

Gas pressure regulator RMG 505



**operating and maintenance instruction
spare parts**

505.20

edition 09/98

safety and reliability

for the gas supply industry



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1. General

For the gas pressure regulator RMG 505 the detailed descriptive leaflet 505.00 is available, containing specifications, designs, and dimensions.

Accessories are described in the following brochures:

Regulator: for active unit	general brochure	630.00
	operation and maintenance instruction/ spare part list	630.20
	for monitor unit	
for monitor unit	general brochure	650.00
	operation and maintenance instruction/ spare part list	650.20
	filter: RMG 905	
filter: RMG 905	general brochure	905.00
	operation and maintenance instruction/ spare part list	905.20

The RMG publication "General operating instructions for gas pressure regulators and safety devices" provides information on installation, commissioning, and operation, and contains notices on fault removal.

The construction, set-up, supervision and maintenance of gas pressure regulating stations are subject to special technical rules, which should be strictly observed, in particular those given by DVGW worksheets G 490, G 491, G 495.

The frequency of periodical maintenance should be determined according to the prevailing service conditions and the type and composition of the gaseous medium. We therefore abstain from imposing any fixed intervals and would rather refer you to the recommendations given in DVGW worksheet G 495

For maintenance all parts are to be cleaned and subjected to a thorough visual inspection. A visual inspection should not be omitted when the course of operation or performance test have shown lack of accuracy. Particular care should be given to the checking of sealings and diaphragms, guide as well as engaging elements within switch and control devices and locking springs.

Damaged parts should be replaced by new ones.

The item numbers referred to in the maintenance instructions are identical with those of the spare parts drawings and spare parts lists.

The item numbers mentioned in the maintenance notices correspond to those in the spare part drawing and spare parts list.

Note! It is recommended to keep the parts marked EV in the spare parts list in stock for maintenance purposes.

1.1 Authorised persons

Specialist

Due to his professional training, practical involvement and experience, the specialist is sufficiently familiar with the repair of gas systems, their components and sub-assemblies. He must be acquainted with the tasks and functions of gas systems, the relevant regulations, directives and the general technical rules, and must be able to act independently.

Skilled worker

The skilled worker must have special proven knowledge of a particular maintenance measure. He must be sufficiently acquainted with the relevant regulations to safeguard a proper execution of the tasks delegated to him.

Instructed person


An instructed person is whoever has been trained in the delegated tasks.

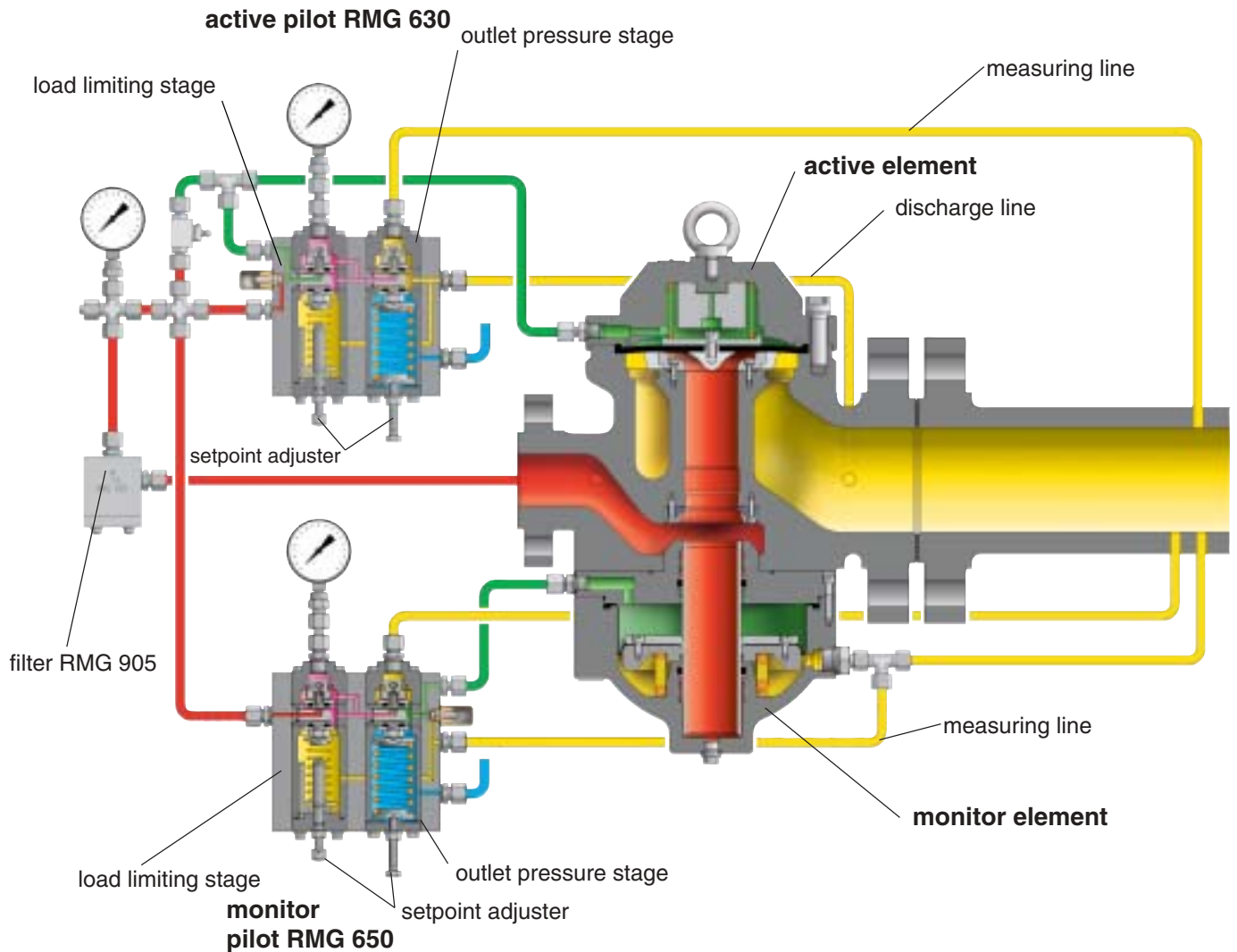
	instructed person	skilled worker	specialist
visual check			
inspection			
functional check			plus 2nd person
maintenance / repair			
Re-commissioning			
Operation of bypass lines			

