

OPERATING AND MAINTENANCE INSTRUCTIONS / SPARE PARTS

Actuator RMG 672

672.20

Version 04/07

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1. General information

All persons involved with the assembly, operation and/or maintenance of safety shut-off valves must read and understand all of the following documents:

- **Technical product information** contained in valves and controls information sheets, e.g. 711.00.
- **General operating manual for gas pressure regulators and safety devices** – this RMG document contains information on assembly and operation as well as general information on troubleshooting.
- **Operating and maintenance instructions / spare parts 672.20** – this document contains more detailed information on assembly and operation of safety shut-off valves.
- **Actuator RMG 672** is an integral component of the safety shut-off valve and is described in this document, "Operating and maintenance instructions, spare parts".

There are **national laws and regulations** for all sorts of jobs on gas pressure governors, from planning to maintenance. Be sure to comply. (In Germany, for instance, DVGW work sheets G 600, G 459/II, G 491 and G 495.)

Inspection and maintenance intervals depend mostly on operating conditions and the nature and properties of the gas. There are no general rules or recommendations for intervals. For Germany, we recommend to consider maintenance intervals as stated in DVGW work sheet G 495 in a first instance. However, in the mid-term, intervals must be adapted to the requirements of each specific equipment.

During maintenance, components must be cleaned and then checked thoroughly. This is necessary even if there have not been any unusual observations during operation and/or functional testing. Checks must focus, in particular, on diaphragms and seals and all movable parts and their respective bearings. Any and all defective parts must be replaced with new ones. The same applies to O rings removed during disassembly.

Item numbers mentioned in the specific operating and maintenance instructions correspond with the numbers in the spare parts lists and drawings.


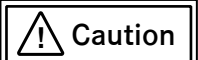
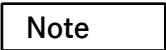
Some parts in the lists and drawings are marked with a letter "W". We recommend to always have a reserve of those parts in stock for maintenance purposes. Those spare parts are put together in another separate list at the end of the spare parts list.

The following actuators are used with the following equipments. For all, there are corresponding operating and maintenance instructions:

RMG 402	402.20
RMG 408	408.20
RMG 503 DN 25/50 - DN 150/300	503.20
RMG 530	530.20
RMG 711	711.20 and 711.21
RMG 721	721.20

1.1 Safety information

In this manual, safety information is highlighted by means of the following titles and eye catchers:

Eye catcher	used for:
	danger to life and limb
	danger of damage to property and/or the environment
	important additional information

2. Specific operating instructions

2.1 Opening the safety shut-off valve

The shut-off valve works on the principle of underpressure shut-off. It can be engaged only if the pressure at the measuring point corresponds to the operating pressure p_a .

Actuators K10a, K11a/1 and K11a/2 must engage first.

2.2 Engaging actuators K10a, K11a/1 and K11a/2

Unscrew sealing cap (1), turn round and put on rod (22, 50). Pull rod all the way to limit stop and let slip back slowly.

The actuator is engaged. The shut-off valve may be opened now.

3. Specific maintenance instructions

3.1 Actuators K10a, K11a/1 and K11a/2

Before dismantling the actuator from the shut-off valve switch device, you must release the actuator.

Devices with underpressure release are released automatically.

NOTE

If you want to dismantle the switch mechanism, you must first initiate the underpressure release and then pull back the rod (22) at least to its engaging position.

When mounting the switch mechanism, pull back rod (22) and push the lock bushing (12) over the spheres (28). (Position as in case of underpressure shut-off.)

- Rod (22) must move easily. If you should find any damages to the switching face (dents, burs etc.), replace the rod.
- The contact faces between the spring support (8) and lock bushing (12) must be free of grease and oil at all times.
- The spheres (28) and their support holes may be greased, but only a very thin layer of grease.

3.2 Actuation tests

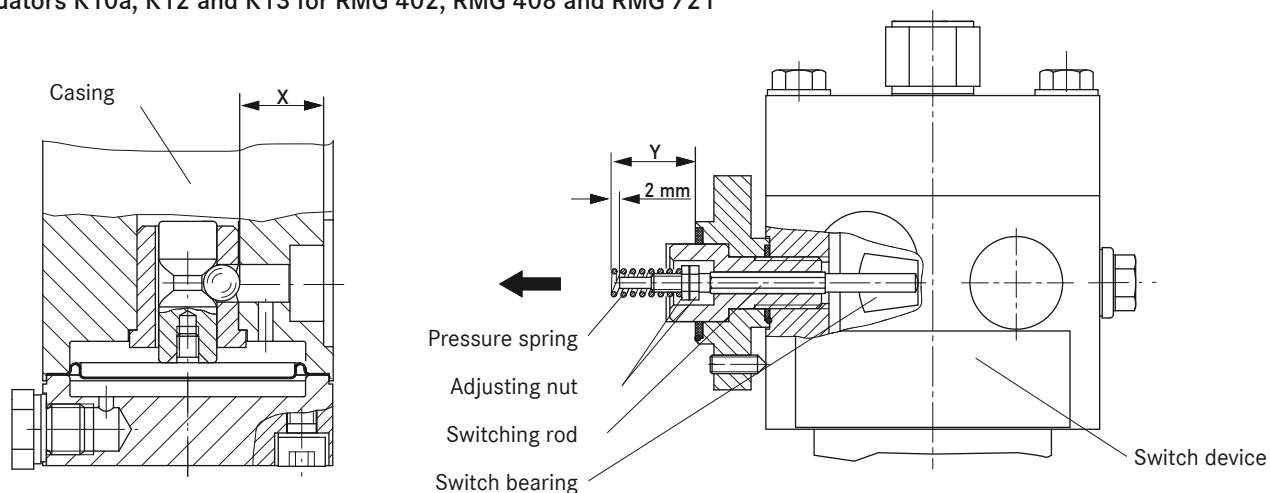
Actuation tests with actuators K10a, K11a/1 and K11a/2 for RMG 503, RMG 530 and RMG 711 may be carried out only with actuators mounted on shut-off valve switch devices. Otherwise, there is a danger of mechanical damage.

Caution

Before starting, remove sealing cap (1) from rod (22).

