

## Installation and operating manual

Hydraulic system for operating DN350/DN500/DN700 gate valve  
Pressure Class PN6/PN4, Flange drilling PN10



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## 1 General information

This manual gives instructions on installation of the hydraulic system for activation of DN350/500/700 gate valve together with maintenance recommendations and shall be read carefully before installation is started.

It is in the responsibility of the installer to ensure that the work is carried out in a satisfactorily manner, approved materials are used and that the installation meets applicable rules and regulations. Regional safety requirements must be applied and observed both at installation and maintenance as well as in repair work.

It is the installer/owner's responsibility to define responsibility and competence of personnel for the installation and maintenance of the valves. In case of problems which cannot be solved from information in this manual the supplier of the valves shall be contacted. The notes and warnings defined in 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

### 2.1 Significance of symbols



**Attention!**

Warning of general danger.

### 2.2 Explanatory notes on safety information

In these Operating and Installation Instructions dangers, risks and items of safety information is highlighted to attract special attention.

Information marked with the above symbol and "*ATTENTION!*" describes practices, a failure to comply with which can result in serious injury or danger of death for users or 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.

### 3 Technical Data

#### 3.1 Gate valve DN350/500/700 Manual version

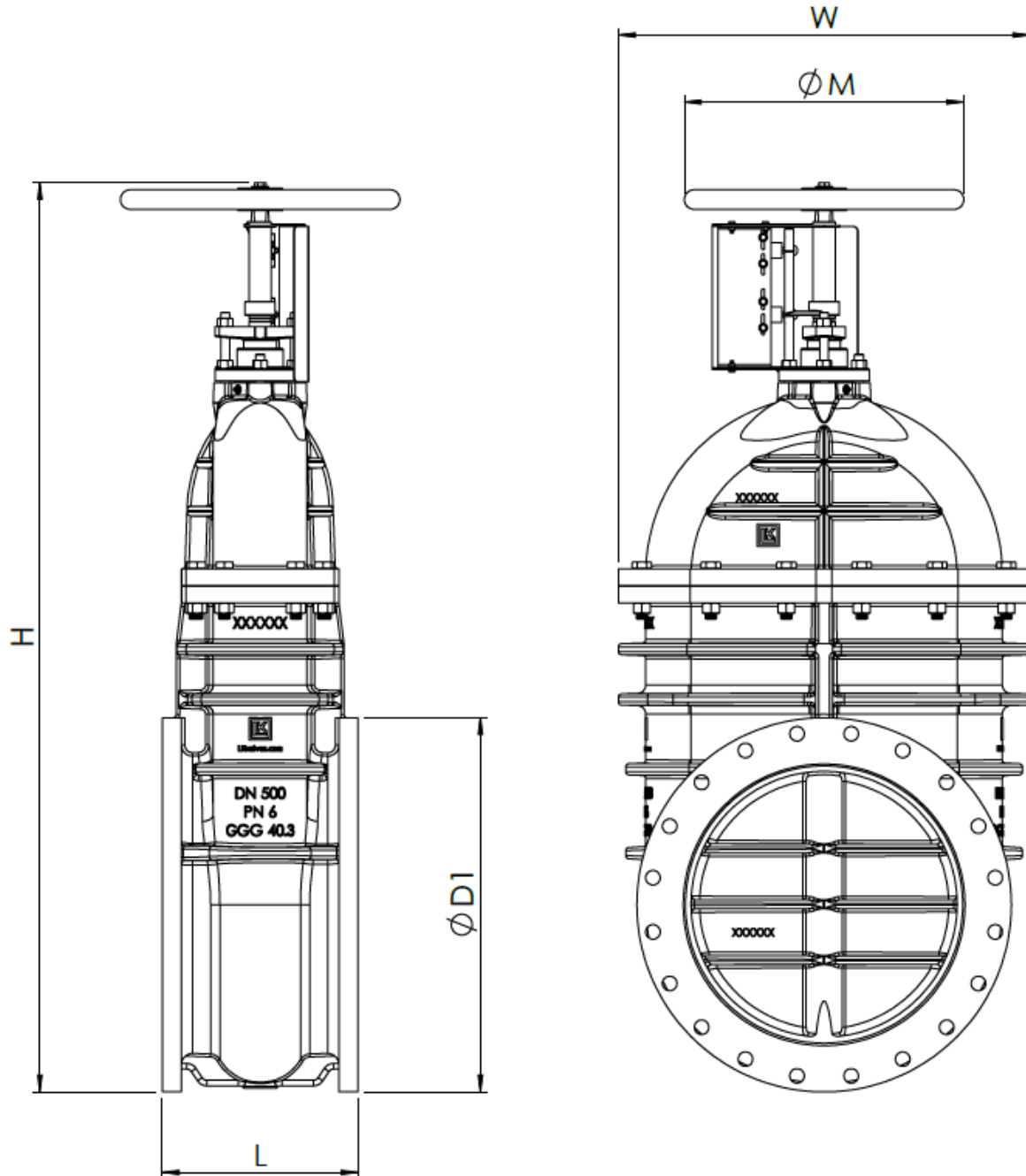


Figure 1 Outline dimensions for Gate Valve, manual version.

DN	$\varnothing D1$	H	W	L	$\varnothing M$	Weight (kg)
350	505	1170	540	290	400	225
500	670	1625	736	350	500	480
700	895	2170	985	430	630	780

Table 1 Dimensions for Gate Valve, manual version (figure 1).

