

# Diaphragm pressure gauge with switch contacts

## For the process industry, up to 10-fold overload safety, max. 40 bar

### Models PGS43.100, PGS43.160

WIKA data sheet PV 24.03



for further approvals,  
see page 12

**switchGAUGE**

### Applications

- Control and regulation of industrial processes at measuring locations with increased overload and scale ranges from 0 ... 25 mbar
- Monitoring of plants and switching of circuits
- For gaseous and liquid, aggressive and highly viscous or contaminated media, also in aggressive environments
- Process industry: Chemical industry, petrochemical industry, power plants, mining, on-/offshore, environmental technology, machine building and general plant construction

### Special features

- High reliability and long service life
- Wide choice of special materials
- Up to 4 switch contacts per instrument
- Can be used with case filling for high dynamic pressure loads or vibrations
- Instruments with inductive contacts for use in hazardous areas
- Instruments with switch contact for PLC applications

### Description

Wherever the process pressure has to be indicated locally and, at the same time, circuits need to be switched, the model PGS43 switchGAUGE finds its use.

Switch contacts (electrical switch contacts) make or break an electric control circuit dependent upon the pointer position of the indicating measuring instrument. The switch contacts are adjustable over the full extent of the scale range (see DIN 16085), and are mounted predominantly below the dial, though also partly on top of the dial. The instrument pointer (actual value pointer) moves freely across the entire scale range, independent of the setting.

The set pointer can be adjusted using a removable adjustment key in the window.



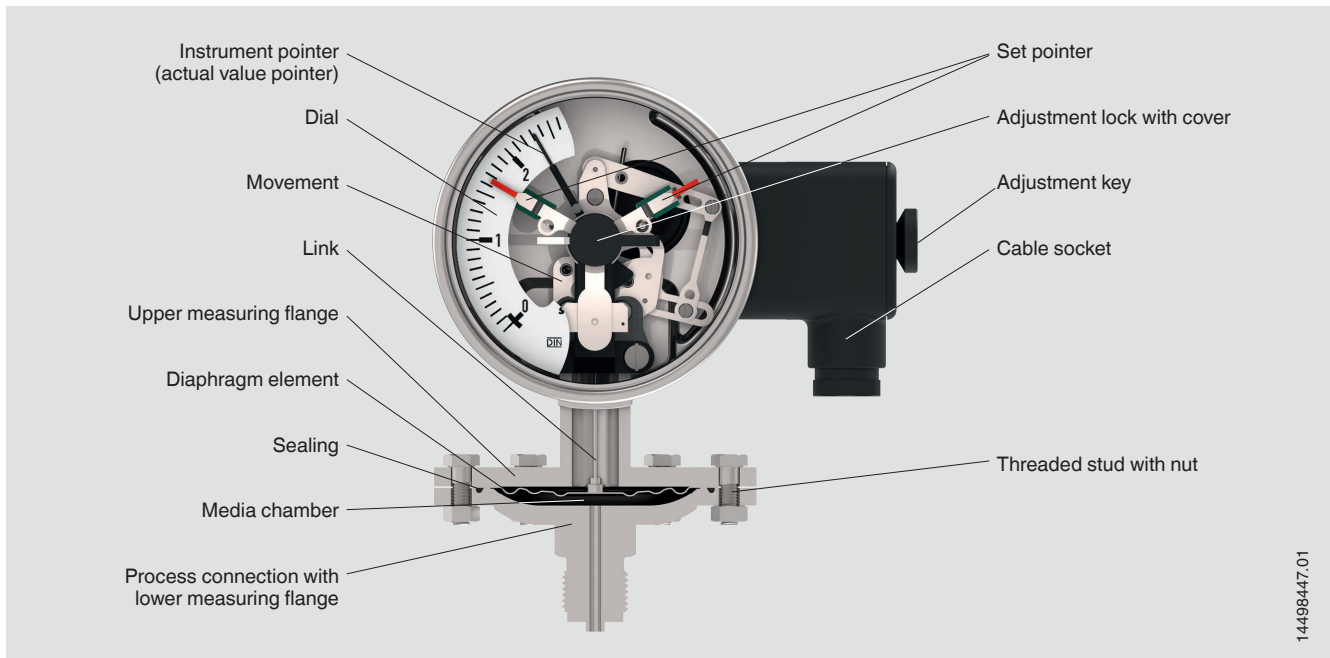
**Diaphragm pressure gauge model PGS43.100 with contact model 831.21**

Switch contacts consisting of several contacts can also be set to a single set point. Contact actuation is made when the actual value pointer travels beyond or below the desired set point.

The pressure gauge is manufactured in accordance with DIN 16085 and fulfils all requirements of the relevant standards (EN 837-3) and regulations for the on-site display of the working pressure of pressure vessels.

As switch contacts, magnetic snap-action contacts, reed switches, inductive contacts and electronic contacts are available. Inductive contacts can be used in hazardous areas. For triggering programmable logic controllers (PLC), electronic contacts and reed switches can be used.

## Functionality



Diaphragm elements are circular, corrugated diaphragms. They are clamped or welded together at the edge between two flanges and are subjected to the pressure on one side by the pressure in the media chamber. The resulting deflection is transmitted to the movement via the link and displayed on the dial with the instrument pointer (actual value pointer).

### Switch contacts

The switch contacts are designed to allow the instrument pointer (actual value pointer) to move beyond the adjusted set pointer after contact actuation takes place, with the contact remaining actuated. The set pointer can be adjusted using a removable adjustment key (stored in the cable socket) via an adjustment lock in the window.

### Overload safety

Diaphragm elements have a relatively large actuating force and, due to the annular clamping of the element, they are less sensitive to vibration in comparison with Bourdon tubes. Diaphragm elements can be subject to higher overload of up to 10 times the full scale value, up to a max. of 40 bar, through load take-up points (by bringing the diaphragm element up against the upper flange). With a display range of 0 ... 4 bar and 10-fold overload safety, a short-term overpressure of up to 40 bar is not problematic, as neither the accuracy nor the switch point setting is affected.

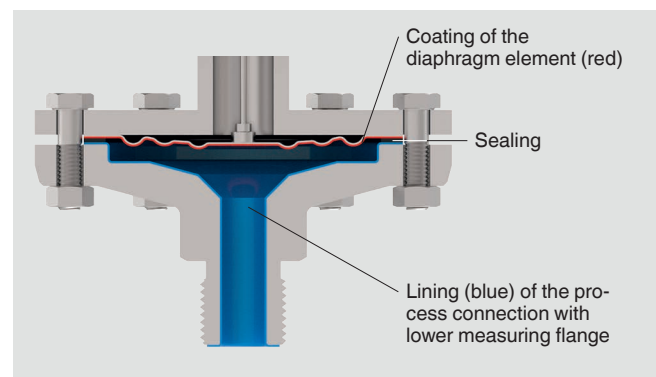
### Versions for special media

Larger pressure ports, open connecting flanges and purging plugs can be integrated for measuring highly viscous, contaminated or crystallising media.

