

MEDENUS

Gas Pressure Regulation



Gas pressure regulator RS 250 / RS 251



Product information

EN

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List of abbreviations and formula symbols

AC	Accuracy class	PS	Maximum allowable pressure	W_{dsu}	Lower adjustment range (SSV)
AG_o	Upper response pressure group	p_u	Inlet pressure	Δp_{wo}	Min. re-engagement difference between upper response pressure and normal operating pressure
AG_u	Lower response pressure group	Q_n	Standard volumetric flow rate		
HDS	High-pressure screw spindle value	RE	Control unit	Δp_{wu}	Min. re-engagement difference between lower response pressure and normal operating pressure
K_G		BV	Breather valve		
p_d	Outlet pressure	RSD	Throttle valve		
p_{df}	SRV closing pressure	RSS	Switching valve		
p_{do}	SRV opening pressure	SSV	Safety shut-off valve		
p_{ds}	Setpoint of the response pressure	SRV	Safety relief valve	ρ_n	Gas density
$p_{ds o}$	Upper SSV response pressure	SG	Closing pressure group		
$p_{ds u}$	Lower SSV response pressure	t_{Gas}	Gas inlet temperature		
$p_{f,max}$	Maximum closing pressure	VS	Valve seat		
		w_d	Outlet gas velocity		
		w_u	Inlet gas velocity		
		W_{dso}	Upper adjustment range (SSV)		

*) K_G value for natural gas: $d = 0,64$ ($\rho_n = 0,83 \text{ kg/m}^3$), $t_u = 15^\circ \text{ C}$

Application, Characteristics, Technical Data

Application

Gas pressure regulator (GDR), direct-acting (operating without auxiliary power), for systems acc. to DVGW - work sheet G 491 (A) and G 600 (A) (TRGI)

Particularly suitable for dynamic regulation sections (e.g. gas fireplaces, natural gas distribution plants, burner, gas engines)

Can be used as an equipment component on gas consumption facilities as defined in EC Directive (90/396/EEC)

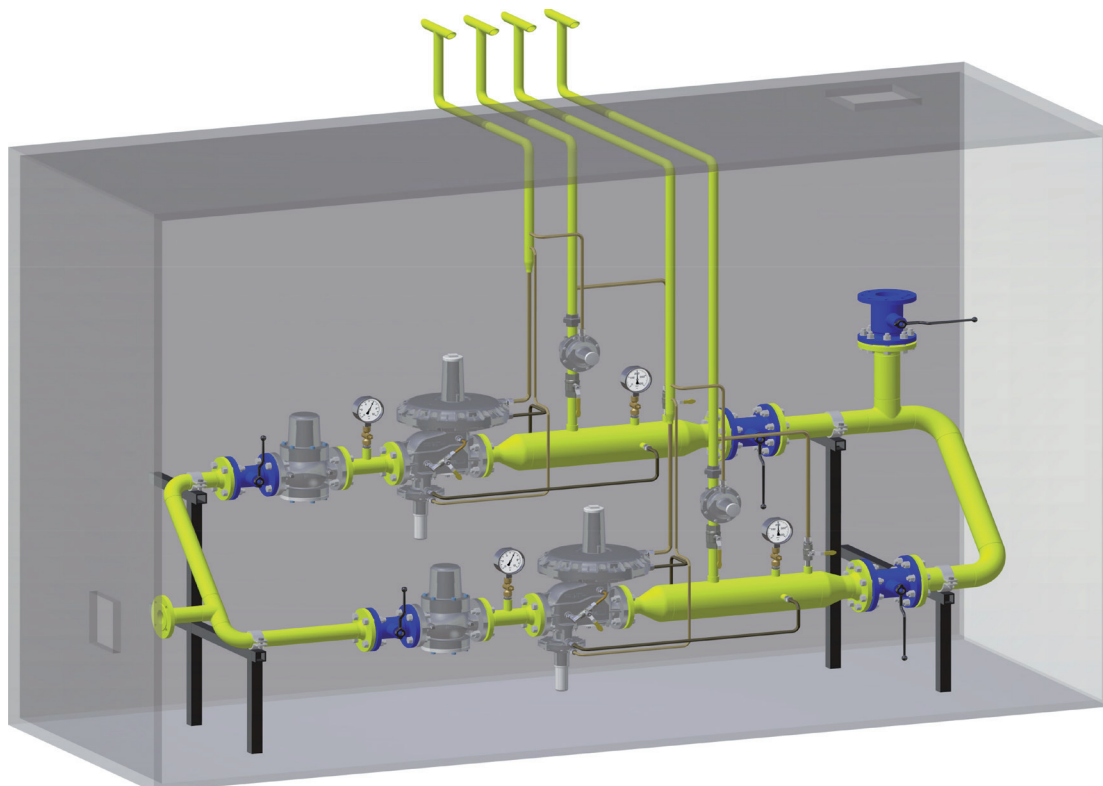
Can be used for the gases defined in DVGW - work sheet G 260 / G 262 and neutral non-aggressive gases. (other gases on request)

Features

- Integral pressure-tight model (IS)
- Gas pressure regulator with integrated SSV
- Easy maintenance through replaceable SSV functional units (modular design)
- SSV functional class, optionally A or B
- outdoor version as standard

Type of model (options)

- Oxygen model
- Without SSV
- With noise reduction
- With SSV manual release
- With SSV - electromagnetic remote release when power is applied or in case of power failure
- With electric position indicator SSV 'Closed' via inductive initiator or via Reed contact
- Control unit with integrated leakage gas SRV or safety diaphragm
- With BV breather valve or with RSS switching valve for SSV
- With throttle valve (RSD) for impulse line of the regulator
- Coating with epoxy resin in RAL colours



double gas train

Technical Data

Type	RS 250 / RS 251
Model	Integral pressure-tight (IS)
Max. allowable pressure PS	8 bar
Max. inlet pressure $p_{u,max}$	8 bar
Nominal size	RS 250: DN 25, DN 50, DN 80, DN 100, DN 150, DN 200 RS 251: DN 50, DN 80, DN 100
Connection type	DIN EN 1092 - PN 16 flanges ASME - B16.5 flanges Class 150 RF
Material	
Housing / actuator housing/ Control device housing	Al cast alloy*
Temperature range, Class 2 (operating/ambient temperature)	-20°C to +60°C
Closing pressure zone group	SZ 2.5

Gas pressure regulator

Accuracy class AC and closing pressure group SG at the outlet pressure range p_d	AC	SG
18 mbar to 100 mbar	10	20
> 100 mbar to 500 mbar	5	10
> 500 mbar to 1500 mbar	2.5	10
>1000 mbar (only RE 205 / 275)	5	10

Safety shut-off valve

Upper response pressure group AG_o in command area w_{dso}	AG_o	Lower response pressure AG_u in command area w_{dsu}	AG_u
50 mbar to 100 mbar	10	10 mbar to 30 mbar	20
> 100 mbar to 500 mbar	5	> 30 mbar to 50 mbar	10
> 500 mbar	2.5	> 50 mbar	5

Function, Strength and Tightness	DIN EN 334 and DIN EN 14382
CE mark to PED/ PIN number	CE-0085-AQ0882 / CE-0085-AQ0883
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.

