MEDENUS

Gas Pressure Regulation

MADE IN GERMANY


# Gas Pressure Regulator R 100 / R 100U

## Product information

EN

## Table of Contents



**ATTENTION** Observe the following publications in relation to installation, start-up and maintenance:
DVGW - work sheets G 491 and G 600
Operating and Maintenance Instructions R 100 / R 100 U

### List of abbreviations and formula symbols

| | |
|---|---|
| AC | Accuracy class |
| $AG_o$ | Upper response pressure group |
| $AG_u$ | Lower response pressure group |
| BV | Breather valve |
| GPR | Gas pressure regulator |
| HDS | High-pressure spindle |
| $K_G$ | Valve flow rate coefficient |
| p | Pressure |
| $p_d$ | Outlet pressure |
| $p_{df}$ | SRV closing pressure |
| $p_{do}$ | SRV opening pressure |
| $p_{ds}$ | Setpoint of the response pressure |
| $p_{ds\,o}$ | Upper SSV response pressure |
| $p_{ds\,u}$ | Lower SSV response pressure |
| $p_{f,max}$ | Maximum closing pressure |
| PS | Maximum allowable pressure |
| $p_u$ | Inlet pressure |
| $Q_n$ | Standard volumetric flow rate |
| RE | Diaphragm assembly |
| RSD2 | Throttle valve |
| SSV | Safety shut-off valve |
| SRV | Safety relief valve |
| SG | Closing pressure group |
| $t_{Gas}$ | Gas inlet temperature |
| VS | Valve seat |
| $w_d$ | Outlet gas velocity |
| $w_u$ | Inlet gas velocity |
| $W_{ds\,o}$ | Upper spring adjustment range (SSV) |
| $W_{ds\,u}$ | Lower spring adjustment range (SSV) |
| Δp | Pressure difference from inlet pressure to outlet pressure |
| $\Delta p_{wo}$ | Min. re-engagement difference between upper response pressure and normal operating pressure |
| $\Delta p_{wu}$ | Min. re-engagement difference between lower response pressure and normal operating pressure |
| $\rho_n$ | Gas density |

*) KG value for natural gas

# Application, Characteristics, Technical Data

## Application

Gas pressure regulator (GDR), direct-acting (operating without auxiliary power), for systems acc. to DVGW work sheets G 491 (A) and G 600 (A) (TRGI)
Particularly suitable for dynamic regulation sections (e.g. gas fireplaces, natural gas supply systems, burner circuits, gas motor operation)
Can be used as an equipment component on gas consumption facilities as defined in Regulation (EU) 2016/426.
Can be used for the gases defined in DVGW work sheet G 260 / G 262 and neutral non-aggressive gases. (other gases on request)

## Characteristics

- Integral pressure-tight version (IS)
- Pilot pressure-compensated double-seat valve
- High flow rate capacity
- Open-air model

## Types of models (options) (see page 11)

- With throttle valve (RSD2) for the impulse line on the diaphragm assembly
- Oxygen model
- With FKM gaskets + stainless steel seat (e.g. for biogas applications)
- Coating with epoxy resin in RAL colors

| Accuracy class AC and closing pressure group SG at the outlet pressure range $p_{d,\ \text{minimum pressure differential 100 mbar}}$ | AC | SG |
|---|---|---|
| 8 mbar to 22 mbar | 10 | 50 |
| > 22 mbar to 1200 mbar | 10 | 20 |

## Technical data

| | |
|---|---|
| **Type** | R 100 / R 100 U |
| **Model** | Integral pressure-tight (IS) |
| **Max. allowable pressure PS** | 8 bar |
| **Max. inlet pressure $p_{u,max}$** | R 100: 8 bar / R 100 U: 1.2 bar |
| **Nominal width** | R 100: DN 50, DN 80, DN 100, DN 150, DN 200 |
| **Connection type** | DIN EN 1092 PN 16 flanges<br>ASME - B16.5 flanges Class 150 RF |
| **Material**<br>Housing / actuator housing/<br>Control device housing | Al cast alloy DIN EN 1706-AC-42100 ST6 |
| **Corrosivity category**<br>C1 to C5-I<br>C5-M | DIN EN ISO 12944-2<br>without additional coatings<br>an epoxy resin coating is recommended |
| **Temperature range, Class 2**<br>(operating/ambient temperature) | -20°C to +60°C |
| **Closing pressure zone group** | SZ 10 |
| **Function, strength and tightness** | DIN EN 334 |
| **CE mark acc. to PED/ PIN number** | CE-0085-AQ0410 |
| **Ex protection** | The mechanical parts of the device do not have any potential ignition sources of their own and therefore do not fall within the scope of ATEX 95 (94/9/EC). Electrical components fitted to the device comply with the ATEX requirements. |

**Preferred installation position**

The gas pressure regulators R100 shall be installed in the pipeline preferably in horizontal position.
For all nominal widths, the direction of flow is indicated by an arrow on the housing.

