

Installation and Operation Manual

Gate Valve Soft Seal DN500



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1 General information

This manual contains instructions on installation of the Gate Valve Soft Seal DN500 for manual and hydraulic operation as well as maintenance recommendations. It is to be read carefully before installation is started.

It is the responsibility of the installer to ensure that the work is carried out in a satisfactory manner. Only approved materials should be used and the installation must comply with applicable rules and regulations. Regional safety requirements must be applied and observed both at installation and maintenance work.

It is the installers responsibility to define competence of personnel for the installation and maintenance of the valve. In case of problems which cannot be solved from information in this manual, the supplier of the valve should be contacted. The notes and warnings defined in the following chapters must be followed as this information concerns your safety.

The manufacturer reserves the right to introduce technical modifications at any time.

2 Safety precautions

In this Operation and installation manual, dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the symbol below and "*Attention!*" describes practices, to which a failure to comply with can result in serious injury, danger of death for users and third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasized such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.



Attention!

Warning of general danger.

3 Technical data

3.1 Specification

Size	DN500
Pressure class	PN6
Flange drilling	PN10
Painting specification	According to ISO 12944 C3
Painting – primer	Hempel 45141 Grey
Painting – top coating	Hempel 55210 Blue RAL5010
Max temperature for wedge rubber	80°C

Table 1. Technical data for Gate Valve Soft Seal DN500.

Body	Ductile iron EN-JS1030 (GGG40)
Bonnet	Ductile iron EN-JS1030 (GGG40)
Wedge	Ductile iron EN-JS1030 (GGG40)
Wedge lining	NBR 70 shore A
Stem	AISI316L

Table 2. Material data for Gate Valve Soft Seal DN500.

The sealing surface of the valve is painted with Hempel antifouling paint. The availability of the antifouling series varies based on region:

- Europe: Hempel Antifouling Globic 9000
- America: Hempel Antifouling Globic 9000
- Asia: Hempel Antifouling Dynamic 79580

3.2 Gate Valve Soft Seal DN500, manual version, with optional inductive sensors

3.2.1 Dimensions [mm]

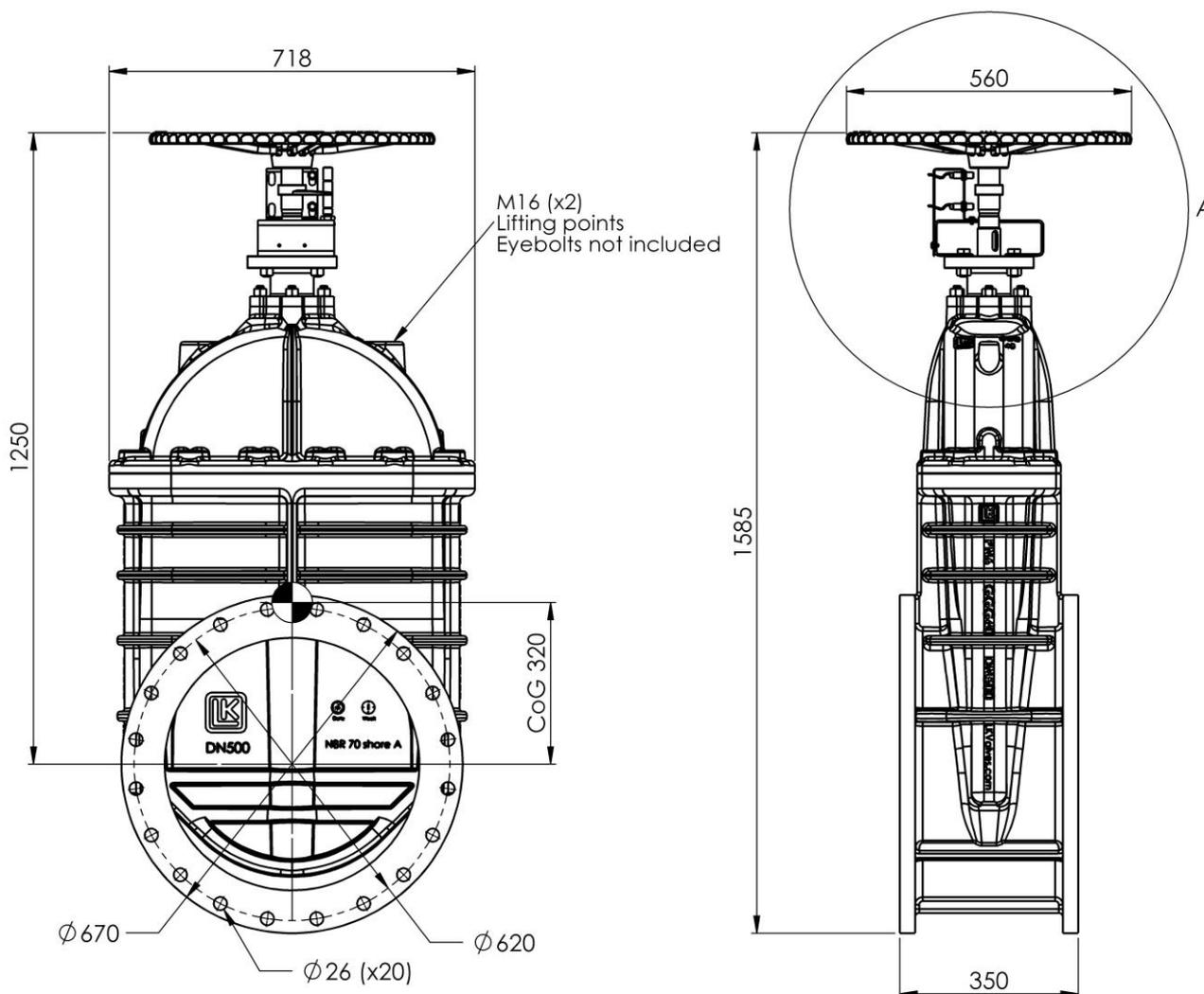


Figure 1. Outline dimensions for Gate Valve Soft Seal DN500, manual version, with optional inductive sensors.

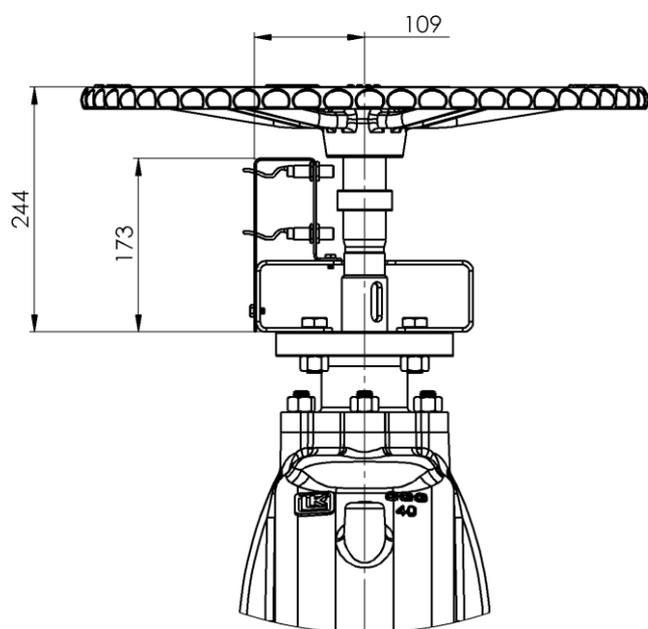


Figure 2. Detailed view A of Gate Valve Soft Seal DN500, manual version with optional inductive sensors.

3.2.2 Specification

Actuation	Manual
Weight	363 kg
Indication brackets material (option)	AISI304

Table 3. Technical data for manually actuated valve.