### Coating / Lining of wetted parts

By selecting a coating / lining for the wetted parts, the instrument can also be used for extremely corrosive media. The materials suitable for this can either be selected for the diaphragm element only, or together with the process connection with lower measuring connection in a freely combinable manner. The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

→ Available materials (wetted) see page 3



# Specifications

| Basic information  |  |
|--|--|
| <b>Standard</b>  |  |
| Diaphragm and capsule pressure gauges  | EN 837-3   |
| Pressure gauges with electrical limit contact devices  | DIN 16085  |
| → For information on the “Selection, installation, handling and operation of pressure gauges”, see Technical information IN 00.05. |  |
| <b>Nominal size (NS)</b>   | <ul style="list-style-type: none"> <li>■ Ø 100 mm [4"]</li> <li>■ Ø 160 mm [6"]</li> </ul>   |
| <b>Window</b>  | Laminated safety glass   |
| <b>Case</b>  |  |
| Design   | <ul style="list-style-type: none"> <li>■ Safety level “S1” per EN 837-1: With blow-out device</li> <li>■ Safety level “S3” per EN 837-1: With solid baffle wall and blow-out back</li> </ul> |
| Material   | <ul style="list-style-type: none"> <li>■ Stainless steel 1.4301 (304)</li> <li>■ Stainless steel 1.4571 (316 Ti)</li> </ul>  |
| <b>Case filling</b>  | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ Silicone oil M50 <sup>1)</sup></li> </ul> Instruments with case filling with compensating valve to vent case.                    |
| <b>Movement</b>  | Stainless steel  |

1) Ingress protection IP65 for instruments with case filling

| Measuring element                              |   |
|--|---|
| <b>Type of measuring element</b>               | Diaphragm element   |
| <b>Materials (wetted)</b>                      |   |
| Diaphragm element                              | <ul style="list-style-type: none"> <li>■ Stainless steel 316L, for span ≤ 0.25 bar</li> <li>■ NiCr alloy (Inconel), for span &gt; 0.25 bar</li> </ul>   |
| Process connection with lower measuring flange | Stainless steel 316L  |
| Coating / Lining <sup>1) 2)</sup>              | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ PTFE</li> <li>■ Hastelloy</li> <li>■ Monel</li> <li>■ Tantalum</li> <li>■ Gold (only for diaphragm element)</li> </ul> Other materials on request |
| Sealing <sup>3)</sup>                          | FPM/FKM   |

1) Diaphragm elements and process connections with lower measuring flanges can be coated / lined with various materials.

→ See page 2

2) Accuracy class 2.5 with selection of a coating / lining.

3) The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

| Accuracy specifications     |  |
|-----------------------------|--|
| <b>Accuracy class</b>       | <ul style="list-style-type: none"> <li>■ 1.6 <sup>1)</sup></li> <li>■ 2.5 <sup>2) 3)</sup></li> </ul>            |
| <b>Temperature error</b>    | On deviation from the reference conditions at the measuring system: ≤ ±0.8 %/10 K of respective full scale value |
| <b>Switch hysteresis</b>    | Depending on the type of contact used (→ See page 6)   |
| <b>Reference conditions</b> |  |
| Ambient temperature         | +20 °C   |

1) After feasibility test, if necessary, accuracy class 1.0 is possible.

2) Accuracy class 2.5 with smallest scale range. Depending on the built-in type of contact, 0 ... 25 mbar or 0 ... 40 mbar.

3) Accuracy class 2.5 with selection of a coating / lining.

## Scale ranges

| Scale range | Overload safety <sup>1)</sup> | Vacuum-resistant to -1 bar |
|-------------|-------------------------------|----------------------------|
| <b>mbar</b> |                               |                            |
| 0 ... 25    | ■ 125<br>■ 250                | Selectable                 |
| 0 ... 40    | ■ 200<br>■ 400                | Selectable                 |
| 0 ... 60    | ■ 300<br>■ 600                | Selectable                 |
| 0 ... 100   | ■ 500<br>■ 1,000              | Selectable                 |
| 0 ... 160   | ■ 800<br>■ 1,600              | Selectable                 |
| 0 ... 250   | ■ 1,250<br>■ 2,500            | Selectable                 |
| 0 ... 400   | ■ 2,000<br>■ 4,000            | Selectable                 |
| 0 ... 600   | ■ 3,000<br>■ 6,000            | Selectable                 |
| 0 ... 1,000 | ■ 5,000<br>■ 10,000           | Selectable                 |
| <b>bar</b>  |                               |                            |
| 0 ... 0.6   | ■ 3<br>■ 6                    | Selectable                 |
| 0 ... 1     | ■ 5<br>■ 10                   | Selectable                 |
| 0 ... 1.6   | ■ 8<br>■ 16                   | Selectable                 |
| 0 ... 2.5   | ■ 12.5<br>■ 25                | Selectable                 |
| 0 ... 4     | ■ 20<br>■ 40                  | Yes                        |
| 0 ... 6     | ■ 30<br>■ 40                  | Yes                        |
| 0 ... 10    | 40                            | Yes                        |
| 0 ... 16    | 40                            | Yes                        |
| 0 ... 25    | 40                            | Yes                        |

## Vacuum scale ranges <sup>2)</sup>

| Scale range  |                |
|--------------|----------------|
| mbar         | bar            |
| -25 ... 0    | -0.6 ... 0     |
| -40 ... 0    | -1 ... 0       |
| -60 ... 0    | <b>psi</b>     |
| -100 ... 0   | -15 inHg ... 0 |
| -160 ... 0   | -30 inHg ... 0 |
| -250 ... 0   |                |
| -400 ... 0   |                |
| -600 ... 0   |                |
| -1,000 ... 0 |                |

1) The specified values for overload safety and vacuum resistance are only valid for versions without coating / lining.

2) Specifications for overload safety and vacuum resistance on request.

Other scale ranges on request

| Scale range | Overload safety <sup>1)</sup> | Vacuum-resistant to -1 bar |
|-------------|-------------------------------|----------------------------|
| <b>psi</b>  |                               |                            |
| 0 ... 10    | ■ 50<br>■ 100                 | Selectable                 |
| 0 ... 15    | ■ 75<br>■ 150                 | Selectable                 |
| 0 ... 30    | ■ 150<br>■ 300                | Selectable                 |
| 0 ... 60    | ■ 300<br>■ 600                | Yes                        |
| 0 ... 100   | ■ 500<br>■ 1,000              | Yes                        |
| 0 ... 150   | ■ 750<br>■ 1,500              | Yes                        |
| 0 ... 160   | ■ 800<br>■ 1,600              | Yes                        |
| 0 ... 200   | ■ 1,000<br>■ 2,000            | Yes                        |
| 0 ... 250   | ■ 1,250<br>■ 2,500            | Yes                        |
| 0 ... 300   | ■ 1,500<br>■ 3,000            | Yes                        |
| 0 ... 400   | ■ 2,000<br>■ 4,000            | Yes                        |

## +/- scale ranges <sup>2)</sup>

| Scale range   |                   |
|---------------|-------------------|
| mbar          | bar               |
| -5 ... +20    | -1 ... +0.6       |
| -10 ... +15   | -1 ... +1         |
| -15 ... +25   | -1 ... +1.5       |
| -20 ... +40   | -1 ... +2         |
| -30 ... +30   | -1 ... +3         |
| -40 ... +60   | -1 ... +5         |
| -50 ... +200  | -1 ... +9         |
| -60 ... +100  | -1 ... +10        |
| -100 ... +150 | -1 ... +15        |
| -125 ... +125 | -1 ... +24        |
| -150 ... +250 | <b>psi</b>        |
| -250 ... +750 | -30 inHg ... +15  |
| -400 ... +600 | -30 inHg ... +60  |
| -500 ... +500 | -30 inHg ... +100 |
| -600 ... +400 | -30 inHg ... +160 |
| -750 ... +250 | -30 inHg ... +200 |
| -800 ... +200 | -30 inHg ... +300 |

| Further details on: Scale ranges |  |           |
|----------------------------------|--|-----------|
| <b>Unit</b>                      | <ul style="list-style-type: none"> <li>■ bar</li> <li>■ psi</li> <li>■ mbar</li> <li>■ kg/cm<sup>2</sup></li> <li>■ MPa</li> <li>■ kPa</li> </ul>                                  |           |
|                                  | Other units on request   |           |
| <b>Overload safety</b>           | <ul style="list-style-type: none"> <li>■ 5 x full scale value, max. 40 bar</li> <li>■ 10 x full scale value, max. 40 bar</li> </ul>  |           |
| <b>Vacuum resistance</b>         | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ Vacuum-resistant to -1 bar</li> </ul>  |           |
| <b>Dial</b>                      |  |           |
| Scale layout                     | <ul style="list-style-type: none"> <li>■ Single scale</li> <li>■ Dual scale</li> </ul>   |           |
| Scale colour                     | Single scale   | Black     |
|                                  | Dual scale   | Black/Red |
| Material                         | Aluminium  |           |
| Customer-specific version        | Other scales, e.g. with red mark, circular arcs or circular sectors, on request<br>→ Alternatively, adhesive label set for red and green circular arcs;<br>see data sheet AC 08.03 |           |
| <b>Instrument pointer</b>        | Aluminium, black   |           |
| <b>Set pointer</b>               | Aluminium, red   |           |

