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 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 $p_{\text{target}}$ 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 $p_2$

The valve closes when the downstream pressure rises above the adjusted set point.
**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 \( \text{p}_{\text{target}} \).

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.

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**Fig. 2: Functional diagram**
Table 1: Technical data · All pressure stated as gauge pressure in bar

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>DN 15</th>
<th>DN 20</th>
<th>DN 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure coefficient</td>
<td>4</td>
<td>6.3</td>
<td>8</td>
</tr>
<tr>
<td>Nominal pressure</td>
<td>PN 25 · PN 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. upstream pressure $p_1$</td>
<td>6 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set point range</td>
<td>0.3 to 3 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. permissible temperature for steam</td>
<td></td>
<td>170 °C</td>
<td></td>
</tr>
<tr>
<td>Actuator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm area of actuator</td>
<td>80 cm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. control pressure $p_s$</td>
<td>6 bar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Materials · Material numbers according to DIN EN

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

Set point adjustment

Provided the upstream pressure $p_1$ remains constant at 6 bar, the target pressure $p_{\text{target}}$ 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 $p_{\text{target}}$.

Table 3: Set point adjustment

<table>
<thead>
<tr>
<th>Upstream pressure $p_1$</th>
<th>6 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target pressure $p_{\text{target}}$</td>
<td>0.3 bar</td>
</tr>
<tr>
<td>Control pressure $p_s$</td>
<td>0.7 bar</td>
</tr>
</tbody>
</table>

The following equation applies to calculate the control pressure $p_s$ to be applied at the given target pressure $p_{\text{target}}$:

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

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 $p_2 = p_{\text{target}}$
Control pressure $p_s$
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 3/8 · Order no.: 1490-2175
Special version ...

Specifications subject to change without notice