1.2 Safety notices

1.2.1 general hazard identification

Safety notices are indicated by the following **key words** or **symbols** in this operating instruction:

indication	used for:
 Caution	Danger to equipment and the environment
Note	additional information



2. Special operating notices

2.1 Commissioning

- close outlet gate valve.
- release setpoint springs by turning the setpoint adjuster at the pilots RMG 630 (or RMG 640) and RMG 650 anti-clockwise.
- open inlet gate valve. Apply pressure slowly.
- set load limiting pressure at the active pilot RMG 630 to 10 bar by turning the setpoint adjuster clockwise.
- set load limiting pressure at the monitor adjuster RMG 650 to 5 bar above the set outlet setpoint value by turning the setpoint adjuster clockwise.
- Turn the setpoint adjuster of the pilot stage at the monitor pilot RMG 650 clockwise and set the outlet pressure setpoint.

Note

The gas flows via the discharge line of the monitor pilot into the outlet chamber and raises the pressure until its closing pressure has been reached. The precise setpoint adjustment at the monitor pilot is fixed later when sufficient gas is being supplied.

- open venting valve.

Note

The escaping gas causes the outlet pressure to drop.

- turn the setpoint adjustment screw of the regulating stage at the active pilot RMG 630 clockwise until outlet setpoint has been reached.

Note The pilot and closing functions can be checked by changing the relief flow via the venting valve. With the venting valve closed the closing pressure arises in the outlet chamber in line with the setpoint adjustment of the monitor pilot RMG 650.

- open outlet shut-off gate valve slowly.

Note It is recommended to set the outlet setpoint at the active pilot RMG 630 initially slightly below the pressure in the downstream pipe system.

- slowly turn setpoint adjustment screw at the active pilot RMG 630 until the outlet setpoint has been reached with sufficient gas supply flow.

Note For the more precise setting of the outlet pressure setpoint at the monitor pilot RMG 650 the setpoint adjustment screw of the active pilot RMG 630 must be turned slowly until the outlet pressure reaches the preset value of the monitor pilot. With further increases of the outlet pressure via the active pilot the monitor pilot automatically takes over the gas supply - it is then possible to correct the setpoint value. The preset outlet setpoint is then set at the active pilot by turning the setpoint adjustment screw anti-clockwise. This completes the setpoint adjustments.

2.2 Minimum pressure difference between the setpoint value of the monitor and the active regulator

For the monitor/active combination to function properly, a minimum pressure difference between the setpoint values of the pilot is required.

