# Bourdon tube pressure switch Flameproof enclosure Ex d Models BA, BAX

WIKA data sheet PV 32.21



## **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, liquid and aggressive media, also in aggressive ambience

# **Special features**

- No power supply needed for switching of electrical loads
- Robust switch enclosure from aluminium, IP 66, NEMA 4X
- Setting ranges from 0 ... 2.5 bar up to 0 ... 1,000 bar, vacuum ranges
- Repeatability of the set point ≤ 0.5% of span
- 1 or 2 independent set points, SPDT or DPDT, high switching power up to AC 250 V, 20 A

# **Process Performance Series**



Bourdon tube pressure switch model BA

# 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.

For applications with special requirements on the wetted parts, a version with Monel<sup>®</sup> is available.

By using a Bourdon tube measuring system, the model BA and BAX pressure switch is extremely robust and guarantees optimal operating characteristics and the highest measuring performances, with repeatability lower than 0.5 % of span.



# Standard version

#### Switch enclosure

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

#### Ingress protection

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

#### Permissible temperature

 Ambient
 T<sub>amb</sub>: -40 ... +85 °C

 Medium
 T<sub>M</sub>: -40 ... +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 0.2 % of the span.

### Ignition protection type

Model BA: Cat. 2 GD

- Ex d IIC T6/T4<sup>1</sup> Gb (gas)
- Ex tb IIIC T85/T135 <sup>1)</sup> Db (dust)

Model BAX: Cat. 1/2 GD

- Ex d IIC T6/T4<sup>1)</sup> Ga/Gb (gas)
- Ex ta/tb IIIC T85/T135 <sup>1</sup>) Da/Db (dust)
- 1) The temperature class is related to the ambient temperature range. See the type examination certificate for further details.

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 <sup>2)</sup>	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 $^{\rm 2)}$	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

 $\leq 0.5$  % 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: 30 bar, falling, set point 2: 60 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 ... 100 bar with one switch contact Repeatability: 0.5 % of 100 bar = 0.5 bar Dead band: 2.0 bar (see table setting ranges)  $2 \times repeatability + dead band = 2 \times 0.5 bar + 2.0 bar = 3.0 bar$ Rising pressure: Adjust set point between 3 ... 100 bar. Falling pressure: Adjust set point between 0 ... 97 bar.

#### **Process connection**

Stainless steel, lower mount (LM)

- ¼ NPT female (standard)
- 1/2 NPT, G 1/2 A, G 1/4 A male via adapter
- ½ NPT, G ¼ female via adapter
- M20 x 1.5 male via adapter

#### **Electrical connection**

- ½ NPT female (standard)
- 3/4 NPT, M 20 x 1.5, Gk 1/2, Gk 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 mm<sup>2</sup>.

For the internal and external grounding cable connection to the protective conductor screws use wire cross-sections  $\leq 4 \text{ mm}^2$ .

#### Wetted parts

Version	Bourdon tube	Process connection
Standard	Stainless steel AISI 316L	
Setting range: 0 1,000 bar	Stainless steel 17-4PH® (1.4542)	Stainless steel AISI 316L
NACE (option) Setting range: 0 40 to 0 400 bar	Monel <sup>®</sup> 400	Stainless steel AISI 316L
Monel <sup>®</sup> (option) Setting range: 0 40 to 0 400 bar	Monel <sup>®</sup> 400	

**Dielectric strength** 

Safety class I (IEC 61298-2: 2008)

#### Setting range

Model	Setting range (=working range)	Proof pressure	Fixed dead band		Adjustable dead band	
	in bar	in bar	1 contact, UN, US, UO, UG in bar	2 contacts, DN, DS, DO, DG in bar		1 contact, UR in bar
				Model BA	Model BAX	
BA	-1 +1.5	4.5	≤ 0.15	≤ 0.30	-	0.35 1.10
	-1 +5	12	≤ 0.20	≤ 0.30	-	0.55 1.70
	-1 +15	30	≤ 0.30	≤ 0.40	-	1.40 3.10
	0 2.5	4.5	≤ 0.15	≤ 0.30	-	0.35 1.10
	06	12	≤ 0.20	≤ 0.30	-	0.55 1.70
	0 16	30	≤ 0.30	≤ 0.40	-	1.40 3.10
BA, BAX	0 40	75	≤ 0.80	≤ 0.70	≤ 1.2	2.10 6.00
	0 100	160	≤2	≤2	≤ 5	6 17
	0 160	210	≤ 3	≤ 3	≤7	13 35
	0 250	330	≤ 5	≤ 5	≤ 10	21 65
	0 400	480	≤ 8	≤ 8	≤ 12	26 93
	0 600	720	≤ 12	≤ 12	≤ 20	40 115
BAX	0 1,000 1)	1,200	≤ 20	-	≤ 50	75 190

