Stellite	Stellite / 13% chrome steel (Cr)	316 / 316
350	Lower valve disc section	13% chrome steel (Cr)	304 stainless steel	Stellite	13% chrome steel (Cr)	316 stainless steel
515	Seat ring	13% chrome steel (Cr)	304 stainless steel	Stellite	Stellite	316 stainless steel
200	Stem	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel
450	Back seat bush	13% chrome steel (Cr)	304 stainless steel	13% chrome steel (Cr)	13% chrome steel (Cr)	316 stainless steel

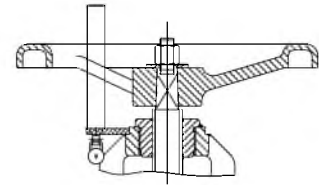
Variants



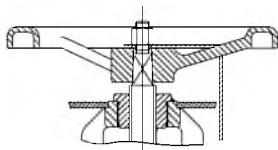
Gearbox
(6"-12" Class 600)



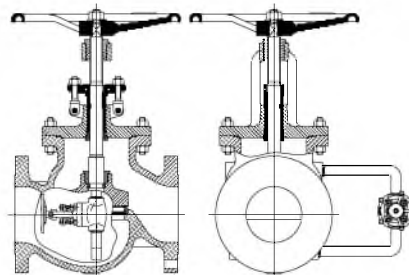
Throttling plug



Locking device

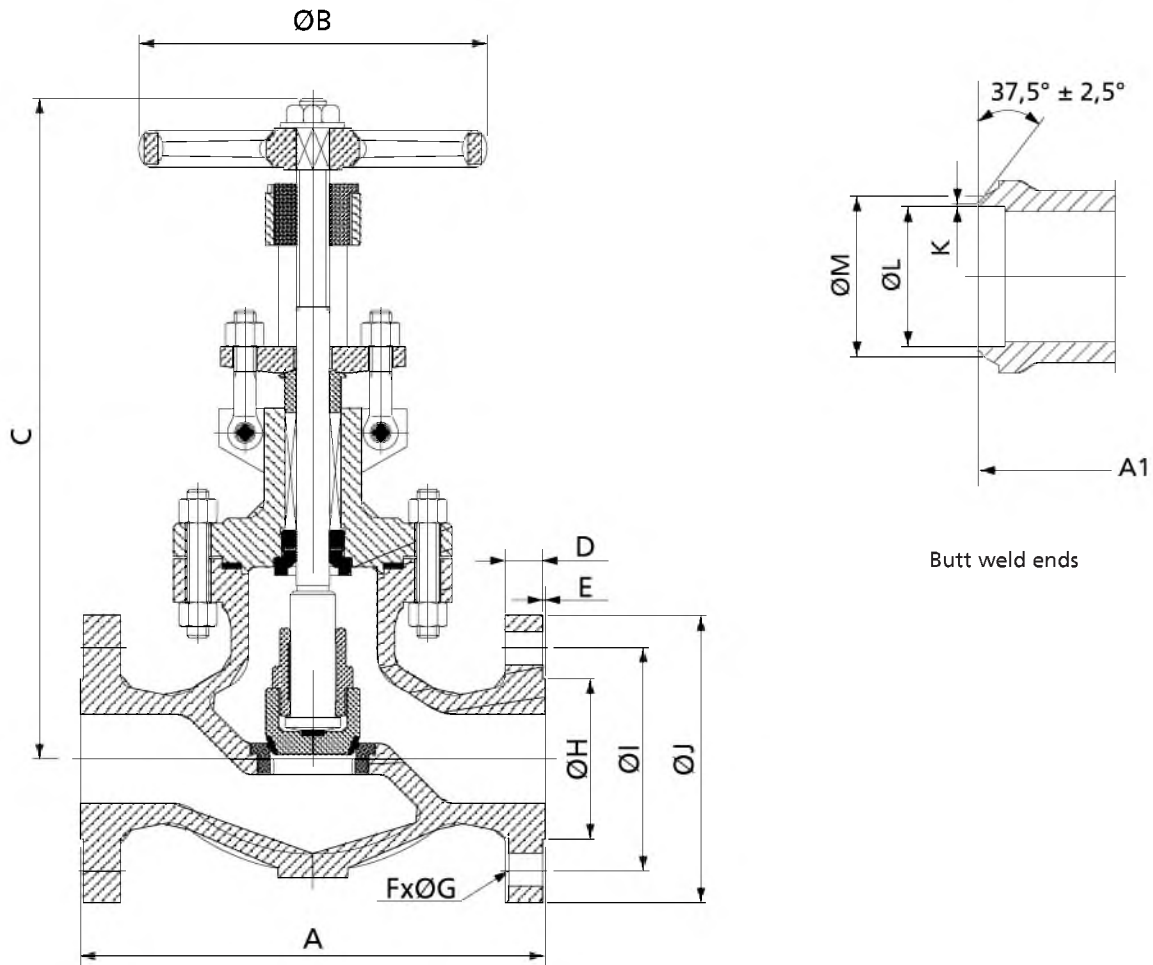


Position indicator



Bypass

Dimensions



Butt weld ends

Dimensions in mm

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
150	2"	203	338	200	14,3	2	92,1	120,7	150	4	19,1	203	19
	2 ½"	216	415	200	15,9	2	104,8	139,7	180	4	19,1	216	32
	3"	241	406	250	17,5	2	127,0	152,4	190	4	19,1	241	35
	4"	292	468	350	22,3	2	157,2	190,5	230	8	19,1	292	55
	6"	406	560	350	23,9	2	215,9	241,3	280	8	22,4	406	115
	8"	495	672	450	27,0	2	269,9	298,5	345	8	22,4	495	140
	10"	622	858	500	28,6	2	323,8	362,0	405	12	25,4	622	255
300	12"	698	862	640	30,2	2	381,0	431,8	485	12	25,4	698	539
	2"	267	355	200	20,7	2	92,1	127,0	165	8	19,1	267	27
	2 ½"	292	474	250	23,9	2	104,8	149,2	190	8	22,4	292	48
	3"	318	430	250	27,0	2	127,0	168,3	210	8	22,4	318	48
	4"	356	500	350	30,2	2	157,2	200,0	255	8	22,4	356	70
	6"	444	607	450	35,0	2	215,9	269,9	320	12	22,4	444	125
	8"	559	828	500	39,7	2	269,9	330,2	380	12	25,4	559	290
600	10"	622	914	500	46,1	2	323,8	387,4	445	16	28,4	622	365
	12"	711	1032	650	49,3	2	381,0	450,8	520	16	31,8	711	632
	2"	292	300	250	25,4	7	92,1	127,0	165	8	19,1	292	35
	2 ½"	330	540	250	28,6	7	104,8	149,4	190	8	22,4	330	70
	3"	356	488	350	31,8	7	127,0	168,3	210	8	22,4	356	65
	4"	432	555	350	38,1	7	157,2	215,9	275	8	25,4	432	105

6) Open

Class	NPS	A	C ⁶⁾	ØB	D	E	ØH	ØI	ØJ	F	ØG	A1	[kg]
	6"	559	777	500	47,7	7	215,9	292,1	355	12	28,4	559	215
	8"	660	915	610	55,6	7	269,9	349,2	420	12	31,8	660	530
	10"	787	1113	610	63,5	7	323,8	431,8	510	16	35,1	787	780
	12"	838	1280	610	66,7	7	381,0	489,0	560	20	35,1	838	900

