

# Miniature pressure switch, stainless steel

## For the process industry

### Model PXS

WIKA data sheet PV 34.36



for further approvals see  
page 5

### Process Mini Series

#### 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 environments
- For measuring locations with limited space, e.g. control panels

#### Special features

- Compact and slimline design
- Robust switch enclosure from stainless steel 316, IP66, NEMA 4X
- Wide selection of setting ranges available, 1 ... 2.5 bar to 200 ... 1,000 bar
- Set point repeatability of  $\leq 1\%$  for reliable switching
- High switching power and large selection of contact variants and electrical connections



Miniature pressure switch model PXS

#### Description

These high-quality mechanical pressure switches have been developed especially for safety-critical applications. The great advantage of mechanical pressure switches is that no supply voltage is required for the switching process.

In production, the switches are traced by quality assurance software at every step and subsequently are 100 % tested. Due to its compactness, the model PXS pressure switch can be installed in measurement environments with limited space. The robust switch enclosure from stainless steel 316 can withstand the rough and corrosive operating conditions of the process industry with working ranges of up to 1,000 bar.

The pressure switch is fitted with micro switches, which make it possible to switch an electrical load of up to AC 250 V, 5 A directly within a repeatability of 1 % of the set point.

Depending on the application, the appropriate variant for the contact version and the electrical connection can be selected; e.g., hermetically sealed micro switches are suitable for corrosive ambient conditions and DPDT contact versions for two separate circuits.

A Belleville spring provides for the simultaneous triggering of the DPDT contact and, through the snap-action behaviour, increases the stability and vibration resistance.

For safety applications, the pressure switch is optionally available in a SIL-2 qualified or a SIL-3 qualified version.

## Specifications

Model PXS													
<b>Version</b>	Miniature pressure switch Option: <ul style="list-style-type: none"> <li>■ Version for hazardous areas (Ex ia)</li> <li>■ Oxygen version (cleaned for oxygen service)</li> <li>■ NACE compliant per MR 0175, ISO 15156 and MR 0103</li> <li>■ Drying of wetted parts</li> <li>■ Offshore version</li> <li>■ Tropical version (suitable for environments with increased air humidity)</li> <li>■ Version for ammonia applications</li> <li>■ Geothermal version</li> </ul>												
<b>Set point repeatability</b>	≤ 1 % of end of setting range												
<b>Setting range/working range</b>	See table on next page												
<b>Ignition protection type (option)</b>	<ul style="list-style-type: none"> <li>■ Ex ia I Ma (mines)</li> <li>■ Ex ia IIC T6/T4 <sup>1)</sup> Ga (gas)</li> <li>■ Ex ia IIIC T85/T135 <sup>1)</sup> Da IP66 (dust)</li> </ul>												
<b>Safety-related maximum values (only for Ex ia version)</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Voltage U<sub>i</sub></td> <td style="width: 33%;">DC 30 V</td> <td style="width: 33%;">Internal capacitance C<sub>i</sub></td> <td style="width: 33%;">0 μF</td> </tr> <tr> <td>Current I<sub>i</sub></td> <td>100 mA</td> <td>Internal inductance L<sub>i</sub></td> <td>0 mH</td> </tr> <tr> <td>Power P<sub>i</sub></td> <td>0.75 W</td> <td></td> <td></td> </tr> </table>	Voltage U <sub>i</sub>	DC 30 V	Internal capacitance C <sub>i</sub>	0 μF	Current I <sub>i</sub>	100 mA	Internal inductance L <sub>i</sub>	0 mH	Power P <sub>i</sub>	0.75 W		
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Power P <sub>i</sub>	0.75 W												
<b>Contact version</b>	Micro switch, hermetically sealed, with fixed dead band <ul style="list-style-type: none"> <li>■ 1 x SPDT (single pole double throw)</li> <li>■ 1 x DPDT (double pole double throw)</li> </ul> The DPDT function is realised with 2 simultaneously triggering SPDT micro switches. See table on next page for available contact versions.												
<b>Electrical connection</b>	<ul style="list-style-type: none"> <li>■ Threaded connection with connection cable                Material of threaded connection: Stainless steel 316                Threaded connections:               <ul style="list-style-type: none"> <li>- ½ NPT male</li> <li>- M20 x 1.5 male via adapter</li> <li>- ½ NPT female, ¾ NPT via adapter</li> </ul>               Connection cable:               <ul style="list-style-type: none"> <li>- Length: 1.5 m, 3 m, 5 m (other lengths on request)</li> <li>- Cable sheath material: Silicone</li> <li>- Wire cross-section: 0.5 mm<sup>2</sup> (20 AWG)</li> </ul> </li> <li>■ Terminal box               <ul style="list-style-type: none"> <li>- Aluminium alloy, copper-free, epoxy resin coated</li> <li>- 3 x ½ NPT female</li> <li>- Ingress protection IP65</li> </ul> </li> </ul>												
<b>Dielectric strength</b>	Safety class I (IEC 61298-2: 2008)												
<b>Process connection</b>	<ul style="list-style-type: none"> <li>■ ¼ NPT female (standard)</li> <li>■ ½ NPT, G ½ A, G ¼ A male via adapter</li> <li>■ ½ NPT, G ¼ female via adapter</li> <li>■ M20 x 1.5 male via adapter</li> </ul> Further threaded connections and open connecting flanges on request												
<b>Permissible temperature</b>													
Medium	Depending on sensor element and sealing, see tables on next page												
Ambient	-40 ... +85 °C for non-Ex versions. For version Ex ia, see operating instructions.												
<b>Switch enclosure</b>	Tamper-proof due to access cover plate with lead seal option Laser-engraved product label from stainless steel												