3.3 Instructions for testing and adjusting actuators / switch devices

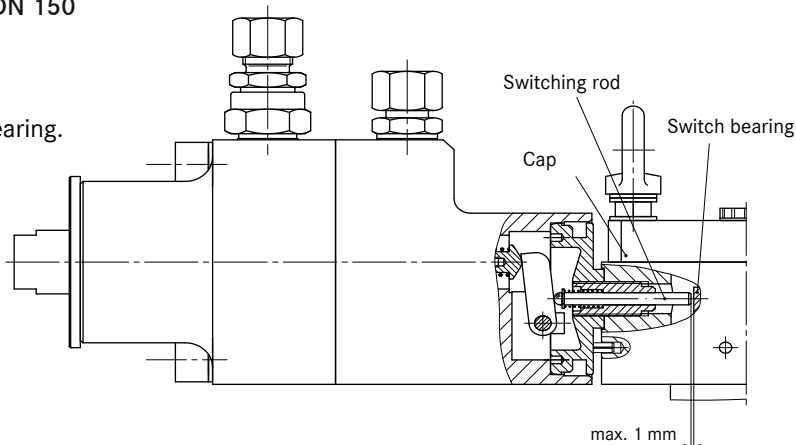
3.3.1 Actuators K10a, K12 and K13 for RMG 402, RMG 408 and RMG 721



Shut-off valve must be engaged. Switching rod must rest on switch bearing. The value of adjustment Y between joining piece and pressure spring must be equal to gap X (with respect to casing). In the event of deviations, turn adjusting nut to adjust. The switch rod must be about 2 mm shorter.

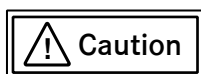
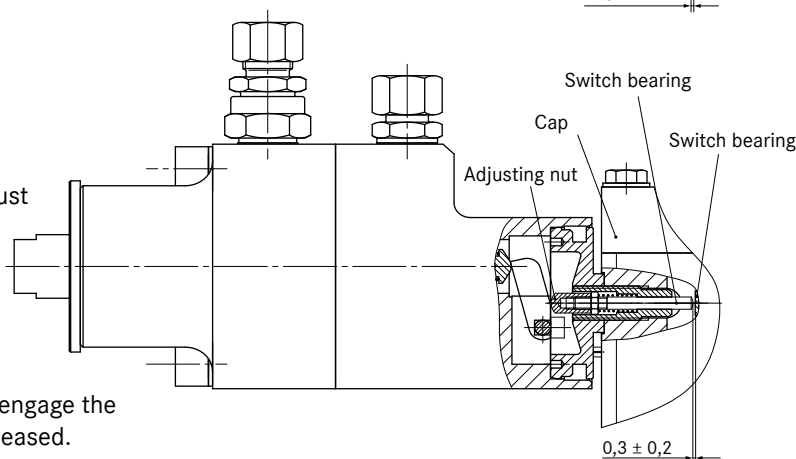
3.3.2 Actuators K10a, K11a/1 and K11a/2 for RMG 503, RMG 530 and RMG 711 DN 25 thru DN 150

- The shut-off valve must be engaged.
The cap must have been dismantled.
- The switch rod **must not** rest on the switch bearing.
- The gap must not be greater than 1 mm max.



3.3.3 Actuators K10a, K11a/1 and K11a/2 for RMG 711 DN 200 thru DN 300

- The shut-off valve must be engaged.
The cap must have been dismantled.
- The gap between switching rod and switch bearing should be 0.3 ± 0.2 . If necessary, adjust by turning the adjusting nut.



Caution Functional testing
It should not be possible to engage the actuator after it has been released.

3.4 Tightening torques M_A

Screws and bolts - Item no.	Tightening torques M_A in Nm		
	K10a, K11a/1, K11a/2	K12	K13
21	20	-	-
24	65	-	-
111	-	20	20
122	-	20	15

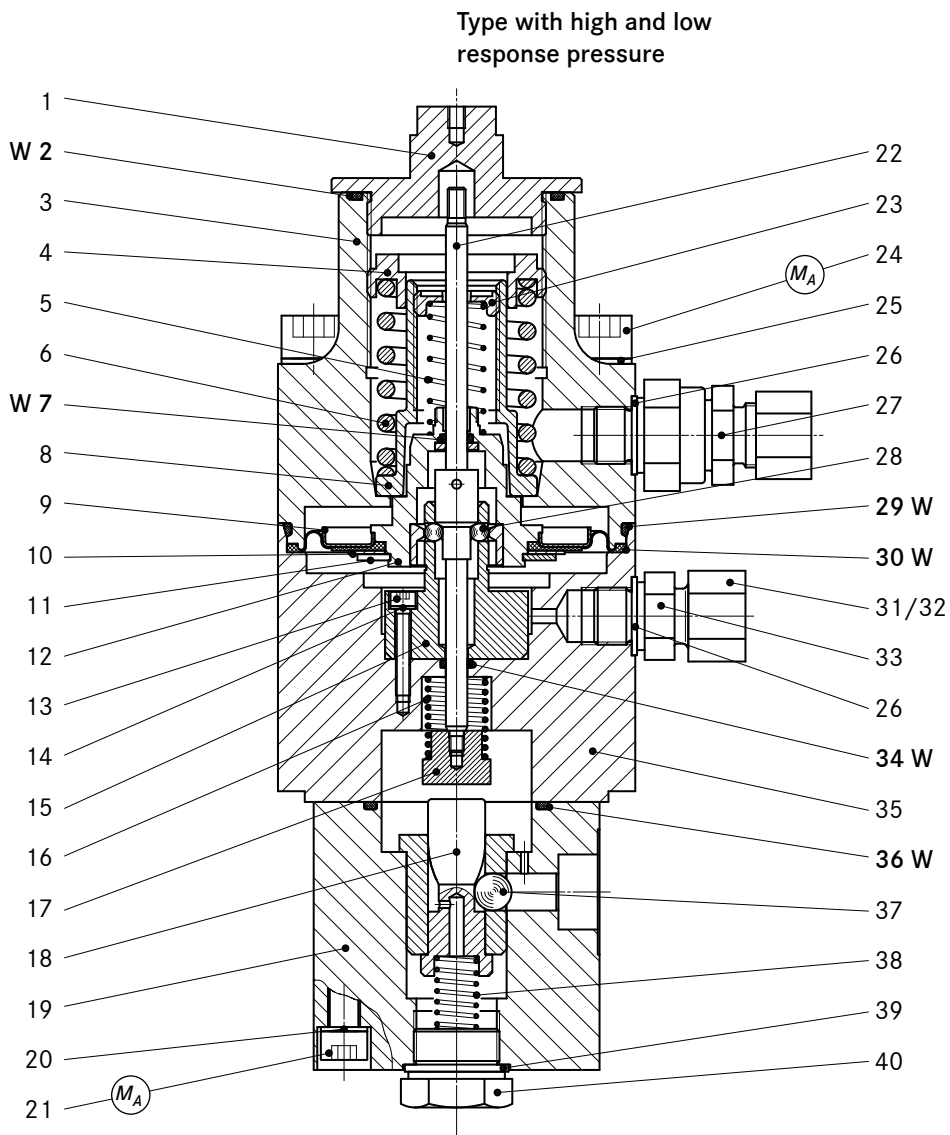
3.5 Lubricants

Components (cover with thin layer)	Lubricant	RMG part no.
Thread of spring plate (4, 101, 114) Tread of sealing cap (1)	Assembly paste	27091
All O rings Diaphragm support Slip guides, slip faces and switching elements	Silicone grease	27081
All fastening screws and screwed pipe connections	Assembly grease	28267

