DATA SHEET

T 2550 EN

Type 2422/2425 Excess Pressure Valve

Self-operated Pressure Regulators · ANSI version

Application

Pressure regulators for set points from **0.75** to **35 psi** (0.05 to 2.5 bar) · Valves in **NPS 6** to **10**[1] (DN 150 to 250)
Pressure rating **Class 125** to **300** · Suitable for water, gases, and vapors up to **+660 °F** (350 °C)

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

The excess pressure valves, consisting of a valve and actuator, control the upstream pressure to an adjustable set point. The medium pressure to be kept constant is transmitted through a control line to the diaphragm of the actuator and consequently the valve plug.

Special features

- Low-maintenance, medium-controlled proportional regulators requiring no auxiliary energy
- Wide set point range and convenient set point adjustment using a nut
- Exchangeable set point springs and actuator
- Spring-loaded, single-seated valve with upstream and downstream pressures balanced by a stainless steel bellows or by a balancing diaphragm
- Reduced C_V (K_{VS}) coefficients to adapt the regulator to the operating conditions
- Standard low-noise plug · Special version with flow divider ST 1 or ST 3 for further noise level reduction. See Data Sheet ▶ T 8081.

Versions

Type 2422/2425 · Excess pressure valve for NPS 6 to 10 (DN 150 to 250)
consisting of:
Type 2422 Valve with soft-seated plug, balanced by a bellows or a diaphragm · Body of cast iron A126B, cast steel A216 WCC or cast stainless steel A351 CF8M · **Type 2425** Actuator with EPDM rolling diaphragm

Fig. 1: *Type 2422/2425 Excess Pressure Valve, valve balanced by a bellows*

Special versions

- With flow divider ST 1 or ST 3 for particularly low-noise operation
- With metal-seated plug
- With FPM (FKM) rolling diaphragm, e.g. for mineral oils or flammable gases
- With NBR rolling diaphragm for flammable gases
- Version completely in stainless steel for pressure rating Class 150 to 300 · Details on request
- Actuator with two diaphragms
- With metal cover to protect the set point springs

[1] Valves larger than NPS 10 (DN 250) on request

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Principle of operation (see Fig. 2)

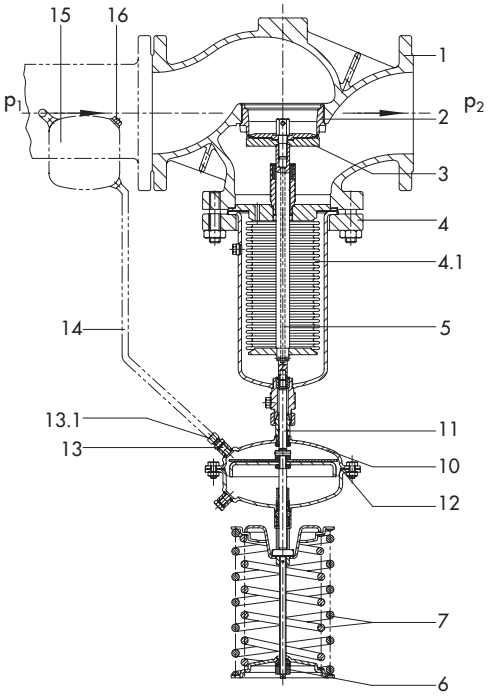
The medium flows through the valve in the direction indicated by the arrow. The position of the plug (3) determines the flow rate across the area released between plug (3) and valve seat (2). The plug stem (5) with the plug is connected to the actuator stem (11) of the actuator (10).

The upstream pressure p_1 is regulated by the set point springs (7) and the set point adjuster (6). When relieved of pressure, the valve is closed by the force of the set point springs.

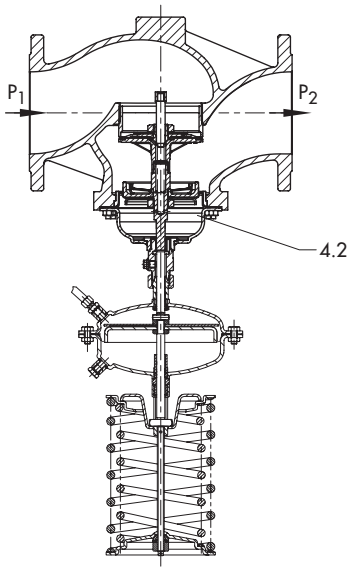
The upstream pressure p_1 to be controlled is tapped upstream of the valve and transmitted over the control line to the operating diaphragm (12) where it is converted into a positioning force. This force is used to move the valve plug (3) according to the force of the set point springs. The spring force is adjustable at the set point adjuster (6).

