

mbar Pressure Reducing Valve Type 2393

Valve closes when the downstream pressure rises

mbar Excess Pressure Valve Type 2398

Valve opens when the upstream pressure rises

Application

For set points from **5 mbar to 50 mbar** · Valve nominal sizes **DN 15 to DN 50** · Nominal pressures **PN 16 and PN 25** · For protective (inert) gas up to 120 °C

Conversion of valve sizing coefficients:

$$C_v \text{ (in U.S.-gallons/min)} = 1.17 \cdot K_{vs} \text{ (in m}^3\text{/h)}$$

$$K_{vs} \text{ (in m}^3\text{/h)} = 0.86 \cdot C_v \text{ (in U.S.-gallons/min)}$$

As an effective sealing medium in industrial plants, inert gas is often applied e.g. as a blanketing or covering gas to reaction and storage tanks containing material which is explosive, toxic or sensitive to oxidation. In this case, the pressure of the inert gas should only slightly exceed the atmospheric pressure when filling or draining these tanks in order to achieve a preferably low consumption of the gas. The Type 2393 Pressure Reducing Valve and Type 2398 Excess Pressure Valve are therefore especially designed for these particular conditions and feature set points adjustable between 5 and 50 mbar.

Special features

- Low-maintenance, proportional regulator requiring no auxiliary energy (controlled by the process fluid)
- Excellent control characteristics; small steady-state deviation (offset) and exceptionally accurate control results
- Suitable for protective (inert) gas
- Wide set point range adjustable from 5 to 50 mbar; easy adjustment at the actuator
- Single-seated valve providing balancing of the upstream and downstream pressure by means of a durable stainless steel bellows

Versions

These two pressure regulators each consist of a globe valve with a soft-seated plug and a housing section constructed of either cast iron, cast steel or stainless steel. Their actuators are equipped with an ethylene propylene dimeterpolymer (EPDM) rolling diaphragm having an effective area of $A = 640 \text{ cm}^2$.

The pressure of the process medium to be maintained at a constant value is transmitted to the spring-loaded diaphragm of the actuator via the control line and, consequently, to the valve plug.

Type 2393 · mbar Pressure Reducing Valve

Accurately maintains the downstream pressure, p_2 , to the adjusted set point.

Type 2398 · mbar Excess Pressure Valve

Accurately maintains the upstream pressure, p_1 , to the adjusted set point.

Special version

- Dimensions and materials in accordance to ANSI available on request
- Type 2393: smaller K_{vs} values available on request



Fig. 1 · Type 2393 mbar Pressure Reducing Valve

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

Nominal size	DN	15	20	25	32	40	50
Nominal pressure	PN	16 or 25					
K_{vs} value		3.2	5	8	12.5	20	32
Special version ¹⁾		0.4 or 1.0		–			
Leakage rate		< 0.001% of K_{vs} value					
Max. perm. temperature		120 °C					
Set point range		5 to 30 mbar / 25 to 50 mbar			10 to 30 mbar / 25 to 50 mbar		
Maximum permissible differential pressure Δp		8 bar			6 bar		
Permissible pressure (actuator)		2 bar					
Effect. diaphragm area		640 cm ²					

¹⁾ Only applies to Type 2393 mbar Pressure Reducing Valve; smaller K_{vs} values available on request

Principle of operation

The process medium flows through the valve in the direction indicated by the arrow. Here, the cross-sectional area between the valve plug (3) and the seat (2) determines the rate of flow.

Depending on the version (pressure reducing valve or excess pressure valve as shown in Fig. 3), the valve closes or opens, resp. when the pressure to be controlled rises. This pressure is transmitted to the operating diaphragm (6) via the control line and respective connection (9), where it is converted into a positioning force. This force adjusts the plug stem (3) as a function of the operating spring force and can be adjusted using the set point adjustment.

The fully balanced plugs contain a balancing bellows (5). Here, the downstream pressure, p_2 , is applied to the interior side, the upstream pressure, p_1 , is applied to the exterior side. Thus, the forces producing the upstream and downstream pressure on the valve plug are equally balanced.

Valve action of the two pressure regulator versions:

- Type 2393 Pressure Reducing Valve: The downstream pressure, p_2 , of the medium to be controlled closes the valve.
- Type 2398 Excess Pressure Valve: The upstream pressure, p_1 , of the medium to be controlled opens the valve.

Installation

- Only install the regulator in horizontal pipelines.
- The direction of flow must coincide with the arrow on the body
- Valve extension, incl. actuator, must be vertically suspended.
- If the gas to be controlled contains moisture, condensate could possibly form in the control line. As a consequence, the actuator and valve could become damaged. In order to ensure adequate run-back in the tank, slope the control line approximately 10% to the pressure tap on the tank.