Installation upside down only after consultation with Medenus GmbH

Note: Observe the following documents in relation to installation, start-up, and maintenance:

- DVGW - work sheets G 491 and G 600
- Operating and Maintenance Instructions R 100

# Application, Characteristics, Technical Data

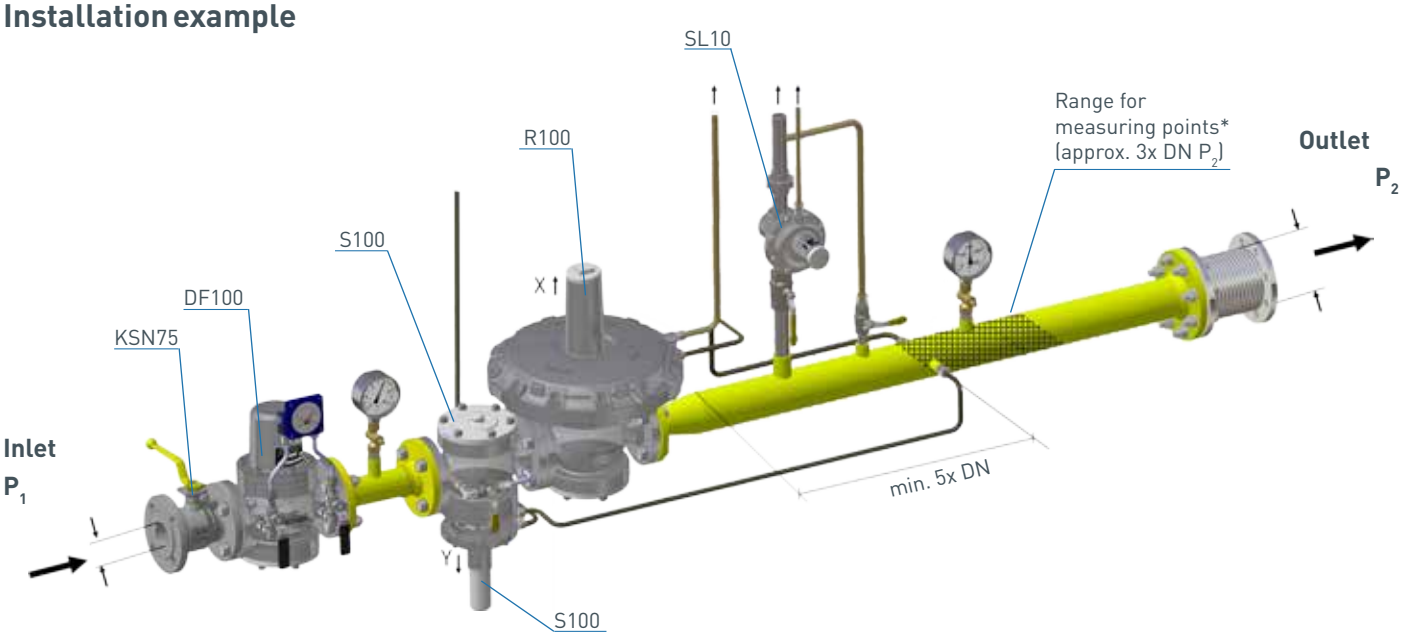
## Design and function R 100

The spring-loaded gas pressure regulator R100 has the function of keeping the outlet pressure of a gaseous medium constant within allowable limit values, independently of the effect of interferences, such as changes in the inlet pressure and/or in the gas tap, in the connected regulation section on the outlet side. The gas pressure regulator is composed of the actuator housing and the "diaphragm assembly plus actuator" functional unit. The double-seat valve seat model is pre-pressure-compensated. The gas flows through the actuator housing in the direction of the arrow. The external measurement line port is used to pass the outlet pressure to be regulated to the bottom of the main diaphragm of the diaphragm assembly. It compares the actual value with the command variable preset by the force of the setpoint spring. The setpoint required in each case is set via the setting screw. Any deviation from the setpoint is transmitted by the screw spindle to the actuator, which is adjusted such that the actual value is adjusted to the setpoint.
In case of zero tap, the actuator will close tight, causing the closing pressure to be established.