3.3 Gate Valve Soft Seal DN500, hydraulic actuator

3.3.1 Dimensions [mm]

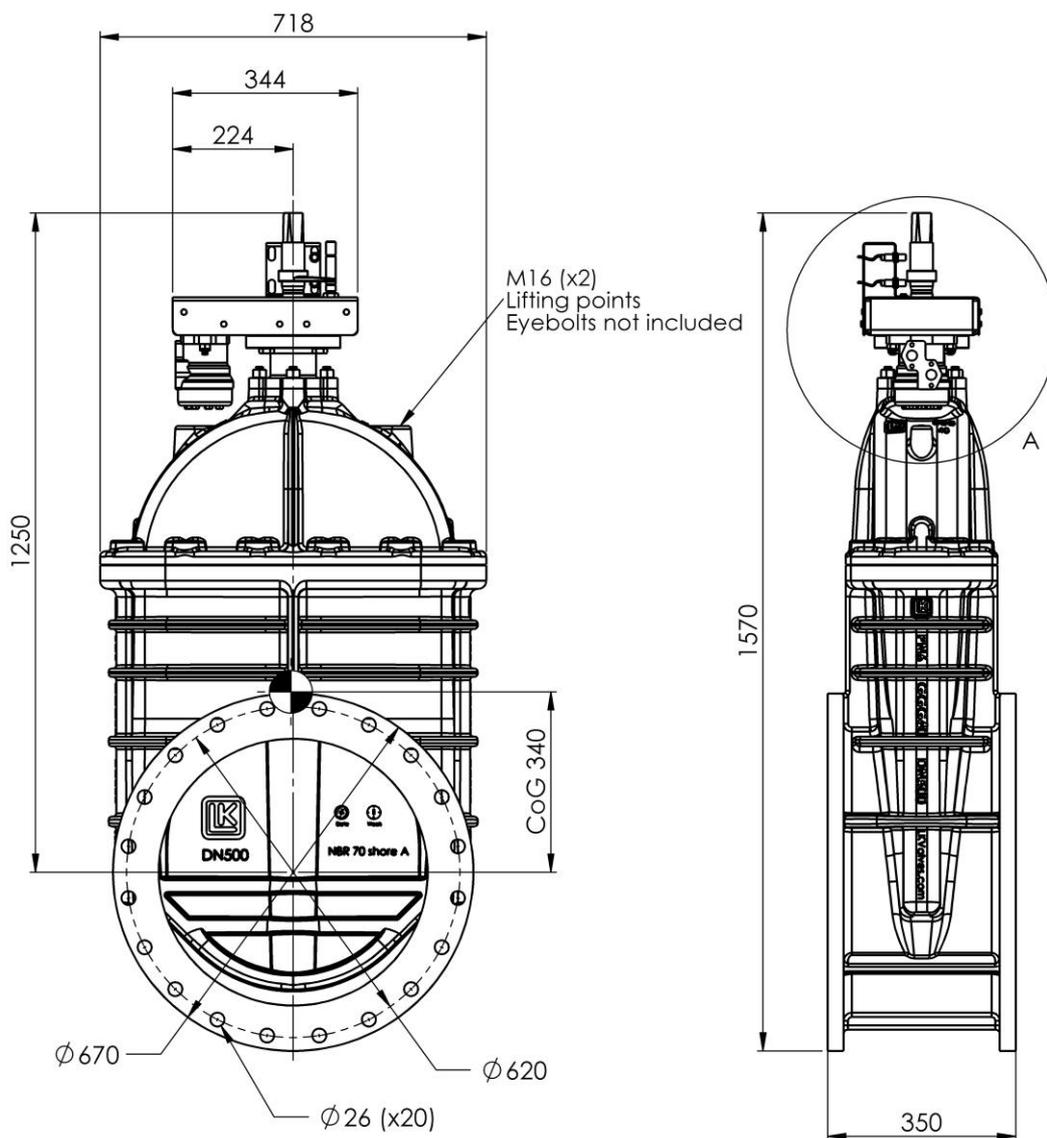


Figure 3. Outline dimensions for Gate Valve Soft Seal DN500 with hydraulic actuator.

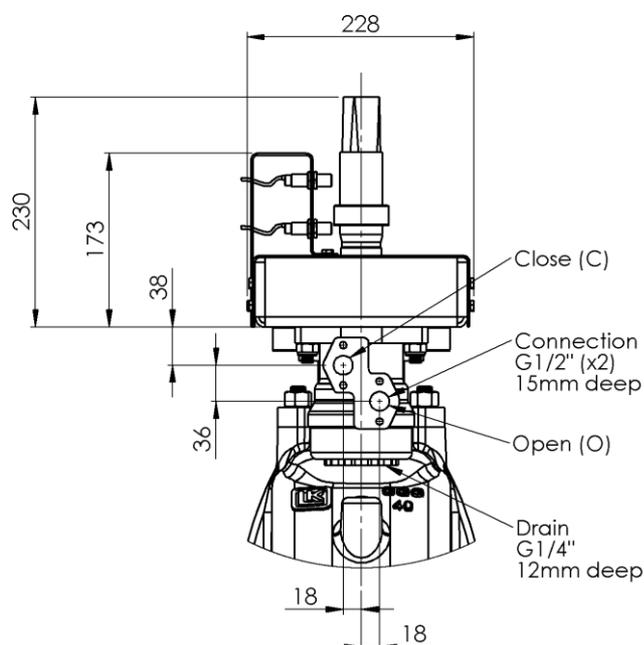


Figure 4. Detailed view A of Gate Valve Soft Seal DN500 with hydraulic actuator.

3.3.2 Specification

Actuation	Hydraulic actuator
Weight	370 kg
Output torque (required torque)	325Nm @ 120 bar (300Nm)
Recommended chain oil	ISO VG 46-460
Recommended chain oil lubrication	2 times/year (or every 200h)
Recommended union fittings	GE 15L R1/2
Actuator gearbox material	AISI304

Table 4. Technical data for hydraulically actuated valve.

Observe:

No hoses, piping or fittings for the hydraulic motor are included.

Note:

Follow the recommended working pressure as stated above. Uncontrolled output torque may result in damage to valve stem.

- Before the valve is put into operation check that it is the right valve for the application (material, pressure, temperature and direction of flow).
- Residues in piping and valve (dirt, weld beads etc.) inevitably leads to leakage.
- Regional safety instructions must be adhered to.

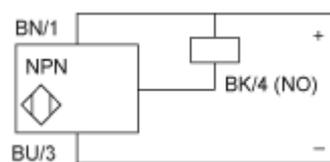
3.4 Inductive sensor (limit switch)

Output signal	Discrete NPN NO
Rated supply voltage	12...48 VDC
Degree of protection	IP68
Operating zone	0...5,6 mm
Cable composition	3 x 0,34 mm ²
Cable length	2 m

Table 5. Technical data for inductive sensor.



Figure 5. Inductive sensor



BU : Blue

BN : Brown

BK : Black

Figure 6. Wiring schema for inductive sensor.

3.5 Hydraulic system (Power pack)

3.5.1 System description

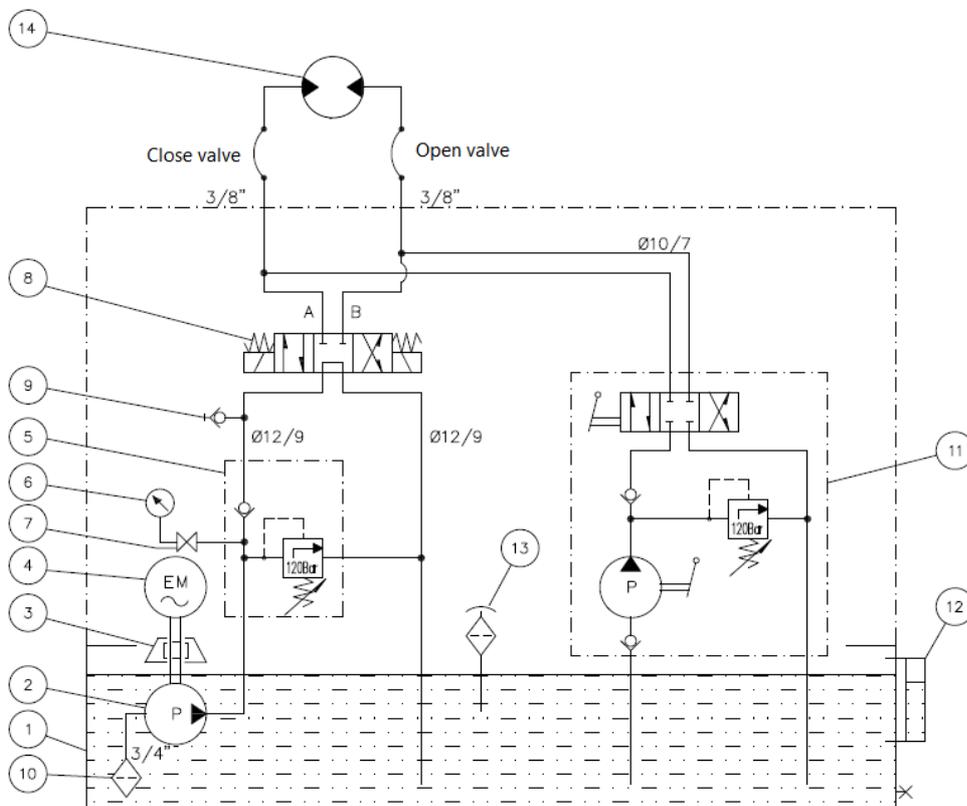


Figure 7. Selector for manual operation.