*) RS 250: DN 50/ DN 80/ DN 100 housing also available in spheroidal cast iron (GJS)



Application, Characteristics, Technical Data

Design and function

The spring-loaded gas pressure regulators RS 250 / RS 251 have 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 train, in the connected regulation section on the outlet side. The gas pressure regulator is composed of the actuator housing and the 'control unit plus actuator' and 'SSV control device/switching device plus actuator' functional units.

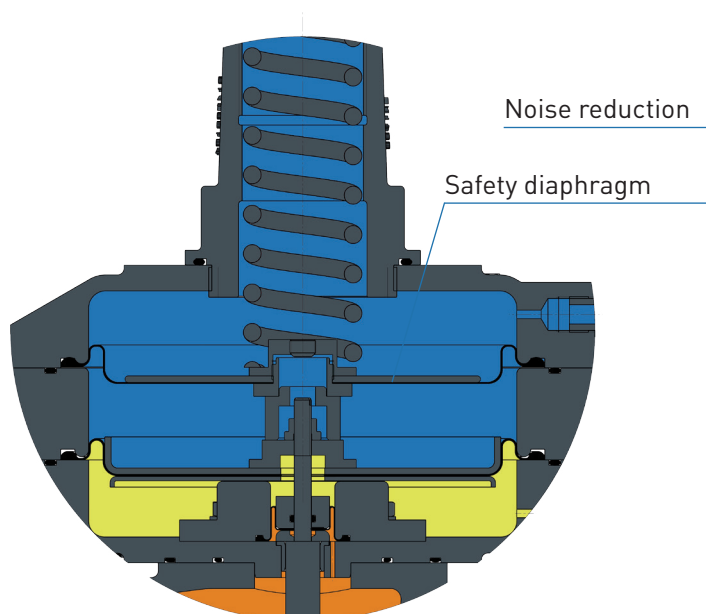
The actuator for the control unit can be produced in various valve seat diameters to suit different nominal size. The valve seat models are pre-pressure-compensated and can, if required, be equipped with noise reduction.

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 control unit. 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. Optionally, the control unit can be equipped with a leakage gas SRV or a safety diaphragm. In the model with safety diaphragm, the safety diaphragm is located above the main diaphragm. When the main diaphragm ruptures, the safety diaphragm makes contact with the top cover of the control unit and prevents any inadmissible escape of gas into the surrounding atmosphere. In case of inadmissible overpressure or lack of gas in the regulating section, the actuator of the safety shut-off valve arranged in the same housing on the inlet side will shut off the gas flow. To this end, the outlet pressure to be monitored is passed on to the SSV control device via a separate measurement line. As a function of the change in pressure, the SSV diaphragm in the controller is raised or lowered. When the outlet pressure in the regulating section exceeds or falls below a certain response pressure, the switch socket connected to the SSV diaphragm will move to the corresponding disengaging position, the balls of the engaging mechanism will release the SSV screw spindle, and the closing spring will press the SSV valve plate against the valve seat. The SSV actuator shuts off the gas flow gas-tight. The SSV can only be opened by hand and engaged in the open position. To do so, the outlet pressure at the measuring point must be lowered below the upper response pressure or raised above the lower response pressure by at least the re-engaging differential amount (Δp).

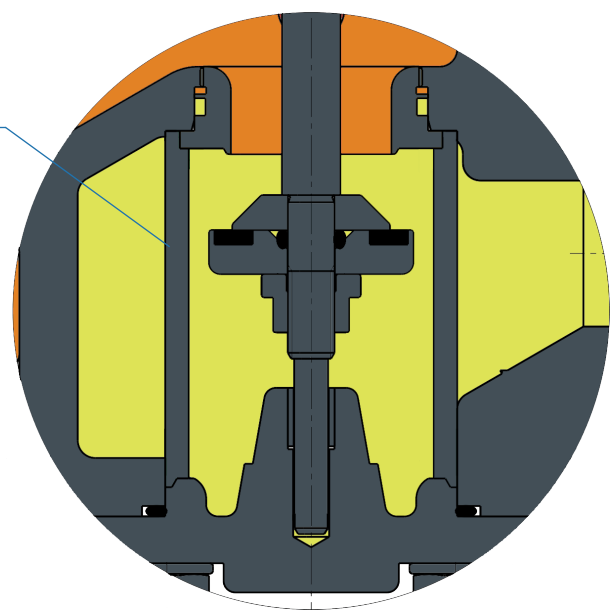
The SSV can, except where otherwise stipulated in specific national legislation, be used in either functional class A (with diaphragm rupture protection) and B (without diaphragm rupture protection).

