

T 2551-2 EN

Type 33-7 Excess Pressure Valve Self-operated Pressure Regulators



Application

Pressure regulators for set points from **1 to 11 bar** · Nominal sizes **DN 65 to 250** · Pressure rating **PN 16 to 40** · Suitable for **water up to 150 °C**

The pressure regulator consists of a valve, actuator and attached pilot valve. The differential pressure across the regulator is used as auxiliary energy to operate the valve. To open the regulator, this pressure must be at least as high as the minimum differential pressure Δp_{\min} specified in Table 1.

The pilot valve determines the function of the regulator depending on how it is hooked up. Its output control pressure and the pressure to be kept constant are transmitted through control lines to the diaphragm of the actuator.

Special features

- Low-maintenance proportional regulators requiring no auxiliary energy
- High dynamic response and small offset, i.e. excellent control accuracy due to the attached pilot valve
- Wide set point range and convenient set point adjustment at the pilot valve
- Single-seated valve with upstream and downstream pressures balanced by a metal bellows

Versions

The pressure regulator consists of a valve with soft-seated plug and a valve body made of cast iron, spheroidal graphite iron (DN 65 to 150) or cast steel as well as an actuator with EPDM rolling diaphragm with an actuator area of $A = 640 \text{ cm}^2$.

Excess pressure valve (Fig. 1) to control the upstream pressure p_1 to the set point adjusted at the pilot valve

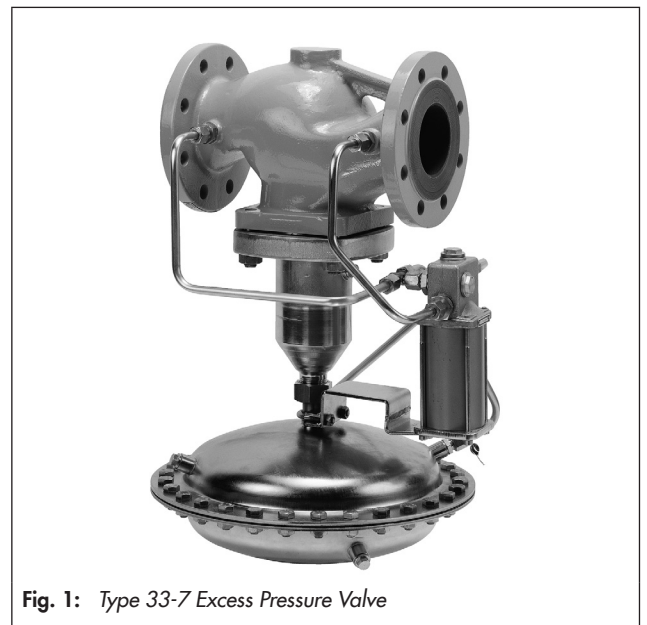


Fig. 1: Type 33-7 Excess Pressure Valve

Principle of operation

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

The valve is fully balanced. The pressure upstream of the plug (3) is transferred through a hole in the plug stem and acts on the outside of the bellows (5), whereas the pressure downstream of the plug acts on the inside of the bellows. As a result, the forces acting on the valve plug are balanced out.

The upstream pressure p_1 is transmitted to the pilot valve (8) through a control line. In the pilot valve, it is used as auxiliary energy to create the control pressure p_s dependent on the adjusted set point.

The upstream pressure p_1 to be controlled acts on the top of the diaphragm. The control pressure p_s created at the pilot valve drops as the upstream pressure p_1 rises. The valve opens opposing the force of the set point springs (7). When p_s is equal to p_1 , the valve is closed by the force of the set point springs.

Installation

Install the regulator in horizontal pipelines.

The following points must be observed:

- The direction of flow must match the direction indicated by the arrow on the body
- The actuator must be suspended downwards.



Further details can be found in ► EB 2551-2.

Ordering text

Type 33-7 Excess Pressure Valve

DN ...

Body material ...

PN ...

