

Gas Pressure Regulator RMG 503



PRODUCT INFORMATION

**Serving the Gas Industry
Worldwide**



GAS PRESSURE REGULATOR RMG 503


Application, properties, technical specifications

Application

- Device for local use at power plants and industrial facilities
- Suitable for use with natural gas and all non-aggressive gases

Properties

- Large inlet pressure range
- Diaphragm valve acts as actuator
- Made up of few parts, easy to maintain, and quiet operation
- With integrated safety shut-off valve

| TECHNICAL SPECIFICATIONS | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Max. inlet pressure p_{max} | | 100 bar | |
| Outlet pressure range W_d optional with pilot RMG 630 in two-stage design, for inlet pressure changes of >15 bar or pilot RMG 640 (one-stage design, used for inlet pressure changes of up to 15 bar) | | 0.3 to 40 bar 20 to 90 bar (with metal harmonica measuring unit) | |
| Pressure difference between inlet and outlet | Min. pressure difference | $\Delta p_{min} = 2,0$ bar, $\Delta p_{min} = 4,0$ bar (at DN 25/25) | |
| | Max. pressure difference | $\Delta p_{max} = 70$ bar | |
| Nominal width and KG value | | DN 25 / 25 | KG = 250 m ³ /h |
| | | DN 25 / 50 | KG = 350 m ³ /h |
| | | DN 50 / 100 | KG = 1400 m ³ /h |
| | | DN 80 / 150 | KG = 3600 m ³ /h |
| | | DN 100 / 200 | KG = 5500 m ³ /h |
| | | DN 150 / 300 | KG = 12000 m ³ /h |
| Type of connection | | DIN PN 40 flange and flanges according to ANSI 150 (DN 25/25 only), ANSI 300, ANSI 600 | |
| Accuracy class and closing pressure category | | outlet pressure range W_d | accuracy class |
| | | | closing pressure category |
| with pilot RMG 630 | 0.30 ... 0.50 bar | AC 20 | SG 30 |
| | > 0.50 ... 1.00 bar | AC 10 | SG 20 |
| | > 1.00 ... 5.00 bar | AC 2.5 | SG 10 |
| | > 5.00 ... 90.0 bar | AC 1 | SG 5 |
| with pilot RMG 640 | 0.30 ... 1.00 bar | AC 20*/30 | SG 30*/50 |
| | > 1.00 ... 3.00 bar | AC 20 | SG 30 |
| | > 2.50 ... 5.00 bar | AC 10 | SG 20 |
| | > 5.00 ... 10.0 bar | AC 5 | SG 10 |
| | > 10.0 ... 90.0 bar | AC 2.5 | SG 10 |
| Closing pressure category | | SZ 2,5 | |
| Class II temperature range | | -20 °C to +60 °C | |
| Operation and strength | | according to DIN EN 334, DIN EN 14382 | |
| CE mark according to PED | |  | |
| Ex protection | | Since the device is not fitted with potential ignition sources of its own, it is not subject to ATEX 95 regulations (all used electronic accessories meet ATEX requirements). | |

*) The lower accuracy class and closing pressure category is valid for inlet pressure changes < 8 bar.

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| MATERIALS | | | |
|---------------------------------|----------------------------|----------------------|--------------------------------------|
| Actuator unit housing | Cast steel | SAV switching device | Steel, brass, aluminum wrought alloy |
| Interior parts of actuator unit | Steel, aluminum alloys | SAV controller | Aluminum wrought alloys |
| Controller | aluminum alloys | | |
| Diaphragms | Rubber plastics (NBR, ECO) | | |
| Gaskets | Rubber plastics (NBR) | | |

ADJUSTMENT RANGES OF SAV CONTROL UNITS USED FOR ACTUATORS WITH INTEGRATED SAVS (DN 50/100 TO DN 100/200)