1	Steel tank 45 liter
2	Pump 10 l/min
3	Junction element
4	Electric motor
5	Central manifold 80-250 bar
6	Pressure gauge 0-250 bar
7	Pressure gauge valve
8	Directional solenoid valve – 24VDC, 31W
9	1/4" test connector
10	Suction strainer 90μ
11	Hand pump 45 cm ³
12	Tank level gauge
13	Filler / breather cap
14	Hydraulic motor (not included in power pack)

Table 6. BOM Power Pack

3.5.2 Technical specification

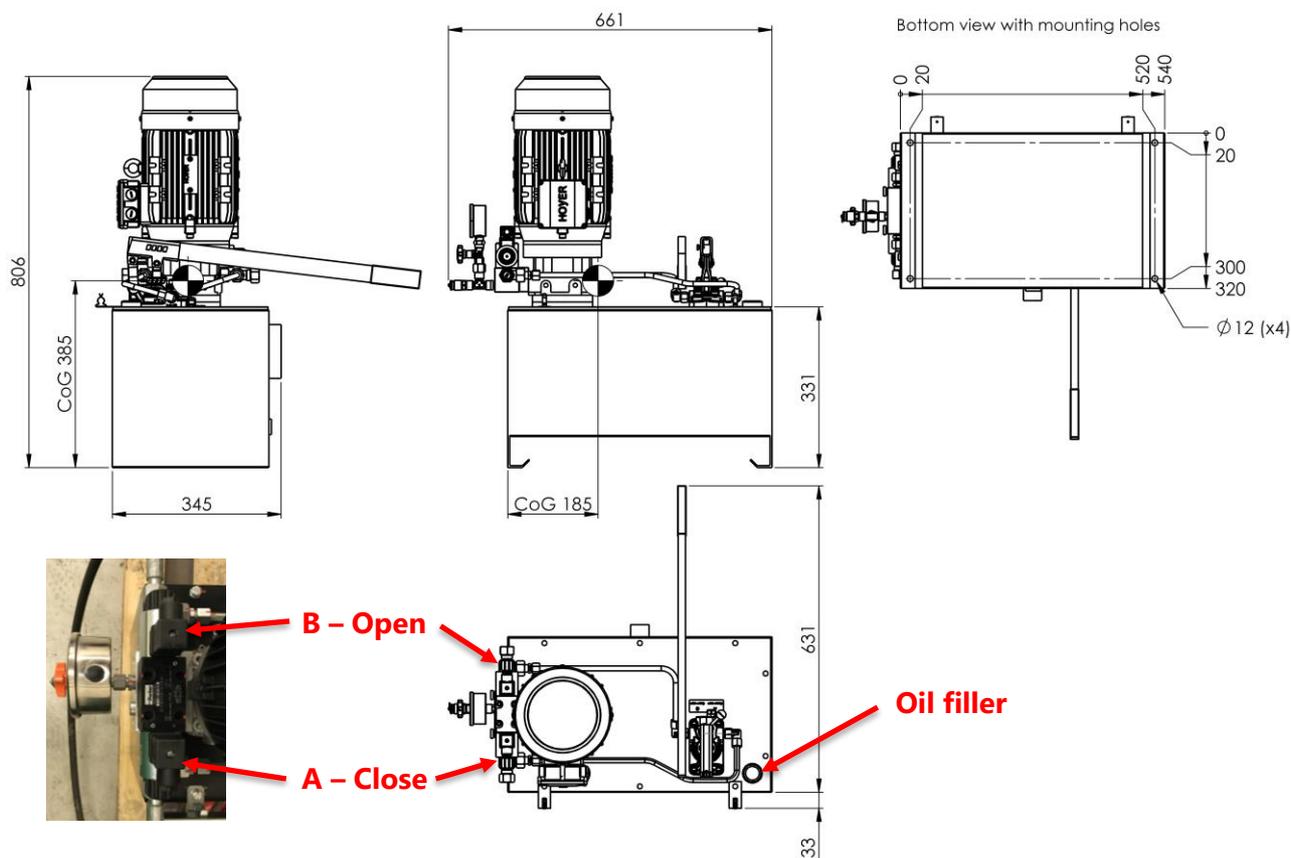


Figure 8. Power Pack layout and dimensions.

	D-connection	Y-connection
Power supply, option 1	3x400VAC 50Hz – 4,60A	3x690VAC 50Hz – 2,65A
	3x440VAC 60Hz – 4,75A	
Power supply, option 2	3x230VAC 50Hz – 7,95A	3x400VAC 50Hz – 4,60A
	3x280VAC 60Hz – 7,95A	3x440VAC 60Hz – 4,75A
Tank capacity	45 liter	
Weight (empty)	65 kg	
Fittings	Pipe 15mm	
Recommended hoses	1/2" (13mm) for 30.0 MPa	
Recommended hydraulic oil	ISO VG 16-46	
Operating temp. min/max (recommended)	-10°C to +55°C (+20°C to +55°C)	
Storage temperature	+5°C to +60°C	
Humidity	15% - 85% (non condensing)	
Conduit entries	M20x1,5 (x3)	

Table 7. Technical specification for Power Pack

IE3		HOYER				CE	
www.hoyermotors.com							
Type: HMA3-100L1-4			Serial no.:SH			3~Motor	
D.E.6206	N.D.E. 6206		40 C	28Kg	IP55	Ins.cl.F	
V.Δ/Y	Hz	KW	rpm	A.Δ/Y	Cosφ	Duty	
230/400	50	2.2	1455	7.95/4.6	0.75	S1	
280/480	60	2.65	1750	7.95/4.6	0.75	S1	
IE3 eff.at: 230/400V 50Hz		1/1: 86.8%		3/4:87.0%		1/2:85.4%	
IM:B14	YY/WW: 19/39					IEC 60034-1	

Figure 9. Rating plate for power pack motor.

Figure 9 shows the rating plate of power pack motor. The values for motor power shown here are for a rating ambient temperature of +40°C. As the ambient temperature deviates from the rating temperature, the motor power changes as shown in table 7. To ensure proper operation of the system, the operation temperatures given in table 6 should not be exceeded.

Amb. temp.	30°C	35°C	40°C	45°C	50°C	55°C
P/P _N	1,05	1,02	1,00	0,97	0,93	0,87

Table 8. Rating table ambient temperature for Power Pack motor.

Connection diagram for main supply is located on the inside of the terminal box lid. No connections needs to be made to the terminals marked "PTC", see figure 10.

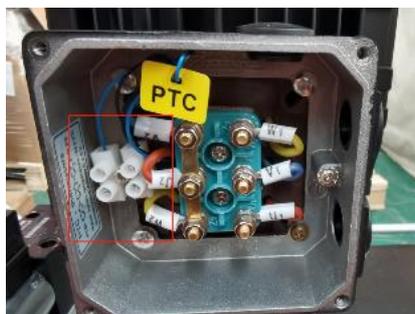


Figure 10. Rating plate for power pack motor.

3.5.3 Hand pump

In case of emergency use the hand pump to manually open and close the gate valve.

When operating the lever manually, there are three functions. Note that these functions corresponds to recommended solenoid function:

B. Open valve manually

Normal operation

A. Close valve manually

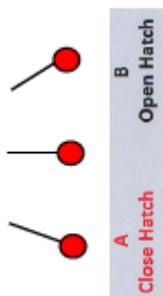


Figure 11. Selector for manual operation.

3.5.4 Heat dissipation

The maximum heat dissipation for the power pack is approximately 730W. Assuming an ambient temperature of 20°C and a runtime of five minutes, the rise in temperature of the power pack tank will be approximately 2,8°C.

3.5.5 EC Directives

The power pack is manufactured in accordance with the following EC Directives:

- Pressure equipment directive 2014/68/EU (PED) of 15 May 2014
- The Low Voltage Directive, i.e. Council Directive 2014/35/EU of 26 February 2014 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
- The EMC Directive, i.e. Council Directive 2014/30/EU of 26 February 2014 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

4 Storage and handling

- Store the valve indoors in a clean and dry place. Corrosion that occurs during storage will significantly reduce the life span of the valve.
- Protect the valve and other equipment against external forces.
- Lifting is to be carried out using suitable handling equipment.
- Be careful when lifting the valve. Never lift by the actuator or the indicator assembly.
- Do not damage the external coating during transport and storing.
- Keep inlet/outlets covered using e.g. plywood as long as possible to avoid damage to the disc. Only remove the covers immediately prior to installation.

