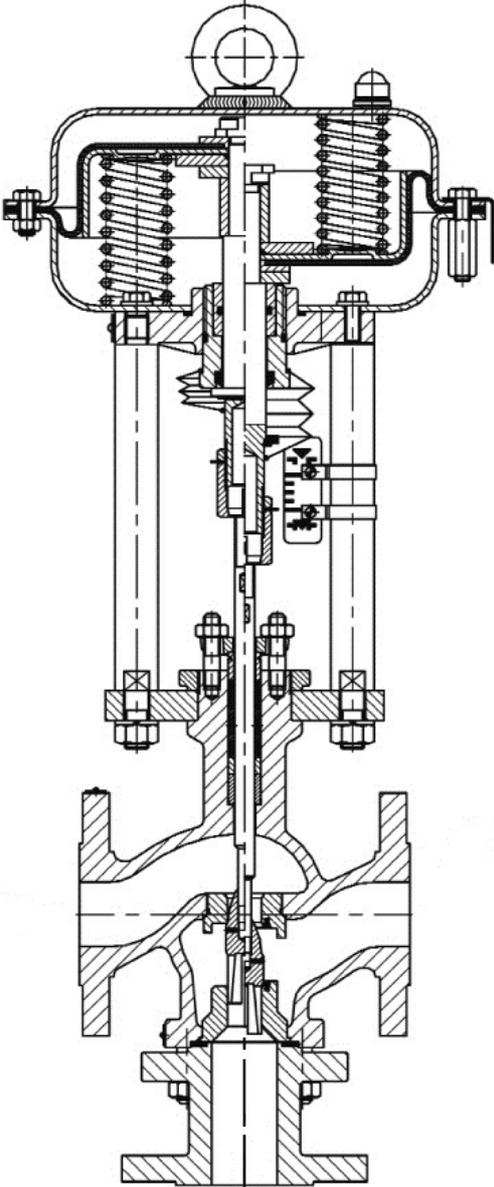


BR13 Instruction Manual



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To ensure trouble-free and safe operation of the valve, it is essential to be familiar with the contents of this BR13 Instruction Manual, and also with the general instructions for installation and operation, before installing and operating the valve.

Failure to observe or comply with these operating instructions will invalidate the manufacturer's guarantee and liability. The manufacturer's general conditions of sales and terms of delivery shall apply unless otherwise stated.

1. FUNCTIONAL PRINCIPLE

The valve regulates mass-flow by a linear movement of the valve spindle, which may be operated pneumatically, electrically or manually. As the stroke of the valve alters, the circular gap between the valve seat and the valve block is increased or reduced. This directly influences the amount of fluid flowing through the valve.

2. INSTALLATION

The valve may be mounted in any position; however, for valves of DN 80 size and above, vertical installation with the drive mounted above is preferred. For valves with extended construction, bellows, or drives weighing more than 50 kg, a suitable support or suspension mounting should be provided for the drive, otherwise its own weight might cause wear and leakage at the seals.

3. OPERATING CONDITIONS

Regulator valves should be operated under conditions that take into account the size and nature of the construction and the type of material. To ensure trouble-free operation over the whole operational lifetime, the regulator valve and its accessories should be regularly inspected and maintained.

Normal operating conditions:

- a) With pneumatic positioning drive
Ambient temperature from - 25 to + 80 °C, with silicone diaphragm of -40 °C to +80 °C
Relative humidity up to 98 %,
The control and feed air supplies must contain no mechanical impurities, oil or corrosive substances, copper or aluminium alloys, and must be dehumidified such that the dew-point corresponds to a temperature that is at least 10 °C lower than the operating temperature of the position controller and the positioning drive.
- b) With electrical positioning drive
In accordance with the manufacturer's instructions.
- c) With hand-operated drives of type NN
Ambient temperature from - 25 to + 80 °C
Relative humidity up to 98 %.

4. OPERABILITY, MAINTENANCE AND REPAIR - STANDARD CONSTRUCTION

The operability of the regulator valve during use is based on maintaining an appropriate flow characteristic and not exceeding the permitted leakage level for the valve.

