MEDENUS

Gas Pressure Regulation

Safety shut-off valve S 50

Product information

EN

Table of Contents

List of abbreviations and formula symbols

AG_o	Upper response pressure group	BV	Breather valve	W_{dsu}	Lower adjustment range (SSV)
AG_u	Lower response pressure group	PS	Maximum allowable pressure	Δp_{wo}	Min. re-engagement difference between upper response pressure and normal operating pressure
K_G	Value	p_u	Inlet pressure		
p_d	Outlet pressure	Q_n	Standard volumetric flow rate		
p_{ds}	Setpoint of the response pressure	SSV	Safety shut-off valve		
$p_{ds\,o}$	Upper SSV response pressure	t_{gas}	Gas inlet temperature	Δp_{wu}	Min. re-engagement difference between lower response pressure and normal operating pressure
$p_{ds\,u}$	Lower SSV response pressure	VS	Valve seat		
$p_{f,max}$	Maximum closing pressure	w_d	Outlet gas velocity		
RSS	Switching valve	w_u	Inlet gas velocity		
		W_{dso}	Upper adjustment range (SSV)	ρ_n	Gas density

Application, Characteristics, Technical Data

Application

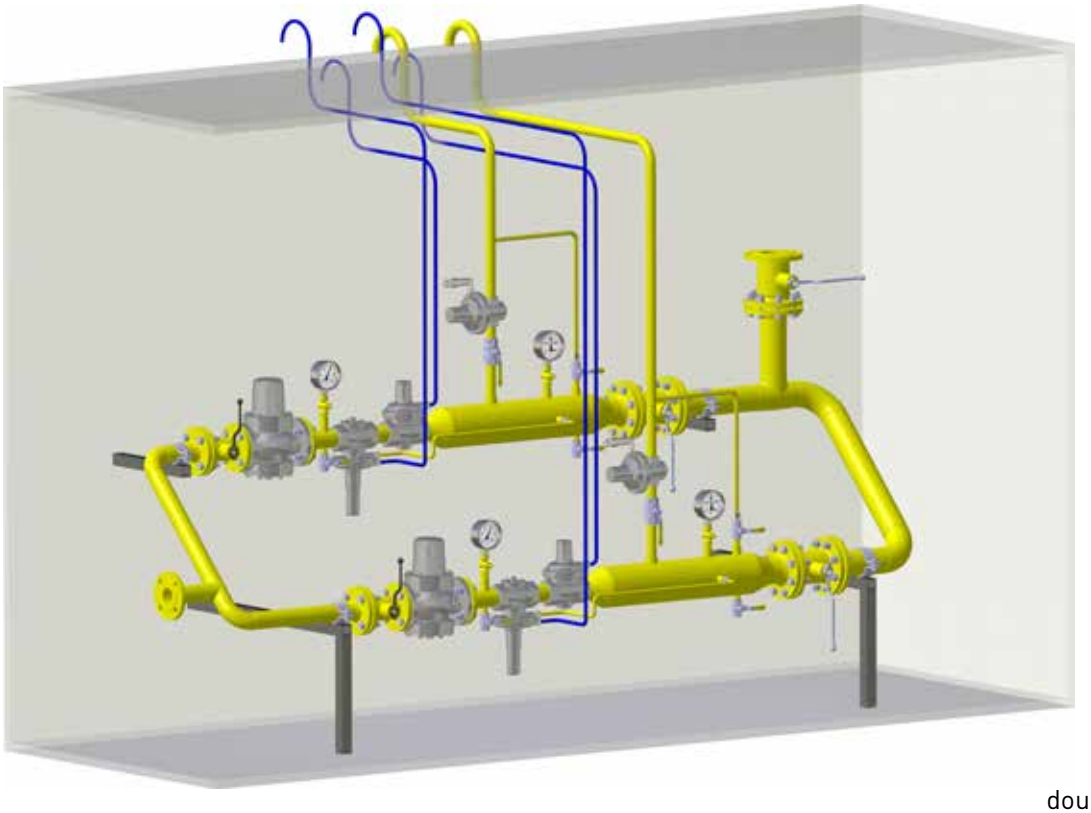
Safety shut-off valve (SSV), direct-acting (operating without auxiliary power), for systems acc. to
DVGW - work sheet G 491 (A) and G 600 (A) (TRGI)
Can be used as an equipment component on gas consumption facilities as defined in EC Directive (90/396/EEC)
Can be used for the gases defined in DVGW - work sheet G 260 / G 262 and neutral non aggressive gases.
(other gases on request)

