

## Diaphragm pressure switch Stainless steel case Model MW

WIKA data sheet PV 31.10



for further approvals  
see page 3

### Process Performance Series

#### Applications

- Pressure monitoring and direct switching of electrical loads
- General process instrumentation 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 and highly viscous or contaminated media, also in aggressive ambience

#### Special features

- Case from 316L, IP 66, NEMA 4X
- Setting ranges from 16 mbar to 600 bar, also all other equivalent vacuum or combined pressure and vacuum ranges
- Repeatability of the switch point < 1 % of the setting range
- Ex ia version available
- 1 or 2 independent switch points, high switching power up to AC 250 V, 20 A

#### Description

These high-quality 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. All wetted materials are from stainless steel as a standard.

In order to ensure as flexible operation as possible, the 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. By using a diaphragm measuring system, the model MW pressure switch is extremely robust and guarantees optimal operating characteristics.



Pressure switch model MW

For applications with special requirements on the wetted parts, versions with materials from PTFE, Monel or Hastelloy are available.

For setting ranges from 4 ... 40 bar a piston replaces or completes the diaphragm as a measuring element. The wetted parts of this variant from stainless steel are particularly suited for liquid media.

## Standard version

### Case

Stainless steel 316L, case cover with bayonet lock, protection against unauthorised access, lead sealing by customer possible, 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 <sup>1)</sup>  
 Medium  $T_M$ : -30 ... +85 °C

<sup>1)</sup> The permissible ambient temperature is depending on the selected instrument version

### Switch contacts with micro switch

Fixed dead band

- 1 x or 2 x SPDT (single pole double throw)
- 1 x DPDT (double pole double throw)

Adjustable dead band:

- 1 x SPDT (single pole double throw)

The DPDT function is realised with 2 simultaneously triggering SPDT micro switches within 0.2 % of the setting range.

Information on the dead band can be found on page 4.

Contact version	Electrical rating (resistive load)	
	AC	DC
<b>Fixed dead band</b>		
Silver-plated contact	250 V, 15 A	24 V, 2 A 125 V, 0.5 A 220 V, 0.25 A
Silver-plated contact Filling with argon gas $T_{amb}$ : -30 ... +70 °C	250 V, 15 A	24 V, 2 A 220 V, 0.5 A
Gold-plated contact	125 V, 1 A	24 V, 0.5 A
Gold-plated contact Filling with argon gas $T_{amb}$ : -30 ... +70 °C	125 V, 1 A	24 V, 0.5 A
<b>Adjustable dead band</b>		
Silver-plated contact	250 V, 20 A	24 V, 2 A 220 V, 0.5 A

### Switch point repeatability

≤ 1 % of setting range

### Switch point setting

The switch point can be specified by the customer or factory set. Subsequent setting of the switch point on site is made using the adjustment screw, which is fastened to the switch and thus secured against loss.

### Distance between switch points

For versions with 2 x SPDT the distance between the switch points must be > 5 % of the respective setting range.

### Electrical connection

- ½ NPT female (standard)
- ¾ NPT, G ½, G ¾, M 20 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
- MIL connector, 7-pin, DTL 5015

Cable connection using internal terminal block, protective conductor connection using internal and external screw, max. grounding cable cross-section 4 mm<sup>2</sup>

### Dielectric strength

Safety class I (IEC 61298-2: 2008)

### Wetted parts

Setting range 0 ... 16 mbar to 0 ... 40 bar	
Diaphragm element	Process connection
Stainless steel 316 <sup>2)</sup>	Stainless steel 316L
Stainless steel 316 <sup>2)</sup> + PTFE <sup>3)</sup>	Stainless steel 316L
Stainless steel 316 <sup>2)</sup> + PTFE <sup>3)</sup>	Stainless steel 316L + PTFE (only for G1/2 A)
Monel <sup>4)</sup>	Monel
Monel <sup>4)</sup>	Stainless steel 316L

<sup>2)</sup> Diaphragm element material depending on setting range:  
 Stainless steel 304: -1 ... 5, 0 ... 6, -1 ... 9, 0 ... 10 bar  
 Inconel 718: -1 ... 15, 0 ... 16, 0 ... 25, 0 ... 40 bar