Butt weld end dimensions in mm

NPS	Pipe OD	K	ØM	ØL for various pipe schedules												
				10	20	30	40	60	80	100	120	140	160	STD	XS	XXS
2"	60,30	1,6 ±0,8	60,30	54,79			52,51		49,25				42,85	Sch 40	Sch 80	38,19
2 ½"	73,03	1,6 ±0,8	75,2	66,93			62,71		59,00				53,98	Sch 40	Sch 80	44,98
3"	88,90	1,6 ±0,8	91,2	82,80			77,93		73,66				66,65	Sch 40	Sch 80	58,42
4"	114,30	1,6 ±0,8	117,3	108,20			102,26		97,18		92,05		87,07	Sch 40	Sch 80	80,06
6"	168,28	1,6 ±0,8	172,2	161,47			154,05		146,33		139,73		131,75			
8"	219,08	1,6 ±0,8	223,0	211,56	206,38		202,72	198,45	193,68	188,90	182,55	177,83	173,05	Sch 40	Sch 80	174,63
10"	273,05	1,6 ±0,8	277,9	264,67	260,35		254,51	247,65	242,87	236,52	230,17	222,25	215,90	Sch 40	Sch 60	Sch 140
12"	323,85	1,6 ±0,8	329,4	314,71	311,15		303,23	295,30	288,90	280,97	273,05	266,70	257,20	304,80	298,45	Sch 120

Mating dimensions - Standards

Face-to-face lengths: ASME B16.10
 Flanges: ASME B16.5
 Butt weld ends: ASME B16.25

Notes on installation

The valve bodies are marked with an arrow indicating the flow direction.

Globe valves should always be installed in such a way that the actual flow direction of the fluid matches the arrow on the body, unless otherwise requested by the customer.

Differential pressures in bar (psi) (standard valve disc)

Class	NPS	Δp bar (psi)			
		Handwheel	Handwheel and bypass	Gearbox	
150	2"	20 (290)	20 (290)	20 (290)	
	3"				
	4"				
	6"				
	8"				
	10"	7 (101)			
300	2"	52 (750)	52 (750)	52 (750)	
	3"				
	4"				
	6"				29 (241)
	8"				14 (203)
	10"	6 (87)			
600	2"	103 (1500)	103 (1500)	103 (1500)	
	3"				
	4"				44 (638)
	6"				25 (363)
	8"				10 (145)
	10"	2 (29)			

⁶⁾ Open

Globe Valve

BOA-H

PN 16/25
DN 15-350

Type Series Booklet



Legal information/Copyright

Type Series Booklet BOA-H

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Globe Valves

Bellows-type Globe Valves to DIN/EN

BOA-H



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Process engineering
- Heat recovery systems
- Sugar industry

Fluids handled

- Hot water
- Saturated steam
- Thermal oil
- Liquids and gases not chemically or mechanically aggressive to the valve materials.
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value	
	EN-GJL-250	EN-GJS-400-18-LT
Nominal pressure	PN 16	PN 16/25
Nominal size	DN 15 - 300	DN 15 - 300 ¹⁾
Max. permissible pressure [bar]	16	25
Min. permissible temperature [°C]	-10	-10
Max. permissible temperature [°C]	+300	+350

1) PN 25: DN 15-150

Selection as per pressure/temperature ratings (⇒ Page 5)

Body materials

Overview of materials available for straight-way valve

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 300 °C
EN-GJS-400-18-LT	5.3103	≤ 350 °C

Overview of materials available for angle valve

Material	Material number	Temperature limit
EN-GJL-250	5.1301	≤ 300 °C

Design details

Design

- Straight-way or angle pattern with horizontal seat
- Throttling plug ≤ DN 100
- On/off disc ≥ DN 125
- All nominal sizes with position indicator, locking device and travel stop
- Compact bonnet
- Maintenance-free bellows-type stem seal with back-up gland
- Non-rising handwheel
- Flanges to DIN EN 1092-2 Type 21
- Exterior coating: blue, RAL 5002
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.
- Type-tested to the specifications of Germanischer Lloyd and Bureau Veritas.

Variants

- V-port plug (seat-guided throttling plug for maximum requirements) for DN 15 to 300
- Valve disc with PTFE ring (≤ 200 °C, throttling plug for DN 15 to 100, on/off disc for DN 125 to 200)
- Lead-sealable cap (prevents unauthorised actuation) as assembly set
- Balanced plug ≥ DN 200
- High-temperature resistant paint (grey aluminium)
- Either one or two limit switch(es) as assembly kit for globe valves of DN 15 to 150 made of EN-GJS-400-18-LT
- Oil-free and grease-free: lubricated exclusively by mineral oil free lubricants approved by the German Federal Office for Materials Testing (Bundesanstalt für Materialforschung und -prüfung, BAM)
- Other flange designs
- Low-temperature steel bolts for temperatures down to -30 °C (EN-GJS-400-18-LT only) up to 0.75 x PN (max.)
- Certification to customer specification
- Globe valve with gland packing and electric actuator
- Globe valve with gland packing and pneumatic actuator

Product benefits

- High operating comfort at no extra charge due to position indicator with travel stop and locking device outside the insulation. Valve disc position can be checked at any time.
- Optimum start-up and throttling due to standard throttling plug up to DN 100 (seat-guided V-port plug optionally available for all valve sizes to meet maximum throttling requirements).
- When the valve is fully open, the bellows is confined within the valve body, protected from pressure surges.
- Little heat loss during operation due to short and smooth bonnet suitable for easy and cheap insulation.
- Added protection against fatigue fracture: The bellows is welded to the stem, so no vibrations are transmitted from the valve disc to the bellows.
- Back-up gland packing provides additional safety in case of defective bellows.
- Position indicator with colour coding system for identification of valve design during replacement work. The disc type and seat/disc interface material can be verified without removing the insulation.
- Space-saving non-rising handwheel.
- Reduced maintenance costs due to replaceable valve disc. Instead of replacing the complete upper section, only the valve disc is replaced, if necessary.

Related documents

Information/documents

Document	Reference number
Flow characteristics	7150.4
Operating manual	0570.8
Installation instructions "Accessories set for capped valves"	0570.811
Installation instructions "Limit switch set"	0570.812
BOA-H Mat E type series booklet	7135.1

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Material
5. Variants
6. Reference number

