

Gas Pressure Regulator RMG 503



Operation and Maintenance, Spare Parts

503.20

edition 01/2003

valid for gas pressure regulator RMG 503
and integrated SAV system RMG 711

from serial no.
from serial no.

0207 31622
9706 19948

Serving the Gas Industry - WORLDWIDE



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1. General matters

For the gas pressure regulator with integrated SAV RMG 503 the detailed product information 503.00 is available containing technical data, designs and measurements as well as design descriptions and operating notices.

The pertinent subassemblies are described in separate operating and maintenance instructions:

regulator	RMG 630/640	630.20
filter	RMG 905	905.20
control unit	K 10a / K 11a	672.20
control unit	K 16 / K 17 / K 18	670.20
push button valve	RMG 910a	910.20
push button valve	RMG 913a	913.20

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.

For planning and maintenance of gas pressure regulators the relevant national regulations must be observed: Germany: DVGW worksheets G 600, G 459/II, G 490/I, G 491 and G 495

The time intervals for maintenance works on the pressure reducer RMG 218 (D118aV) depend largely on the operating conditions and the composition of the gas. Therefore, no fixed maintenance intervals are being prescribed. It is recommended to keep to the maintenance cycles stated in the DVGW worksheet G 495.




During maintenance all components must be cleaned and thoroughly checked for safety. A visual check is required even if irregularities were found during operation or functional checks. The check must cover seals and membranes in particular as well as any guiding components. Damaged components must be renewed.

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

It is recommended to keep the parts marked "W" in the spare part drawings and spare part lists in stock for maintenance purposes. These parts are listed on a separate sheet.

1.1 Safety notices

Safety indications are indicated by the following key words or symbols

indication	used for:
	danger to persons
	danger to equipment and the environment
	Important additional information

2. Gas pressure regulator

2.1 Special operating notices

2.1.1 Commissioning

- Close outlet gate valve
- Fully release the setpoint springs of the regulator RMG 630/640 in the regulating stage and the load limiting stage (regulator RMG 630 only) by turning the setpoint adjustment screw anti-clockwise.

Note!

- Open the startup valve.
The startup valve is used to achieve safe pressure compensation at the throttle diaphragm.

Caution

- Apply inlet pressure slowly.

Note!

- The startup valve must always be closed again.
- Adjust the setpoint value in the load limiting stage at the regulator RMG 630 to approx. 10 bar above p_a .
- Adjust the output pressure in small steps by turning the setpoint adjustment screw clockwise until the desired value has been reached. The load limiting pressure at the RMG 630 will rise automatically.

2.1.2. De-commissioning

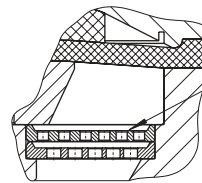
- Turn the setpoint adjustment screw of the regulating stage anti-clockwise
- Slowly close the outlet gate valve

2.2 Special maintenance notices

Due to the maintenance-friendly design the maintenance of the gas pressure regulator is principally limited to checking the throttle diaphragm. This must be checked for wear and swelling and where necessary be renewed.

Danger

- Prior to dismantling all gas supplied chambers must be depressurised.
- The throttle diaphragm (306) must be inserted into the main valve body without distortion.
Foam rings (314 and 319) from nominal width DN 80/150 are to be renewed with every maintenance.
- For designs with noise reduction the correct position of the relief plates (328) must be observed ->



The groove of the relief plates must face upwards

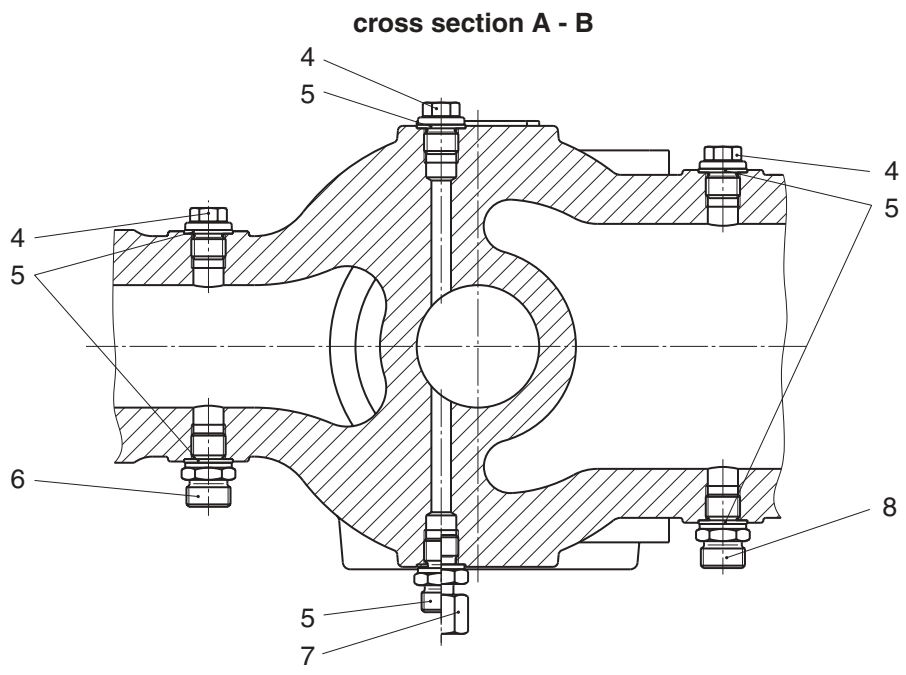
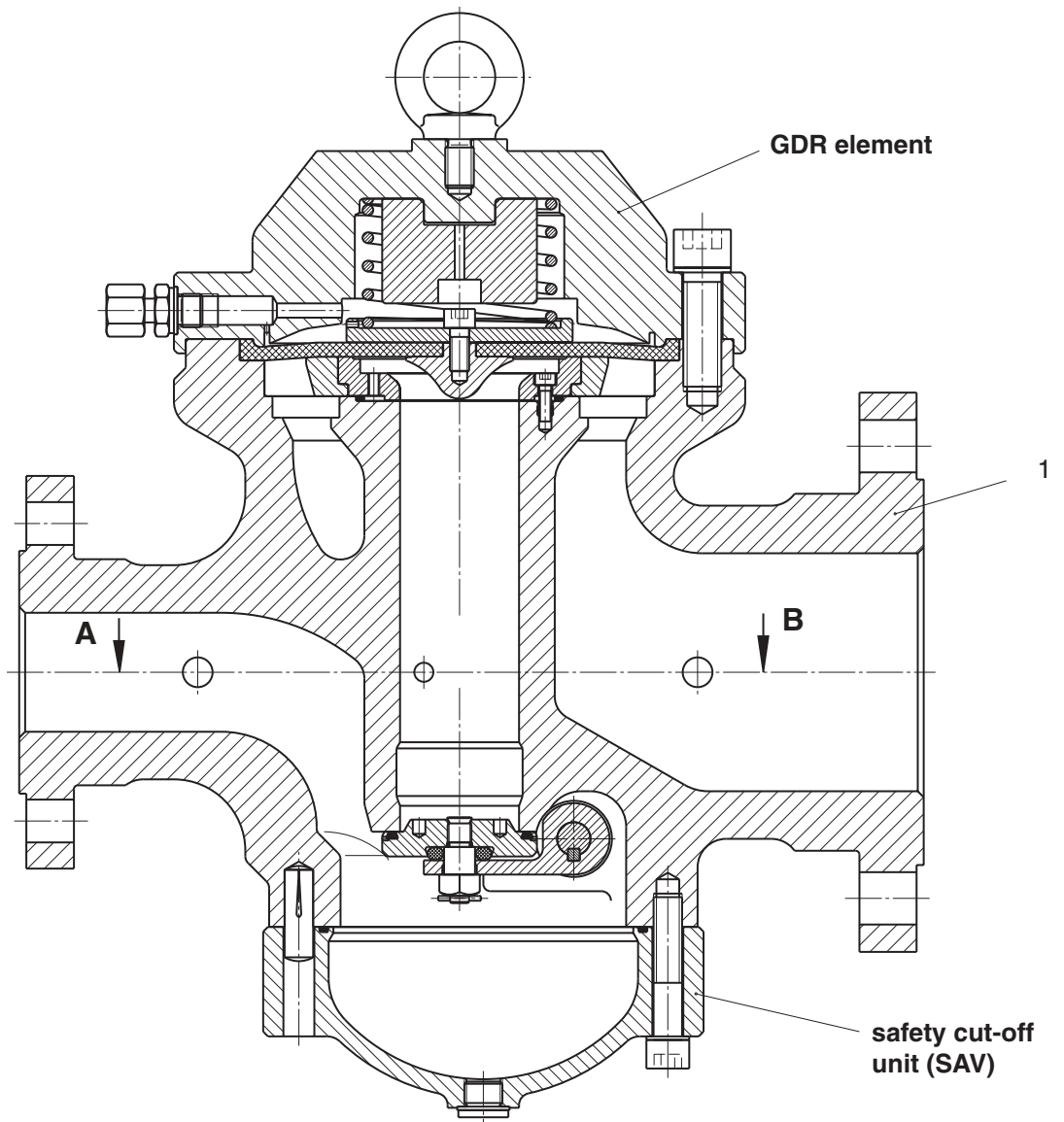
2.2.1 Screw tightening torques M_A in Nm