5 Marking

Marking of class certification number is placed on either the flange edge or the body rib.

On the side of the valve body are the following markings:

- Valve size: DN500
- Pressure rating: PN6
- Valve material: GGG40

On the disc are the following markings:

- Disc size: DN500
- Disc material: NBR
- Production date: Year, month and week.

6 Installation

6.1 General installation notes



Attention!

- Protect the valve and actuator from dirt during the installation procedure.
- Check for dirt and foreign particles in the valve.
- Only use counter flanges and screws with correct dimensions.
- Avoid damaging forces on the valve and actuator during installation.
- Lifting is to be carried out using suitable handling equipment.
- Weights of equipment to be taken from section 3.2.2 and section 3.3.2.
- Keep stem threads and shaft free from paint.
- To avoid injuries, it is important to remove the handwheel from the valve when using the valve with hydraulic actuator.

6.2 Hydraulic system notes

- Power pack should be outside of watertight trunk to facilitate closing of gate valve in case of flooding of trunk.
- Make sure power pack is located in such a way that the handle for manual pumping is unobstructed and the tank gauge is accessible.
- Flexible tubes must be installed between the hydraulic motor/Power Pack and the hydraulic pipelines.

6.2.1 Start procedure hydraulic system

- Verify that the mechanical and hydraulic installation is OK.
- Fill the hydraulic tank and system with recommended hydraulic oil until the check glass is full.
- Check the rotation direction of the electric motor (arrow on motor).
- Start the pumping station.
- The system is now ready for use.

6.3 Installation manual for hydraulic actuator

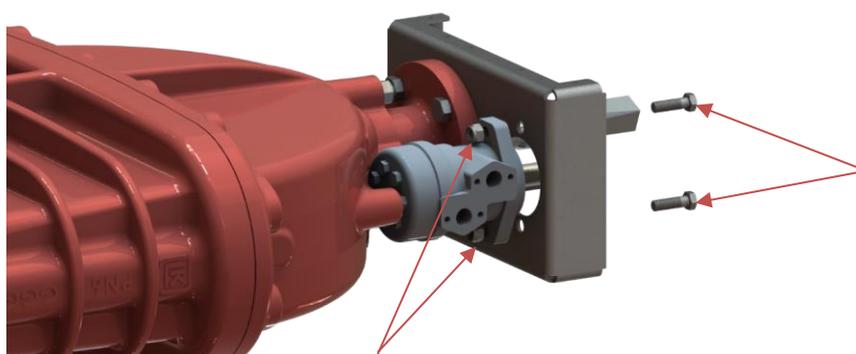
1. Remove the hand wheel and brackets from the valve. Make sure that the valve is fully opened before removing the hand wheel.



2. Fit the bottom plate of the actuator against the ISO-top on the valve using 4 pcs M16x45 screws and 4 pcs M16 nuts.



3. Attach the hydraulic motor to the bottom plate using 2 pcs M12x40 screws and 2 pcs M12 nuts. Do not tighten the screws, the motor should still be able to move slightly.



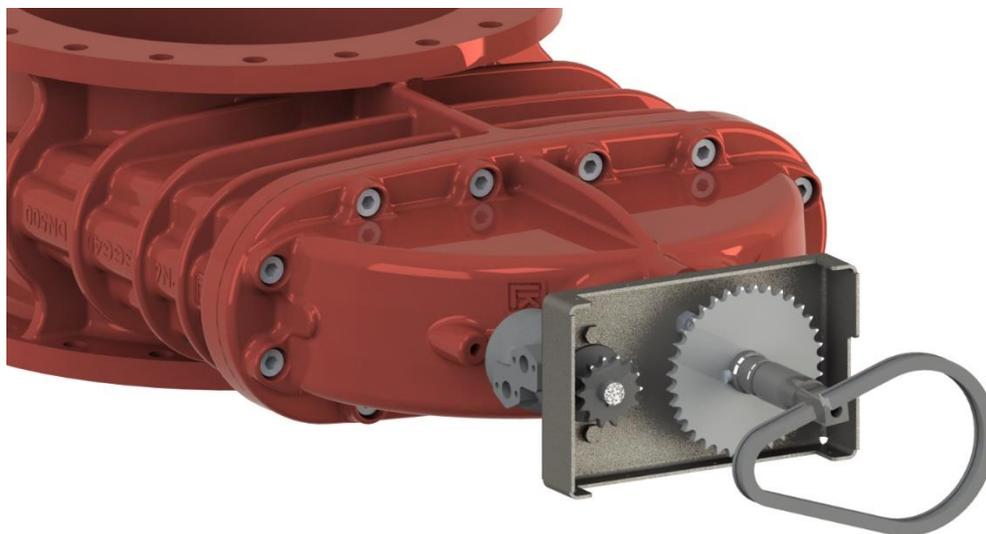
4. Fit the two keys to the keyways on the stem.



5. Fit the larger sprocket to the stem and the smaller one to the shaft of the motor, making sure they are in line. Use the set screws to fasten the sprockets in their right positions.



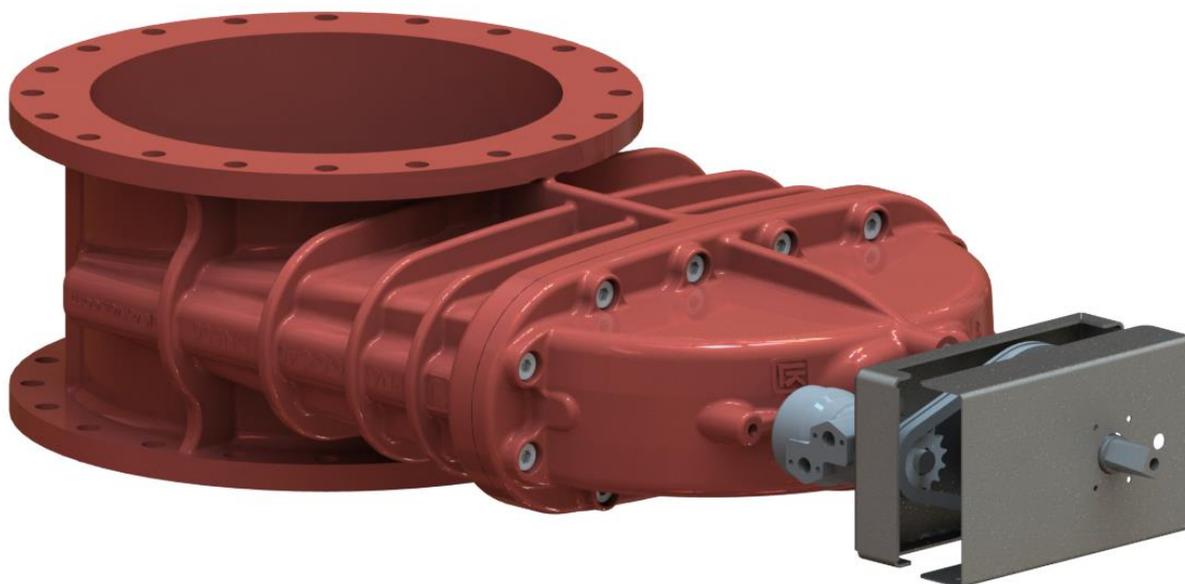
6. Mount the open chain around the sprockets and lock it in place.



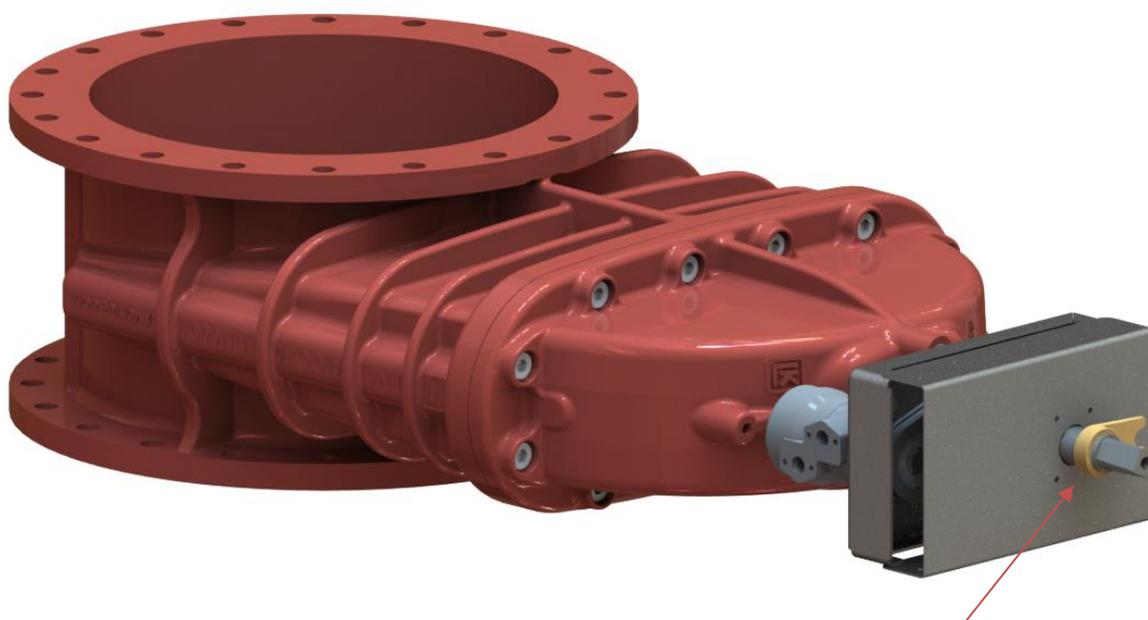
7. Tighten the screws connecting the hydraulic motor the bottom plate.