| Process connection                             |   |
|--|---|
| <b>Standard</b>                                | <ul style="list-style-type: none"> <li>■ EN 837</li> <li>■ ANSI / ASME B1.20.1</li> <li>■ ASME B16.5</li> <li>■ EN 1092-1, form B</li> </ul>  |
| <b>Size <sup>1)</sup></b>                      |   |
| EN 837   | <ul style="list-style-type: none"> <li>■ G ½ B</li> <li>■ M20 x 1.5</li> </ul>  |
| ANSI / ASME B1.20.1                            | <ul style="list-style-type: none"> <li>■ ½ NPT</li> </ul>   |
| ASME B16.5                                     | <ul style="list-style-type: none"> <li>■ Open connecting flange 1" class 150, RF</li> <li>■ Open connecting flange 2" class 150, RF</li> <li>■ Open connecting flange 1" class 300, RF</li> </ul> |
| EN 1092-1, form B                              | <ul style="list-style-type: none"> <li>■ Open connecting flange DN 25 PN 40</li> <li>■ Open connecting flange DN 50 PN 40</li> </ul>  |
| <b>Materials (wetted)</b>                      |   |
| Diaphragm element                              | <ul style="list-style-type: none"> <li>■ Stainless steel 316L, for span ≤ 0.25 bar</li> <li>■ NiCr alloy (Inconel), for span &gt; 0.25 bar</li> </ul>   |
| Process connection with lower measuring flange | Stainless steel 316L  |
| Coating / Lining <sup>2) 3)</sup>              | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ PTFE</li> <li>■ Hastelloy</li> <li>■ Monel</li> <li>■ Tantalum</li> <li>■ Gold (only for diaphragm element)</li> </ul>                |
|  | Other materials on request  |
| Sealing <sup>4)</sup>                          | FPM/FKM   |

1) Further threaded connections and open connecting flanges per ASME B16.5 / EN 1092-1 form B from DN 15 to DN 80 (→ See data sheet IN 00.10)

2) Diaphragm elements and process connections with lower measuring flanges can be coated / lined with various materials.

→ See page 2

3) Accuracy class 2.5 with selection of a coating / lining.

4) The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

Other process connections on request

| <b>Output signal</b>                    |  |
|---|--|
| <b>Type of contact</b>                  | <ul style="list-style-type: none"> <li>■ Magnetic snap-action contact, model 821 (→ See page 7)</li> <li>■ Inductive contact, model 831 (→ See page 8)</li> <li>■ Electronic contact, model 830 E (→ See page 9)</li> <li>■ Reed switch, model 851 (→ See page 10)</li> </ul>  |
| <b>Switching technology</b>             |  |
| Magnetic snap-action contact, model 821 | <ul style="list-style-type: none"> <li>■ No control unit and no supply voltage required</li> <li>■ Direct switching up to 250 V, 1 A</li> </ul>  |
| Inductive contact, model 831            | <ul style="list-style-type: none"> <li>■ Suitable for use in hazardous areas with corresponding control unit (model 904.xx)</li> <li>■ Long service life due to non-contact sensor</li> <li>■ Low influence on the indication accuracy</li> <li>■ Fail-safe switching at high switching frequency</li> <li>■ Insensitive to corrosion</li> <li>■ Also available in safety version</li> </ul> |
| Electronic contact, model 830 E         | <ul style="list-style-type: none"> <li>■ For direct triggering of a programmable logic controller (PLC)</li> <li>■ Long service life due to non-contact sensor</li> <li>■ Low influence on the indication accuracy</li> <li>■ Fail-safe switching at high switching frequency</li> <li>■ Insensitive to corrosion</li> </ul>   |
| Reed switch, model 851                  | <ul style="list-style-type: none"> <li>■ No control unit and no supply voltage required</li> <li>■ Direct switching up to 250 V, 1 A</li> <li>■ For direct triggering of a programmable logic controller (PLC)</li> <li>■ Free from wear as without contact</li> </ul>   |
| <b>Contact setting</b>                  | <ul style="list-style-type: none"> <li>■ Contact(s) adjustable, adjustment key attached to cable socket</li> <li>■ Contact(s) fixed, without adjustment lock <sup>1)</sup></li> <li>■ Adjustment lock sealable (tamper-proof)</li> <li>■ Adjustment lock sealed (tamper-proof) <sup>1)</sup></li> <li>■ Captive adjustment key with the adjustment lock connected</li> </ul>                 |

1) Specify switch point(s) when ordering.

| Output signal: Magnetic snap-action contact, model 821 |   |
|--|---|
| Type of contact  | Magnetic snap-action contact  |
| Switching technology                                   | <ul style="list-style-type: none"> <li>■ No control unit and no supply voltage required</li> <li>■ Direct switching up to 250 V, 1 A</li> </ul>   |
| <b>Number of switch contacts</b>                       |   |
| Span $\geq$ 25 mbar ... < 40 mbar <sup>1)</sup>        | Max. 2 switch contacts  |
| Span $\geq$ 40 mbar                                    | Max. 4 switch contacts  |
| Switching function                                     | <ul style="list-style-type: none"> <li>■ Separate circuits with <math>\geq</math> 2 switches</li> <li>■ Cable break monitoring with parallel resistance (47 k<math>\Omega</math> or 100 k<math>\Omega</math>)</li> </ul> <p>The switching function of each switch is indicated by index 1, 2 or 3</p> |
| Model 821.1  | Normally open (clockwise pointer motion)  |
| Model 821.2  | Normally closed (clockwise pointer motion)  |
| Model 821.3  | Change-over; one contact breaks and one contact makes simultaneously when pointer reaches set point   |
| Switch point setting                                   | Set pointers of the contact pressure gauges are freely adjustable over the full scale range   |
| Setting range (recommended)                            | 25 ... 75 % of span (0 ... 100 % on request)  |
| Distance between switch points                         | Recommended minimum distance between 2 contacts: 20 % of span   |
| Switch hysteresis                                      | 2 ... 5 % (typical)   |
| Switching current                                      | 0.02 ... 0.3 A (resistive load)<br>Permissible switch-on and switch-off current: $\leq$ 0.5 A   |
| Switching voltage                                      | AC/DC 24 ... 250 V  |
| <b>Switching power</b>                                 |   |
| Unfilled instruments                                   | $\leq$ 30 W, $\leq$ 50 VA   |
| Filled instruments                                     | $\leq$ 20 W, $\leq$ 20 VA   |
| Contact material                                       | Silver-nickel, gold-plated  |

1) For scale range 0 ... 25 mbar and scale range 0 ... 40 mbar with 3 or 4 contacts, accuracy class 2.5 applies

### Recommended contact load

| Switching voltage   | Unfilled instruments |                     |                      | Filled instruments |                     |                      |
|---------------------|----------------------|---------------------|----------------------|--------------------|---------------------|----------------------|
|                     | Resistive load       |                     | Inductive load       | Resistive load     |                     | Inductive load       |
|                     | Direct current       | Alternating current | $\cos \varphi > 0.7$ | Direct current     | Alternating current | $\cos \varphi > 0.7$ |
| DC 220 V / AC 230 V | 100 mA               | 120 mA              | 65 mA                | 65 mA              | 90 mA               | 40 mA                |
| DC 110 V / AC 110 V | 200 mA               | 240 mA              | 130 mA               | 130 mA             | 180 mA              | 85 mA                |
| DC 48 V / AC 48 V   | 300 mA               | 450 mA              | 200 mA               | 190 mA             | 330 mA              | 130 mA               |
| DC 24 V / AC 24 V   | 400 mA               | 600 mA              | 250 mA               | 250 mA             | 450 mA              | 150 mA               |