To ensure long-term correct and safe operation of the valve, it is essential to carry out regular recorded inspections. Valves that operate continuously should be checked at least every 6 months. Valves that operate discontinuously should be checked at least every 12 months.

If it is necessary to carry out maintenance or repair work on the regulator valve, it should be carried out as follows:

4.1. Gland packing

A key criterion for operability is external seal-tightness, which is provided by the gland packing.

The gland packing to be used is normally pre-specified based on the operating conditions. With normal gland packing, the tightness of the seal is achieved by tightening the sealing nut.

WARNING:

When the valve is supplied, the sealing nut is only hand-tightened. Before putting the valve into service, it is essential to tighten the sealing sufficiently to achieve an adequate contact pressure, thus ensuring a secure external seal, but without blocking the valve spindle.

If self-adjusting sealing glands are used, the constant contact pressure is provided by a stainless steel spring. For this reason, the sealing nut should be screwed in up to the stop.

To change the gland packing, proceed as follows:

Before changing the gland packing, ensure that the valve is not under pressure and is not contaminated.

1. Disconnect the connection between valve and drive. in valves with air-operated or hand-operated actuators, by undoing connecting nut (32) after loosening low (counter) nut (34)
2. undo nut (13) fastening actuator or hand-operation and disconnect it from the valve
3. undo and remove from valve stem the interlocking nut (33) and the connecting nut (32)
4. Loosen sealing packings in the packing-chamber by loosen the nut (11) on the threaded bolts (10), the packing gland (12) or the gland plate (18) by the TA Luft version.
5. Loosen the nut (11) at the 3-way-bottom-flange (10) and remove the flange essay and the body gasket .
6. remove fitted seat (4.2)
7. pull out head and stem (5) set from packing-chamber of the valve body and remove it
8. loosen the nut (11) the packing gland (12) or packing plate (18) and packing gland or plate
9. Remove the pilot sleeve (14) and the packing (8,15) with suitable tools and clean the packing chamber.
10. Put in the stem (5) with plug into the valve
11. Install carefully the new packing. Observe the correct placement. (in reversed order as removed)
12. Install the pilot sleeve (14) and tight it.
13. Install fitted seat (4.2) new gasket (7) and the flange essay (2) and tight it about the nuts (11).
14. Interlocking nut (33) and connecting nut (32) back on to the stem.
15. Replace carefully the drive and connect him in reverse order as by disassembling

4.2. Replacement of the valve seat and the valve plug

If it is necessary to change the valve seat and valve block due to a change in the operating conditions or due to wear and tear, proceed as follows:

Before making the change, ensure that the valve is not under pressure and is not contaminated.

In order to achieve a better seal when changing the valve seat and valve block, we recommend lapping the seat and the block with a fine abrasive paste.

Replacing the double plug

1. Disassembling the valve as described in point 4.1 (changing packing gland) (point 1 until 7).
2. Knock out the pin (17) and unscrew the plug, screw in a new plug, redrill and put in the pin. Please check that the stem has no grooves or other damages.
3. Install the stem (5) with plug into the valve.
4. Tight with the nuts (11) the packing gland or gland plate that the stuffing box seals.
5. Install fitted seat (4.2) new gasket (7) and the flange essay (2) and tight it about the nuts (11).
6. Interlocking nut (33) and connecting nut (32) back on to the stem
7. Replace carefully the drive and connect him in reverse order as by disassembling

Replacing fitted seat (4.2)

1. Disconnect the connection between valve and drive. in valves with air-operated or hand-operated actuators, by undoing connecting nut (32) after loosening low (counter) nut (34)
2. Undo nut (13) fastening actuator or hand-operation and disconnect it from the valve
3. Undo and remove from valve stem the interlocking nut (33) and the connecting nut (32)
4. Loosen sealing packings in the packing-chamber by loosen the nut (11) on the threaded bolts (10), the packing gland (12) or the gland plate (18) by the TA Luft version.

