

Compact pressure switch, flameproof enclosure Ex d For the process industry Model PCA

WIKA data sheet PV 33.31



for further approvals
see page 4

Process Compact 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, 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 aluminium alloy or stainless steel with identical dimensions, IP66, NEMA 4X
- Setting ranges from 0.2 ... 1.2 to 200 ... 1,000 bar, vacuum ranges
- Repeatability of the set point $\leq 1\%$ of span
- 1 set point, SPDT or DPDT, high switching power up to AC 250 V, 15 A



Model PCA, compact pressure switch

Description

The pressure switches have been developed especially for safety-critical applications with limited space. 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. All wetted parts are from stainless steel as a standard. The switch enclosure is available in aluminium alloy or stainless steel. To adjust the set point simply open the access cover plate. This access can be sealed as an option. The access to the terminal block for the electrical connection is protected by a screw-on lid, which is secured with a screw-type lock against unauthorised intervention.

The pressure switches are fitted with one micro switch, which enables the switching of an electrical load of up to AC 250 V, 15 A directly. 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. For two separate circuits the switches are also available in the version DPDT (double pole double throw).

By using a diaphragm with antagonist spring as sensor element, the model PCA pressure switch is extremely robust and guarantees optimal operating characteristics. For medium and high setting ranges starting at 3 ... 25 bar, a piston replaces or completes the diaphragm as a sensor element. The piston sensor element is designed for the specific requirements of liquid media.

Standard version

Switch enclosure

- Aluminium alloy, copper-free, painted with polyurethane
- Stainless steel 316L

Tamper-proof.

Laser-engraved product label from stainless steel.

Ingress protection

IP66 per IEC/EN 60529, NEMA 4X

Permissible temperature

Ambient T_{amb} : See the type examination certificate

Medium T_M : See table on next page.

Depending on sensor element.

Switch contact

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 2 simultaneously triggering SPDT micro switches within 2 % of the span.

Contact version		Electrical rating (resistive load)	
		AC	DC
A	1 x SPDT, silver	250 V, 15 A	24 V, 2 A, 125 V, 0.5 A, 220 V, 0.25 A
B	1 x SPDT, silver, hermetically sealed, argon gas filling ¹⁾	250 V, 15 A	24 V, 2 A, 220 V, 0.5 A
C	1 x SPDT, gold-plated, hermetically sealed, argon gas filling ¹⁾	125 V, 1 A	24 V, 0.5 A
G	1 x DPDT, silver	250 V, 5 A	24 V, 0.5 A
H	1 x DPDT, silver, hermetically sealed, air filling	250 V, 5 A	24 V, 0.5 A

1) Permissible ambient temperature range: -30 ... +70 °C

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 bushing, which is covered by the access cover plate with lead seal option.

Repeatability of the set point

≤ 1 % of span

Please specify:

Set point, switching direction for the contact, e.g. :

Set point: 5 bar, increasing

After unscrewing the access cover plate, set point adjustment can be made using the adjustment bushing. 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: 1.6 ... 10 bar with one switch contact

Repeatability: 1 % of 10 bar = 100 mbar

Dead band = 200 mbar (see table setting ranges)

Rising pressure: Adjust set point between 2.0 ... 10 bar.

Falling pressure: Adjust set point between 1.6 ... 9.6 bar.

Ignition protection type

- Ex db I Mb (mines), only available with stainless steel switch enclosure
- Ex db IIC T6/T4 ¹⁾ Ga/Gb (gas)
- Ex tb IIIC T85/T135 ¹⁾ Db IP66 (dust)

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

Process connection

Stainless steel 316L, lower mount (LM)

- 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

- ½ NPT female (standard)
- ¾ NPT female
- M20 x 1.5 female
- Cable gland non-armoured Ex d, nickel-plated brass
- Cable gland non-armoured Ex d, AISI 304
- Cable gland armoured Ex d, nickel-plated brass
- Cable gland armoured Ex d, AISI 304

For cable connections to the internal terminal block use wire cross-sections between 0.5 ... 1.5 mm².

For the grounding cable connection to the protective conductor screws use max. 2.5 mm² for the internal screw and max. 4 mm² for the external screw.