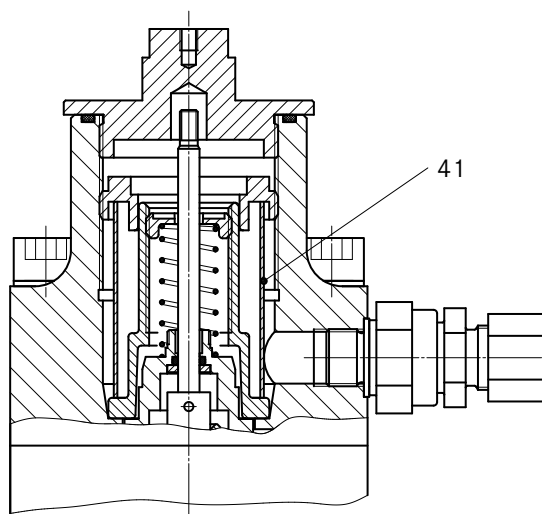
3.6 Montage und Einstellwerkzeuge

Tools	Part no.	for item no.
Case A19 DIN 5254	26531	11
Shut-off valve adjusting ke	10004912	4 and 23
Screw driver 14 DIN 911	26266	101

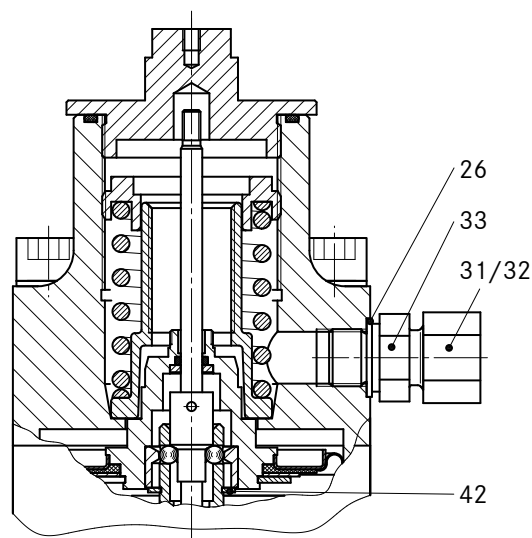
4.1.1 Spare parts drawing actuator K10a for RMG 402, RMG 408 and RMG 721



Type with low response pressure only



**Type with high response pressure only
Special design (without diaphragm-break safety device)**



M_A Be sure to comply with tightening torques in table on page 5.

W Parts should be held in stock for maintenance purposes.

4.1.2 Spare parts list actuator K10a for RMG 402, RMG 408 and RMG 721

Item no.	Denomination	Number	W	Material	Part no.
1	Sealing cap	1		LM	10001789
2	O ring	1	W	KG	20244
3	Diaphragm cap	1		LM	10022523
4	Spring plate	1		Ms	10001844
5	Pressure spring for low response pressure, optionally:				
5	wire ø 1.1 mm - light blue	1		FSt	10000868
5	wire ø 1.2 mm - white	1		FSt	10001837
5	wire ø 1.4 mm - black	1		FSt	10001760
6	Pressure spring for high response pressure, optionally:				
6	wire ø 2.5 mm - yellow	1		FSt	10001838
6	wire ø 3.2 mm - light red	1		FSt	10000866
6	wire ø 3.6 mm - dark red	1		FSt	10000867
6	wire ø 4.75 mm - white	1		FSt	10001839
7	O ring	1	W	KG	21069
8	Spring support	1		K	10008563
9	Diaphragm disk	1		St	10010611
10	Pressure disk	1		LM	10004882
11	Sealing ring	1		FSt	19131
12	Lock bushing, complete	1		St/LM/KG	10010619
13	Cheese head screw	3		St	10370
14	Lock washer	3		FSt	14125
15	Guide bush	1		Al/Bz	10001799
16	Pressure spring	1		FSt	10009227
17	Thrust piece	1		LM	10001785
18	Indexing bolt	1		NSt	10001780
19	Bottom, complete	1		LM/Ms	10001736
20	Lock washer	4		FSt	14112
21	Cheese head screw	4		St	10369
22	Rod, complete	1		St/NSt	10001787
23	Spring plate	1		K	10000856
24	Cheese head screw	4		St	10594
25	Lock washer	4		FSt	14114
26	Conical nipple	2		LM	18694
27	On / off valve	1			89190000
28	Sphere	6		St	5108
29	O ring	1	W	KG	20518
30	Diaphragm	1	W	KG	10010610
31	Union nut	1		St	30804
32	Cutting ring	1		St	30904
33	Connection pipe	1		St	30113
34	O ring	1	W	KG	20226
35	Actuator casing	1		LM	10001752
36	O ring	1	W	KG	20243
37	Sphere	1		St	26267
38	Pressure spring	1		FSt	10014029
39	Conical nipple	1		LM	18735
40	Sealing cap	1		Ms	10014030
41	Stopping pipe	1		LM	10001784
42	Sealing ring	1		FSt	19182