## Design and function R 100 U

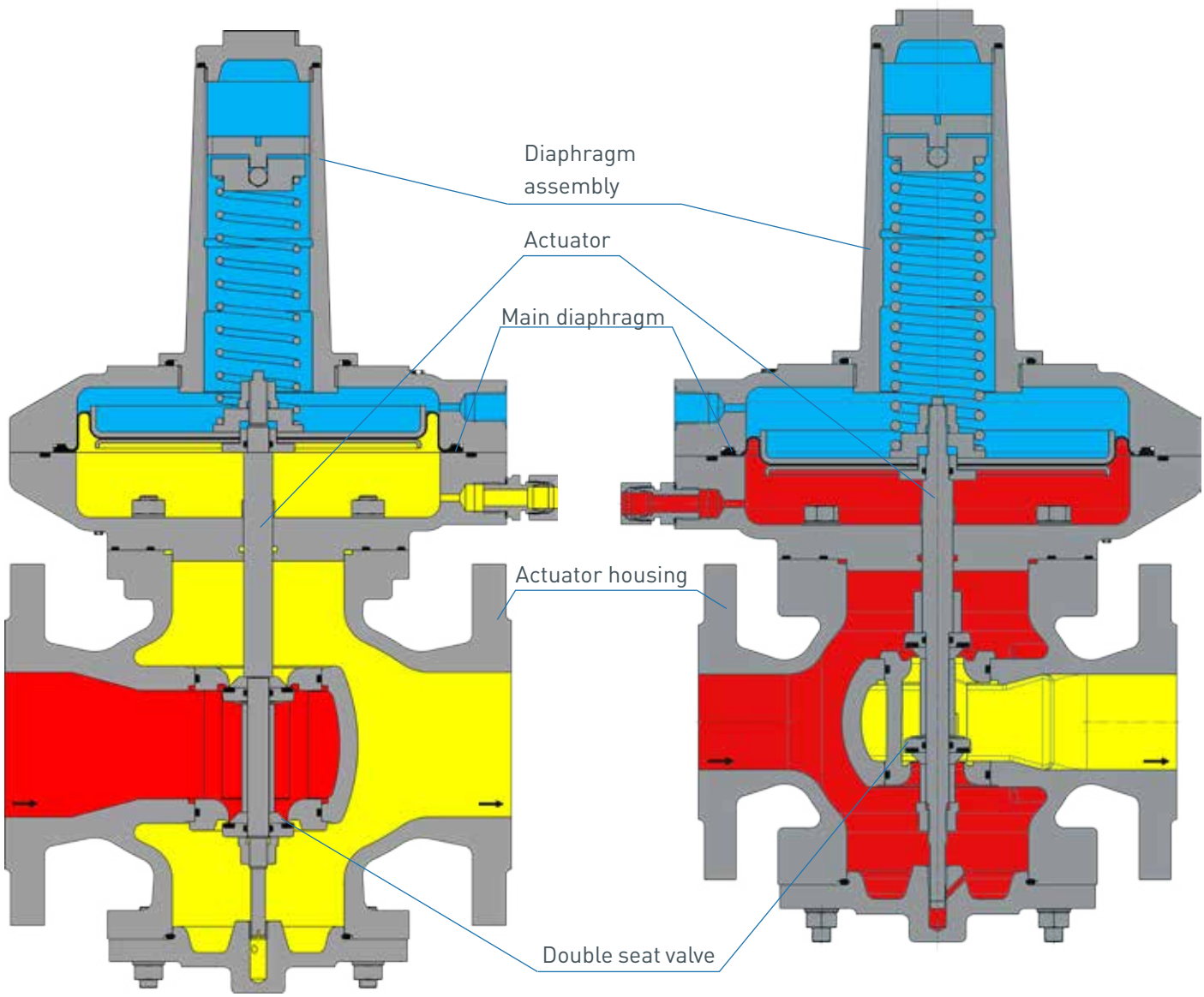
The spring-loaded gas pressure regulator R 100U has the function of keeping the inlet pressure of a gaseous medium constant within allowable limit values, independently of the effect of interferences, such as changes in the outlet pressure, in the connected regulation section on the inlet side. The gas pressure regulator is composed of the actuator housing and the "diaphragm assembly plus actuator" functional unit. The double-seat valve seat model is pre-pressure-compensated. The gas flows through the actuator housing in the direction of the arrow. The external measurement line port is used to pass the inlet pressure to be regulated to the bottom of the main diaphragm of the diaphragm assembly. It compares the actual value with the command variable preset by the force of the setpoint spring. The setpoint required in each case is set via the setting screw. Any deviation from the setpoint is transmitted by the screw spindle to the actuator, which is adjusted such that the actual value is adjusted to the setpoint.