The outlet setpoint of the monitor pilot must be set above the setpoint value of the active pilot by at least the pressure difference Δp stated in the table below.

The size of the pressure difference depends on the setpoint value set at the active pilot.

outlet pressure range in bar setting at the active pilot	min. difference Δp in bar setting at the monitor pilot
1.....3	+0.3
3.....5	+0.3.....0.5
5.....10	+0.5.....0.8
10.....20	+0.8.....1.2
20.....40	+1.2.....1.8
40.....90	+1.8.....3.0

Note The setpoint adjustments at the active and monitor pilots must be made at sufficiently high and almost equal gas supply levels.

2.3 De-commissioning

- Turn the setpoint adjustment screw of the regulating stage at the active pilot RMG 630 anti-clockwise.

Note Close the active pilot.

- Slowly close the outlet gate valve.

Note The closing pressure of the monitor pilot will now develop in the outlet system.

- close inlet gate valve.

- open venting valve.

Caution For maintenance works all chambers must be depressurised.

3. Special maintenance notices

3.1 active unit

Due to the maintenance-friendly design the maintenance is principally limited to checking the throttle diaphragm. This needs to be checked for wear and swellings and must where necessary be renewed.

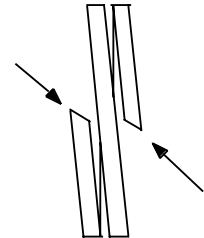
3.2 monitor unit

For maintenance of the monitor unit note the following:

support rings (41) - DN 50/100 only

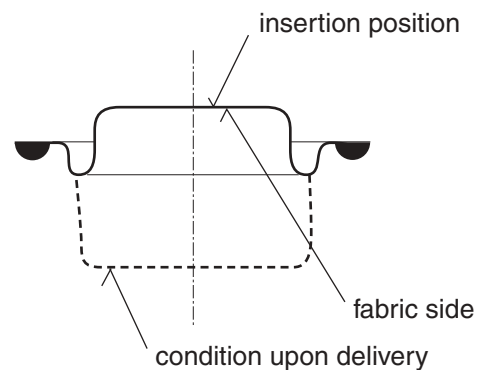
Note Note the position of the support rings during installation!

Both edge inclinations must face each other as shown in the diagram.



Rolling diaphragm (49)

- slightly lubricate rolling diaphragm, place into insertion position as shown in adjacent diagram and slide over diaphragm disk (48). The fabric side (with printed stamp) must rest on the diaphragm disk. Insert rolling fold between diaphragm disk and monitor cover (43).



Caution Do not use any sharp implements!

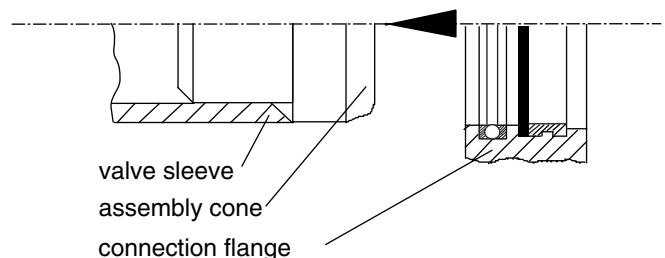
lubricant compartments (40)

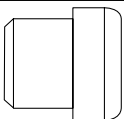
The lubricant compartments (40) in front of the two guiding rings (38) must be filled completely with silicone fat (part no. 00 027 052).

connection flange (43) for DN 50/100

connection flange (43) with guide sleeve (58) for DN 80/100 and DN 100/200

When sliding the connection flange (41) onto the valve sleeve (53) an assembly cone must be used to protect the sealing and guiding elements (38,39,41).