The principle of operation of the regulator balanced by a bellows or diaphragm only differs concerning the pressure balancing. The valves balanced by a diaphragm have a balancing diaphragm (4.2) instead of a bellows (4.1). In both cases, the forces created by the upstream and downstream pressures that act on the valve plug are balanced out.

The valves can be supplied with flow divider ST 1 or ST 3. The valve seat must be replaced on retrofitting the flow divider.



Type 2422/2425 Excess Pressure Valve
Type 2422 Valve, balanced by a bellows



Type 2422/2425 Excess Pressure Valve
Type 2422 Valve, balanced by a diaphragm

Fig. 2: *Functional diagram of Type 2422/2425*

1 Valve body
2 Seat (exchangeable)
3 Plug
4 Bellows housing
4.1 Balancing bellows
4.2 Balancing diaphragm
5 Plug stem
6 Set point adjuster
7 Set point springs
10 Actuator
11 Actuator stem
12 Operating diaphragm
13 Control line connection G ¼ (with ¼ NPT adapter)
13.1 Screw joint with restriction
14 Control line (to be provided on site)
15 Compensation chamber
16 Filler plug

p_1 Upstream pressure
p_2 Downstream pressure

Table 1: *Technical data · All pressures (gauge)*

Type 2422 Valve				
Valve size		**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**
Pressure rating		Class 125, 150 or 300		
Max. permissible temperature	Valve body	See pressure-temperature diagram in ▶ T 2500		
	Valve plug balanced by a bellows	Metal seal: 660 °F (350 °C) · PTFE soft seal: 430 °F (220 °C) · EPDM or FPM (FKM) soft seal: 300 °F (150 °C) · NBR soft seal: 175 °F (80 °C)		
	Valve plug balanced by a diaphragm	300 °F (150 °C)		
Leakage class according to IEC 60534-4 or ANSI/FCI 70-2		≤0.05 % of C_V or K_{VS} coefficient		
Compliance		CE · EAC		
Type 2425 Actuator				
Set point ranges		0.75 to 3.5 psi · 1.5 to 8.5 psi · 3 to 14.5 psi · 7 to 20 psi · 14.5 to 35 psi[1)]		
		0.05 to 0.25 bar · 0.1 to 0.6 bar · 0.2 to 1 bar · 0.5 to 1.5 bar · 1 to 2.5 bar[1)]		
Max. perm. pressure at actuator	Actuator area	50 in² · 320 cm²	100 in² · 640 cm²	
	Pressure	43.5 psi · 3 bar	22 psi · 1.5 bar	
Max. permissible temperature		Gases, 175 °F (80 °C) at the actuator · Liquids 300 °F (150 °C), with compensation chamber max. 660 °F (350 °C) · Steam with compensation chamber max. 660 °F (350 °C)		

1) Set point ranges above 35 psi (2.5 bar) ▶ T 2554 · Type 2335 Excess Pressure Valve

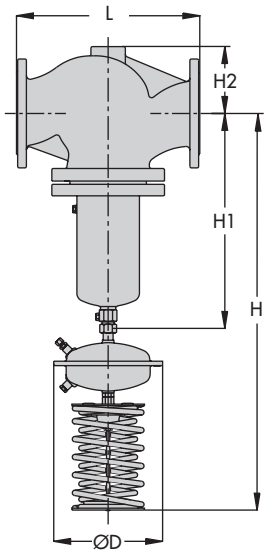
Table 2: *Materials · Material numbers according to ASTM and DIN EN*

Type 2422 Valve, balanced by a bellows				
Pressure rating		**Class 125**	**Class 150/300**	
Body		Cast iron A126B	Cast steel A216 WCC	Cast stainless steel A351 CF8M
Seat		1.4006		1.4571/1.4404
Plug		1.4571		1.4571/1.4301 with PTFE seal
	Seal for soft-seated plug	PTFE with 15 % glass fiber · EPDM · NBR · FPM (FKM)		
Plug stem		1.4301		
Balancing bellows		1.4571		
Bottom section		1.0305		1.4571
Seal		Graphite on metal core		
Type 2422 Valve, balanced by a diaphragm				
Pressure rating		**Class 125**	**Class 150/300**	
Body		Cast iron A126B	Cast steel A216 WCC	Cast stainless steel A351 CF8M
Seat		Red brass[1)]		
Plug (standard version)		Red brass[1)] · With EPDM soft seal or with PTFE soft seal		
Pressure balancing		Balancing cases made of sheet steel DD11 · EPDM balancing diaphragm for liquids and non-flammable gases or NBR diaphragm for flammable gases		
Gasket		Graphite on metal core		
Type 2425 Actuator				
Diaphragm cases		Sheet steel DD11		1.4301
Diaphragm		EPDM with fabric reinforcement · FPM (FKM) · NBR		
Guide bushing		DU bushing		PTFE
Seals		EPDM · FPM (FKM) · NBR		