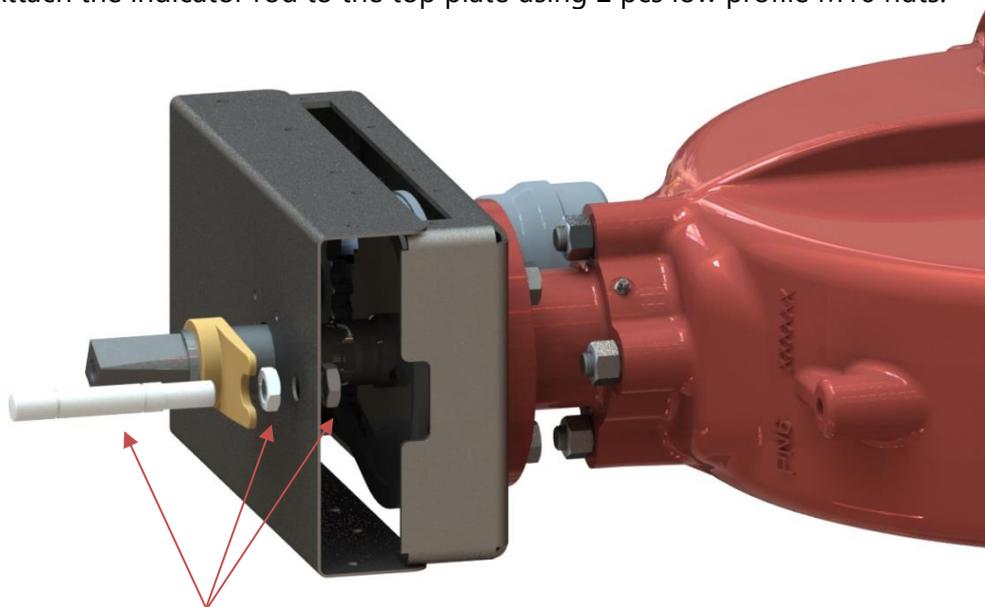
8. Mount the top plate of the actuator, without attaching any screws.



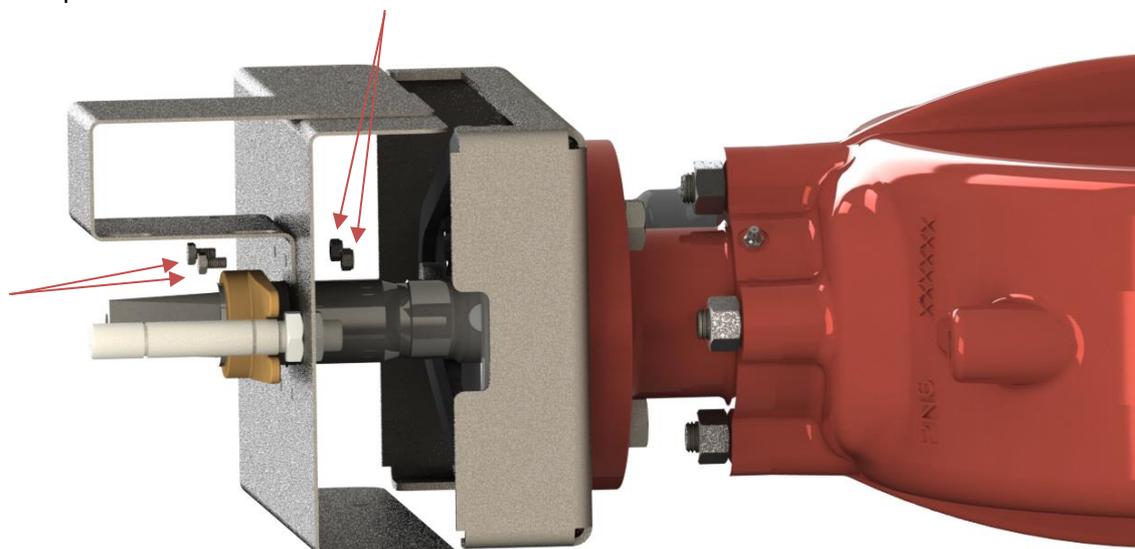
9. Screw the indicator nut on to the stem until a few threads are visible above it.



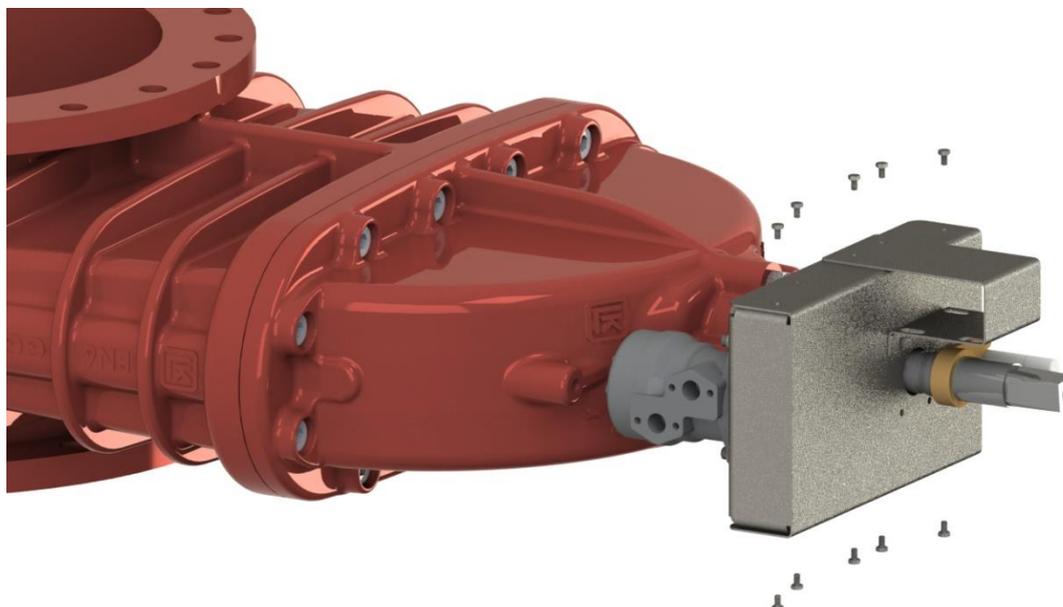
10. Attach the indicator rod to the top plate using 2 pcs low profile M16 nuts.



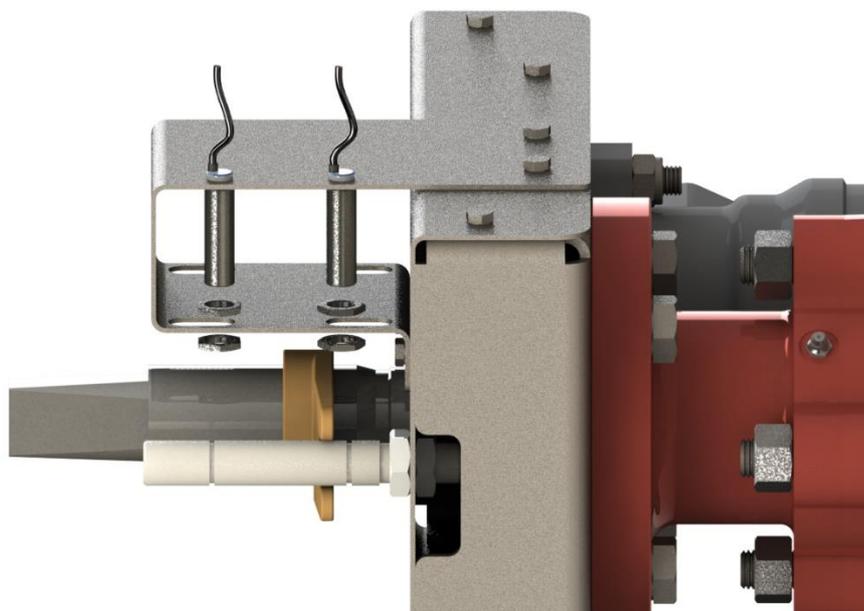
11. Use 2 pcs M6x10 screws and 2 pcs M6 locking nuts to connect the sensor bracket to the top plate.



