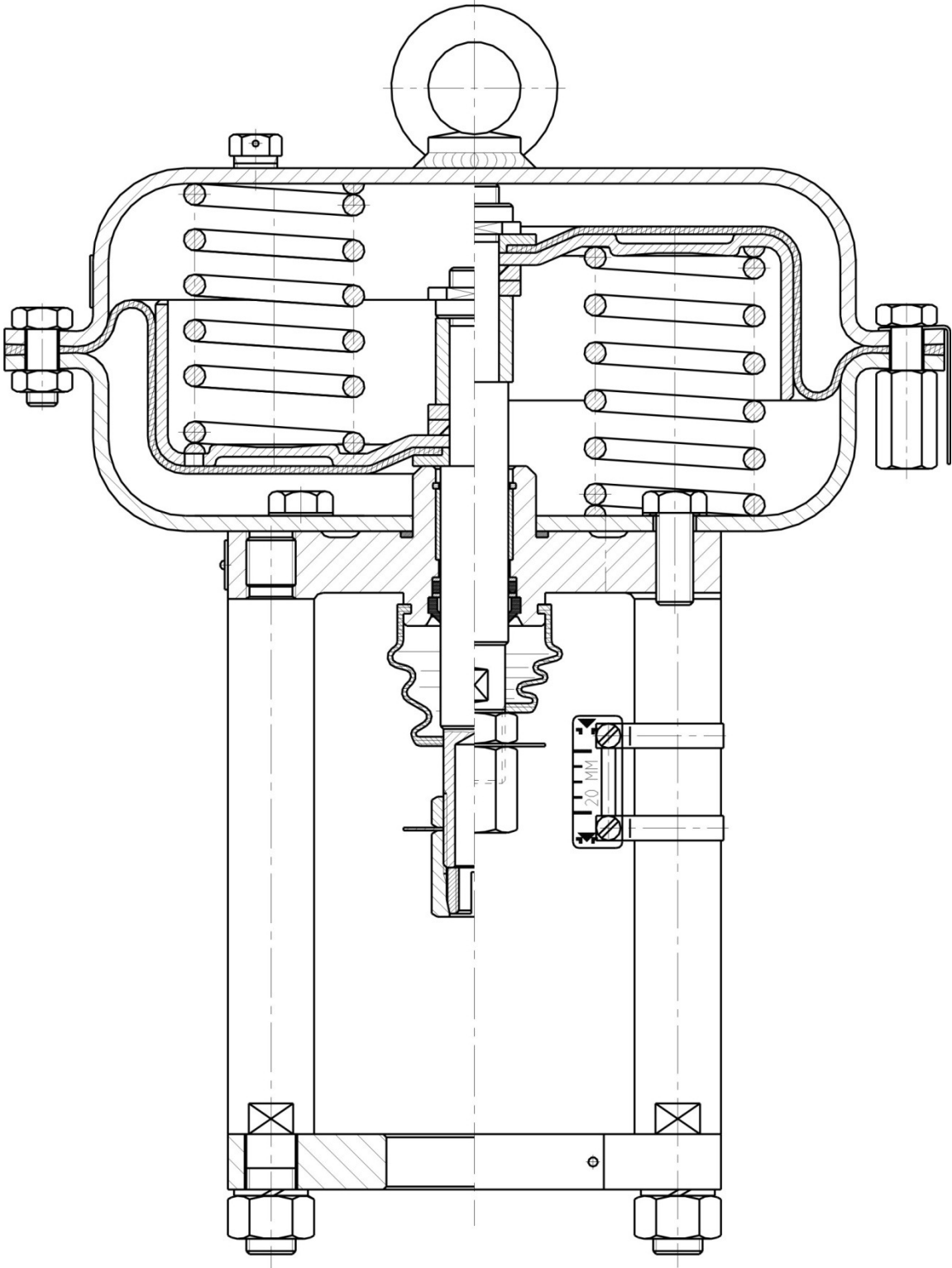


# P/R - Instruction Manual



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

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.

## 1.0 Functional principle

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 cm<sup>2</sup> 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.

## 2. Operating Conditions

- Ambient temperature from - 25 to + 80 °C, with silicone diaphragm of -40 °C to +80 °C

-Relative humidity up to 98 %,

- Permissible variations in air pressure + / -10%

- The control and tool air must be carried out according to DIN ISO 8573-1 Class 3.

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.

