

Differential pressure switch Flameproof enclosure Ex d Models DA, DA10

WIKA data sheet PV 35.43



Applications

- Differential 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, liquid and aggressive media, also in aggressive ambience
- Filter and level monitoring

Special features

- No power supply needed for switching of electrical loads
- Robust switch enclosure from aluminium alloy, IP66, NEMA 4X
- Setting ranges from 0 ... 16 mbar to 0 ... 40 bar with high static and high one-sided pressure up to 160 bar
- Repeatability: $\leq 1\%$ of span
- 1 or 2 independent set points, SPDT or DPDT, high switching power up to AC 250 V, 20 A

Description

These high-quality differential 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 differential pressure switches are fitted with micro switches, which enable the switching of an electrical load of up to AC 250 V, 20 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.



Fig. left: Differential pressure switch for medium/high setting ranges, model DA



Fig. right: Differential pressure switch for low setting ranges, model DA10

All wetted materials are from stainless steel as a standard. For applications with special requirements on the wetted parts, a version with MoneI® is available.

By using a diaphragm measuring system, the model DA differential pressure switch is extremely robust and guarantees optimal operating characteristics and the highest measuring performances, with repeatability lower than 1 % of span.

The process connection with a centre distance of 54 mm lower mount allows an easy and comfortable mounting of a standard valve manifold.

Standard version

Model DA

Double diaphragm with transmission shaft, without sealing elements

Model DA10

Single diaphragm with transmission shaft without sealing elements

For clean gas or non-condensing vapour only.

Switch enclosure

Aluminium alloy, copper-free, epoxy resin coated, tamper-proof. Laser-engraved product label from stainless steel

Ingress protection

IP66 per EN/IEC 60529, NEMA 4X

Permissible temperature

Ambient T_{amb} : -30 ... +85 °C

Medium T_M : -30 ... +85 °C

Switch contact

Micro switches with fixed dead band

■ 1 x or 2 x SPDT (single pole double throw)

■ 1 x DPDT (double pole double throw)

Micro switches with adjustable dead band

■ 1 x SPDT (single pole double throw)

The DPDT function is realised with 2 simultaneously triggering SPDT micro switches within 0.5 % of the span.

Contact version		Electrical rating (resistive load)	
		AC	DC
UN	1 x SPDT, silver	250 V, 15 A	24 V, 2 A, 125 V, 0.5 A, 220 V, 0.25 A
US	1 x SPDT, silver, hermetically sealed, argon gas filling ²⁾	250 V, 15 A	24 V, 2 A, 220 V, 0.5 A
UO	1 x SPDT, gold-plated, hermetically sealed, argon gas filling ²⁾	125 V, 1 A	24 V, 0.5 A
UG	1 x SPDT, gold-plated	125 V, 1 A	24 V, 0.5 A
UR	1 x SPDT, silver, adjustable dead band	250 V, 20 A	24 V, 2 A, 220 V, 0.5 A
DN	2 x SPDT or 1 x DPDT, silver	250 V, 15 A	24 V, 2 A, 125 V, 0.5 A, 220 V, 0.25 A
DS	2 x SPDT or 1 x DPDT, silver, hermetically sealed, argon gas filling ²⁾	250 V, 15 A	24 V, 2 A, 220 V, 0.5 A
DO	2 x SPDT, or 1 x DPDT gold-plated, hermetically sealed, argon gas filling ²⁾	125 V, 1 A	24 V, 0.5 A
DG	2 x SPDT or 1 x DPDT, gold-plated	125 V, 1 A	24 V, 0.5 A

²⁾ 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 screw, which is fastened to the switch and thus secured against loss.

Repeatability of the set point

≤ 1 % of span

Ignition protection type (option)

■ 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.

Distance between set points

For versions with 2 x SPDT the distance between the set points must be > 5 % of the respective span.

Please specify:

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

Set point 1: 3 bar, falling, set point 2: 6 bar, rising.

With two micro switches, the set points can be set independently of each other.

For optimal performance we suggest to adjust the set point between 25 ... 75 % of the span.

Example

Setting range: 0 ... 10 bar with one switch contact
 Repeatability: 1 % of 10 bar = 0.1 bar
 Dead band: (see table setting ranges)
 $2 \times \text{repeatability} + \text{dead band} = 2 \times 0.1 \text{ bar} + 0.3 \text{ bar} = 0.5 \text{ bar}$
 Rising pressure: Adjust set point between 0.5 ... 10 bar.
 Falling pressure: Adjust set point between 0 ... 9.5 bar.