screw item no.	nominal width DN			
	25/50	50/100	80/150	100/200
318	160	160	240	240

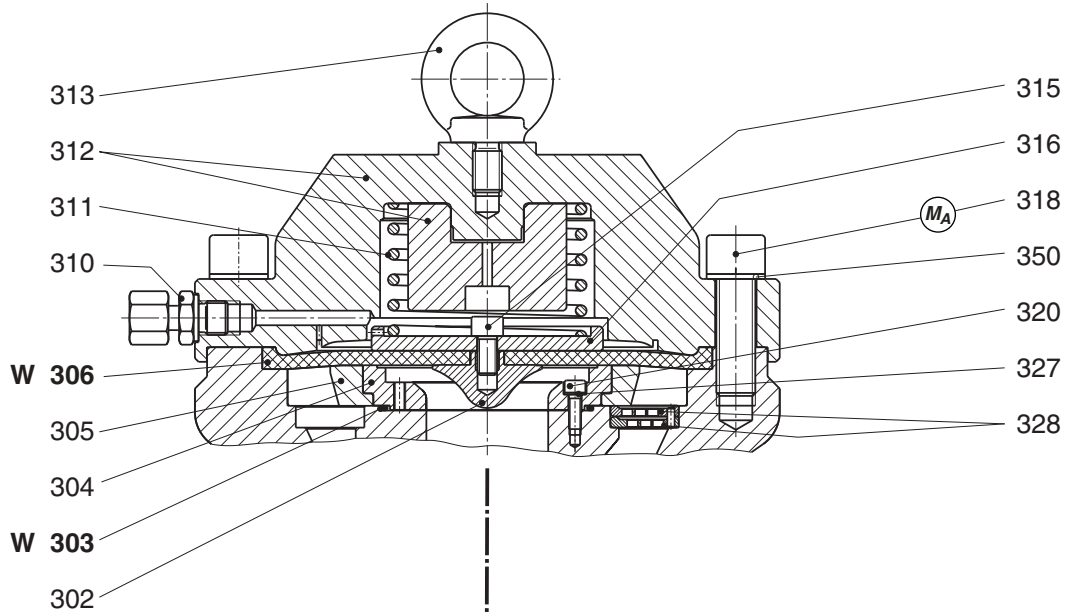
2.2.2 Lubricants

components	lubricants	RMG part no.
all O rings and diaphragm tensioning bead	silicon grease	00 027 081 (tube 0.1 kg)
all fastening screws and pipe screw connections	assembly grease	00 028 267