## Installation example




*) Recommended max. velocity at the measurement line port 25 m/s

## Sectional view




shown R 100

shown R 100 U

## $K_G$ value and diaphragm assemblies

(KG value for natural gas: d = 0.64 ($\rho_n$ = 0.83 kg/m³), $t_u$ = 15° C)

| | R 100 | | | | | R 100 U | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nominal width | DN 50 | DN 80 | DN 100 | DN 150 | DN 200 | DN 50 | DN 80 | DN 100 | DN 150 | DN 200 |
| Diaphragm assembly Ø / Valve seat Ø | 160 275 390 | 160 275 390 | 160 275 390 | 275-2 385 | 275-2 385 | 160 275 390 | 160 275 390 | 160 275 390 | 275-2 385 | 275-2 385 |
| 27.5 - 27.5 mm | 800 | | | | | 1100 | | | | |
| 32.5 - 32.5 mm | | 1500 | | | | | 1700 | | | |
| 42.5 - 42.5 mm | | | 2400 | | | | | 3200 | | |
| 45.0 - 50.0 mm | | 2500 | | | | | 3400 | | | |
| 60.0 - 65.0 mm | | | 4700 | | | | | 6000 | | |
| 65.0 - 65.0 mm | | | | 5200 | | | | | 7000 | |
| 90.0 - 90.0 mm | | | | | 10000 | | | | | 11000 |
| 95.0 - 100.0 mm | | | | 12000 | | | | | 13500 | |
| 125.0 - 130.0 mm | | | | | 20200 | | | | | 25000 |
| Connection | DIN EN 1092 - PN16 | | | | | | | | | |

## RE - Diaphragm assembly

| Regulator type Nominal width | Nominal width | Diaphragm assembly | Outlet pressure ranges [mbar] | Recommended use of the high-pressure screw spindle in the pressure range [mbar] (illustration with HDS on p. 11) |
|---|---|---|---|---|
| R100 / R100U | DN 50 DN 80 DN100 | RE 390 | 8 - 130 | 130 - 450 |
| | | RE 275 | 130 - 450 | 450 - 1,100 |
| | | RE 160 | 450 -1,200 | |
| | DN 150 DN 200 | RE 385 | 8 - 350 | 350 - 850 |
| | | RE 275 | 350 - 850 | 850 - 1,200 |

## Diaphragm assembly setpoint spring table R 100 / R100 U

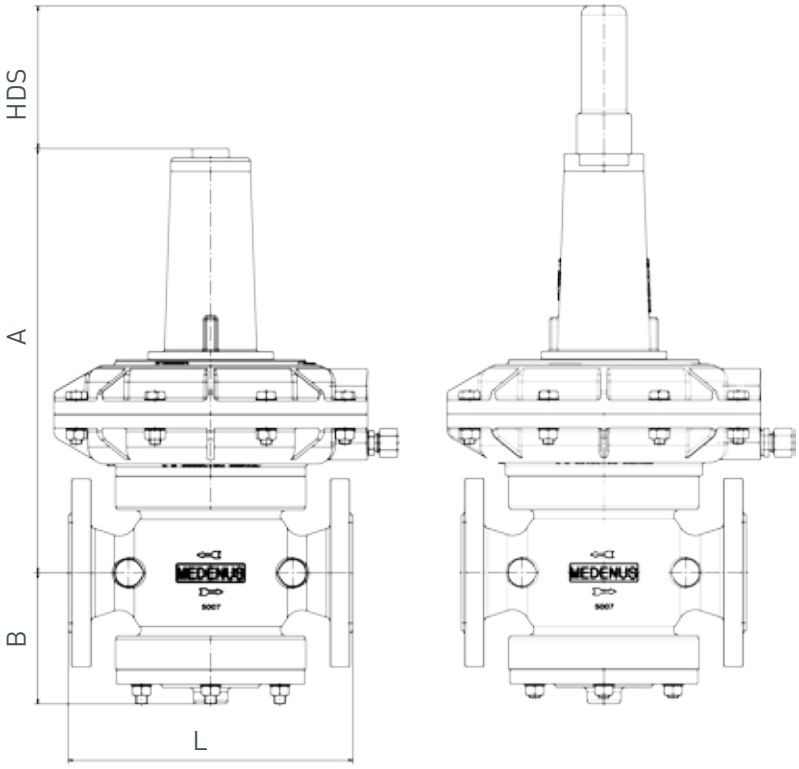
| Spring data | | Specific command range $W_{ds}$ [mbar] | | | |
|---|---|---|---|---|---|
| Spring no. | Color [RAL] | RE 205 | RE 275 | RE 320 | RE 390 |
| FA 01 | blank | 36 - 39 | 23 - 25 | 10 - 12 | 8 - 10 |
| FA 02 | 9006 | 38 - 45 | 24 - 28 | 11 - 13 | 9 - 12 |
| FA 03 | 5015 | 44 - 52 | 27 - 31 | 14 - 18 | 11 - 13 |
| FA 04 | 4002 | 51 - 64 | 30 - 37 | 17 - 22 | 12 - 15 |
| FA 05 | 7037 | 62 - 81 | 35 - 46 | 21 - 29 | 14 - 19 |
| FA 06 | 9005 | 78 - 107 | 43 - 59 | 28 - 39 | 18 - 24 |
| FA 07 | 3020 | 103 - 147 | 55 - 80 | 38 - 54 | 23 - 32 |
| FA 08 | 9010 | 140 - 205 | 73 - 110 | 53 - 77 | 31 - 45 |
| FA 09 | 7016 | 195 - 295 | 100 - 156 | 76 - 111 | 42 - 64 |
| FA 10 | 6010 | 280 - 430 | 141 - 225 | 110 - 166 | 59 - 94 |
| FA 11 | 2002 | 419 - 653 | 208 - 339 | 165 - 250 | 88 - 142 |
| FA 12* | 7035 | 595 - 935 | 293 - 484 | 239 - 361 | 124 - 203 |
| FA 13* | 5010 | 819 - 1408 | 436 - 726 | 360 - 544 | 185 - 305 |
| FA 14* | 1028 | 1245 - 1976 | 607 - 1017 | 506 - 765 | 258 - 428 |
| FA 15* | 6018 | 1212 - 2553 | 699 - 1333 | 535 - 978 | 297 - 568 |
| FA 16* | 3020 | 1330 - 3012 | 785 - 1580 | 602 - 1157 | 333 - 673 |