Process connection

Stainless steel, lower mount (LM)
 ■ 1/4 NPT female (standard)
 ■ 1/2 NPT, G 1/2 A, G 1/4 A male via adapter
 ■ 1/2 NPT, G 1/4 female via adapter
 ■ M20 x 1.5 male via adapter

Electrical connection

- 1/2 NPT female (standard)
- 3/4 NPT, M20 x 1.5, G 1/2, G 3/4 female
- Cable gland non-armoured, Ex d, nickel-plated brass
- Cable gland non-armoured, Ex d, stainless steel (AISI 304)
- Cable gland armoured, Ex d, nickel-plated brass
- Cable gland armoured, Ex d, stainless steel (AISI 304)

For cable connections to the internal terminal block use wire cross-sections between 0.5 ... 2.5 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)

Wetted parts

Setting range	Stainless steel version		NACE ¹⁾ version (option)		Monel version (option)			
	Diaphragm	Process Connection	Diaphragm	Process Connection	Diaphragm	Process Connection		
16 mbar	AISI 316	AISI 316L	-	-	-			
25 mbar								
40 mbar								
60 mbar								
160 mbar			Monel® 400	AISI 316L	Monel® 400			
250 mbar								
400 mbar								
600 mbar								
1 bar								
2.5 bar								
4 bar	AISI 304	AISI 316L	-					
6 bar								
10 bar								
16 bar								
25 bar	Inconel® 718					Inconel® 718	-	
40 bar								

1) NACE compliant to MR 0175, ISO 15156 and MR 0103

Sealing material for all versions: NBR

Mounting

- Mounting fixture from stainless steel (AISI 304)
- Option: Mounting bracket for 2" pipe mounting (AISI 304)

Weight

- Model DA: approx. 7.2 kg
- Model DA10: approx. 10 kg

Setting range, model DA

Ap-cell	Setting range	Fixed dead band for contact version		Adjustable dead band for contact version	Static / One-sided pressure
	in bar	1 contact UN, US, UO, UG in mbar	2 contacts DN, DS, DO, DG in mbar	1 contact UR in mbar	in bar
L	0 ... 0.16	≤ 6	≤ 6	25 ... 60	≤ 40, ≤ 100 or ≤ 160
	0 ... 0.25	≤ 8	≤ 8	30 ... 80	
-	0 ... 0.4	≤ 20	≤ 20	45 ... 120	
	0 ... 0.6	≤ 25	≤ 25	80 ... 200	
	0 ... 1	≤ 40	≤ 40	100 ... 270	
	0 ... 2.5	≤ 70	≤ 70	260 ... 700	
	0 ... 4	≤ 120	≤ 120	450 ... 1,150	
	0 ... 6	≤ 180	≤ 180	600 ... 1,600	
	0 ... 10	≤ 300	≤ 300	1,100 ... 2,800	
	0 ... 16	≤ 480	≤ 480	1,600 ... 3,500	
	0 ... 25	≤ 700	≤ 700	2,500 ... 5,500	
V	0 ... 40	≤ 1,200	≤ 1,200	on request	

Other available setting ranges:

- -40 ... +120 mbar, -60 ... +190 mbar, -200 ... +200 mbar, -300 ... +300 mbar, -500 ... +500 mbar
- -1.25 ... +1.25 bar, -2 ... +2 bar, -3 ... +3 bar, -5 ... +5 bar, -8 ... +8 bar, -12.5 ... +12.5 bar

Setting range, model DA10 ¹⁾

Ap-cell	Setting range	Fixed dead band for contact version		Adjustable dead band for contact version	Static / One-sided pressure
	in mbar	1 contact UN, US, UO, UG in mbar	2 contacts DN, DS, DO, DG in mbar	1 contact UR in mbar	in bar
-	0 ... 16	≤ 1.2	≤ 1.6	-	≤ 10 ²⁾
	0 ... 25	≤ 1.2	≤ 1.6	4 ... 10	≤ 10
	0 ... 40	≤ 1.6	≤ 2.2	5 ... 14	
	0 ... 60	≤ 2.5	≤ 3.0	6 ... 18	

¹⁾ For clean gas or non-condensing vapour only

²⁾ One-sided pressure 2 bar

Assembly






- 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
- Differential pressure gauge

Options

- Cleaned for oxygen service
- Offshore version ³⁾
- NACE compliant to MR 0175, ISO 15156 and MR 0103 ³⁾
- Wetted parts from Monel®
- Wetted parts dried


³⁾ WIKA recommends argon gas-filled contact versions, use of adjustable dead band allowed.

