

Compact pressure switch Flameproof enclosure Ex d Model PCA

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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, IP 66, 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

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.



**Fig. left: Switch enclosure aluminium alloy
Fig. right: Switch enclosure stainless steel**



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 measuring 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 measuring element. The piston measuring element is designed for the specific requirements of liquid media.

Standard version

Switch enclosure

- Aluminium alloy, copper-free, epoxy resin coated
- Stainless steel 316L

Tamper-proof.

Laser-engraved product label from stainless steel.

Ingress protection

IP 66 per EN 60529 / IEC 60529, NEMA 4X

Permissible temperature

Ambient T_{amb} : -40 ... +85 °C

Medium T_M : See table on next page.
Depending on measuring 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, argon gas filling ¹⁾	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 d I Mb (mines), only available with stainless steel switch enclosure
- Ex d IIC T6/T4 ¹⁾ Ga/Gb (gas)
- Ex ta/tb IIIC T85/T135 ¹⁾ Da/Db (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)

Measuring element

Measuring element		Wetted parts	Permissible medium temperature
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 ¹⁾	Stainless steel 316, O-ring FPM	0 ... 200 °C
G	Piston with antagonist spring and welded diaphragm	Hastelloy® C276	-40 ... +140 °C

1) Particularly suited for liquid media.

Setting range

Setting range	Measuring element	Working range	Proof pressure	Dead band for contact version		
in bar		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	1.06
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 ²⁾	-	-
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 ²⁾		
200 ... 1,000	P	0 ... 1,000	1,500	40 ... 110 ²⁾		

2) 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

Weight

■ 1.0 kg, switch enclosure aluminium alloy

■ 1.5 kg, switch enclosure stainless steel

For mounting positions see drawing on page 5.

Options

- Cleaned for oxygen service
- Drying of wetted parts
- Measuring element piston with O-ring NBR (permissible medium temperature: -10 ... +110 °C)
- Permissible ambient temperature to -60 °C ³⁾
- Offshore version with increased corrosion protection ⁴⁾
- NACE compliant to MR 0175, ISO 15156 and MR 0103 ⁴⁾






3) only available for silver contacts without hermetic sealing and with measuring element "M" (see table on next page)

4) 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
	EC declaration of conformity <ul style="list-style-type: none"> ■ Pressure equipment directive 97/23/EC PED, annex 1, category IV, safety accessories, module B + D ■ Low voltage directive 2006/95/EC, EN 60730-1 ■ ATEX ¹⁾ directive 94/9/EC; annex III, IV I M 2 (only available with stainless steel 316L switch enclosure) II 1/2 GD II 2 GD (only with measuring element "P") 	European Community
	IECEx ¹⁾ per IEC 60079-0, IEC 60079-1, IEC 60079-26, IEC 60079-31 Ex d I Mb (only available with stainless steel 316L switch enclosure) Ex d IIC T6/T4 ²⁾ Ga/Gb (gas), Ex ta/tb IIIC T85/T135 ²⁾ Da/Db (dust) Ex d IIC T6/T4 ²⁾ Gb, Ex tb IIIC T85/T135 ²⁾ Db (only with measuring element "P")	IECEx member states
	EAC (option) Hazardous areas (option)	Eurasian Economic Community
	INMETRO (option) Hazardous areas (option)	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) , per IEC 61508 Functional safety 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

Stainless steel

ME = "M", "m" = 23

ME = "m" = 25

ME = "M"

ME = "G"

SW 22

SW 36

①	Ground screw, outside	④	Adjustment bushing	⑦	Set point adjustment rod
②	Terminal block	⑤	Calibration scale	A	Process connection
③	Ground screw, inside	⑥	Access cover plate	B	Electrical connection
SW	Spanner width		ME	Measuring Element, see table on page 3	

Aluminium alloy

Stainless steel

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

WIKA data sheet PV 33.31 · 11/2015

Page 5 of 5