SEMPELL ELECTRO PNEUMATIC RELIEF VALVE
TYPE EPRV

Protect your main valves reliable with our pneumatic actuated relief valve type SEP in combination with the control unit type STE8

FEATURES

- Small opening and closing pressure difference
- High reproducibility
- Lifting of the SEP also below set pressure possible
- Adjustment control of the SEP without changing the system pressure
- Check of the control function without response of the SEP
- System pressure signal at pressure switch
- Compact
- Easy to operate
- Very ruggedly design for high pressure and temperature
- With removable seat insert, replacing the seat while the valve can stay installed
- Simple replacement of parts, no special tools necessary
- Double acting cylinder

APPLICATION

Providing overpressure protection for steam boilers.

TECHNICAL DATA

- Standard size NPS: inlet 2½ x outlet 4
- Pressure: up to 350 barg [5000 psig]
- Temperature: up to 630°C [1150°F]
- Connection: Flanged or welded
- Body material:
  - Casting: A216WCB, A217WC6, A217WC9, C12A
  - Forged: A105, A182 F12, A182 F22, A182 F91
**SEMPPELL ELECTRO PNEUMATIC RELIEF VALVE**

**TYPE EPRV**

According to the ASME I code one or more power-actuated pressure relieving valves shall be provided in direct communication with the boiler when the boiler is under pressure and shall receive a control impulse to open when the maximum allowable working pressure at the super heater outlet as shown in the master stamping is exceeded.

The Sempell Electro Pneumatic Relief Valve (EPRV) is designed to provide automatic or manual overpressure protection for steam boilers. It is configured for dependable service in superheated and saturated steam applications.

An isolation stop valve may be installed between the power-actuated pressure relieving valve and the boiler to permit repairs provided an alternate power-actuated relieving valve of the same capacity is so installed as to be in direct communication with the boiler in accordance with the requirements of the code.

**MAIN COMPONENTS OF EPRV**

- spring loaded main valve type SEP including a double acting pneumatic actuator A160 and solenoid valve
- pneumatic control unit STE8 with two boxes:
  - A161 contains a double acting pressure switch with lockable isolation valve and test connection
  - A162 electrical control box for operating and monitoring the valve automatic or manual
- optional push button box PBP for remote control.

**MODE OF OPERATION**

During normal operation of the plant the valve is kept closed by the spring and by a pneumatic closing force. Pressurized air is connected via a 5/2 solenoid valve to the upper side of the actuator. In case of pressure increase to the set point of the pressure switch the solenoid valve is energized and it switches the air supply from upper chamber to the lower one. By this the pneumatic force changes from closing to opening action and the main valve opens. When during relieving the pressure decreases to the closing set pressure of the pressure switch, the air supply is reconnected to the upper chamber again and the main valve closes.

At the front of the electric control unit lamps are installed giving information on status of main valve position and of the pressure switch. Typically the unit works in automatic mode. The opening of the main valve can be initiated manually or by a signal i.e. from control room.

* EPRV can also be used as relief valve on hot reheater

**EPRV DESIGN**

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TYPE EPRV
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**TYPE EPRV**

PNEUMATIC ACTUATED RELIEF VALVE

**TYPE SEP**

In combination with our control unit STEB you have a proper system to protect your main valves.

The design of the main valve follows the principle of spring operated safety valves. The primary closing force is achieved by the spring. The double acting pneumatic actuator A160 opens and re-closes the valve. The valve is equipped with a balance piston and a cooling spacer to minimize the steam emission and protect the spring against high temperature. In valves for high pressure the seat can be replaced. With the setting of the spring the mode of the fail safe status can be selected. As default the spring setting is higher than pressure switch setting. In case of pneumatic pressure loss the valve will stay closed. As option the spring can be set to a lower value. This results in fail safe open mode that the valve opens spring operated without pneumatic pressure.

<table>
<thead>
<tr>
<th>Orifice</th>
<th>Area mm²</th>
<th>kdr</th>
<th>Standard size</th>
<th>Dimensions only for information not for final design</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>1134</td>
<td>0.878</td>
<td>2½ in  out  A mm  B mm  H1 mm  Weight kg</td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>1590</td>
<td>0.878</td>
<td>2½ in  out  310  215  920  240</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>2206</td>
<td>0.878</td>
<td>2½ in  out  320  250  1020  335</td>
<td></td>
</tr>
</tbody>
</table>

Actuator A160

Emergency supply
Compressed air 4-8 barg
24 V DC for actuation (other commutation on request)

Option
Increased pneumatic actuator size possible, to open the valve at atmospheric system pressure.
**SEMPELL ELECTRO PNEUMATIC RELIEF VALVE**

**TYPE EPRV**

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**CONTROL UNIT STE 8**

Control system for our EPRV electro pneumatic relief valve.