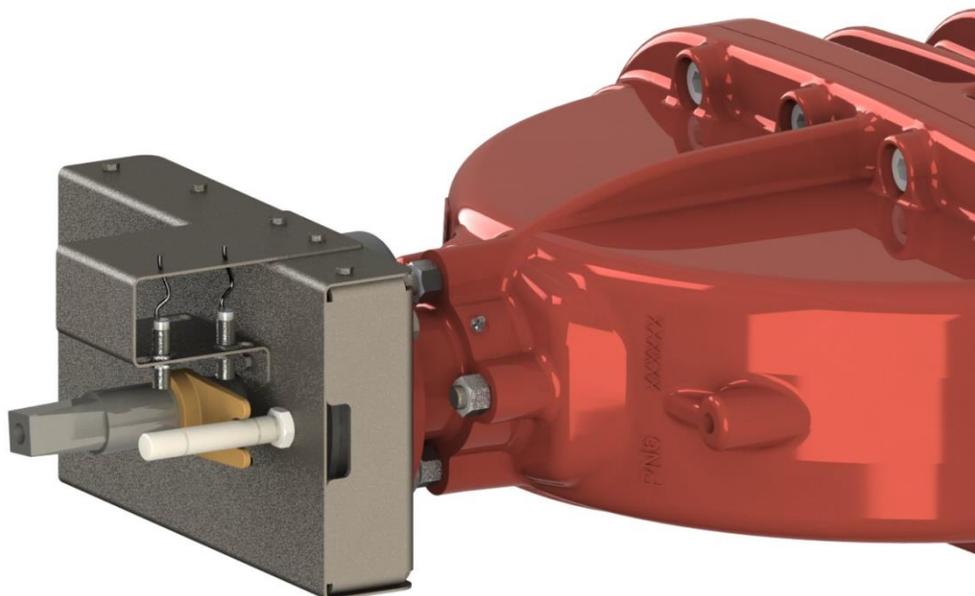
12. Fasten the top plate to the bottom plate using 10 pcs M6x10 screws.



13. Attach the two inductive sensors to the sensor bracket.



14. The actuator should now look like the picture below.



Adjustments

1. After the hydraulic system has been connected, use the hand pump on the power pack to close the valve slightly (three revolutions on the stem).
2. Adjust the indicator rod so that the upper slot is in line with the indicator nut. Adjust the upper sensor so that it is in line with the indicator nut and gives a signal that the valve is fully opened. The distance between the sensors and the indicator nut has to be less than 5,6mm. The recommended mounting distance is 2-3 mm from the sensor when pushing the indicator nut up towards the sensor.
3. Close the valve completely.
4. Open the valve slightly (three revolutions on the stem).
5. Adjust the lower sensor so that it gives a signal.
6. With everything connected, open the valve approximately halfway and then close it using the automatic control. If the valve does not fully close, verify settings in the control cabinet and/or adjust the position of the sensor. Repeat this cycle until a satisfactory result is achieved.
7. Repeat the procedure in point 6 for the open position.

7 Maintenance instructions

1. Check your system regularly to prevent any unforeseen breakdowns. Check for leakage or any unusual noises and check the operating temperature.
2. Change the hydraulic oil according to the instructions from your supplier. The oil should also be checked for remaining operating hours at least once a year.
3. It is recommended to operate the valve (open and close) at least once every two weeks.
4. Maintenance of stem support with grease through grease nipple at least three times per year.
5. Check the oil level in the power pack through the oil level glass on a regular basis.
6. For hydraulic actuators, recommended chain oil lubrication is 2 times/year (or every 200h)

7.1 Repair – dismantling the actuator



Attention!

The following points must be observed before dismantling the actuator:

- Pressureless pipe system.
- Medium and valve must cool.
- Clean the area around the actuator from dirt.
- Check the actuator and the valve for damages.

7.2 Putting the valve into operation after repair



Attention!

- Before the valve is put into operation check that it is the right valve for the application (material, pressure, temperature and direction of flow).
- Residues in piping and valve (dirt, weld beads etc.) inevitably leads to leakage.
- Regional safety instruction must be adhered to.
- Touching valve operating at high media temperatures $>50^{\circ}\text{C}$ can cause injury.
- Affix warning notice or protective insulation as appropriate.

Before putting a new valve into operation or restarting after repairs or modifications, always make sure that all work has been completed for the valve, the actuator and for other depending systems.

7.3 Space requirements for opening of valve

To be able to open the valve, e.g. for replacing the disc, the free space needed around the valve is described below.

After disconnecting the bonnet from the body and the stem from the disc, the bonnet can be pulled straight out in the direction of the stem. The necessary space for this operation is 1600 mm as illustrated in figure 12.

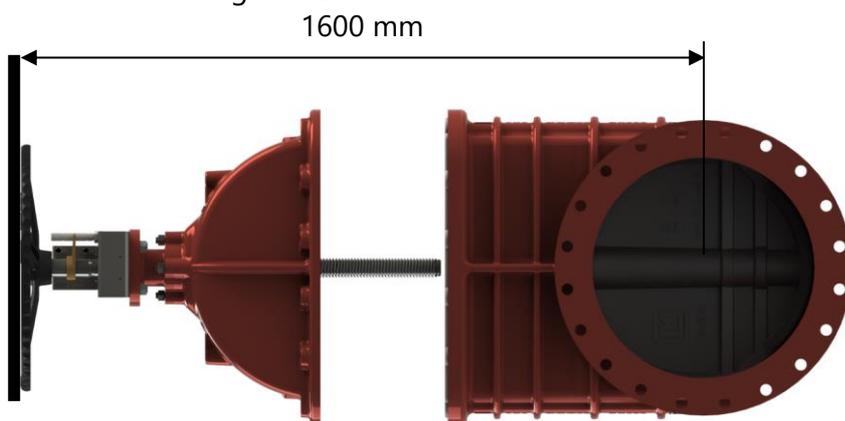


Figure 12. Dismantling the valve for service.

If the space in the direction of the stem is limited, the bonnet can be removed by rotating it as described in figure 13 to 15. This operation requires that the valve is fully closed. The necessary space in the direction of the stem is 1400 mm for this operation and in the direction perpendicular to the stem 1100 mm.

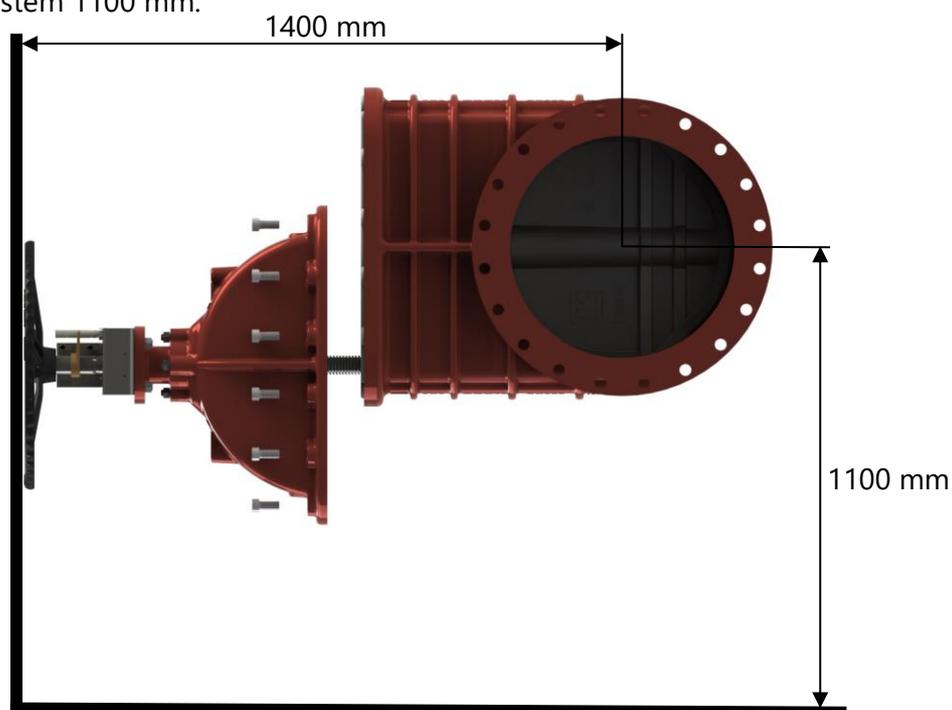


Figure 13. Dismantling the valve for service, step 1.