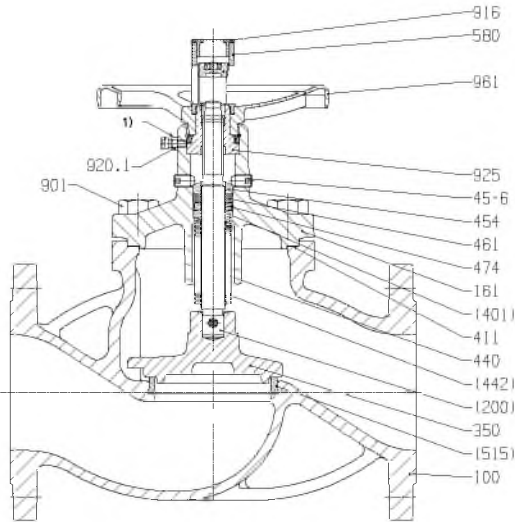
Pressure/temperature ratings

Test pressure and operating pressure

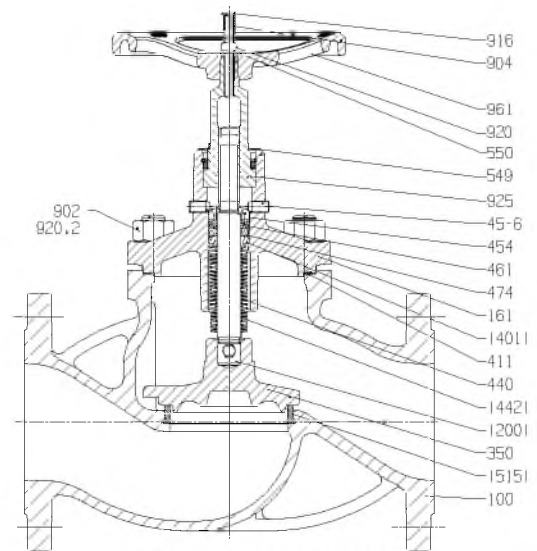
PN	Material	Shell test	Leak test (seat)	Permissible operating pressure [bar] ²⁾³⁾								
		With water		[°C]								
		Tests P10 and P11 to DIN EN 12266-1 [bar]	Test P12, leakage rate A to DIN EN 12266-1 [bar]	-10 to +120	150	180	200	230	250	300	350	
16	EN-GJL-250	24	17,6	16	14,4	13,4	12,8	11,8	11,2	9,6	-	
	EN-GJS-400-18-LT	24	17,6	16	15,5	-	14,7	-	13,9	12,8	11,2	
25	EN-GJS-400-18-LT	37,5	27,5	25	24,3	-	23	-	21,8	20	17,5	

2) Intermediate temperatures can be derived by linear interpolation.
3) Static load

Materials



EN-GJL-250 (5.1301)



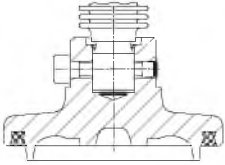
EN-GJS-400-18-LT (5.3103)

Parts list

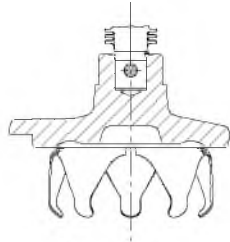
Part No.	Description	DN	Material	Material number	
100 ⁴⁾	Body	15-300	EN-GJL-250	5.1301	
		15-350	EN-GJS-400-18-LT	5.3103	
161	Body bonnet	15-300	EN-GJL-250	5.1301	
		15-350	EN-GJS-400-18-LT	5.3103	
350 ⁴⁾	Valve disc	15-150	X 20 Cr 13	1.4021+QT (1.4021)	
		200-350	C 22/X 15 CrNi 18 8	1.0402/1.4370	
411 ⁴⁾	Joint ring	-	CrNi steel/graphite	-	
440	Bellows set consisting of:				
	200	Stem	-	Stainless steel (min. 13 % chrome)	-
	401	Weld ring	-	Stainless steel (min. 13 % chrome)	-
	442	Bellows	-	X 6 CrNiTi 18 10	1.4541
454	Stuffing box ring	-	Steel	-	
45-6	Stuffing box screw	-	Steel	-	
461	Gland packing	-	Pure graphite	-	
474	Thrust ring	-	Stainless steel	-	
515	Seat ring	-	Stainless steel	-	
543	Spacer bush	15-65	Plastic, glass-fibre reinforced	-	
549	Collar bush	-	Stainless steel	-	
550	Disc	-	Steel	-	
580 ⁴⁾	Cap	15-150	Plastic, glass-fibre reinforced, impact-resistant	-	
		200-350	Steel	-	
901 ⁴⁾	Hexagon head bolt	-	8.8 on EN-GJL-250 variant	-	
902 ⁴⁾	Stud	-	C 35 E on EN-GJS-400-18-LT variant	-	
904 ⁴⁾	Grub screw	-	Steel	-	
916 ⁴⁾	Plug	-	Plastic	-	
920 ⁴⁾	Hexagon nut	-	C 35 on EN-GJS-400-18-LT variant	-	
925	Stem nut	-	Coated steel	-	
961 ⁴⁾	Handwheel	15-150	Die-cast aluminium on EN-GJL-250 variant	-	
		200-300	EN-GJL-200 on EN-GJL-250 variant	5.1300	
		15-350	EN-GJL-200 on EN-GJS-400-18-LT variant	5.1300	

4) Spare part

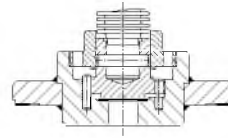
Variants



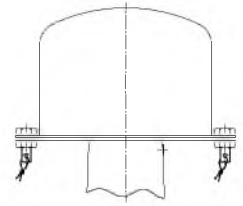
Throttling plug with PTFE ring, DN 15-100



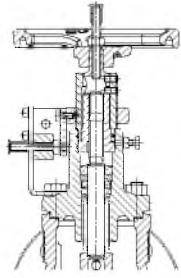
V-port plug



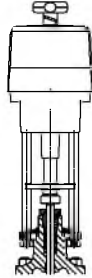
Balanced plug design from DN 200



Lead-sealable cap (prevents unauthorised actuation) as assembly set

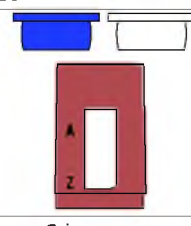

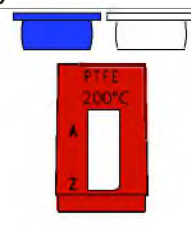




Limit switch(es)