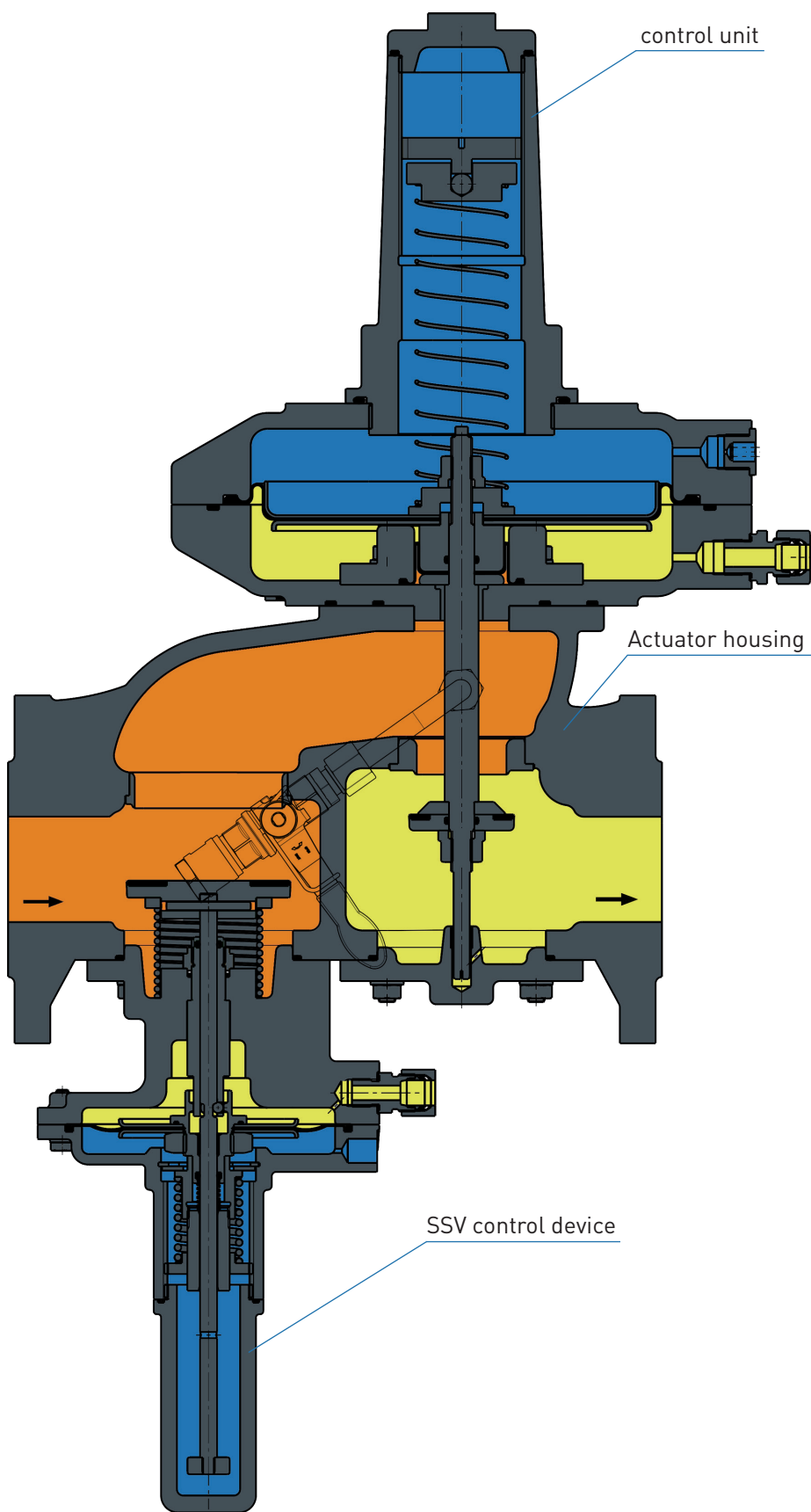
There is also the option of using a remote indication for the SSV position 'CLOSED' and a manual and remote release when power is applied or in case of power failure.

Option 1: Safety diaphragm

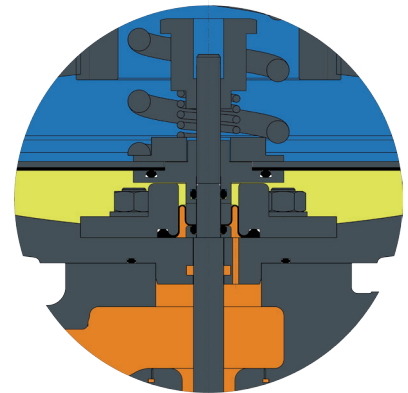


Option 2: Noise reduction

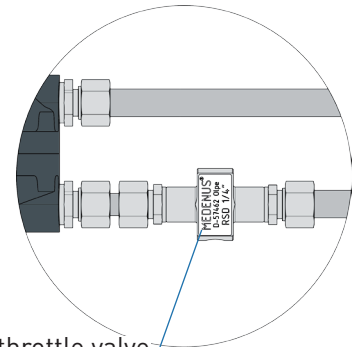




**Option 3:
integrated SRV**

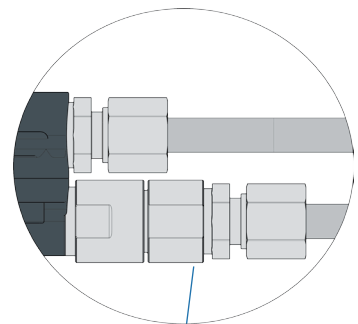


**Connection options on the
controller**

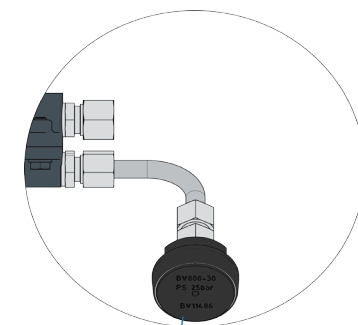


RSD throttle valve

SSV connection options



RSS breather valve



Breather valve BV

Application, Characteristics, Technical Data

K_G^* value and control units

	RS 250						RS 251		
	DN 25	DN 50	DN 80	DN 100	DN 150	DN 200	DN 50	DN 80	DN 100
Nominal size	205	205	205	205	275-2	275-2	205	275-2	275-2
control unit \emptyset	320	320	275	275	385	385	275	385	385
Valve seat \emptyset	390	390	485	485	390	485	390	485	485
17.5 mm	200	220							
27.5 mm	420	500	550	600			550		
32.5 mm		750	850	900			750		
42.5 mm			1,450	1,500	1,600		1,250	1,500	1,500
52.5 mm				1,800	2,000		1,700	1,800	1,850
65.0 mm					3,500			2,600	3,200
85.0 mm					4,600			3,500	4,300
95.0 mm					5,800	6,100			4,800
115.0 mm						8,950			
Connection type	DIN EN 1092 - PN16								
	ASME B 16.5 - Class 150								

Integrated safety relief valve (Leakage gas SRV)

Spring no.	control unit	Opening pressure** Setting via p_{ds} [mbar]
FM 404	275	15 + 5
		30 + 10
		60 + 15
		90 + 15
	320	15 + 5
		30 + 10
		60 + 15
		90 + 15
FM 405		90 + 15
FM 404	385 / 390	15 + 5
		30 + 10
		60 + 15
		90 + 15
FM 405	485	15 + 5
		30 + 10
		60 + 15
FD 919		90 + 15

*) K_G value for natural gas: $d = 0.64$ ($\rho_n = 0.83 \text{ kg/m}^3$), $t_u = 15^\circ\text{C}$

**) When selecting the opening pressure for the leakage gas SRV, the value must not drop below the closing pressure of the setpoint setting!