### 3.2 Gate valve DN(350)/500 Hydraulic

#### 3.2.1 Dimensions [mm]

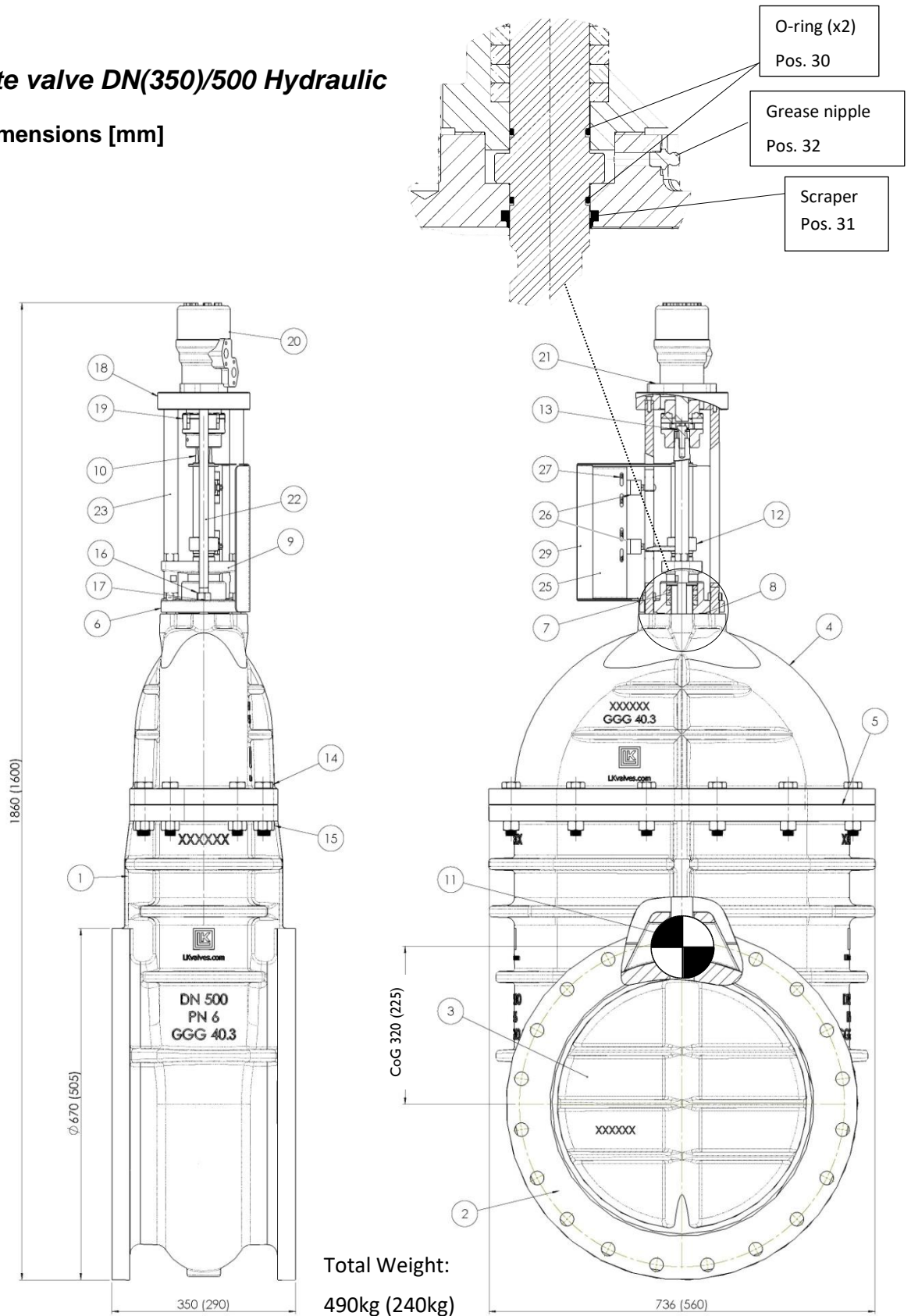


Figure 2 Gate Valve outline dimensions

1	Body Nodular Cast Iron EN-JS1025 (GGG40.3)
2	Seat ring EN GJS400-15
3	Wedge Nodular Cast Iron EN-JS1025 (GGG40.3)
4	Bonnet Nodular Cast Iron EN-JS1025 (GGG40.3)
5	Gasket Bonnet Specma DIXO 4000 128
6	Stuffing Box Nodular Cast Iron EN-JS1025 (GGG40.3)
7	Stuffing Packing Merkel Universal 6323 L~200mm 25
8	Gasket Stuffing Box Specma DIXO 4000 10
9	Gland Nodular Cast Iron EN-JS1025 (GGG40.3)
10	Stem M40x1.5 L=979mm
11	Wedge Nut Bronze CC491K (Rg5)
12	Indicator Bronze CC491K (Rg5)
13	Washer 13,5x44x4 A4
14	Screw M6S 20x90 8.8 Galv. - 298
15	Nut M6M M20 Galv. 8.8 Galv. 65
16	Nut M6M M16 A4
17	BRB 17x30x3 A4
18	Flange
19	Coupling ROTEX-3
20	Hydraulic Motor MR 250
21	Screw M6S 12x40 A4
22	Gland rod
23	Distance rod
24	Screw MC6S 8x20 A4 (Not shown)
25	Bracket - Indicator kit
26	Limit Switch Telemecanique XCKM115 319 (x2)
27	Screw M6S 5x16 A4
28	M5 NYLOC A4 (Not shown)
29	Cover -Indicator kit
30	O-ring
31	Scraper
32	Grease nipple

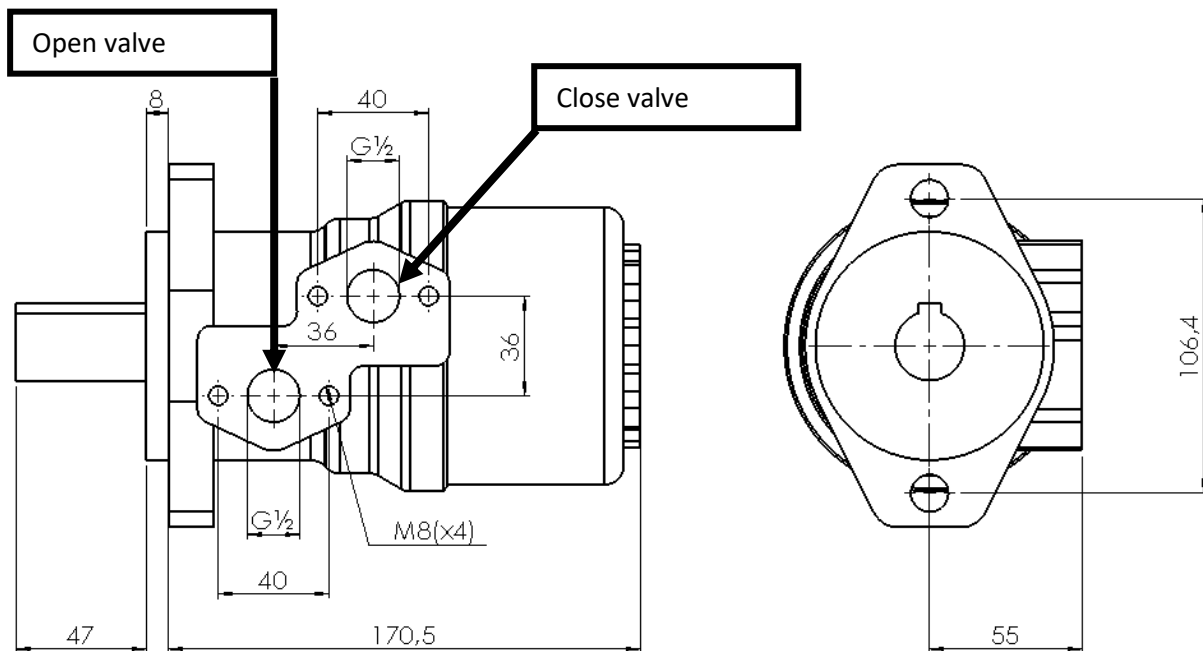
**Table 2 BOM hydraulic Gate valve DN500**

### 3.2.2 Painting

Painting specification	ISO 12944 C3
Painting - primer	Hempel 45141 Grey
Painting - top coating	Hempel 55210 Red RAL3011

**Table 3** Painting specification

### 3.2.3 MR 250 Hydraulic motor



Hydraulic Motor – Meson Art.no. 90744      Union BSP Fitting, GE 15L R1/2 – Meson Art.no. 95272

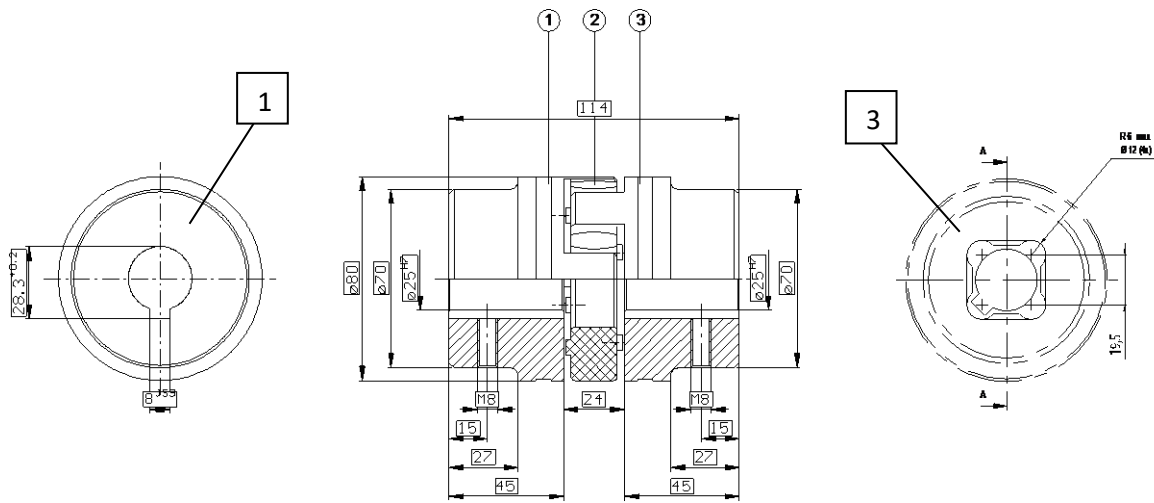


**Figure 3** Hydraulic motor and Union Fitting

**Observe:**

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

**3.2.4 Rotex 38**



**Figure 4 Dimensions for Rotex Flexible Coupling**

Pos	Description
1,2,3	Coupling Rotex Complete
Single Components	
Pos	Description
1	Ø25H7 keyway to DIN
2	Spider 92 Shore A YELLOW
2*	Single Spider
3	Hub conical square Hub

**Table 4 Parts for Rotex Flexible Coupling**

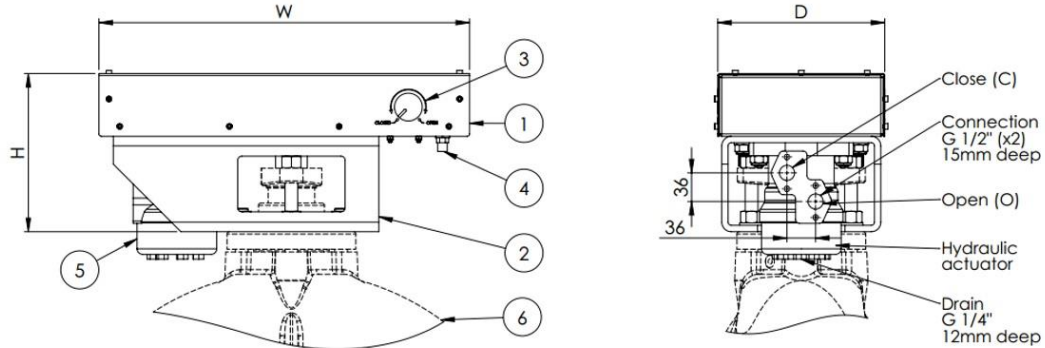


**Figure 5 Rotex Flexible Coupling**



### 3.3 Gate valve DN350/500/700 Compact Hydraulic actuator

#### 3.3.1 Dimensions [mm]



CompAct	350	500	700
H	199	199	229
W	466	466	522
D	210	210	254
OxN	14,5 x 4	18 x 4	18 x 4
1	Gearbox, Stainless steel (1.4301) (AISI 304)		
2	Valve Adaptor, EN 10 025-S235 JRG2, Painted black		
3	Position Indicator, Aluminium Anodized		
4	Chassis connector M12, Nickel plated Steel		
5	Hydraulic actuator		
6	Gate Valve		