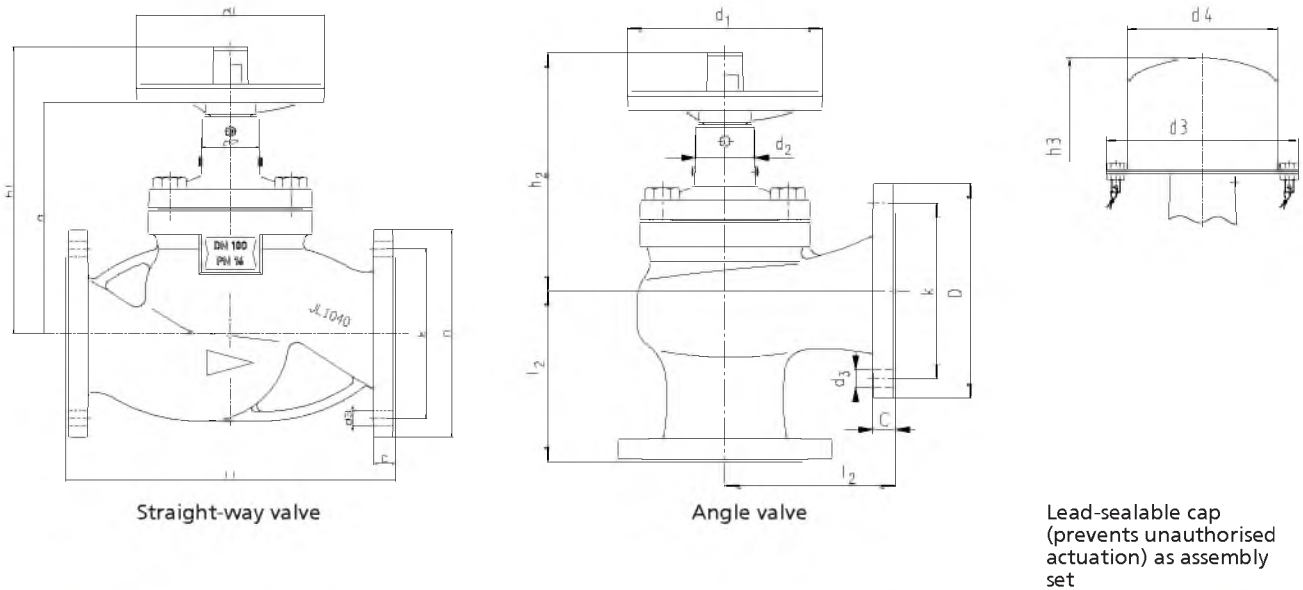
BOA-H Mat E

Colour coding system

Body made of EN-GJL-250			Body made of EN-GJS-400-18-LT		
Metal-seated valve disc			Metal-seated valve disc		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Crimson cap				
Valve disc with PTFE gasket			Valve disc with PTFE gasket		
Blue plug Design: on/off disc		White plug Design: throttling plug	Blue plug Design: on/off disc		White plug Design: throttling plug
	Red orange cap			Sheet metal disc	
V-port plug (DN 15-300)			V-port plug (DN 15-150)		
Tag on handwheel	<input type="checkbox"/> Kronenkegel				White plug
				Sheet metal disc	
			V-port plug (DN 200-350)		
			Tag on handwheel	<input type="checkbox"/> Kronenkegel	

Dimensions and weights

Dimensions and weights PN 16, EN-GJL-250



Dimensions [mm] and weights [kg]

PN	DN	l ₁	l ₂	h ₁	h ₂	d ₁	d ₂	a	Flange				Capped valve						
									D	k	n × d ₃	C	[kg]		d ₃	d ₄	h ₃		
													DF ⁵⁾	EF ⁶⁾				DF ⁵⁾	EF ⁶⁾
16	15	130	90	175	150	125	47	137	95	65	4 × 14	14	3,1	3,2	166	130	204	179	
	20	150	95	178	153	125	47	140	105	75	4 × 14	16	4	4	166	130	207	182	
	25	160	100	184	151	125	47	146	115	85	4 × 14	16	4,7	4,8	166	130	213	180	
	32	180	105	205	170	125	47	161	140	100	4 × 19	18	7,3	7,5	166	130	228	193	
	40	200	115	210	172	125	47	166	150	110	4 × 19	18	7,7	7,7	166	130	233	208	
	50	230	125	235	198	160	51	190	165	125	4 × 19	20	10,2	9,6	210	170	298	260	
	65	290	145	246	198	160	51	201	185	145	4 × 19	20	17	16,3	210	170	309	272	
	80	310	155	282	226	200	60	223	200	160	8 × 19	22	22	21,8	270	220	390	342	
	100	350	175	304	244	200	60	245	220	180	8 × 19	24	32	30,8	270	220	412	356	
	125	400	200	390	316	250	86	310	250	210	8 × 19	26	54	48,3	390	340	479	405	
	150	480	225	408	320	250	86	328	285	240	8 × 23	26	70,5	65,7	390	340	497	409	
	200	600	275	570	468	400	100	440	340	295	12 × 23	30	130	114,2	-	-	-	-	
	250	730	325	606	480	400	100	476	405	355	12 × 28	32	230	180,5	-	-	-	-	
300	850	375	660	510	400	93	530	460	410	12 × 28	32	328	267,5	-	-	-	-		

Mating dimensions as per standard

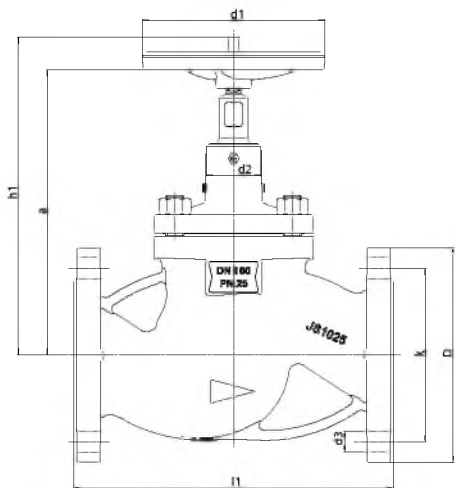
- Face-to-face lengths: Straight-way valve: DIN EN 558/1, ISO 5752
Angle valve: DIN EN 558/8, ISO 5752
- Flanges: DIN EN 1092-2, flange type 21 for EN-GJL-250
DIN EN 1092-2, flange type 21-2 for EN-GJS-400-18-LT
- Flange facing: DIN EN 1092-2, type B

Other flange designs

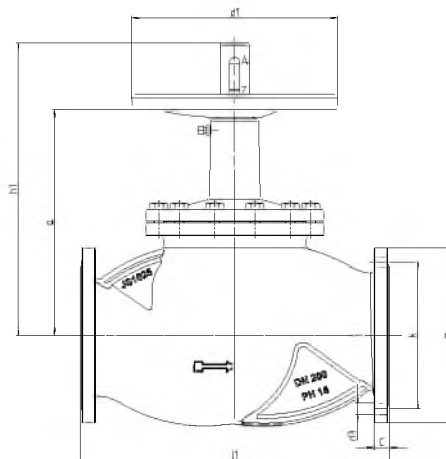
- Undrilled, DN 200-300 drilled to PN 10, drilled to PN 6 (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- Other flange designs on request

5) Straight-way valve
6) Angle valve

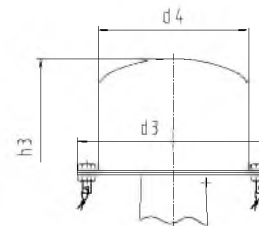
Dimensions and weights PN 16 and PN 25, EN-GJS-400-18-LT



PN 16/25 up to DN 150



PN 16 DN 200-350



Lead-sealable cap
(prevents unauthorised
actuation) as assembly
set

Dimensions [mm]

PN	DN	l ₁	h ₁	d ₁	d ₂	a	Flange				[kg]	Capped valve		
							D	k	n × d ₃	C		d ₃	d ₄	h ₃
16	15	130	211	125	47	179	95	65	4 × 14	14	3,1	166	130	222
	20	150	214	125	47	182	105	75	4 × 14	16	4,1	166	130	225
	25	160	220	125	47	188	115	85	4 × 14	16	4,6	166	130	231
	32	180	238	125	47	203	140	100	4 × 19	18	8,1	166	130	246
	40	200	243	125	47	208	150	110	4 × 19	18	8,5	166	130	251
	50	230	266	160	51	240	165	125	4 × 19	20	11	210	170	298
	65	290	290	160	51	250	185	145	4 × 19	20	17	210	170	308
	80	310	324	200	60	290	200	160	8 × 19	22	21	270	220	391
	100	350	348	200	60	312	220	180	8 × 19	24	31	270	220	415
	125	400	460	250	80	400	250	210	8 × 19	26	51	390	340	480
	150	480	479	250	80	418	285	240	8 × 23	26	68,5	390	340	499
	200	600	570	400	93	440	340	295	12 × 23	30	139	-	-	-
	250	730	606	400	93	476	405	355	12 × 28	32	239	-	-	-
	300	850	660	400	93	530	460	410	12 × 28	32	343	-	-	-
350	980	660	400	93	530	520	470	16 × 28	36	390	-	-	-	
25	15	130	211	125	47	179	95	65	4 × 14	14	3,1	166	130	222
	20	150	214	125	47	182	105	75	4 × 14	16	4,1	166	130	225
	25	160	220	125	47	188	115	85	4 × 14	16	4,6	166	130	231
	32	180	238	125	47	203	140	100	4 × 19	18	8,2	166	130	246
	40	200	243	125	47	208	150	110	4 × 19	18	8,5	166	130	251
	50	230	266	160	51	240	165	125	4 × 19	20	11	210	170	298
	65	290	290	160	51	250	185	145	8 × 19	20	17	210	170	308
	80	310	324	200	60	290	200	160	8 × 19	22	28,9	270	220	391
	100	350	348	200	60	312	235	190	8 × 23	24	40	270	220	415
	125	400	460	250	80	400	270	220	8 × 28	26	65	390	340	480
150	480	479	250	80	418	300	250	8 × 28	26	89	390	340	499	