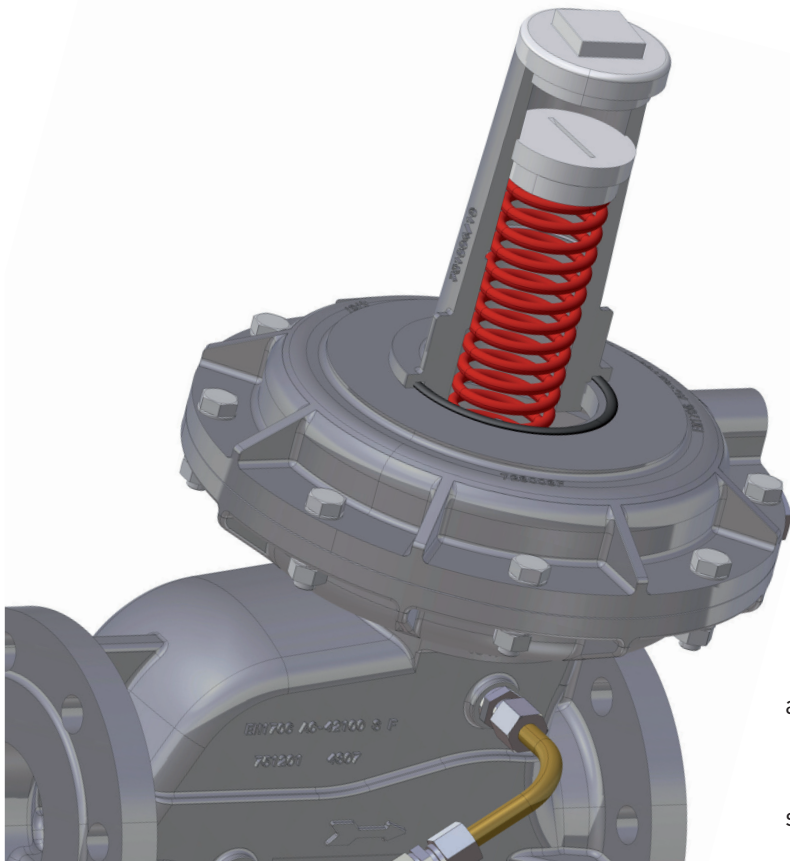
Accuracy class AC / Closing pressure group SG

Outlet pressure range p_d	control units						
	205	275	275-2	320	385	390	485
18 mbar to 100 mbar				10 / 20	10 / 20	10 / 20	5 / 10
90 mbar to 500 mbar		5 / 10					
100 mbar to 500 mbar				5 / 10	5 / 10	5 / 10	5 / 10
350 mbar to 500 mbar			10 / 20				
500 mbar to 1000 mbar	10 / 20						
> 500 mbar		2.5 / 10	5 / 10	2.5 / 10	2.5 / 10	2.5 / 10	
> 1000 mbar	5 / 10						

Application, Characteristics, Technical Data

Control unit setpoint spring table

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



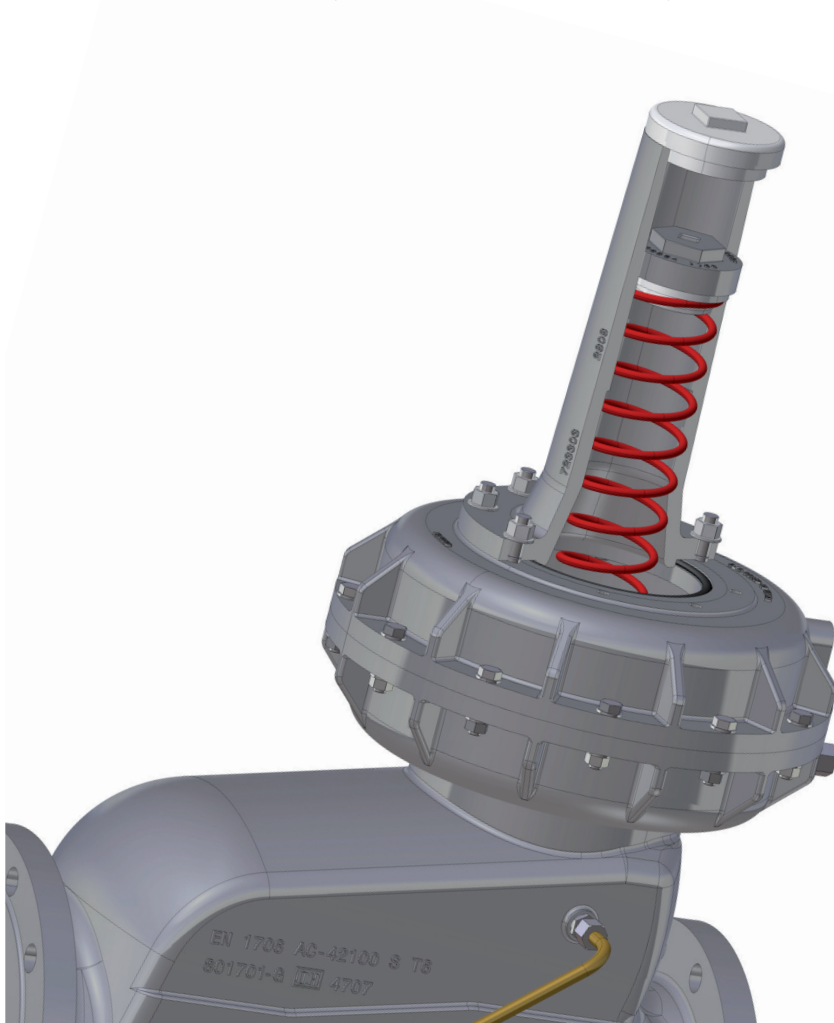
FA spring series for RS250 DN 025 - DN 100
and RS251 DN 050

shown RS250 DN 080 with FA11

*) with high-pressure screw spindle (HDS shown on p.14)