Figure 6 Dimensions Compact hydraulic actuator for DN350/500/700 Gate valve

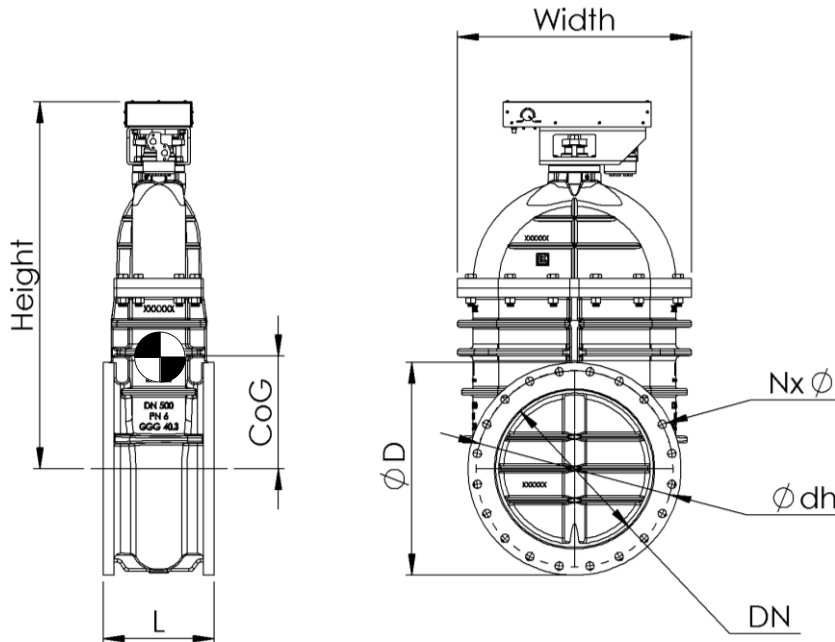


Figure 7 Dimensions Gate valve DN350/500/700 with Compact hydraulic actuator

DN	L	Height	Width	ØD	ØDh	NxØ	CoG	Weight (kg)
350	290	890	540	505	460	16x22	240	250
500	350	1160	736	670	620	20x26	320	500
700	430	1560	985	895	840	24x30	470	850

### 3.3.2 Technical data

#### CompAct 350

Hydraulic Motor MR 80	Output torque ~280Nm @ 100bar	Required torque (260Nm)	Recom. hydraulic oil ISO VG 32
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#### CompAct 500

Hydraulic Motor MR 125	Output torque ~460Nm @ 110bar	Required torque (440Nm)	Recom. hydraulic oil ISO VG 32
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#### CompAct 700

Hydraulic Motor MR 200	Output torque ~650Nm @ 90bar	Required torque (620Nm)	Recom. hydraulic oil ISO VG 32
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#### General:

Pre-adjusted Open/Closed position	Yes
Recommended motor shut off time (Close)	+ 2-3 s
Recommended chain oil lubrication	2 times/year (or every 200h)
Recommended chain oil	ISO VG 46-460
Electrical connection	Binder M12, 4-poles
Electrical recommended Max rating:	
Resistive load	30VDC 5A, 50VDC 1A
Inductive load	30VDC 3A, 50VDC 1A

#### Open & Closed indication

If necessary, it's possible to adjust the indication for open/closed signal. Remove the top cover and localize the desired indicator arm.

Indicator for CLOSED signal is situated on the left side when facing the actuator with the motor on the far side.

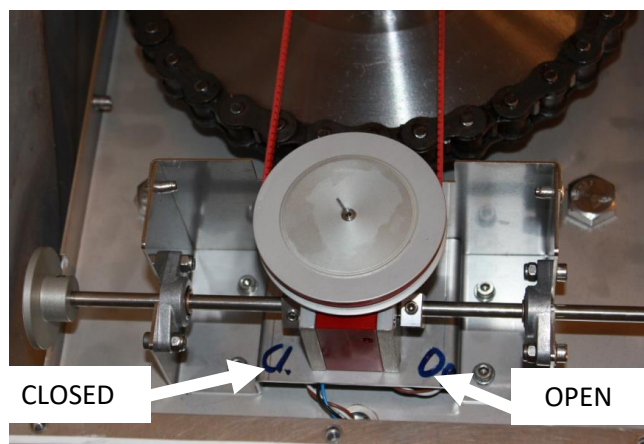
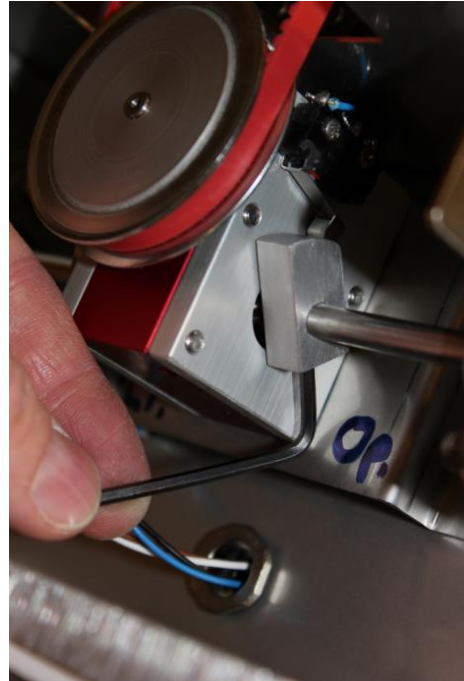


Figure 8 Open closed indication in compact actuator

### Indication adjustment

Use a 2.5 mm Allen key and adjust the indicator arm as seen on the picture. Use a multimeter. Adjust the arm and secure the screw again.



**Figure 9 Compact actuator indication adjustment**

**Electrical connection**

Please use the supplied 4-pole M12 connector for safe and reliable connection.

The connector accepts cable  $\varnothing$  of 6-8mm.

The screw connection accepts up to 4x0,75mm<sup>2</sup> cable area.

Pole 1+2 = **closed position**

Pole 3+4 = **open position**

Limit switches are connected normally open (NO)



Figure 10 M12 4-pole connector

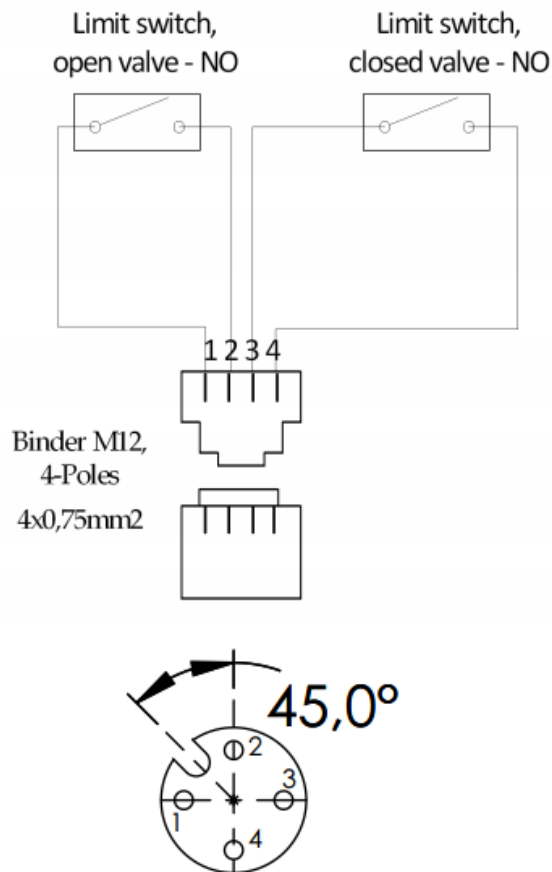


Figure 11 Wiring M12 4-pole connector



Figure 12 M12 4-pole connector disassembled

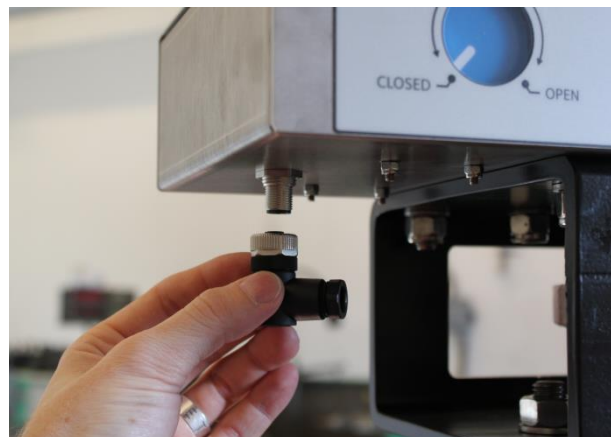


Figure 13 Connector placement on actuator

### Hydraulic connections

Connection thread G1/2"

Follow the illustration to connect open and close flow the right way.