The control system consists of two boxes one for the pressure switches and the local control box. The system design is for a proper function of the EPRV.

Performed by logic opening “1 of 1” and closing “1 of 1”.

With monitoring for the relief valve and switches for open and close position of the valve.

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**Pressure switch box**

A161.EP pressure switch box with one adjustable high precision switches with test connection.

Standard blowdown 1%.

Additional blowdown adjustable.

Shut-off valve for pressure tapping line.

Test connection with shut-off valve.

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**Local control box**

A162.EP.RC local electric control box with one switch for “auto-off-manual”.

Applicable for the A162.EPRC “push bottom panel”.

With function for “off-on-hand”.

With function for EPRV opening and closing.

Monitoring of pressure switch’s with control lamps.

Monitoring of valves position with control lamps.

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**OPTION - PUSH BUTTON PANEL**

This option you can order later or direct and assembled it with our STE8 without modification of the local control box.

PBP Remote control system with identical function of the A162.EPRC, and with an optically monitoring to our local control box.

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Consult the factory for specific voltage for your applications.
## SELECTION GUIDE MAIN VALVE SEP

<table>
<thead>
<tr>
<th>Example</th>
<th>SEP</th>
<th>WL</th>
<th>K1</th>
<th>2½”</th>
<th>4”</th>
<th>06</th>
<th>W</th>
<th>-</th>
<th>A160.4.22</th>
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</table>

**Valve type**

<table>
<thead>
<tr>
<th>Inlet</th>
<th>Valve type</th>
<th>W</th>
<th>Welded end or class for flange</th>
<th>L</th>
<th>Low</th>
<th>M</th>
<th>Medium</th>
<th>S</th>
<th>Super</th>
<th>Orifice</th>
<th>Material code based on Casting steel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>01</td>
<td>150 lbs</td>
<td>03</td>
<td>300 lbs</td>
<td>06</td>
<td>600 lbs</td>
<td>09</td>
<td>900 lbs</td>
<td>15</td>
<td>1500 lbs</td>
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<tr>
<td></td>
<td></td>
<td>02</td>
<td></td>
<td>04</td>
<td></td>
<td>07</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Material code based on Forged steel**

<table>
<thead>
<tr>
<th>Body</th>
<th>Inlet</th>
<th>Yoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>A105</td>
<td>216WCB</td>
</tr>
<tr>
<td>06</td>
<td>A182 F22</td>
<td>217WC6</td>
</tr>
<tr>
<td>07</td>
<td>A182 F91</td>
<td>217WC9</td>
</tr>
<tr>
<td>08</td>
<td>C12A</td>
<td>217WC9</td>
</tr>
</tbody>
</table>

**Outlet size**

<table>
<thead>
<tr>
<th>W</th>
<th>Welded end or class for flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>150 lbs</td>
</tr>
<tr>
<td>03</td>
<td>300 lbs</td>
</tr>
<tr>
<td>06</td>
<td>600 lbs</td>
</tr>
</tbody>
</table>

**Fail safe status**

<table>
<thead>
<tr>
<th>Blank</th>
<th>Standard close</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Open</td>
</tr>
</tbody>
</table>

**Pneumatic actuator**

**DESIGN DESIGNATION CONTROL UNIT STE 8**

<table>
<thead>
<tr>
<th>Example</th>
<th>STE8</th>
<th>220 V AC</th>
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</thead>
</table>

**Control unit type**

**Pressure controlling**

<table>
<thead>
<tr>
<th>PE</th>
<th>Pressure transducer design</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Pressure transducer design with test connection</td>
</tr>
<tr>
<td>PS</td>
<td>Mechanical pressure switch with test connection</td>
</tr>
</tbody>
</table>

**Voltage**

<table>
<thead>
<tr>
<th>220 V AC</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>or customer requirement</td>
</tr>
</tbody>
</table>

**Option**

Push button box

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