Mating dimensions as per standard

- Face-to-face lengths: Straight-way valve: DIN EN 558/1, ISO 5752
Angle valve: DIN EN 558/8, ISO 5752
- Flanges: DIN EN 1092-2, flange type 21 for EN-GJL-250
DIN EN 1092-2, flange type 21-2 for EN-GJS-400-18-LT
- Flange facing: DIN EN 1092-2, type B

Other flange designs

- PN 16:
undrilled, DN 200-300 drilled to PN 10, drilled to PN 6 (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- PN 25:
undrilled (DIN EN 1092-2), drilled to ANSI Class 150, tongue (type C), groove (type D), spigot (type E), recess (type F) at both ends (to DIN EN 1092-1)
- Other flange designs on request

Installation instructions


Flow through globe valves should be in the direction of the embossed arrow on the valve body. An alternating direction of flow is permissible for valves with standard valve disc, but not for valves fitted with a balanced plug.

If the following differential pressures are exceeded on BOA-H globe valves from DN 200 upwards, a balanced plug design is required.

Differential pressures [bar]

PN	DN	Δp
16	150	-
16	200	12
16	250	9
16	300/350	6
25	150	21 ⁷⁾
25	200	12
25	250	9
25	300/350	6

The balanced plug only takes effect if the pressure to be sealed lies above the valve disc. Therefore, flow through valves with balanced plug must be reversed (embossed flow direction arrow is reversed).

 In steam pipelines the valve must not be installed with the stem pointing downwards (risk of steam hammer).

7) No balanced plug available.

Chemical resistance chart

The information provided in this chemical resistance chart is based on experience, the Dechema lists as well as manufacturer information. Corrosion resistance is largely dependent on the operating conditions, temperatures and concentrations. Hydroabrasive wear in fluids containing solids is not covered in this list. All information provided herein, therefore, only serves as an orientation. Warranty claims may not be asserted on the basis of this list!

Symbols key

Symbol	Description
✓	The fluid handled is not normally aggressive toward the materials.
✘	The fluid handled is aggressive toward the materials. Valve cannot be used.
○	The materials and/or the valve can only be used under certain operating conditions. Please enquire accordingly, stating the operating conditions such as concentration, temperature, pH and composition of the fluid handled.

Chemical resistance chart for water⁸⁾

Fluids handled	A ⁹⁾	B ¹⁰⁾
Brackish water ¹¹⁾	✘	✘
Service water ¹¹⁾	✓	✓
Fire-fighting water	✓	✓
Chlorinated water (≤ 0.6 mg/kg)	✓	✓
Deionised water (demineralised water) ¹²⁾	○	○
Distilled water ¹²⁾	○	○
Boiler feed water	✓	✓
Hot water	✓	✓
High-temperature hot water	✓	✓
Condensate	✓	✓
Oil-free cooling water	✓	✓
Oil-containing cooling water	✓	✓
Ozonised water (≤ 0.5 mg/kg)	✓	✓
Pure water	✓	✓
Seawater	✘	✘
Scale-forming water ¹¹⁾	○	○
Raw water ¹¹⁾	✓	✓
Partly desalinated water ¹²⁾	○	○
Fully desalinated water ¹²⁾	○	○
Municipal waste water ¹¹⁾¹³⁾	✓	✓
Industrial waste water ¹¹⁾¹⁴⁾	✓	✓

Chemical resistance chart for oils (aromatic content 5 mg/kg)

Fluids handled	A ⁹⁾	B ¹⁰⁾
Vegetable oils	✓	✓
Mineral oils	✓	✓
Synthetic oils	✓	✓
Crude oil	✓	✓
Petroleum	✓	✓
Light fuel oil	✓	✓

Fluids handled	A ⁹⁾	B ¹⁰⁾
Linseed oil	✓	✓
Oil/water emulsion ¹¹⁾	✓	✓
Jet fuel	○ ¹⁵⁾	✓
Petrol	○ ¹⁵⁾	✓
Kerosene	○ ¹⁵⁾	✓

Chemical resistance chart for refrigerants

Fluids handled	A ⁹⁾	B ¹⁰⁾
Ammonium hydroxide (≤ 30 %, ≤ 25 °C)	✓	✓
Glycol (ethylene glycol)	✓	✓
Propylene glycol	✓	✓
Water/glycol mixture (≤ 50 %, ≤ 40 °C)	✓	✓
Inorganic cooling brine, pH 7.5	✓	✓

Chemical resistance chart for thermal oils

Fluids handled	A ⁹⁾	B ¹⁰⁾
Synthetic thermal oils	✓	✓
Mineral-based thermal oils	✓	✓

Chemical resistance chart for acids

Fluids handled	A ⁹⁾	B ¹⁰⁾
Hydrochloric acid	✘	✘
Sulphuric acid (pure, technical, concentrated)	✘	✘
Sulphurous acid	✘	✘
Fatty acid	✘	✘
Nitric acid	✘	✘

Chemical resistance chart for cleaning agents

Fluids handled	A ⁹⁾	B ¹⁰⁾
Lye for bottle rinsers (e.g. P3) ≤ 80 °C ¹¹⁾	○	○
Lye for metal cleaning ≤ 80 °C ¹¹⁾	○	○

Chemical resistance chart for steam

Fluids handled	A ⁹⁾	B ¹⁰⁾
Saturated steam	○ ¹⁵⁾	✓

Chemical resistance chart for other fluids

Fluids handled	A ⁹⁾	B ¹⁰⁾
Sodium hydroxide (≤ 50 %, ≤ 50 °C)	○	○
Natural gas	✓	✓
Oil-containing compressed air	✓	✓
Dry chlorine (≤ 30 °C)	○	✓
Ammonia	✓	✓
Butane (liquefied gas)	✓	✓
Aqueous glycerine	✓	✓
Carbon dioxide (gas)	✓	✓
Carbon dioxide (aqueous solution)	✘	✘

- 8) General criteria for water to be handled by valves made of non-alloyed materials: pH > 7; chlorides (Cl-) < 150 mg/kg; chlorine (Cl) < 0.6 mg/kg. Other factors to be considered: hardness, carbon dioxide content (CO₂), oxygen (O₂) and dissolved substances. Contact KSB if limits are exceeded!
- 9) EN-GJL-250, T_{max.} +300 °C
- 10) EN-GJS-400-18-LT, T_{max.} +350 °C
- 11) Without solids
- 12) Can only be used for installations and the respective water quality as specified in the VdTÜV 1466 or VDI 2035 guidelines. A pH ≥ 9.5 and an oxygen content ≤ 0.02 mg/l are also recommended.
- 13) Biologically treated
- 14) Non-corrosive, non-abrasive
- 15) EN-GJS-400-18-LT is recommended for safety reasons (ductility).