1) The temperature class is related to the ambient temperature range. See operating instructions for further details.

Model PXS	
<b>Wetted materials</b>	
Process connection	Stainless steel 316L
Sensor element	See table below
<b>Non-wetted materials</b>	
Case	Stainless steel 316
<b>Ingress protection per IEC/EN 60529</b>	IP66 (NEMA 4X)
<b>Weight</b>	<ul style="list-style-type: none"> <li>■ 0.6 kg, with cable outlet and 1.5 m connection cable</li> <li>■ 1.1 kg, with terminal box</li> </ul>

Contact version		Electrical rating (resistive load)	
		AC	DC
E	1 x SPDT, silver, hermetically sealed	250 V, 5 A	24 V, 5 A
J	1 x SPDT, gold-plated, hermetically sealed	250 V, 0.5 A	24 V, 1 A
L	1 x DPDT, silver, hermetically sealed	250 V, 5 A	24 V, 5 A
M	1 x DPDT, gold-plated, hermetically sealed	250 V, 0.5 A	24 V, 1 A

Sensor element		Wetted parts		Permissible medium temperature <sup>1)</sup>
		Sensor element	Sealing	
M	1 = Welded diaphragm element with antagonist spring	Hastelloy C276	-	-40 ... +200 °C
	2 = Diaphragm element with antagonist spring and O-ring	Hastelloy C276	O-ring: FPM	-30 ... +200 °C
G	Piston with antagonist spring and welded diaphragm element	Hastelloy C276	-	-40 ... +140 °C
P	Piston with antagonist spring <sup>2)</sup>	Stainless steel 316L	■ O-ring: FPM	0 ... 200 °C
			■ O-ring: NBR	-10 ... +110 °C
			■ O-ring: EPDM	-40 ... +110 °C

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. For further information, see operating instructions.

2) Particularly suited for liquid media.

