

# Compact differential pressure switch

## Flameproof enclosure Ex d

### Models DE, DEC

WIKA data sheet PV 35.41



## Process Compact Series

### 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 or stainless steel 316L, IP66, NEMA 4X
- Setting ranges from 0 ... 160 mbar to 0 ... 40 bar with high static and high one-sided pressure up to 250 bar
- Repeatability:  $\leq 1\%$  of span
- 1 set point, SPDT or DPDT, high switching power up to AC 250 V, 15 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, 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.



Differential pressure switch, model DE

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 DE 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

### Measuring system

Double diaphragm with transmission shaft, without sealing elements

### Switch enclosure

- Aluminium alloy, copper-free, epoxy resin coated
- Stainless steel 316L (only available for model DE)

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 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 <sup>2)</sup>	250 V, 15 A	24 V, 2 A, 220 V, 0.5 A
C	1 x SPDT, gold-plated, hermetically sealed, argon gas filling <sup>2)</sup>	125 V, 1 A	24 V, 0.5 A
G	1 x DPDT, silver	250 V, 1 A	24 V, 0.5 A

<sup>2)</sup> 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 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, rising

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

### 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 x repeatability + dead band = 2 x 0.1 bar + 0.3 bar = 0.5 bar

Rising pressure: Adjust set point between 0.5 ... 10 bar.

Falling pressure: Adjust set point between 0 ... 9.5 bar.

### Ignition protection type

- Ex d I Mb (mines), only available for model DE with stainless steel switch enclosure
- Ex d IIC T6/T4 <sup>1)</sup> Ga/Gb (gas)
- Ex d IIIC T85/T135 <sup>1)</sup> Da/Db (dust)

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

### Process connection

Stainless steel, 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, M20 x 1.5, 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 mm<sup>2</sup>.

For the grounding cable connection to the protective conductor screws use max. 2.5 mm<sup>2</sup> for the internal screw and max. 4 mm<sup>2</sup> for the external screw.

### Dielectric strength

Safety class I (IEC 61298-2: 2008)

### Wetted parts, model DE

Setting range	Stainless steel version		NACE version (option) <sup>1)</sup>		Monel version (option)	
	Diaphragm	Process connection	Diaphragm	Process connection	Diaphragm	Process connection
0 ... 160 mbar	AISI 316	AISI 316L	Monel® 400	AISI 316L	Monel® 400	
0 ... 250 mbar						
0 ... 400 mbar						
0 ... 600 mbar						
0 ... 1 bar						
0 ... 2.5 bar						
0 ... 4 bar	AISI 304					
0 ... 6 bar						
0 ... 10 bar						
0 ... 16 bar	Inconel® 718		Inconel® 718			
0 ... 25 bar						
0 ... 40 bar						

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

### Wetted parts, model DEC

Setting range	Diaphragm	Process connection
0 ... 160 mbar	Inconel® 718	Aluminium alloy (EN AW-5082 per EN 573-3)
0 ... 250 mbar		
0 ... 400 mbar		
0 ... 600 mbar		
0 ... 1 bar		
0 ... 1.6 bar		
0 ... 2.5 bar		
0 ... 4 bar		
0 ... 6 bar		

Sealing material for all models and versions: NBR

### Mounting

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

### Weight

- approx. 5.4 kg, switch enclosure aluminium alloy
- approx. 5.9 kg, switch enclosure stainless steel

## Setting range, model DE

Δp-cell	Setting range	Fixed dead band for contact version		Static / One-sided pressure
	in bar	1 contact A, B, C in mbar	1 contact G in mbar	in bar
L	0 ... 0.16	≤ 6	≤ 12	≤ 40, ≤ 100 or ≤ 160
	0 ... 0.25	≤ 8	≤ 20	
H	0 ... 0.4	≤ 20	≤ 40	≤ 40, ≤ 100, ≤ 160 or ≤ 250
	0 ... 0.6	≤ 25	≤ 50	
	0 ... 1	≤ 40	≤ 80	
	0 ... 2.5	≤ 70	≤ 170	
	0 ... 4	≤ 120	≤ 200	
	0 ... 6	≤ 180	≤ 250	
	0 ... 10	≤ 300	≤ 400	
	0 ... 16	≤ 480	≤ 600	
	0 ... 25	≤ 700	≤ 1,000	
V	0 ... 40	≤ 1,200	≤ 1,800	≤ 40, ≤ 100 or ≤ 160

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 DEC <sup>1)</sup>

Δp-cell	Setting range	Fixed dead band for contact version		Static / One-sided pressure
	in bar	1 contact A, B, C in mbar	1 contact G in mbar	in bar
L	0 ... 0.25	≤ 5	≤ 10	≤ 25
H	0 ... 1	≤ 30	≤ 50	
	0 ... 1.6	≤ 50	≤ 110	
	0 ... 2.5	≤ 80	≤ 170	
	0 ... 4	≤ 120	≤ 200	
	0 ... 6	≤ 120	≤ 200	

1) For clean gas or non-condensing vapour only

Other setting ranges on request.