| Spring data | | Specific command range $W_{ds}$ [mbar] | | |
|---|---|---|---|---|
| Spring no. | Color [RAL] | RE 275-2 | RE 385-2 | RE 485 |
| FB 701 | 6018 | 59 - 69 | 31 - 35 | 19 - 22 |
| FB 702 | 9006 | 68 - 83 | 34 - 41 | 21 - 25 |
| FB 703 | 5015 | 80 - 105 | 40 - 51 | 24 - 31 |
| FB 704 | 4002 | 96 - 127 | 50 -61 | 28 - 36 |
| FB 705 | 7037 | 112 - 156 | 60 - 77 | 33 - 44 |
| FB 706 | 9005 | 146 - 207 | 76 - 100 | 41 - 56 |
| FB 707 | 3020 | 184 - 266 | 98 - 127 | 51 - 71 |
| FB 708 | 9010 | 238 - 358 | 125 - 167 | 65 - 94 |
| FB 709 | 7016 | 302 - 450 | 165 - 215 | 82 - 118 |
| FB 710 | 6010 | 397 - 596 | 212 - 285 | 105 - 155 |
| FB 711 | 2002 | 542 - 814 | 280 - 390 | 140 - 209 |
| FB 712 | 7035 | 742 - 1078 | 385 - 520 | 188 - 275 |
| FB 713* | 5010 | 977 - 1442 | 515 - 671 | 246 - 369 |
| FB 714* | 1028 | 1245 - 1878 | 661 - 873 | 311 - 479 |
| FB 715* | 6018 | 1547 - 2469 | 712 - 1186 | 393 - 618 |
| FB 716* | 3020 | 2136 - 3008 | 975 - 1514 | 517 - 752 |

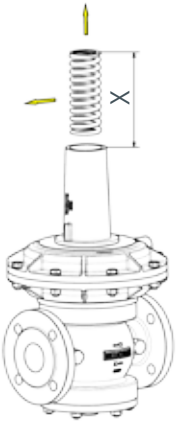
* High-pressure spindle HDS required (illustration p. 11)