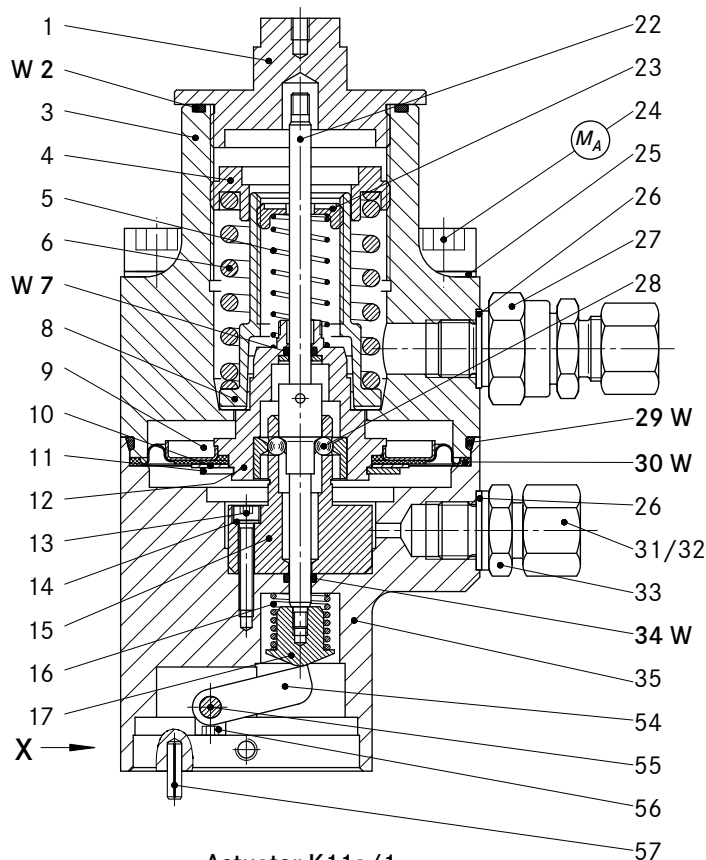
W Parts should be held in stock for maintenance purposes.

German abbreviations stand for the following materials:

St ... steel	LM ... light metal / alloy	GMs ... cast brass
NSt ... stainless steel	Ms ... brass	GZn ... cast zinc
FSt ... spring steel	GS ... cast steel	AlBz ... aluminium bronze
NFSt ... stainless spring steel	GGG ... spheroidal graphite cast iron	K ... synthetic materials
Bz ... bronze	GBz ... cast bronze	KG ... gummy synthetic materials
Cu ... copper	GLM ... cast light metal	SSt ... foamed materials

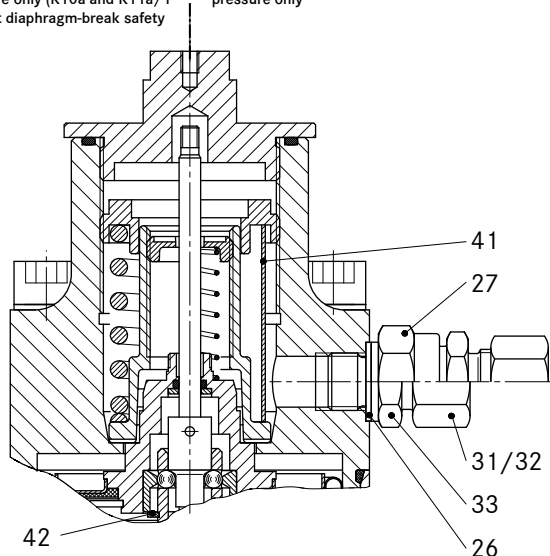
4.2.1 Spare parts drawing actuators K10a, K11a/1 and K11a/2 for RMG503, RMG530 and RMG711

Actuator K10a

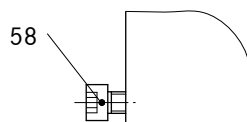


Type with high and low response pressure

Type with high response pressure only (K10a and K11a/1 without diaphragm-break safety device) Type with low response pressure only

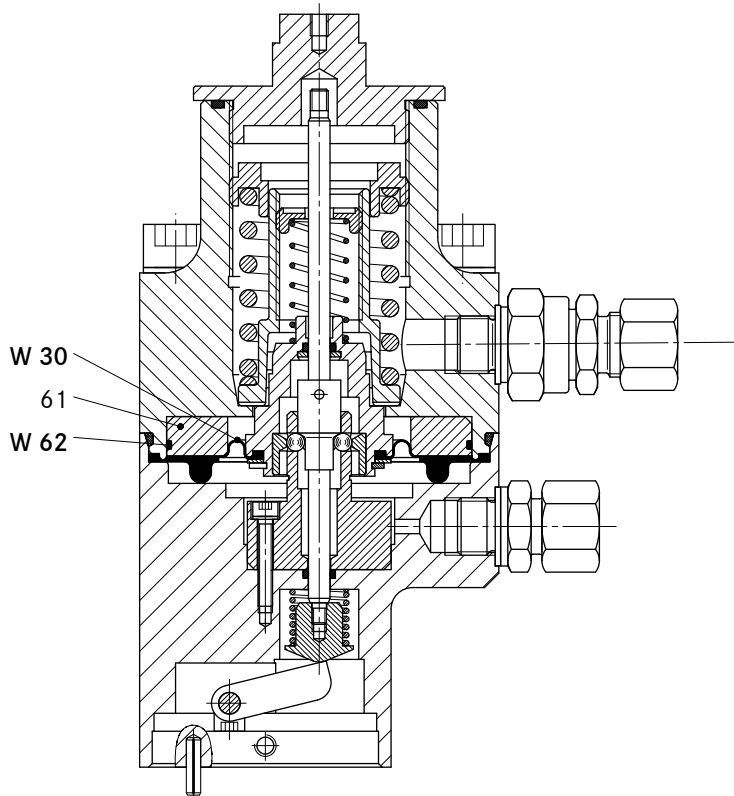


Ansicht X



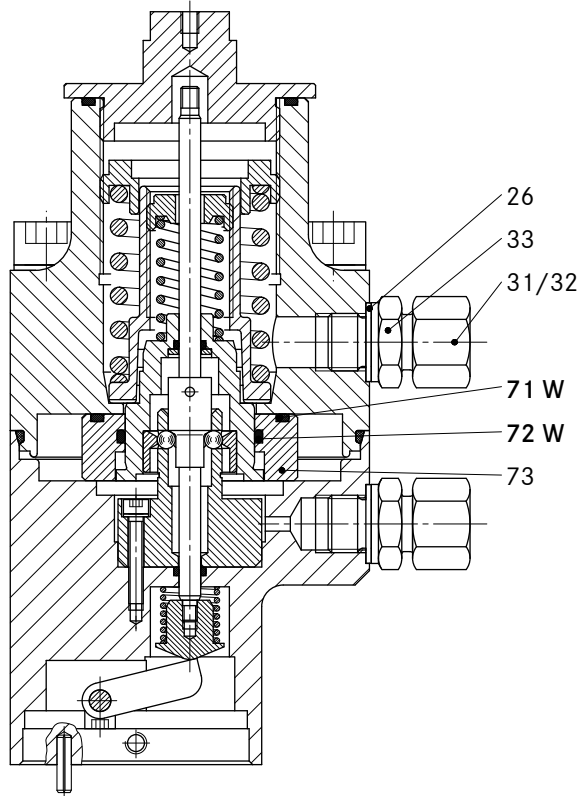
Actuator K11a/1

(for items missing, see K10a)



Actuator K11a/2

(for items missing, see K10a)



M_A Be sure to comply with tightening torques in table on page 5.