Characteristics

- Integral pressure-tight version (IS)
- High flow rate capacity
- outdoor version as standard

Type of model (options)

- with BV breather valve
- with RSS switching valve (SSV diaphragm rupture protection)
- with electric position indicator SSV 'Closed' via inductive proximity initiator or via Reed contact
- with SSV manual release
- with SSV electromagnetic remote release when power is applied, or in case of power failure
- Oxygen model



double gas train

Technical Data

Type	S 50
Model	Integral pressure-tight (IS)
Max. allowable pressure PS	**3 bar**
Max. inlet pressure $p_{u,max}$	3 bar
Nominal size	Rp 1" (DN 25), Rp 1½" (DN 40), Rp 2" (DN 50) (NPT thread on request)
Standard volumetric flow rate $Q_{n,max}$	Rp 1": 100m³/h, Rp 1½": 300m³/h, Rp 2": 300m³/h
Type of connection	Internal thread acc. to EN 10226-1
Material Housing / actuator housing/ control device housing	Al - cast alloy
Temperature range, Class 2 (operating/ambient temperature)	-20°C to +60°C

Response pressure groups

Upper response pressure group AG_o in command area w_{dso}	AG_o
50 mbar to 500 mbar	10
> 500 mbar	5

Lower response pressure AG_u in command area w_{dsu}	AG_U
10 mbar to 50 mbar	20
> 50 mbar	10

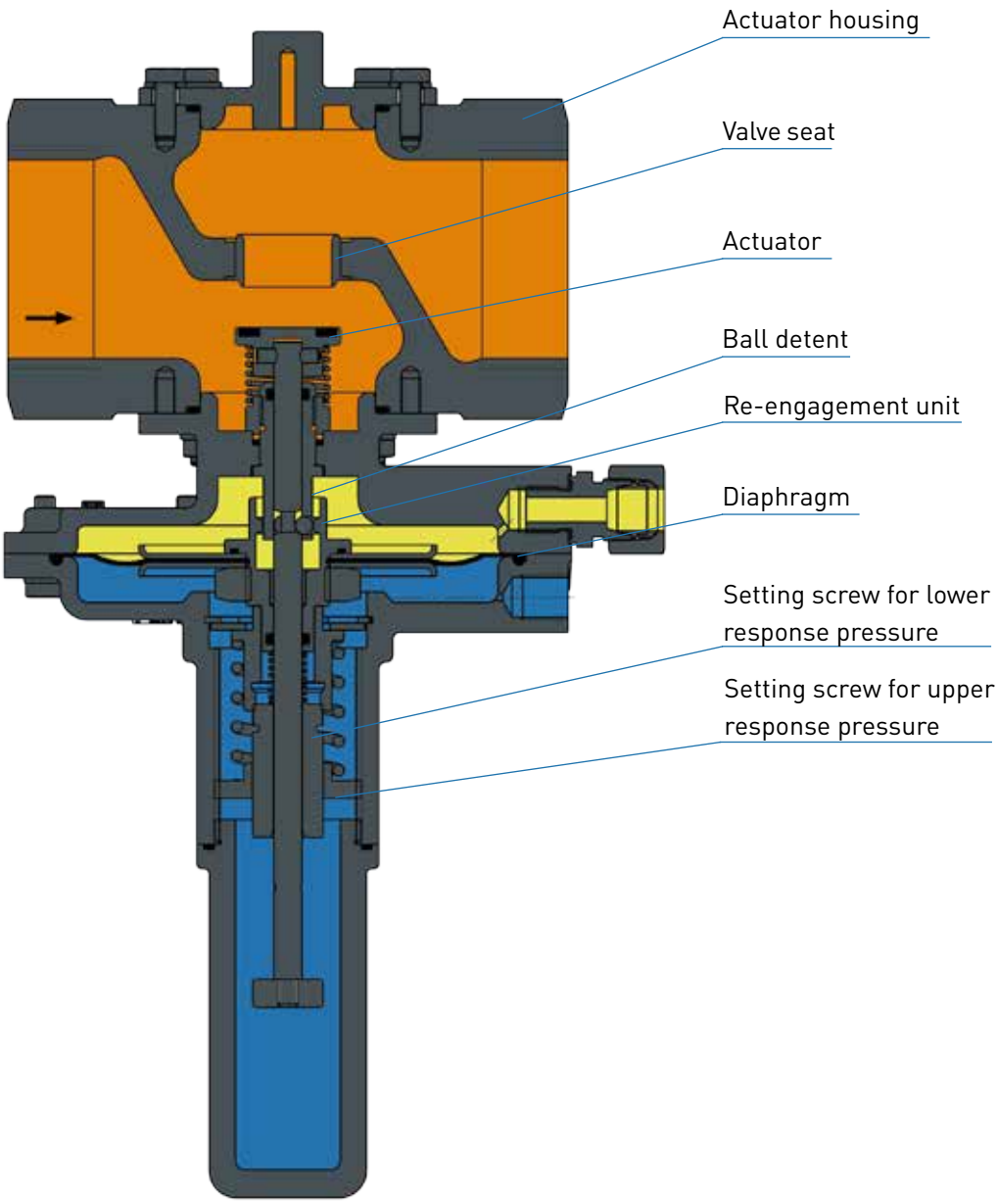
Function, Strength and Tightness	DIN EN 14382
CE mark acc. to PED/ PIN number	CE-0085-BS0420
Ex protection	The mechanical parts of the device do not have any potential ignition sources of their own and therefore do not fall within the scope of ATEX 95 (94/9/EC). Electrical components fitted to the device comply with the ATEX requirements.

