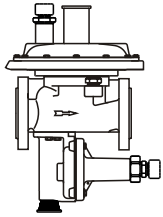
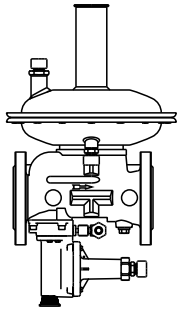
OPERATING INSTRUCTIONS

for gas pressure regulators PN10

with integrated slam shut valve (SSV)
and integrated limited capacity safety relief valve (RV)



MR 25 F10, MR 25 SF10
p_e 20 kPa - 10 MPa (0,2- 10 bar)
p_{as} 2 - 50 kPa (20 - 500 mbar)



MR 50 F10, MR 50 SF10
p_e 20 kPa - 10 MPa (0,2 - 10 bar)
p_{as} 2 - 50 kPa (20 - 500 mbar)

For natural gas, town gas, propane (gases to DVGW G 260 II) and air.
Ambient temperature: -20 °C to +60 °C
Installation, adjustment and maintenance ONLY by trained and authorized staff!

WARNING:
Incorrect handling during installation, adjustment, modification, functional testing and/or maintenance activities may cause injuries and/or material damage.
Read the operating instructions prior to starting the installation.
This unit must be installed and monitored in accordance with the rules in force.

Maximum inlet pressure:	p_{emax}	: 1 MPa (10 bar)
Set outlet pressure:	p_{as}	: according to typeplate
Slam shut setting pressures:	p_{so}	: according to typeplate
	p_{su}	: according to typeplate

We recommend installing a filter upstream of each unit.

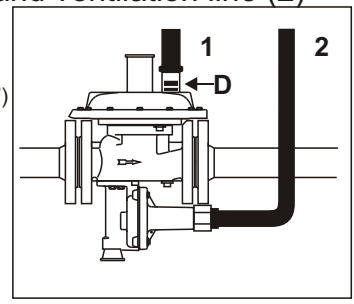
Each unit is equipped with a sieve in the inlet.

Regulators witch are not installed should be supported in horizontal position to avoid damages on the diaphragm.

Install pressure regulator into the pipework (see also label on regulator)

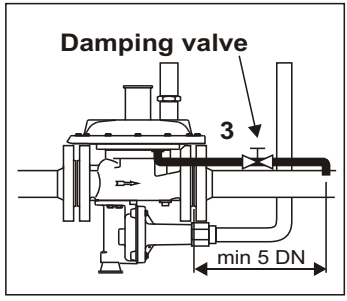
- Remove sealing caps and/or foils from the connecting surfaces.The direction of the
- gas flow must coincide with the arrow on the housing.
- Test and ensure that the inside of the gas lines is clean.
- The pressure regulator can be installed both into vertical and horizontal pipes. **Attention!** If required, the setting of the outlet pressure must be corrected. As a rule, the factory adjustment is for horizontal installation with the diaphragm housing upwards.
- The housing must not touch any surrounding walls.
- Use only approved jointing compounds and approved gaskets.
- No jointing compound should be allowed to enter the gas pipe when installing the pressure regulator.
- Always use an appropriate spanner. Do not use chimney on top of diaphragm housing as a lever..

Install and connect exhaust line (1) and ventilation line (2)



- Connection exhaust line 15L (G1/2"); line diameter: DN 15 for line lengths up to 3 m; DN 20 up to 5 m; DN 25 up to 10 m; DN 50 for lengths exceeding 5 m. Vent. line SSV: 12L (G1/4")
- Connect relief line using approved jointing compounds and lead it outdoors.
- Do not connect relief line with other function lines (if possible) and, as far as possible, use no or few elbows.
- If oscillation appears, remove the damping valve D in the exhaust connection.

