DATA SHEET

T 2523 EN

Type 2406 Excess Pressure Valve

Self-operated Pressure Regulators · ANSI version

CE

Application

Excess pressure valve for set points from **0.075 to 150 psi** · Nominal size **NPS ½ to 2** [1] · Pressure rating **Class 125 to 300**
Suitable for gases at temperatures from **–5 to +140 °F** · **32 to +300 °F** [2]

The valve **opens** when the upstream pressure **rises**.

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.

Fig. 1: *Type 2406 Excess Pressure Valve*

Special features

- Low-maintenance proportional regulators
- Compact regulator design providing excellent control accuracy
- Internal set point springs with set point adjustment using a set point adjuster on the actuator
- Spring-loaded, single-seated valve balanced by a balancing diaphragm
- External connection of a control line
- Meets strict emission requirements (TA Luft)
- Minimum leakage class IV

Version

Valves in NPS ½ to 2 · Flanged connections · Soft-seated plug · Body made of cast iron, cast steel or cast stainless steel

Special versions

- FDA version [3]
- NACE version for sour gas applications
- Actuator with seal and leakage line connection
- Version with connected control line. Pressure tapped directly at the valve body; optionally also with pressure gauge

1) NPS ½ and ¾ not in Class 125
2) For unbalanced versions with FKM diaphragm and FKM soft seal
3) This version is not suitable for direct contact with products manufactured in the food and pharmaceutical industries. It can only be used close to the product.

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Edition February 2025

Principle of operation

The medium flows through the regulator in the direction indicated by the arrow. The position of the plug determines the flow rate across the area released between plug (3) and seat (2).

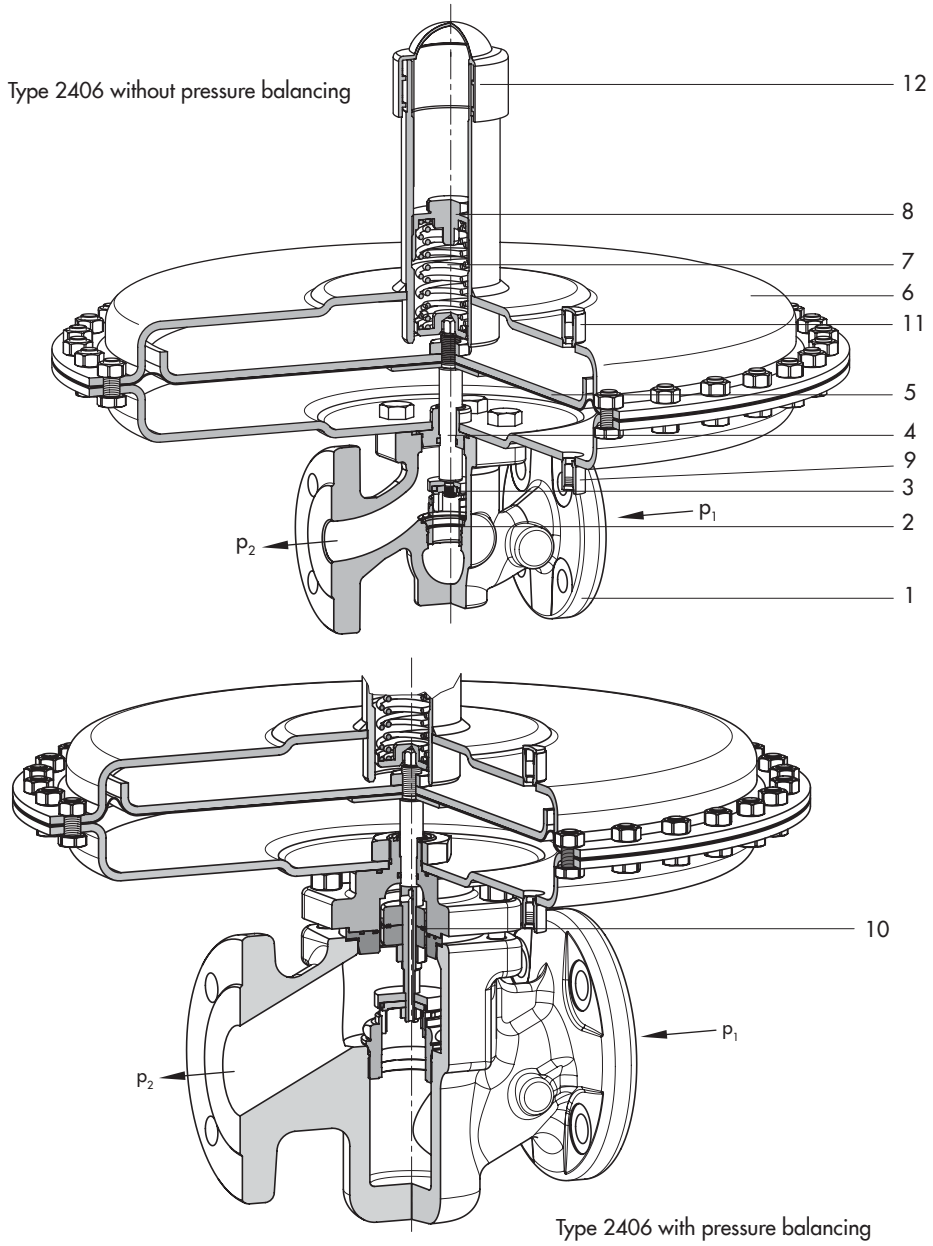
In the pressureless state (control line not connected and no pressure applied) the valve is closed by the force of the set point spring (7).