W Parts should be held in stock for maintenance purposes.

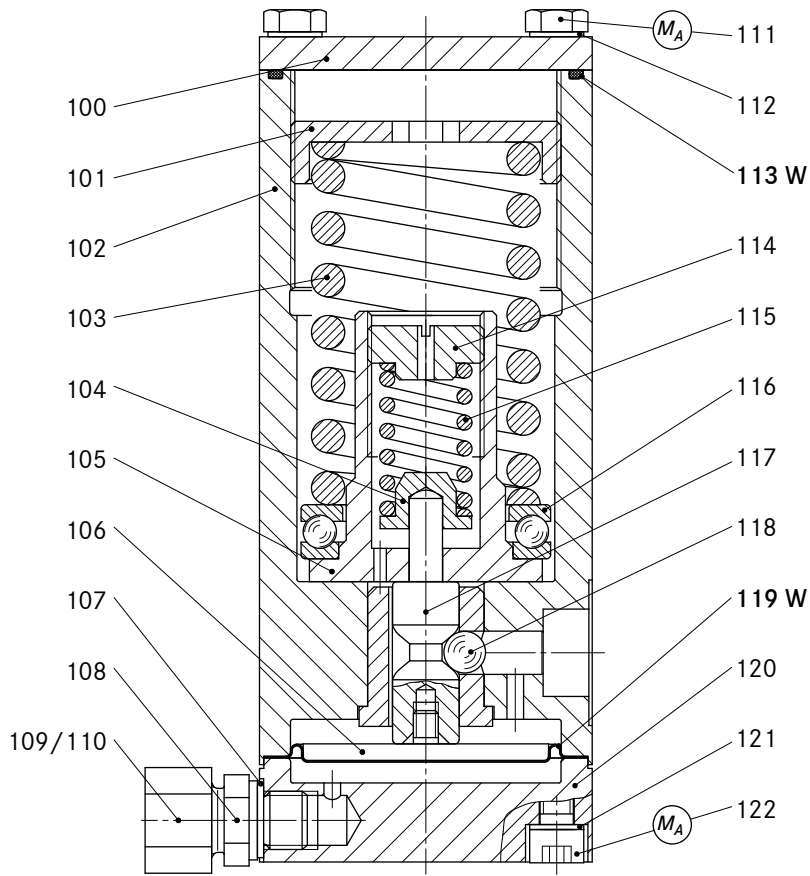
4.2.2 Spare parts list actuators K10a, K11a/1 and K11a/2

for RMG 503, RMG 530 and RMG 711

Item no.	Denomination	Number	W	Material	Part no.		
					K10a	K11a/1	K11a/2
1	Sealing cap	1		LM	10001789	10001789	10001789
2	O ring	1	W	KG	20244	20244	20244
3	Diaphragm cap	1		LM	10022523	10022523	10022523
4	Spring plate	1		Ms	10001844	10001844	10001844
5	Pressure spring for low response pressure, optionally:						
5	Wire ø 1.1 mm - light blue	1		FSt		10000868	
5	Wire ø 1.2 mm - white	1		FSt	10001837		
5	Wire ø 1.4 mm - black	1		FSt	10001760	10001760	
5	Wire ø 2.25 mm - fiery red	1		FSt		10001830	10001830
6	Pressure spring for high response pressure, optionally:						
6	Wire ø 3.2 mm - light red	1		FSt	10000866	10000866	
6	Wire ø 3.6 mm - dark red	1		FSt	10000867	10000867	
6	Wire ø 4.75 mm - white	1		FSt	10001839	10001839	10001839
7	O ring	1	W	KG	21069	21069	21143
8	Spring support	1		K	10008563	10008563	10008563
9	Diaphragm disk	1		St	10010611		
10	Pressure disk	1		LM	10004882	10022516	
11	Sealing ring	1		FSt	19131	19187	
12	Lock bushing, complete	1		St/LM/KG	10010619	10022512	10022525
13	Cheese head screw	3		St	10370	10370	10370
14	Lock washer	3		FSt	14125	14125	14125
15	Guide bush	1		Al/Bz	10001799	10001799	10001799
16	Pressure spring	1		FSt	10011077	10011077	10011077
17	Thrust piece	1		LM	10022527	10022527	10022527
22	Rod, complete	1		St/NSt	10022504	10022504	10022504
23	Spring plate	1		K	10000856	10000856	
23	Spring plate	1		Ms			10001842
24	Cheese head screw	4		St	10594	10594	10594
25	Lock washer	4		FSt	14114	14114	14114
26	Conical nipple	2		LM	18694	18694	18694
27	On / off valve	1			89190000	89190000	
28	Sphere	6		St	5108	5108	5108
29	O ring	1	W	KG	20518	20518	20518
30	Diaphragm	1	W	KG	10010610	10022515	
31	Union nut	1		St	30804	30804	
31	Union nut	2		St			30804
32	Cutting ring	1		St	30904	30904	
32	Cutting ring	2		St			30904
33	Connection pipe	1		St	30113	30113	
33	Connection pipe	2		St			30113
34	O ring	1	W	KG	21143	21143	21143
35	Actuator casing	1		LM	10022522	10022522	10022522
41	Stopping pipe	1		LM	10001784	10001784	10001794
42	Sealing ring	1		FSt	19182	19182	19182
54	Lever	1		Ms	10022508	10022508	10022508
55	Stud	1		NSt	10022507	10022507	10022507
56	Cheese head screw	2		St	10361	10361	10361
57	Dowel pin	1		FSt	17186	17186	17186
58	Cheese head screw	2		St	10004895	10004895	10004895
61	Intermediate ring	1		LM		10022514	
62	O ring	1	W	KG		21005	
71	O ring	1	W	KG			20243
72	O ring	1	W	KG			21144
73	Guide ring	1		Al/Bz			10022524