# Dimensions, Connection, and Weight

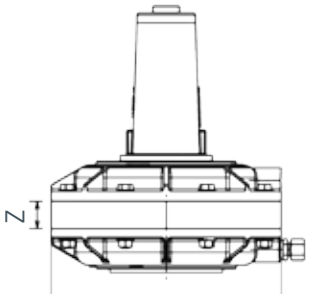
## Dimensional drawing




Dismounting dimensions for springs / HDS




Safety diaphragm




## Dimensions and weight

| Dimensions \ Nominal width | RE | R100 / R100 U DN 50 | DN 80 | DN 100 | DN 150 | DN 200 |
|---|---|---|---|---|---|---|
| A [mm] | 160 | 398 | 421 | 433 | - | - |
| | 275 | 372 | 395 | 407 | 694 | 724 |
| | 385/390 | 372 | 395 | 407 | 647 | 677 |
| HDS [mm] | | 125 | 125 | 125 | 205 | 205 |
| B [mm] | | 115 | 138 | 150 | 195 | 245 |
| L [mm] | | 250 | 280 | 300 | 380 | 420 |
| X [mm] | | 260 | 260 | 260 | 410 | 410 |
| Z [mm] | | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Weight [kg] | 160 | 14 | 16 | 19 | - | - |
| | 275 | 17 | 19 | 22 | 62 | 60 |
| | 385/390 | 19 | 22 | 25 | 65 | 64 |
| SM safety diaphragm weight [kg] | 275 | 3 | 3 | 3 | 3.3 | 3.3 |
| | 385/390 | 5 | 5 | 5 | 6 | 6 |
| HDS weight [kg] | | 0.6 | 0.6 | 0.6 | 1.6 | 1.6 |
| Connection | DIN EN 1092 - PN16 | | | | | |

Example: R100/050/390 with HDS and safety diaphragm
Weight (regulator + HDS + SM): 19 kg + 0.6 kg + 5 kg = 24.6 kg
Dimensions (A + HDS + SM): 372 mm + 125 mm + 32.5 mm = 529.5 mm

# Types of Models / Options

## Safety diaphragm

In the model with safety diaphragm, the safety diaphragm is located above the main diaphragm. When the main diaphragm is damaged, the safety diaphragm makes contact with the top cover of the diaphragm assembly and limits any inadmissible escape of gas into the surrounding atmosphere to a maximum of 30l/h (air).

**(Option not available for hydrogen version $H_2$)**


## RSD2 throttle valve

The RSD2 is a throttle valve which regulates the volume flow in the sensing/impulse line by means of a continuously adjustable cross-sectional reduction. The setting is made tool-free by means of a rotary knob and can be adjusted using a screw to be fixed. The throttle valve cannot be completely shut off, therefore a guaranteed minimum flow is ensured.


## High-pressure spindle HDS

The high pressure spindle (HDS) is used to adjust the control spring at high pressure. (See spring tables p. 9)

## Epoxy resin coating in RAL colors

To protect the gas pressure regulator from external influences, starting from a corrosivity category C5-M we recommend an epoxy resin coating.

## Types of models

Oxygen version $O_2$

Hydrogen version $H_2$ (with helium leak test)

The Medenus gas pressure regulators are suitable for use with hydrogen as a medium up to a proportion of 100%. Further information can be found in the special edition (10/2019) of gwf Gas+Energie and on our homepage at (www.medenus.de)

# Design

**Note** All calculated pressures are absolute pressures for natural gas. (p+1 bar) The required KG value for a gas pressure regulator is determined with the smallest inlet pressure or lowest pressure drop.

$p_u$ Inlet pressure (bar)
$p_d$ Outlet pressure (bar)
$Q_n$ Standard volumetric flow rate m³/h

## Calculation of the required $K_G$ value

| $p_d / p_u > 0.5$ | $p_d / p_u \leq 0.5$ |
|---|---|
| Value flow rate coefficient $K_G$ at a subcritical pressure ratio | Value flow rate coefficient $K_G$ at a supercritical pressure ratio |
| $K_G = Q_n / \sqrt{p_d \cdot (p_u - p_d)}$ | $K_G = 2 \bullet Q_n / p_u$ |

**Example:**

| | Overpressure | Absolute pressure |
|---|---|---|
| $p_{u\ min}$ | 5.0 bar | 6.0 bar |
| $p_{d\ min}$ | 0.5 bar | 1.5 bar |
| $Q_{n\ min}$ | 2500 m³/h | |

1.5 bar / 6 bar = 0.25 < 0.5
→ Supercritical pressure ratio
$K_G = 2 \bullet 2500 / 6 = 833$ [m³/(h*bar)]

**Note** For spring-loaded devices, a capacity reserve of 10-20% is recommended in order to comply with the accuracies given.

The device is selected on the basis of its $K_G$ value from the table of flow rate coefficients (page 8)

## Device selection

**Selected device**

| | |
|---|---|
| Type | R 100 |
| DN - Nominal width | 080 |
| D - Nozzle | V 32.5 - 32.5 |
| $K_G$ value | 1500 m³/(h*bar) |

**Note** Closing pressure zone group: SZ 2.5

For the small load $Q_{min}$ with SZ this yields 2.5: $Q_{min} = 0.025 \bullet K_G \bullet p_{u\ max}$

$Q_{min} = 0.025 \bullet 833 \bullet 6 = 124.95$ m³/h

Small load $Q_{min}$ - When burner is started or at $Q_{min}$ a $K_G$ utilization level of at least 1% should be reached.
Selection of the diaphragm assembly from the diaphragm assembly setpoint spring table (page 9)