<sup>3)</sup> PTFE coating not available for setting ranges:  
 -16 ... 0, -25 ... 0, -40 ... 0, 0 ... 16, 0 ... 25, 0 ... 40 mbar, 0 ... 40 bar

<sup>4)</sup> Only for setting ranges ≤ 10 bar

Setting range 4 ... 40 bar to 30 ... 600 bar	
Piston with diaphragm <sup>5)</sup>	Process connection
Hastelloy C276	Stainless steel 316L
Piston <sup>6)</sup>	Process connection
Stainless steel 316	Stainless steel 316L

<sup>5)</sup> The measuring element is a piston with welded diaphragm, therefore particularly suited for gaseous media. Extended permissible medium temperature -40 ... +85 °C

<sup>6)</sup> The measuring element is a piston, therefore particularly suited for liquid media. Limited permissible medium temperature -10 ... +85 °C for sealing material NBR or 0 ... 85 °C for sealing material FPM

### Sealing

PTFE, FPM, NBR, without sealing: welded diaphragm, depending on setting range and operating conditions

### 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 A female via adapter
- Flange connection

### Mounting

Direct or wall mounting

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

For mounting positions see drawing on page 5.

### Weight

approx. 1.0 ... 1.5 kg, depending on setting range

## Safety-related maximum values

(only for Ex ia version)

Parameter	
Maximum voltage $U_i$	30 V
Current limitation $I_i$	100 mA
Power limitation $P_i$	0,75 W
Internal capacitance $C_i$	0 $\mu$ F
Internal inductance $L_i$	0 mH

## Options

- Cleaned for oxygen service
- Protection from stainless steel 316L or Hastelloy for setting ranges 2.5 bar up to 25 bar
- Sealing towards the pressure chamber PTFE/NBR
- Permissible ambient temperature to -60 °C, not available for argon gas filled contacts
- Offshore version with increased corrosion protection <sup>1)</sup>
- NACE version <sup>1)</sup>

### Please specify:

Switch point, switching direction for each contact (e.g. switch point 1: 0.5 bar, falling, switch point 2: 3 bar, rising)  
With two micro switches, the switch points can be set independently of each other.

After unscrewing the case cover, **switch point adjustment** can be made using the adjustment screw.  
The switch point is selectable within the entire setting range.

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

### Example:

Setting range: 0 ... 1 bar with one switch contact  
Repeat accuracy: 1 % of 1 bar = 10 mbar  
Dead band = 15 mbar (see table setting ranges)  
If the pressure is rising, the switch point should be set between 35 mbar and 1 bar.  
If the pressure is falling, the switch point should be set between 0 and 965 mbar.

## CE conformity

### Low voltage directive

2006/95/EC, EN 60730-1

### Pressure equipment directive

Pressure equipment directive 97/23/EC (PED, annex 1, category IV, safety accessories, module B + D

### ATEX directive <sup>1)</sup> (Option)

94/9/EC, annex III, IV

## Approvals (Option)

- **IECEx** <sup>1)</sup>, IEC 60079-0, -11, -26  
Ex ia I Ma (mining)  
Ex ia IIC T6/T4 Ga (gas)  
Ex ia IIIC T85/T135 Da IP 66 (dust)
- **EAC-Ex** <sup>1)</sup>, import certificate, customs union Russia/Belarus/Kazakhstan  
Low voltage directive: TR CU004/2011
- Hazardous areas (Ex): TR CU 012/2011
- **KOSHA** <sup>1)</sup>, ignition protection type "i" - intrinsic safety, South Korea
- **SIL 2 rating**, per IEC 61508

1) WIKA recommends argon gas-filled contact versions or contacts with adjustable dead band.