→ For further information on switch contacts, see data sheet AC 08.01

| Output signal: Inductive contact, model 831              |  |
|--|--|
| Type of contact  | Inductive contact  |
| Switching technology                                     | <ul style="list-style-type: none"> <li>■ Suitable for use in hazardous areas with corresponding control unit (model 904.xx)</li> <li>■ Long service life due to non-contact sensor</li> <li>■ Low influence on the indication accuracy</li> <li>■ Fail-safe switching at high switching frequency</li> <li>■ Insensitive to corrosion</li> <li>■ Also available in safety version</li> </ul> |
| <b>Number of switch contacts</b>                         |  |
| Span $\geq$ 25 mbar <sup>1)</sup>                        | Max. 3 switch contacts   |
| Switching function                                       | Contact versions: <ul style="list-style-type: none"> <li>■ 831-N</li> <li>■ 831-SN, safety version <sup>2)</sup></li> <li>■ 831-S1N, safety version <sup>2)</sup>, inverted signal</li> </ul> The switching function of each switch is indicated by index 1 or 2   |
| Model 831.1  | Normally open (clockwise pointer motion)   |
| Model 831.2  | Normally closed (clockwise pointer motion)   |
| Switch point setting                                     | Set pointers of the contact pressure gauges are freely adjustable over the full scale range  |
| Setting range (recommended)                              | 10 ... 90 % of span (0 ... 100 % on request)   |
| Distance between switch points                           | Up to 2 contacts can be set to an identical set point. For a version with 3 contacts this is not possible. The left (no. 1) or right (no. 3) contact may not be set to the same set point as the other 2 contacts. The required displacement is approx. 30°, optionally to the right or to the left.   |
| Switching current  | Depending on the isolating amplifier/control unit used (→ See data sheet AC 08.01)   |
| Switching voltage  | Depending on the isolating amplifier/control unit used (→ See data sheet AC 08.01)   |
| Switching power  | Depending on the isolating amplifier/control unit used (→ See data sheet AC 08.01)   |
| <b>Permissible temperature ranges in hazardous areas</b> |  |
| T6   | -20 ... +60 °C   |
| T5 ... T1  | -20 ... +70 °C   |
| T135°C   | -20 ... +70 °C   |

1) For scale range 0 ... 25 mbar, accuracy class 2.5 applies

2) Only operate with a corresponding isolating amplifier (model 904.3x)

### Associated isolating amplifiers/control units

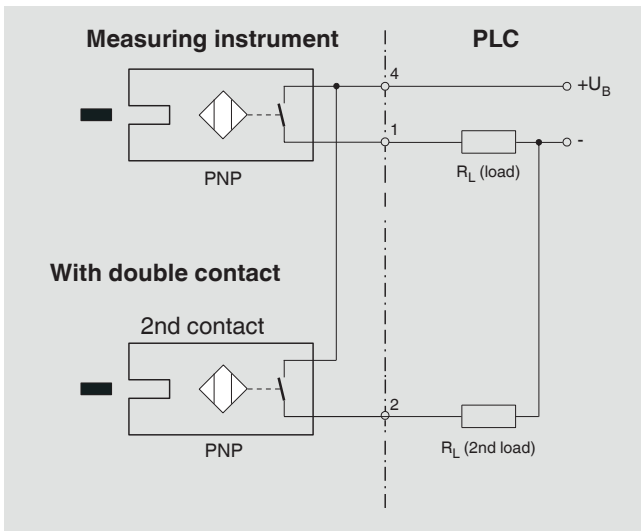
| Model                     | Version           | Ex version           |
|---------------------------|-------------------|----------------------|
| 904.28 KFA6 - SR2 - Ex1.W | 1 contact         | Yes                  |
| 904.29 KFA6 - SR2 - Ex2.W | 2 contacts        | Yes                  |
| 904.30 KHA6 - SH - Ex1    | 1 contact         | Yes - Safety version |
| 904.33 KFD2 - SH - Ex1    | 1 contact         | Yes - Safety version |
| 904.25 MSR 010-I          | 1 contact         | No                   |
| 904.26 MSR 020-I          | 2 contacts        | No                   |
| 904.27 MSR 011-I          | Two-point control | No                   |

→ For further information on switch contacts, see data sheet AC 08.01

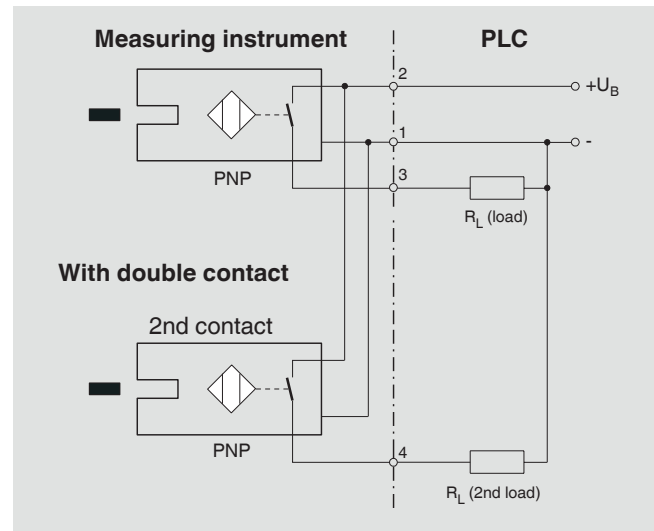


| Output signal: Electronic contact, model 830 E |  |
|--|--|
| Type of contact                                | Electronic contact (PNP transistor)  |
| Switching technology                           | <ul style="list-style-type: none"> <li>■ For direct triggering of a programmable logic controller (PLC)</li> <li>■ Long service life due to non-contact sensor</li> <li>■ Low influence on the indication accuracy</li> <li>■ Fail-safe switching at high switching frequency</li> <li>■ Insensitive to corrosion</li> </ul> |
| <b>Number of switch contacts</b>               |  |
| Span $\geq 25$ mbar <sup>1)</sup>              | Max. 3 switch contacts   |
| Switching function                             | Contact versions: <ul style="list-style-type: none"> <li>■ 2-wire system</li> <li>■ 3-wire system</li> </ul> The switching function of each switch is indicated by index 1 or 2  |
| Model 830 E.1                                  | Normally open (clockwise pointer motion)   |
| Model 830 E.2                                  | Normally closed (clockwise pointer motion)   |
| Setting range (recommended)                    | 10 ... 90 % of span (0 ... 100 % on request)   |
| Distance between switch points                 | Up to 2 contacts can be set to an identical set point. For a version with 3 contacts this is not possible. The left (no. 1) or right (no. 3) contact may not be set to the same set point as the other 2 contacts. The required displacement is approx. 30°, optionally to the right or to the left.                         |
| Switching current                              | $\leq 100$ mA  |
| Switching voltage                              | DC 10 ... 30 V   |

### 2-wire system



### 3-wire system



→ For further information on switch contacts, see data sheet AC 08.01

| Output signal: Reed switch, model 851       |   |
|---|---|
| <b>Type of contact</b> <sup>1) 2)</sup>     | Bistable reed switch  |
| <b>Switching technology</b>                 | <ul style="list-style-type: none"> <li>■ No control unit and no supply voltage required</li> <li>■ Direct switching up to 250 V, 1 A</li> <li>■ For direct triggering of a programmable logic controller (PLC)</li> <li>■ Free from wear as without contact</li> </ul>                                |
| <b>Number of switch contacts</b>            |   |
| NS 100                                      | Max. 2 switch contacts  |
| NS 160 <sup>3)</sup>                        | 1 switch contact  |
| <b>Switching function</b>                   | <ul style="list-style-type: none"> <li>■ Separate circuits with <math>\geq 2</math> switches</li> <li>■ Cable break monitoring with parallel resistance (47 k<math>\Omega</math> or 100 k<math>\Omega</math>)</li> </ul> <p>The switching function of each switch is indicated by index 1, 2 or 3</p> |
| Model 851.1                                 | Normally open (clockwise pointer motion)  |
| Model 851.2                                 | Normally closed (clockwise pointer motion)  |
| Model 851.3                                 | Change-over; one contact breaks and one contact makes simultaneously when pointer reaches set point   |
| <b>Switch point setting</b>                 | Set pointers of the contact pressure gauges are freely adjustable over the full scale range   |
| <b>Setting range (recommended)</b>          | 10 ... 90 % of span   |
| <b>Distance between switch points</b>       | When using two contacts, these cannot be set to the same point. Depending on the switching function, a minimum clearance of 15 ... 30° is required.   |
| <b>Switch hysteresis</b>                    | 3 ... 5 %   |
| <b>Switching current</b>                    | $\leq$ AC/DC 1 A  |
| <b>Switching voltage</b>                    | $\leq$ AC/DC 250 V  |
| <b>Switching power</b>                      | $\leq$ 60 W, 60 VA  |
| <b>Contact material</b>                     | Rhodium   |
| <b>Transport current</b>                    | AC/DC 2 A   |
| <b>Inductive load cos <math>\phi</math></b> | 1   |
| <b>Contact resistance (static)</b>          | 100 m $\Omega$  |
| <b>Insulation resistance</b>                | 109 $\Omega$  |
| <b>Breakdown voltage</b>                    | DC 1,000 V  |
| <b>Switching time incl. contact chatter</b> | 4.5 ms  |