DN		part no. for assembly cone
50/100		10 013 547
80/150 u. 100/200		10 013 647

4. Tables

4.1 Tightening moments

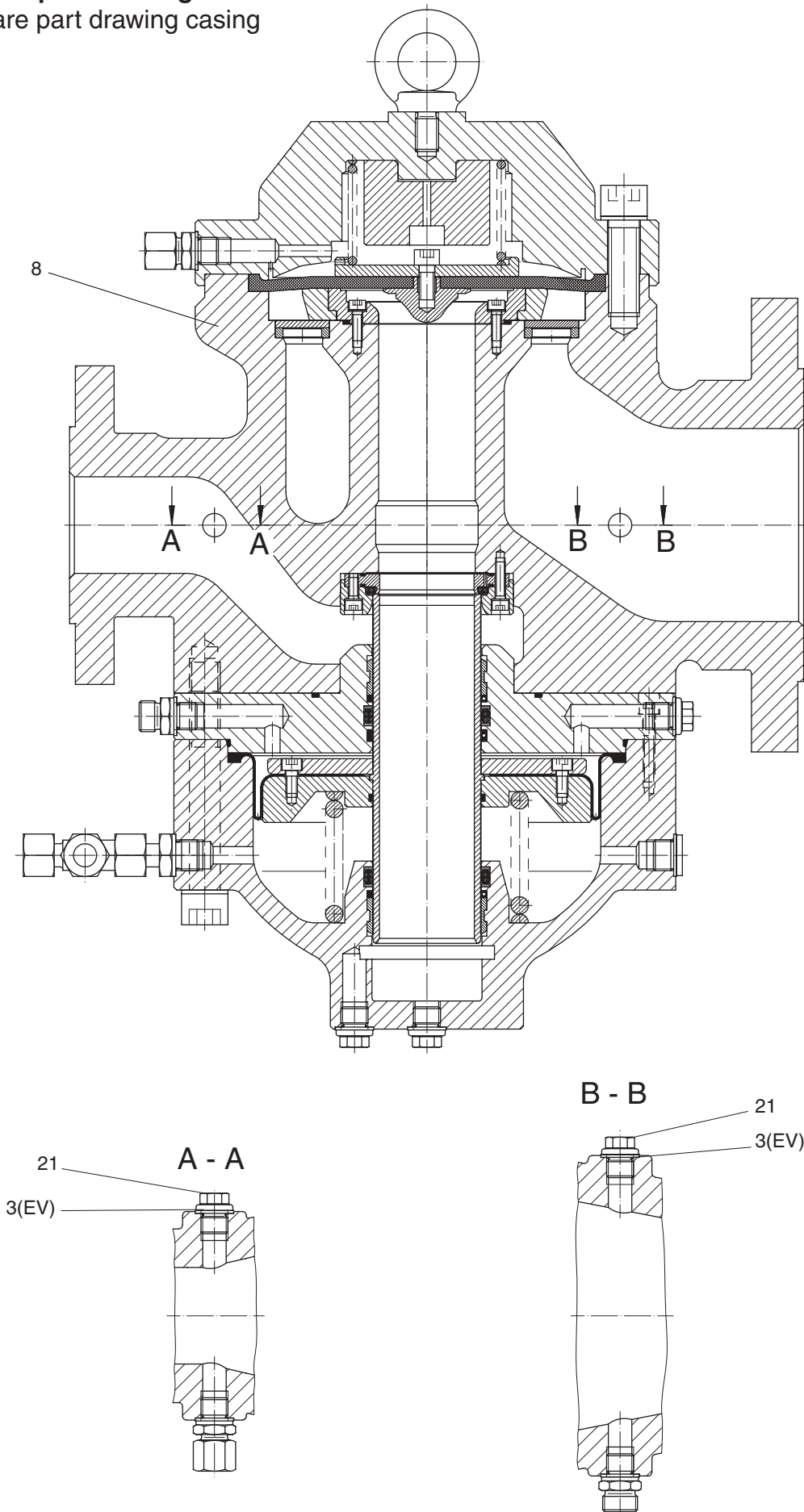
item no.	Torque in Nm		
	DN 50/100	DN 80/150	DN 100/200
19	160	160	160
24	160	240	240

4.2 Lubricants

component (brush lightly)	lubricant	part no.
all O rings	silicone grease	00 027 081
lubricant compartments (40), sliding faces of valve sleeve (53) valve sleeve seal, tensioning bead of rolling diaphragm (49) and flange diaphragm (27)	silicone grease	00 027 052
all fastening screws and all pipe screw connections	high duty grease	00 027 058