Globe Valve

BOA-H/HE/HV/HEV

PN 25/40
DN 10-350
Bellows
Flanged/Butt Weld Ends
or Socket Weld Ends

Type Series Booklet



Legal information/Copyright

Type Series Booklet BOA-H/HE/HV/HEV

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Globe Valves

Bellows-type globe valves to DIN/EN

BOA-H/HE/HV/HEV



Main applications

- Process engineering
- Chemical industry
- Petrochemical industry
- Sugar industry
- Heat recovery systems
- Boiler recirculation
- Boiler feed applications

Fluids handled

- Water
- Steam
- Thermal oil
- Other non-aggressive fluids such as gas or oil on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 25/40
Nominal size	DN 10 - 350 ¹⁾
Max. permissible pressure	40 bar
Min. permissible temperature	-10 °C
Max. permissible temperature	+450 °C

Selection as per pressure/temperature ratings (⇒ Page 4)

1) DN 250-350 Type BOA-HV/HEV

Design details

Design

- Straight-way pattern
- On/off disc
- Seat/disc interface made of wear-resistant and corrosion-proof chrome (Cr) steel or chrome nickel (CrNi) steel
- Outside screw
- Back seat
- Stem sealed by double-walled bellows and back-up gland packing
- EC type-tested (Module B), component mark TÜ.A./AR-291
- Exterior coating: blue RAL 5002
- The valves meet the requirements specified in TA-Luft (German Technical Guidelines on Air Quality Control, VDI 2440).
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.
- The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU.

Variants

- Throttling plug
- Balanced plug for DN 250-350 (for DN 125-200 NORI 40)
- Position indicator (standard for DN 250-350)
- Studs and nuts of A4-70 (low-temperature steel)
- Cap
- Oil and grease-free (wetted parts)
- Other flange designs or butt weld end designs
- Inspections to technical codes such as TRD/TRB/AD2000 – German Steam Boiler / Pressure Vessel Regulations – or to customer specification

Body materials

Overview of available materials

Material	Material number	Temperature limit
P 250 GH	1.0460	Up to 450 °C
GP 240 GH+N	1.0619+N	Up to 450 °C

Product benefits

- Reliable sealing: bonnet gasket fully confined to prevent creep.
- Improved energy efficiency of the system. Short, easy-to-insulate bonnet minimises heat losses.
- Additional stem seal for emergency operation and blow-out protection by standard back seat as well as back-up gland packing made of pure graphite.
- Hard-faced valve seat made of wear-resistant and corrosion-proof materials for long service life and high functional reliability.

- Corrosion-resistant and easy to repair due to olive-chromated nuts and bolts/screws.

Related documents

- We recommend using our maintenance-free DN 10-200 NORI 40 globe valves, types ZXLB and ZXSb, if actuators are to be mounted (see type series booklet 7165.1).
- Operating manual 0570.82

2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet

On all enquiries/orders please specify

1. Type

Pressure/temperature ratings

Permissible operating pressures in bar at temperatures in °C (to EN 1092-1)²⁾

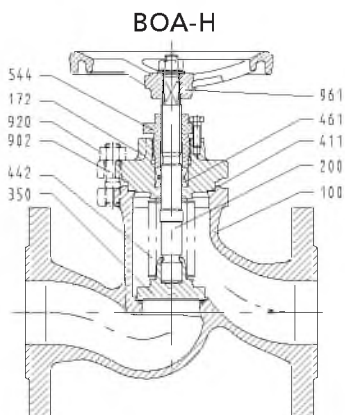
Nominal pressure PN	Material	RT ³⁾	100	150	200	250	300	350	400	450
25	P 250 GH - 1.0460	25,0	23,2	22,0	20,8	19,0	17,2	16,0	14,8	8,2
40	GP 240 GH+N - 1.0619+N	40,0	37,1	35,2	33,3	30,4	27,6	25,7	23,8	13,1
40		DN 250-350 ⁴⁾	27,0	27,0	23,0	22,0	21,0	19,0	18,0	17,0	13,0

²⁾ Operating pressures to DIN 2401 are also permissible

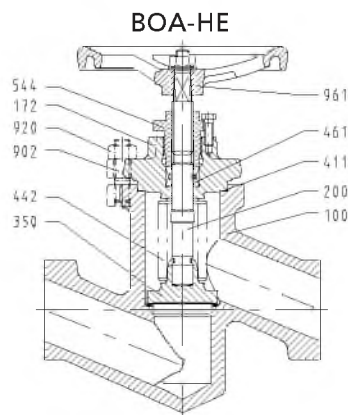
³⁾ RT: room temperature (-10 °C to +50 °C)

⁴⁾ Values deviating from EN 1092-1

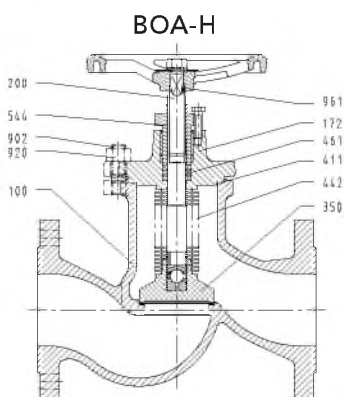
Materials



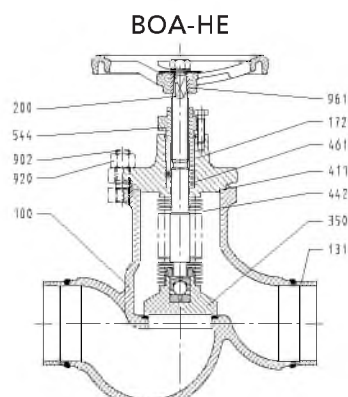
DN 10-50⁵⁾



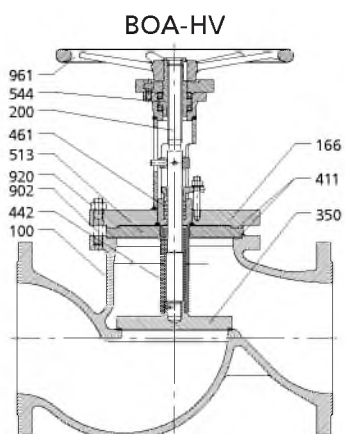
DN 10-50



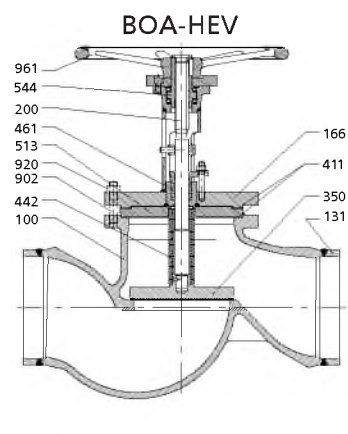
DN 65-200



DN 65-200



DN 250-350



DN 250-350

Overview of available materials

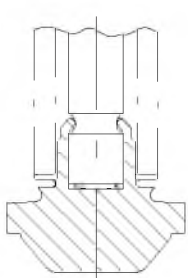
Part No.	Description	Material	Material number	Note
100	Body	P 250 GH	1.0460	Hard-faced with stainless steel (1.4370)
		GP 240 GH+N	1.0619+N	
131	Connection branch	P 235 GH	1.0305	≥ DN 65
166	Yoke	P 250 GH	1.0460	DN 250

