

# Gas Pressure Regulator RMG 408



## PRODUCT INFORMATION

**Serving the Gas Industry  
Worldwide**



# Gas Pressure Regulator RMG 408

## Application, Characteristics, Technical Data


### Application

- for gas supply to municipal distribution systems, industrial and power plants
- suitable for outlet pressure control, inlet pressure control, outlet and differential pressure control (flow control)
- for natural gas acc. to DVGW G 260, for further gases on request.

### Characteristics

- regulator with integrated noise attenuating device
- easy maintenance due to interchangeable cartridge (plug-in arrangement)
- large inlet pressure range
- different valve seat diameters possible

TECHNICAL DATA			
max. inlet pressure PS	16 bar		
Set range $W_d$	0,020 to 0,500 bar		
with pilot RMG 610, measuring unit „N“ (RS10d, version „MN“)	0,100 to 3,500 bar		
with pilot RMG 610, measuring unit „M“ (RS10d, version „MM“)	1,000 to 15,00 bar		
with pilot RMG 650	0,02 to 0,03 bar	AC 10	SG 30
	>0,03 to 0,10 bar	AC 10	SG 20
	>0,10 to 0,50 bar	AC 5	SG 10
	>0,50 to 2,50 bar	AC 2,5	SG 10
	>2,50 to 15,0 bar	AC 1	SG 5
accuracy class (AC) and lock-up pressure class (SG)			
class of lock-up pressure zone	SZ 2,5		
minimum pressure drop $\Delta p_{min}$	0,20 to 1,00 bar		
Anschlussart	flange PN 16		

TECHNICAL DATA											
<b>material</b>	<table border="0"> <tr> <td>main valve body</td> <td>aluminium alloy</td> </tr> <tr> <td>main valve internal parts</td> <td>steel, aluminium, brass</td> </tr> <tr> <td>pilot</td> <td>aluminium alloy, steel</td> </tr> <tr> <td>diaphragms</td> <td>Perbunan (rubber-like-plastic)</td> </tr> <tr> <td>sealings</td> <td>Perbunan (rubber-like-plastic)</td> </tr> </table>	main valve body	aluminium alloy	main valve internal parts	steel, aluminium, brass	pilot	aluminium alloy, steel	diaphragms	Perbunan (rubber-like-plastic)	sealings	Perbunan (rubber-like-plastic)
main valve body	aluminium alloy										
main valve internal parts	steel, aluminium, brass										
pilot	aluminium alloy, steel										
diaphragms	Perbunan (rubber-like-plastic)										
sealings	Perbunan (rubber-like-plastic)										
<b>temperature range class 2</b>	-20 °C to +60 °C										
<b>function and strength</b>	acc. to DIN EN 334 respectively DIN EN 14382										
<b>ex-zone</b>	Mechanical components of regulator do not contain a potential ignition source, thus do not fall in limits of ATEX 95 (94/9/EG). (Used electronic accessories comply with ATEX-demands.)										
<b>DIN-DVGW-reg.-no.</b>	NG - 4101 AS 0161										
<b>CE mark acc. to PED</b>											

GERÄTEKENNGRÖSSE						
size	valve seat diameter in mm	K <sub>G</sub> value in m <sup>3</sup> /h	KG value with metal sponge in m <sup>3</sup> /h	max. inlet pressure p <sub>umax</sub> for actuator*		
				Größe 1	Größe 2	Größe 3
DN 50/100	30	450		16	16	
	37	650		16	16	
	52	1150	800	10 (16)	16	
DN 80/100	37	750			16	
	52	1400	1000		16	
	81	2400	1900		16	
DN 100/200	52	1700	1200		16	16
	81	3400	2650		16	16
	102	3800	3300		10 (16)	16

\*) IMPORTANT: The restriction of the inlet pressure p<sub>umax</sub> is not due to reasons of strength, but serves for control accuracy. The regulating and closing precision categories are stipulated in DVGW type tests. The values are guaranteed under the following conditions:  
 „The inlet pressure may exceed the p<sub>umax</sub>-figure stated in the table twice its value, at the most limited by nominal pressure level, provided that the inlet pressure changes Δp<sub>u</sub> are not higher than the p<sub>umax</sub>-figure stated in the table.“

**Example for DN 50/100 with valve seat diameter 52 mm:**

The max. inlet pressure p<sub>umax</sub> is 10 bar acc. to the table. The highest value is calculated as twice its value of inlet pressure p<sub>umax</sub> = 20 bar, but the pressure rating reduces this value to 16 bar (this value is given in brackets).