2.3.1 Spare part drawings

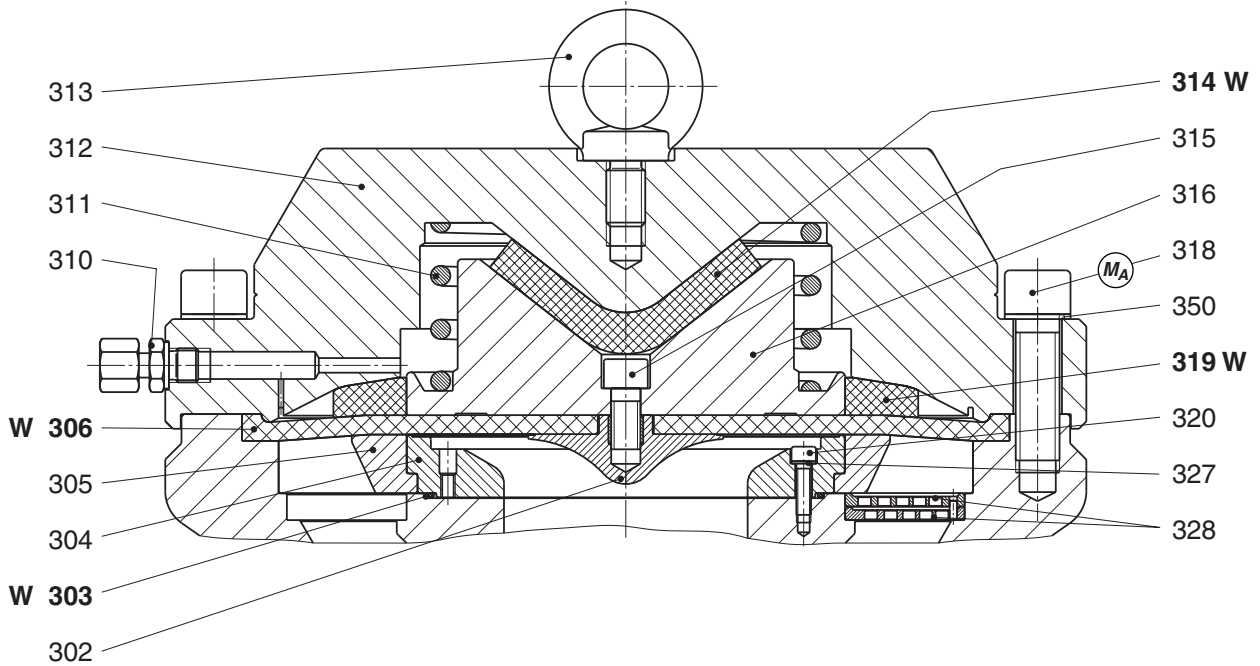


DN 25/50 and DN 50/100



without noise reduction with noise reduction

DN 80/150 and DN 100/200



MA Observe torques in table on page 4!

W Parts should be kept in stock for maintenance.

2.3.2. spare parts list

item no.	description	quant	W	material	RMG stock no.			
					DN 25/50	DN 50/100	DN 80/150	DN 100/200
1	body, version "-":							
1	PN 40	1		GS	10 024 470	10 024 520		10 024 620
1	PN 40 / ANSI 600 RF	1		GS	10 024 477	10 024 527		10 024 627
1	ANSI 300 RF	1		GS	10 024 473	10 024 523		10 024 623
1	ANSI 300 RF / ANSI 600 RF	1		GS	10 024 478	10 024 528		10 024 628
1	ANSI 300 RJ	1		GS	10 024 474	10 024 524		10 024 624
1	ANSI 600 RF	1		GS	10 024 475	10 024 525		10 024 625
1	ANSI 600 RJ	1		GS	10 024 476	10 024 526		10 024 626
1	body, version "a"							
1	PN 40	1		GS			10 027 670	
1	PN 40 / ANSI 600 RF	1		GS			10 027 677	
1	ANSI 300 RF	1		GS			10 027 673	
1	ANSI 300 RF / ANSI 600 RF	1		GS			10 027 678	
1	ANSI 300 RJ	1		GS			10 027 674	
1	ANSI 600 RF	1		GS			10 027 675	
1	ANSI 600 RJ	1		GS			10 027 676	
4	screw plug	3		St	00 026 175	00 026 175	00 026 175	00 026 175
5	sealing ring	6		LM	00 018 842	00 018 842		
5	sealing ring	5		LM			00 018 842	00 018 842
6	connecting piece	1		St	00 030 074	00 030 074	00 030 111	00 030 111
7	connecting piece	1		St	00 030 111	00 030 111	00 030 023	00 030 023
8	connecting piece	1		St	00 030 074	00 030 074	00 030 074	00 030 074

W Parts should be kept in stock for maintenance purposes

material identifications

St ... steel	LM ... light alloy	SSt ... foam
NSt ... rustproof steel	Ms ... brass	K ... plastic
FSt ... spring steel	Cu ... copper	KG ... rubbery plastic
NFSt ... rustproof spring steel	Bz ... bronze	KGT ... rubbery plastic with coating
GS ... steel cast	GLM ... light alloy cast	KV ... rubber-like plastic material (NBR)
GGG ... steel cast with spheroidal graphite	GMs ... brass cast	KT ... special plastic (NBR)
GZn ... zink cast	AIBz ... aluminium bronze	PGL ... plexiglass
GBz ... bronze cast		

item no.	description	quant	W	material	RMG stock no.			
					DN 25/50	DN 50/100	DN 80/150	DN 100/200
302	flow divider	1		LM	10 011 137	10 011 137	10 011 237	10 011 237
303	o-ring	1	W	KG	00 020 508	00 020 508	00 021 184	00 021 184
304	insert	1		St	10 023 551	10 023 551	10 023 631	10 023 631
305	slotted valve part	1		LM	10 023 550	10 023 550	10 023 630	10 023 630
306	diaphragm	1	W	KG	10 011 140	10 011 140	10 011 240	10 011 240
310	connecting piece	1		St	00 030 023	00 030 023	00 030 023	00 030 023
311	spring	1		NFSt	10 011 149	10 011 149	10 011 249	10 011 249
312	diaphragm cover	1		St	10 021 590	10 021 620	10 021 653	10 021 685
313	pan head screw	1		St	00 010 021	00 010 021	00 010 003	00 010 003
314	foam disc	1	W	SSt			10 023 593	10 023 633
315	pan head screw	1		St	00 008 176	00 008 176	00 010 393	00 010 393
316	diaphragm plate	1		LM	10 011 138	10 011 138	10 011 238	10 011 238
318	pan head screw	10		St	00 010 555	00 010 555		
318	pan head screw	24		St			00 010 601	00 010 601
319	foam disc	1	W	SSt			10 023 592	10 023 632
320	pan head screw	4		St	00 010 361	00 010 361	00 010 097	00 010 097
327	locking washer	4		St	00 014 118	00 014 118	00 014 123	00 014 123
328	release plate	1		LM	10 023 510	10 023 510	10 023 589	10 023 589
350	locking washer	10		St	00 014 116	00 014 116		
350	locking washer	24		St	00 014 139	00 014 139	00 014 139	00 014 139

3. Integrated SAV system RMG 711

3.1 Special operating notices

opening the safety shut-off valve (SAV)

- To open the SAV main valve insert handle (712) into the corresponding bore of the disk (734) and turn.

Note!

With control units K 10a or K 11a the SAV main valve can only be opened if the control units have first been engaged.

- To engage the control units K 10a and K 11a screw off lid, turn upside-down, and screw lid on to the switching rod inside the control unit. Then pull the switch rod upward to the stop (see also 672.20).