5. Loose the nut (11) at the 3-way-bottom-flange (10) and remove the flange essay and the body gasket.
6. remove fitted seat (4.2)
7. Install new fitted seat (4.2) new gasket (7) and the flange essay (2) and tight it about the nuts (11).
8. Tight with the nuts (11) the packing gland or gland plate that the stuffing box seals.
9. Interlocking nut (33) and connecting nut (32) back on to the stem
10. Replace carefully the drive and connect him in reverse order as by disassembling

Replacing screwed in seat (4.1)

1. Disassembling the valve as described in „replacing fitted seat (4.2) “. Point 1 until 6
2. Remove stem with double plug from the body
3. Screw out anticlockwise the seat (4.1) with suitable seat-tool
4. Clean the new seat or repaired seat, grease them with mounting paste and screw in.
5. Install the stem (5) with plug into the valve.
6. Tight with the nuts (11) the packing gland or gland plate that the stuffing box seals
7. Install fitted seat (4.2) new gasket (7) and the flange essay (2) and tight it about the nuts (11).
8. Interlocking nut (33) and connecting nut (32) back on to the stem
9. Replace carefully the drive and connect him in reverse order as by disassembling

5. PNEUMATIC P/R DRIVE

When the pressure rises in the drive pressure chamber, a force is applied to the membrane in the drive unit. If this force exceeds the spring force of the springs in the second chamber, the springs are compressed and the drive spindle starts to travel out or in, according to the function. If the pressure continues to increase, once the maximum spring force is reached the springs will be pressed against the end-stop and the drive will halt. Thus, a simple pneumatic drive can reach a defined position in proportion to the air pressure.

The size of the drive is based on the cm² surface of the membrane.

Drive size	Stroke [mm]	Spring range (kPa)													
		1		2		3		4		5		6		7	
		20 - 100		40 - 200		40 - 120		80 - 240		60 - 140		120 - 280		180 - 380	
		No. of springs	Total tension [mm]	No. of springs	Total tension [mm]	No. of springs	Total tension [mm]	No. of springs	Total tension [mm]	No. of springs	Total tension [mm]	No. of springs	Total tension [mm]	No. of springs	Total tension [mm]
250	20	3	-	6	-	3	-	6	-	3	6	6	6	-	-
400	20	3	-	6	-	3	-	6	-	3	6	6	6	-	-
630	38	3	-	6	-	3	10	6	10	3	10 + 10	6	10 + 10	12	10 + 10
1000	38	3	-	6	-	3	9,5	6	9,5	3	9,5 + 9,5	6	9,5 + 9,5	12	9,5 + 9,5
	50	3	-	6	-	3	12,5	6	12,5	3	12,5 + 12,5	6	12,5 + 12,5	12	12,5 + 12,5
	63	3	-	6	-	3	16	6	16	3	16 + 16	6	16 + 16	12	16 + 16

Spring range and drive sizes for pneumatic drives of type P/R

P type drive: Single membrane drive.
 Safe position NO (open on loss of pressure)
 When pressure rises in the upper chamber, the drive spindle travels out.

R type drive: Single membrane drive.
 Safe position NC (closed on loss of pressure)
 When pressure rises in the lower chamber, the drive spindle travels in.

5.1 Changing the operating mode of the drive

No additional components are required in order to alter the direction of operation of type P/R pneumatic drives.

Changing P to R and vice versa

1. Disconnect the valve from the drive.
2. Ensure that no air pressure is applied to the drive.
3. Remove the top cover of the position drive, taking care that the tensioning nuts (long nuts) (82) are unscrewed to the ends – in accordance with the notes on the warning label.

The further steps in the procedure depend on the current operating mode of the drive before it is changed.

To change the drive function from P to R, proceed as follows:

4. Undo the special nuts (34) from the bolts on the positioning drive.
5. Remove the membrane with its membrane plate, spacer ring, washer and spacer cover (or spacer covers for drive sizes 630 and 1000).
6. Remove the springs (31) from the lower casing.
7. Turn the membrane together with all the parts as listed above through 180 degrees, and fit the membrane back over the drive bolts.
8. Screw the special nuts (34) on to the drive bolts, thus compressing the whole of the above group of components.
9. Place the springs on the membrane plate so that they fit in the guide cut-outs and their ends are aligned with the axis of the bolts.
10. Place the top cover over the springs and initially tighten the tensioning nuts (82).
11. Compress the springs evenly until the upper part of the drive end-stop is pressed against the lower part, then insert the rest of the bolts and screw on the nuts.