The permissible inlet pressure deviation of Δp<sub>u</sub> = 10 bar can be used as follows:

The inlet pressure may deviate e.g. from p<sub>u1</sub> = 2 bar to p<sub>u2</sub> = 12 bar, or e.g. from p<sub>u1</sub> = 6 bar to p<sub>u2</sub> = 16 bar in compliance with the stipulated regulating and closing precision categories.

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#### Safety cut-off valve

A safety cut-off valve type RMG 720 or RMG 721 can be incorporated in the main valve body optionally and even afterwards.

Depending on the required cut-off setpoints the following safety cut-off actuators can be used:

CONTROL DEVICE K4, K5 AND K6 (SAFETY CUT-OFF ACTUATOR TYPE RMG 720)								
measuring unit	setpoint spring			overpressure cut-off*		underpressure cut-off*		response precision category ** AG
	No.	colour	wire dia. in mm	specific setpoint range $W_{dso}$ (bar)	min. differential between response pressure and normal service pressure* $\Delta p_{wo}$ (bar)	specific setpoint range $W_{dsu}$ (bar)	min. differential between response pressure and normal service pressure $\Delta p_{wu}$ (bar)	
K4	2	bright red	3,2	0,040 ... 0,100	0,020			5/2,5
	3	dark red	3,6	0,080 ... 0,250	0,030			2,5
	4	black	4,5	0,200 ... 0,500	0,060			2,5/1
	5	light blue	1,1			0,005 ... 0,020	0,010	20/5
	6	black	1,4			0,015 ... 0,060	0,020	5
K5	3	dark red	3,6	0,200 ... 0,800	0,100			2,5
	4	black	4,5	0,600 ... 1,500	0,200			2,5/1
	5	light blue	1,1			0,015 ... 0,050	0,030	20/5
	6	black	1,4			0,040 ... 0,120	0,060	5
K6	3	dark red	3,6	0,600 ... 2,000	0,200			2,5
	4	black	4,5	1,500 ... 4,500	0,400			2,5/1
	5	light blue	1,1			0,040 ... 0,120	0,060	20/5
	6	black	1,4			0,120 ... 0,300	0,120	5

\*) Note: if control devices are used with both overpressure and underpressure release, then the min. gap between the two setpoints  $p_{dso}$  and  $p_{dsu}$  has to be at least 10% larger than the sum of the two differential values ( $\Delta p_{wo} + \Delta p_{wu}$ ).

$$p_{dso} - p_{dsu} \geq 1.1 (\Delta p_{wo} + \Delta p_{wu})$$

\*\*) The higher response precision category is valid for the first half, the lower response precision category is valid for the second half of the setting range.

SAFETY CUT-OFF ACTUATORS K10A, K12, K13, K16 AND K17 (SAFETY CUT-OFF VALVE TYPE RMG 721)								
measuring unit	setpoint spring			overpressure cut-off*		underpressure cut-off*		response precision category ** AG
	No.	colour	wire dia. in mm	specific setpoint range	min. differential between response pressure and normal service pressure*	specific setpoint range	min. differential between response pressure and normal service pressure	
				$W_{dso}$ (bar)	$\Delta p_{wo}$ (bar)	$W_{dsu}$ (bar)	$\Delta p_{wu}$ (bar)	
K10a	1	yellow	3,2	0,050 ... 0,100	0,030			10/5
	2	light red	3,6	0,080 ... 0,250	0,050			10/5
	3	dark red	4,5	0,200 ... 0,500	0,100			5/2,5
	4	white	4,75	0,400 ... 1,500	0,250			5/2,5
	5	light blue	1,1			0,010 ... 0,015	0,012	20
	6	white	1,2			0,014 ... 0,040	0,030	20/5
	7	black	1,4			0,035 ... 0,120	0,060	5
K12	1	light green	5,0	0,500 ... 1,500	0,250			5/2,5
	2	yellow	6,3	1,000 ... 3,000	0,500			2,5/1
	3	light red	8,0	2,000 ... 8,000	1,000			2,5/1
	4	white	2,0			0,100 ... 0,200	0,200	20
	5	light blue	2,8			0,150 ... 0,800	0,400	10/5
	6	black	3,6			0,500 ... 2,000	0,800	10/5
K13	2	yellow	6,3	4,000 ... 14,00	2,000			2,5/1
	3	light red	8,0	7,000 ... 30,00	4,000			2,5/1
	4	white	2,0			0,500 ... 1,200	0,800	10
	5	light blue	2,8			0,700 ... 3,500	1,500	10/5
	6	black	3,6			1,500 ... 6,000	3,500	10/5
	K16	0	blue	3,2	0,800 ... 1,500	0,100		
1		black	4,5	1,000 ... 5,000	0,200			2,5/1
2		grey	5,0	2,000 ... 10,00	0,400			1
3		brown	6,3	5,000 ... 20,00	0,800			1
4		red	7,0	10,00 ... 40,00	1,200			1
K17	2	grey	5,0			4,000 ... 10,00	0,400	5
	3	brown	6,3			5,000 ... 20,00	0,800	5
	4	red	7,0			10,00 ... 40,00	1,200	5