#### Note:

Follow the recommended working pressure as stated in technical data.

Uncontrolled output torque may result in damage to valve stem.

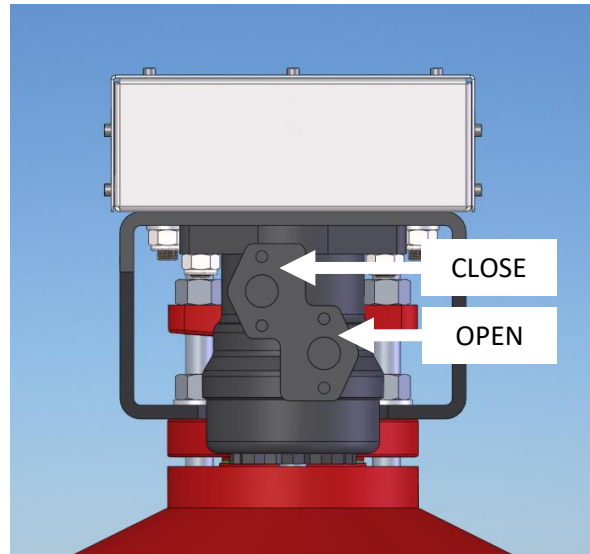


Figure 14 Compact hydraulic connections

### 3.3.3 Repair – Dismantling Compact actuator



## Attention!

The following points must be observed before dismantling the CompAct:

Pressure less pipe system.

Medium and valve must cool.

Clean the area around the CompAct from dirt and check for leakage between CompAct and valve or damages

### 3.3.4 Putting valve into operation after repair, Compact actuator



## Attention!

Before the valve is put into operation check that it is the right valve for the CompAct in its right position (material, pressure, temperature and direction of flow).

Residues in piping and valves (dirt, weld beads, etc.) inevitable lead to leakage.

Check remote control system function and operation directly on valve.

Regional safety instruction must be adhered to.

Touching valves operating at high media temperatures  $>50^{\circ}\text{C}$  can cause injury.

Affix warning notice or protective insulation as appropriate.

Before putting a new plant into operation or restarting after repairs or modifications, always make sure that:

All works has been completed for the valves and CompAct and for other depending systems.

### 3.4 Hydraulic system (Power pack)

#### 3.4.1 System drawing

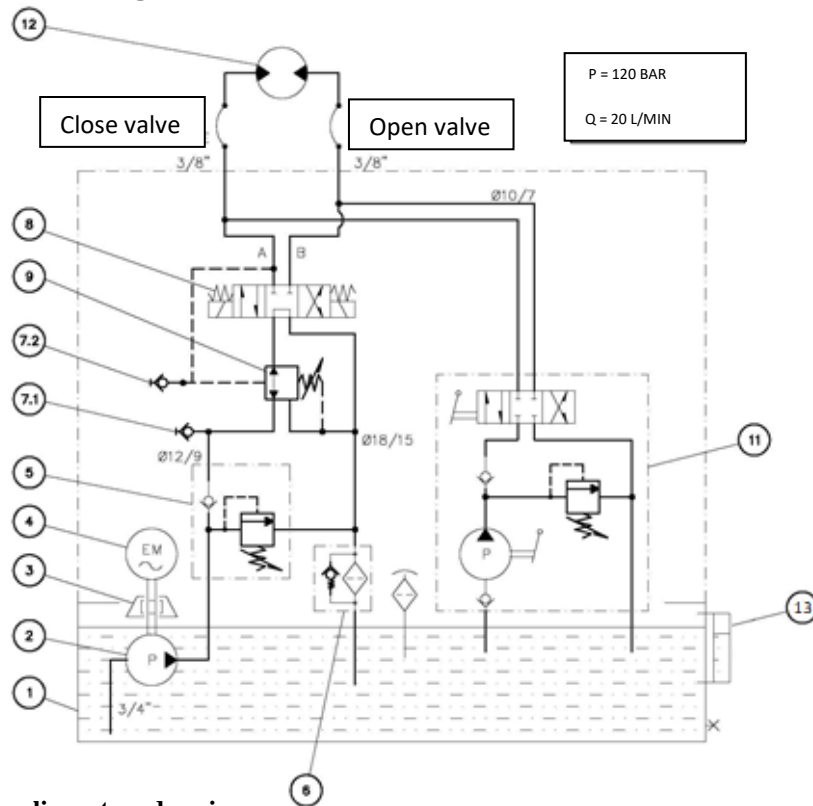


Figure 15 Hydraulic system drawing

1	Steel tank 45 liter
2	Pump 20 l/min
3	Junction element
4	Electric motor
5	Central manifold 50-220 Bar
6	Return filter
7	1/4" Test connector
8	Directional solenoid valve – 24VDC, 31W
9	Pressure reducing valve
11	Hand pump 45 cm <sup>3</sup>
12	Hydraulic Motor
13	Tank level gauge

Table 5 BOM Power pack (Hydraulic motor not included in Power Pack)