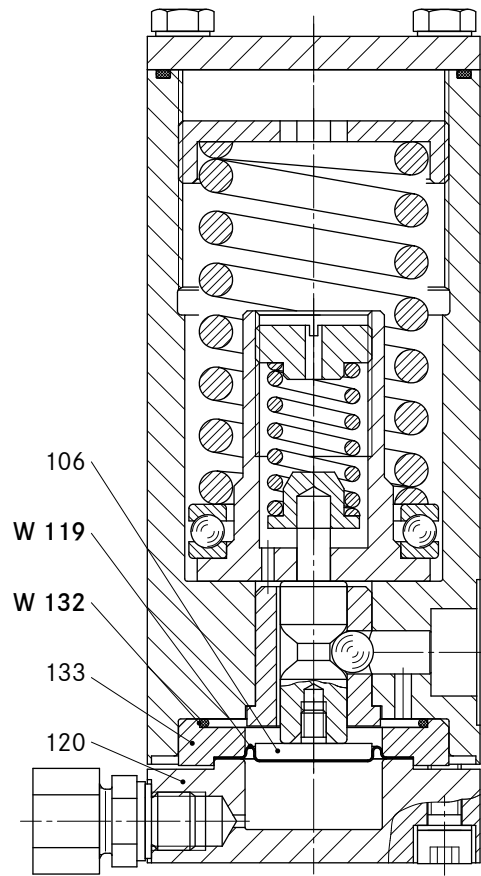
4.3.1 Spare parts drawing actuators K12 and K13
for RMG 402, RMG 408 and RMG 721

Actuator K12

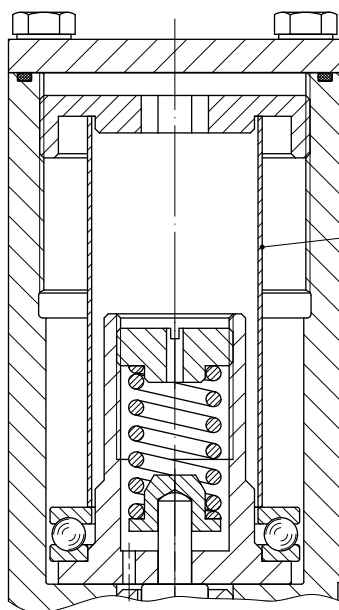


Actuator K13

(for items missing, see K12)



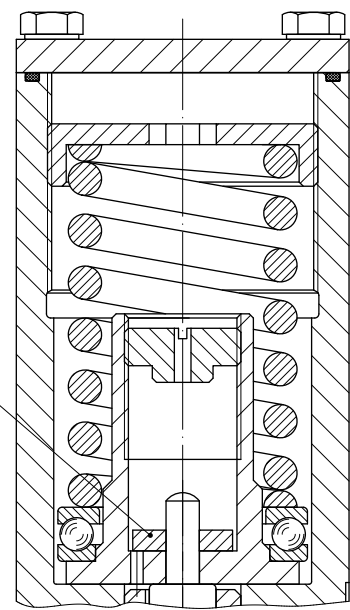
Type with low response pressure only



Type with high response pressure only (special design)

123

124



M_A Be sure to comply with tightening torques in table on page 5.

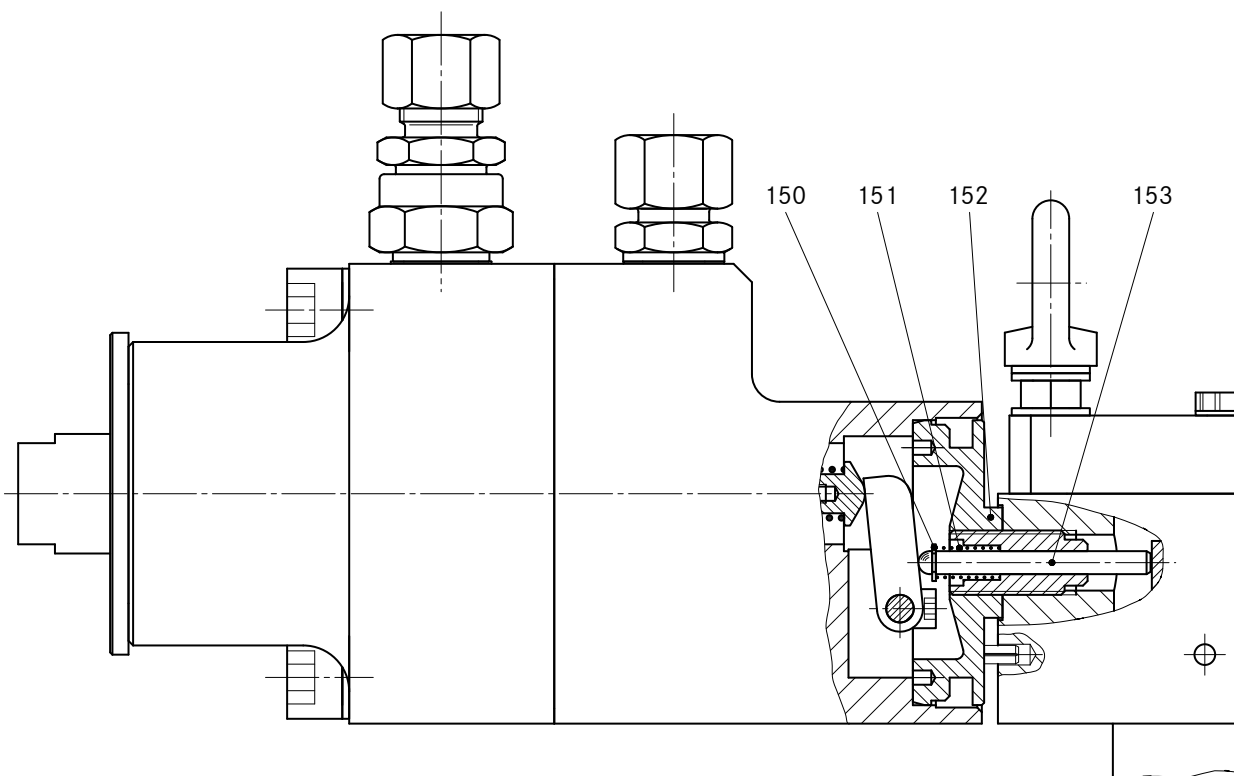
W Parts should be held in stock for maintenance purposes.