\*) Note: if control devices are used with both overpressure and underpressure release, then the min. gap between the two setpoints  $p_{dso}$  and  $p_{dsu}$  has to be at least 10% larger than the sum of the two differential values ( $\Delta p_{wo} + \Delta p_{wu}$ ).

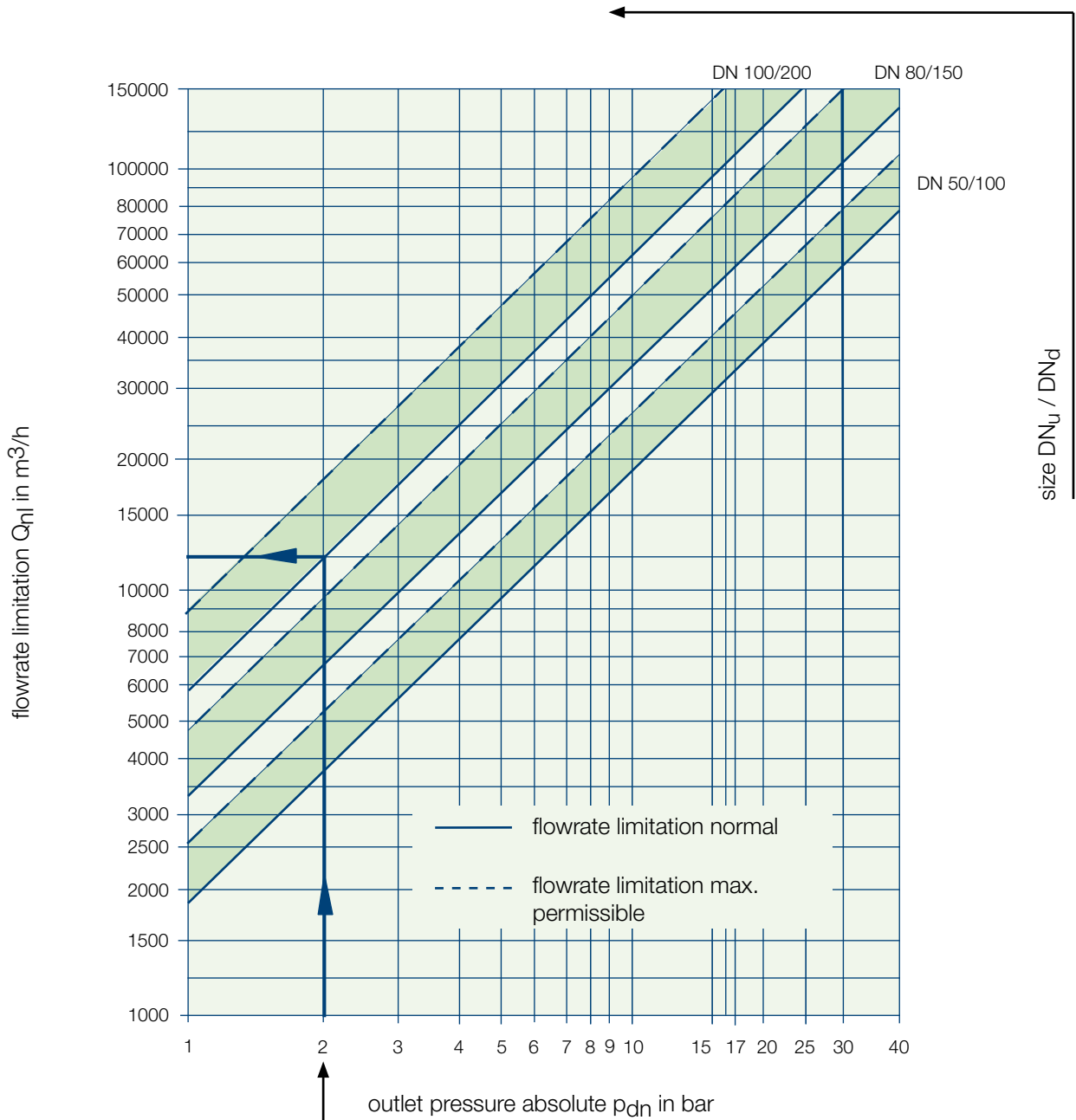
$$p_{dso} - p_{dsu} \geq 1.1 (\Delta p_{wo} + \Delta p_{wu})$$