3.4.2 Arrangement drawing

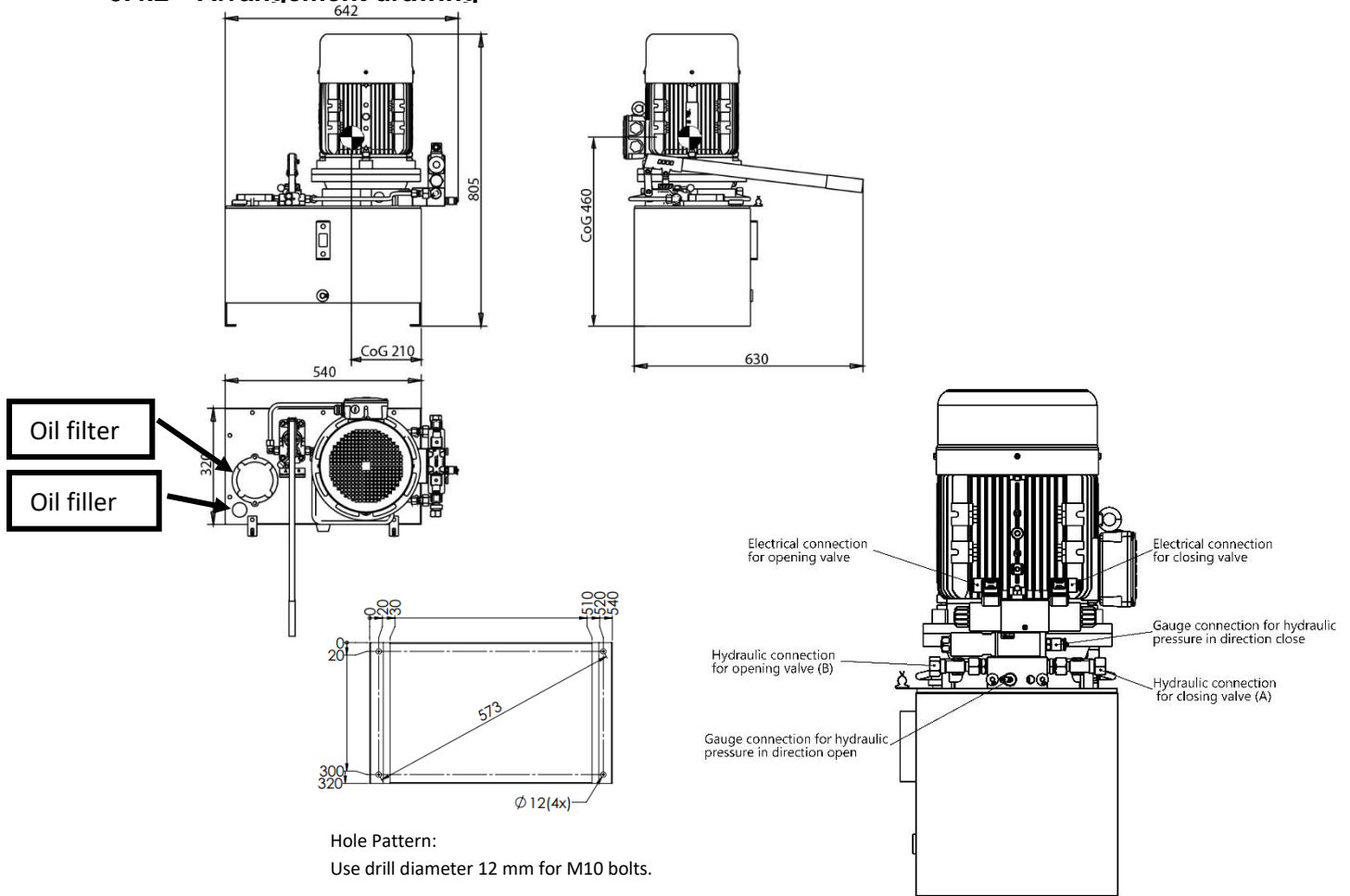


Figure 16 Power Pack Layout and dimensions

	D-connection	Y-connection	Relief valve setpoint: 120 Bar Cleanliness requirement for system piping: NAS 10-12 Regulated pressure settings: Open Valve - 120 Bar Close Valve - 110 Bar
Power supply, option 1	3x400VAC 50Hz	3x690VAC 50Hz	
	3x440VAC 60Hz		
Power supply, option 2	3x230VAC 50Hz	3x400VAC 50Hz	
	3x280VAC 60Hz	3x440VAC 60Hz	
Tank capacity (usable capacity)	45 liter (30 liter)		
Weight (empty)	92 kg		
Fittings	Pipe 15mm		
Recommended hoses	½" (13mm) for 30.0 MPa		
Recommended hydraulic oil	ISO VG 16-46		
Operating temperature, 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 6 Power Pack Technical data

**Observe:** No hoses or fittings between valve actuator motor and Power pack are included.

IE3		<b>HOYER</b>				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 17. Rating plate for power pack motor.**

Figure 17 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 <sub>N</sub>	1,05	1,02	1,00	0,97	0,93	0,87

**Table 7 Power Pack Technical data**

Connection diagram for main supply is located on the inside of the terminal box lid. No connections need to be made to the terminals marked "PTC", see figure 18.






**Figure 18. Rating plate for power pack motor.**



### 3.4.3 Hand pump for emergency opening of gate valve

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

- B - Open valve manually 
- Normal operation 
- A - Close valve manually 



**Figure 19** Selector for manual pumping

### 3.4.4 Oil quality

Recommended oil quality: According to ISO VG 32 specifications.

### 3.4.5 Heat dissipation

The maximum heat dissipation for the power pack is approximately 730 W. 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.

## 4 Installation

### 4.1 Physical Installation

Power Pack should be outside of watertight trunk to facilitate closing of Gate Valve in case of flooding of trunk.

Make sure the Power Pack is located in such a way that the handle for manual pumping is unobstructed and the check glass and pressure adjustment are accessible.

Flexible tubes must be installed between Hydraulic motor/Power Pack and the hydraulic pipelines.



Figure 20 Example of a typical installation of Hydraulic motor

### 4.2 Hydraulic system start procedure

1. Verify that the mechanical and hydraulic installation is OK.
2. Check that the limit switch cables are connected to the electrical system. Fill the hydraulic tank and system with recommended hydraulic oil until the check glass is full.
3. Screw the adjustment screw (Figure ) on the relief valve counter clockwise until there is no resistance felt.
4. Electric motor. Check rotation direction. (Arrow on motor).
5. Start the pumping station and create a back pressure in the system.
6. Slowly turn the adjustment screw (Figure ) on the relief valve clockwise, the pressure will now increase in the system.
7. Adjust pressure to approx. 100bar through the adjustment screw (Figure ).
8. If there are any other relief valves in the system, they should not be adjusted until the main relief valve has been adjusted.
9. The pumping station is now ready for use.

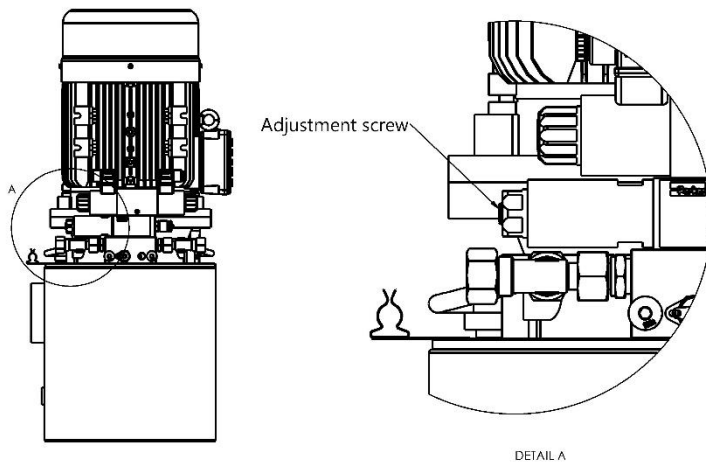


Figure 21 Adjustment screw

### 4.3 Installation notes for Compact actuator (DN350/500/700)



#### Attention!

- Protect valve and CompAct from dirt during the whole installation procedure.
- Check for dirt and foreign particles in the valve.
- Use only counter flanges and screws with correct dimensions.
- Avoid damaging forces on CompAct when installed.
- Lifting to be carried out by using suitable handling equipment.
- Weights of equipment to be taken from data sheet.
- Installation of the valve with stem vertical is preferred, but all positions indicated below can be used.
- Keep stem threads and shaft free from paint

## 5 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 filter cartridge regularly. The first time after 40-50 operating hours and then after every 500 operating hours.
3. 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.
4. It is recommended to operate the valve (open and close) at least once every two weeks.
5. Maintenance of stem support with grease through grease nipple. At least 3 times per year.
6. Check on regular basis oil level of power pack oil tank through oil level glass.
7. Check oil filter in power pack tank on regular basis depending on operational situation. Change oil filter if needed. For Oil filter spare part no., see table 2, pos. 6.
8. Only for compact actuators, recommended chain oil lubrication is 2 times/year (or every 200h)
9. Only for compact actuators, clean the area around the CompAct from dirt and check for leakage between CompAct and valve or damages.

### Test certificate

Items to be checked	Checked (sign)
Mechanical and hydraulic installation	
Adjusted open and close limit switch	
Run open/close, limit sw. setting ok	

## 6 Marking Certification Gate Valve

Marking of Certification by Meson is placed as picture below, outpointed with arrows. Paint is grinded for a clean service for marking.

When tested and certified by Bureau Veritas, Gate Valve is marked on the flange edges. See location outpointed with arrows in figure 26.