1) Special version: 1.4409

Dimensions

Type 2422 Valve, balanced by a bellows



Type 2422 Valve, balanced by a bellows

Type 2425 Actuator

Table 3: *Dimensions and weights · Type 2422 Valve* ***balanced by a bellows*** *· The values in parentheses apply to temperatures from 430 °F (220 °C) to 660 °F (350 °C)*

Pressure rating					
Valve size			**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**
Valve	Length L	Class 125/150	17.75″ · 451 mm	21.4″ · 543 mm	26.5″ · 673 mm
		Class 300	18.6″ · 473 mm	22.4″ · 568 mm	27.9″ · 708 mm
	Height H1		23.2″ · 590 mm (28.4″ · 730 mm)	28.7″ · 730 mm (34.25″ · 870 mm)	
	Height H2, approx.		6.9″ · 175 mm	9.25″ · 235 mm	10.7″ · 270 mm
Set point range	**Valve with actuator**				
0.75 to 3.5 psi 0.05 to 0.25 bar	Height H		44.1″ · 1120 mm (49.6″ · 1260 mm)	49.6″ · 1260 mm (55.1″ · 1400 mm)	
	Actuator		ØD = 15″ · 390 mm, A = 100 in² · 640 cm²		
1.5 to 8.5 psi 0.1 to 0.6 bar	Height H		44.1″ · 1120 mm (49.6″ · 1260 mm)	49.6″ · 1260 mm (55.1″ · 1400 mm)	
	Actuator		ØD = 15″ · 390 mm, A = 100 in² · 640 cm²		
3 to 14.5 psi 0.2 to 1.0 bar	Height H		44″ · 1120 mm (49.6″ · 1260 mm)	49.6″ · 1260 mm (55.1″ · 1400 mm)	
	Actuator		ØD = 15″ · 390 mm, A = 100 in² · 640 cm²		
7 to 20 psi 0.5 to 1.5 bar	Height H		42.1″ · 1070 mm (47.6″ · 1210 mm)	47.6″ · 1210 mm (53.1″ · 1350 mm)	
	Actuator		ØD = 11.2″ · 285 mm, A = 50 in² · 320 cm²		
14.5 to 35 psi 1 to 2.5 bar	Height H		42.1″ · 1070 mm (47.6″ · 1210 mm)	47.6″ · 1210 mm (53.1″ · 1350 mm)	
	Actuator		ØD = 11.2″ · 285 mm, A = 50 in² · 320 cm²		
Weight					
0.75 to 14.5 psi	**Weight**[1] (valve with actuator) for cast iron A216B, Class 125		258 lb · 117 kg	633 lb · 287 kg	655 lb · 297 kg
7 to 35 psi			245 lb · 111 kg	619 lb · 281 kg	642 lb · 291 kg

[1] Class 150: +10 %, Class 300: +15 %

Fig. 3: *Dimension diagram of Type 2422 Valve balanced by a bellows with Type 2425 Actuator*

Type 2422 Valve, balanced by a diaphragm

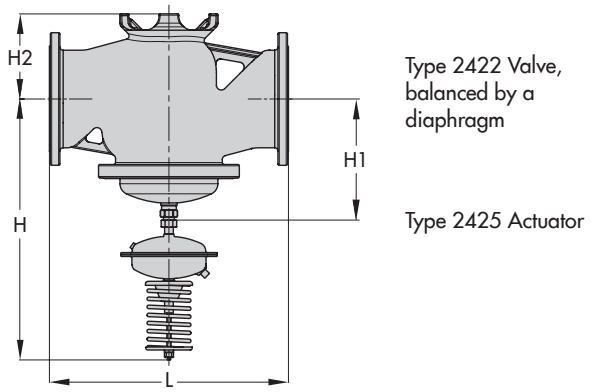


Fig. 4: *Dimension drawing of Type 2422 Valve balanced by a diaphragm with Type 2425 Actuator*

Table 4: *Dimensions and weights · Type 2422 Valve* ***balanced by a diaphragm***

