Self-operated Pressure Regulators

Steam Pressure Reducing Valve Type 39-2

Application

Set points from 0.02 bar to 16 bar \cdot Valves in DN 15 to DN 50 Nominal pressure PN 16 and PN 25 \cdot Suitable for steam up to max. 350 °C

The Type 39-2 Steam Pressure Reducing Valve regulates the steam pressure downstream from the valve to an adjusted set point.

The valve closes when the downstream pressure rises.

Special features

- Low-maintenance P-regulators requiring no auxiliary energy
- Actuator and springs are exchangeable
- Single-seated valve with balanced valve plug and a frictionless plug stem sealing by means of a stainless steel bellows
- All wetted parts are free of non-ferrous metal

Versions

Type 39-2 Steam Pressure Reducing Valve:

Valve body made of cast iron, spheroidal graphite iron or cast steel \cdot Actuator (with EPDM rolling diaphragm) \cdot With condensation chamber and screw fitting \cdot For steam temperatures up to 350 °C.

Special version

With St I flow divider for especially low-noise operation. For details, see Data Sheet T 8081 EN. When the flow divider St I is retrofitted, the valve seat must be replaced.

ANSI versions are available on request.

Accessories (refer to T 2595 EN)

Screw fitting for the control line connection

Condensation chamber with funnel tube for collecting condensate and as a temperature safeguard

Conical expansion piece, nominal pressure PN 16 or PN 40



T 2500 EN







Principle of operation (Fig. 2)

The process medium flows through the valve in the direction indicated by the arrow. The position of the valve plug determines the flow rate between the free area between the plug (3) and seat (2). The downstream pressure (p_2) to be controlled is transmitted via a control line (14) to the operating diaphragm (13) where it is converted into a positioning force. This force adjusts the valve plug as a function of the spring force. The spring force can be adjusted using the set point adjustment (6).

The balanced valves are equipped with a stainless steel bellows (4). The upstream pressure (p_1) is applied to the outside bellows surface. As a result, the forces created by the upstream pressure and acting on the valve plug are balanced out. The downstream pressure is balanced via the diaphragm area in the actuator.

Installation

Install the valves in horizontal pipelines with a slight downward slope on both sides of the valve for drainage of the condensate (refer to EB 2506 EN for more details).

- The direction of medium flow must correspond with the arrow on the valve body.
- The actuator must be suspended downwards.
- Pressure tapping approx. one meter downstream of the valve. The control line (3/8" pipe) is mounted on site and not included in the scope of delivery.
- A conical expansion piece can be used to double the nominal outlet diameter (refer to dimensional drawing and accessories).





Fig. 2 · Functional diagram of Type 39-2

- 1 Valve body
- 2 Valve seat
- 3 Plug
- 4 Bellows
- 5 Plug stem
- 6 Set point adjustment
- 7 Positioning springs
- 10 Actuator
- 11 Actuator stem
- 12 Venting (only for actuator area $A = 640 \text{ cm}^2$)
- 13 Operating diaphragm
- 14 Control line (attached on site)
- 15 Control line connection
- 16 Condensation chamber
- 17 Filler plug

Pressure-temperature diagram - acc. to DIN EN 12516-1 -



Nominal size	DN 15 to 50				
Nominal pressure	PN 16 or 25				
Temperature range	See pressure-temperature diagram				
Valve plug	Metal sealing · Up to 350 °C				
Actuator with condensation chamber	Steam · Up to 350 °C				
Max. perm. differential pressure ∆p	25 bar				
Set point ranges	0.02 to 0.25 bar · 0.1 to 0.6 bar · 0.2 to 1.2 bar · 0.8 to 2.5 bar · 2 to 5 bar · 4.5 to 10 bar · 8 to 16 bar				
Leakage rate	≤0.05 % of K _{VS} coefficient				
Valve spring force F and actuator area A	See Table 4 · Dimensions in mm and weights				

Table 1 · Technical data · All pressures in bar (gauge)

Table 2 · Materials · Material number according to DIN EN

Valve							
Nominal pressure	PN 16	PN 25					
Max. perm. temperature	300 °C	350 °C					
Body	Cast iron EN-JL1040 (GG-25)	040 Spheroidal graphite iron Cast steel EN-JS1049 (GGG-40.3) (GS-C					
Seat and plug	Stainless steel						
Bellows	Stainless steel						
Sealing ring	Graphite with metal core						
Actuator							
Diaphragm cases	Sheet steel 1.0037 (St 37-2)						
Diaphragm	EPDM with fabric reinforcement \cdot Max. perm. ambient temperature 80 °C						

Table 3 \cdot KVS coefficients

Nominal size DN	Seat Ø in	K _{VS}	K _{vs} l ¹⁾	
	mm	Standard version	With flow divider St I	
15	22	4	3	
20	22	6.3	5	
25	22	8	6	
32	40	16	12	
40	40	20	15	
50	40	32	23	

¹⁾ Terms for noise level calculation according to VDMA 24422 (edition 1.89) \cdot K_{VS}I = K_{VS} with flow divider St I installed



Terms for control valve sizing according to DIN EN 60534, Parts 2.1 and 2.2: $E_1 = 0.95$

 $F_L = 0.95$ $X_T = 0.75$

 $\Delta \textbf{L}_{\textbf{G}}$ = Valve-specific correction terms; values as specified in the diagram

Table 4	4 .	Dimensions	in mm	and	weights

Nominal siz	e	DN	15	20	25	32	40	50
Set point	Length L (valve)		130	150	160	180	200	230
range	L1 (valve + conical	PN 16	220	256	278	314	337	380
in bar	expansion piece)	PN 25						
0.02 to 0.25	Height H		425 480					
	Actuator	Ø D = 380, A = 640 cm ²						
	Valve spring force F	1750 N						
0.1 to 0.6	Height H	425 480						
	Actuator	Ø D = 380, Å = 640 cm ²						
	Valve spring force F	4400 N						
	Height H			410			465	
0.2	Actuator	Ø D = 285, A = 320 cm ²						
10 1.2	Valve spring force F	4400 N						
	Height H		410 465					
0.8 to 2.5	Actuator	Ø D = 225, A = 160 cm ²						
to 2.5	Valve spring force F	4400 N						
	Height H	390			445			
2 to 5	Actuator	Ø D = 170, A = 80 cm ²						
10 0	Valve spring force F	4400 N						
	Height H	390			445			
4.5 to 10	Actuator	\emptyset D = 170, A = 40 cm ²			Ø D = 170, A = 80 cm ²			
	Valve spring force F	4400 N			8000 N			
	Height H	390 445						
8 to 16	Actuator		Ø D = 170, A = 40 cm ²					
10 10	Valve spring force F	8000 N						
0.02 to 0.6	1.2 Weight for PN 16 ¹⁾ 2.5 in approx. kg		21	22	22	28	30	34
0.1 to 1.2			16	17	17	22	24	28
0.8 to 2.5			14	15	15	21	22	26
2 to 16			12	13	13	18	21	24

¹⁾ +10 % for PN 25

Dimensional drawing



Specifications subject to change without notice.