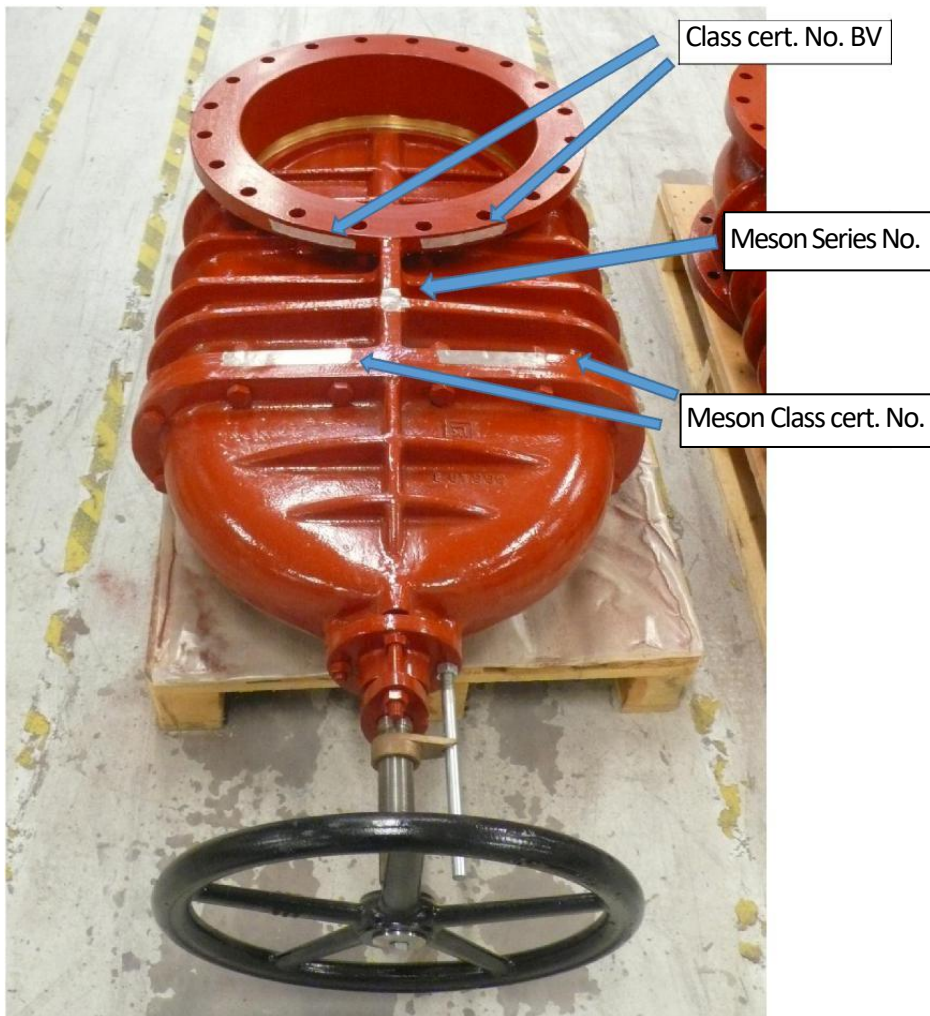


Figure 22 Certification markings on valve

## 7 Spare parts

### 7.1 Spare parts for Gate Valve DN500

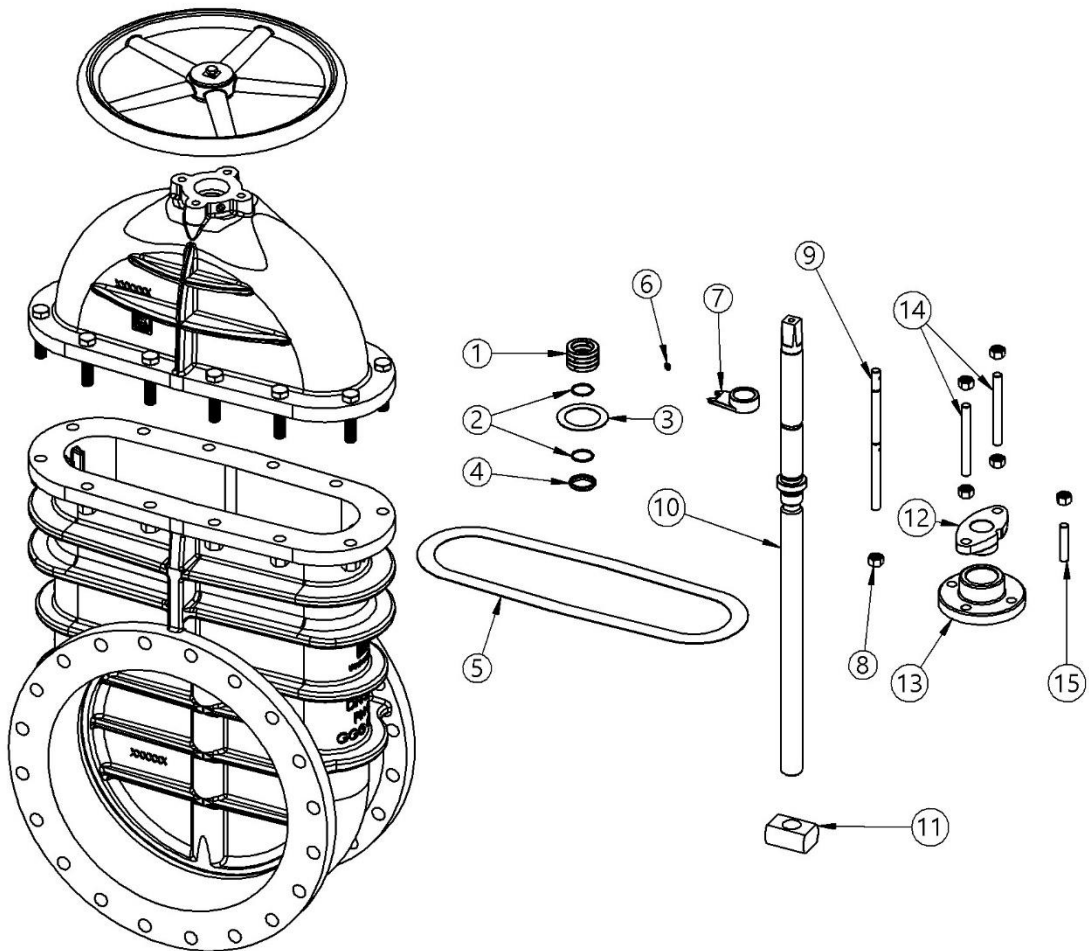


Figure 23 Components in spare part kits for Gate Valve DN500

### 7.1.1 Sealing kit

Meson no: M96497

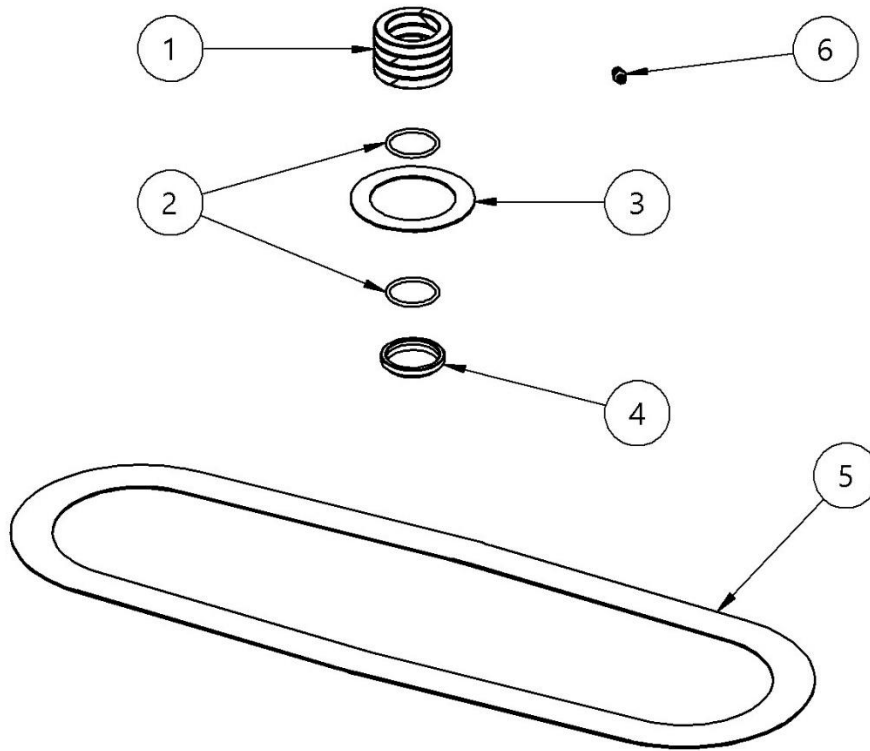
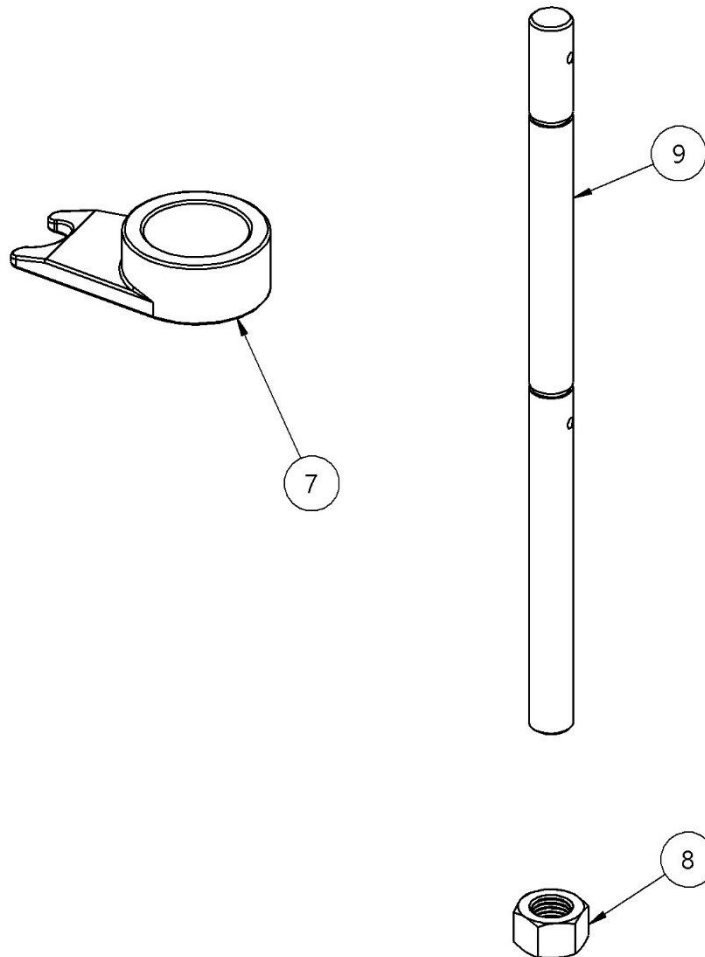