⁵⁾ DN 10 to 40 with forged body

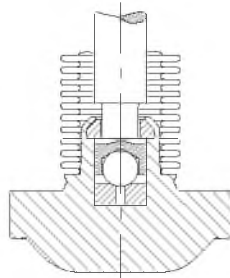
Part No.	Description	Material	Material number	Note	
		P 265 GH	1.0425	≥ DN 300	
172	Bonnet	P 250 GH	1.0460		
200 ⁶⁾	Stem	X 20 Cr 13	1.4021	Nitrided (DN 10-100)	
350 ⁶⁾	Valve disc	X 20 Cr 13	1.4021		
		P 250 GH	1.0460	≥ DN 125	Hard-faced (1.4115)
442 ⁶⁾	Bellows	X 6 CrNiMoTi 17-12-2	1.4571		
544 ⁶⁾	Threaded bush	11 SMn 30+C	1.0715	Nitrided	
		X 39 CrMo 17-1	1.4122	Nitrided, ≥ DN 250	
411 ⁶⁾	Joint ring	CrNi steel/graphite			
461 ⁶⁾	Gland packing	Graphite			
513	Insert ring	P 250 GH	1.0460	≥ DN 250	
902	Stud	21 CrMoV 5-7	1.7709		Olive-chromated
920	Hexagon nut	25 CrMo 4	1.7218		
961	Handwheel	JL1030	0.6020		

Variants

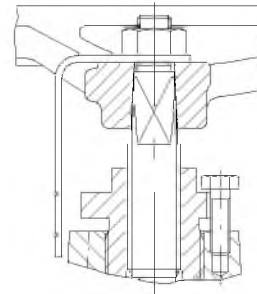
BOA-H/HE



DN 10-50



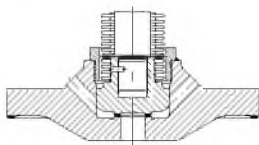
DN 65-200



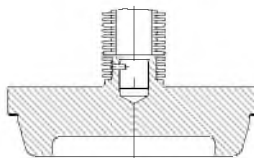
DN 10-200
Position indicator

Throttling plug

BOA-HV/HEV



Balanced plug

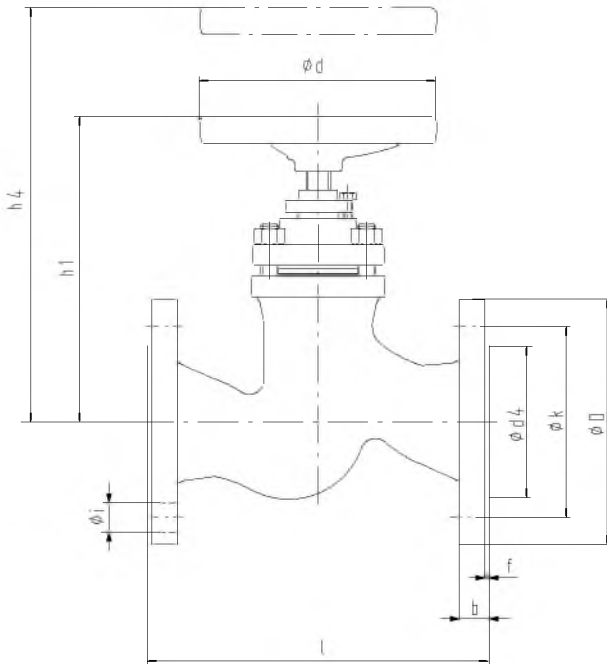


Throttling plug

⁶⁾ Recommended spare parts

Dimensions

BOA-H dimensions



Dimensions in mm

PN	DN	l	ø D	ø k	No. of bolt holes z	Bolt hole dia. i	ø d ₄ x f	b	h ₁ ⁷⁾	h ₄ ⁸⁾	Travel	ø d	[kg]
25/40	10	130	90	60	4	14	40 x 2	16	140	210	4,0	125	3.8
	15	130	95	65	4	14	45 x 2	16	140	210	4,0	125	3.3
	20	150	105	75	4	14	58 x 2	18	165	260	6,5	125	4.8
	25	160	115	85	4	14	68 x 2	18	165	260	6,5	125	5.4
	32	180	140	100	4	18	78 x 2	18	190	290	8,0	160	9.1
	40	200	150	110	4	18	88 x 3	18	200	300	10,0	160	10.2
	50	230	165	125	4	18	102 x 3	20	220	330	12,5	160	13.2
	65	290	185	145	8	18	122 x 3	22	270	420	16,5	200	19.8
	80	310	200	160	8	18	138 x 3	24	305	480	20,0	200	27
	100	350	235	190	8	22	162 x 3	24	345	550	25,0	250	41.7
	125	400	270	220	8	26	188 x 3	26	395	580	31,5	315	66
150	480	300	250	8	26	218 x 3	28	430	620	37,5	315	88	
25	200	600	360	310	12	26	278 x 3	30	500	760	47,5	400	144.6
40	200	600	375	320	12	30	285 x 3	34	500	760	47,5	400	175

Mating dimensions - Standards

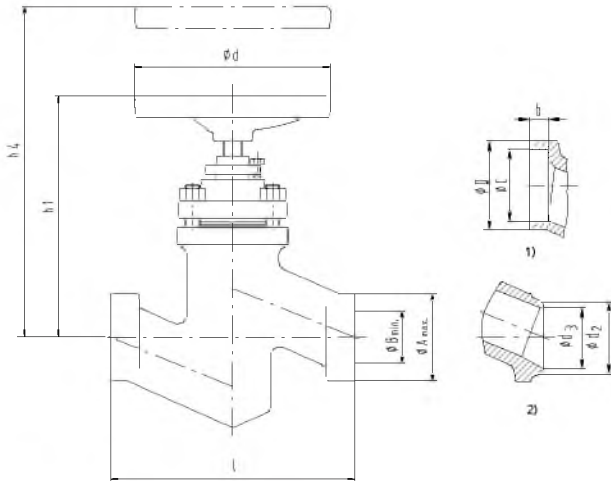
Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092, ISO 7005
 Flange facing: DIN EN 1092-2, type B

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

7) Open
 8) Vertical clearance for removal

BOA-HE dimensions



1)	2)
----	----

Dimensions in mm

PN	DN	l	Butt weld ends, unmachined		Butt weld ends to DIN EN 12627			Socket weld ends to DIN EN 12760			h ₁ ⁹⁾	h ₄ ¹⁰⁾	Travel	ø d	[kg]
			ø A _{max}	ø B _{min}	ø d ₂	ø d ₃	Associated pipe dimensions	ø D _{0.5}	ø C ^{+0.2}	b _{min.}					
25/40	10	130	37	10	18	13	17,2 x 2,0	25	17,6	10	165	260	4,0	125	3
	15	130	37	15	22	17	21,3 x 2,0	30,5	21,7	10	165	260	4,0	125	2.9
	20	130	37	20	28	22	26,9 x 2,3	36,5	27,1	13	165	260	6,5	125	3.3
	25	130	37	24	34	28,5	33,7 x 2,6	44,5	33,8	13	165	260	6,5	125	3.2
	32	160	60	33	43	37	42,4 x 2,6	53,5	42,5	13	200	290	8,0	160	5.5
	40	180	60	38	49	43	48,3 x 2,6	60,5	48,7	13	200	300	10,0	160	5.5
	50	210	73	48	61	54	60,3 x 3,2	73,5	61,1	16	220	330	12,5	160	8.3
	65	290	76,1	64,9	76,1	69	76,1 x 3,6				270	420	16,5	200	17
	80	310	88,9	79,9	88,9	81	88,9 x 4,0				305	480	20,0	200	30
	100	350	114,3	100,1	114,3	104	114,3 x 5,0				345	550	25,0	250	40
	125	400	139,7	125,5	139,7	130,5	139,7 x 4,5				395	580	31,5	315	60
	150	480	168,3	148,3	168,3	156,5	168,3 x 5,6				430	620	37,5	315	80
	200	600	219,1	199,1	219,1	204,5	219,1 x 7,1				500	760	47,5	400	130

