Miniature pressure switch, stainless steel
For the process industry
Model PXS

Applications

- Pressure monitoring and control of processes
- Safety-critical applications in general process instrumentation, especially in the chemical and petrochemical industries, oil and gas industries, power generation incl. nuclear power plants, water/wastewater industries, mining
- For gaseous and liquid, aggressive and highly viscous or contaminated media, also in aggressive ambience
- For measuring points with limited space, e.g. control panels

Special features

- No power supply needed for switching of electrical loads
- Robust switch enclosure from stainless steel 316, IP66, NEMA 4X
- Setting ranges from 1 ... 2.5 bar to 200 ... 1,000 bar
- Intrinsic safety Ex ia available
- 1 set point, SPDT or DPDT, high switching power up to AC 250 V, 5 A

Description

These high-quality pressure switches have been developed especially for safety-critical applications. The high quality of the products and manufacturing in accordance with ISO 9001 ensure reliable monitoring of your plant. In production, the switches are traced by quality assurance software at every step and subsequently are 100 % tested.

In order to ensure as flexible operation as possible, the pressure switches are fitted with micro switches, which enable the switching of an electrical load of up to AC 250 V, 5 A directly.

For two separate circuits the switches are also available in the version DPDT (double pole double throw). By using a Belleville spring the simultaneous triggering of the DPDT occurs at either rising or falling pressure. Moreover the snap-acting behaviour of the Belleville spring increases stability and vibration resistance.

All wetted materials are from stainless steel as a standard. For applications with special requirements on the wetted parts, versions with materials from Hastelloy are available.

For lower switching power ratings, such as for PLC applications, argon gas-filled micro switches with gold-plated contacts can be selected as an option.
Standard version

Switch enclosure
Stainless steel 316
Tamper-proof
Laser-engraved product label from stainless steel

Ingress protection
IP66 per IEC/EN 60529, NEMA 4X

Permissible temperature
Ambient $T_{amb}$: -40 ... +85 °C for non-Ex versions
For Ex versions see the type examination certificate

Medium $T_M$: See table on next page.
Depending on sensor element.

Switch contact
Hermetically sealed micro switches with fixed dead band.
- 1 x SPDT (single pole double throw)
- 1 x DPDT (double pole double throw)

The DPDT function is realised with a Belleville spring triggering 2 SPDT micro switches simultaneously.

<table>
<thead>
<tr>
<th>Contact version</th>
<th>Electrical rating (resistive load)</th>
<th>Suitable for Ex ia option</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>1 x SPDT, silver, hermetically sealed</td>
<td>250 V, 5 A, 24 V, 5 A</td>
</tr>
<tr>
<td>J</td>
<td>1 x SPDT, gold-plated, hermetically sealed</td>
<td>250 V, 0.5 A, 24 V, 1 A</td>
</tr>
<tr>
<td>L</td>
<td>1 x DPDT, silver, hermetically sealed</td>
<td>250 V, 5 A, 24 V, 5 A</td>
</tr>
<tr>
<td>M</td>
<td>1 x DPDT, gold-plated, hermetically sealed</td>
<td>250 V, 0.5 A, 24 V, 1 A</td>
</tr>
</tbody>
</table>

Set point adjustment
The set point can be specified by the customer or factory-set within the setting range. Subsequent adjustment of the set point on site is made using the adjustment screw, which is covered by the access cover plate with lead seal option.

Repeatability of the set point
≤ 1 % of end of setting range

Please specify:
Set point, switching direction for the contact, e.g.:
Set point: 5 bar, rising

After removing the access cover plate, set point adjustment can be made using the adjustment screw. The set point is selectable within the entire setting range. For optimal performance we suggest to adjust the set point between 25 ... 75 % of the setting range.

Example
Setting range: 1 ... 2.5 bar with one switch contact
Dead band: 0.3 bar (see table setting ranges)
Rising pressure: Adjust set point between 1.3 ... 2.5 bar.
Falling pressure: Adjust set point between 1 ... 2.2 bar.

Process connection (A)
Stainless steel 316L
- ¼ NPT female (standard)
- ½ NPT, G ½ A, G ¼ A male via adapter
- ½ NPT, G ¼ female via adapter
- M20 x 1.5 male via adapter

Electrical connection
- Connection cable
  Length: 1.5 m
  Wire cross-section: 0.5 mm² (20 AWG)
  Insulation material: Silicone

Threaded connection (B)
Material: AISI 316
- ¼ NPT male (standard)
- M20 x 1.5 male (adapter)
- M20 x 1.5 female (adapter)
- ½ NPT female (adapter)
- ¾ NPT female (adapter)
- Terminal box

Dielectric strength
Safety class I (IEC 61298-2: 2008)

Mounting option
- Direct
- Wall bracket from stainless steel
  Option: Mounting bracket for 2” pipe mounting

Weight
- 0.6 kg (standard)
- 1.1 kg, with terminal box

Ignition protection type (option)
- Ex ia I Ma (mines)
- Ex ia IIIC T85/T135 ¹) Da IP66 (dust)

¹) The temperature class is related to the ambient temperature range. See the type examination certificate for further details.