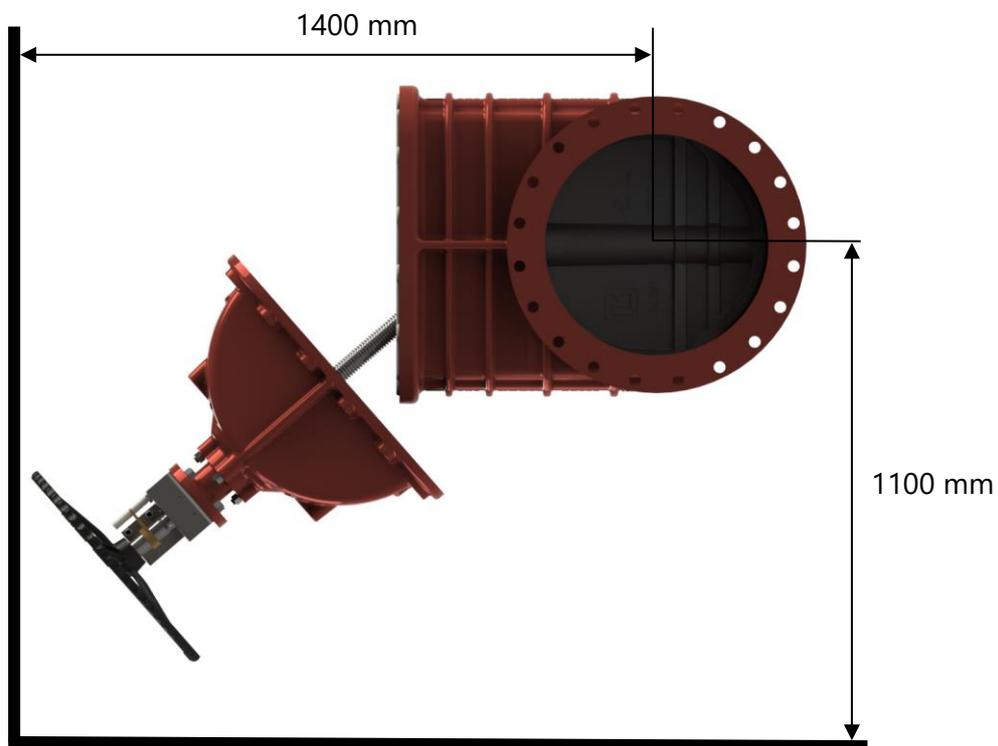


Figure 14. Dismantling the valve for service, step 2.

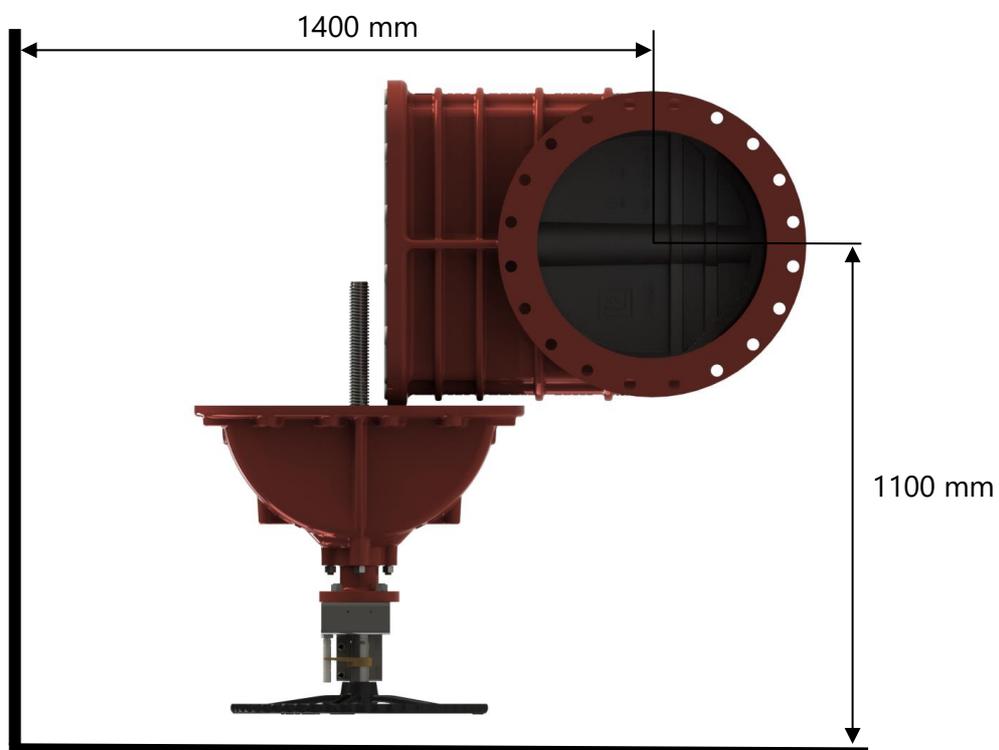


Figure 15. Dismantling the valve for service, step 3.

8 Spare parts

8.1 Spare parts for Gate Valve Soft Seal DN500

8.1.1 Sealing kit

Meson no: M96431

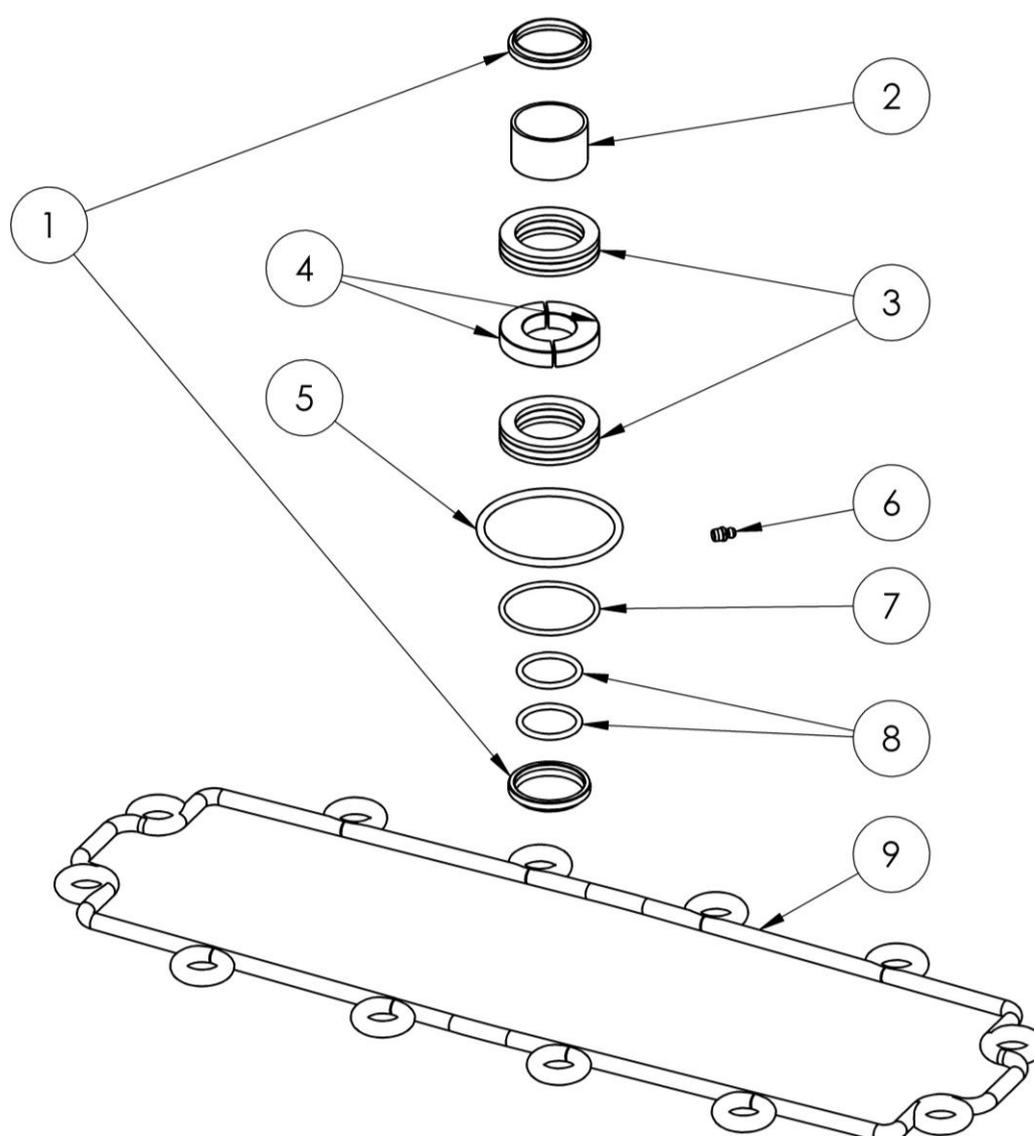


Figure 16. Sealing kit.

