Self-operated Pressure Regulators

Excess Pressure Valve Type 2408

SAMSON

Application

Excess pressure valve for set points from **5 mbar** to **1000 mbar** · Valves with flanged body **DN 15** and **25** as well as with female thread **G ½, G ¾** and **G 1** · Nominal pressure **PN 25** · Suitable for gases at temperatures from **−20** to **+60 °C** **(0** to **150 °C)** [1]

This regulator is used to control the pressure of flammable gases used as a source of energy, e.g. in boilers, driers, vaporizers, heat exchangers or industrial ovens. Alternatively, it can control the compressed air supply in process engineering applications.

An additional application of the regulator is the pressure control of inert gas used for inerting or blanketing reaction or storage tanks to protect the product in the tank from oxidation, explosion or escaping.

To achieve an economical consumption of the inert gas, its pressure must be controlled to always remain slightly higher than atmospheric pressure while the tank is being filled or emptied.

Special features

- Low-maintenance proportional regulators
- Compact regulator design providing excellent control accuracy
- Internal set point springs with set point adjustment using a nut on the actuator
- Spring-loaded, single-seated valve
- Connection G ¼ for external control line
- Fulfills stricter fugitive emission requirements (TA-Luft)
- Minimum leakage class IV
- Suitable for vacuum

Versions

Valves in G ½, G ¾ and G 1 or DN 15 and 25 · Soft-seated plug · Body made of stainless steel 1.4408 or spheroidal graphite iron EN-JS1049

Special versions

- Version with FDA-compliant materials for food processing and pharmaceutical industries
- Version to comply with NACE (sour gas)

[1] Version with soft seal and diaphragm made of FPM for air and nitrogen

Fig. 1 · Type 2408 Excess Pressure Valve

Principle of operation

The medium flows through the valve as indicated by the arrow. The position of the valve plug and the area released between the plug (3) and seat (2) determine the flow rate.

In the pressureless state (control line not connected and no pressure applied) the valve is closed by the force of the set point springs (7).

The upstream pressure p_1 to be controlled is tapped upstream of the valve and transmitted over the external control line to the actuator (6) where it is converted into a positioning force. This force is used to move the valve plug according to the force of the set point springs (7). The spring force can be adjusted at the set point adjuster (8).

When the force resulting from the upstream pressure p_1 rises above the adjusted set point, the valve opens proportionally to the change in pressure.
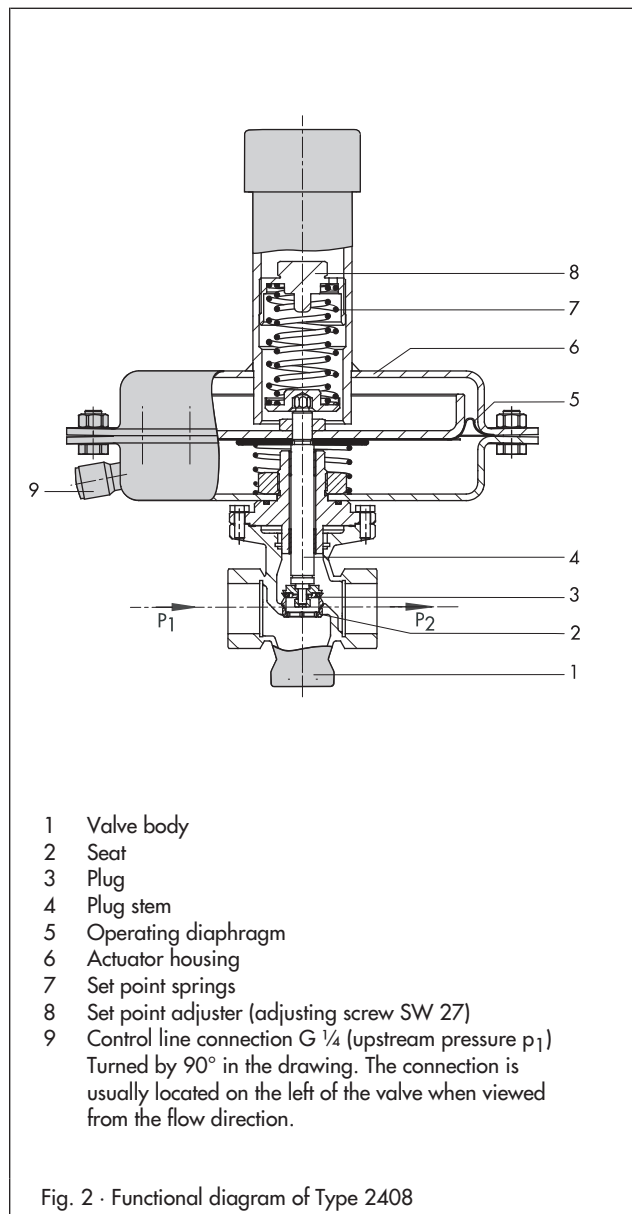
1   Valve body
2   Seat
3   Plug
4   Plug stem
5   Operating diaphragm
6   Actuator housing
7   Set point springs
8   Set point adjuster (adjusting screw SW 27)
9   Control line connection G ¼ (upstream pressure p_1)
    Turned by 90° in the drawing. The connection is usually located on the left of the valve when viewed from the flow direction.