\*\*) The higher response precision category is valid for the first half, the lower response precision category is valid for the second half of the setting range.

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Diagram showing flowrate limitation for best noise reduction



Example: RMG 408 - 100/200  $p_{dn} = 2$  bar → flowrate limitation  $Q_{nlimit} = 12500$   $m^3/h$

To achieve best results for the noise reducing outlet duct, a certain expansion value in the last expansion stage (at the flow straightener) should be guaranteed. The diagram shows the the permissible flowrate limitation in relation to valve size and absolute outlet pressure  $p_{dn}$ .

The gas pressure regulator RMG 408 was designed to keep the outlet pressure constant in the main and independent from disturbing influences like inlet pressure and flow rate changes.

The RMG 408 consists of a main body and the units „regulator“ and „safety cut-off valve“ (SAV). The regulator-unit consists of actuator assembly with actuator and main valve and an added pilot with filter. Dissolve fasteners first to remove units of main valve body. By doing this maintenance is easy to perform. The outlet pressure is taken at the measuring point and fed to the pilot regulator. In the pilot regulator the outlet pressure is compared to the adjustable spring loading across the pilot diaphragm, so that any variation in outlet pressure will cause a corresponding change of loading pressure to adjust the valve position accordingly and restore the outlet pressure to the setpoint. The regulator gives tight shut-off on zero flow.

The main valve can be equipped with orifices of various sizes. From valve seat  $\varnothing$  52 mm on a compensation diaphragm ensures inlet pressure ballance of the main valve of the regulator to a large extend.

In order to avoid high noise emission the main valve is equipped with a perforated expansion piece which splits the gas steam up into many thin partial streams moving against one another. For further noise attenuation three concentric perforated plates are located around the outlet of the main valve control element, thus causing a pressure cut of several stages and again dividing the gas steam into a great number of partial streams. A rectifying cone and filling material are installed in the outlet duct of the main valve to achieve additional noise suppression. Optionally, the perforated expansion piece can be fitted with an internal layer of metal foam material, with which an additional noise reduction of at least 10 dB(A) can be achieved. The usual perforated expansion piece can be replaced off-hand by a perforated expansion piece with internal layer of metal foam material. Please note that when using the metal foam insert the KG-value (flowrate coefficient) is reduced accordingly (see page 3, table of valve data).

The valve plate of the safety cut-off valve (SAV) installed in the inlet side of the body cuts off the gas flow if the outlet pressure rises above or falls below preset limits. The RMG 408 can be equipped with the cut-off units RMG 720 or RMG 721.