### 3.0 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

#### Umbau P auf R und umgekehrt

##### 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.

### 3.1 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

4. DRAWINGS / SPARE PARTS LISTS

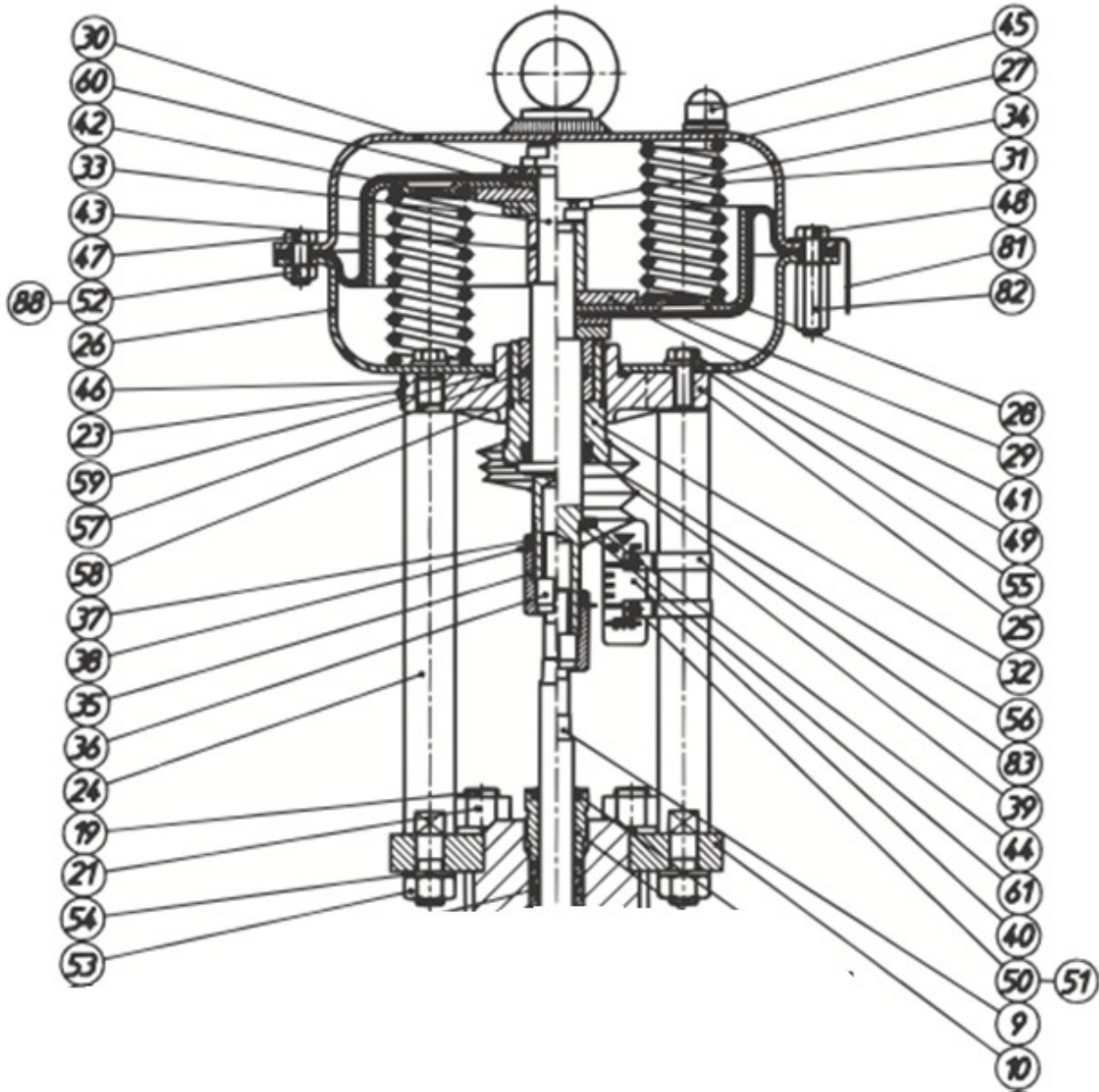


Figure 1 - pneumatic positioning drive

## Parts list and drawing numbers

No. on drawing	Name of component
1	Casing
2	Standard throttle
2A	Throttle of unloaded valve
2B	Extended throttle
2C	Bellows throttle
2C1	Seal unit
3	Valve seat
3A	Valve seat seal
4	Valve blade
4A	Unloaded valve blade (unit)
4A1	Unloaded valve blade seal ring
5	Insert piece
6	Dowel pin
7	Support ring
8	Ring
9	Valve bolts
10	Connecting plate
11	Guide sleeve
12	Threaded plug
13	Support ring
14	Seal
14A	V seal set
14B	Spring
15	Casing seal
16	Plug StB 3/8° (optional)
17	Plug StB ¼°
18	Valve nameplate
19	casing bolt
20	Fastening nut
21	Nut
22	Spacer sleeve
31	Spring