Connect sensing line (3)



Connection thread: 12L (G1/4")

- Connect and install sensing line. Attention! for best operations, there should be a line of 5 DN between regulator and sensing connection.
- MR50: install an additional sensing line for the SSV
- Use approved jointing compounds.
- If oscillation appear, install separate damping valve
- For low capacities (flow rate $q < 30\% \cdot q_{max}$) there is no separate sensing line necessary. MR 50: change the regulator to internal impulse. MR25: there is no change necessary.

Test impermeability

Attention! The gas pressure regulator must not be included when carrying out the leak test for the overall system (if required, insert blinds).

- Pressurize gas pressure regulator
  inlet: $1.1 \times p_{e\,max}$
  outlet: $1.1 \times p_{as\,max}$ (however, always lower than 1.0 bar)

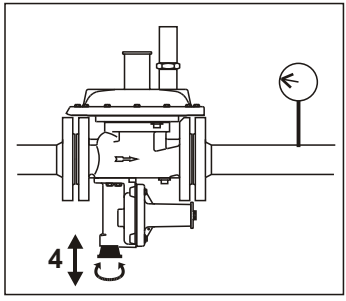
  The inlet pressure must always be equal to or higher than the outlet pressure.
- Use detergents at the connections of pipe and sensing line to check for leaks.

Periodical Inspection / Maintenance

- The inspection and maintenance intervals correspond to gas and working conditions. For good efficiency and safety we recommend that the schedule of periodical inspection and maintenance should not exceed legal guidelines. In any case good technical standards must be respected.
- During maintenance all parts are to clean and to check visually. This applies particularly to all seals, diaphragms and guiding parts. Damaged parts are to replace.
- Assembly drawing, spare part lists, tools and torques you can find in chapter maintenance.
- After every maintenance work a tightness and function test is to perform.

Starting and functional testing

Reset slam shut valve (SSV) (4)



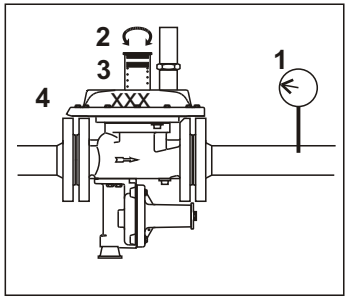
- Connect manometer to measure the outlet pressure.
- Open valve upstream of the pressure regulator.
- Close the valve downstream of the regulator.
- Check slam shut lock up: observe pressure reading; the pressure downstream must not rise.
- Unscrew and remove reset cap.
- Slightly pull reset cap; approx. 1 mm, and observe pressure reading. The line downstream of the unit is now pressurizing. The outlet pressure will be stabilized at approx. 1.2 x p_{as}.
- Remove reset cap up to the stop and keep holding for approx. 10 seconds.
- Screw down reset cap again.
- Check lock up of the control valve: observe pressure reading; the outlet pressure must not rise.
- Cause consumption for a few seconds.
- Determine lock up pressure: maximum 1.3 x pas for lock up pressure class SG 30; maximum 1.2 x pas for lock up pressure class SG 20.
- Test RV set pressure: increase outlet pressure via feed line until the relief valve is actuated. Observe pressure reading.
- Check lock up of relief valve: without any additional gas supply, the outlet pressure must not fall below 0.9 x set pressure.
- Close relief line.
- Check setting of over pressure slam shut: increase outlet pressure via feed line (approx. 1 mbar/s) until over pressure slam shut is tripping. Observe pressure reading.
- Lower outlet pressure and release slam shut.
- Open relief line.

Only MR 25 SF... , MR 50 SF...

- Close valve upstream of the pressure regulator.
- Check setting of under pressure slam shut. Lower outlet pressure (approx. 1 mbar/s) until under pressure slam shut is tripping. Observe pressure reading.
- Open valve upstream of the pressure regulator. Release slam shut. Open valve downstream of the pressure regulator.

Change outlet pressure p_{as}

Attention! The outlet pressure range is covered by several adjusting springs. In case the desired outlet pressure cannot be adjusted by means of the built-in spring, the corresponding spring must be mounted.