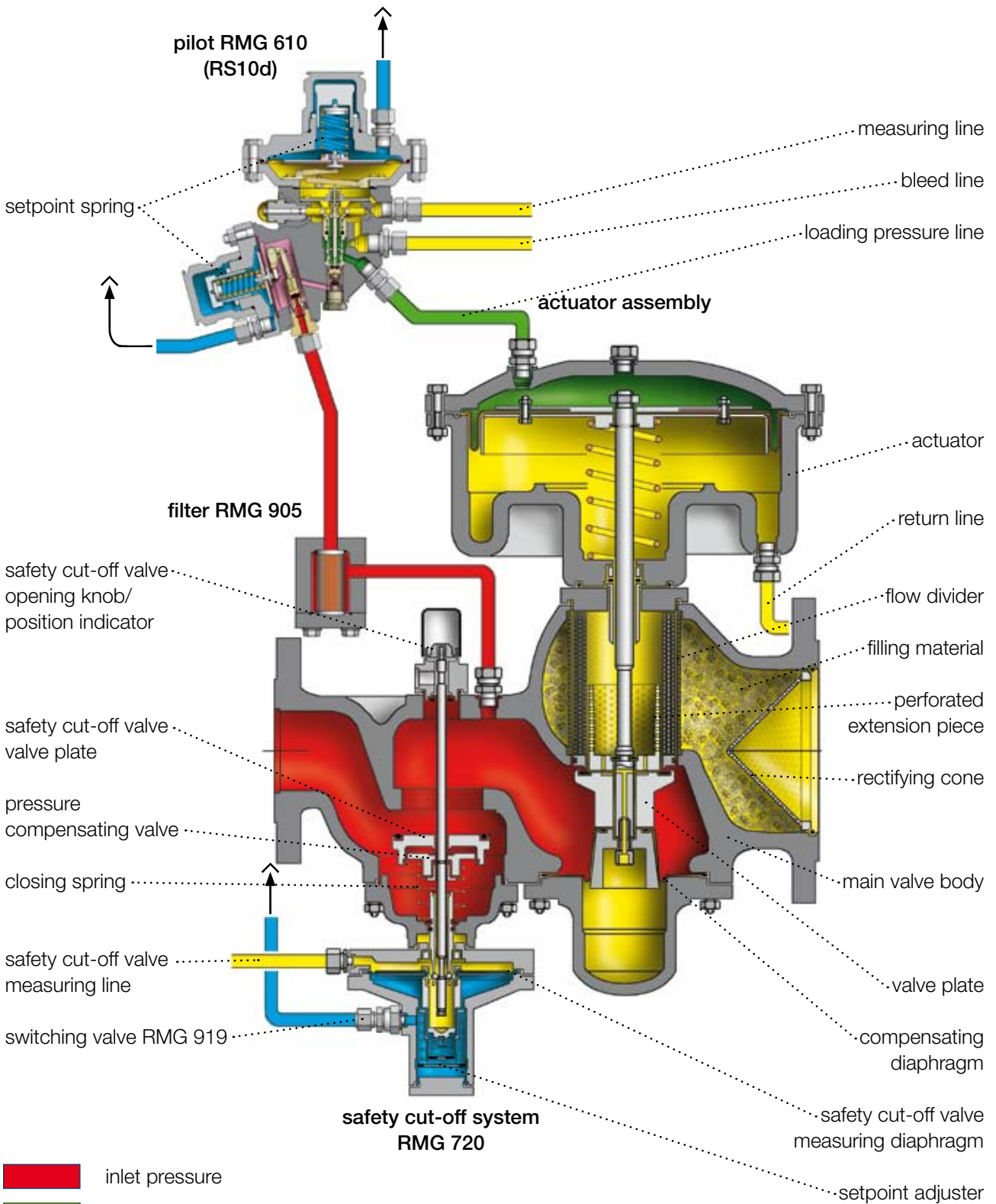
The safety cut-off valve can be opened manually if the outlet pressure at measuring point is below (in case of exceeding pressure) or above (in case of undercutting pressure) the re-engagement differential (note that the min. differential between response pressure and normal service pressure is observed, see tables on page 4 and page 5).