5. Spare part drawing

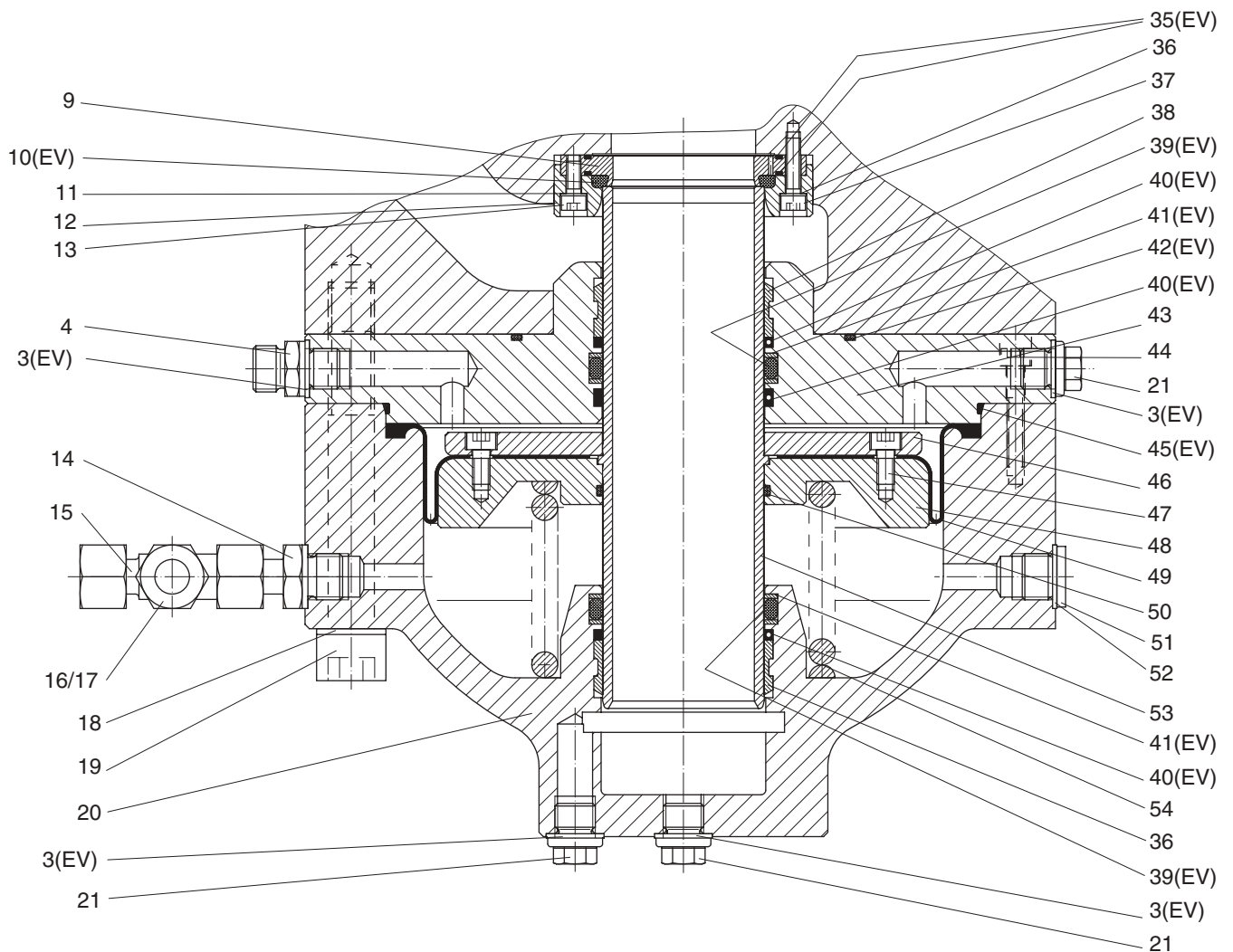
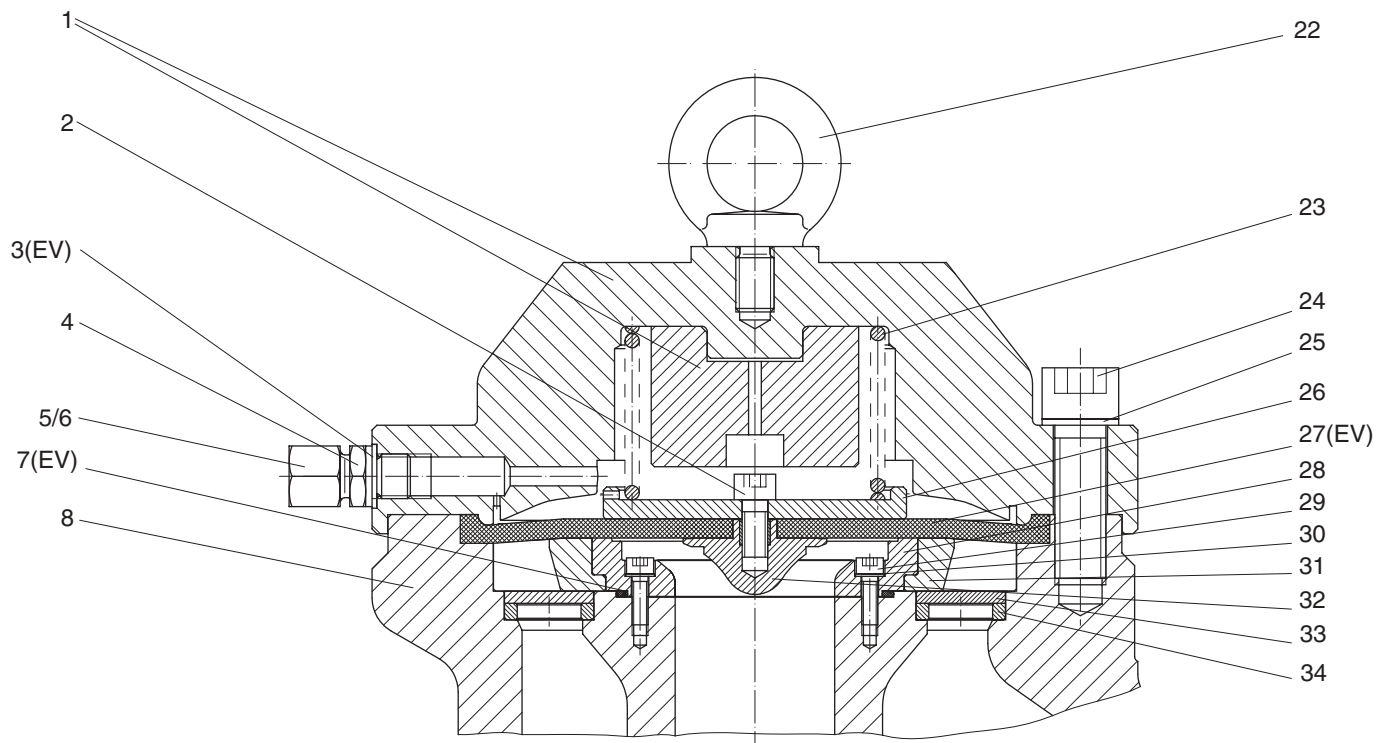
5.1 Spare part drawing casing