To change the drive function from R to P, proceed as follows:

4. Remove the springs (31) from the membrane plate (28).
5. Undo the special nuts (34) from the bolts on the positioning drive.
6. Remove the membrane with its membrane plate, spacer ring, washer and spacer cover (or spacer covers for drive sizes 630 and 1000).
7. Place the springs in the designated locations in the lower cover.
8. Turn the membrane together with all the parts as listed above through 180 degrees, and fit the membrane back over the drive bolts, so that the 6 mm diameter opening on the base and the nut on the edge of the drive membrane plate are axially aligned with one of the openings on the edge of the membrane.
9. Screw the special nuts (34) on to the drive bolts, thus compressing the whole of the above group of components.
10. Place the springs on the membrane plate (28) so that they fit in the guide cut-outs. To check that the springs are in the correct position, rotate the membrane (to the position of the notch on the nut at the edge of the membrane plate) until the 6 mm opening on the base is visible. By sighting through the opening, check that there is a spring in place on the underside.
11. Place the top cover over the springs and initially tighten the tensioning nuts (82).
12. Compress the springs evenly until the upper part of the drive end-stop is pressed against the lower part, then insert the rest of the bolts and screw on the nuts.

5.2 Changing the membrane

Should it be necessary to change a membrane, the drive should be dismantled as described in item 6.1. Instead of putting the drive back together in reverse order, it should simply be re-assembled in its original order after changing the membrane.

6. Other Drives

It is possible to equip model BR13 valves with electrical drives. Sizing the drive to the regulator valve is normally a part of the bidding process.

It is also possible to supply model BR13 valves with a purely manual operation (type NN), or to fit the pneumatic drive with an additional hand-wheel (type P/R-N).

(See the following diagrams)