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Design and Function

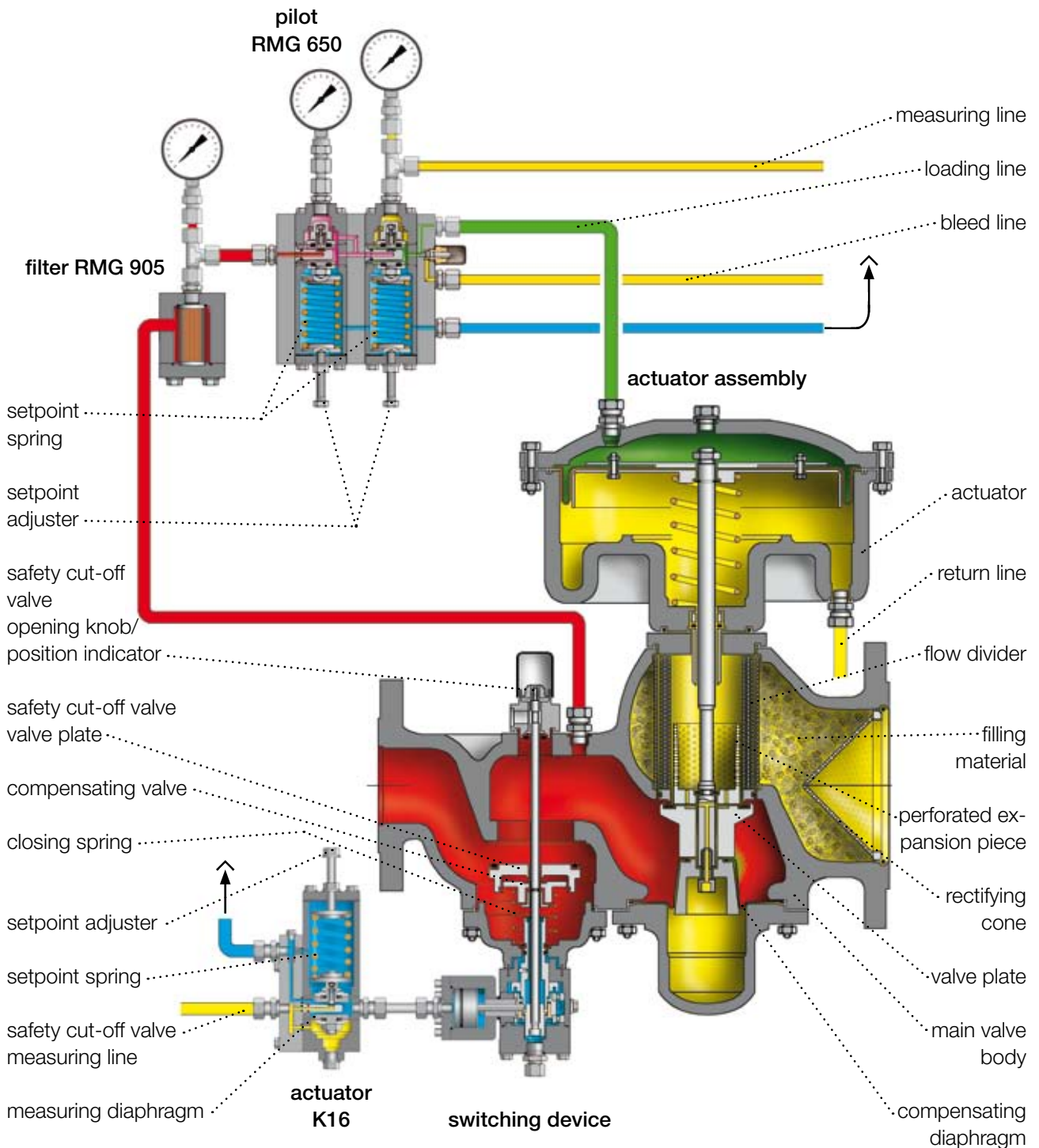
## RMG 408 with pilot RMG 610 and SSV-system RMG 720

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RMG 408 with pilot RMG 610 and safety cut-off valve system RMG 720