4.3.2 Spare parts list K12 and K13

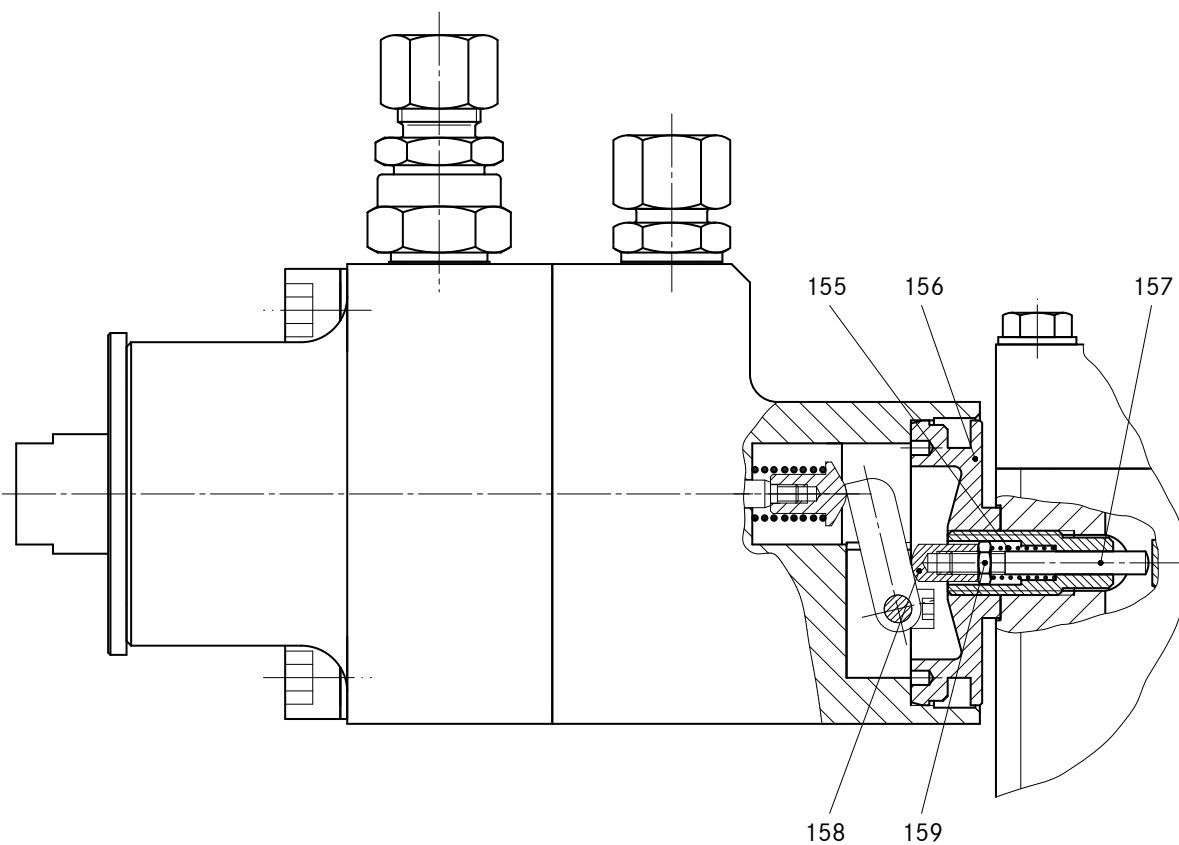
for RMG 402, RMG 408 and RMG 721

Item no.	Part no. Denomination	Number	W	Materials	K12	K13
100	Cap	1		St	10001777	10001777
101	Adjusting screw	1		Ms	10001776	10001776
102	Actuator casing, complete	1		LM/Ms	10001731	10001731
103	Pressure spring for high response pressure, optionally:					
103	Wire ø 5.0 mm - light green	1		FSt	10001820	
103	Wire ø 6.3 mm - yellow	1		FSt	10001821	10001821
103	Wire ø 8.0 mm - light red	1		FSt	10001822	10001822
104	Spring plate	1		NSt	10001774	10001774
105	Spring suspension	1		LM	10001773	10001773
106	Diaphragm disk	1		LM	10001750	10001751
107	Conical nipple	1		LM	18842	18842
108	Connection pipe	1		St	30074	30074
109	Union nut	1		St	30804	30804
110	Cutting ring	1		St	30904	30904
111	Hex screw	4		St	10358	10358
112	Lock washer	4		FSt	14122	14122
113	O ring	1	W	KG	20308	20308
114	Adjusting screw	1		Ms	10001775	10001775
115	Pressure spring for low response pressure, optionally:					
115	Wire ø 2.0 mm - white	1		FSt	10001825	10001825
115	Wire ø 2.8 mm - light blue	1		FSt	10001826	10001826
115	Wire ø 3.6 mm - black	1		FSt	10001827	10001827
116	Deep groove ball thrust bearing	1		St	26268	26268
117	Diaphragm rod	1		NSt	10001746	10001746
118	Sphere	1		St	26267	26267
119	Diaphragm	1	W	KG	10001757	10001763
120	Diaphragm cap	1		LM	10001744	10001745
121	Lock washer	4		FSt	14122	14122
122	Cheese head screw	4		St	10351	10351
123	Stopping pipe	1		LM	10001817	10001817
124	Adhesive disk	1		KG	10001818	10001818
132	O ring	1	W	KG		20307
133	Diaphragm support	1		LM		10001772

4.4.1 Spare parts drawing, accessories for actuators K10a, K11a/1 and K11a/2
Assembly on RMG 503, RMG 530 and RMG 711 DN 25 thru DN 150