Setting range of set point	Sensor element	Setting range depending on the switching direction in bar		Working range	Proof pressure	Max. dead band	
		rising	falling			Start of setting range <sup>1)</sup>	End of setting range <sup>1)</sup>
in bar				in bar	in bar	in bar	in bar
-1 ... 1.5	M <sup>2)</sup>	-0.7 ... 1.5	-0.9 ... 1.2	-1 ... 10	40	0.3	0.3
1 ... 2.5 <sup>3)</sup>	M <sup>2)</sup>	1.3 ... 2.5	1 ... 2.2	0 ... 10	16	0.3	0.3
1.6 ... 6	M <sup>2)</sup>	2.1 ... 6	1.6 ... 5.8	0 ... 10	16	0.5	0.2
2 ... 6	M <sup>4)</sup>	2.5 ... 6	2 ... 5.8	0 ... 207	315	0.5	0.2
3 ... 10	M <sup>4)</sup>	4.5 ... 10	3 ... 9.2	0 ... 207	315	1.5	0.8
3 ... 10	M <sup>2)</sup>	4.5 ... 10	3 ... 9.2	0 ... 10	16	1.5	0.8
6 ... 25 <sup>3)</sup>	M <sup>2)</sup>	8 ... 25	6 ... 24.2	0 ... 25	40	2	0.8
6 ... 25	M <sup>4)</sup>	8 ... 25	6 ... 24.2	0 ... 207	315	2	0.8
14 ... 60	P, G	23 ... 60	14 ... 49	0 ... 500	750	9	11
25 ... 100	P, G	40 ... 100	25 ... 82	0 ... 500	750	15	18
50 ... 160	P, G	65 ... 160	50 ... 142	0 ... 500	750	15	18
70 ... 400	P, G	95 ... 400	70 ... 365	0 ... 500	750	25	35
150 ... 700 <sup>5)</sup>	P	230 ... 700	150 ... 600	0 ... 1,000	1,500	80	100
200 ... 1,000 <sup>5)</sup>	P	300 ... 1,000	200 ... 850	0 ... 1,000	1,500	100	150

1) 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.

2) Sensor element "M" with welded diaphragm element (1)

3) With DPDT contact, simultaneous actuation occurs within 1 % of the end of the setting range

4) Sensor element "M" with O-ring; FPM (2)

5) Setting range is recommended for hydraulic systems

## Set point adjustment

The set point can be specified by the customer or factory-set within the setting range.

The switch point and the switching direction need to be specified (e.g. switch point: 2 bar, rising).

For optimal performance we suggest to adjust the set point between 25 ... 75 % of the setting range. In the following example, the maximum possible setting range is shown to be dependent upon the switching direction.

### Example

Setting range: 1 ... 2.5 bar with one switch contact

Dead band: 0.3 bar (see table "setting ranges")

Rising pressure: Set point can be adjusted between 1.3 ... 2.5 bar

Falling pressure: Set point can be adjusted between 1 ... 2.2 bar

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. See operating instructions for further details.

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ Pressure equipment directive</li> <li>■ Low voltage directive</li> <li>■ RoHS directive</li> <li>■ ATEX directive <sup>1)</sup></li> </ul> I M 1 II 1 GD	European Union
	<b>IECEX <sup>1)</sup></b> Ex ia I Ma Ex ia IIC T6/T4 <sup>2)</sup> Ga Ex ia IIIC T85/T135 <sup>2)</sup> Da IP66	International
	<b>EAC (option)</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ Low voltage directive</li> <li>■ Hazardous areas</li> </ul>	Eurasian Economic Community
	<b>KOSHA (option)</b> 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.