Selected diaphragm assembly

| | |
|---|---|
| RE - Diaphragm assembly | 275 |
| Setpoint spring | FA11 ($W_{ds}$ 208 - 339) |

AC 5/SG 10 (for RE 275 D - Nozzle 27.5)

Selection of the closing pressure group from the closing pressure group table (page 4)
$p_{f\ max} = p_{ds} \bullet (1 + SG/100)$

Selected SSV

Selection of the SSVs from the SSV control device table (page 10)
Recommended upper SSV response pressure $p_{ds\ o} < 500$ mbar + $p_{ds}$

MD-R with FD 913 (285 - 460 mbar) $AG_o$ 10
set to $P_{dso} =$ 375 mbar
and FE 901 (50 - 80 mbar) $AG_u$ 5

## Determining the upper response pressure

| Outlet pressure $P_d$ (mbar) | Upper response pressure $W_{dso}$ * |
|---|---|
| ≤200 | $P_d$ +100 mbar |
| >200 - ≤800 | $P_d$ x 1.5 |
| >800 - ≤1600 | $P_d$ x 1.3 |
| >1600 | $P_d$ +500 mbar |

**Note** Standard setpoint springs SSV

| | |
|---|---|
| (small ball lock) | |
| MD | FE 902 (12 - 24 mbar) |
| MD-R | FE 901 (50 - 80 mbar) |
| (large ball lock) | |
| MD | FM 402 (35 - 115 mbar) |
| MD-R | FM 400 (10 - 180 mbar) |

## Checking the gas velocities

$w = 380 \bullet Q_n / (DN^2 \bullet p_{abs})$

**Note** The factor 380 refers to an operating gas temperature from approx. 15°C to 20°C. For other temperatures, the velocity must be corrected as follows: $w_{corr} = w \bullet (t_{gas} + 273.15)/290$

Nominal width of input and output of pipeline according to the selected device: 80 mm
Selected widening of outlet pipeline: 200 mm

Recommended max. gas velocity at the inlet flange:
50 - 70 m/s lower value for redirections upstream of the control valve, 20 m/s for upstream filters

$w_u = 380 \bullet 3000 / (80^2 \bullet 14) = 13$m/s

Recommended max. gas velocity at the outlet flange:
100 - 200 m/s lower value to reduce noise emissions

$w_d = 380 \bullet 3000 / (80^2 \bullet 1{,}25) = 143$ m/s

Recommended max. gas velocity on impulse tap: 15 - 25 m/s
15 m/s max. value for outlet pressures below 100 mbar

$w_{Impulse} = 380 \bullet 3000 / (200^2 \bullet 1.25) = 23$ m/s

The device selected in the example of nominal width DN 80 can be operated under these conditions.

*) The upper response pressure is rounded up to full tens (e.g. 251 mbar-> 260 mbar)

## Properties of gases

- for natural gas ($\rho_n$ = 0.83 kg/m³; t = 15°C)
- Δp = pressure difference from inlet pressure to outlet pressure
- $Q_n$ = max. possible volume flow (determined using $K_G$ values with a safety margin of 10%)
- f - natural gas conversion factor- L

| Gas | f | Hs,n [kWh/m³] | Gas | f | Hs,n [kWh/m³] |
|---|---|---|---|---|---|
| Acetylene | 0.84 | 16.25 | Sewage gas | 0.84 | |
| Ammonia | 1.04 | 4.83 | Carbon monoxide | 0.81 | 3.51 |
| Butane | 0.55 | 37.23 | Carbon dioxide | 0.65 | - |
| Chlorine | 0.51 | - | Air | 0.80 | - |
| Landfill gas | approx. 0.80 | | Methane | 1.08 | 11.06 |
| Natural gas L | 1.00 | 9.77 | Propane | 0.64 | 28.03 |
| Natural gas H | 1.03 | 11.45 | Oxygen | 0.76 | - |
| Ethane | 0.78 | 19.55 | Sulphur dioxide | 0.53 | - |
| Ethylene | 0.97 | 16.516 | Nitrogen | 0.81 | - |
| Mine gas | (30% CH4) | 0.86 | Hydrogen | 3.04 | 13.43 |
| Helium | 2.15 | - | | | |

## Notes

## Notes

## Notes

# Order Data

In every selection group, only one option can be selected in each case.