Valve size			**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**
Valve	Length L	Class 125/150	17.75″ · 451 mm	21.4″ · 543 mm	26.5″ · 673 mm
		Class 300	18.6″ · 473 mm	22.4″ · 568 mm	27.9″ · 708 mm
	Height H1		12.2″ · 310 mm	15″ · 380 mm	
	Height H2, approx.		6.9″ · 175 mm	9.25″ · 235 mm	10.7″ · 270 mm
Set point range	**Valve with actuator**				
0.75 to 3.5 psi 0.05 to 0.25 bar	Height H		33″ · 840 mm	35.8″ · 910 mm	
	Actuator		ØD = 15.4″ · 390 mm · A = 100 in² · 640 cm²		
	Weight [2], approx. kg		207 lb · 94 kg	527 lb · 239 kg	549 lb · 249 kg
1.5 to 8.5 psi 0.1 to 0.6 bar	Height H		33″ · 840 mm	35.8″ · 910 mm	
	Actuator		ØD = 15.4″ · 390 mm · A = 100 in² · 640 cm²		
	Weight [2], approx. kg		207 lb · 94 kg	527 lb · 239 kg	549 lb · 249 kg
3 to 14.5 psi 0.2 to 1.0 bar	Height H		36.1″ · 790 mm	33.9″ · 860 mm	
	Actuator		ØD = 11.2″ · 285 mm · A = 50 in² · 320 cm² [1]		
	Weight [2], approx. kg		207 lb · 94 kg	527 lb · 239 kg	549 lb · 249 kg
7 to 20 psi 0.5 to 1.5 bar	Height H		31.1″ · 790 mm	33.9″ · 860 mm	
	Actuator		ØD = 11.2″ · 285 mm · A = 50 in² · 320 cm² [1]		
	Weight [2], approx. kg		194 lb · 88 kg	514 lb · 233 kg	536 lb · 243 kg
14.5 to 35 psi 1 to 2.5 bar	Height H		36.1″ · 790 mm	33.9″ · 860 mm	
	Actuator		ØD = 8.2″ · 225 mm · A = 50 in² · 320 cm²		
	Weight [2], approx. kg		194 lb · 88 kg	514 lb · 233 kg	536 lb · 243 kg

[1] Optionally with actuator 100 in² (640 cm²)
[2] Valve in Class 125 with actuator. Class 150: +10 %, Class 300: +15 %

Table 5: *C_V (K_{VS}) coefficients and max. permissible differential pressures Δp_{max}*

Type 2422 Valve, balanced by a bellows							
C_V (K_{VS}) coefficients and max. permissible differential pressures Δp_{max}							
		C_V (K_{VS}) coefficients · Differential pressures			Reduced C_V (K_{VS}) coefficients · Differential pressures		
Valve size		**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**	**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**
Standard C_V (K_{VS}) coefficients	C_V	330	490	585	145	330	330
	K_{VS}	280	420	500	125	280	280
Flow divider ST 1	C_V 1	245	370	440	110	245	245
	K_{VS} 1	210	315	375	95	210	210
Flow divider ST 3	C_V 3	165	230	260	70	165	165
	K_{VS} 3	140	200	220	60	140	140
Max. perm. differential pressure Δp_{max}	psi	175	145	145	230	175	175
	bar	12	10	10	16	12	12

Type 2422 Valve, balanced by a diaphragm				
C_V (K_{VS}) coefficients and max. permissible differential pressures Δp_{max}				
Valve size		**NPS 6 · DN 150**	**NPS 8 · DN 200**	**NPS 10 · DN 250**
C_V/K_{VS} coefficients	C_V coefficient	445	760	930
	K_{VS} coefficient	380	650	800
Max. perm. differential pressure Δp_{max}	psi	175 psi	145 psi	
	bar	12 bar	10 bar	

Installation

- Install valves (balanced by a bellows or diaphragm) with the actuator suspended downward.
- Install pipelines horizontally with a slight downward slope on both sides of the valve to prevent condensed water from collecting.
- The direction of flow must match the direction indicated by the arrow on the body.
- Connect a control line to the actuator from the point of pressure tapping located approx. 39" (1 m) upstream of the valve in the pipe wall or at the point of measurement of the connected plant (with compensation chamber, if applicable).

Accessories

- Screw joints with restriction for connection of the control line e.g. for ¼" or ½" (6 or 12 mm) pipe
- Only applicable to valves balanced by a bellows: compensation chamber for condensation and to protect the operating diaphragm against extreme temperatures. The chamber is required for steam and liquids above 300 °F (150 °C).

For detailed information on accessories refer to Data Sheet ▶ T 2595

Ordering text

Type 2422/2425 Excess Pressure Valve
Valve balanced by a bellows or diaphragm
NPS (DN) ..., body material ..., Class ...
C_V (K_{VS}) coefficient ..., set point range ... psi (bar)
Special version ...
Accessories ...