- Activate consumer or cause consumption.

1 Measure outlet pressure.

2 Unscrew sealing cap.

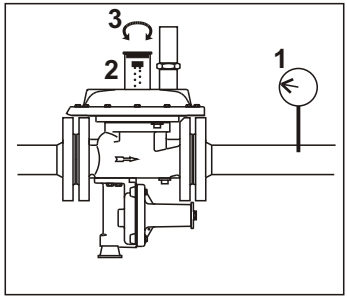
3 Turn adjusting ring by means of special key or Allen key
Clockwise: outlet pressure increases.
Anticlockwise: outlet pressure decreases.

4 Mark adjusted value of outlet pressure on the unit (xxx).

- Screw sealing cap tight.

Change relief valve set pressure

Attention! The relief valve set pressure must always be higher than the lock up pressure of the control valve and lower than the slam shut set over pressure.



1 Measure outlet pressure.

2 Unscrew sealing cap.

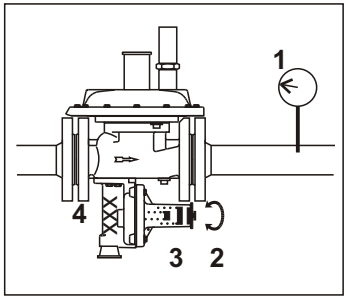
3 Turn adjusting ring by means of screw driver.
Clockwise: set pressure increases.
Anticlockwise: set pressure decreases.

- Test set pressure.
- Screw sealing cap tight.

(Blocking RV: Turn adjusting ring clockwise as far as it will go)

Change slam shut set pressures

Attention! The set pressure ranges are covered by several adjusting springs. In case the desired set pressure cannot be adjusted by means of the built-in spring, the corresponding spring must be mounted.



- Cause consumption for a few seconds.

1 Measure outlet pressure.

2 Unscrew sealing cap.

3 Turn adjusting ring by means of special key for over pressure slam shut and screw driver for under pressure slam shut.
Clockwise: set pressure increases.
Anticlockwise: set pressure decreases.

- Screw sealing cap tight.
- Test set pressure respectively set pressures.

4 Mark adjusted values of set pressures on the unit (xxx).

Maintenance and disassembly

During maintenance all o-rings are to check. Exchange damaged or worn rubber parts. .
Attention: use correct torques (see pages 6 - 8)
check smooth operation of movable parts

Regulator

- Take off vent and sense lines.
- Unscrew top cap, take out adjusting ring and setting spring..
- Disassemble top cover.
  Only MR50: Remove spring positioner.
- Remove adjusting nut of relief valve (RV), take out relief valve adjusting spring.
- Dismantle relief valve / working diaphragm assembly.
- Check o-ring and seat of RV and condition of working diaphragm
  if necessary take apart relief valve / working diaphragm assembly.
- Only MR50: Remove nut on valve spindle by means of two additional nuts which are screwed counter, afterwards: Remove diaphragm spacer (Aluminium).
- Check equalizing diaphragm.
- Dismantle bottom cover.
  Only MR50: Take out adapter ring (brass).
- Check o-rings at bottom cover and adapter ring
- Disassembly and check of valve seat (sealing edge and o-ring) with valve seat spanner, after that: take out valve spindle.
- Check valve plate.

Assembly of the regulator is reverse to disassembly.

Safety Shut-off Valve (SSV)

- Take off vent pipe (MR50: SSV sense line too).
- Unscrew SSV (MR50: incl. Adapter plate) off regulator body.
  Check o-rings.
- Check valve plate and valve seat.
- Dismantle SSV top cover completely.
- Disengage working diaphragm by turning 90° and take it out.
  Check working diaphragm.

