

Differential pressure switch Stainless steel switch enclosure Models DW, DW10

WIKA data sheet PV 35.42



Process Performance 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 stainless steel 316L, 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
- Intrinsic safety Ex ia available
- 1 or 2 independent set points, SPDT or DPDT, high switching power up to AC 250 V, 20 A



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

Fig. right: Differential pressure switch for low setting ranges, model DW10

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.

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 DW 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 DW

Double diaphragm with transmission shaft, without sealing elements

Model DW10

Single diaphragm with transmission shaft, without sealing elements

For clean gas or non-condensing vapour only.

Switch enclosure

Stainless steel 316L, 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.

Ignition protection type (option)

- Ex ia I Ma (mines)
- Ex ia IIC T6/T4 ¹⁾ Ga (gas)
- Ex ia IIIC T85/T135 ¹⁾ Da (dust)

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

Safety-related maximum values

(only for optional Ex ia versions)

Maximum values	
Voltage U_i	DC 30 V
Current I_i	100 mA
Power P_i	0.75 W
Internal capacitance C_i	0 µF
Internal inductance L_i	0 mH

Contact version		Electrical rating (resistive load)		Suitable for Ex ia option
		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	No
US	1 x SPDT, silver, hermetically sealed, argon gas filling ²⁾	250 V, 15 A	24 V, 2 A, 220 V, 0.5 A	Yes
UO	1 x SPDT, gold-plated, hermetically sealed, argon gas filling ²⁾	125 V, 1 A	24 V, 0.5 A	Yes
UG	1 x SPDT, gold-plated	125 V, 1 A	24 V, 0.5 A	No
UR	1 x SPDT, silver, adjustable dead band	250 V, 20 A	24 V, 2 A, 220 V, 0.5 A	Yes ³⁾
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	No
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	Yes
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	Yes
DG	2 x SPDT or 1 x DPDT, gold-plated	125 V, 1 A	24 V, 0.5 A	No

²⁾ Permissible ambient temperature range: -30 ... +70 °C

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

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

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 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.

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, G ½, G ¾ female
 ■ Cable gland non-armoured, nickel-plated brass
 ■ Cable gland non-armoured, stainless steel (AISI 304)
 ■ Cable gland armoured, nickel-plated brass
 ■ Cable gland armoured, stainless steel (AISI 304)
 ■ MIL connector, 7-pin, DTL 5015

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 version (option) ¹⁾		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						
250 mbar						
400 mbar						
600 mbar						
1 bar						
2.5 bar						
4 bar	AISI 304					
6 bar						
10 bar						
16 bar	Inconel® 718		Inconel® 718			
25 bar						
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 DW: approx. 6.2 kg
 ■ Model DW10: approx. 8.2 kg

Setting range, model DW

Δp-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 DW10 ¹⁾

Δp-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 (option); annex III, IV I M 1 II 1 GD 	European Community
	IECEx ¹⁾ per IEC 60079-0, IEC 60079-11, IEC 60079-26 (option) Ex ia I Ma Ex ia IIC T6/T4 ²⁾ Ga Ex ia IIIC T85/T135 ²⁾ Da	IECEx member states
	EAC (option) Hazardous areas (option)	Eurasian Economic Community
	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.