Dielectric strength

Safety class I (IEC 61298-2: 2008)

Sensor element

Sensor element		Wetted parts	Permissible medium temperature ¹⁾
V	Diaphragm with antagonist spring	NBR	-30 ... +110 °C
T	Diaphragm with antagonist spring	PTFE	-30 ... +110 °C
M	Diaphragm with antagonist spring	Inconel®, O-ring FPM	-30 ... +200 °C
P	Piston with antagonist spring ²⁾	Stainless steel 316, O-ring FPM	0 ... 200 °C
G	Piston with antagonist spring and welded diaphragm	Hastelloy® C276	-40 ... +140 °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. See operating instructions for details.

2) Particularly suited for liquid media.

Setting range

Setting range in bar	Sensor element	Working range	Proof pressure	Dead band for contact version		
		in bar	in bar	A, B, C in bar	G in bar	H in bar
-1 ... -0.2	V	-1 ... 6	10	0.03	0.06	0.12
0.1 ... 2.5	M	-1 ... 30	40	0.05	0.1	0.4
0.2 ... 1.2	T	0 ... 6	10	0.03	0.06	0.12
0.5 ... 2.5	M	-1 ... 10	40	0.05	0.1	0.4
0.8 ... 6	M	-1 ... 10	40	0.06	0.2	0.8
1.6 ... 10	M	-1 ... 25	40	0.2	0.4	1.6
3 ... 25	P, G	0 ... 250	400	2	4	16
3.5 ... 70	P, G	0 ... 140	500	7	7	21
4 ... 25	M	-1 ... 25	60	0.25	0.75	3
8 ... 40	P, G	0 ... 100	400	2	4	16
10 ... 40	M	-1 ... 60	100	1	2	8
16 ... 100	P, G	0 ... 250	400	5	5	20
20 ... 100	M	0 ... 100	150	7	9	20
20 ... 220	P, G	0 ... 350	500	8	15	24
40 ... 250	P, G	0 ... 400	600	12	20	80
60 ... 250	P, G	0 ... 400	600	5 ... 12 to 12 ... 20 ³⁾	-	-
80 ... 400	P, G	0 ... 600	600	20	20	80
100 ... 600	P, G	0 ... 600	700	30	30	120
100 ... 700	P	0 ... 700	1,050	30 ... 100 ³⁾		
200 ... 1,000	P	0 ... 1,000	1,500	40 ... 110 ³⁾		

3) The dead band depends on the set point adjustment. The indicated ranges are valid for start and end of the setting range. Other setting ranges are proportional.

Mounting

Direct or wall mounting

Option: Mounting bracket for 2" pipe mounting

For mounting positions see drawing on page 5.

Weight

■ 0.8 kg, switch enclosure aluminium alloy

■ 1.5 kg, switch enclosure stainless steel

Options

- Cleaned for oxygen service
- Drying of wetted parts
- Sensor element piston with O-ring NBR (permissible medium temperature: -10 ... +110 °C)
- Permissible ambient temperature to -60 °C ⁴⁾
- Offshore version with increased corrosion protection ⁵⁾
- NACE compliant to MR 0175, ISO 15156 and MR 0103 ⁵⁾
- Version compliant to EN 1854, pressure sensing devices for gas burners and gas burning appliances






4) Only available for silver contacts without hermetic sealing and with sensor element "M" (see table on next page)

5) WIKA recommends argon gas-filled contact versions

Assembly (Option)

- Shut-off valve model 910.11, see data sheet AC 09.02
- Barstock valve model 910.81, see data sheet AC 09.18
- Diaphragm seals, see website


Approvals

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none"> ■ Pressure equipment directive PED, annex 1, category IV, safety accessories, module B + D ■ Low voltage directive ■ RoHS directive ■ ATEX ¹⁾ <ul style="list-style-type: none"> I M2 (only available with stainless steel 316L switch enclosure) II 1/2 GD II 2 GD (only with sensor element "P") 	European Union
	IECEX ¹⁾ Hazardous areas <ul style="list-style-type: none"> Ex db I Mb (only available with stainless steel 316L switch enclosure) Ex db IIC T6/T4 ²⁾ Ga/Gb (gas), Ex tb IIIC T85/T135 ²⁾ Db IP66 (dust) Ex db IIC T6/T4 ²⁾ Gb, Ex tb IIIC T85/T135 ²⁾ Db (only with sensor element "P") 	International
	EAC (option) Hazardous areas	Eurasian Economic Community
	INMETRO (option) Hazardous areas	Brazil
	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. See the type examination certification for further details.