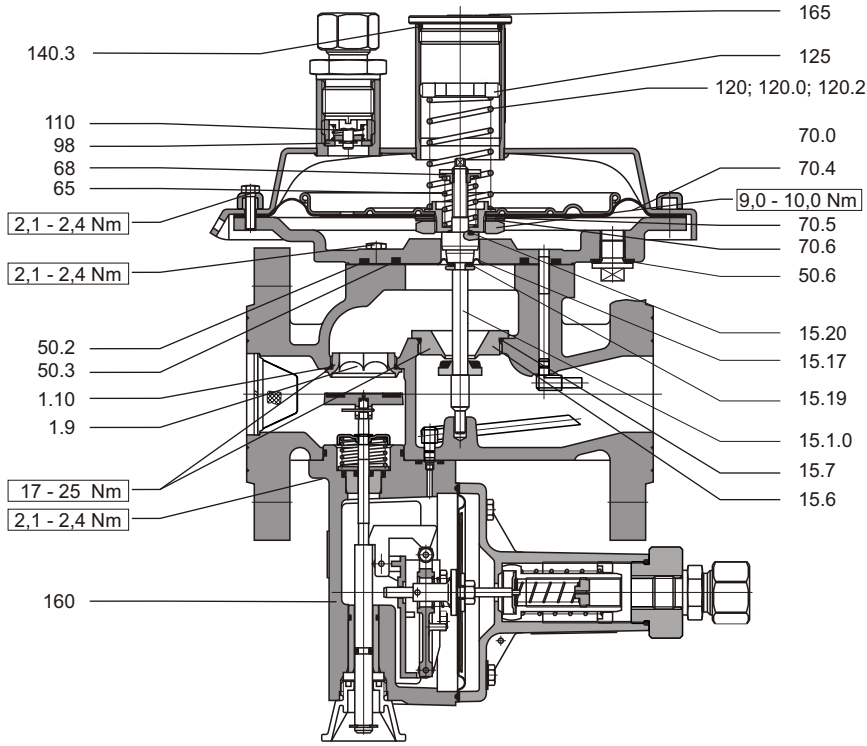
Assembly of the Safety Shut-off valve is reverse to disassembly.

Attention: Always carry out starting and functional testing according to the rules after maintenance (page 3).

EC declaration of conformity

In our capacity as manufacturers, we hereby declare that the products MR25 F10, MR25 SF10, MR50 F10 and MR50 SF10 marked with identification No. CE/0085BM0201, comply with the fundamental requirements of the following Directive:
- 97/23/EC in conjunction with EN 334
The relevant products correspond to the types tested by the notified body 0085 (DVGW). Comprehensive quality is guaranteed by a certified Quality Management System pursuant to DIN EN ISO 9001:2000 according annex II, paragraph 3 of Directive 90/396/EEC.