Manufacturer's information and certificates

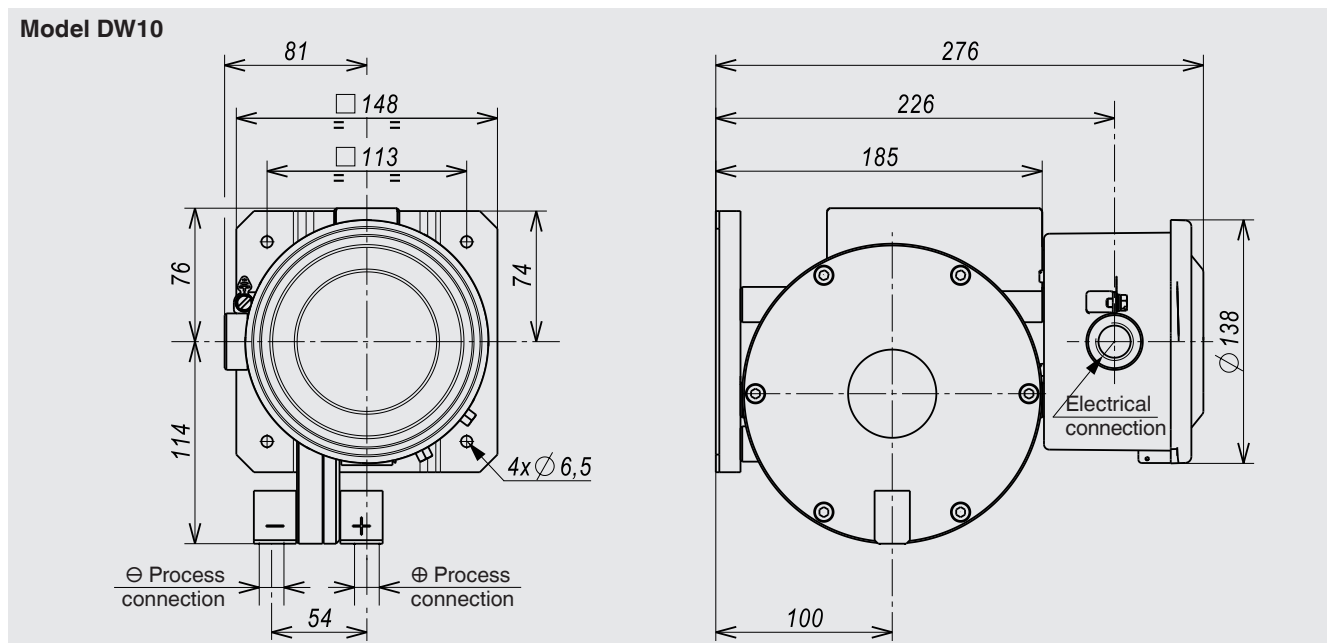
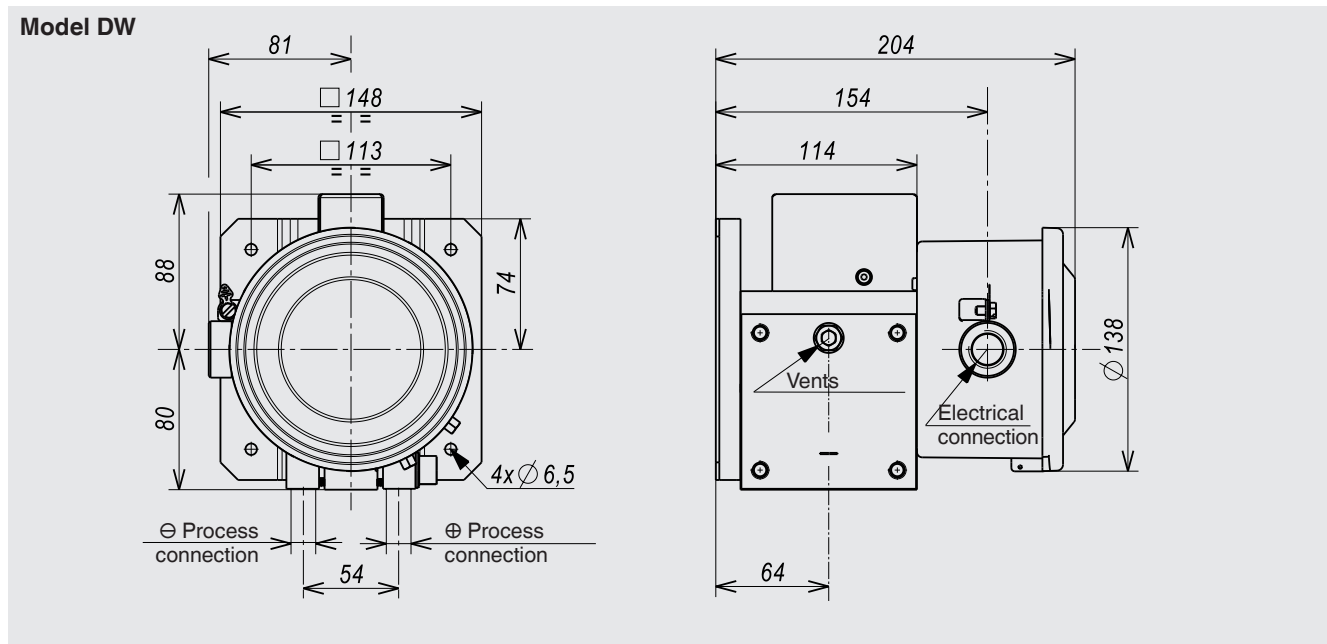
Logo	Description
	SIL 2 rating (option) , per IEC 61508 Functional safety The electrical rating for DC applications is limited to 30 V / 100 mA Only available with contact version US or UO

Certificates (option)

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

Approvals and certificates, see website

Dimensions in mm



Ordering information

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

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