Figure 24 Sealing kit

**7.1.2 Indicator replacement kit**

Meson no: M96498



**Figure 205 Indicator replacement kit**



### 7.1.3 Stem replacement kit

Meson no: M96499

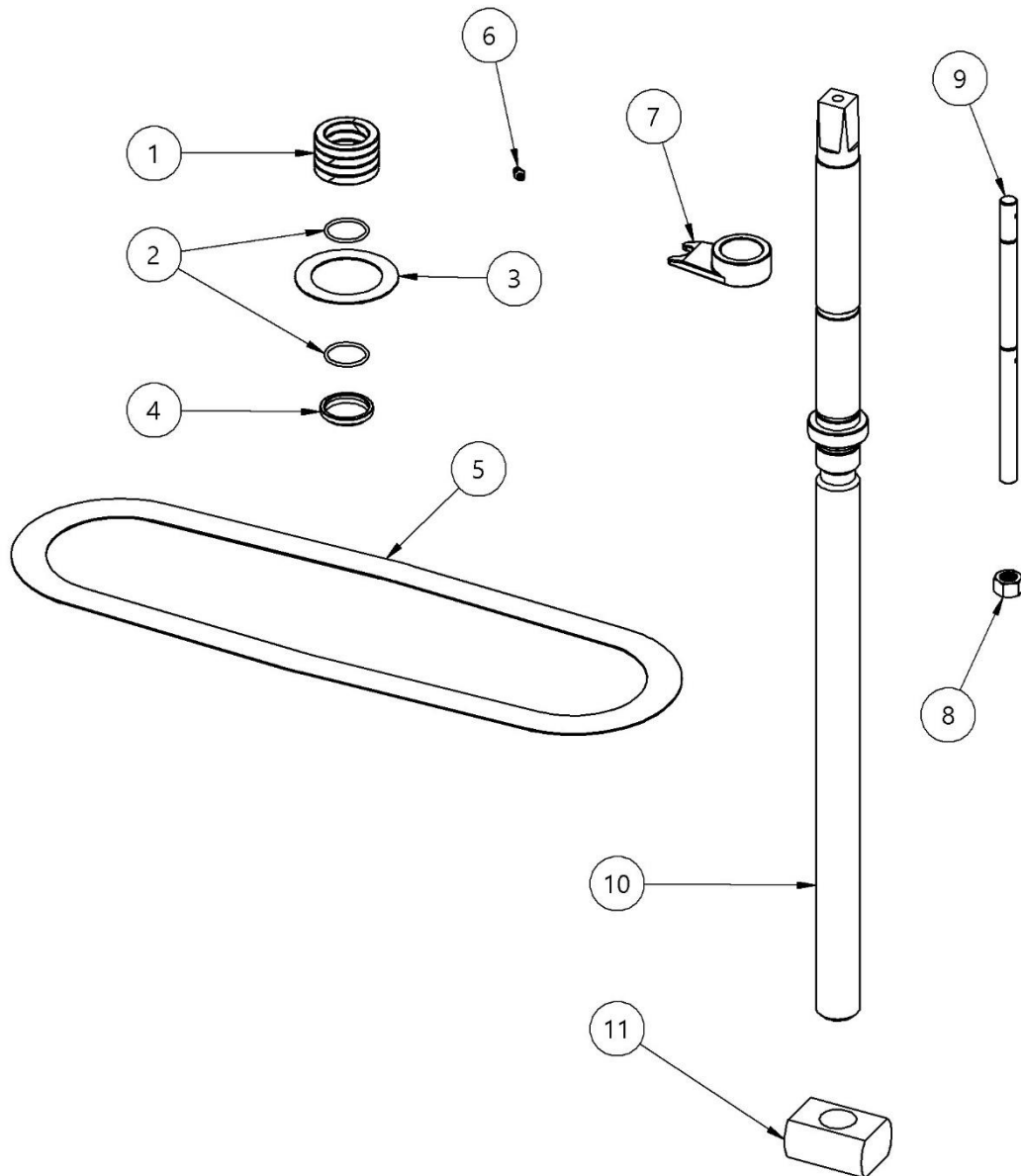


Figure 26 Stem replacement kit

### 7.1.4 Gland kit

Meson no: M96500

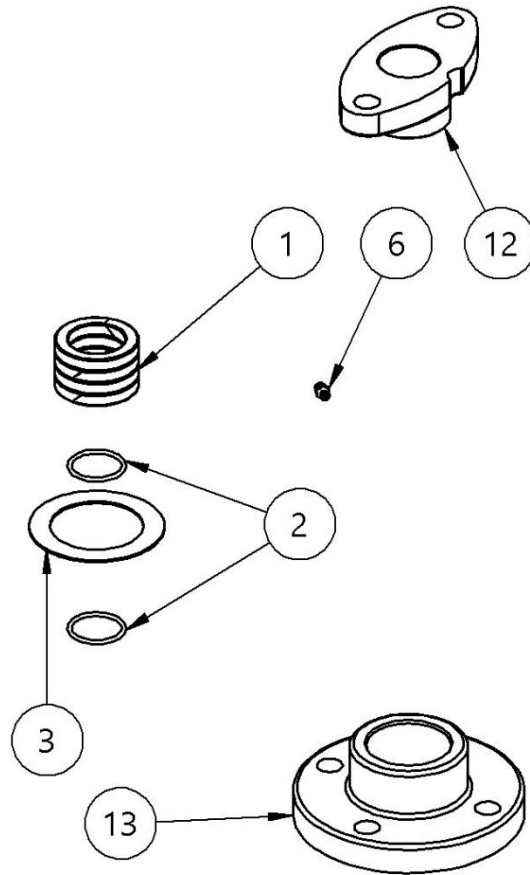
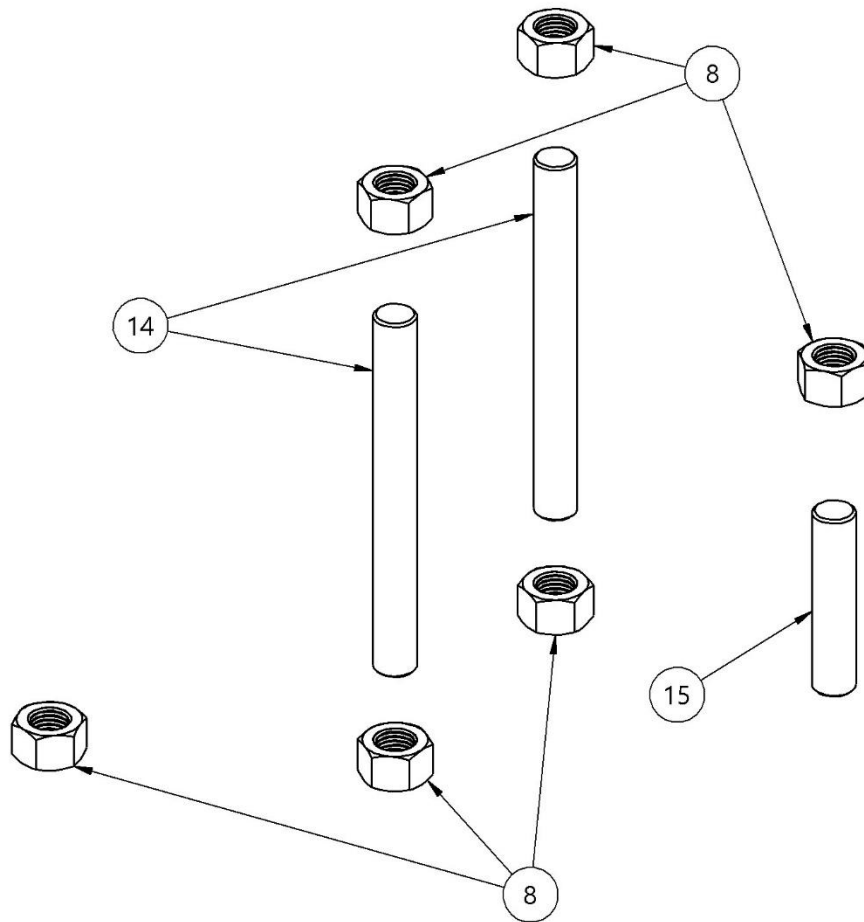