Application, Characteristics, Technical Data

Design and function

The safety shut-off valve S 50 shuts off the gas flow when the outlet pressure in the regulating section exceeds or falls below a certain response pressure. To this end, the outlet pressure to be monitored is passed on to the SSV controller via a separate measurement line. As a function of the change in pressure, the main diaphragm in the controller is raised or lowered. When the outlet pressure in the regulating section falls below the lower switch-off point or exceeds the upper switch-off point, 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 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 display for SSV position 'CLOSED' and a manual and remote release when power is applied, or in case of power failure.



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 S50: Rp 1"-2"			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
	35 - 70	20			FD 911	2002
	65 - 110	30			FD 912	6010
	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 S50: Rp 1"-2"			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
	120 - 210	40			FD 911	2002
	200 - 330	60			FD 912	6010
	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

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

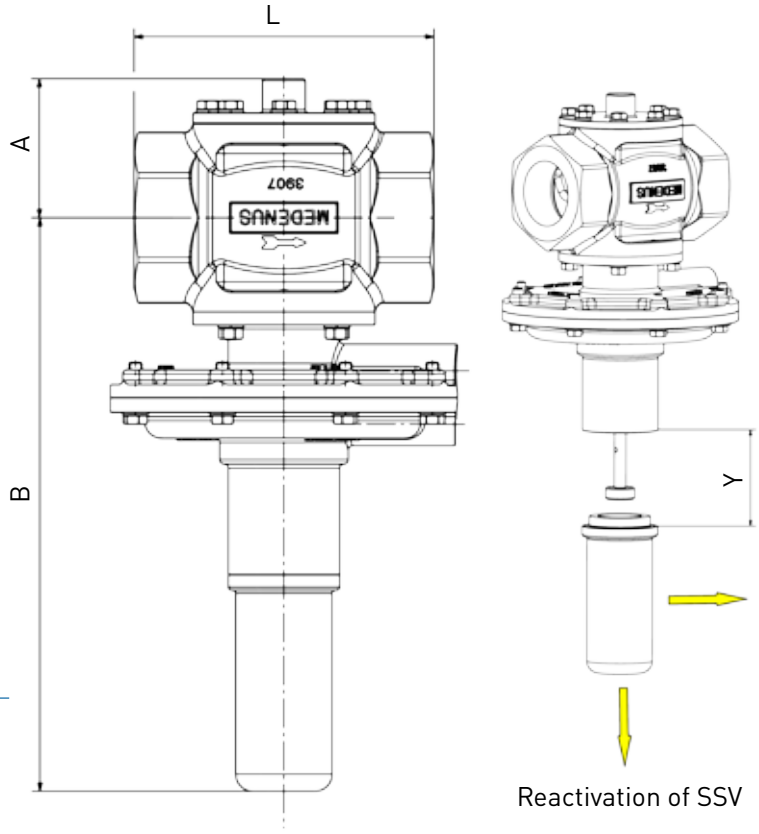
*) If the control device is set up simultaneously for the upper and lower response pressure, the difference between the setpoints of the upper and lower response pressure (p_{dso} and p_{dsu}) should be at least 10% greater than the total of values given for Δp_{wo} and Δp_{wu}.