Note

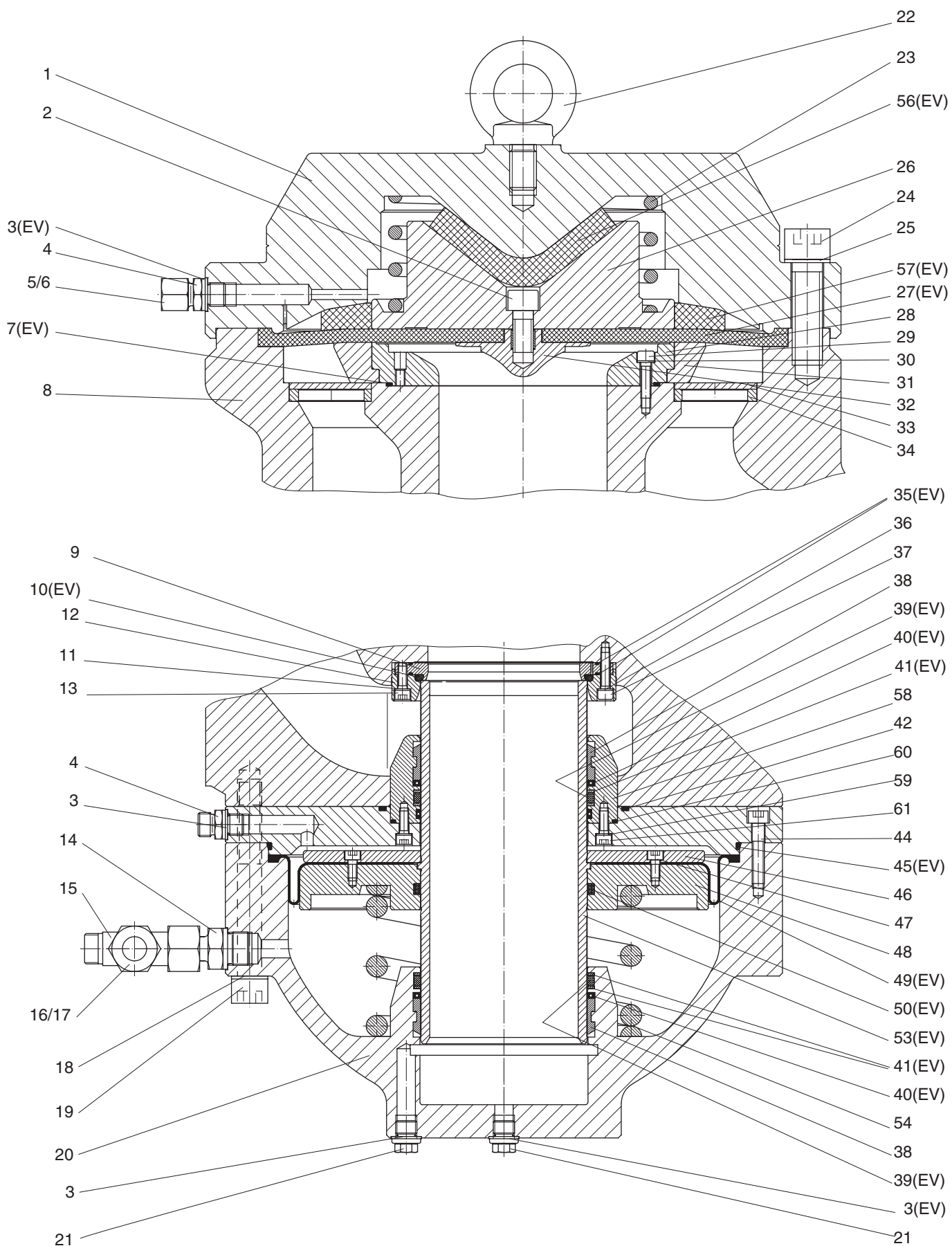
It is recommended to keep the parts marked "EV" in the spare part list in stock for maintenance purposes.