Safety-related maximum values (only for Ex ia versions)

<table>
<thead>
<tr>
<th>Maximum values</th>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage $U_i$</td>
<td>DC 30 V</td>
<td></td>
</tr>
<tr>
<td>Current $I_i$</td>
<td>100 mA</td>
<td></td>
</tr>
<tr>
<td>Power $P_i$</td>
<td>0.75 W</td>
<td></td>
</tr>
<tr>
<td>Internal capacitance $C_i$</td>
<td>0 µF</td>
<td></td>
</tr>
<tr>
<td>Internal inductance $L_i$</td>
<td>0 mH</td>
<td></td>
</tr>
</tbody>
</table>
Sensor element

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>Wetted parts</th>
<th>Permissible medium temperature 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M Welded diaphragm with antagonist spring</td>
<td>Hastelloy® C276</td>
<td>-40 ... +200 °C</td>
</tr>
<tr>
<td>G Piston with antagonist spring and welded diaphragm</td>
<td>Hastelloy® C276</td>
<td>-40 ... +140 °C</td>
</tr>
<tr>
<td>P Piston with antagonist spring 2)</td>
<td>Stainless steel 316L, O-ring FPM 1)</td>
<td>0 ... 200 °C</td>
</tr>
</tbody>
</table>

1) Permissible medium temperature range in the main process line. Depending on the measuring arrangement, this may differ from the permissible temperature at the process connection. See operating instructions for details.

2) Particularly suited for liquid media.

Setting range

<table>
<thead>
<tr>
<th>Setting range</th>
<th>Sensor element</th>
<th>Setting range depending on the switching direction in bar</th>
<th>Working range</th>
<th>Proof pressure</th>
<th>Max. dead band</th>
</tr>
</thead>
<tbody>
<tr>
<td>in bar</td>
<td>rising</td>
<td>falling</td>
<td>in bar</td>
<td>in bar</td>
<td>Start of setting range 3) in bar</td>
</tr>
<tr>
<td>1 ... 2.5 4)</td>
<td>M</td>
<td>1.3 ... 2.5</td>
<td>0 ... 10</td>
<td>16</td>
<td>0.3</td>
</tr>
<tr>
<td>1.6 ... 6</td>
<td>M</td>
<td>2.1 ... 6</td>
<td>0 ... 10</td>
<td>16</td>
<td>0.5</td>
</tr>
<tr>
<td>3 ... 10</td>
<td>M</td>
<td>4.5 ... 10</td>
<td>0 ... 10</td>
<td>16</td>
<td>1.5</td>
</tr>
<tr>
<td>6 ... 25 4)</td>
<td>M</td>
<td>8 ... 25</td>
<td>0 ... 25</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>14 ... 60</td>
<td>P, G</td>
<td>23 ... 60</td>
<td>0 ... 500</td>
<td>750</td>
<td>9</td>
</tr>
<tr>
<td>25 ... 100</td>
<td>P, G</td>
<td>40 ... 100</td>
<td>0 ... 500</td>
<td>750</td>
<td>15</td>
</tr>
<tr>
<td>50 ... 160</td>
<td>P, G</td>
<td>65 ... 160</td>
<td>0 ... 500</td>
<td>750</td>
<td>15</td>
</tr>
<tr>
<td>70 ... 400</td>
<td>P, G</td>
<td>95 ... 400</td>
<td>0 ... 500</td>
<td>750</td>
<td>25</td>
</tr>
<tr>
<td>150 ... 700 5)</td>
<td>P</td>
<td>230 ... 700</td>
<td>0 ... 1,000</td>
<td>1,500</td>
<td>80</td>
</tr>
<tr>
<td>200 ... 1,000</td>
<td>P</td>
<td>300 ... 1,000</td>
<td>0 ... 1,000</td>
<td>1,500</td>
<td>100</td>
</tr>
</tbody>
</table>

3) The dead band depends on the set point adjustment. The indicated values are valid for start and end of the setting range. The dead band of other set points is proportional.

4) With DPDT contact the simultaneous triggering occurs within 1% of the end of setting range

5) Setting range is recommended for hydraulic systems

Options

- Cleaned for oxygen service
- Drying of wetted parts
- Sensor element piston with O-ring NBR (permissible medium temperature: -10 ... +110 °C)
- Sensor element piston with O-ring EPDM (permissible medium temperature: -40 ... +110 °C)
- NACE compliant to MR 0175, ISO 15156 and MR 0103
- Terminal box, aluminium alloy, copper-free epoxy resin, coated with 3 connections ½ NPT female, ingress protection IP65
- Grounding cable cross-section: max. 4 mm²
- Other cable length: 3 m, 5 m
- Offshore version

Assembly (Option)

- Shut-off valve model 910.11, see data sheet AC 09.02
- Needle valve and multiport valve models IV10, IV11, see data sheet AC 09.22
- Block-and-bleed valve models IV20, IV21, see data sheet AC 09.19
- Diaphragm seals, see website
## Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
</thead>
</table>
| ![CE logo] | EU declaration of conformity  
- Pressure equipment directive  
- Low voltage directive  
- ATEX 1) directive (option)  
  I M 1  
  II 1 GD | European Community |
| ![IECEx logo] | IECEx 1) (option)  
  Ex ia I Ma  
  Ex ia IIIC T6/T4 2) Ga  
  Ex ia IIIC T85/T135 2) Da IP66 | International |
| ![EAC logo] | EAC (option)  
Hazardous areas | Eurasian Economic Community |
| ![KOSHA logo] | KOSHA (option)  
Hazardous areas | South Korea |

1) Double marking ATEX and IECEx on the same product label.  
2) The temperature class is related to the ambient temperature range.

## Certificates (option)

- 2.2 test report per EN 10204  
- 3.1 inspection certificate per EN 10204

Approvals and certificates, see website
Dimensions in mm

Standard version

Legend

1 Access cover plate
2 Lead seal
3 Stainless steel wire
4 Adjustment screw

■ Set point adjustment rod Ø 3 mm

Option: Terminal box

Option: Wall bracket

Ordering information

Model / Sensor element / Contact version / Setting range / Process connection / Electrical connection / Options

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