Dimensions, Connection and Weight

Dimensions and weight

Nominal size / Dimensions	DN 25 Rp 1“	DN 40 Rp 1 1/2“	DN 50 Rp 2“
A [mm]	261	268	268
B [mm]	59	65	65
L [mm]	100	140	160
Y [mm]	100	100	100
Weight [kg]	2.5	3.5	4.0

Dimensional drawing



Connection of the measuring lines and breather lines

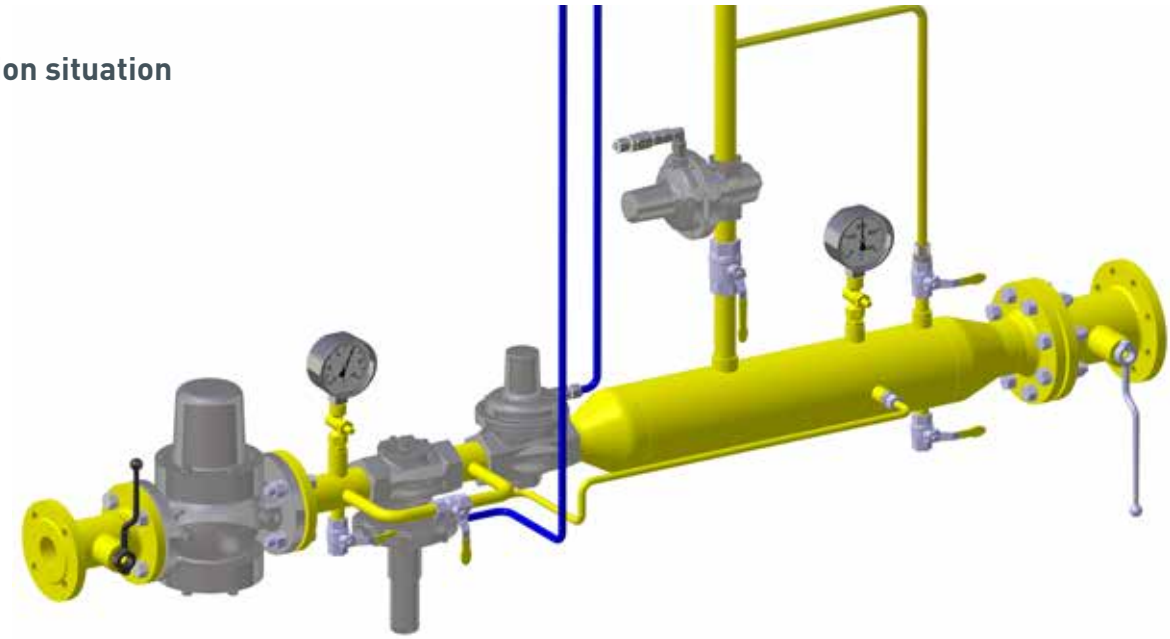
Nominal size	Measuring line	Breather line
DN 025 Rp 1“	Connection* for: pipe 12 x 1.5 (thread G 1/4)	
DN 040 Rp 1½“		
DN 050 Rp 2“		

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 S 50

The safety shut-off valve S 50 shall be installed in the pipeline preferably in horizontal position with vertical position of the safety shut-off spring cap. For all nominal sizes, the direction of flow is indicated by an arrow on the housing.

Installation situation



Selection

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: $w_{corr} = w \bullet (t_{gas} + 273.15) / 290$

Recommended max. gas velocity at the inlet flange:
50 - 70 m/s Lower value for redirections upstream of the SSV

Example:

Inlet and outlet nominal size of the pipeline according to the selected device: 25 mm
$Q_n = 70 m^3/h$ $p_u / (p_d) = 5$ bar

$w_u = 380 \bullet 70 / (25^2 \bullet 6) = 7.1$ m/s

Order data

Example:

	Safety shut-off valve:	S50/Rp1"/MD-R/links/RSS/N/H/WAZ/So									
	Order code:	S50	Rp1"	MD-R	-	links	RSS	N	H	WAZ	So
Order selection	**Designation**										
Type											
S50	S50	S50									
DN - nominal size	Table S.9		Rp1"								
SSV											
with MD control device	MD										
with MD-R control device	MD-R			MD-R							
SSV functional class											
A	-				-						
B	B										
Direction of flow											
Right (from left to right)	-										
Left (from right to left)	links					links					
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			
Type	Rp 1"	Rp 1½"	Rp 2"
S50	X	X	X

*) e.g.:
- Coating with epoxy resin in RAL colours
- Oxygen model

In every selection group, there is only one possible that can be selected.

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If you wish to learn more about solutions from MEDENUS for
the gas industry, please contact your local contact person or go to our website at www.medenus.de
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Notes

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