## Certificates (Option)

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

Approvals and certificates, see website

## Measuring element: Diaphragm

Span of setting range from 16 mbar to max. 100 mbar

Standard		Option 1		Option 2		Dead band		
Setting range (=working range)	Test pressure	Working range	Test pressure	Working range	Test pressure	1 contact, fixed	2 contacts, fixed	1 contact, adjustable
in mbar		in bar	in bar	in bar	in bar	in mbar	in mbar	in mbar
0 ... 16	250	0 ... 8	10	-1 ... 8 <sup>1)</sup>	10	≤ 2.0	≤ 2.8	-
0 ... 25	250	0 ... 8	10	-1 ... 8 <sup>1)</sup>	10	≤ 2.0	≤ 3	8 ... 18
0 ... 40	300	0 ... 8	10	-1 ... 8 <sup>1)</sup>	10	≤ 2.6	≤ 3.4	8 ... 20
0 ... 60	300	0 ... 8	10	-1 ... 8 <sup>1)</sup>	10	≤ 3.0	≤ 4.2	12 ... 25
0 ... 100	600	0 ... 8	10	-1 ... 8 <sup>1)</sup>	10	≤ 3.6	≤ 5	17 ... 40
-16 ... 0	-21	-1 ... 0 <sup>1)</sup>	0.25	-	-	≤ 2.0	≤ 2.8	-
-25 ... 0	-35	-1 ... 0 <sup>1)</sup>	0.25	-	-	≤ 2.0	≤ 3	8 ... 18
-40 ... 0	-55	-1 ... 0 <sup>1)</sup>	0.30	-	-	≤ 2.6	≤ 3.4	8 ... 20
-60 ... 0	-90	-1 ... 0 <sup>1)</sup>	0.30	-	-	≤ 3.0	≤ 4.2	12 ... 25
-100 ... 0	-150	-1 ... 0 <sup>1)</sup>	0.40	-	-	≤ 3.6	≤ 5	17 ... 40
-12.5 ... +12.5	-25 / 250	-	-	-	-	≤ 2.0	≤ 3	8 ... 18
-30 ... +30	-60 / 250	-	-	-	-	≤ 3.0	≤ 4.2	12 ... 25
-50 ... +50	-100 / 250	-	-	-	-	≤ 3.6	≤ 5	17 ... 40

Span of setting range from 0.2 bar to max. 40 bar

Standard		Option 1		Option 2		Dead band		
Setting range (=working range)	Test pressure	Working range	Test pressure	Working range	Test pressure	1 contact, fixed	2 contacts, fixed	1 contact, adjustable
in bar		in bar	in bar	in bar	in bar	in mbar	in mbar	in mbar
0 ... 0.2	0.4	0...32	40	-1 ... 32 <sup>1)</sup>	40	≤ 10	≤ 13	30...70
0 ... 0.4	1	0...32	40	-1 ... 32 <sup>1)</sup>	40	≤ 15	≤ 20	40 ... 95
-0.2 ... 0	-0.3	-1...0 <sup>1)</sup>	-1	-1 ... 8	10	≤ 10	≤ 13	30 ... 70
-0.4 ... 0	-0.6	-1...0 <sup>1)</sup>	-1	-1 ... 8	10	≤ 15	≤ 20	40 ... 95
-0.1 ... + 0.1	-0.2 / 1	-	-	-	-	≤ 10	≤ 13	30 ... 70
-0.5 ... 0.5	-1 / 4	-	-	-	-	≤ 15	≤ 50	75 ... 170
-1 ... 0	-1	-1 ... 8	10	-	-	≤ 15	≤ 50	75 ... 170
-1 ... 1.5	2	-1 ... 8	10	-	-	≤ 48	≤ 67	200 ... 500
-1 ... 5	12	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 100	≤ 160	400 ... 1,000
-1 ... 9	20	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 100	≤ 180	600 ... 1,400
-1 ... 15	25	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 150	≤ 250	1,000 ... 2,400
0 ... 1	4	0 ... 32	40	-1 ... 32	40	≤ 15	≤ 50	75 ... 170
0 ... 1.2	4	0 ... 32	40	-1 ... 32	40	≤ 15	≤ 50	75 ... 170
0 ... 2.5	5	0 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 48	≤ 67	200 ... 500
0 ... 6	12	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 100	≤ 160	400 ... 1,000
0 ... 10	20	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 100	≤ 180	600 ... 1,400
0 ... 16	25	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 150	≤ 250	1,000 ... 2,400
0 ... 25	40	-1 ... 32	40	-1 ... 80	100 <sup>2)</sup>	≤ 300	≤ 450	1,700 ... 4,000
0 ... 40	50	-	-	-	-	≤ 400	≤ 800	2,200 ... 5,800