Note!

The control units K 10a and K 11a are fitted with an underpressure shut-off device. They can only be engaged if the pressure at the measuring point corresponds to the operating pressure.

Test switching of the control units K 10a and K 11a



Test switching must only take place if the control units K 10a and K 11a have been fitted to the switch casing (710), otherwise mechanical damage could result.

3.2 Special maintenance notices

3.2.1 switch gear

- Prior to removing the switch bearing (707) the pressure piece (768) must be removed from the switch casing (710).
- Please note during assembly of the switch bearing:
 - an angled double edge of the switch bearing must point towards the pressure piece (768).
(see 3.3.1 SAV system cross section A-A)
 - the sliding ring (721) must be positioned below the switch bearing.

3.2.2 Main valve

valve flap (753)

- To visually check the o-ring of the valve flap (754) remove cover (747) and open SAV (engage).
When inserting a new lubricated o-ring (774) into the groove of the valve flap (753) the o-ring should initially be pressed into the groove at 3 - 4 points spaced equally along the diameter. Only then should the o-ring be pressed in completely.
After separating the valve flap from the valve flap lever (750) the locking nut (752) must be tightened with the correct torque and must further be secured using the splint (773).

closing springs (731)

- 2 grooves for receiving the closing springs are formed into the spring casing (733). The grooves are required for the different reception of the closing springs in the desings "right hand operation" or "left hand operation".
- When inserting the closing springs, they should initially be placed into the spring casing (733). The correct orientation of the springs as shown in figure 1 and 2 should be observed.
- The closing springs are properly pre-tensioned when all 4 fastening screws (732) can be fitted to the casing (approx. half a turn of the spring casing). The valve flap must be in the "closed" position.

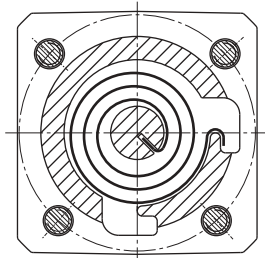


figure 1 closing spring inserting position for "right hand" operation

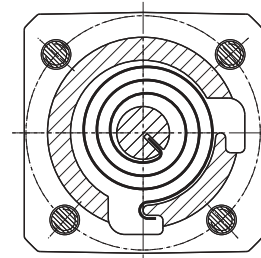


figure 2 closing spring inserting position for "left hand" operation

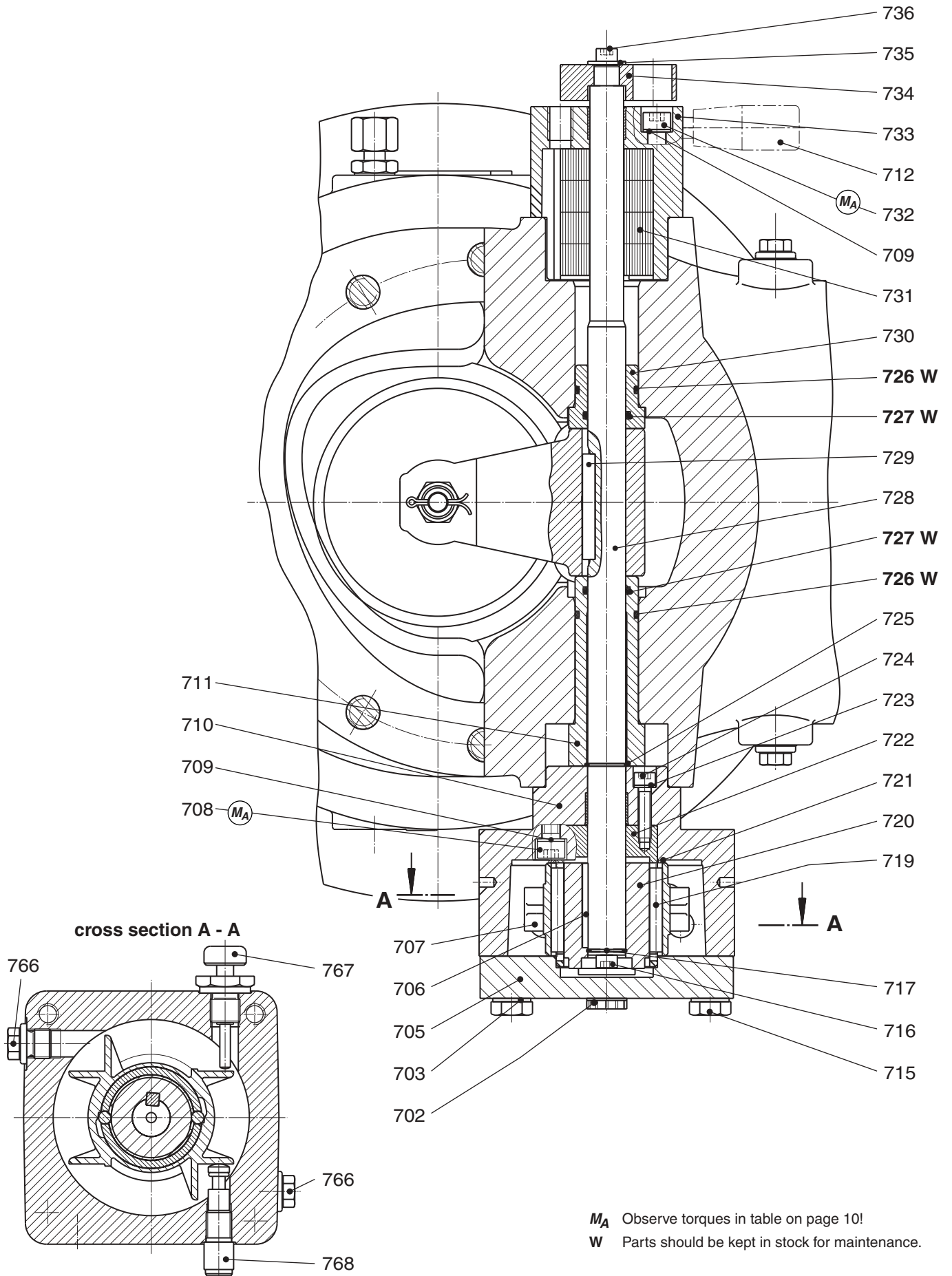
3.2.3 Screw tightening moments M_A

DN	Torque M_A in Nm				
	Schrauben-Pos.-Nr.				
	708	732	745	752	800
25/50	8	8	40	8	-
50/100	8	8	75	12	-
80/150	20	20	160	40	10
100/200	20	20	160	40	10