Control unit setpoint spring table

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



FB spring series for RS250 DN 150 - DN 200
and RS251 DN 080 - DN 100

shown RS250 DN 200 with FB707

Setpoint spring table - SSV

Type	Upper response pressure		Lower response pressure		Spring data	
	w_{dso} [mbar]	Δp_{wo}^{**} [mbar]	w_{dsu} [mbar]	Δp_{wu}^{**} [mbar]	Spring no.	Colour [RAL]
MD* small ball lock			1 - 8	15	FE 900	1028
			6 - 17	15	FE 901	2002
			12 - 24	20	FE 902	6010
			22 - 40	30	FE 903	5015
			30 - 50	30	FE 904	9005
			45 - 70	40	FE 905	9010
			65 - 100	50	FE 906	4002
		20 - 40	20		FD 910	1028
	RS 250:	35 - 70	20		FD 911	2002
	DN 25 - 100	65 - 110	30		FD 912	6010
RS 251: DN 50 - 80	100 - 160	30		FD 913	5015	
	150 - 235	40		FD 914	9005	
	225 - 355	60		FD 915	9010	
	345 - 510	80		FD 916	3020	
	500 - 710	80		FD 917	5010	
	655 - 1205	100		FD 918	9006	
	760 - 1550	200		FD 919	4002	
MD-R small ball lock			30 - 55	30	FE 900	1028
			50 - 80	40	FE 901	2002
			70 - 105	50	FE 902	6010
			100 - 140	80	FE 903	5015
			110 - 160	80	FE 904	9005
			150 - 205	100	FE 905	9010
			200 - 300	100	FE 906	4002
		90 - 125	30		FD 910	1028
	RS 250:	120 - 210	40		FD 911	2002
	DN 25 - 100	200 - 330	60		FD 912	6010
RS 251: DN 50 - 80	285 - 460	80		FD 913	5015	
	450 - 680	80		FD 914	9005	
	640 - 1040	100		FD 915	9010	
	1030 - 1480	200		FD 916	3020	
	1450 - 2200	200		FD 917	5010	
	1900 - 3500	200		FD 918	9006	
	2200 - 4500	200		FD 919	4002	

Setpoint spring table - SSV

Type	Upper response pressure		Lower response pressure		Spring data	
	w_{dso} [mbar]	Δp_{wo}^{**} [mbar]	w_{dsu} [mbar]	Δp_{wu}^{**} [mbar]	Spring no.	Colour [RAL]
MD large ball lock RS 250: DN 150 - 200 RS 251: DN 100			10 - 40	15	FM 400	1028
			35 - 115	30	FM 402	6010
			60 - 245	60	FM 404	9005
	40 - 180	20			FL 412	6010
	70 - 340	50			FL 413	5015
	330 - 1100	80			FL 415	9010
MD-R large ball lock RS 250: DN 150 - 200 RS 251: DN 100			10 - 180	50	FM 400	1028
			155 - 380	100	FM 402	6010
			200 - 950	150	FM 404	9005
	145 - 670	100			FL 412	6010
	270 - 1230	200			FL 413	5015
	1200 - 4500	200			FL 415	9010

Determining the upper response pressure

Outlet pressure P_d (mbar)	Upper response pressure w_{dso} ***
≤ 200	$P_d + 100$ mbar
$> 200 - \leq 800$	$P_d \times 1.5$
$> 800 - \leq 1600$	$P_d \times 1.3$
> 1600	$P_d + 500$ mbar

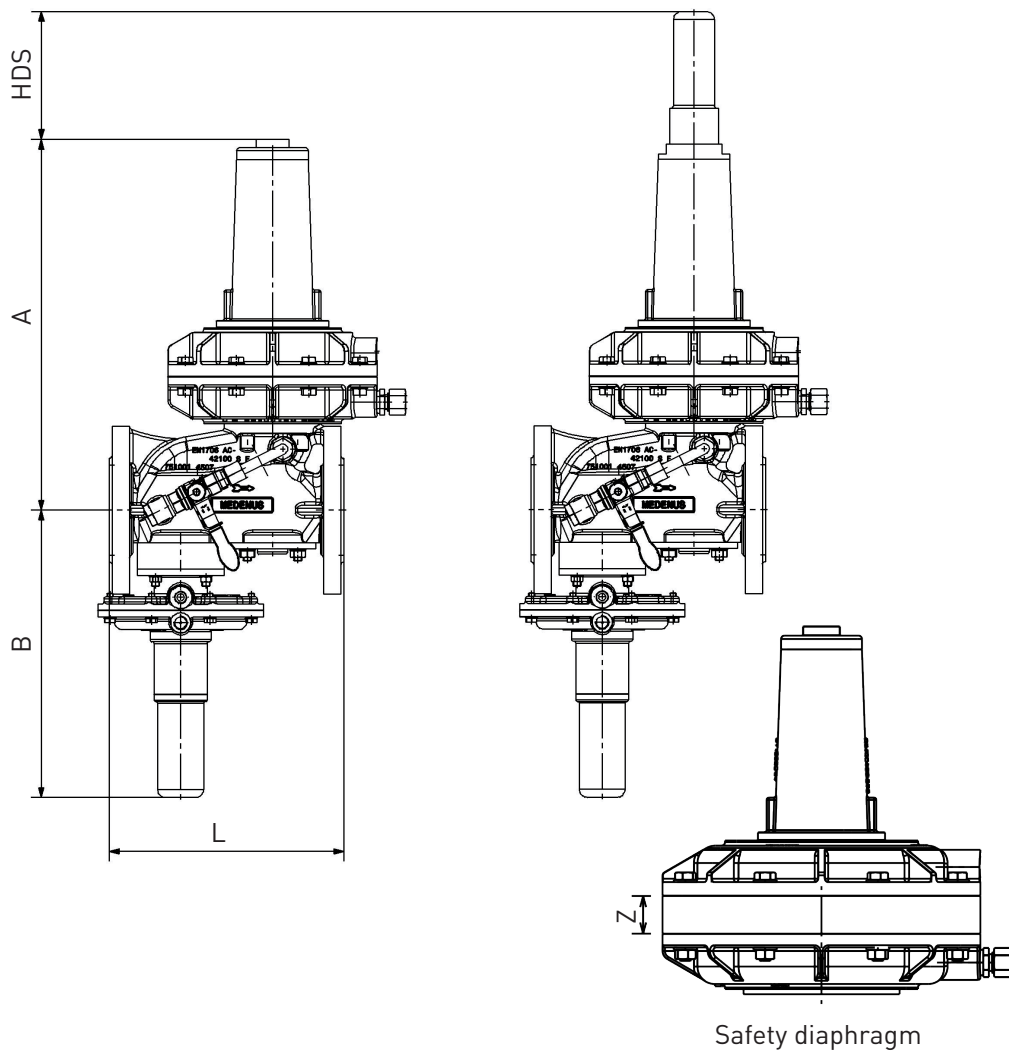
*) if possible not greater than 450 mbar

***) If the control device is set up for simultaneous monitoring of upper and lower response pressures, the difference between the setpoints for the upper and lower response pressures (p_{dso} and p_{dsu}) should be at least 10% greater than the total of values given for Δp_{wo} and Δp_{wu} .