Figure 27 Gland kit

**7.1.5 Fastening kit**

Meson no: M96501



**Figure 28 Fastening kit**

### 7.1.6 ROTEX coupling

Meson no: M62519

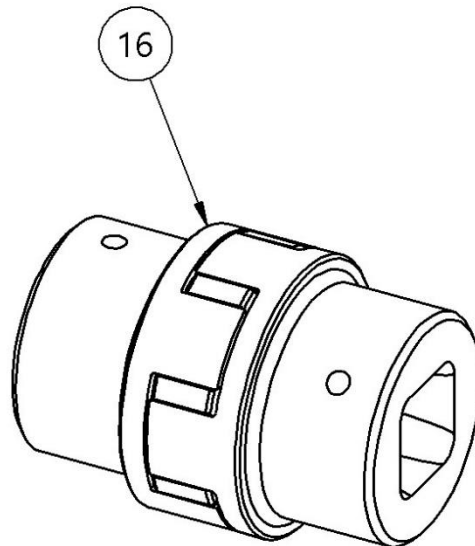


Figure 29 ROTEX coupling

### 7.1.7 ROTEX spider

Meson no: M92364

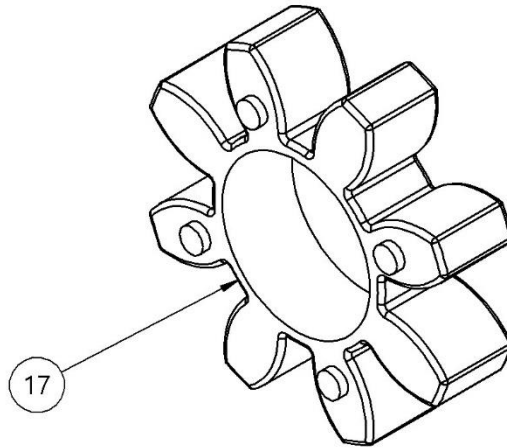


Figure 210 ROTEX spider

### 7.1.8 Limit switch kit

Meson no: M96502

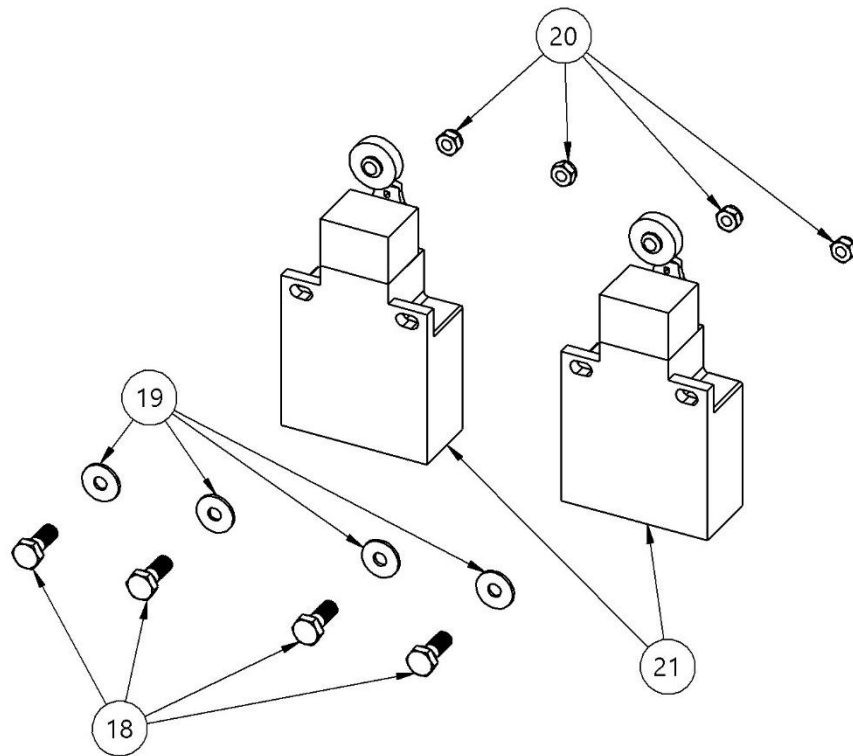


Figure 221 Limit switch kit

### 7.1.9 Limit switch and bracket kit

Meson no: M80475

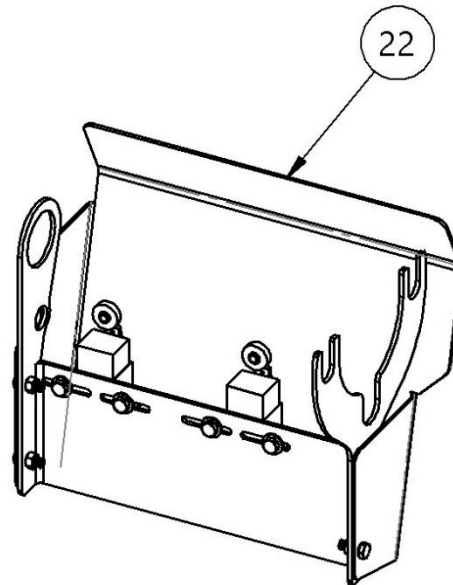
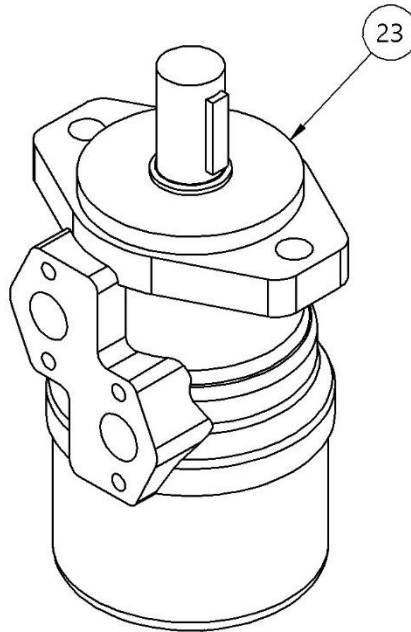


Figure 32 Limit switch and bracket kit

**7.1.10 Hydraulic motor**

Meson no: M90744

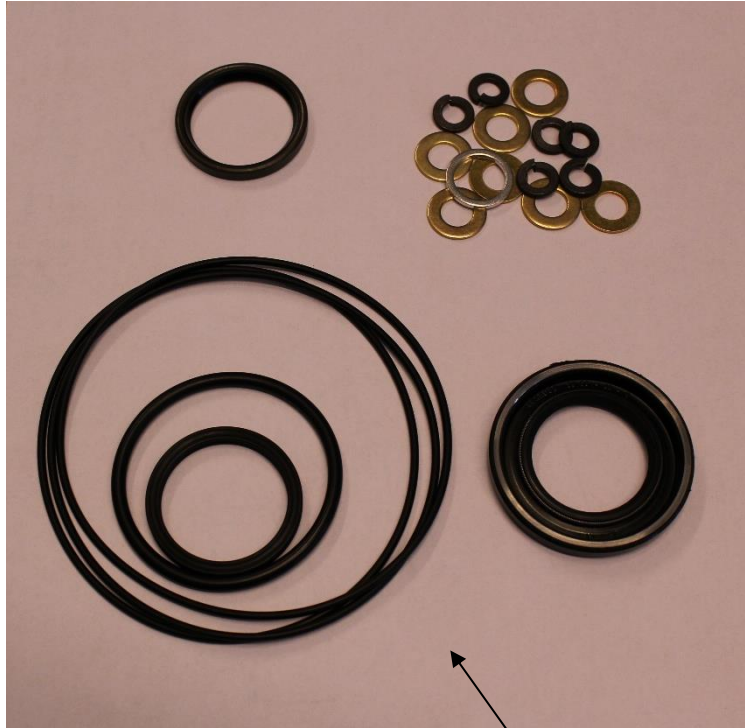


**Figure 233 Hydraulic motor**



**7.1.11 Service kit – hydraulic motor**

Meson no: M95259



**Figure 34 Service kit - hydraulic motor**

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## 7.2 Spare parts for power pack

Electric motor



	<u>3x400VAC</u>	<u>3x690VAC</u>	<u>3x230VAC</u>
Meson art.no:	M96468	M96478	M94349

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



Meson art.no: M93093

Directional solenoid valve



Meson art.no: M95197

Pressure reducing valve



Meson art.no: M95198

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

Filter element CR 60/1



Meson art.no: M92362

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