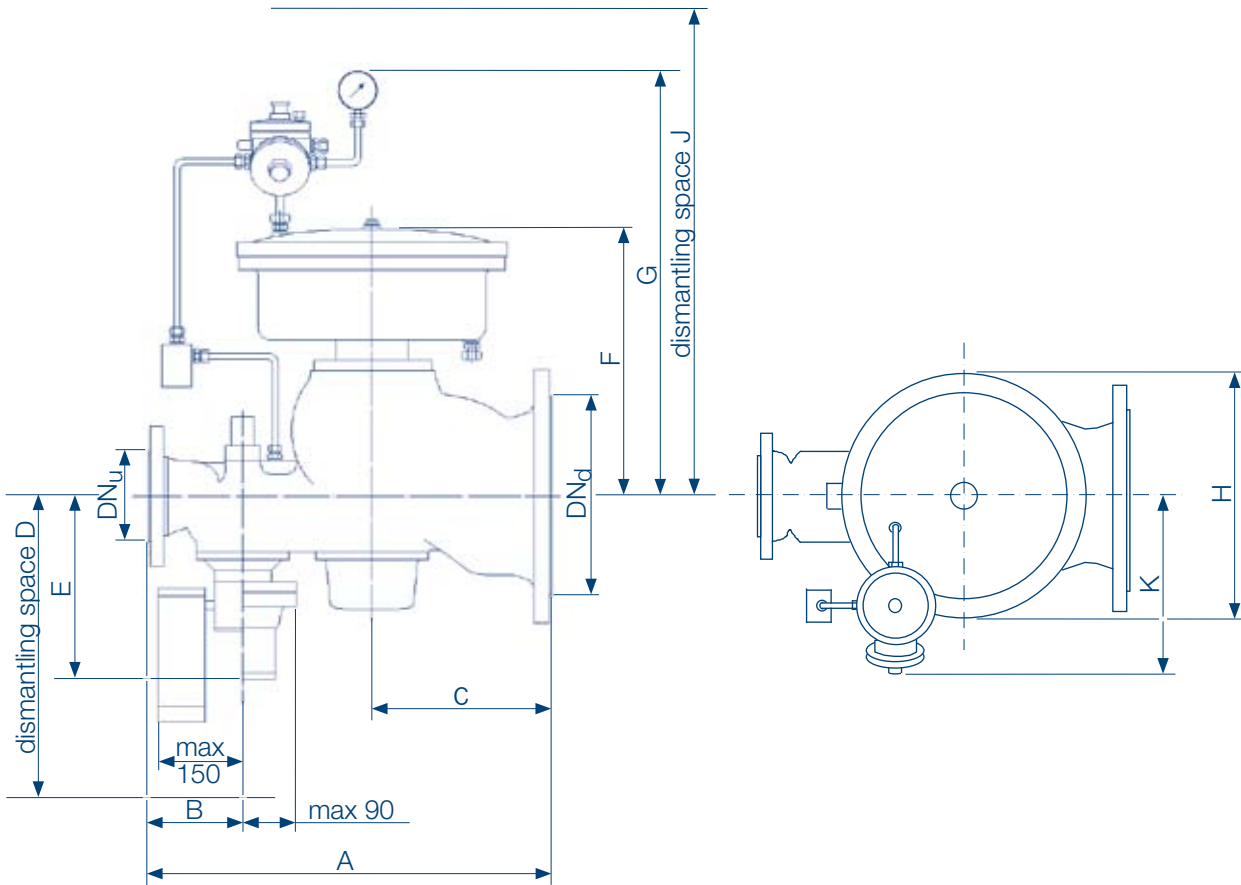


safety cut-off valve -system RMG 721

- inlet pressure
- outlet pressure
- loading pressure
- loading limiting pressure
- atmosphere

# Gas Pressure Regulator RMG 408

## Dimensions and Weights



DIMENSIONS IN MM																				
size	main valve body					safety cut-off valve		actuator												
	DN <sub>u</sub> /DN <sub>d</sub>	A	B	C	D	E	F	G	size 1			size 2			size 3					
									H	J	K	F	G	H	J	K	F	G	H	J
50/100	450	125	175	410	315	360	600	308	560	300	420	660	380	680	300					
80/150	500	165	165	450	360						380	620	380	650	300					
100/200	650	175	245	475	330						445	685	380	750	300	500	750	545	850	300

APPROX. WEIGHTS IN KG							
size	regulator with actuator						
	DN <sub>u</sub> /DN <sub>d</sub>	size 1		size 2		size 3	
		mit SAV	ohne SAV	mit SAV	ohne SAV	mit SAV	ohne SAV
50/100	51	46	80	75			
80/150			81	74			
100/200			95	84	102	91	