Fig. 2 · Functional diagram of Type 2408

Installation

Preferably the regulator is to be installed in horizontal pipelines:

– Actuator housing on top of the valve, facing upwards
– The direction of medium flow must correspond with the arrow on the valve body.
– In applications in which the blanketing gas can liquefy, condensate may form in the control line, causing damage to the regulator. To allow condensate to run back into the tank, install the control line with an approximate 10 % slope to the pressure tapping point at the tank.
– Distance between the pressure tapping point and regulator min. 2 x DN.

In exceptional cases, the regulator can also be installed in vertical pipelines with the direction of flow from the bottom to the top.

Refer to EB 2528 EN for more details.
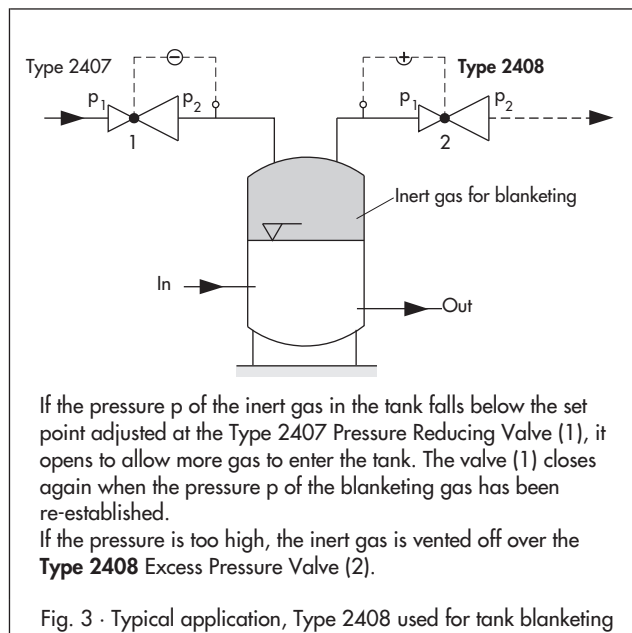
If the pressure p of the inert gas in the tank falls below the set point adjusted at the Type 2407 Pressure Reducing Valve (1), it opens to allow more gas to enter the tank. The valve (1) closes again when the pressure p of the blanketing gas has been re-established.

If the pressure is too high, the inert gas is vented off over the **Type 2408** Excess Pressure Valve (2).

Fig. 3 · Typical application, Type 2408 used for tank blanketing

T 2528 EN

Table 1 · Technical data

| Nominal size	G ½, G ¾ and G1	DN 15 and DN 25
Nominal pressure	PN 25	
Control line connection for 8 x 1 mm pipe	G ¼	
K_{VS} coefficients	0.25 · 1.0 · 2.5 · 3.2 [1] · 5.0 [1]	
Max. perm. differential pressure Δp	6 bar	

Max. perm. pressure at the actuator
    Actuator area A = 1200 cm²
    Actuator area A = 640 cm²
    Actuator area A = 320 cm²
    Actuator area A = 160 cm²
	0.5 bar
	1 bar
	2 bar
	4 bar	