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, EN 60730-1 ■ ATEX ¹⁾ directive; annex III, IV II 1/2 GD 	European Community
	IECEx ¹⁾ per IEC 60079-0, IEC 60079-11, IEC 60079-26 Ex d IIC T6/T4 ²⁾ Ga/Gb Ex ta/tb IIIC T85/T135 ²⁾ Da/Db	IECEx member states
	EAC (option) Hazardous areas (option)	Eurasian Economic Community
	KOSHA (option) Hazardous areas	South Korea
	INMETRO <ul style="list-style-type: none"> ■ Metrology, measurement technology ■ Hazardous areas 	Brazil

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

Logo	Description
	SIL 2 rating (option) , per IEC 61508 Functional safety The electrical rating for DC applications is limited to 30 V / 100 mA Only available with contact version US or UO

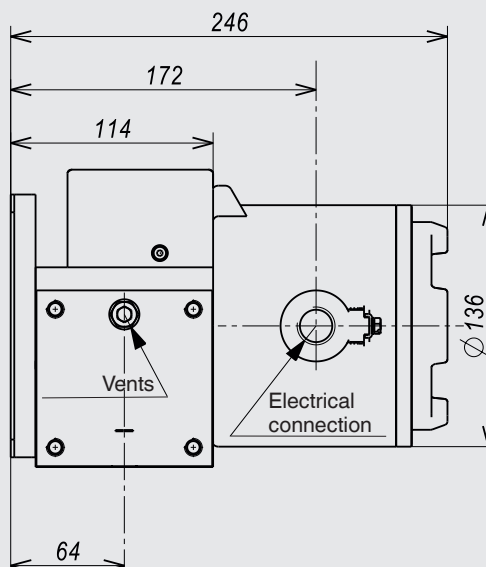
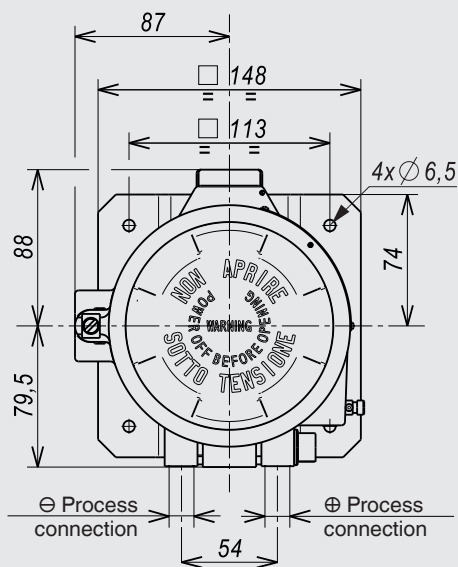
Certificates (option)

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

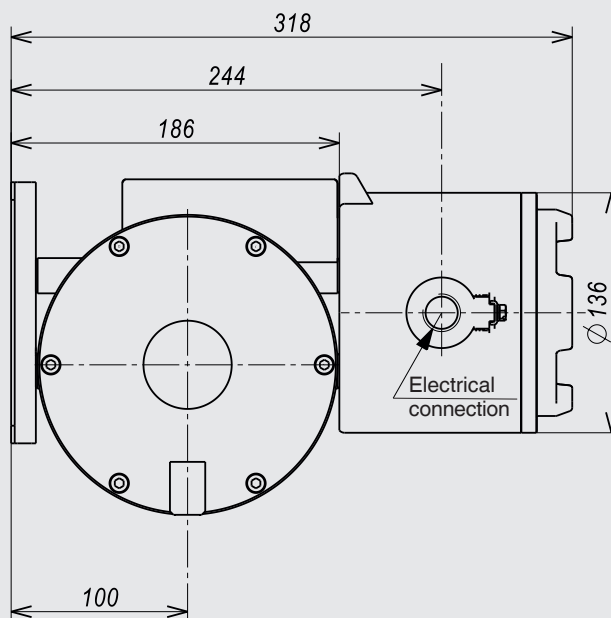
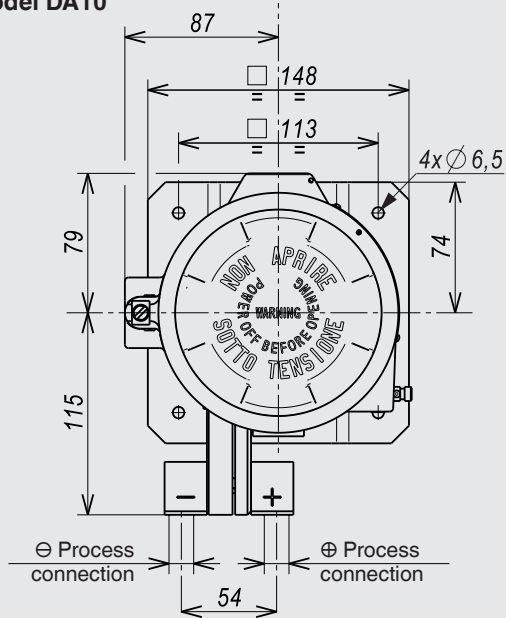
Approvals and certificates, see website

Dimensions in mm

Model DA



Model DA10



Ordering information

Model / Δp -cell / Static - One-sided pressure / Contact version / Setting range / Process connection / Electrical connection / Options

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