| Control unit | Setpoint spring | | | Upper response pressure p _{dso} | | Lower response pressure p _{dsu} | | Response pressure group ** |
|--------------|-----------------|------------|-----------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------|
| | No. | Color | Wire ø in mm | Adjustment range W _{dso} (bar) | Smallest difference between response pressure and normal operating pressure* Δp _{w0} (bar) | Adjustment range W _{dsu} (bar) | Smallest difference between response pressure and normal operating pressure* Δp _{wu} (bar) | |
| K1a | 1 | yellow | 2,50 | 0,05 ... 0,10 | 0,030 | | | 10 / 5,0 |
| | 2 | light red | 3,20 | 0,08 ... 0,25 | 0,050 | | | 10 / 5,0 |
| | 3 | dark red | 3,60 | 0,20 ... 0,50 | 0,100 | | | 5 / 2,5 |
| | 4 | white | 4,75 | 0,40 ... 1,50 | 0,250 | | | 5 / 2,5 |
| | 5 | light blue | 1,10 | | | 0,010 ... 0,015 | 0,012 | 20 |
| | 6 | white | 1,20 | | | 0,014 ... 0,040 | 0,030 | 10 / 5,0 |
| | 7 | black | 1,40 | | | 0,035 ... 0,120 | 0,060 | 5 |
| K2a/1 | 1 | light red | 3,20 | 0,40 ... 0,80 | 0,100 | | | 10 / 5,0 |
| | 2 | dark red | 3,60 | 0,60 ... 1,60 | 0,200 | | | 10 / 5,0 |
| | 3 | white | 4,75 | 1,50 ... 4,50 | 0,300 | | | 5 / 2,5 |
| | 4 | light blue | 1,10 | | | 0,060 ... 0,150 | 0,050 | 10 / 5,0 |
| | 5 | black | 1,40 | | | 0,120 ... 0,400 | 0,080 | 5 |
| K2a/2 | 3 | white | 4,75 | 2,50 ... 8,00 | 0,500 | | | 10 / 5,0 |
| | 6 | red | 2,25 | | | 0,800 ... 2,200 | 0,400 | 15 / 5,0 |
| K10a | 2 | light red | 3,20 | 0,08 ... 0,250 | 0,050 | | | 10 / 5,0 |
| | 3 | dark red | 3,60 | 0,20 ... 0,500 | 0,100 | | | 5 / 2,5 |
| | 4 | white | 4,75 | 0,40 ... 1,500 | 0,250 | | | 5 / 2,5 |
| | 6 | white | 1,20 | | | 0,010 ... 0,040 | 0,030 | 10 / 5,0 |
| | 7 | black | 1,40 | | | 0,035 ... 0,120 | 0,060 | 5 |
| K11a/1 | 1 | light red | 3,20 | 0,4 ... 0,8 | 0,100 | | | 10 / 5,0 |
| | 2 | dark red | 3,60 | 0,6 ... 1,6 | 0,200 | | | 10 / 5,0 |
| | 3 | white | 4,75 | 1,5 ... 4,5 | 0,300 | | | 5 / 2,5 |
| | 4 | light blue | 1,10 | | | 0,060 ... 0,150 | 0,050 | 10 / 5,0 |
| | 5 | black | 1,40 | | | 0,120 ... 0,400 | 0,080 | 5 |
| | 6 | red | 2,25 | | | 0,350 ... 1,000 | 0,100 | 5 |
| K11a/2 | 3 | white | 4,75 | 2,5 ... 8,0 | 0,500 | | | 10 / 5,0 |
| | 6 | red | 2,25 | | | 0,800 ... 2,200 | 0,400 | 10 / 5,0 |
| K16 | 0 | ***blue | 3,20 | 0,8 ... 1,5 | 0,100 | | | 2,5 |
| | 1 | black | 4,50 | 1,0 ... 5,0 | 0,200 | | | 2,5 / 1,0 |
| | 2 | gray | 5,00 | 2,0 ... 10 | 0,400 | | | 1 |
| | 3 | brown | 6,30 | 5,0 ... 20 | 0,800 | | | 1 |
| K17 | 4 | red | 7,0 | 10 ... 40 | 1,200 | | | 1 |
| | 2 | gray | 5,00 | | | 2 ... 10 | 0,400 | 5 |
| | 3 | brown | 6,30 | | | 5 ... 20 | 0,800 | 5 |
| K18 | 4 | red | 7,00 | | | 10 ... 40 | 1,200 | 5 |
| | 1 | | 9,00 | 20 ... 90 | 1,500 | | | 1 |

*) Please note: When using control units for both the upper and the lower response pressure, make sure that the difference between the two setpoints p_{dso} and p_{dsu} is at least 10 % greater than the sum of the two values Δp_{w0} and Δp_{wu}.

**) The higher AG group applies to the first half, while the lower AG group applies to the second half the adjustment range.