Max. perm. temperature range (medium temperature)	−20 to +60 °C (0 to 150 °C) [2]	
Leakage class acc. to IEC 60534-4	Soft-seated plug, minimum class IV	
Set point ranges	5 to 15 mbar · 10 to 30 mbar · 25 to 60 mbar · 50 to 200 mbar 100 to 1000 mbar	

[1] Only in conjunction with 100 to 1000 mbar set point range
[2] Version with FPM soft seal and FPM diaphragm for air and nitrogen

Table 2 · Materials · Material number acc. to DIN EN

Body	Stainless steel 1.4408 – Body with screwed ends –	Spheroidal graphite iron EN-JS1049 – Flanged body –
Seat	1.4404	1.4305
Plug	1.4404 with soft seal	
Plug sealing	EPDM · FPM · NBR	
Operating diaphragm	EPDM · FPM · NBR	
Positioning spring and set point springs	1.4310 K	
Actuator housing	1.4301	1.0039

Dimensions

Turned by 90°
in the drawing
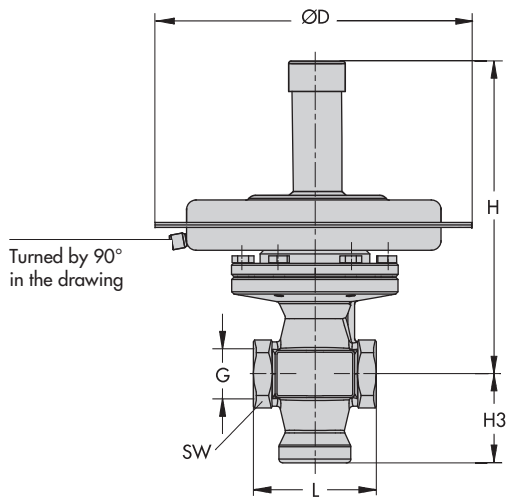
Type 2408 · Stainless steel body with screwed ends

Turned by 90°
in the drawing
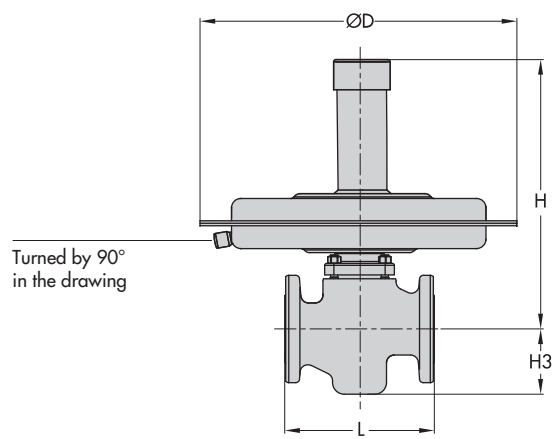
Type 2408 · Flanged body made of
spheroidal graphite iron

Table 3 · Dimensions in mm and weights in kg

Nominal size		G ½	G ¾	G 1	DN 15	DN 25
Female thread		G ½	G ¾	G 1	–	–
Face-to-face dimension L		65	75	90	130	160
Width across flats SW		34	34	46	–	–
Height H3		45				
5 to 15 mbar	Height H	360				
	Actuator	Actuator $\varnothing$ D = 490 mm, actuator area A = 1200 cm^2				
10 to 30 mbar	Height H	360				
	Actuator	Actuator $\varnothing$ D = 380 mm, actuator area A = 640 cm^2				
25 to 60 mbar	Height H	360				
	Actuator	Actuator $\varnothing$ D = 380 mm, actuator area A = 640 cm^2				
50 to 200 mbar	Height H	360				
	Actuator	Actuator $\varnothing$ D = 285 mm, actuator area A = 320 cm^2				
100 to 1000 mbar	Height H	360				
	Actuator	Actuator $\varnothing$ D = 225 mm, actuator area A = 160 cm^2				
Weight, approx. in kg	Set point range 5 to 60 mbar	15.5	15.7	15.9	17	18
	Set point range 50 to 1000 mbar	12	12.2	12.4	13.5	14.5

Fig. 4 · Dimensional drawings of Type 2408

Ordering text

Excess Pressure Valve Type 2408

Nominal size DN ..., thread size G ...,
Set point range ... mbar, K$_{VS}$ coefficient ...
Body material ...
Material:
Plug sealing ..., operating diaphragm ...

Specifications subject to change without notice

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