The upstream pressure p_1 to be controlled is tapped upstream of the valve and transmitted over the control line [1] to the control line connection (9) on the actuator housing (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 spring (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.

In the version with pressure balancing, the forces produced by the upstream and downstream pressures acting on the plug are eliminated by the balancing diaphragm (10). The plug is fully balanced.

[1] Optional: pressure tapping directly at the valve body



1	Valve body	5	Operating diaphragm	9	Control line connection G ¼
2	Seat	6	Actuator housing	10	Balancing diaphragm
3	Plug	7	Set point spring	11	Leakage line connection (optional)
4	Plug stem	8	Set point adjuster	12	Cap

Fig. 2: *Functional diagram of Type 2406 Excess Pressure Valve*

Table 1: *Technical data*

Nominal size [1]		**NPS ½**	**NPS ½**	**NPS 1**	**NPS 1½**	**NPS 2**
Pressure rating (valve)		Class 125 · Class 150 · Class 300				
C_V coefficients	Standard	5	7.5	9.4	23	37
	Reduced C_V coefficients	0.12 · 0.3 · 0.5 1.2 · 2 · 3	0.12 · 0.3 · 0.5 1.2 · 2 · 3 · 5	0.12 · 0.3 · 0.5 1.2 · 2 · 3 · 5 · 7.5	7.5 9.4 · 20	7.5 · 9.4 20 · 23
Max. permissible temperature range (medium temperature)		–5 to +140 °F · (32 to 300 °F) [2]				
Leakage class according to ANSI/FCI 70-2		Soft-seated, minimum Class IV				
Conformity		CE · EAC				
Set point ranges		0.075 to 0.25 psi · 0.15 to 0.42 psi · 0.35 to 0.87 psi · 0.75 to 3 psi 1.5 to 8 psi · 3 to 15 psi · 10 to 35 psi · 30 to 75 psi · 65 to 150 psi				
Max. permissible pressure at operating diaphragm [3]	186 in²	7 psi				
	100 in²	14.5 psi				
	50 in²	30 psi				
	25 in²	45 psi				
	12.5 in²	75 psi				
	6 in²	220 psi				
Pressure balancing	C_V = 0.12 to 5	Without balancing diaphragm				
	C_V = 7.5 to 37	With balancing diaphragm				
Pressure tapping over a connected control line		External control line · Direct at the valve body (special version)				
Control line connection		G ¼ – with ¼ NPT adapter –				