5.2 Spare part drawing RMG 505, DN 50/100



Note It is recommended to keep the parts marked "EV" in the spare part list in stock for maintenance purposes.

5.3 Spare part drawing RMG 505, DN 80/100 and DN 100/200



Note

It is recommended to keep the parts marked "EV" in the spare part list in stock for maintenance purposes.

6. Spare part list RMG 505

item no.	designation	quant	EV	material	part no.	part no.	part no.
					DN 50/100	DN 80/150	DN 100/200
1	diaphragm cover	1		St	10 021 620	10 021 653	10 021 685
2	pan head screw	1		St	00 008 176	00 010 393	00 010 393
3	sealing ring	9	EV	LM	00 018 842		
	sealing ring	8	EV	LM		00 018 842	00 018 842
4	connection piece	3		St	00 030 111	00 030 111	00 030 111
5	union nut	2		St	00 030 803	00 030 803	00 030 803
6	cutting ring	2		St	00 030 903	00 030 903	00 030 903
7	O ring	1	EV	KG	00 020 508	00 021 184	00 021 184
8	casing, optionally						
	PN 40	1		GS	10 025 870	10 025 920	10 025 970
	PN 40 / ANSI 600RF	1		GS	10 025 877	10 025 927	10 025 977
	ANSI 300RF	1		GS	10 025 873	10 025 923	10 025 973
	ANSI 300RF / ANSI 600RF	1		GS	10 025 878	10 025 928	10 025 978
	ANSI 300RJ	1		GS	10 025 874	10 025 924	10 025 974
	ANSI 600RF	1		GS	10 025 875	10 025 925	10 025 975
	ANSI 600RJ	1		GS	10 025 876	10 025 926	10 025 976
9	valve plate	1		NSt	10 025 890	10 025 990	10 025 990
10	O ring	1	EV	KG	00 021 307	00 021 310	00 021 310
11	locking washer	3		FSt	00 014 118		
	locking washer	4		FSt		00 014 111	00 014 111
12	pressure ring	1		AIBz	10 025 891	10 025 991	10 025 991
13	pan head screw	3		St	00 010 318		
	pan head screw	4		St		00 010 320	00 010 320
14	connection piece	1		St	00 030 038	00 032 697	00 032 697
15	T connection piece	1		St	00 030 608	00 031 423	00 031 423
16	union nut	1		St	00 030 804	00 030 807	00 030 807
17	cutting ring	1		St	00 030 904	00 030 906	00 030 906
18	locking washer	12		FSt	00 014 116		
	locking washer	30		FSt		00 014 116	00 014 116
19	pan head screw	12		St	00 010 648		
	pan head screw	30		St		00 010 647	00 010 647
20	monitor cover	1		St	10 025 882	10 025 982	10 025 982
21	screw plug	5		St	00 026 175		
	screw plug	4		St		00 026 175	00 026 175
22	ring bolt	1		St	00 010 021	00 010 003	00 010 003
23	pressure spring	1		FSt	10 011 149	10 011 249	10 011 249
24	pan head screw	10		St	00 010 555		
	pan head screw	24		St		00 010 601	00 010 601
25	locking washer	10		FSt	00 014 116		
	locking washer	24		FSt		00 014 139	00 014 139
26	diaphragm disk	1		LM	10 011 138	10 011 238	10 011 238
27	diaphragm	1	EV	KG	10 011 140	10 011 240	10 011 240