***) only DN 25/25

GAS PRESSURE REGULATOR RMG 503

Setup and mode of operation

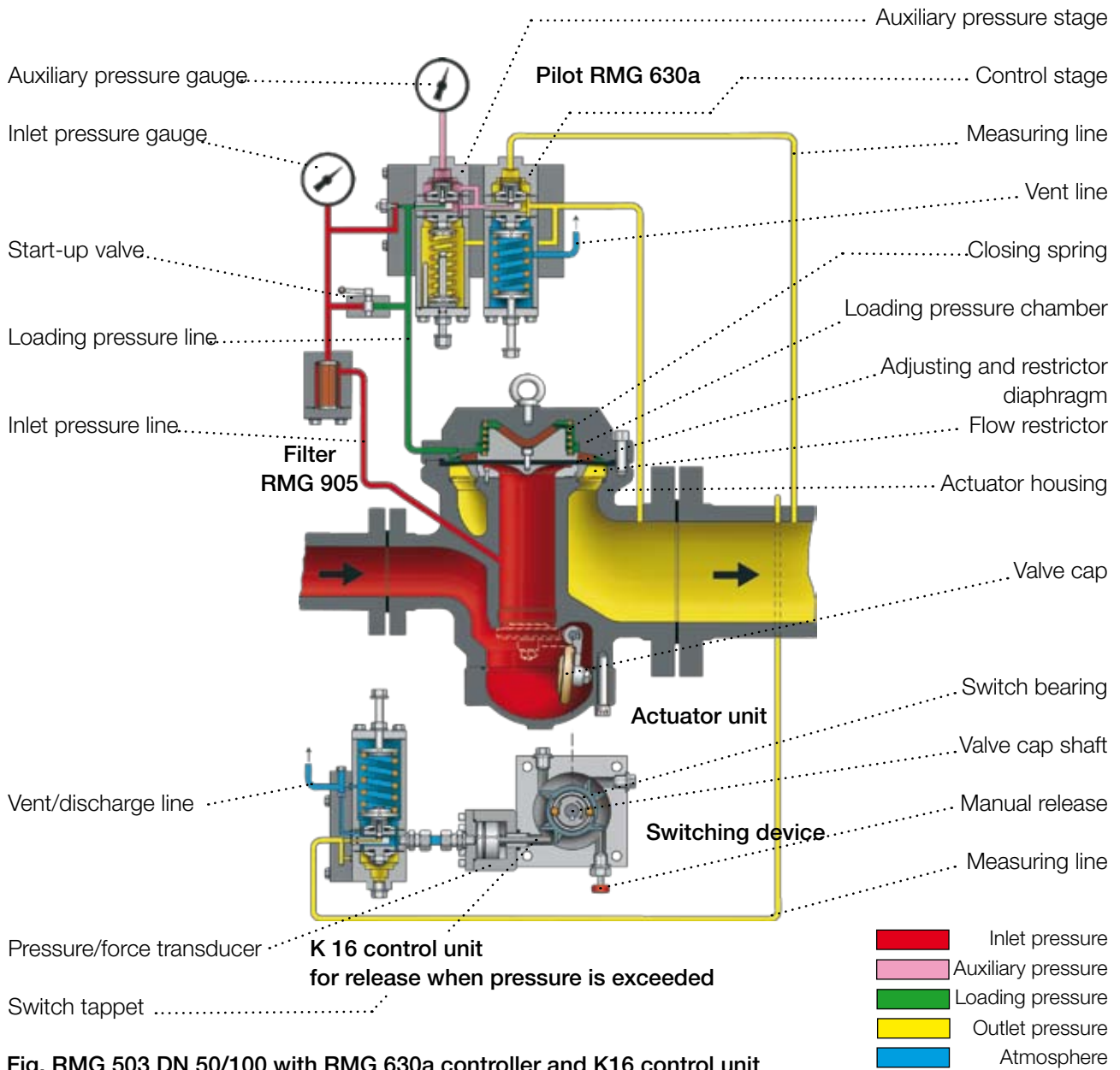


Fig. RMG 503 DN 50/100 with RMG 630a controller and K16 control unit

The gas pressure regulator RMG 503 unit is used to keep the outlet pressure of a gaseous medium at a constant level independent of any disturbance variables such as changes in inlet and/or outlet pressure throughout the controlled system.

The RMG 503 is composed of the actuator unit and the functional units "pilot" and "safety shut-off valve (SAV)." A fine filter is switched in front of the pilot to protect it against dirt.