1) For scale range 0 ... 25 mbar, accuracy class 2.5 applies

2) For NS 100, the case conforms to the safety level "S3" in accordance with EN 837

3) For switching voltages AC < 50 V and DC < 75 V, switch contact not adjustable from outside

→ For further information on switch contacts, see data sheet AC 08.01

| Electrical connection |  |
|-----------------------|--|
| Connection type       | <ul style="list-style-type: none"> <li>■ Cable socket, black<br/>Per VDE 0110 insulation group C/250 V<br/>Cable gland M20 x 1.5</li> <li>■ Connector (instead of cable socket)</li> </ul> |
| Wire cross-section    | 6 screw terminals + PE for 2.5 mm <sup>2</sup>   |
| Cable diameter        | → See dimensions   |
| Pin assignment        | Connection details are given on the product label of the instrument. Connection terminals and ground terminals are appropriately marked.   |
| Material              | PA 6 (polyamide)   |

| Operating conditions                |   |
|-------------------------------------|---|
| Medium temperature range            | <ul style="list-style-type: none"> <li>■ +100 °C [+212 °F] maximum</li> <li>■ +200 °C [+392 °F] maximum</li> </ul>                                    |
| Ambient temperature range           | -20 ... +60 °C [-4 ... 140 °F]  |
| Storage temperature range           | -20 ... +60 °C [-4 ... 140 °F]  |
| <b>Pressure limitation</b>          |   |
| Steady                              | Full scale value  |
| Fluctuating                         | 0.9 x full scale value  |
| Ingress protection per IEC/EN 60529 | <ul style="list-style-type: none"> <li>■ IP54</li> <li>■ IP65 <sup>1)</sup></li> <li>■ IP66 <sup>2)</sup> (ingress protection of the case)</li> </ul> |

- 1) Ingress protection IP65 for instruments with case filling  
2) Hermetically sealed case; see data sheet IN 00.18


For hazardous areas, the permissible temperature of the contact model 831 will exclusively apply (see page 8). These must not be exceeded at the instrument either (for details, see operating instructions). If necessary, measures for cooling (e.g. syphon, instrumentation valve, etc.) have to be taken.

## Other versions














- Oil- and grease-free
- For oxygen, oil- and grease-free
- Silicone-free
- Per NACE <sup>1)</sup> MR 0175 / ISO 15156, use in H<sub>2</sub>S-containing environments in oil and gas production
- Per NACE <sup>1)</sup> MR 0103 / ISO 17945, metals resistant to sulfide stress cracking
- With pre-volume deflagration flame arrester <sup>1)</sup> for connection to zone 0 (EPL Ga); model 910.21; see data sheet AC 91.02

- 1) General information about NACE standards; see data sheet IN 00.21  
2) Only for instruments with Ex approval

## Approvals

| Logo  | Description   | Region         |
|---|---|----------------|
|  | <b>EU declaration of conformity</b>                           | European Union |
|   | EMC directive   |                |
|   | Low voltage directive   |                |
|   | RoHS directive  |                |
| -   | <b>CRN</b><br>Safety (e.g. electr. safety, overpressure, ...) | Canada         |

## Optional approvals

| Logo   | Description   | Region                      |
|--|---|-----------------------------|
| <br> | <b>EU declaration of conformity</b>   | European Union              |
|  | ATEX directive <sup>1)</sup><br>Hazardous areas<br>Without coating / lining from PTFE<br>Gas II 2G Ex ia IIC T6/T5/T4 Gb<br>Dust II 2D Ex ia IIIB T135°C Db<br>With coating / lining from PTFE<br>Gas II 2G Ex ia IIC T6/T5/T4 Gb <sup>2)</sup> |                             |
| <br> | <b>IECEx</b> <sup>1)</sup><br>Hazardous areas<br>Without coating / lining from PTFE<br>Gas Ex ia IIC T6/T5/T4 Gb<br>Dust Ex ia IIIB T135°C Db<br>With coating / lining from PTFE<br>Gas Ex ia IIC T6/T5/T4 Gb <sup>2)</sup>                     | International               |
| <br> | <b>EAC</b>  | Eurasian Economic Community |
|  | EMC directive   |                             |
|  | Low voltage directive   |                             |
|  | Hazardous areas <sup>1)</sup>   |                             |
|   | <b>Ex Ukraine</b><br>Hazardous areas <sup>1)</sup>  | Ukraine                     |
|   | <b>NEPSI</b><br>Hazardous areas <sup>1)</sup>   | China                       |
|   | <b>PAC Russia</b><br>Metrology, measurement technology  | Russia                      |
|   | <b>PAC Kazakhstan</b><br>Metrology, measurement technology  | Kazakhstan                  |
| -  | <b>MChS</b><br>Permission for commissioning   | Kazakhstan                  |
|   | <b>PAC Belarus</b><br>Metrology, measurement technology   | Belarus                     |
|   | <b>PAC Ukraine</b><br>Metrology, measurement technology   | Ukraine                     |
|   | <b>PAC Uzbekistan</b><br>Metrology, measurement technology  | Uzbekistan                  |

1) Only for instruments with inductive contact model 831

2) In the area of the coating / lining from PTFE, measures must be taken, if necessary, in order to exclude electrostatic charging.

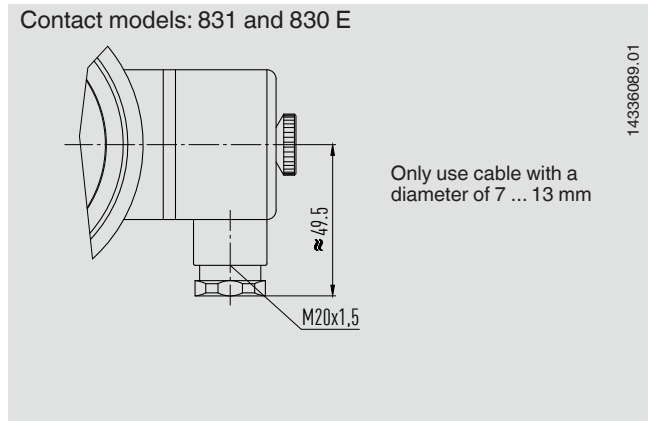
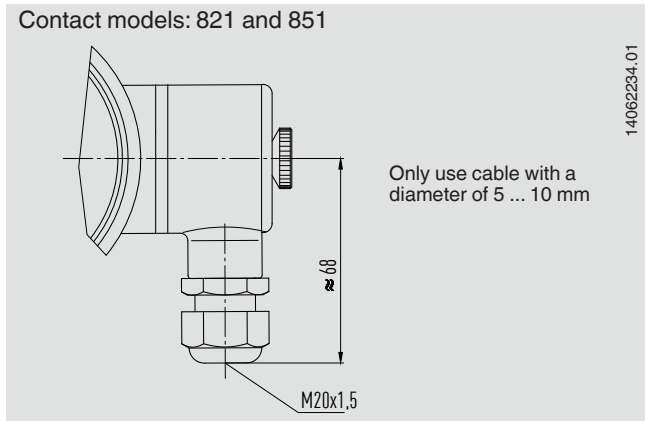
## Certificates (option)

| Certificates                              |   |
|---|---|
| <b>Certificates</b>                       | <ul style="list-style-type: none"> <li>■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)</li> <li>■ 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)</li> </ul> |
| <b>Recommended recalibration interval</b> | 1 year (dependent on conditions of use)   |