7. DRAWINGS / SPARE PARTS LISTS

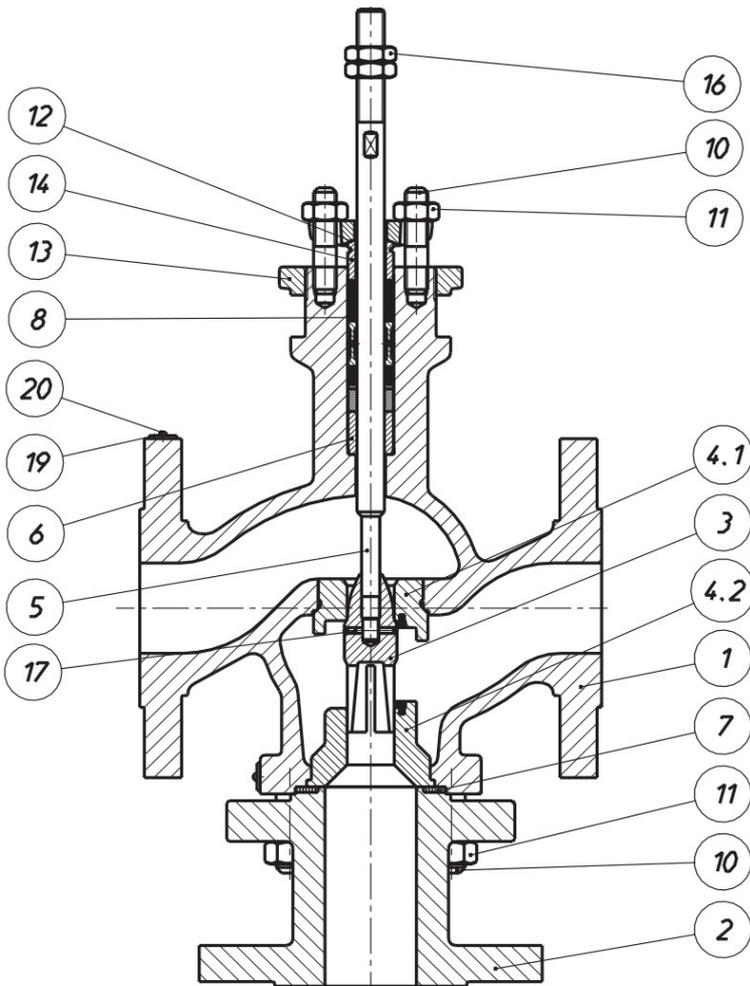


Figure 1a
valve BR13 with standard
stuffing box

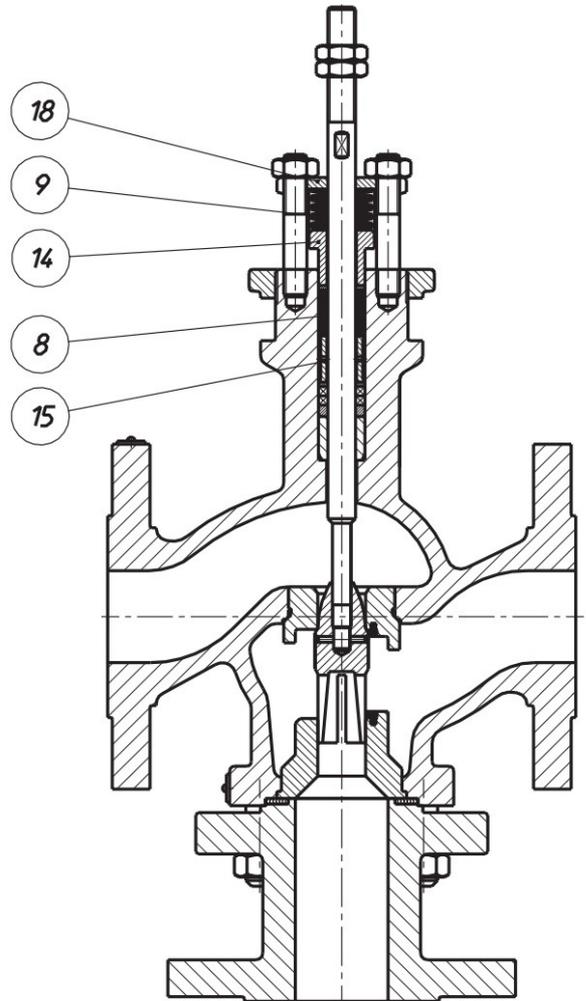


Figure 1b
Valve BR13 with
TA-Luft stuffing box

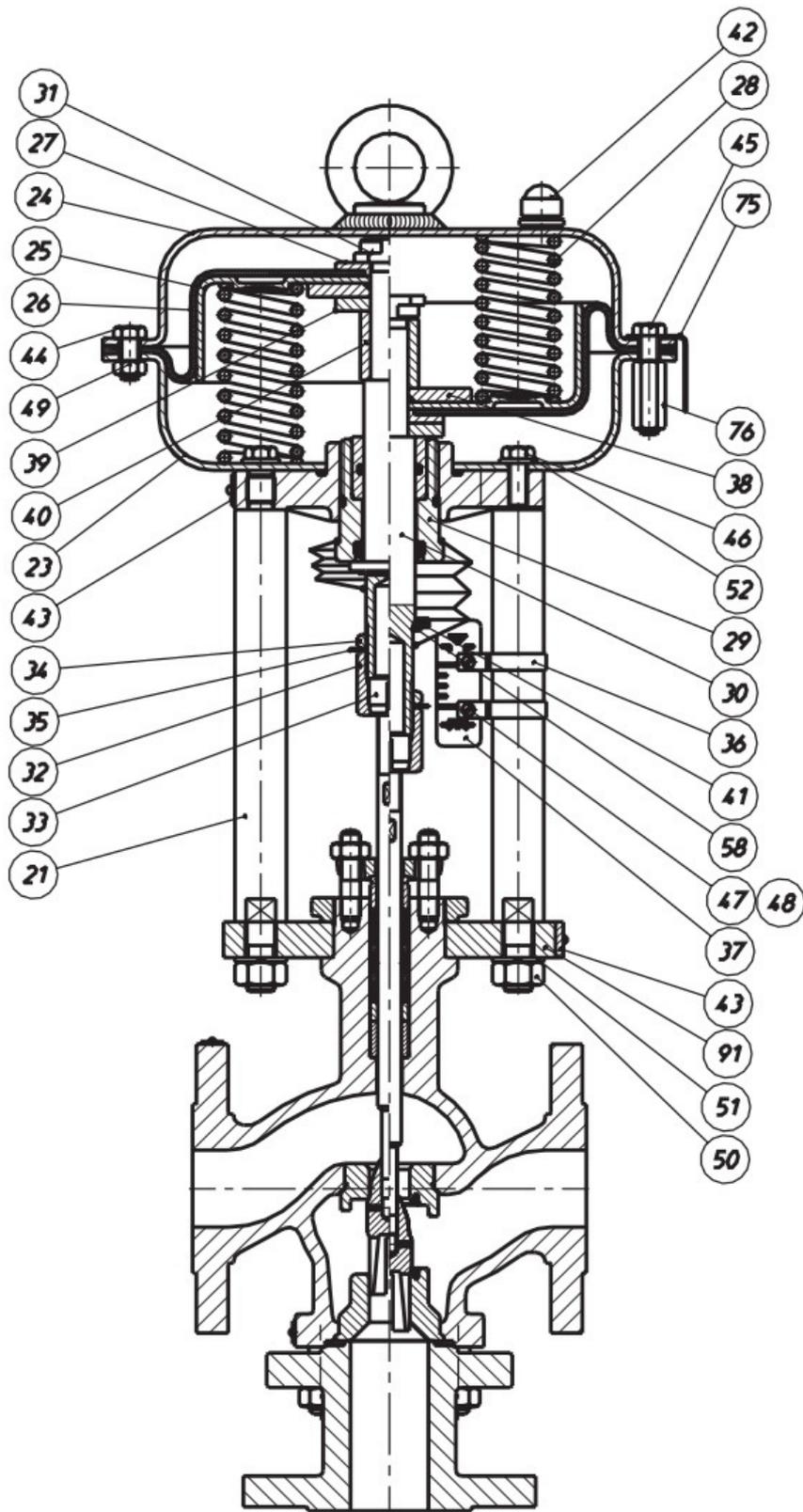


Figure 2a
Valve BR13 with pneumatic drive P/R

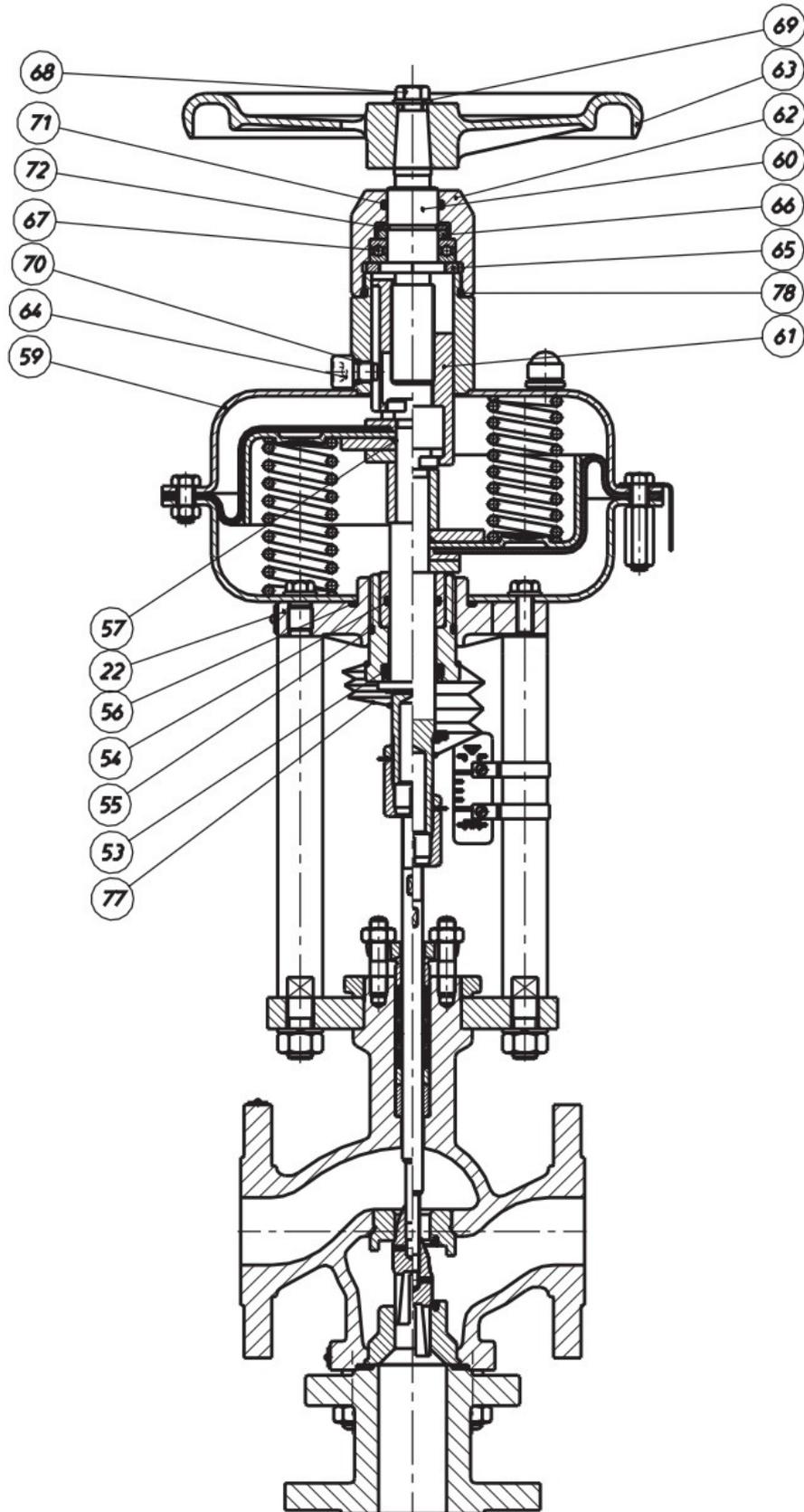


Figure 2b
Valve BR13 with pneumatic drive
PN/RN

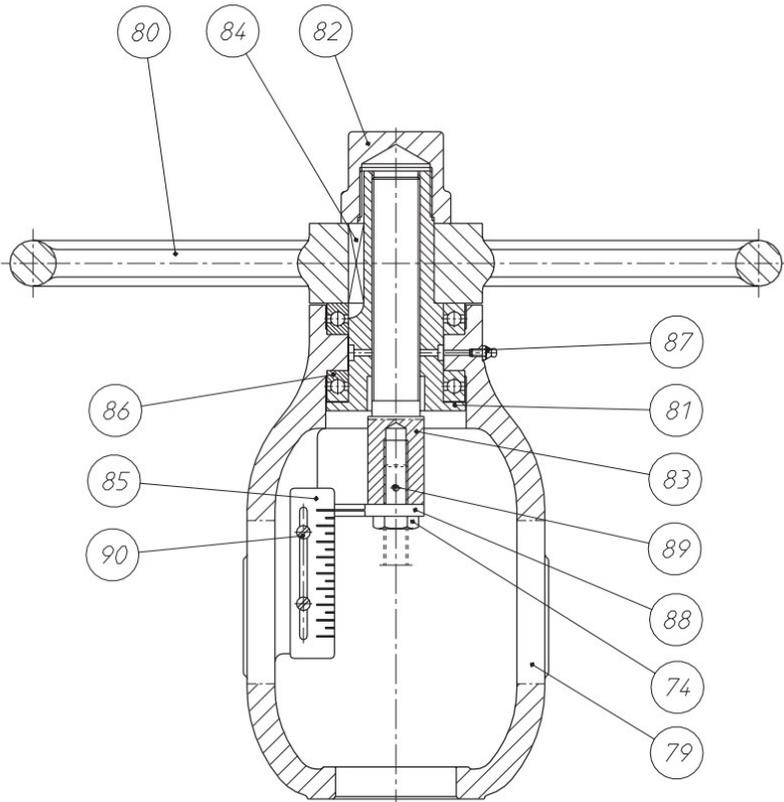


Figure 3a
Handwheel Typ 20

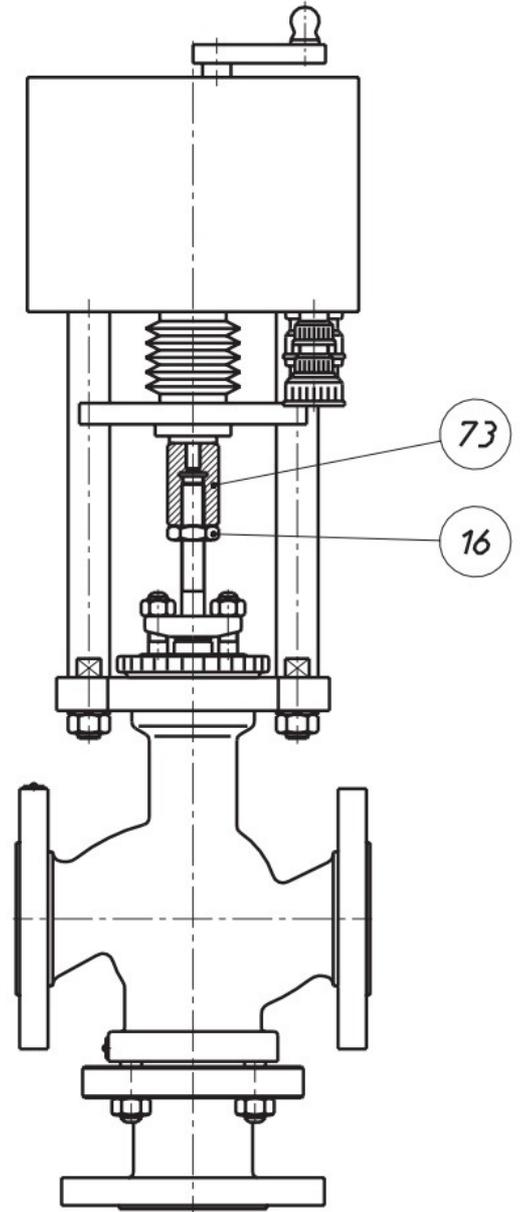