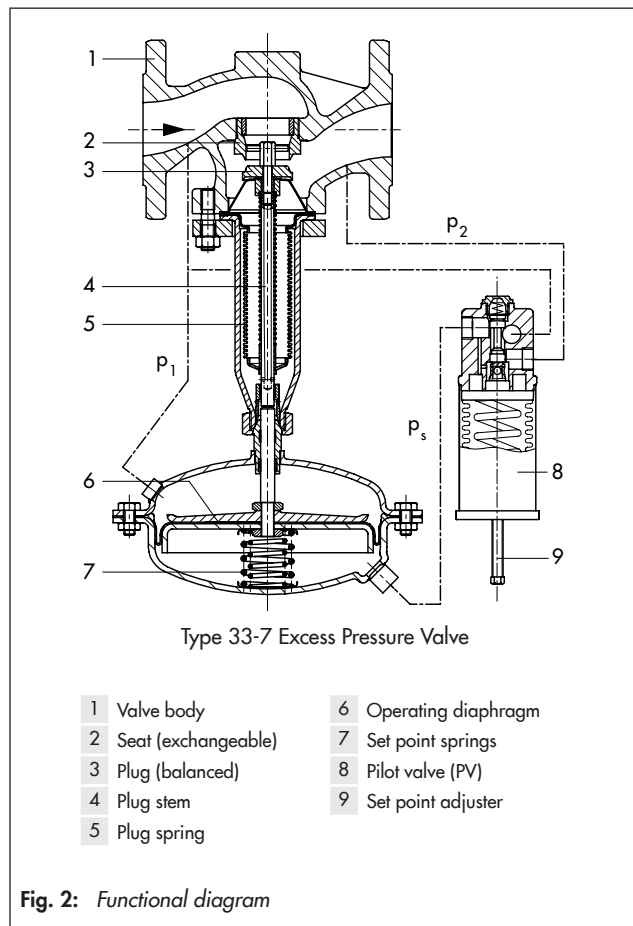


Fig. 2: Functional diagram

Table 1: Technical data - All pressures in bar (gauge)

Pressure rating	PN 16 to 40						
	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250
Nominal size	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250
K_{VS} coefficient	50	80	125	190	280	420	500
Value at $K_{VS} 0.3$	1.6	1.7	2	2.4	3	5	
x_{FZ} value	0.4	0.35				0.3	
Max. permissible temperature	150 °C ¹⁾						
Min. differential pressure Δp_{min} in bar	0.4			0.5		0.6	
Set point range (continuously adjustable)	1 to 11 bar						
Max. perm. differential pressure Δp in bar	16				12	10	
Max. permissible upstream pressure p_1 in bar	16 bar						
Conformity	CE ENEC						

¹⁾ Valve body made of cast iron (EN-GJL-250), DN 125 to 250: max. 130 °C, taking into account the material table in DIN 4747-1 for the use of the regulator in hot-water district heating networks.

Table 2: Materials · Material numbers according to DIN EN

Valve			
Pressure rating	PN 16	PN 16 · PN 25	PN 16 · PN 25 · PN 40
Body	Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT ¹⁾	Cast steel 1.0619
Seat	Stainless steel 1.4006		
Plug with EPDM seal	Stainless steel · 1.4004		
Balancing bellows	Stainless steel 1.4571		
Seal	Graphite on metal core		
Actuator			
Diaphragm cases	Sheet steel DD11 (StW22)		
Diaphragm	EPDM with fabric reinforcement		
Sealing element	EPDM seal		
Pilot valve			
Body	Brass/1.4541		
Plug	Brass		
Metal bellows	Brass CW502L		
Control lines	CrNiMo steel		
Screw fittings	Steel		

¹⁾ DN 150 and smaller

Dimensional drawing

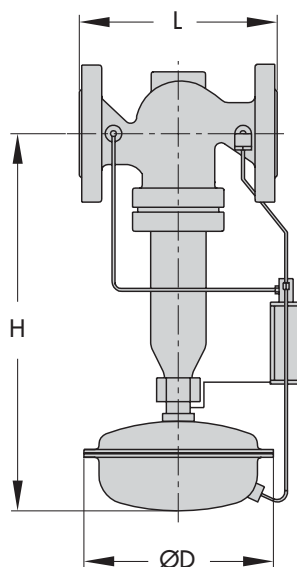


Fig. 3: Dimensions

Table 3: Dimensions in mm and weights

Nominal size	DN	65	80	100	125	150	200	250
Face-to-face dimension	L	290	310	350	400	480	600	730
Height ¹⁾	H	495		550	635	755	925	
Actuator area		A = 640 cm ²						
Diaphragm housing	ØD	380						
Weight for PN 16 ²⁾		53 kg	58 kg	66 kg	96 kg	140 kg	280 kg	330 kg

¹⁾ +15 mm for PN 40

²⁾ +10 % for cast steel 1.0619 and spheroidal graphite iron EN-GJS-400-18-LT