No. on drawing	Name of component
32	Throttle unit
33	Actuator drive bolts
34	Special nut
35	Connecting nut
36	Lock-nut
37	Thin nut (counter-nut)
38	Position indicator
39	Pillar clamp
40	Hub plate
41	Washer
42	Washer
43	Spacer sleeve
44	Support ring
45	Vent plug
46	Drive nameplate
47	Bolt
48	Bolt
49	Bolt
50	Bolt pin M4x8
51	Nut M4-A
52	Nut
53	Nut
54	Spring washer
55	Ring washer
56	Wiper ring
57	O seal ring
58	O seal ring
59	O seal ring
60	O seal ring
61	Circlip
62	Upper cover

No. on drawing	Name of component
71	Bolt
72	Washer
73	O seal ring 8.3x2.4
74	O seal ring
75	Z circlip
76	Bracket (bracket unit)
77	Drive bolt
78	Carrier
79	Connecting piece
80	Rack-nut (counter-nut)
81	Warning table
82	Tensioning nut
83	Bolt sleeve
84	Wiper ring
85	O seal ring
86	Linear throttle casing seal
87	Bellows unit seal
88	Washer
89	Throttle cover, DW and DM
90	Throttle – DW
91	Throttle – DM
92	Spacer sleeve
93	Bellows throttle seal
94	Sleeve
95	O seal ring
96	O seal ring
97	O seal ring
98	Bolt
99	Nut
100	Spring washer
101	Sleeve
102	O seal ring

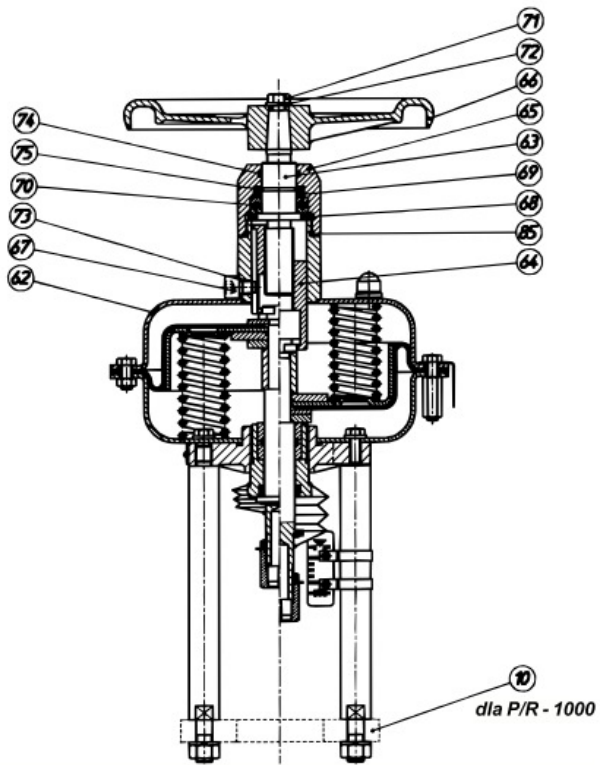


Figure 8 - Pneumatic positioning drive  
with manual drive type P/R-N

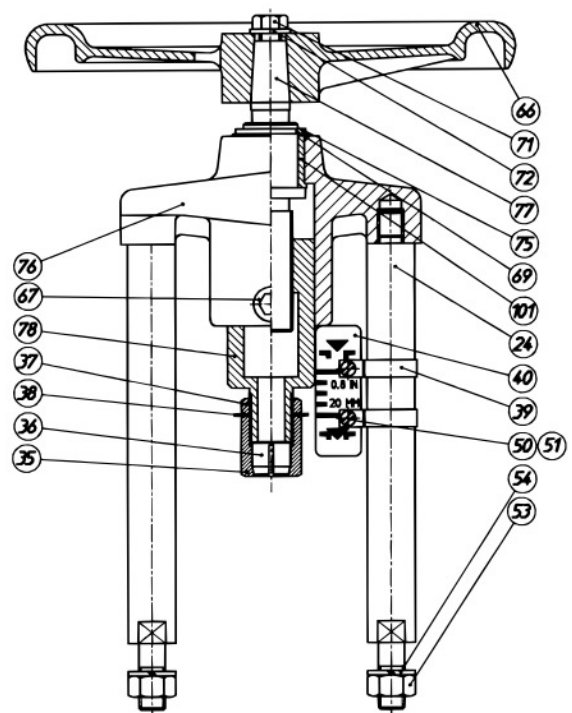


Figure 9 - Manual drive, type NN

## 5. Contacting us

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

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Manual version 1.3 07.11.2019