Steam Pressure Reducing Valve with pneumatic set point adjustment
Type 2434

Application

Set point range from **0.3** to **3 bar** · Nominal valve size **DN 15, 20** and **25** · Nominal pressure **PN 25** and **40** · Suitable for **steam** up to max. **170 °C**

The valve closes when the downstream pressure rises above the adjusted set point.

The Type 2434 Steam Pressure Reducing Valve controls the steam pressure (at a constant upstream pressure p_1 of 6 bar) downstream of the valve to the pneumatically adjusted target pressure p_{target} within the range between 0.3 to 3 bar.

Special features

- Low-maintenance, low-noise pneumatically controlled P-regulator
- Pneumatically adjustable set point

Versions

Type 2434 Steam Pressure Reducing Valve, consisting of:

Valve with body made of EN-JS1049 (spheroidal graphite iron) · PN 25

or

Valve with body made of cast steel 1.0619 · PN 40

Nominal size DN 15, 20 and 25 · Pneumatic actuator with EPDM diaphragm · Pneumatic set point adjustment

ANSI version on request

Accessories

Coiled control line for downstream pressure p_2

Fig. 1: *Type 2434 Steam Pressure Reducing Valve, PN 40*

Principle of operation

The steam pressure reducing valve mainly consists of the valve (1) with seat (2) and soft-seated plug (3). The actuator housing (6) for pneumatic set point adjustment is connected over an extension piece (5) to the valve.

The regulator is used to keep the pressure downstream of the valve p_2 constant to the pneumatically adjusted target pressure p_{target}.

The valve is closed by the springs when no pressure is applied. In the operating state, the valve is opened by the control pressure p_S.

The medium flows through the valve in the direction indicated by the arrow. The position of the valve plug determines the flow rate between the free area between the plug (3) and seat (2) and the downstream pressure as a result.

The downstream pressure p_2 is routed over the connected external control line to the low-pressure diaphragm chamber (7) of the actuator where it is converted into a positioning force. This force is compared with the force of the control pressure p_S in the high-pressure diaphragm chamber (8) of the actuator. If the force resulting from the downstream pressure p_2 is greater than that of the control pressure p_S, the plug (3) moves in the closing direction.

The lines for the control pressure p_S and the downstream pressure p_2 are connected to the actuator housing over compression fittings.

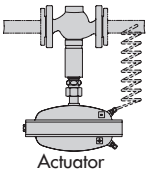
If the regulator tends to hunt, we recommend installing a SAMSON screw fitting with restriction at the control line connection of the actuator housing (13).

Installation

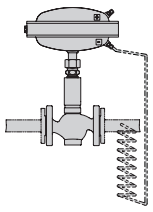
A control line (14) is required to operate the regulator. It can be obtained from SAMSON (see Accessories). Observe the mounting position with the actuator on top/suspended downward.

The following generally applies:

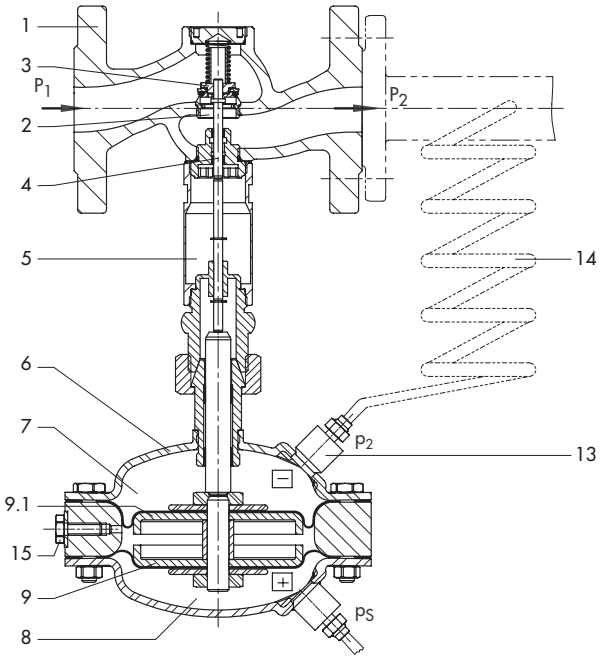
- Install the valves in horizontal pipelines free of stress.
- The actuator must be suspended downward or located on top.
- Direction of flow must match the direction indicated by the arrow on the body.
- Install a strainer upstream of the valve.
- Do **not** insulate the extension piece and actuator when insulating the steam line.



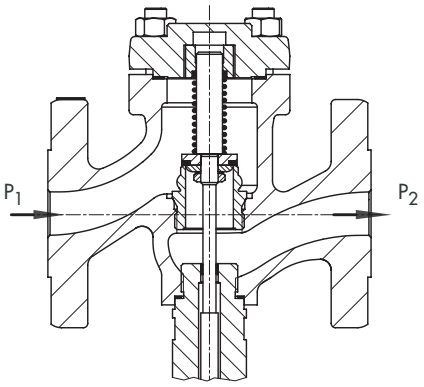
Actuator suspended



Actuator on top



Type 2434, PN 25 · Body made of spheroidal graphite iron
Actuator suspended



Type 2434 view of the valve, PN 40
Body made of cast steel 1.0619

1 Valve body
2 Seat (exchangeable)
3 Plug with soft seal
4 Plug stem
5 Extension piece
6 Actuator housing
7 Low-pressure diaphragm chamber
8 High-pressure diaphragm chamber
9 Operating diaphragm
9.1 Backup diaphragm
13 Screw fitting G 3/8
14 Control line, coiled (accessories)
15 Vent screw

Upstream pressure p_1
Downstream pressure p_2 = Target pressure p_{target}
Control pressure p_S