1) Option Diaphragm with PTFE not available

2) Test pressure of 100 bar not available for wetted parts PTFE and Monel

## Measuring element: Piston with diaphragm or piston

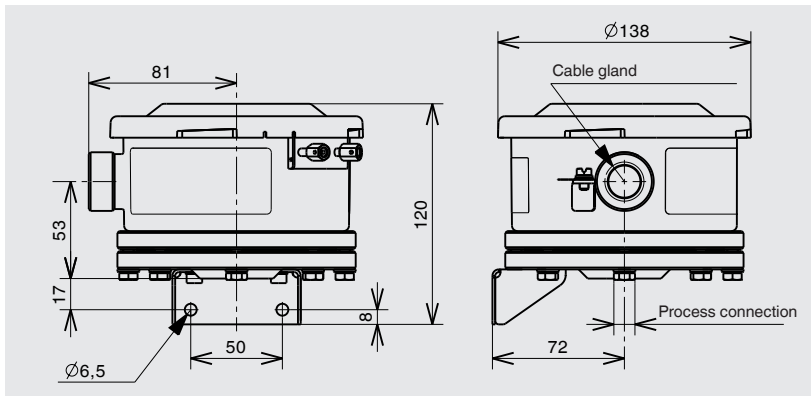
Setting range to 600 bar

Standard		Dead band		
Setting range (=working range)	Test pressure	1 contact, fixed	2 contacts, fixed	1 contact, adjustable <sup>3)</sup>
in bar		in bar	in bar	in bar
4 ... 40	100	≤ 3	≤ 4	5 ... 11 to 8 ... 15
10 ... 100	200	≤ 4	≤ 6	10 ... 22 to 15 ... 28
10 ... 250	400	≤ 10	≤ 13	15 ... 38 to 27 ... 55
20 ... 400	600	≤ 10	≤ 25	35 ... 80 to 43 ... 90
30 ... 600	700	≤ 20	≤ 25	45 ... 105 to 83 ... 155

3) The adjustable dead band is depending on the switch point setting. The indicated ranges are valid for start and end of the setting range. Other setting ranges are proportional.

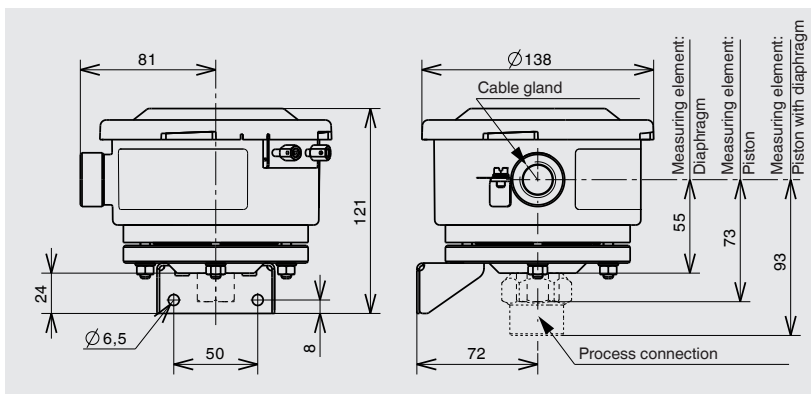
## Dimensions

Span of setting range from 16 mbar to max. 100 mbar

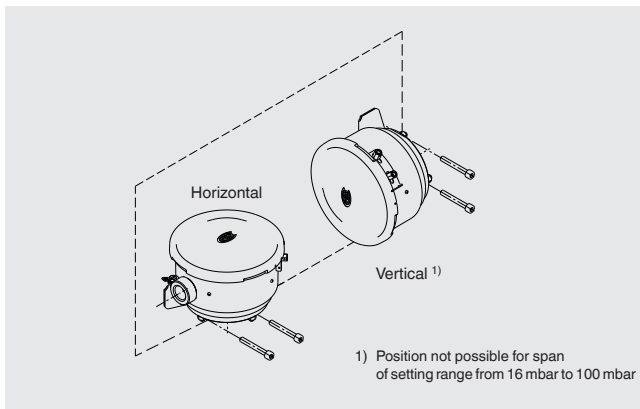


## Dimensions

Setting range from 0.2 bar to max. 600 bar



## Mounting positions



## Ordering information

Model / Unit / Setting range of switch point / Number of switches / Contact type / Wetted parts / Options