Thanks to the fact that it is composed of only a few parts, the actuator unit is particularly easy to maintain: its only wearing part, the restrictor diaphragm, can be subjected to a quick inspection by simply removing the upper part of the housing without the need to remove the actuator housing from the controlled system.

The valve cap gasket (SAV) can also be serviced without the need to remove the unit from the system.

The actuator is designed as a diaphragm valve. The diaphragm supports itself on the flow restrictor, which is fitted with bores. An all-around sealing edge is located in front of the bores. A closing spring generates the necessary sealing force for zero shut-off.

In contrast to a device operating with a valve disk/actuator, this standard version achieves a noise reduction of 10 to 15 dB(A) thanks to its integrated gas flow divider inside the flow restrictor. Installing additional noise-reducing components (nominal widths of DN 25/50 or more) below the flow restrictor will lower the noise level even further.

However, a KG value reduced by approx. 10 % is to be expected. The outlet pressure you want to control is fed to the controller via the measuring line. The double diaphragm system inside the controller captures the actual value of the outlet pressure as a force acting on the measuring diaphragm and compares it to the force of the setpoint spring, which serves as a set point. If this comparison reveals any deviations from the controlled pressure, the device will adjust the set pressure by changing the opening position of the restrictor diaphragm in an effort to bring the outlet pressure (actual value) in line with the set point. Thanks to its use of a diaphragm construction as an actuator, the RMG 503 manages to operate soundly even when handling only low flow rates. The device will seal tightly when consumption is zero.

The gas pressure control unit will be equipped with a start-up valve for nominal widths of DN 25/50 or greater to allow the device to faster equalize the inlet pressure acting on the restrictor diaphragm.

The tried and tested RMG 711 system or, for nominal widths of DN 25/25 or greater, the SAV RMG 704 function as safety shut-off valves (SAV). The SAV will close every time the pressure exceeds or falls below the set response pressure. For a functional description of the SAV and information on how to adjust it and reset it, see the technical product information on the RMG devices 703/704/711, the associated operating and maintenance instructions of RMG devices 703/711 as well as the brochure sheets of the corresponding control units.

Fig. RMG 503 DN 25/25 with RMG 640-1 controller (view of the control unit)