## 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 <sup>2)</sup>
- NACE compliant to MR 0175, ISO 15156 and MR 0103 <sup>2)</sup>
- Wetted parts from Monel<sup>® 3)</sup>
- Wetted parts dried

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


3) Only available for model DE

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ Pressure equipment directive PED, annex 1, category IV, safety accessories, module B + D</li> <li>■ Low voltage directive, EN 60730-1</li> <li>■ ATEX <sup>1)</sup> directive; annex III, IV I M 2 (only available with stainless steel 316L switch enclosure) II 1/2 GD</li> </ul>	European Community
	<b>IECEX</b> <sup>1)</sup> 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 <sup>2)</sup> Ga/Gb Ex d IIIC T85/T135 <sup>2)</sup> Da/Db	IECEX member states
	<b>EAC (option)</b> Hazardous areas (option)	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

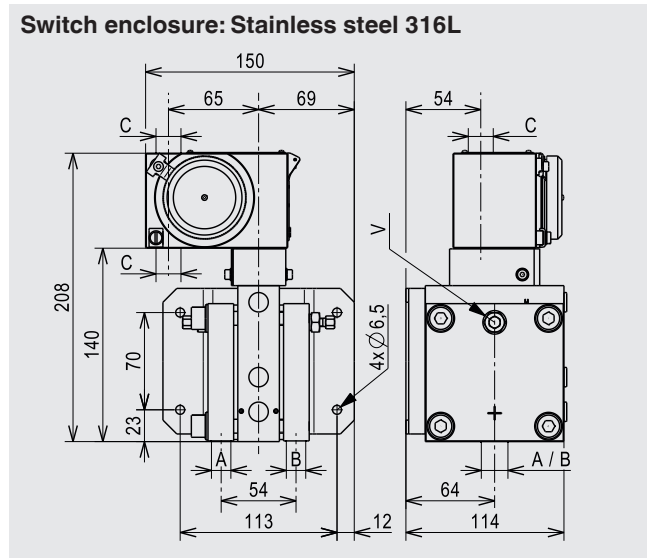
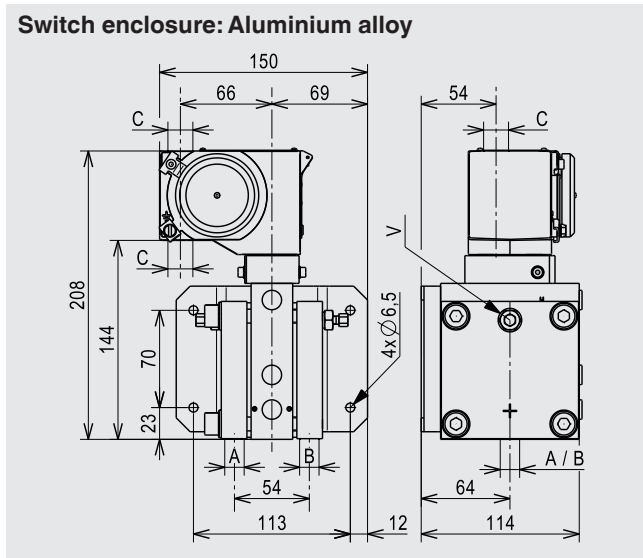
Logo	Description
	<b>SIL 2 rating (option)</b> , per IEC 61508 Functional safety The electrical rating for DC applications is limited to 30 V / 100 mA Only available with contact version B or C

## Certificates (option)

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

Approvals and certificates, see website

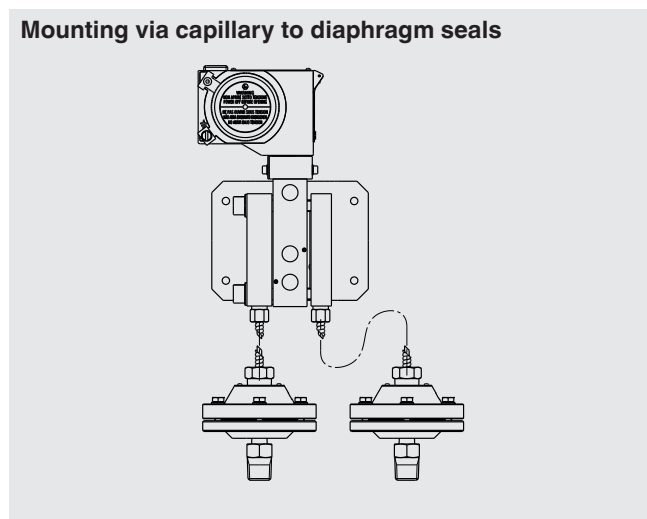
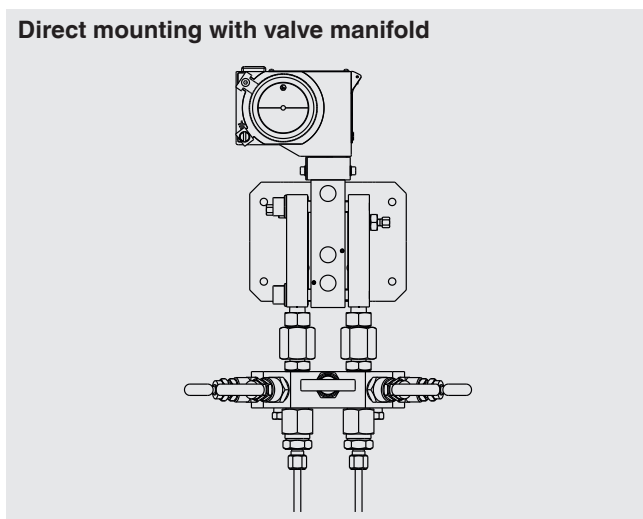
## Dimensions in mm



### Legend

- |                        |                         |
|------------------------|-------------------------|
| A ⊖ Process connection | C Electrical connection |
| B ⊕ Process connection | V Vent                  |

## Assembly examples



### Ordering information

Model / Static - One-sided pressure /  $\Delta p$ -cell / Switch enclosure / Contact version / Setting range / Process connection / Electrical connection / Options

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