1) Larger nominal sizes on request
2) Unbalanced version with FKM diaphragm and FKM soft seal; not for FDA version
3) Corresponds to the maximum differential pressure

Table 2: *Materials · Material numbers according to ASTM and DIN EN*

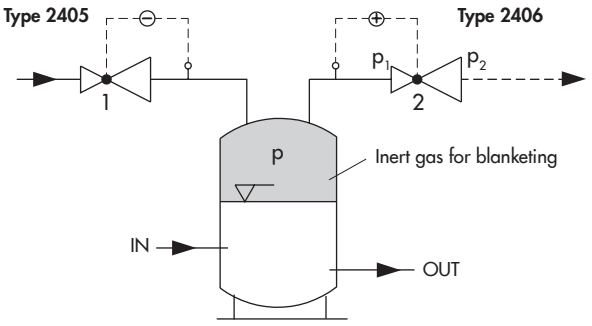
Valve body	**A126B, A216 WCC**	**A351 CF8M**
Seat	316L	316L
Plug	316L	316L
Plug stem	316L	
Seal	EPDM · FKM · NBR	
Balancing diaphragm	EPDM · FKM · NBR	
Actuator housing	**1.0332**	**1.4301**
Operating diaphragm	EPDM · FKM · NBR	

Installation

The regulator is preferably to be installed in horizontal pipelines:

- Actuator housing on top of the valve. The actuator faces upward in the upright direction.
- The direction of flow must match the direction indicated by the arrow on the 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. 2x NPS

In exceptional cases, the regulator can also be installed in vertical pipelines with the direction of flow from the top (see ▶ EB 2522 for more details).

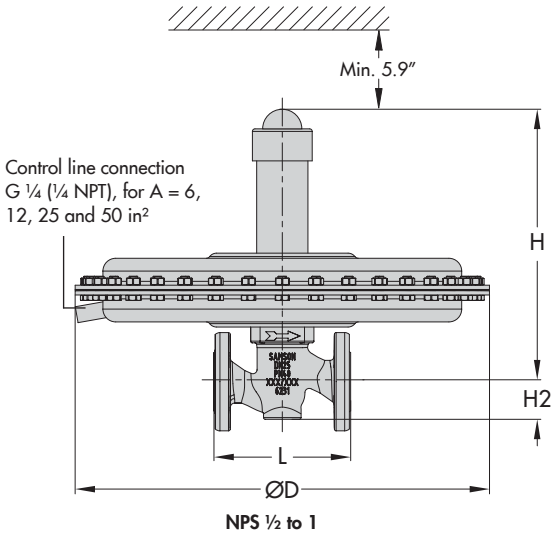


If the pressure p of the inert gas in the tank falls below the set point p_1 adjusted at the **Type 2405** Pressure Reducing Valve (1), it opens to allow more gas to enter the tank. The valve (1) closes again when the pressure p of the blanketing gas has been reestablished.
If the pressure is too high, the inert gas is vented off over the **Type 2406** Excess Pressure Valve (2).