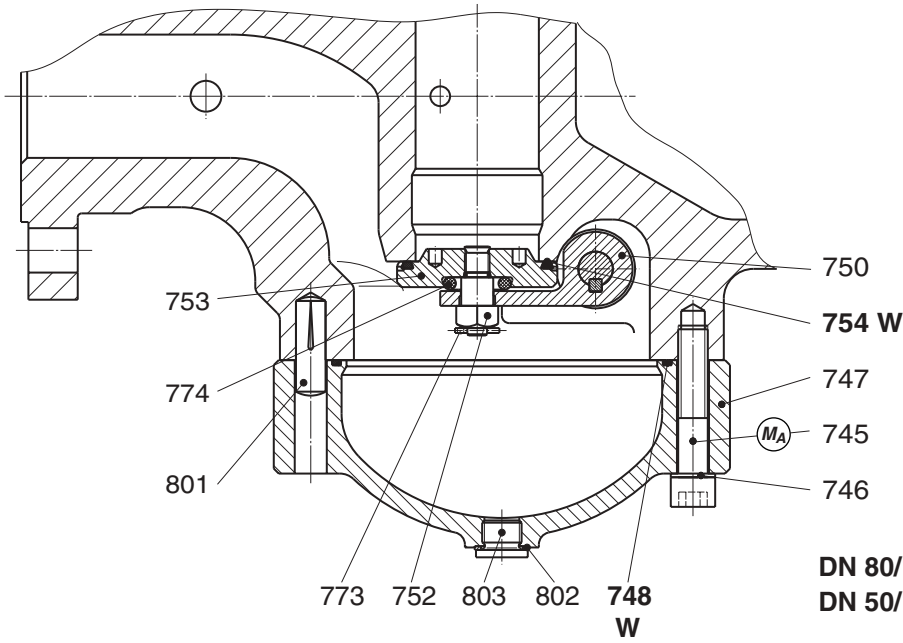
3.2.4 Lubricants

components	lubricants	RMG part no.
manual actuator thread (767)	assembly paste	00 027 091
all o-rings, sliding sleeves, sliding faces and switch elements	silicone grease	00 027 081 (tube 0.1 kg)
all fastening screws and pipe screw connections	assembly grease	00 028 267

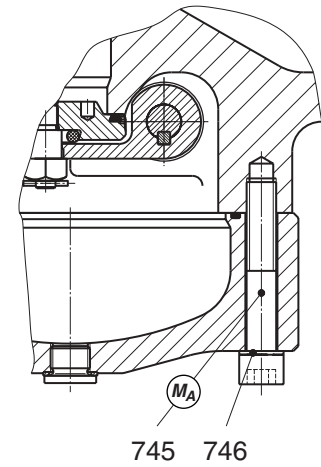
3.3.1. Spare part drawings



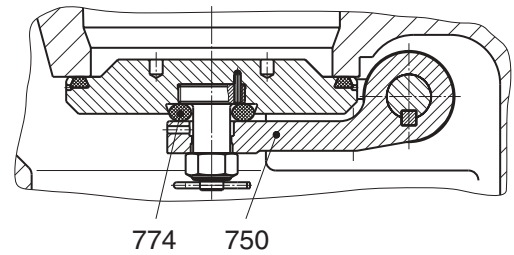
**safety cut-off unit
DN 25/50 to DN 100/200 version "-"**



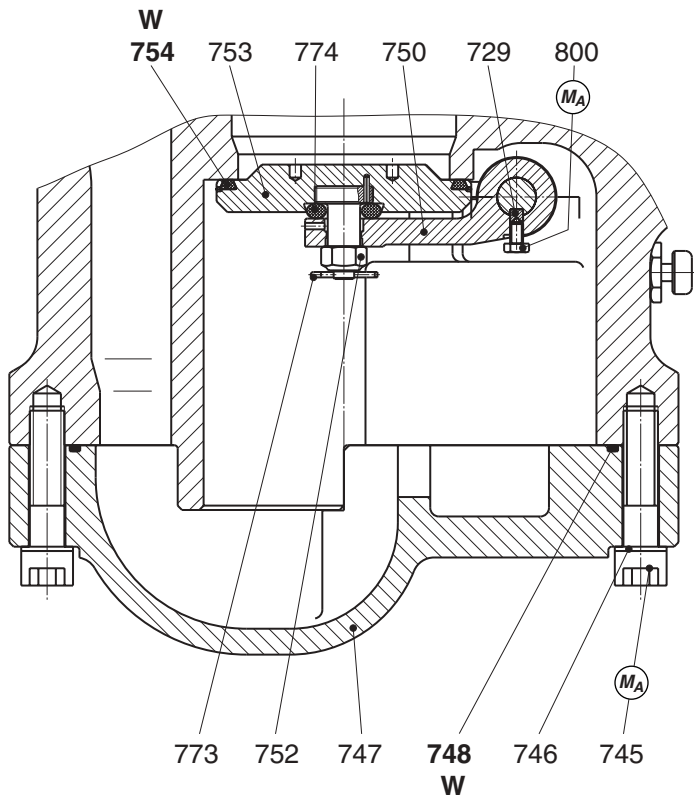
**lid design
DN 50/100 to DN 100/20 up to 09/96**



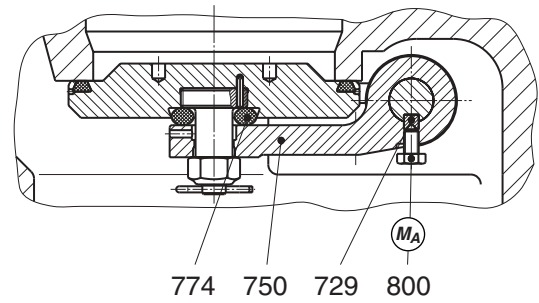
**DN 80/150 and DN 100/200 design from 06/97
DN 50/100 design from 01/99**



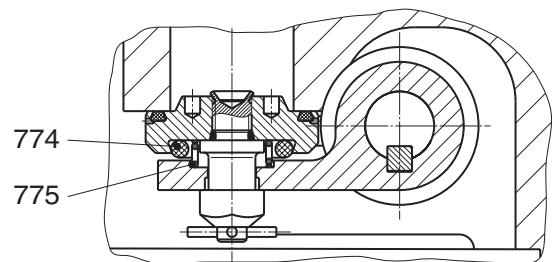
**safety cut-off unit
DN 80/150 version "a"**