Manufacturer's information and certifications

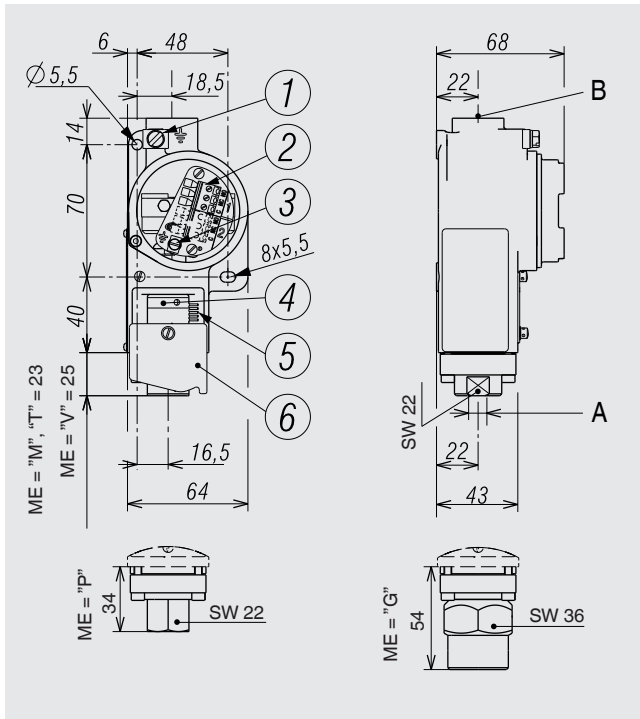
Logo	Description
	SIL 2 rating (option) Functional safety per IEC 61508 The electrical rating for DC applications is limited to 30 V / 100 mA

Certificates (option)

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

Approvals and certificates, see website

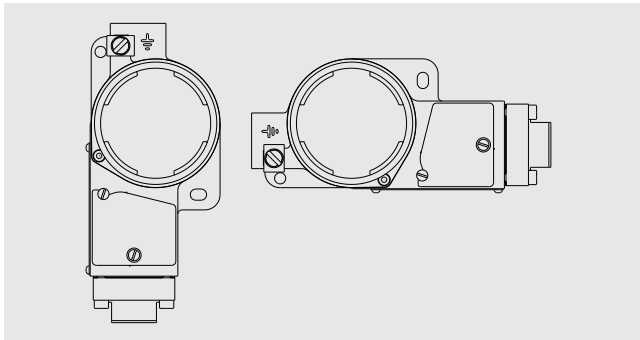
Dimensions in mm



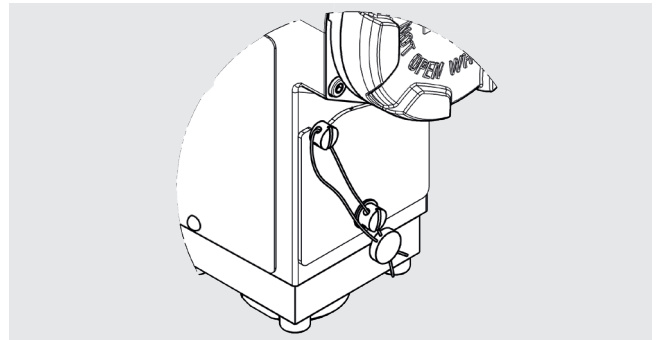
Legend

- | | | |
|-------------------------|--|-------------------------|
| ① Ground screw, outside | ④ Adjustment bushing | A Process connection |
| ② Terminal block | ⑤ Calibration scale | B Electrical connection |
| ③ Ground screw, inside | ⑥ Access cover plate | |
| SW Spanner width | ME Sensor element, see table on page 3 | |

Permissible mounting positions



Lead seal attached



Ordering information

Model / Unit / Setting range of set point / Contact version / Process connection / Electrical connection / Wetted parts / Options

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