example: RMG 408 - 50/10 - K4 / E1/HA / F - 30 / 1 - 10d M N - So

SIZE		DN				
inlet/outlet		DN				
DN 50/100		50/100				
DN 80/150		80/150				
DN 100/200		100/200				
SAFETY CUT-OFF VALVE						
type	overpressure cut-off setpoint range in bar	underpressure cut-off setpoint range in bar	actuator type			
RMG 720	0,040 ... 0,500	0,005 ... 0,060	K4			
	0,200 ... 1,500	0,015 ... 0,120	K5			
	0,600 ... 4,500	0,040 ... 0,300	K6			
RMG 721	0,050 ... 1,500	0,010 ... 0,120	K10a			
	0,500 ... 8,000	0,100 ... 2,000	K12			
	4,000 ... 17,60	0,500 ... 6,000	K13			
	0,800 ... 17,60		K16			
		4,000 ... 16,00	K17			
RELEASE AND REMOTE						
optional: remote safety cut-off release		release: - upon current supply - upon current failure (only with RMG721)	E1 E2			
optional: manual release of safety cut-off		for RMG 720: push-button valve RMG 912 for RMG 721: included in system	HA			
optional: electric remote signalling of safety cut-off valve			F			
VALVE SEAT DIAMETER AND ACTUATOR SIZE						
size DN	K <sub>G</sub> -value in m <sup>3</sup> /h	max. inlet pressure* in bar	valve seat-Ø in mm	actuator size	valve	actuator
50/100	450	16	30	1	30	1
	650	16	37	1	37	1
	1150	10 (16)	52	1	52	1
80/150	450	16	30	2	30	2
	650	16	37	2	37	2
	1150	16	52	2	52	2
100/200	750	16	37	2	37	2
	1400	16	52	2	52	2
	2400	16	81	2	81	2
100/200	1700	16	52	2	52	2
	3400	16	81	2	81	2
	3800	10 (16)	102	2	102	2
	1700	16	52	3	52	3
	3400	16	81	3	81	3
	3800	16	102	3	102	3
PILOT						
type	version	setpoint range W <sub>d</sub> in bar			denomination	
RMG 650		1,000 ... 15,00			650	
RMG 610 (RS10d)	N (M/N)	0,020 ... 0,500			10d	M/N
	M (M/M)	0,500 ... 3,500				M/M
SPECIAL VERSION						
... to be specified						So

\*) see table page 3

### **For More Information**

To learn more about RMG's Advanced Gas Solutions, contact your RMG account manager or visit [www.rmg.com](http://www.rmg.com)

### **GERMANY**

#### **Honeywell Process Solutions**

RMG Regel + Messtechnik GmbH  
Osterholzstrasse 45  
34123 Kassel, Germany  
Tel: +49 (0)561 5007-0  
Fax: +49 (0)561 5007-107

#### **Honeywell Process Solutions**

RMG Messtechnik GmbH  
Otto-Hahn-Strasse 5  
35510 Butzbach, Germany  
Tel: +49 (0)6033 897-0  
Fax: +49 (0)6033 897-130

#### **Honeywell Process Solutions**

RMG Gaselan Regel + Messtechnik GmbH  
Julius-Pintsch-Ring 3  
15517 Fürstenwalde, Germany  
Tel: +49 (0)3361 356-60  
Fax: +49 (0)3361 356-836

#### **Honeywell Process Solutions**

WÄGA Wärme-Gastechnik GmbH  
Osterholzstrasse 45  
34123 Kassel, Germany  
Tel: +49 (0)561 5007-0  
Fax: +49 (0)561 5007-207

### **POLAND**

#### **Honeywell Process Solutions**

Gazomet Sp. z o.o.  
ul. Sarnowska 2  
63-900 Rawicz, Poland  
Tel: +48 (0)65 5462401  
Fax: +48 (0)65 5462408

### **ENGLAND**

#### **Honeywell Process Solutions**

Bryan Donkin RMG Gas Controls Ltd.  
Enterprise Drive, Holmewood  
Chesterfield S42 5UZ, England  
Tel: +44 (0)1246 501-501  
Fax: +44 (0)1246 501-500

### **CANADA**

#### **Honeywell Process Solutions**

Bryan Donkin RMG Canada Ltd.  
50 Clarke Street South, Woodstock  
Ontario N4S 0A8, Canada  
Tel: +1 (0)519 5398531  
Fax: +1 (0)519 5373339

### **USA**

#### **Honeywell Process Solutions**

Mercury Instruments LLC  
3940 Virginia Avenue  
Cincinnati, Ohio 45227, USA  
Tel: +1 (0)513 272-1111  
Fax: +1 (0)513 272-0211

### **TURKEY**

#### **Honeywell Process Solutions**

RMG GAZ KONT. SIS. ITH. IHR. LTD. STI.  
Birlik Sanayi Sitesi, 6.  
Cd. 62. Sokak No: 7-8-9-10  
TR - Sasmaz / Ankara, Turkey  
Tel: +90 (0)312 27810-80  
Fax: +90 (0)312 27828-23