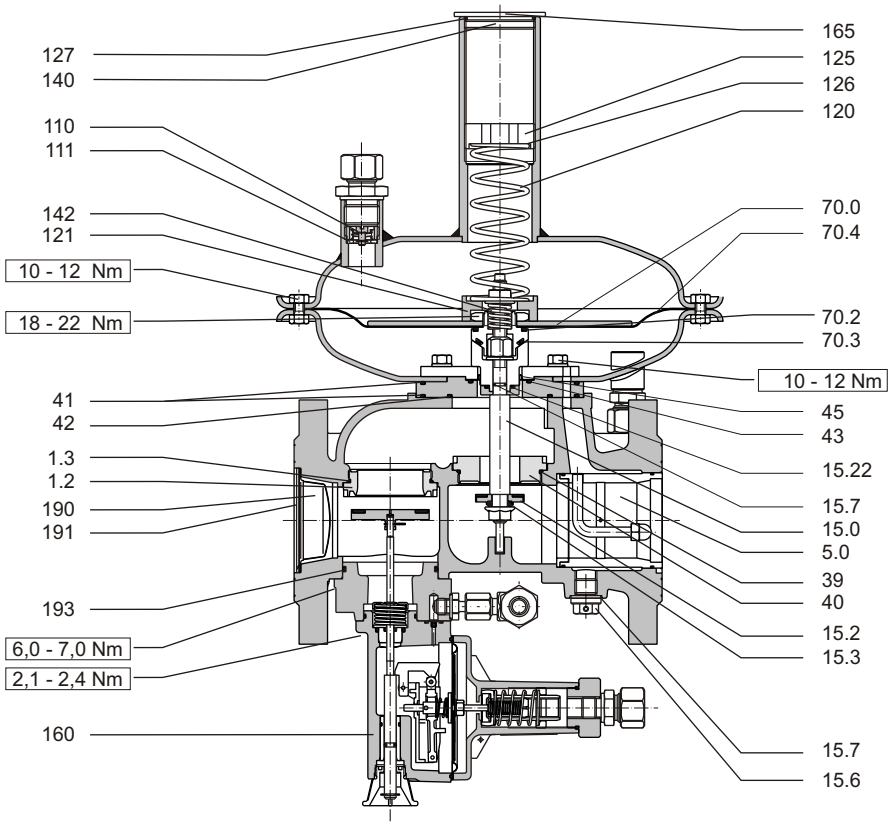
ELSTER GmbH
Mainz-Kastel, Germany



Spare Parts List: MR 25 PN 10			10 / 2004
Item	**Part Name**	**Part no**	**Qty.**
1.9	SSV valve seat	73014149	X
1.10*	O-Ring 22x1,5 DIN 3535 T3, SSV valve seat	03109178	X
15.1.0	Valve spindle with balancing diaphragm and valve seat	73090080	X
15.6	Regulator valve seat Ø 11,7 mm	73007371	X
15.7*	O-Ring 30x1,5 DIN 3535 T3, Regulator valve seat	03109177	X
15.17	Balancing diaphragm	73090052	X
15.19	Gasket	73008721	2x
15.20	O-Ring 6,75x1,78 DIN 3535 T3, Limited capacity relief valve	03109338	X
50.2	O-Ring 74x3 DIN 3535 T3, Botem cover / housing	03109200	X
50.3	O-Ring 47x3 DIN 3535 T3, Balancing diaphragm	03110079	X
50.6	Gasket 13x9,2x2 plug / external sensing connector	34462820	X
65	Adjusting spring RV d=1.8mm	73012343	8-90 mbar[1]
	Adjusting spring RV d=1.7mm	33470052	15-125 mbar[1]
	Adjusting spring RV d=2mm	73010839	100-230 mbar

[1]) Set ranges are offset to the outlet pressure (Pas)