Figure 3b
Valve BR13 with electric drive

	Part name
1	Body
2	Flange essay (3 –way-flange)
3	plug
4.1	Screwed in seat
4.2	Fitted seat
5	stem
6	Guiding sleeve
7	Body gasket
8	Stuffing box
9	spring
10	Bolt
11	Nut
12	Packing gland
13	Fastening nut
14	Pilot sleeve
15	Spacing sleeve
16	Nut (low)
17	Pin
18	Gland plate
19	Nameplate
20	Rivet pin 3x6
21	Column
22	Bracket
23	Bottom housing
24	Top housing (set)
25	Diaphragm plate
26	diaphragm
27	Spacing ring
28	spring
29	Packing-box set
30	Actuator stem
31	Special nut
32	Connecting nut
33	Interlocking nut
34	Low (counter) nut
35	Position indicator
36	Column clamping ring
37	Stroke plate
38	washer
39	washer
40	Spacing sleeve
41	Stopper ring
42	Venting pin
43	Actuator nameplate
44	Bolt
45	bolt
46	bolt
47	screw M4x8
48	nut M4-A
49	Nut
50	nut
51	Spring washer
52	Washing ring
53	Scraping ring

	Part name
54	O-Ring
55	O-Ring
56	O-Ring
57	O-Ring
58	snapping
59	Top housing (set)
60	Drive bolt
61	Driver
62	holder
63	Drive wheel
64	Special bolt
65	washer
66	washer
67	Thrust bearing
68	bolt
69	washer
70	O-Ring
71	O-Ring
72	Snap ring Z
73	Connector
74	
75	Warning plate
76	turnbuckle
77	Stem casing
78	O-Ring
79	Drive yoke
80	Drive wheel
81	Drive sleeve
82	Drive cap
83	Drive stem
84	key
85	Stroke plate
86	Ball bearing
87	Grease nipple
88	indicator
89	Pin with notches
90	screw
91	Connecting plate

9. Contacting us

Details / specific information (Operating instructions with spare parts lists) are available for download on our website.

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