## Example:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gas pressure regulator:** | | R100/050/275/27.5-27.5/HDS/left/SM/RSD2/WAZ/So | | | | | | | | | |
| **Order code:** | | R100 | 050 | - | 205 | 27.5-27.5 | HDS | left | SM | RSD2 | WAZ | So |
| **Order selection** | **Designation** | | | | | | | | | | | |
| **Type** | | | | | | | | | | | | |
| R 100 | R 100 | R100 | | | | | | | | | | |
| R 100 U | R 100 U | | | | | | | | | | | |
| **DN - Nominal width** | Table p. 8 | | 050 | | | | | | | | | |
| **Flange model** | | | | | | | | | | | | |
| PN 16 | - | | | - | | | | | | | | |
| Class 150 | C | | | | | | | | | | | |
| **RE - Diaphragm assembly** | Table p. 8 | | | | 275 | | | | | | | |
| **D - Nozzle (valve seat diameter)** | Table p. 8 | | | | | 27.5-27.5 | | | | | | |
| **High-pressure spindle** | Fig. p. 11 | | | | | | | | | | | |
| without high-pressure spindle | - | | | | | | | | | | | |
| with high-pressure spindle | HDS | | | | | | HDS | | | | | |
| **Direction of flow** | | | | | | | | | | | | |
| Right (from left to right) | - | | | | | | | | | | | |
| Left (from right to left) | left | | | | | | | left | | | | |
| **Additional unit, diaphragm assembly** | Fig. p. 11 | | | | | | | | | | | |
| without additional unit, diaphragm assembly | - | | | | | | | | | | | |
| Safety diaphragm | SM | | | | | | | | SM | | | |
| **Throttle valve** | Fig. p. 11 | | | | | | | | | | | |
| without throttle valve | - | | | | | | | | | | | |
| with throttle valve | RSD2 | | | | | | | | | RSD2 | | |
| **Acceptance test certificate to EN 10204/3.1** | | | | | | | | | | | | |
| without acceptance test certificate | - | | | | | | | | | | | |
| with acceptance test certificate | WAZ | | | | | | | | | | WAZ | |
| **Special model** | So | | | | | | | | | | | So |

- Coating with epoxy resin in RAL colors
- Oxygen model
- Hydrogen model
- FKM gaskets + stainless steel seat

# Contact

Management
ALEXANDER CHRISTIANI

Phone: +49 (0) 2761 / 82788-18
Mail: a.christiani@medenus.de

Technical Inside Sales Department
MINDAUGAS PECKAITIS

Phone: +49 (0) 2761 / 82788-23
Mail: m.peckaitis@medenus.de

Head of Sales & Marketing
FRANZ FEICHTNER

Phone: +49 (0) 2761 / 82788-26
Mobile phone: +49 (0) 151 / 51002711
Mail: f.feichtner@medenus.de

Inside Sales Department
SEBASTIAN HUCKESTEIN

Phone: +49 (0) 2761 / 82788-11
Mail: s.huckestein@medenus.de

Head of Inside Sales Department
MANUEL SCHEPP

Phone: +49 (0) 2761 / 82788-20
Mobile phone: +49 (0) 170 / 6355309
Mail: m.schepp@medenus.de

Inside Sales Department
STEFANIE MÜLLER

Phone: +49 (0) 2761 / 82788-13
Mail: s.mueller@medenus.de


If you want to know more about solutions from MEDENUS for the gas industry, please contact your local contact person or go to our internet site at www.medenus.de

**Trade representation worldwide**
medenus.de/de/kontakt.html


**MEDENUS**
Gas-Druckregeltechnik GmbH

Im Langen Feld 3
D-57462 Olpe
Phone: +49 (0)2761 82788-0
Fax: +49 (0)2761 82788-9
Mail: info@medenus.de
**Internet: www.medenus.de**


## THE MEDENUS PLUS
10 reasons for good business relations

1. Consultancy expertise and quality standards developed over decades
2. Broad and proven standard range of feedback controllers
3. Modern, fast and efficient production for series products and for individual orders
4. Customer-specific design of pressure regulators and vacuum regulators and special designs
5. Guaranteed deadline compliance with a delivery deadline guarantee
6. Fast response time in all matters
7. Sufficiently large parts storage for production and spare parts
8. Customer-specific theory & practice training courses
9. Modular design right across the entire product range to facilitate optimized handling of spare parts
10. Made in Germany

**In the download area of our homepage, this document is available in different languages. You can use the following QR codes and links to go directly to this document in your language.**

**Deutsch:**

http://medenus.de/files/upload/downloads/R100/Pi_R100_de.pdf

**English:**

http://medenus.de/files/upload/downloads/R100/Pi_R100_en.pdf

## Notes

**MEDENUS** Gas-Druckregeltechnik GmbH
Phone +49 (0)2761 82788-0
Fax +49 (0)2761 82788-9
Im Langen Feld 3 / D-57462 Olpe
info@medenus.de
www.medenus.de

EN