Approvals and certificates, see website

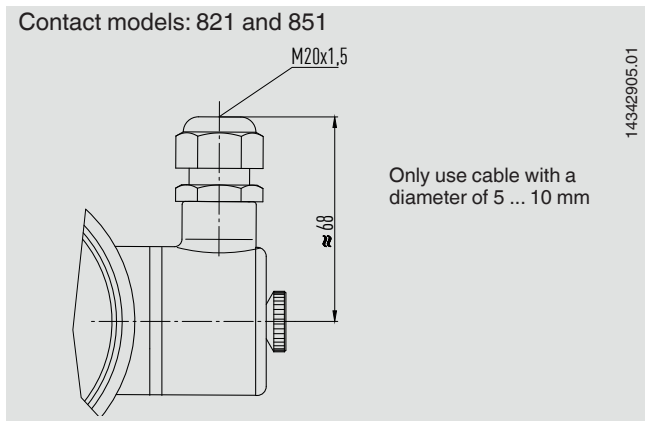
# Dimensions in mm

## Standard cable socket

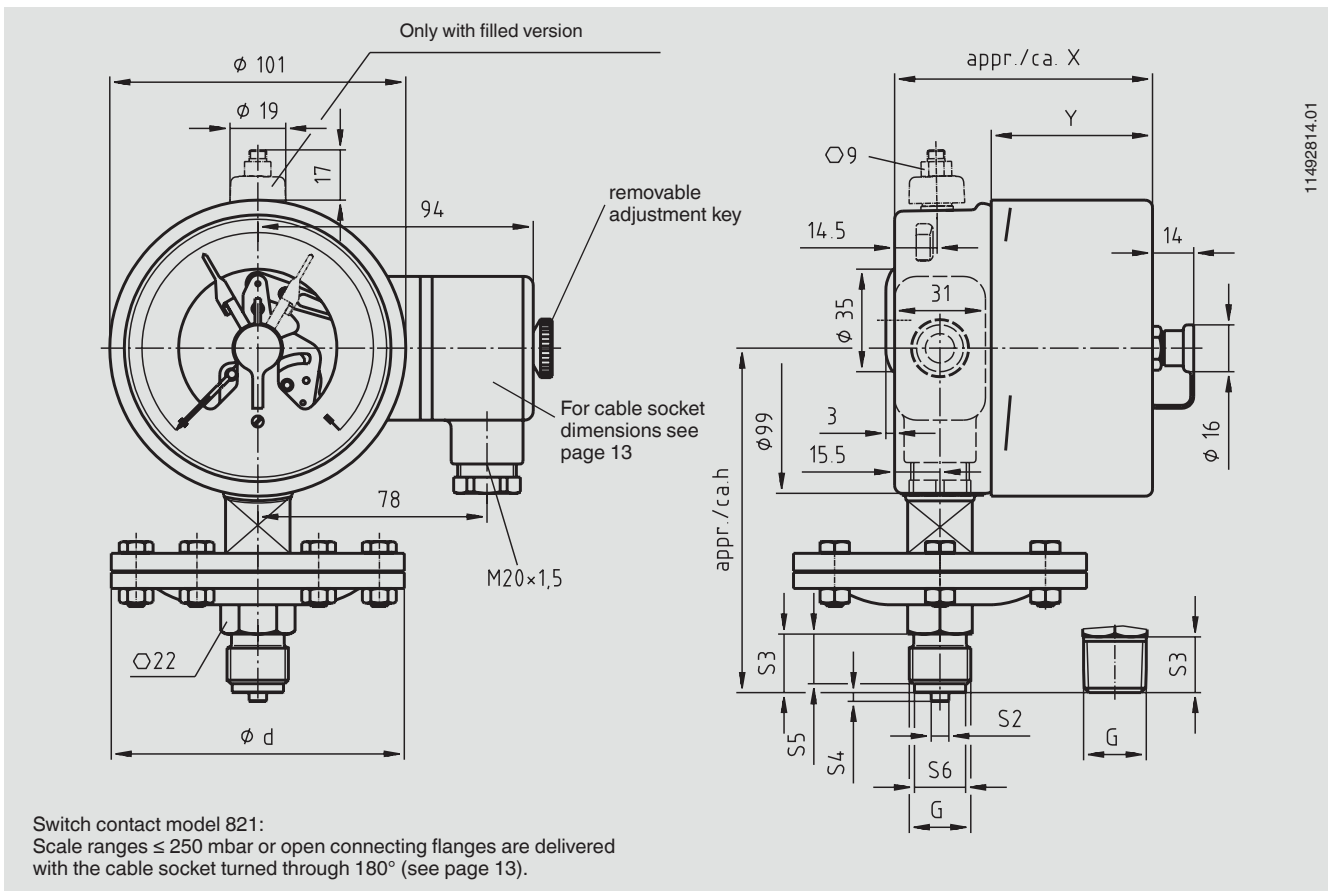


NS 100 instruments with contact models 821 or 851 are delivered with the cable socket turned through 180° for measuring ranges ≤ 250 mbar or for process connections with open connecting flanges.

## Cable socket, turned through 180°



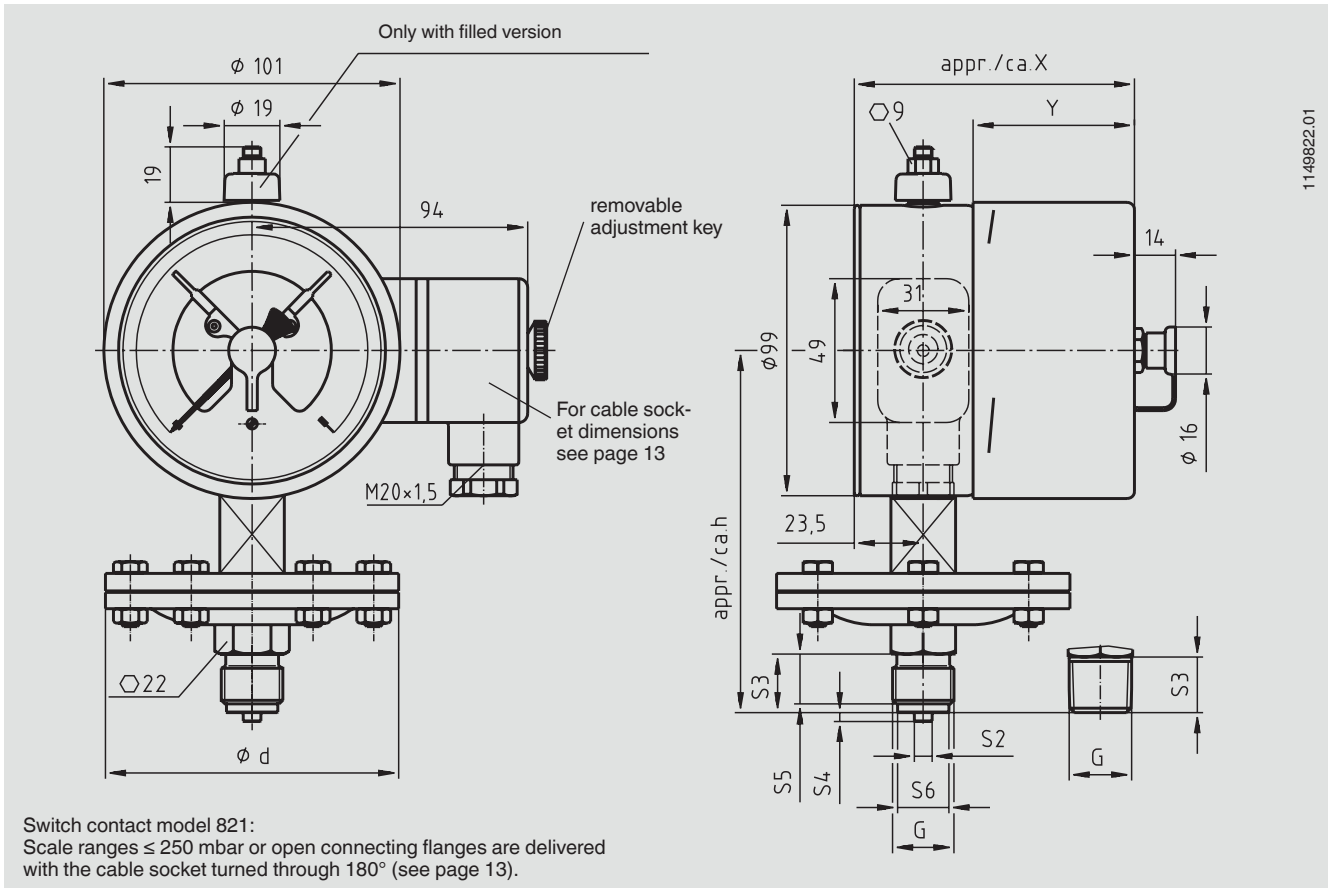
switchGAUGE model PGS43.100, safety level "S1", with switch contact model 821, 831 or 830 E