**DN 80/150 und DN 100/200
design from 01/2000**



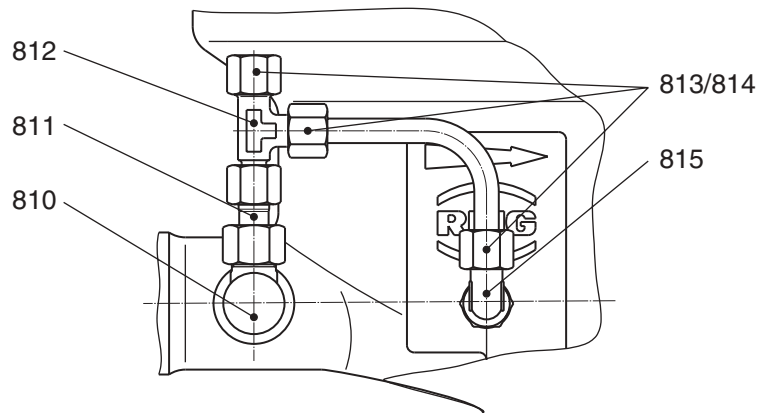
**DN 25/50,
DN 50/100 design up to 1/99**



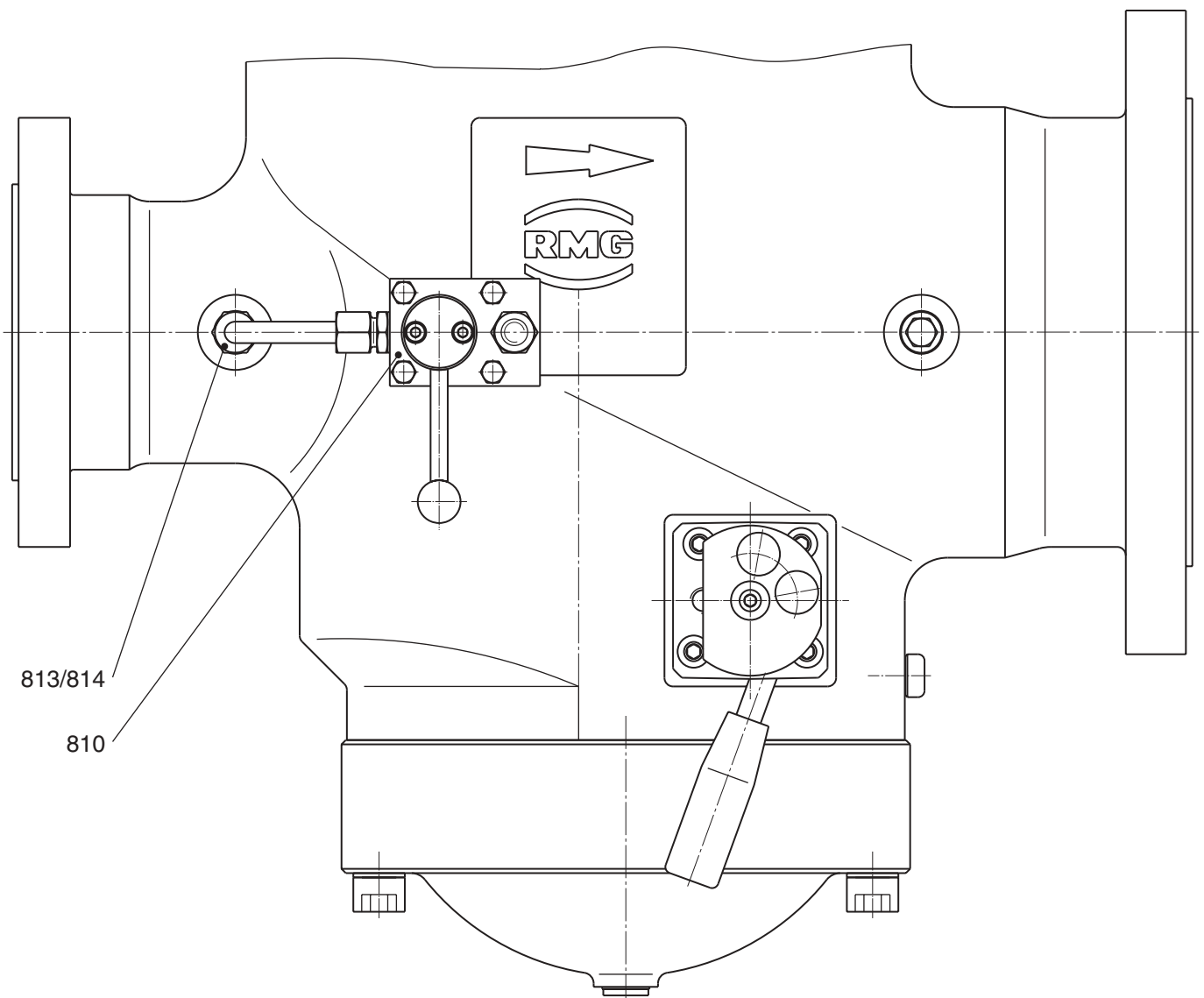
MA Observe torques in table on page 10!

W Parts should be kept in stock for maintenance.

