

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

WIKA data sheet PV 32.21



Process Performance Series

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 $\leq 0.5\%$ of span
- 1 or 2 independent set points, SPDT or DPDT, high switching power up to AC 250 V, 20 A



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® 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_{amb} : -40 ... +85 °C
Medium T_M : -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 ¹⁾ Gb (gas)
- Ex tb IIIC T85/T135 ¹⁾ Db (dust)

Model BAX: Cat. 1/2 GD

- 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.

| 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

≤ 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 x repeatability + dead band = 2 x 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)

- 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

Dielectric strength

Safety class I (IEC 61298-2: 2008)

Electrical connection

- 1/2 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 mm².

For the internal and external grounding cable connection to the protective conductor screws use wire cross-sections ≤ 4 mm².

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® 400 | Stainless steel AISI 316L |
| Monel® (option) Setting range: 0 ... 40 to 0 ... 400 bar | Monel® 400 | |

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 |
| | 0 ... 6 | 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

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 ¹⁾
- Offshore version ²⁾
- NACE compliant to MR 0175, ISO 15156 and MR 0103 ²⁾
- Wetted parts from Monel®

1) Only available for contacts without hermetic sealing

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

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.


Approvals

| Logo | Description | Country |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
|  | EC declaration of conformity <ul style="list-style-type: none">■ Pressure equipment directive 97/23/EC PED, annex 1, category IV, safety accessories, module B + D■ Low voltage directive 2006/95/EC, EN 60730-1■ ATEX ³⁾ directive 94/9/EC; annex III, IV Model BA Model BAX II 2 GD II 1/2 GD | European Community |
|  | IECEx ³⁾ per IEC 60079-0, IEC 60079-1, IEC 60079-26, IEC 60079-31 Model BA Model BAX Ex d IIC T6/T4 ⁴⁾ Gb Ex d IIC T6/T4 ⁴⁾ Ga/Gb Ex tb IIIC T85/T135 ⁴⁾ Db Ex ta/tb IIIC T85/T135 ⁴⁾ Da/Db | IECEx member states |
|  | EAC (option) Hazardous areas (option) | Eurasian Economic Community |
|  | 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 |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|  | SIL 2 rating (option) , per IEC 61508 Functional safety The electrical rating for DC applications is limited to 30 V ... 100 mA. |

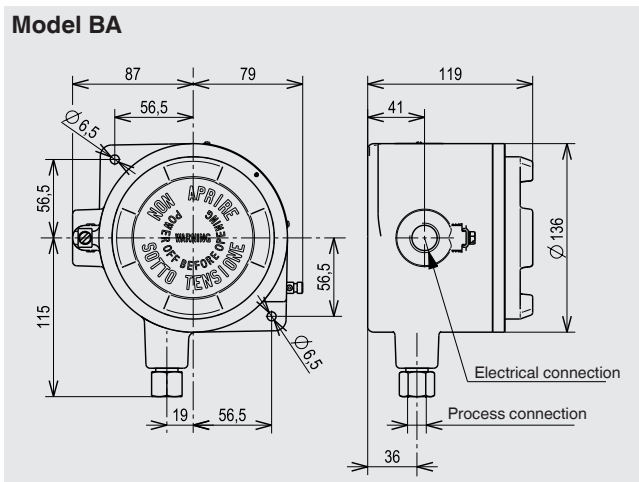
Certificates (option)

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

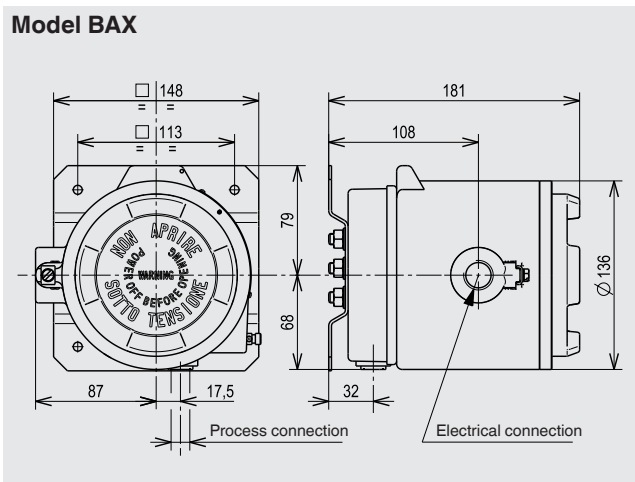
Approvals and certificates, see website

Dimensions in mm

Model BA

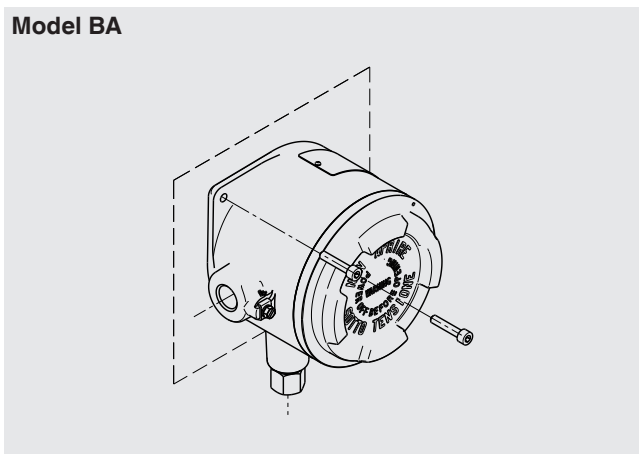


Model BAX

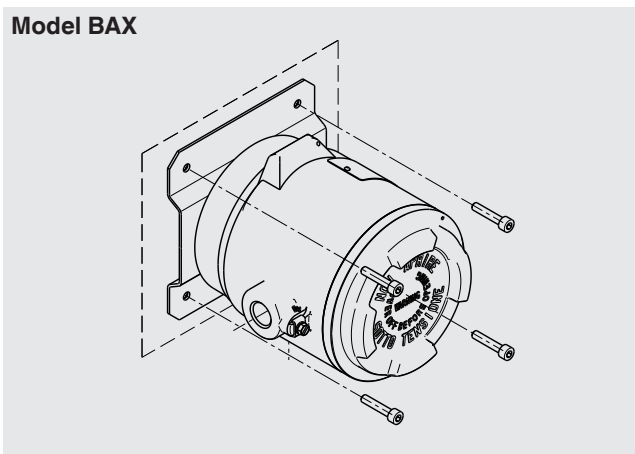


Permissible mounting position

Model BA



Model BAX



Ordering information

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