| Process connection G | Scale range     | Dimensions in mm |     |                 |    |    |    |                    |
|----------------------|-----------------|------------------|-----|-----------------|----|----|----|--------------------|
|                      |                 | $\varnothing d$  | h   | S2              | S3 | S4 | S5 | S6                 |
| G 1/2 B              | $\leq 250$ mbar | 160              | 119 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| G 1/2 B              | $> 250$ mbar    | 100              | 117 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| 1/2 NPT              | $\leq 250$ mbar | 160              | 118 | -               | 19 | -  | -  | -                  |
| 1/2 NPT              | $> 250$ mbar    | 100              | 116 | -               | 19 | -  | -  | -                  |

| Type of contact              | Dimensions in mm |    |
|------------------------------|------------------|----|
|                              | X                | Y  |
| Single or double contact     | 88               | 55 |
| Double (change-over) contact | 113              | 80 |
| Triple contact               | 96               | 63 |
| Quadruple contact            | 113              | 80 |

switchGAUGE model PGS43.100, safety level "S3", with switch contact model 821, 831 or 830 E

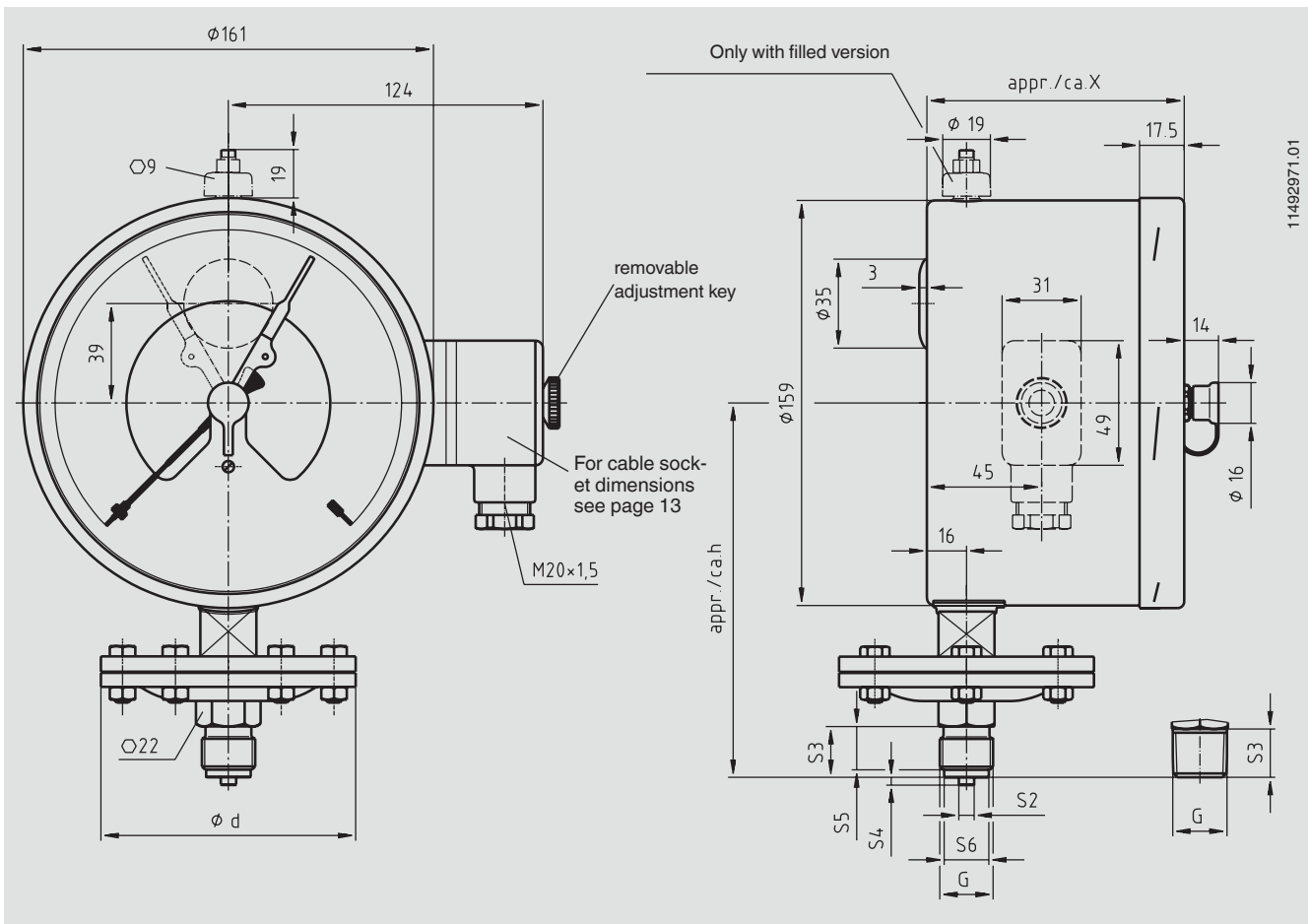


1149822.01

| Process connection G | Scale range | Dimensions in mm |     |     |    |    |    |        |
|----------------------|-------------|------------------|-----|-----|----|----|----|--------|
|                      |             | Ø d              | h   | S2  | S3 | S4 | S5 | S6     |
| G ½ B                | ≤ 250 mbar  | 160              | 119 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| G ½ B                | > 250 mbar  | 100              | 117 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| ½ NPT                | ≤ 250 mbar  | 160              | 118 | -   | 19 | -  | -  | -      |
| ½ NPT                | > 250 mbar  | 100              | 116 | -   | 19 | -  | -  | -      |

| Type of contact              | Dimensions in mm |    |
|------------------------------|------------------|----|
|                              | X                | Y  |
| Single or double contact     | 88               | 55 |
| Double (change-over) contact | 113              | 80 |
| Triple contact               | 96               | 63 |
| Quadruple contact            | 113              | 80 |

switchGAUGE model PGS43.160, safety level "S1", with switch contact model 821, 831 or 830 E