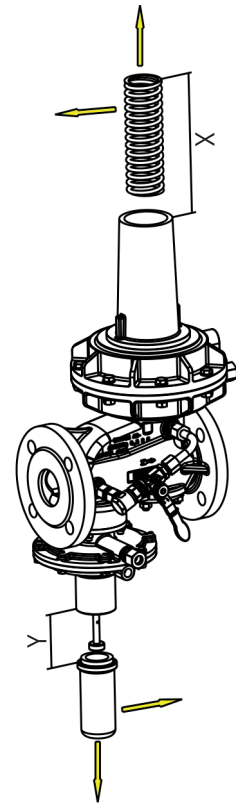
***) The upper response pressure is rounded up to full tens, for example 251 mbar -> 260 mbar

Dimensions, Connection and Weight

Dimensional drawing

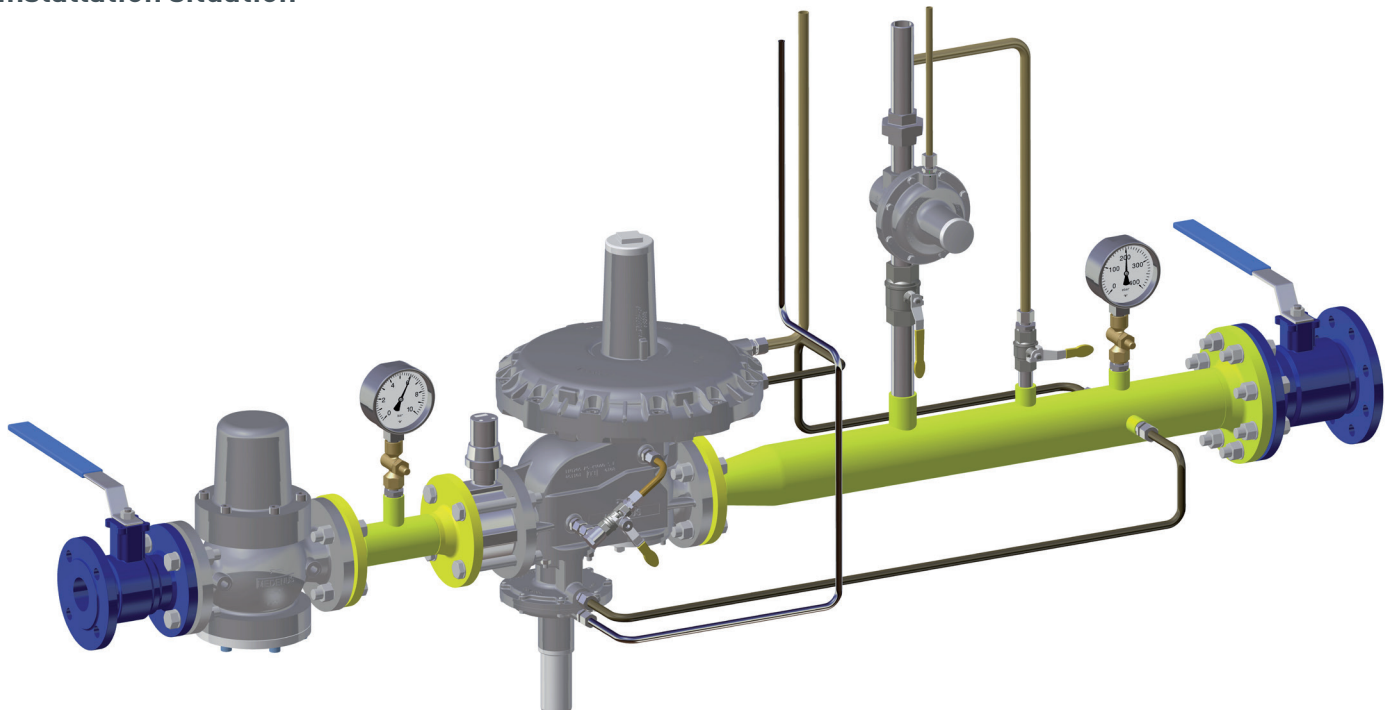


Dismounting dimensions for springs / HDS



Reactivation of SSV

Installation situation



Dimensions and weight

Nominal size	RE	RS 250						RS 251		
		DN 25	DN 50	DN 80	DN 100	DN 150	DN 200	DN 50	DN 80	DN 100
A [mm]	205	346	364	406	421	-	-	406	-	-
	275	-	-	406	421	730	799	406	658	730
	320	328	346	-	-	-	-	-	-	-
	385/390	-	-	406	421	716	785	406	644	716
	485	-	-	-	-	722	791	-	644	722
HDS [mm]		125	125	125	125	205	205	125	205	205
B [mm]		270	282	305	315	386	400	305	311	386
L* [mm]		230	230	310	350	480	600	310	410	480
X [mm]		260	260	260	260	410	410	260	410	410
Y [mm]		100	100	100	100	150	150	100	150	150
Safety diaphragm - SM Z [mm]		32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
Weight [kg]	205	11.5	13	22	23	-	-	16	-	-
	275	-	-	24	25	52	82	19	37	52
	320	13.5	15	-	-	-	-	22	-	-
	385/390	-	-	28	29	58	88	-	42	58
	485	-	-	-	-	68	98	-	-	68
HDS - Weight [kg]		0.6	0.6	0.6	0.6	1.6	1.6	0.6	1.6	1.6
Safety diaphragm - SM - Weight [kg]	205	2	2	2	2	-	-	2	-	-
	275	-	-	3	3	3.3	3.3	3	3.3	3.3
	320	3	3	-	-	-	-	-	-	-
	385/390	-	-	5	5	6	6	5	6	6
Connection	DIN EN 1092 - PN16									
	ASME B 16.5 - Class 150									

Example:

RS250/050/320 with HDS and safety diaphragm

Weight (regulator + HDS + SM): $15 \text{ kg} + 0.6 \text{ kg} + 3 \text{ kg} = 18.6 \text{ kg}$

Dimensions (A + HDS + SM): $346 \text{ mm} + 125 \text{ mm} + 32.5 \text{ mm} = 503.5 \text{ mm}$