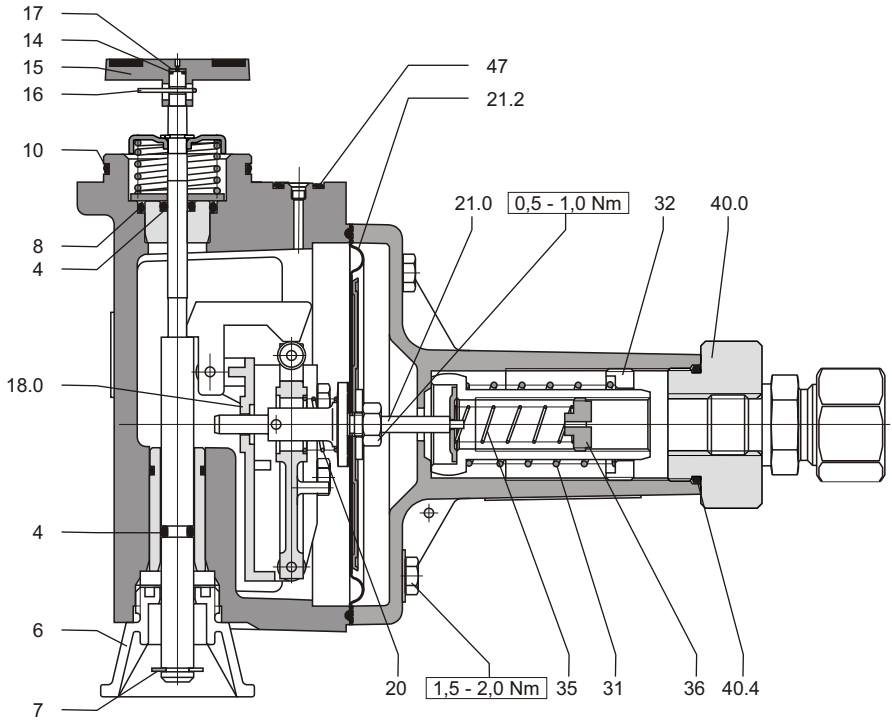
Item	**Part Name**	**Part no**	**Qty.**
70.0	Working diaphragm assembly	73009500	X
70.4	Working diaphragm	73009521	X
70.5	Cardboard underneth balancing diaphragm	73009463	X
70.6	Plate	73013954	X
98	Washer underneath damping valve	03602106	X
110	Damping valve assembly	73002208	X
120	Adjusting spring d=1.6 Brown	73008974	19-32 mbar
	Adjusting spring d=2 Lightblue	73008950	25-50 mbar
	Adjusting spring d=2 Darkblue	33470005	45-70 mbar
	Adjusting spring d=2.5 Yellow	73017779	55-130 mbar
	Adjusting spring d=3.6 Anthracite	73017667	120-300 mbar
	Adjusting spring d=4 Black	73018456	250-500 mbar
120.2	Slip ring for adjusting spring	73009527	X
125	Unsiversal adjusting ring	33470005	X
125	Adjusting ring for pas > 100 mbar	73009514	X
140.3	O-Ring 27x2 DIN 3535 T3 for top cap	03110001	X
160.0	Safety shut-off valve MR 25 F	73018048	X
	Safety shut-off valve MR 25 SF	73018049	
165	Seal white	73012038	X
-	Sieve MR25	33470026	X
-	Circlip MR25	03710010	X



Spare Parts List: MR 50 PN10			10 / 2004
Item	**Part Name**	**Part no**	**Qty.**
1.6	Plug G ¼"	73009787	X
1.7	Seal A 14x18x1,5	03720314	X
5.0	Outlet cartridge assembly	73018184	
	Outlet cartridge assembly, int. Impuls	73015581	X
15.0	Valve spindle assembly incl. valve seat	73018141	X
15.2*	Valve plate	73018143	X
15.2	Valve plate hard 60 Shore	73018258	X
15.3*	O-Ring 9 x 3 NBR 70 Shore	03109549	X
15.7*	O-Ring 5 x 1,5 NBR 70 Shore	03109095	X
15.22*	O-Ring 14 x 2 NBR 70 Shore	03109398	X
39*	O-Ring 47 x 2 NBR 70 Shore	03109446	X
40	Valve seat	73018144	X
41*	O-Ring 90 x 2,5 NBR 70 Shore	03109465	2 x
42*	O-Ring 58 x 2,5 NBR 70 Shore	03109464	X
43*	O-Ring 32 x 2,5 NBR 70 Shore	03109554	X
45*	Balancing diaphragm	73018145	X
70.0	Working diaphragm assembly	73018150	X
70.2*	O-Ring 26 x 2,5 NBR 70 Shore	03109453	X
70.3*	O-Ring 24 x 3 NBR 70 Shore	03109550	X
70.4*	Working diaphragm	73018152	X
110.0	Damping valve assembly	73002208	X
111	Washer for damping valve	03602106	X

[1]) Set ranges are offset to the outlet pressure (Pas)