## Manufacturer's information and certificates (option)

Logo	Description
	<b>SIL 2 or SIL 3</b> Functional safety

## Certificates (option)

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

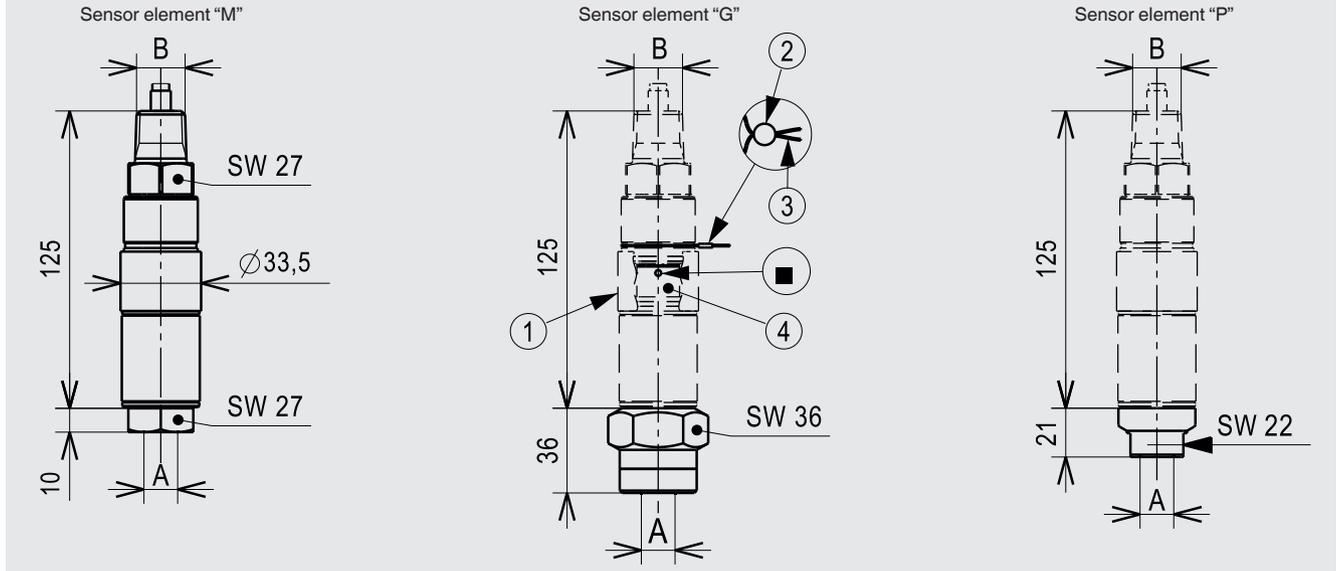
Approvals and certificates, see website

## Accessories

- Wall bracket from stainless steel
- Mounting bracket for 2" pipe mounting
- 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

# Dimensions in mm

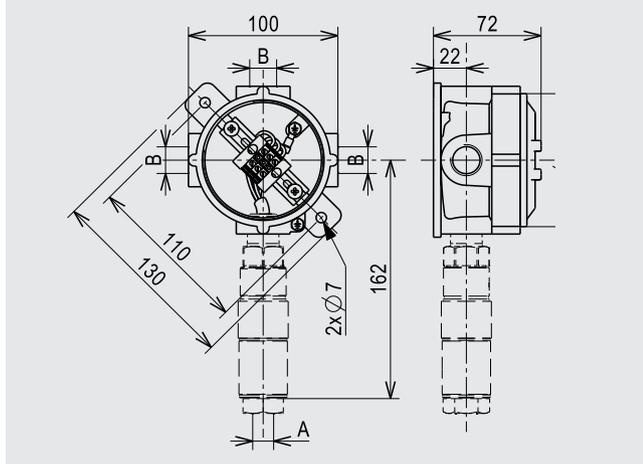
## Standard version



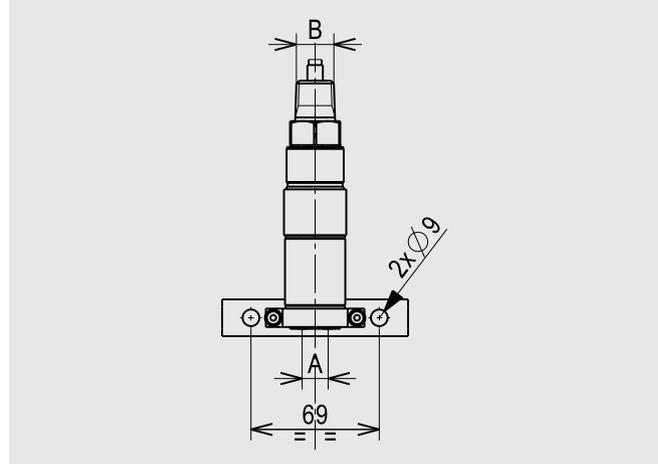
## Legend

- ① Access cover plate
- ② Lead seal
- ③ Stainless steel wire
- ④ Adjustment screw
- Bore  $\varnothing$  3 mm (for adjustment)
- A Process connection
- B Electrical connection

## Option: Terminal box



## Option: Wall bracket



## Ordering information

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

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