* Alternatively, for the RS 250 for nominal sizes of DN 50, DN 80 and DN 100 the housings are also available on request in spheroidal cast iron (GJS)

Dimensions, Connection and Weight

RS 250: Connection of the measuring lines and breather lines

Nominal size	control unit		SSV control device / switching device	
	Measuring line	Breather line	Measuring line	Breather line
DN 025	Connection* for: Tube 12 x 1.5 (thread G 3/8)		Connection* for: tube 12 x 1.5 (thread G 1/4)	
DN 050				
DN 080				
DN 100				
DN 150			Connection* for: tube 12 x 1.5 (thread G 3/8)	
DN 200				

RS 251: Connection of the measuring lines and breather lines

Nominal size	control unit		SSV control device / switching device	
	Measuring line	Breather line	Measuring line	Breather line
DN 050	Connection* for: Tube 12 x 1.5 (thread G 3/8)		Connection* for: tube 12 x 1.5 (thread G 1/4)	
DN 080				
DN 100			Connection* for: tube 12 x 1.5 (thread G 3/8)	

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

DVGW - work sheets G 491 and G 600

Operating and Maintenance Instructions RS 250 /251

The gas pressure regulators RS 250 / 251 shall be installed in the pipeline preferably in horizontal position with vertical position of the control unit spring cap. For all nominal sizes, the direction of flow is indicated by an arrow on the housing.

Selection

Calculation of the required K_G value

$$p_d / p_u > 0.5$$

K_G value at
a sub-critical pressure ratio

$$K_G = Q_n / \sqrt{p_d \cdot (p_u - p_d)}$$

$$p_d / p_u \leq 0.5$$

K_G value at
a super-critical pressure ratio

$$K_G = 2 \cdot Q_n / p_u$$

Example:

$$p_{u \min} 5.0 \text{ bar} \quad / \quad p_{u \max} 8.0 \text{ bar}$$

$$p_{d \min} 0.3 \text{ bar} \quad / \quad p_{d \max} 0.5 \text{ bar}$$

$$Q_{n \min} 800 \text{ m}^3/\text{h} \quad / \quad Q_{n \max} 1500 \text{ m}^3/\text{h}$$

$$1.5 \text{ bar} / 6 \text{ bar} = 0.25 < 0.5$$

→ Supercritical pressure ratio

$$K_G = 2 \cdot 1500 / 6 = 500 \text{ [(m}^3/\text{h)/bar]}$$

RS 250 DN 50 VS 32.5

K_G value: 750 (m³/h)/bar

Note: all calculated pressures are absolute pressures.

Device selection

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

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

Note: To obtain a more accurate design configuration of our gas pressure regulators, you can use our configurator, on our homepage medenus.de, under Service. (medenus.de/de/service/konfigurator.html)

*) Threaded pipe connections to DIN EN ISO 8434-1 (DIN 2353)

Selection

Device selection

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

Note: 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 control unit from the diaphragm assembly setpoint spring table (page 10)

Selection of the closing pressure group from the closing pressure group table (page 9)

$$p_{f \max} = p_{ds} \cdot (1 + SG/100)$$

Selection of the SSVs from the SSV control device table (page 11)

Note: Recommended upper SSV response pressure $p_{ds o} < 500 \text{ mbar} + p_{ds}$

Note: When selecting springs, AG_o and AG_u must be observed. The possible minimum and maximum response pressures are calculated as follows:

$$p_{dso \min/\max} = p_{ds o} \cdot (1 \pm AG_o / 100)$$

$$p_{dsu \min/\max} \cdot (1 \pm AG_u / 100)$$

$$p_{dso \min} > p_{f \max} \text{ and } p_{dsu \max} \ll p_{ds} \cdot (1 - AC / 100)$$

Use of a leakage gas SRV:

Selection of leakage gas SRV - Settings from table (page 8)

Note: The opening pressure (p_{do}) and closing pressure (p_{df}) to be selected for the SRV must be greater than the maximum allowable closing pressure $p_{f \max}$ on the regulator. We recommend: $p_{do} = p_{df} > 1.1 \cdot p_{f \max}$

Note: When using an SRV, $p_{dso \min}$ must be $> p_{ds} + p_{do} + p_{do \text{ tolerance}}$ (page 8).

Checking the gas velocities

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

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}

$$= w \cdot (t_{gas} + 273.15) / 290$$

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

Recommended max. gas velocity at the outlet flange:

100 - 200 m/s Lower value to reduce noise emissions

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

$$Q_{\min} = 0.025 \cdot 750 \cdot 9 = 169 \text{ m}^3/\text{h}$$

RE320 with spring FA13 (300-600 mbar)

AC 5/SG 10 (for RE 320 valve $\varnothing = 32.5$)

$$p_{f \max} = 500 \cdot (1 + 10 / 100) = 550 \text{ mbar}$$

MDR with FD 914 (440-770 mbar) AG_o 10

set to $p_{ds o} = 700 \text{ mbar}$

and FE 904 (110-150 mbar) AG_u 5

set to $p_{ds u} = 130 \text{ mbar}$

$$p_{dso \max} = 700 \cdot (1 + 10 / 100) = 770 \text{ mbar}$$

$$p_{dso \min} = 700 \cdot (1 - 10 / 100) = 630 \text{ mbar}$$

$$p_{dsu \max} = 130 \cdot (1 + 5 / 100) = 136.5 \text{ mbar}$$

$$p_{dsu \min} = 130 \cdot (1 - 5 / 100) = 123.5 \text{ mbar}$$

$$630 > 550 \text{ and } 136.5 \ll 475$$

FM 404 set to 60 mbar over 500 mbar

($p_{do} = p_{df} = 560 \text{ mbar}$)

FM 405 set to 90 mbar over 500 mbar

($p_{do} = p_{df} = 590 \text{ mbar}$)

Selected: FM 405 ($p_{do} = p_{df} = 590 \text{ mbar}$)

$$630 > 500 + 90 + 15$$

$$630 > 605$$

Inlet and outlet nominal size of the pipeline according to the selected device: 50 mm

Selected widening of outlet pipeline: 150 mm

$$w_u = 380 \cdot 1500 / (50^2 \cdot 6) = 38 \text{ m/s}$$

$$w_d = 380 \cdot 1500 / (50^2 \cdot 1.5) = 152 \text{ m/s}$$

$$w_{\text{impulse}} = 380 \cdot 1500 / (150^2 \cdot 1.5) = 17 \text{ m/s}$$

The device selected in the example of nominal size DN 50 can be operated under these conditions.