Fig. 2: *Functional diagram*

Table 1: *Technical data · All pressure stated as gauge pressure in bar*

Nominal size	**DN 15**	**DN 20**	**DN 25**
K_{VS} coefficient	4	6.3	8
Nominal pressure	PN 25 · PN 40		
Max. upstream pressure p_1	6 bar		
Set point range	0.3 to 3 bar		
Max. permissible temperature for steam with coiled control line	170 °C		
Actuator			
Diaphragm area of actuator	80 cm²		
Max. control pressure p_S	6 bar		

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

Valve		
Valve body	PN 25	Spheroidal graphite iron EN-JS1049
	PN 40	Cast steel 1.0619
Seat and plug	PN 25 · Spheroidal graphite iron	1.4305
	PN 40 · Cast steel	1.4104, 1.4571
Plug stem	PN 25 · Spheroidal graphite iron	1.4305
	PN 40 · Cast steel	1.4301
Bottom section		1.4571
Plug seal		PTFE
Actuator		
Diaphragm cases		1.0332
Diaphragm (steam side)		EPDM
Guide bushing		1.4104
Diaphragm (control pressure side)		FKM (FPM)

Set point adjustment

Provided the upstream pressure p_1 remains constant at 6 bar, the target pressure p_{target} is regulated by the control pressure p_S.

A pressure gauge on the downstream pressure side can be used to check the target pressure.

The valve closes as soon as the downstream pressure p_2 exceeds the adjusted target pressure p_{target}.

Table 3: *Set point adjustment*

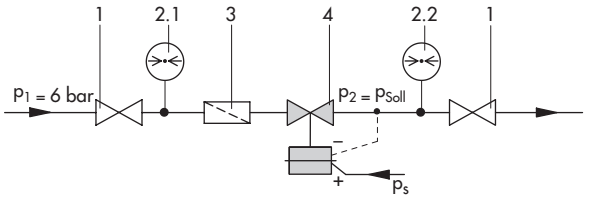
Upstream pressure p_1	**6 bar**			
Target pressure p_{target}	0.3 bar	1 bar	2 bar	3 bar
Control pressure p_S	0.7 bar	1.4 bar	2.3 bar	3.3 bar

The following equation applies to calculate the control pressure p_S to be applied at the given target pressure p_{target}:

$$p_S = p_{target} + \frac{[(p_1 - p_{target}) \times 3.14] + 12}{80}$$

All gauge pressure specifications in bar

Typical application

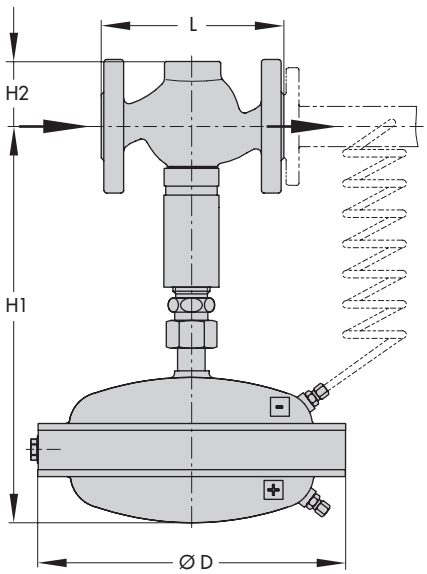


1 Shut-off valve
2.1 Pressure gauge (upstream pressure)
2.2 Pressure gauge (target pressure)
3 Strainer
4 Type 2434 Regulator

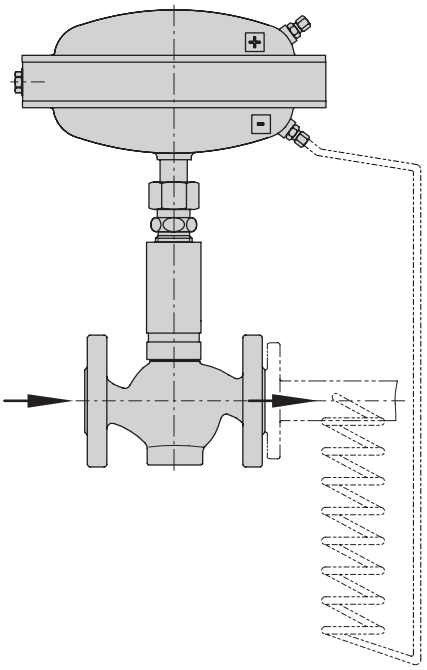
Upstream pressure p_1
Downstream pressure p_2 = Target pressure p_{target}
Control pressure p_S

Fig. 3: *Typical application*

Dimensions



Type 2434 with control line (coiled to cool down the medium in it); actuator suspended downward



Type 2434 with control line (coiled to cool down the medium in it); actuator on top

Table 4: *Dimensions and weights*

Nominal size		**DN 15**	**DN 20**	**DN 25**
Length L		130 mm	150 mm	160 mm
Height H1		277 mm		
Height H2	PN 25 · Spheroidal graphite iron	46 mm		
	PN 40 · Cast steel	90 mm		
Actuator	Actuator housing Ø D	170 mm		
	Diaphragm area of actuator	80 cm²		
Weight, approx.	PN 25 · Spheroidal graphite iron	28 kg	28.5 kg	30 kg
	PN 40 · Cast steel	30.5 kg	31 kg	33 kg

Fig. 4: *Dimensions*

Ordering text

Type 2434 Steam Pressure Reducing Valve with pneumatic set point adjustment

DN …, PN …

Accessories:

Control line (coiled to cool down the medium in it) including compression fitting, actuator installed suspended downward or on top · Order no.: 1402-0194

Screw fitting with restriction G ⅜ · Order no.: 1490-2175

Special version …

Specifications subject to change without notice

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