**DN 25/ 50 and DN 50/100
with push button valve RMG 913a**



**DN 80/150 and 100/200
with push button valve RMG 910a**



3.3.2 spare parts list

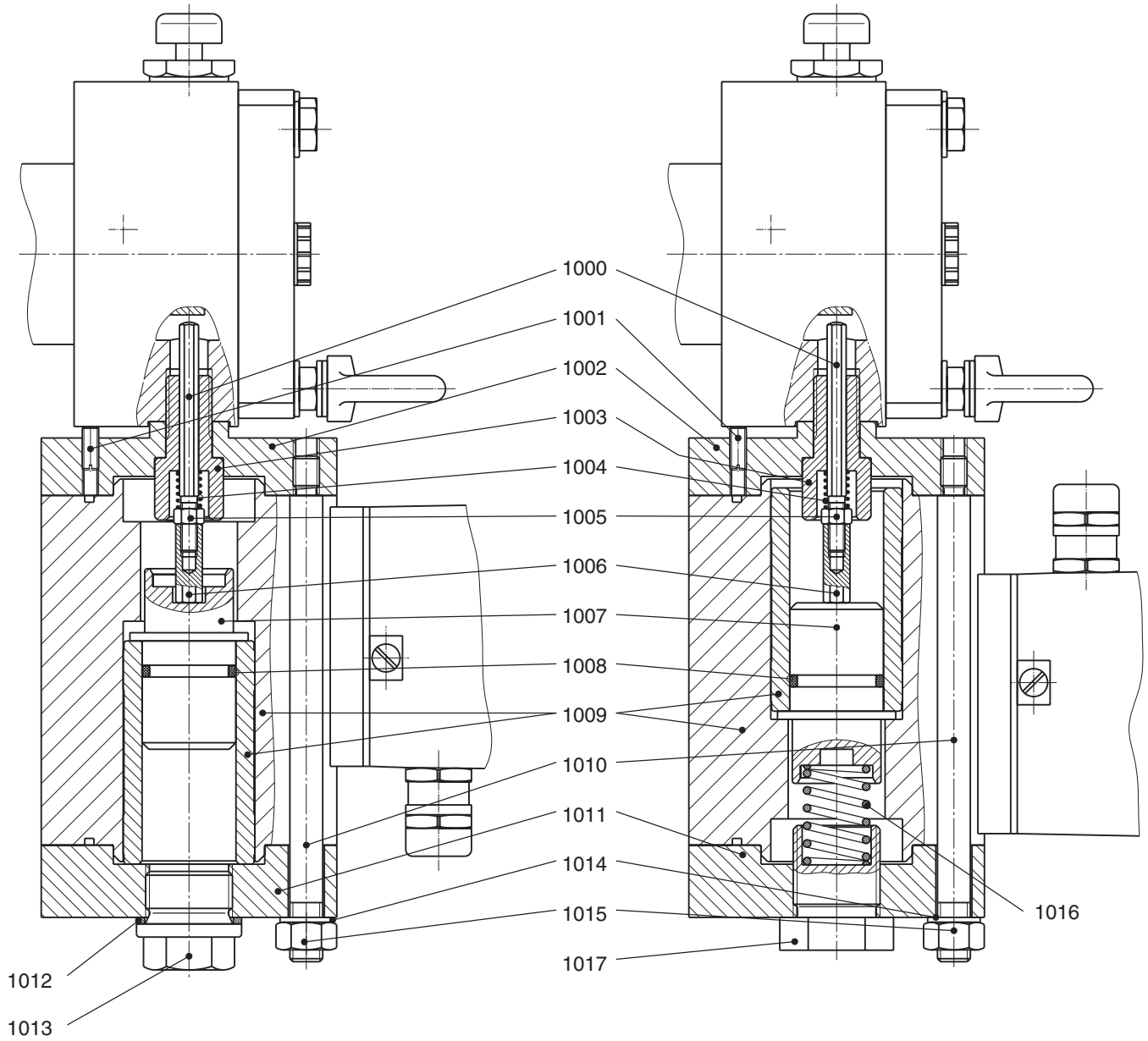
item no.	description	quant.	W	material	RMG stock no.			
					DN 25/50	DN 50/100	DN 100/200	DN 80/150 "a"
702	plug	1		K	00 026 550	00 026 550	00 026 550	00 026 550
703	disk	4		St	00 008 281	00 008 281	00 014 106	00 014 106
705	switch casing cover	1		LM	10 022 323	10 022 323	10 022 423	10 022 423
706	feather key	1		St	00 026 255	00 026 255	00 026 240	00 026 240
707	switch bearing	1		NSt	10 022 327	10 022 327	10 024 632	10 024 632
708	pan head screw	4		St	00 010 120	00 010 120	00 010 379	00 010 379
709	safety washer	8		FSt	00 014 111	00 014 111	00 014 112	00 014 112
710	switch casing, complete	1		GLM/K	10 022 326	10 022 326	10 022 426	10 022 426
711	bearing bush	1		Ms	10 022 318	10 022 318	10 024 638	10 027 688
712	handle, complete	1		NSt/K/KG	10 024 536	10 024 536	10 024 636	10 024 636
715	hexagonal screw	4		St	00 010 083	00 010 083	00 003 873	00 003 873
716	pan head screw	1		St	00 008 177	00 008 177	00 008 177	00 008 177
717	disk	1		LM	10 001 186	10 001 186	10 001 386	10 001 386
719	switch pin	2		St	00 027 646	00 027 646	00 027 301	00 027 301
720	arresting sleeve, complete	1		NSt/SF	10 022 332	10 022 332	10 022 432	10 022 432
721	sliding ring	1		KT	00 021 140	00 021 140	00 021 112	00 021 112
722	guiding sleeve	1		NSt	10 022 330	10 022 330	10 022 430	10 022 430
723	safety washer	3		FSt	00 014 118	00 014 118	00 014 111	00 014 111
724	pan head screw	3		St	00 010 561	00 010 561	00 010 150	00 010 150
725	retainer ring	1		FSt	00 019 110	00 019 110	00 019 112	00 019 112
726	o-ring	2	W	KG	00 020 227	00 020 227	00 020 235	00 020 235
727	o-ring	2	W	KG	00 021 142	00 021 142	00 020 607	00 020 607
728	valve flap shaft	1		NSt	10 022 317	10 022 317	10 024 637	10 027 687
729	feather key	1		St	00 026 256	00 026 256	10 024 646	10 024 646
730	bearing bush	1		Ms	10 022 319	10 022 319	10 022 369	10 022 369
731	spiral band spring	3		NSt	10 022 336	10 022 336		
731	spiral band spring	4		NSt			10 022 436	10 022 436
732	pan head screw	4		St	00 010 549	00 010 549	00 010 428	00 010 428
733	spring casing, complete	1		GLM/K	10 024 535	10 024 535	10 024 635	10 024 635
734	disk, complete	1		LM/St	10 024 540	10 024 540	10 024 640	10 024 640
735	disk	1		St	00 014 082	00 014 082	00 014 137	00 014 137
736	pan head screw	1		St	00 010 618	00 010 618	00 008 177	00 008 177
745	pan head screw	M10x30	10	St	00 010 400			
745	pan head screw	M12x60	12	St		00 010 625		
745	up to autumn 1996	M12x70	12	St		00 010 594		
745	pan head screw	M16x80	12	St			00 010 626	
745	up to autumn 1996	M 16x110	12	St			00 010 543	
745	pan head screw	M16x65	18	St				00 010 669
746	safety washer	12		FSt		00 014 114	00 014 116	
746	safety washer	18		FSt				00 014 116
746	safety washer	10		FSt	00 014 113			