Item	**Part Name**	**Part no**	**Qty.**
120	Adjusting spring d=2.7mm White	73018431	20-30 mbar
	Adjusting spring d=3.2mm Yellow	73018432	25-50 mbar
	Adjusting spring d=3.6mm Green	73018433	45-100 mbar
	Adjusting spring d=4mm Blue	73018434	90-200 mbar
	Adjusting spring d=4.5mm Red	73018435	150-300 mbar
	Adjusting spring d=5mm Brown	73018436	250-400 mbar
	Adjusting spring d=5.3mm Black	73018437	350-500 mbar
121	Spring positioner	73018154	X
125	Adjusting ring	73002189	X
	Adjusting ring >100 mbar	73018155	
126	Slip ring for adjusting spring	33470067	X
127*	O-Ring 36x2 DIN 3535T3 for top cap	03109210	X
140	Top cap	73002890	X
142	Adjusting spring RV d=1.8mm	73012343	8-40 mbar[1]
	Adjusting spring RV d=1.7mm	33470052	16-54 mbar[1]
	Adjusting spring RV d=2mm	73010839	40-120 mbar[1]
160.0	Safety shut-off valve MR 50 F	73018181	X
	Safety shut-off valve MR 50 SF	73018182	
165	Seal white	73012038	X
190	Sieve MR 50	73005355	X
191	Circlip	03024158	X
193*	O-Ring 53x2,5 DIN 3535T3, SSV Adapter	03109448	X
207	Sense line SSV, internal impuls	73015593	X
208	Connection piece, internal impuls	03008197	2 x



Spare Parts List: SAV for MR PN10			10 / 2004
Item	**Part Name**	**Part no**	**Qty.**
-	SSV SV O 25 (MR 25 F)	73014155	
-	SSV SV O/U 25 (MR 25 SF)	73014154	
-	SSV SV O 50 (MR 50 F)	73014701	
-	SSV SV O/U 50 (MR 50 SF)	73014702	
4	O-Ring 4,2 x 1,9 NBR 70 Shore	03109397	X
6	SSV reset knob	73013935	X
7	Circlip for SSV reset knob	03627109	X
8	O-Ring 14x2 NBR 70 Shore at guiding liner	03109398	X
10	O-Ring 28,3x1,78 NBR 70 Shore at conection part	03109091	X
14	SSV-Valve plate MR 25	73011288	X
14	SSV-Valve plate MR 50	73011415	X
15	O-Ring 1,78x1,02 NBR 70 Shore in SSV valve plate	03110040	X
16	Clip for valve plate fixing	33470076	X
17	Gasket in SSV valve plate	73012164	X
18.0	Trip mechanism assembly SSV O	73013223	X
18.0	Trip mechanism assembly SSV O/U	73013226	X
20	relief spring	73010576	X
21.0	diaphragm holder assembly (incl. working diaphragm)	73009193	X
21.2	Working diaphragm SSV	73003819	X

Item	**Part Name**	**Part no**	**Qty.**
31	Adjusting spring "O" Orange	73008954	31-67 mbar
	Adjusting spring "O" White	73008955	59-138 mbar
	Adjusting spring "O" Lightblue	73008956	117-276 mbar
	Adjusting spring "O" Yellow	73008957	236-470 mbar
	Adjusting spring "O" Black	73018496	450-900 mbar
32	Adjusting ring over set pressure up to 100 mbar	73011076	P_{so} >=100 mbar
32	Adjusting ring over set pressure exceeding 100 mbar	73007626	P_{so} < 100 mbar
35	Adjusting spring "U" Yellow	73010871	6-18 mbar
	Adjusting spring "U" White	73008959	16-49 mbar
	Adjusting spring "U" Lightblue	73008960	47-146 mbar
36	Adjusting ring under set pressure	73007625	X
40.0	Top cap	73010710	X
40.4	O-Ring 22x2 NBR 70 Shore at top cap	03109201	X
47	O-Ring 7,65x1,78 NBR 70 Shore at impulse hole	03110340	X