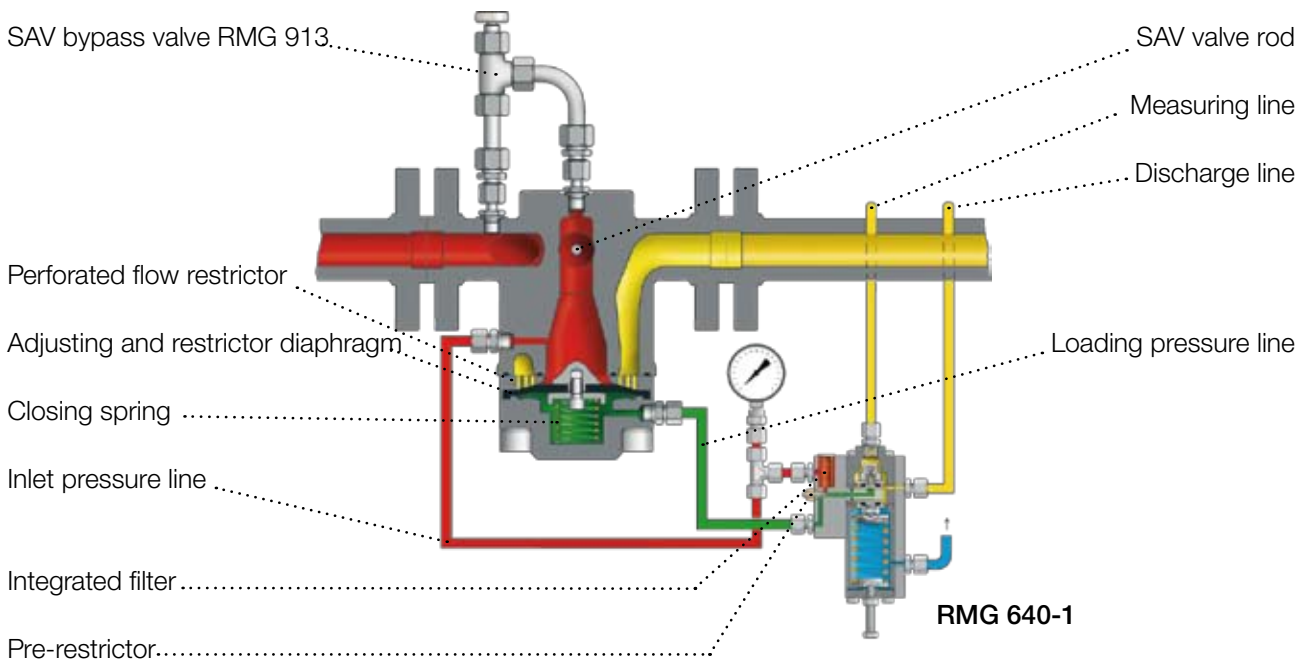
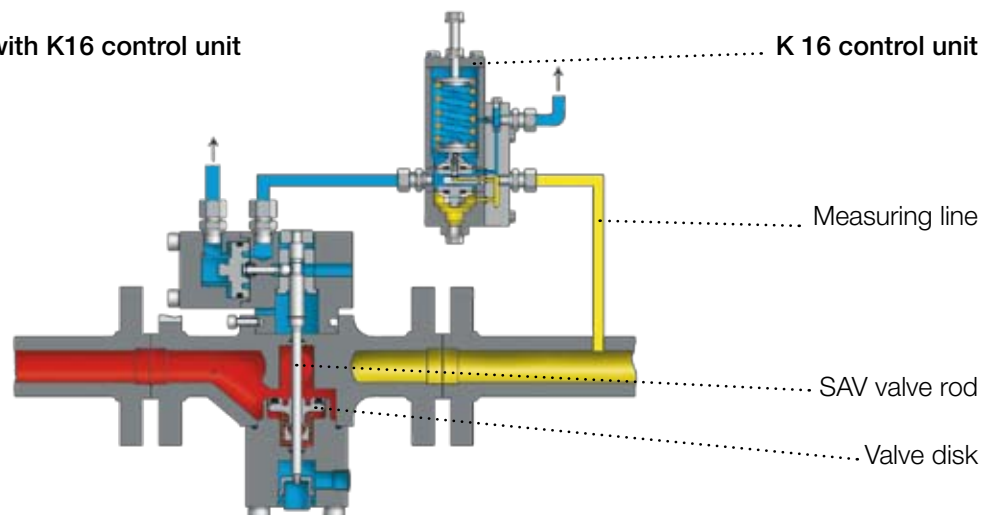
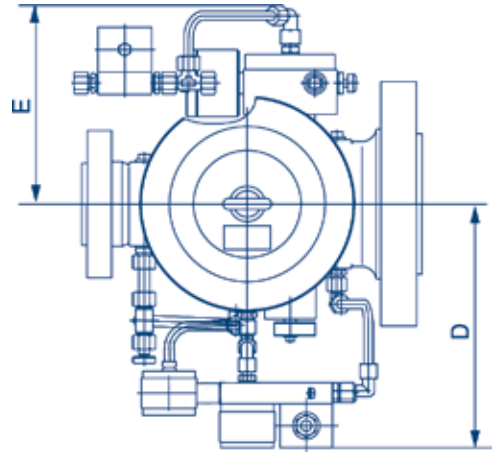
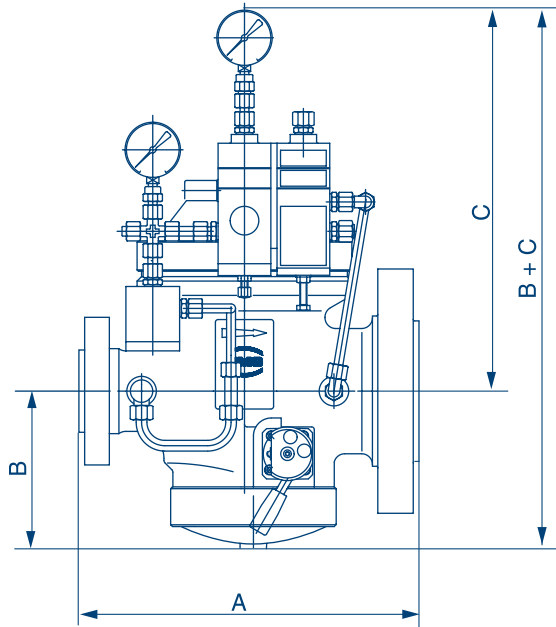


Fig. RMG 503 DN 25/25 with K16 control unit (view of the SAV unit)