1) Wetted parts, bourdon tube: Stainless steel 17-4PH® (1.4542), process connection: Stainless steel AISI 316L

# standard)

#### Mounting

- Model BA: direct mounting or wall mounting
- Model BAX: wall mounting, mounting fixture from stainless steel (AISI 304)

Option: Mounting bracket for 2" pipe mounting

For mounting positions see drawing on page 5.

# Options

- Cleaned for oxygen service
- Drying of wetted parts
- Permissible ambient temperature to -60 ... +85 °C <sup>1</sup>)
- Offshore version <sup>2)</sup>
- NACE compliant to MR 0175, ISO 15156 and MR 0103<sup>2)</sup>
- Wetted parts from Monel<sup>®</sup>

 Only available for contacts without hermetic sealing
 WIKA recommends argon gas-filled contact versions, use of adjustable dead band allowed.

# Approvals

# 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

#### Weight

Model BA: approx. 2.4 kg. Model BAX: approx. 3.7 kg.

Logo	Description		Country
<b>€€</b> €x	<ul> <li>EC declaration of conformity</li> <li>Pressure equipment directive 97, PED, annex 1, category IV, safety</li> <li>Low voltage directive 2006/95/EC</li> <li>ATEX <sup>3)</sup> directive 94/9/EC; annex Model BA II 2 GD</li> </ul>	/ accessories, module B + D C, EN 60730-1	European Community
IEC TECEX	IECEx <sup>3)</sup> per IEC 60079-0, IEC 6007 Model BA Ex d IIC T6/T4 <sup>4)</sup> Gb Ex tb IIIC T85/T135 <sup>4)</sup> Db	<sup>7</sup> 9-1, IEC 60079-26, IEC 60079-31 Model BAX Ex d IIC T6/T4 <sup>4)</sup> Ga/Gb Ex ta/tb IIIC T85/T135 <sup>4)</sup> Da/Db	IECEx member states
EHLEx	EAC (option) Hazardous areas (option)		Eurasian Economic Community
<u>s</u>	KOSHA (option) Hazardous areas		South Korea
	INMETRO (option) (model BA only)		Brazil

3) Double marking ATEX and IECEx on the same product label

4) The temperature class is related to the ambient temperature range

## Manufacturer's information and certifications

Logo	Description
SLY	<b>SIL 2 rating (option)</b> , per IEC 61508 Functional safety The electrical rating for DC applications is limited to 30 V 100 mA.

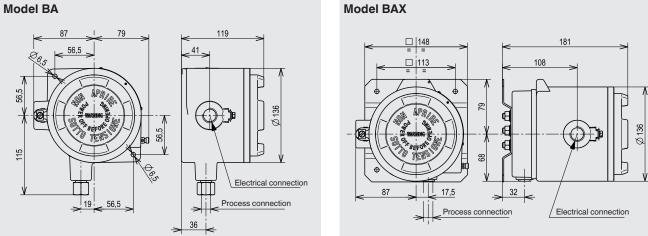
# **Certificates (option)**

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

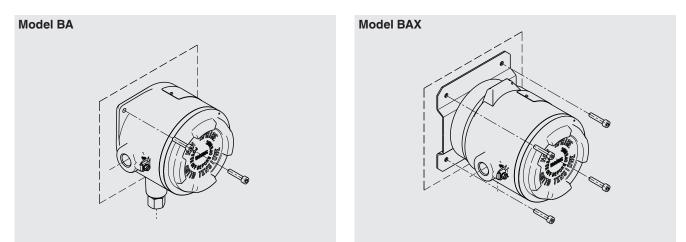
Approvals and certificates, see website

# **Dimensions in mm**





# Permissible mounting position



#### **Ordering information**

Model / Unit / Setting range / Number of switches / Contact type / Process connection / Electrical connection / Wetted parts / Options

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WIKA Alexander Wiegand SE & Co. KG Alexander-Wiegand Straße 30 63911 Klingenberg/Germany Tel. +49 9372 132-0 Fax +49 9372 132-406 info@wika.de www.wika.de