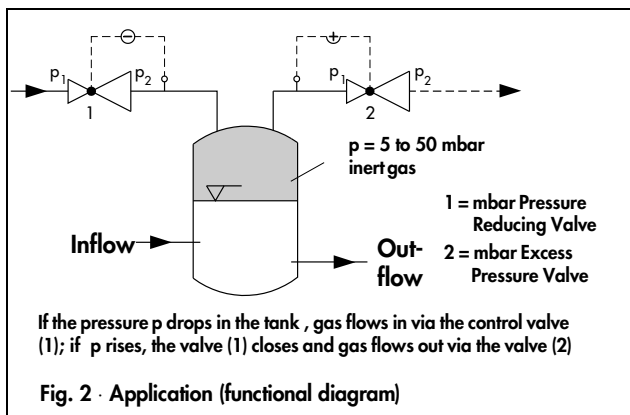


Fig. 2 · Application (functional diagram)

- Minimum distance "pressure tap - regulator" at least 10 DN.

Table 2 · Materials (WN = Material Number accord. to DIN)

Body	GG-25 WN 0.6025/ GS-C25 WN 1.0619	CrNiMo steel WN 1.4581
Seat	WN 1.4006	WN 1.4571
Plug	WN 1.4104	WN 1.4571
	With EPDM soft sealing	
Bottom section	St 35-8	WN 1.4571
Balancing bellows	WN 1.4571	WN 1.4571
Cover plates	St 37-2	WN 1.4301
Diaphragm	EPDM	

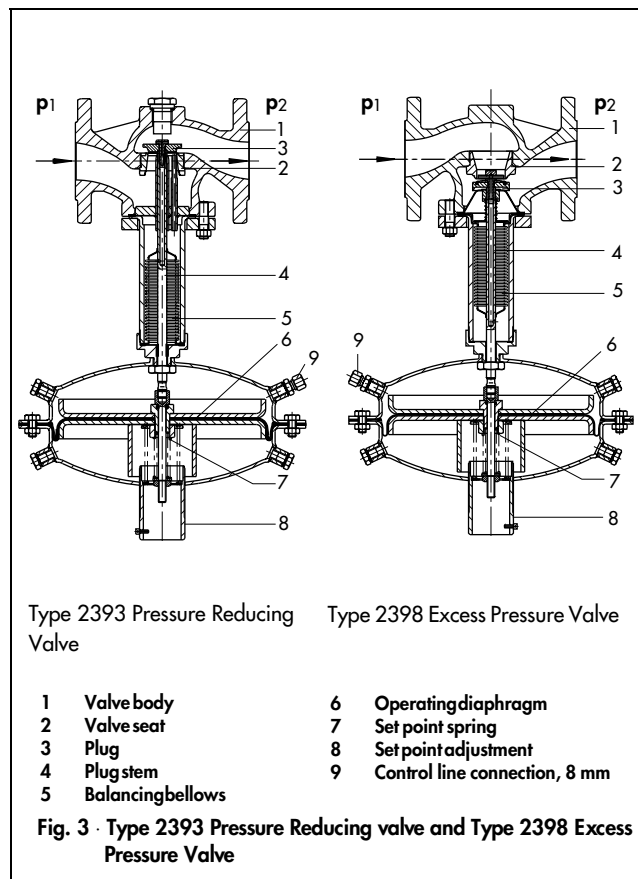


Fig. 3 · Type 2393 Pressure Reducing valve and Type 2398 Excess Pressure Valve

Specifications subject to change without notice.

Table 3 · Dimensions in mm and weights

Nominal size DN	15	20	25	32	40	50
Overall length L	130	150	160	180	200	230
Overall height H	405			460		
Approx. weight in kg	20	21	22	26	28	30

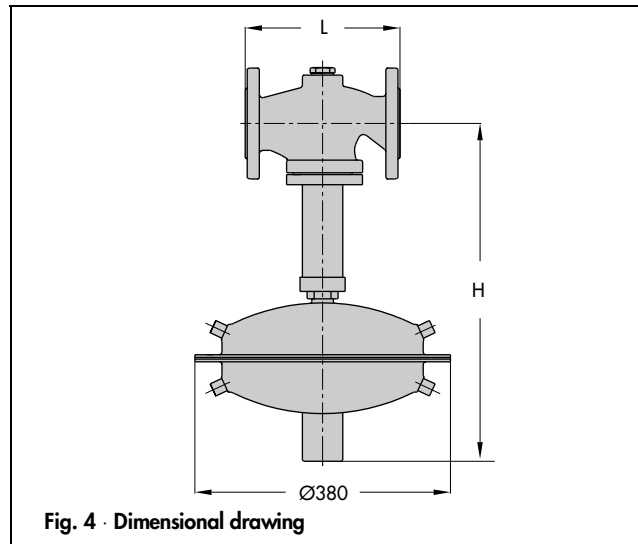


Fig. 4 · Dimensional drawing

Ordering text

mbar Pressure Reducing Valve Type 2393/
mbar Excess Pressure Valve Type 2398



Size DN ..., body material ..., pressure PN ..., Kvs value ...,
Set point range ... mbar, optional special version ...