Assembly on RMG 711 DN 200 thru DN 300

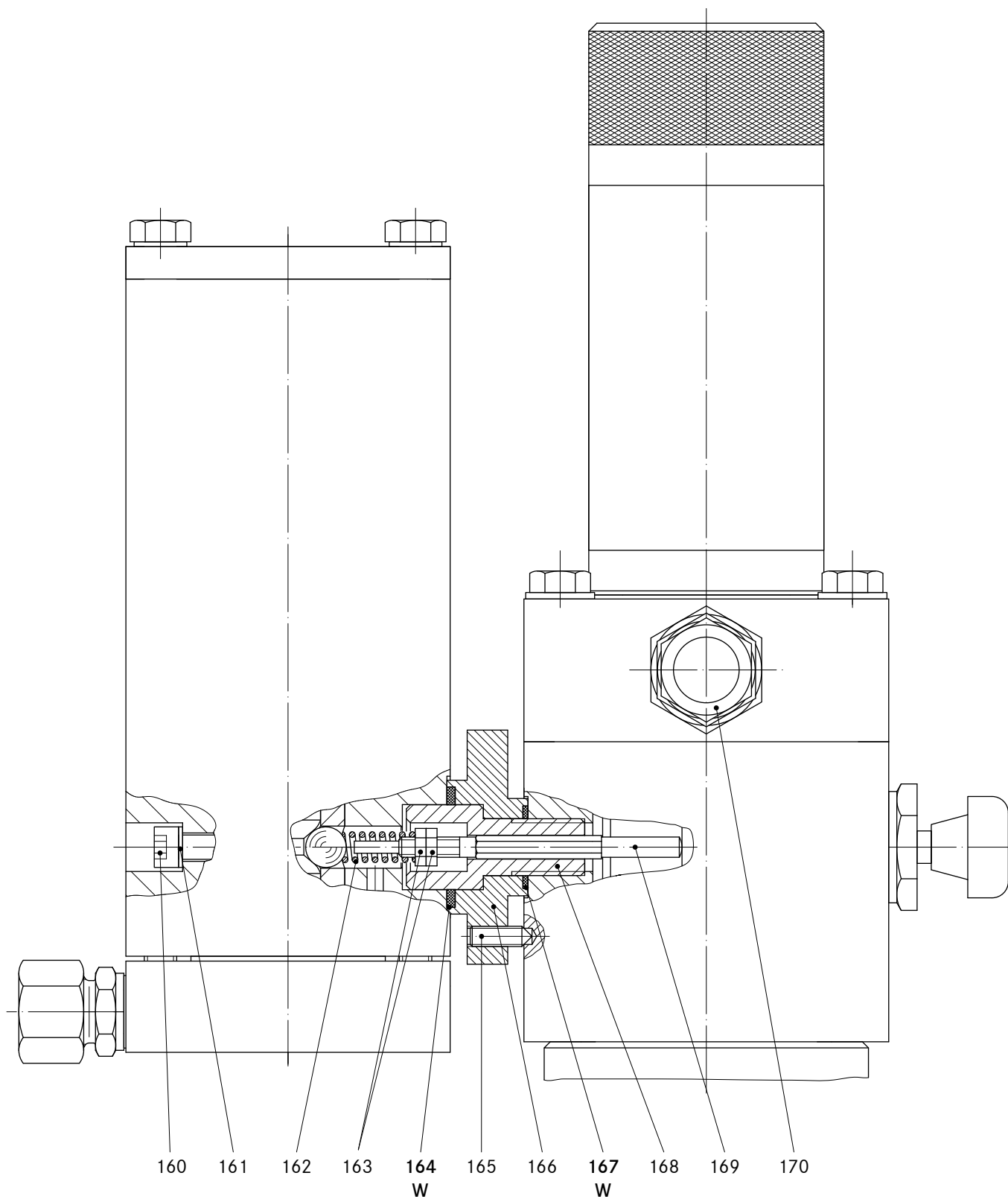


4.4.2 Spare parts drawing, accessories for actuators K10a, K11a/1 and K11a/2 Assembly on RMG 503, RMG 530 and RMG 711

Item no.	Denomination	Number	W	Material	Part no.
<i>Assembly on RMG 503, RMG 530 and RMG 711 DN 25 thru DN 150</i>					
150	Lock washer	1		FSt	19101
151	Pressure spring	1		FSt	10017639
152	Joining piece, complete, optionally for:				
152	RMG 503 DN 25/50 and DN 50/100	1		LM/Ms	10022545
152	RMG 530DN 50/100	1		LM/Ms	10022545
152	RMG 711 DN 25 and DN 50	1		LM/Ms	10022545
152	RMG 503 DN 80/150 and DN 100/200	1		LM/Ms	10022550
152	RMG 530 DN 80/150 and DN 100/200	1		LM/Ms	10022550
152	RMG 711 DN 80 and DN 100	1		LM/Ms	10022550
152	RMG 503 DN 150/300	1		LM/Ms	10022555
152	RMG 711 DN 150	1		LM/Ms	10022555
153	Switching rod optionally for:				
153	RMG 503 DN 25/50 and DN 50/100	1		NSt	10022543
153	RMG 530DN 50/100	1		NSt	10022543
153	RMG 711 DN 25 and DN 50	1		NSt	10022543
153	RMG 503 DN 80/150 and DN 100/200	1		NSt	10022548
153	RMG 530 DN 80/150 and DN 100/200	1		NSt	10022548
153	RMG 711 DN 80 and DN 100	1		NSt	10022548
153	RMG 503 DN 150/300	1		NSt	10022553
153	RMG 711 DN 150	1		NSt	10022553
<i>Assembly on RMG 711 DN 200 thru DN 300</i>					
155	Pressure spring	1		FSt	10017639
156	Joining piece, complete	1		LM/Ms	10030202
157	Switching rod	1		NSt	10030204
158	Adjusting nut	1		Ms	10030205
159	Hex nut	1		St	13046

4.5.1 Spare parts drawing, accessories for actuators K10a, K12 and K13

Assembly on RMG 402, RMG 408 and RMG 721



W Parts should be held in stock for maintenance purposes.

4.5.2 Spare parts list, accessories for actuators K10a, K12 and K13 Assembly on RMG 402, RMG 408 and RMG 721

Item no.	Denomination	Number	W	Material	Part no.
160	Cheese head screw	2		St	10550
161	Lock washer	2		St	14123
162	Pressure spring	1		FSt	10001831
163	Hex nut	1		St	13046
164	O ring	1	W	KG	20235
165	Headless pin (setscrew)	1		St	8486
166	Joining piece	1		St	10001810
167	O ring	1	W	KG	20310
168	Guide screw	1		NSt	10001811
169	Switching rod	1		NSt	10001812
<i>Only for actuators K12 and K13 with underpressure release</i>					
170	On / off valve	1			89190100

4.6 Parts for maintenance purposes

Actuators K10a for RMG 402, RMG 408 and RMG 721

Item no.	Denomination	Part no.
2	O ring	20244
7	O ring	21069
29	O ring	20518
30	Diaphragm	10010610
34	O ring	20226
36	O ring	20243

Actuators K10a, K11a/1 and K11a/2 for RMG 503, RMG 530 and RMG 711

Item no.	Denomination	Part no.		
		K10a	K11a/1	K11a/2
2	O ring	20244	20244	20244
7	O ring	21069	21069	21143
29	O ring	20518	20518	20518
30	Diaphragm	10010610	10022515	
34	O ring	21143	21143	21143
62	O ring		21005	
71	O ring			20243
72	O ring			21144

Actuators K12 and K13 for RMG 402, RMG 408 and RMG 721

Item no.	Denomination	Part no.	
		K12	K13
113	O ring	20308	20308
119	Diaphragm	10001757	10001763
132	O ring		20307

Accessories for actuators K12 and K13

Assembly on RMG 402, RMG 408 and RMG 721

Item no.	Denomination	Part no.
164	O ring	20235
167	O ring	20310