GAS PRESSURE REGULATOR RMG 503

Dimensions, weights, and connectors



| DIMENSIONS | | | | | |
|---------------|------------------|-----|-----|-----|-----|
| Nominal width | Dimensions in mm | | | | |
| Inlet/outlet | A | B | C | D | E |
| 25 / 25 | 230 | 130 | 300 | 250 | 200 |
| 25 / 50 | 340 | 150 | 490 | 300 | 265 |
| 50 / 100 | 380 | 190 | 490 | 300 | 265 |
| 80 / 150 | 550 | 310 | 500 | 350 | 330 |
| 100 / 200 | 550 | 310 | 500 | 350 | 330 |
| 150 / 300 | 750 | 470 | 640 | 430 | 390 |

| WEIGHTS | |
|---------------|---------------|
| Nominal width | Weights in kg |
| Inlet/outlet | Weights in kg |
| 25 / 25 | 26 |
| 25 / 50 | 90 |
| 50 / 100 | 100 |
| 80 / 150 | 270 |
| 100 / 200 | 330 |
| 150 / 300 | 850 |

| CONNECTIONS | | | |
|-----------------------|------|-------------------------|------|
| Pilot | SAV | | |
| Inlet pressure line | E 10 | Measuring line | E 12 |
| Loading pressure line | E 10 | Vent/ discharge line | E 12 |
| Measuring line | E 12 | | |
| Discharge line | E 12 | | |
| Vent line | E 12 | | |

Example

503 – 50/100 – K 16 / E2 / HA / F – 630a 2 – So

| | | | | | | | |
|---------------------------------------------------------|------------------------------|---------------|--------------------------------|----------------|--------------------|-----------------|----------------|
| Type | Nominal width (inlet/outlet) | Control unit | Release unit | Remote control | Type of controller | Setpoint spring | Special design |
| NOMINAL WIDTH | | | | | | | |
| DN | | | | | | | |
| 25 / 25 | | | | | | | |
| 25 / 50 | | | | | | | |
| 50 / 100 | | | | | | | |
| 80 / 150 | | | | | | | |
| 100 / 200 | | | | | | | |
| 150 / 300 | | | | | | | |
| ADJUSTMENT RANGE IN BAR | | | | | | | |
| W _{do} | W _{du} | | Control unit | | | | |
| 0,05 ... 1,50 | 0,01 ... 0,12 | only DN 25/25 | K 1a | | | | |
| 0,40 ... 4,50 | 0,06 ... 0,40 | only DN 25/25 | K 2a/1 | | | | |
| 2,50 ... 8,00 | 0,80... 2,20 | only DN 25/25 | K 2a/2 | | | | |
| 0,08 ... 1,50 | 0,01 ... 0,12 | from DN 25/50 | K 10a | | | | |
| 0,40 ... 4,50 | 0,06 ... 1,00 | from DN 25/50 | K 11a/1 | | | | |
| 2,50 ... 8,00 | 0,80 ... 2,20 | from DN 25/50 | K 11a/2 | | | | |
| 1,00 ... 40,0 | | | K 16 | | | | |
| | 2,00 ... 40,0 | | K 17 | | | | |
| 20,0 ... 90,0 | | | K 18 | | | | |
| RELEASE | | | | | | | |
| Current input | | | E1 | | | | |
| Power failure (DN 25/50 or greater) | | | E2 | | | | |
| Manual release | | | HA | | | | |
| REMOTE CONTROL | | | | | | | |
| Electrical remote control of the valve position "CLOSE" | | | F | | | | |
| PILOT TYPE | | | | | | | |
| Pilot | | | RMG 630a | | | | |
| | | | RMG 640 | | | | |
| | | | RMG 640-1 | | | | |
| OUTLET PRESSURE RANGE IN BAR | | | | | | | |
| W _d | | | Setpoint spring | | | | |
| 0,30 ... 1,00 | | | 1 | | | | |
| 1,00 ... 5,00 | | | 2 | | | | |
| 2,00 ... 10,0 | | | 3 | | | | |
| 5,00 ... 20,0 | | | 4 | | | | |
| 10,0 ... 40,0 | | | 5 | | | | |
| 20,0 ... 90,0 | | | Metal harmonica measuring unit | | | | |
| SPECIAL DESIGN (TO BE SPECIFIED IN MORE DETAIL) | | | | | | | |
| | | | So | | | | |

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For More Information

To learn more about RMG's advanced gas solutions, contact your RMG account manager or visit www.rmg.com

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