item no.	description	quant.	W	material	RMG stock no.			
					DN 25/50	DN 50/100	DN 100/200	DN 80/150 "a"
747	lid	1		St	10 022 311	10 024 541	10 024 641	10 027 681
748	o-ring	1	W	KG	00 020 247	00 020 427	00 020 573	00 021 361
750	valve flap lever	1		St	10 022 263	10 022 313	10 024 633	10 024 633
752	securing nut	1		St	00 013 199	00 013 200	00 013 202	00 013 202
753	valve plate, complete	1		Ms/NSt/St	10 022 262	10 022 312	10 022 407	10 022 407
754	o-ring	1	W	KG	00 020 236	00 020 458	00 020 313	00 020 313
766	screw plug	2		St	00 026 175	00 026 175	00 026 175	00 026 175
767	manual release, complete	1		Al/FSt/NSt	10 022 340	10 022 340	10 022 440	10 022 440
768	pin with spring, complete	1		Ms/NSt	10 022 391	10 022 391	10 022 391	10 022 391
773	pin	1		St	00 015 000	00 015 000	00 015 007	00 015 007
774	O-Ring	1		KG	00 020 282	00 021 334	00 021 287	00 021 287
775	Druckfeder	1		FSt	10 018 394			
800	hexagonal screw	2		St			10 024 648	10 024 648
801	grooved dowel pin	2		St	00 017 200	00 017 200	00 017 200	
802	sealing ring	1		LM	00 018 694	00 018 694	00 018 694	
803	screw plug	1		St	00 010 381	00 010 381	00 010 381	
810	push button valve	1			10 005 200	10 005 200	89 100 210	89 100 210
811	screw connection	1		St	00 031 817	00 031 817		
812	connecting piece	1		St	00 030 622	00 030 622		
813	union nut	3		St	00 030 803	00 030 803		
813	union nut	1		St			00 030 803	00 030 803
814	cutting ring	3		St	00 030 903	00 030 903		
814	cutting ring	1		St			00 030 903	00 030 903
815	screw connection	1		St	00 031 207	00 031 207		

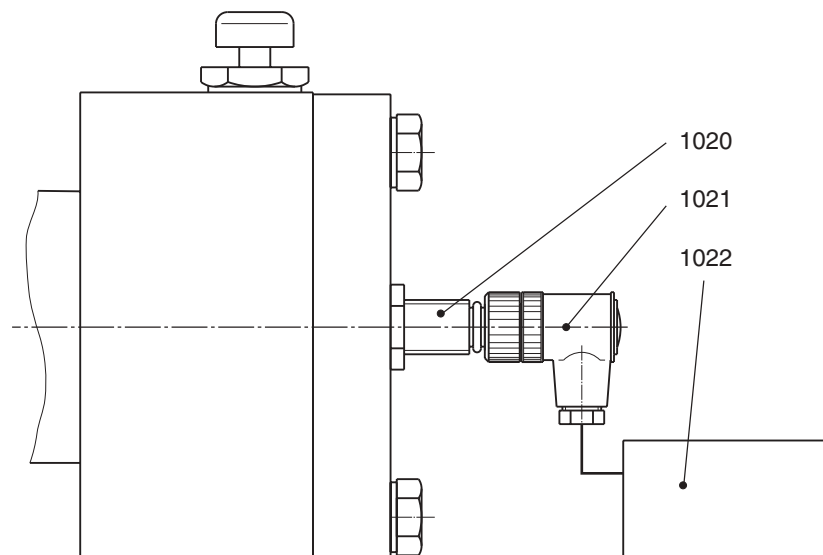
3.3.3 Spare part drawing accessories

electromagnet actuation during power supply

electromagnet actuation during power failure



electrical indicator for "CLOSED" position



3.3.4 Spare part list accessories

item no.	designation	quant.	W	material	part no.
1000	switch rod, optionally for:				
1000	RMG 711 DN 25 and DN 50	1		NSt	10 022 568
1000	RMG 503 DN 25/50 and DN50/100	1		NSt	10 022 568
1000	RMG 530 DN 50/100	1		NSt	10 022 568
1000	RMG 711 DN 80 and DN 100	1		NSt	10 022 573
1000	RMG 503 and RMG 530 DN 80/150 and DN 100/200	1		NSt	10 022 573
1000	RMG 711 DN 150	1		NSt	10 022 578
1001	threaded bolt	1		St	00 008 486
1002	connection flange	1		LM	10 022 582
1003	guiding screw	1		NSt	10 001 811
1004	pressure spring	1		SF	10 001 183
1005	hexagonal nut	1		St	00 003 020
1006	adjustment nut	1		Ms	10 001 864
1007	bushing	1		LM	10 022 584
1008	O ring	1		KG	00 020 327
1009	magnet	1			00 024 436
1010	threaded bolt	4		NSt	10 022 585
1011	cover	1		LM	10 022 583
1012	packing ring	1		LM	00 018 706
1013	screw plug	1		St	00 026 523
1014	locking washer	4		SF	00 014 113
1015	hexagonal nut	4		St	00 005 692
1016	pressure spring	1		SF	00 028 067
1017	screw plug	1		Ms	10 022 586
1020	proximity switch	1			00 024 160
1021	cable box	1			00 024 099
1022	relay, optional:				
1022	for 1 proximity switch (230V AC)	1			00 024 402
1022	for 2 proximity switches (230V AC)	1			00 024 403

4. Parts for maintenance

item no.	description	quant.	RMG part no.			
			DN 25/50	DN 50/100	DN 100/200	DN 80/150 "a"
303	o-ring	1	00 020 508	00 020 508	00 021 184	00 021 184
306	diaphragm	1	10 011 140	10 011 140	10 011 240	10 011 240
314	foam ring	1			10 023 593	10 023 633
319	foam ring	1			10 023 592	10 023 632
726	o-ring	2	00 020 227	00 020 227	00 020 235	00 020 235
727	o-ring	2	00 021 142	00 021 142	00 020 607	00 020 607
748	o-ring	1	00 020 247	00 020 427	00 020 573	00 021 361
754	o-ring	1	00 020 236	00 020 458	00 020 313	00 020 313

We supply you with products for gas pressure regulation:



RMG REGEL + MESSTECHNIK GMBH

Osterholzstrasse 45, D-34123 Kassel, Germany
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gas pressure regulators and safety devices



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gas pressure regulating equipment, displacement meters, complete stations



Bryan Donkin RMG Gas Controls Ltd.

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gas pressure regulating equipment, below ground gas control modules



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design and assembly of gas pressure regulating and metering stations

The RMG Group of Companies on the internet: <http://www.rmg.de>

Serving the Gas Industry - WORLDWIDE



We reserve the right for technical changes