Note Parts marked EV should be kept in stock for maintenance purposes

item no.	designation	quant	EV	material	part no.	part no.	part no.
					DN 50/100	DN 80/150	DN 100/200
28	insert	1		St	10 023 551	10 023 631	10 023 631
29	pan head screw	4		St	00 010 361	00 010 097	00 010 097
30	locking washer	4		FSt	00 014 118	00 014 111	00 014 111
31	slotted valve part	1		LM	10 023 550	10 023 630	10 023 630
32	lower diaphragm plate	1		LM	10 011 137	10 011 237	10 011 237
33	metal foam ring	1		Ni	10 023 556	10 023 635	10 023 635
34	ring	1		St	10 023 555	10 023 634	10 023 634
35	O ring	2	EV	KG	00 021 306	00 021 309	00 021 309
36	locking washer	6		FSt	00 014 118		
	locking washer	8		FSt		00 014 111	00 014 111
37	pan head screw	6		St	00 010 561		
	pan head screw	8		St		00 010 150	00 010 150
38	guiding ring	2		K	00 021 009	00 021 015	00 021 015
39	O ring	2	EV	KG	00 020 596	00 021 016	00 021 016
40	silicone grease		EV		00 027 052	00 027 052	00 027 052
41	support ring	4	EV	KT	00 021 025	00 021 017	00 021 017
42	O ring	1	EV	KG	00 020 335	00 020 514	00 020 514
43	connection flange	1		St	10 025 883	10 025 983	10 025 983
44	pan head screw	3		St	00 010 562	00 010 425	00 010 425
45	O ring	1	EV	KG	00 020 573	00 021 311	00 021 311
46	mounting plate	1		LM	10 025 888	10 025 988	10 025 988
47	pan head screw	8		St	00 010 319		
	pan head screw	16		St		00 010 319	00 010 319
48	diaphragm disk	1		LM	10 025 886	10 025 986	10 025 986
49	rolling diaphragm	1	EV	KG	10 025 887	10 025 987	10 025 987
50	O ring	1	EV	KG	00 020 413	00 021 016	00 021 016
51	screw plug	1		St	00 010 381		
52	sealing ring	1	EV	LM	00 018 694		
53	valve sleeve	1	EV	St	10 025 884	00 025 984	10 025 984
54	pressure spring	1		FSt	10 025 889	18 356 714	18 356 714
55	connection piece	1		St	00 030 074	00 030 074	00 030 074
56	disk	1	EV	K		10 023 593	10 023 633
57	ring	1	EV	K		10 023 592	10 023 632
58	guiding sleeve	1		St		10 025 992	10 025 992
59	pan head screw	6		St		00 010 320	00 010 320
60	O ring	1	EV	KG		00 020 250	00 020 250
61	locking washer	6		FSt		00 014 111	00 014 111

Note Parts marked EV should be kept in stock for maintenance purposes

St..... steel	GLM..... light alloy cast	Cu..... copper
NSt..... rustproof steel	GZn..... zink cast	K.....plastic
FSt..... spring steel	MS..... brass	KG..... rubbery plastic
NFSt..... rustproof spring steel	GMS..... brass cast	KGT.... rubbery plastic with coating
GS..... steel cast	Bz.....bronz	KV..... rubber-like plastic material (NBR)
GGG..... cast iron with spheroidal graphite	GBz..... bronze cast	KT..... special plastic (FP)
LM..... light alloy	AIBz..... aluminium bronze	Ni..... nickel

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