Order data

Example:

Gas pressure regulator: RS250/050/205/32,5/MD-R/HDS/links/SR/SBV/RSD/SV/N/H/WAZ/So

Order selection	Designation	RS250	050	-	205	32.5	MD-R	-	HDS	links	SR	SBV	RSD	RSS	N	H	WAZ	So
Type																		
RS 250	RS250	RS 250																
RS 251	RS251																	
DN - Nominal size	Table p.18		050															
Flange model																		
PN 16	-			-														
Class 150	C																	
RE - Control unit	Table p.19				205													
D - Orifice (valve seat diameter)	Table p.19					32.5												
SSV																		
with MD control device	MD																	
with MD-R control device	MD-R						MD-R											
SSV functional class																		
A	-							-										
B	B																	
High-pressure screw spindle																		
without	-																	
with high-pressure screw spindle	HDS								HDS									
Direction of flow																		
Right (from left to right)	-																	
Left (from right to left)	links									links								
Noise reduction																		
without	-																	
with noise reduction	SR										SR							
Additional unit, control unit																		
without	-																	
Leakage gas quantities SRV	SRV											SRV						
Safety diaphragm	SM																	
Throttle valve																		
without	-																	
with throttle valve	RSD												RSD					
SSV valve accessories																		
without	-																	
Switching valve	RSS													RSS				
Breather valve	BV																	
Electrical position indicator, SSV 'Closed'																		
without	-																	
with ... , via proximity switch	N														N			
with ... , via Reed contact	R																	
SSV release																		
without	-																	
with manual release	H															H		
with electromagnetic remote release, when power is supplied	SG																	
with electromagnetic remote release, in case of power failure	SA																	
Acceptance test certificate to EN 10204/3.1																		
without	-																	
with acceptance test certificate	WAZ																	WAZ
Special model	So*																	So

DN - Nominal size

Regulator type	025	050	080	100	150	200
RS250	X	X	X	X	X	X
RS251		X	X	X		

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

*] for example coating with epoxy resin in RAL colours

RE - Control unit

Regulator type	Nominal size	Description	Recommended use of the high-pressure screw spindle in the pressure range [mbar]	Outlet pressure ranges [mbar]
RS250	DN 25	with RE 320	200 - 800	18 - 200
		with RE 205	750 - 3,000	200 - 3,000
	DN 50	with RE 320	200 - 800	18 - 200
		with RE 205	750 - 3,000	200 - 3,000
	DN 80	with RE 390	130 - 450	18 - 100
		with RE 275	400 - 1,100	100 - 400
		with RE 205	750 - 3,000	400 - 3,000
	DN 100	with RE 390	130 - 450	18 - 100
		with RE 275	400 - 1,100	100 - 400
		with RE 205	750 - 3,000	400 - 3,000
	DN 150	with RE 485	150 - 450	18 - 150
		with RE 385	350 - 850	150 - 350
		with RE 275-2	850 - 3,000	350 - 3,000
	DN 200	with RE 485	150 - 450	18 - 150
		with RE 385	350 - 850	150 - 350
with RE 275-2		850 - 3,000	350 - 3,000	
RS251	DN 50	with RE 390	130 - 450	18 - 100
		with RE 275	400 - 1,100	100 - 400
		with RE 205	750 - 3,000	400 - 3,000
	DN 80	with RE 385	350 - 850	18 - 350
		with RE 275-2	850 - 3,000	350 - 3,000
	DN 100	with RE 485	150 - 450	18 - 150
		with RE 385	350 - 850	150 - 350
		with RE 275-2	850 - 3,000	350 - 3,000

D - Orifice (valve seat diameter)

Regulator type	Nominal size	17.5	27.5	32.5	42.5	52.5	65	85	95	115
RS250	025	X	X							
	050	X	X	X						
	080		X	X	X					
	100		X	X	X	X				
	150				X	X	X	X	X	
	200								X	X
RS251	050		X	X	X	X				
	080				X	X	X	X		
	100				X	X	X	X	X	

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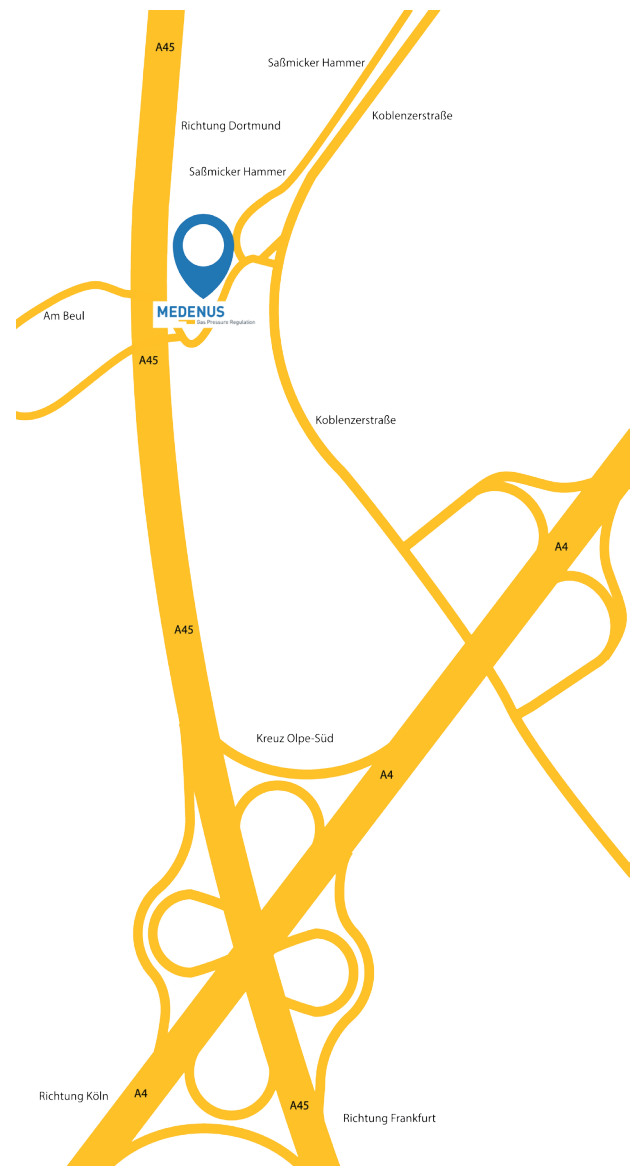
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