Fig. 3: *Sample application, Type 2406 used for vapor recovery*

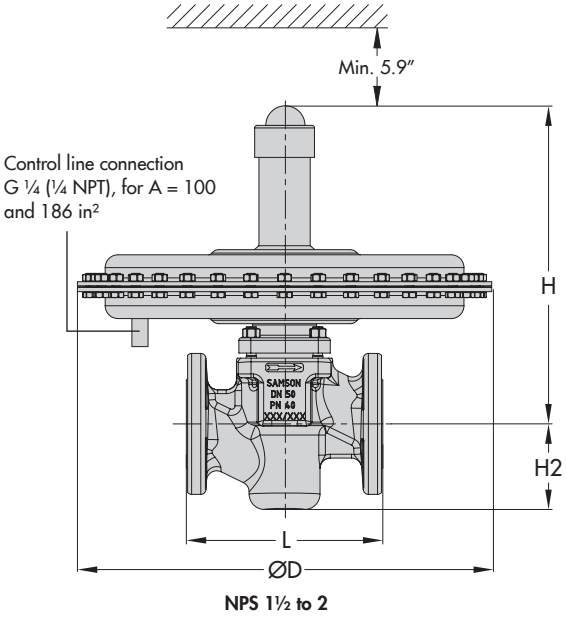
Dimensional drawings

NPS ½ to 1



NPS ½ to 1

NPS 1½ to 2



NPS 1½ to 2

The control line connection is turned by 90° in the drawing. The connection is normally located opposite the side with the arrow indicating the direction of flow.
An adapter G ¼ to ¼-18 NPT (order no. 0230-3417) must be ordered separately.

Fig. 4: *Dimensions of Type 2406*

Table 3: *Dimensions in inch and weights in lb*

Nominal size					NPS ½	NPS ¾	NPS 1	NPS 1½	NPS 2
Valve	Length L ANSI	Class 125 and 150		inch	7.25 [2]	7.25 [2]	7.25	8.75	10.00
		Class 300		inch	7.50	7.62	7.75	9.25	10.50
	Height H2	Cast steel		inch	1.73			2.83	
		Forged steel		inch	2.1	–	2.8	3.7	3.9
Set point range	0.075 to 0.25 psi	Height H	Without balancing		12.8″			14.6″	
			With balancing		13.9″			14.8″	
		Actuator			ØD = 19.1″, A = 186 in²				
	0.15 to 0.42 psi	Height H	Without balancing		12.5″			14.4″	
			With balancing		13.6″			14.6″	
		Actuator			ØD = 15″, A = 100 in²			ØD = 19.1″, A = 186 in²	
	0.35 to 0.87 psi	Height H	Without balancing		12.5″			14.4″	
			With balancing		13.6″			14.6″	
		Actuator			ØD = 15″, A = 100 in²				
	0.75 to 3 psi	Height H	Without balancing		12.5″			14.4″	
			With balancing		13.6″			14.6″	
		Actuator			ØD = 11.2″, A = 50 in²				
	1.5 to 8 psi	Height H	Without balancing		12.5″			14.4″	
			With balancing		13.6″			14.6″	
		Actuator			ØD = 11.2″, A = 50 in²				
	3 to 15 psi	Height H	Without balancing		12.5″			14.4″	
			With balancing		13.6″			14.6″	
		Actuator			ØD = 8.9″, A = 25 in²				
	10 to 35 psi	Height H	Without balancing		13.0″			14.4″	
			With balancing		14.0″			14.5″	
		Actuator			ØD = 6.7″, A = 12 in²				
	30 to 75 psi	Height H	Without balancing		13.1″			14.5″	
			With balancing		14.1″			14.7″	
		Actuator			ØD = 6.7″, A = 6 in²				
	65 to 145 psi	Height H	Without balancing		17.2″			19.1″	
			With balancing		18.2″			19.3″	
		Actuator			ØD = 6.7″, A = 6 in²				

Set point range	**Weight** [1] in lb (approx.)		
0.075 to 0.25 psi		61.7 lb	88.2 lb
0.15 to 0.42 psi		39.7 lb	
0.35 to 0.87 psi		30.9 lb	66.1 lb
0.75 to 3 psi			57.3 lb
1.5 to 8 psi			
3 to 15 psi		22 lb	48.5 lb
10 to 35 psi		17.6 lb	44.1 lb
30 to 75 psi		17.6 lb	44.1 lb
65 to 145 psi		19.8 lb	46.3 lb

[1] Body made of A216 WCC and A351 CF8M: +10 %

[2] Not for Class 125

Ordering text

Type 2406 Excess Pressure Valve

Nominal size NPS …

Set point range … psi

C_V coefficient …

Materials: plug seal ..., balancing diaphragm ..., operating diaphragm ...

Body material …, optionally, special version ...