8.1.2 Disc replacement kit

Meson no: M96435

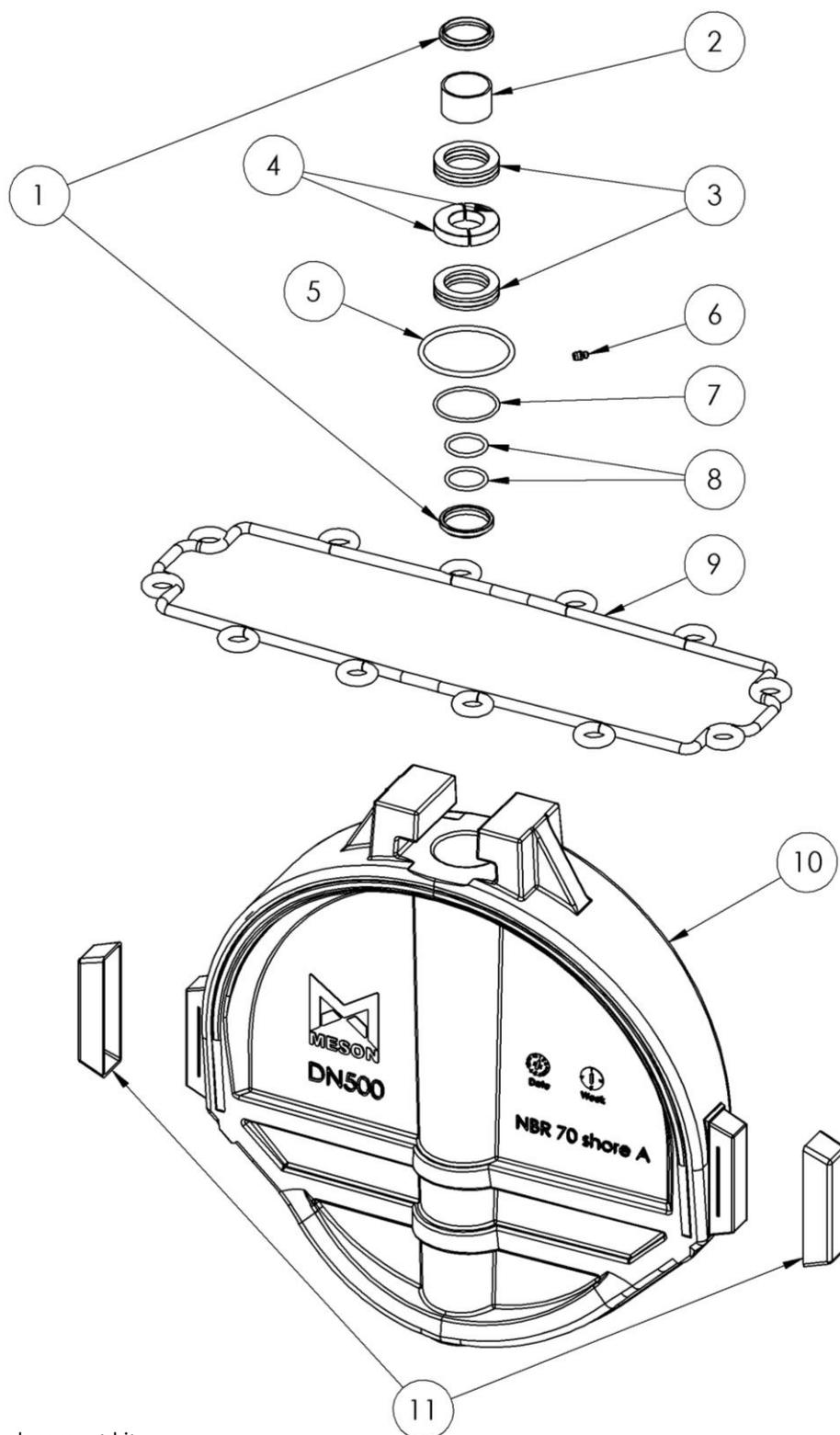


Figure 17. Disc replacement kit.

8.1.3 Gear replacement kit

Meson no: M96440

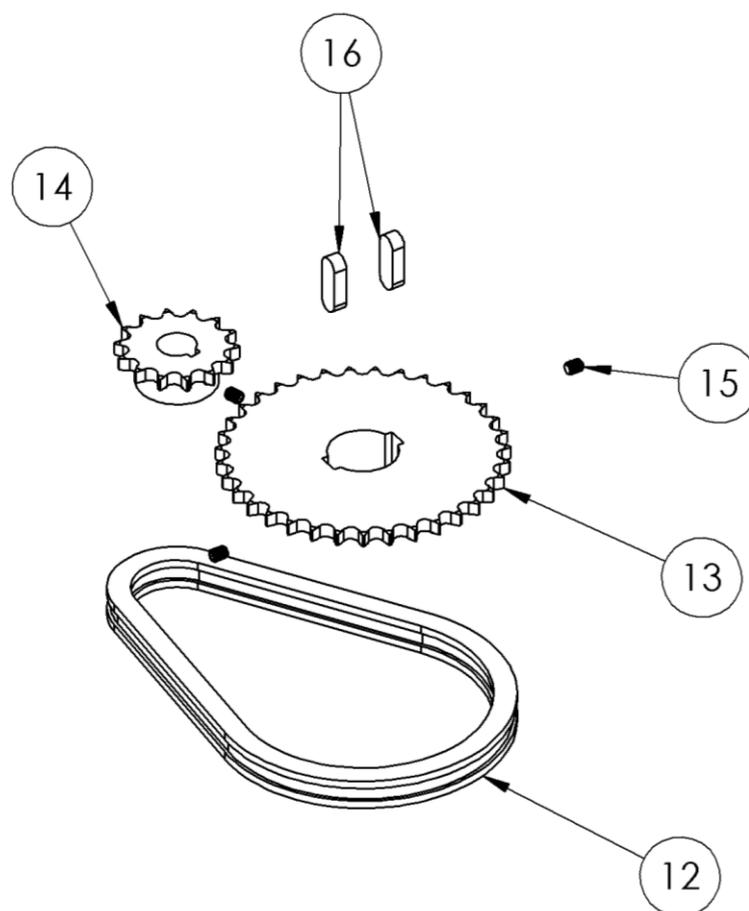


Figure 18. Gear replacement kit.

8.1.4 Service kit – hydraulic motor

Meson no: M96442



Figure 19. Service kit – hydraulic motor.

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8.1.5 BOM spare part kits

	Sealing kit	Disc replacement kit	Gear replacement kit	Service kit - hydraulic motor
Meson art.no. kit	M96431	M96435	M96440	M96442
No. Description				
1 Wiper seal	2	2		
2 Bushing	1	1		
3 Axial bearing	2	2		
4 Rotating key	2	2		
5 O-ring	1	1		
6 Grease fitting	1	1		
7 O-ring	1	1		
8 O-ring	2	2		
9 Bonnet gasket	1	1		
10 Wedge		1		
11 Wedge shoe		2		
12 Chain			1	
13 Spocket 35t			1	
14 Spocket 14t			1	
15 Set screw M8			3	
16 Slot key 14x9x40			2	
17 MR80 service kit				1

Table 9. BOM spare part kits, part 1.

8.2 Spare parts for power pack

Electric motor



	<u>3x400VAC</u>	<u>3x690VAC</u>	<u>3x230VAC</u>
Meson art.no:	M96466	M96479	M96467

Spare part kit for electric motor (fan blade and protection cap)



Meson art.no: M96490

Directional solenoid valve



Meson art.no: M95197

Emergency hand lever



Meson art.no: M94717

Tank level gauge



Meson art.no: M96463

Knob for manual operation selector (5 pcs)



Meson art.no: M96491

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