Mating dimensions - Standards

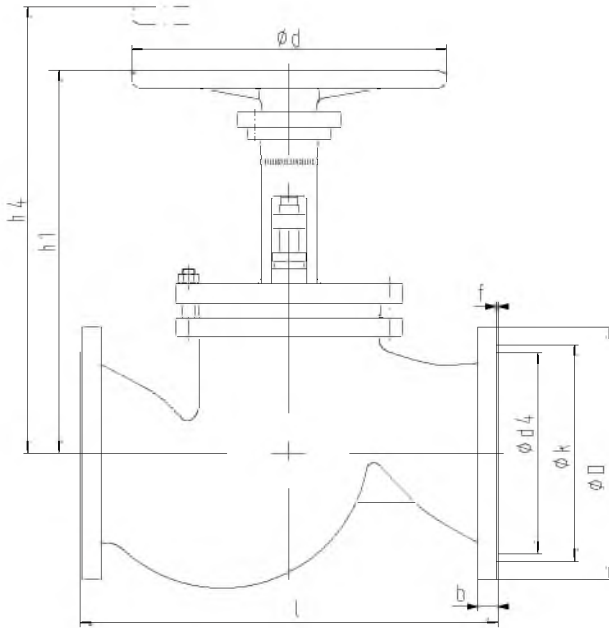
Face-to-face lengths: EN 12982/64
 Butt weld ends: DIN EN 12627 Fig. 2
 Socket weld ends: DIN EN 12760

Different designs of butt weld ends, socket weld ends and welding groove types are possible, but only within the dimensions A_{max.} and B_{min.}.

Butt weld ends to DIN 3239, type 1, or socket weld ends to ASME B16.11/DIN 3239/2 possible.

⁹⁾ Open
¹⁰⁾ Vertical clearance for removal

BOA-HV dimensions



Dimensions in mm

PN	DN	l	$\varnothing D$	$\varnothing k$	No. of bolt holes z	Bolt hole dia. i	$\varnothing d_4 \times f$	b	$h_1^{11)}$	$h_4^{12)}$	$\varnothing d$	[kg]
25	250	730	425	370	12	30	335 x 3	32	705	1035	500	270
	300	850	485	430	16	30	395 x 4	34	785	1145	630	385
	350	980	555	490	16	33	450 x 4	38	950	1400	800	630
40	250	730	450	385	12	33	345 x 3	38	705	1035	500	300
	300	850	515	450	16	33	410 x 4	42	785	1145	630	430
	350	980	580	510	16	36	465 x 4	46	950	1400	800	660

Mating dimensions - Standards

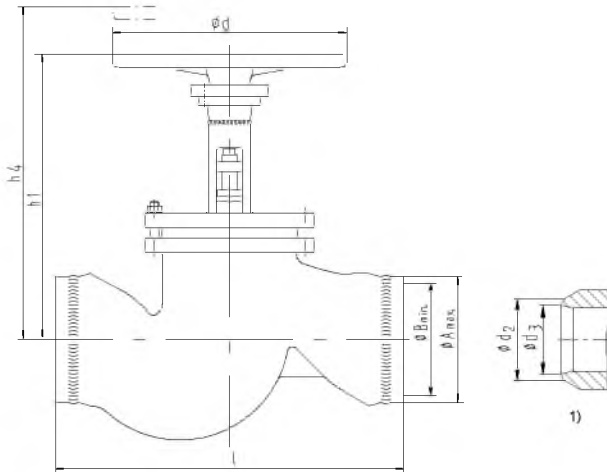
Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: Mating dimensions to DIN EN 1092, ISO 7005
 Flange facing: DIN EN 1092-2, type B

Other flange designs

- E.g. groove (type D), tongue (type C), recess (type F), spigot (type E) to EN 1092-1 at both ends
- Other flange designs on request

11) Open
 12) Vertical clearance for removal

BOA-HEV dimensions



1) Butt weld end

Dimensions in mm

PN	DN	l	Butt weld ends, unmachined		Butt weld ends to DIN EN 12627			h ₁ ¹³⁾	h ₄ ¹⁴⁾	ø d	[kg]
			ø A _{max.}	ø B _{min.}	ø d ₂	ø d ₃	Associated pipe dimensions				
25/40	250	730	273	251	273	256,5	273,0 x 8,0	705	1035	500	260
	300	950	345	305	323,9	306,5	323,9 x 8,8	785	1145	630	290
	350	1100	385	335	355,6	336,5	355,6 x 10,0	950	1400	800	600

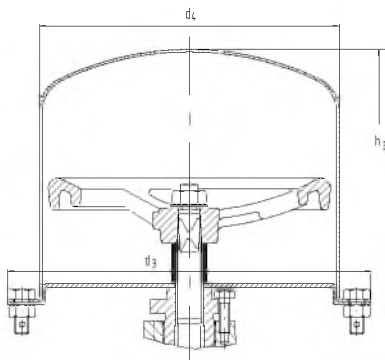
Mating dimensions - Standards

Face-to-face lengths: EN 12982/64 (for DN 250)
or as per table (for DN 300, 350)
Butt weld ends: DIN EN 12627 Fig. 2

Different designs of butt weld ends, socket weld ends and welding groove types are possible, but only within the dimensions A_{max.} and B_{min.}.

13) Open
14) Vertical clearance for removal

Dimensions of lead-sealable cap



Lead-sealable cap (prevents unauthorised closing)

Dimensions in mm

Nominal size DN	d ₃	d ₄	h ₃		[kg]
			BOA-H	BOA-HE	
10	165	130	185	205	0,8
15	165	130	185	205	0,8
20	165	130	205	205	0,8
25	165	130	205	205	0,8
32	205	170	265	275	1,6
40	205	170	275	275	1,6
50	205	170	295	295	1,6
65	256	220	385	385	2,5
80	256	220	415	415	2,5
100	390	340	455	455	6,5
125	390	340	495	495	6,5
150	390	340	520	520	6,5
200	470	420	550	550	9,0

Installation instructions

Shut-off globe valves must be installed in the line so as to ensure that the fluid enters the valve beneath the valve disc and flows out above the valve disc. They can also be installed in lines with alternating flow.

If the max. permissible differential pressures for shut-off are exceeded for valves from DN 125 to 350, a balanced plug design is required. In this case the valve must be installed in such a way that the pressure to be sealed off lies above the valve disc.

The balanced plug works on the bypass principle and can only serve its purpose if backpressure builds up after opening, so that the max. permissible differential pressures for shut-off (see table) are not exceeded.

If a balanced plug design is required for DN 125 to 200, a NORI 40 ZXLBV/ZXSbv or ZXLB/ZXSB shut-off valve must be used.

Differential pressures in bar (standard valve disc)

DN	125	150	200	250	300	350
Δp [bar]	33	21	14	9	6	4,5

For globe valves with throttling plug, detailed information about the operating mode is required for optimum valve selection.

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72	Краснодар (861)203-40-90	Санкт-Петербург (812)309-46-40
Астана (7172)727-132	Красноярск (391)204-63-61	Саратов (845)249-38-78
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Ижевск (3412)26-03-58	Орел (4862)44-53-42	Ульяновск (8422)24-23-59
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	Самара (846)206-03-16	

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