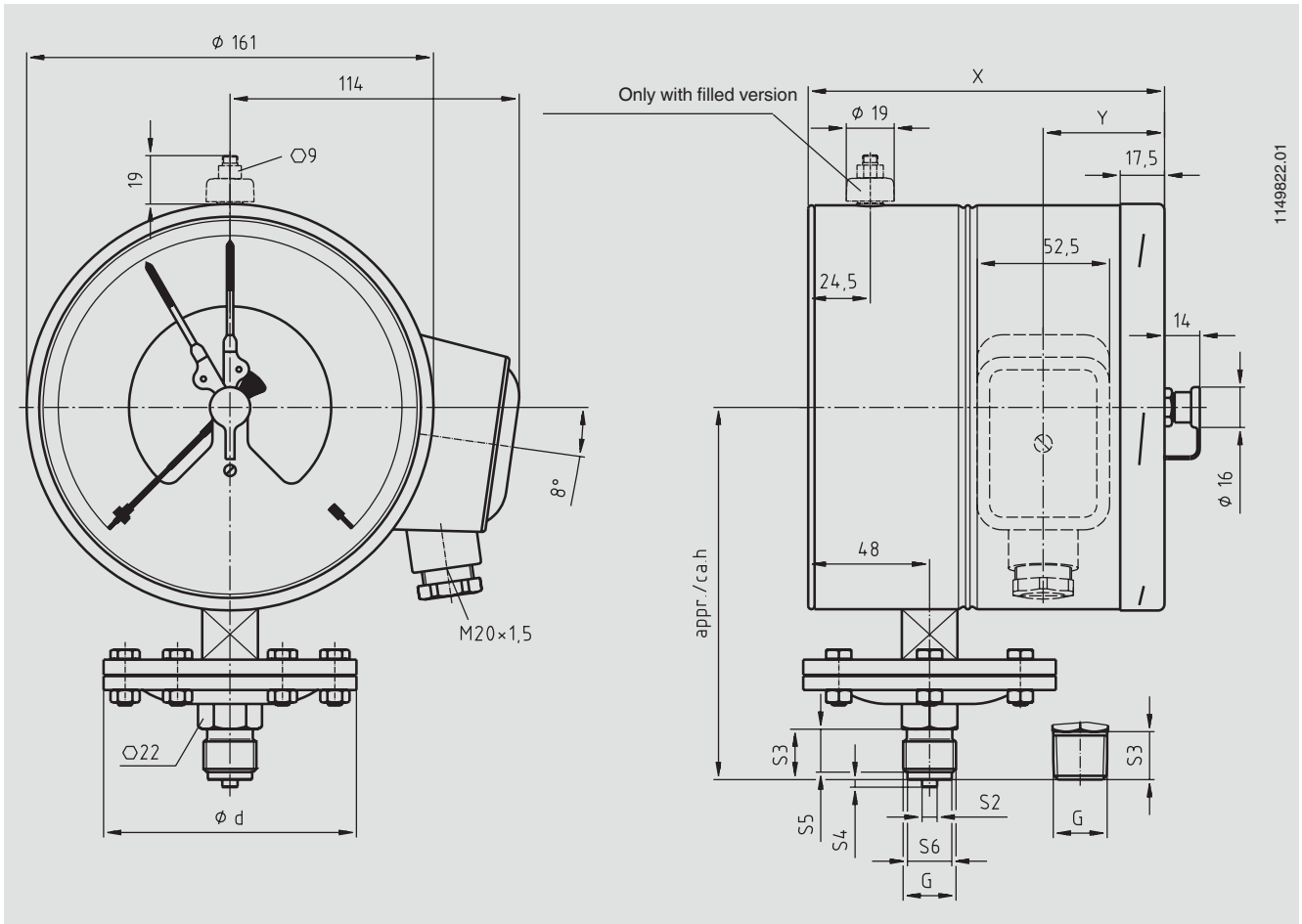


| Process connection G | Scale range | Dimensions in mm |     |     |    |    |    |        |
|----------------------|-------------|------------------|-----|-----|----|----|----|--------|
|                      |             | Ø d              | h   | S2  | S3 | S4 | S5 | S6     |
| G ½ B                | ≤ 250 mbar  | 160              | 149 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| G ½ B                | > 250 mbar  | 100              | 147 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| ½ NPT                | ≤ 250 mbar  | 160              | 148 | -   | 19 | -  | -  | -      |
| ½ NPT                | > 250 mbar  | 100              | 146 | -   | 19 | -  | -  | -      |

| Type of contact              | Dimensions in mm |
|------------------------------|------------------|
|                              | X                |
| Single or double contact     | 102              |
| Double (change-over) contact | 116              |
| Triple contact               | 102              |
| Quadruple contact            | 116              |



switchGAUGE model PGS43.160, safety level "S3", with switch contact model 821, 831 or 830 E

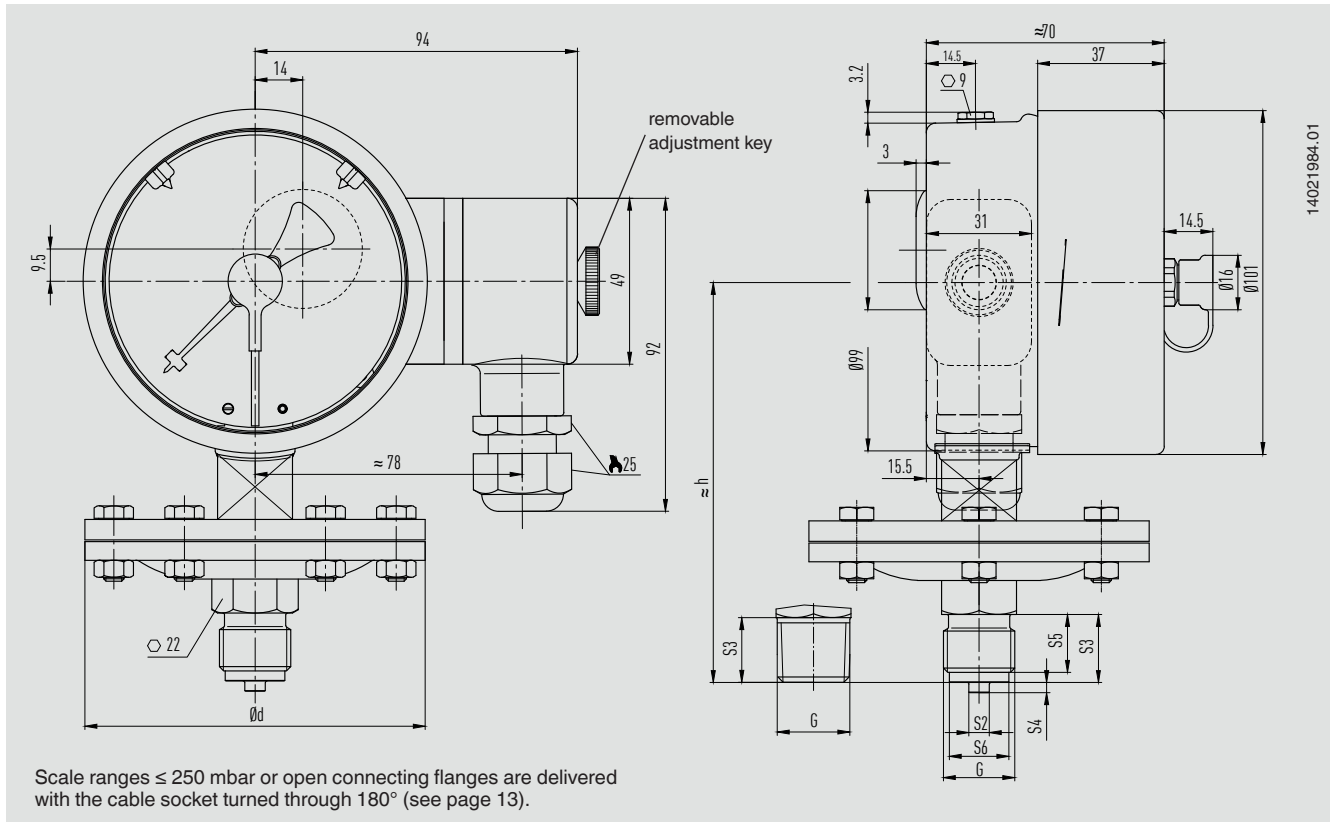


1149822.01

| Process connection G | Scale range | Dimensions in mm |     |     |    |    |    |        |
|----------------------|-------------|------------------|-----|-----|----|----|----|--------|
|                      |             | Ø d              | h   | S2  | S3 | S4 | S5 | S6     |
| G ½ B                | ≤ 250 mbar  | 160              | 149 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| G ½ B                | > 250 mbar  | 100              | 147 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| ½ NPT                | ≤ 250 mbar  | 160              | 148 | -   | 19 | -  | -  | -      |
| ½ NPT                | > 250 mbar  | 100              | 146 | -   | 19 | -  | -  | -      |

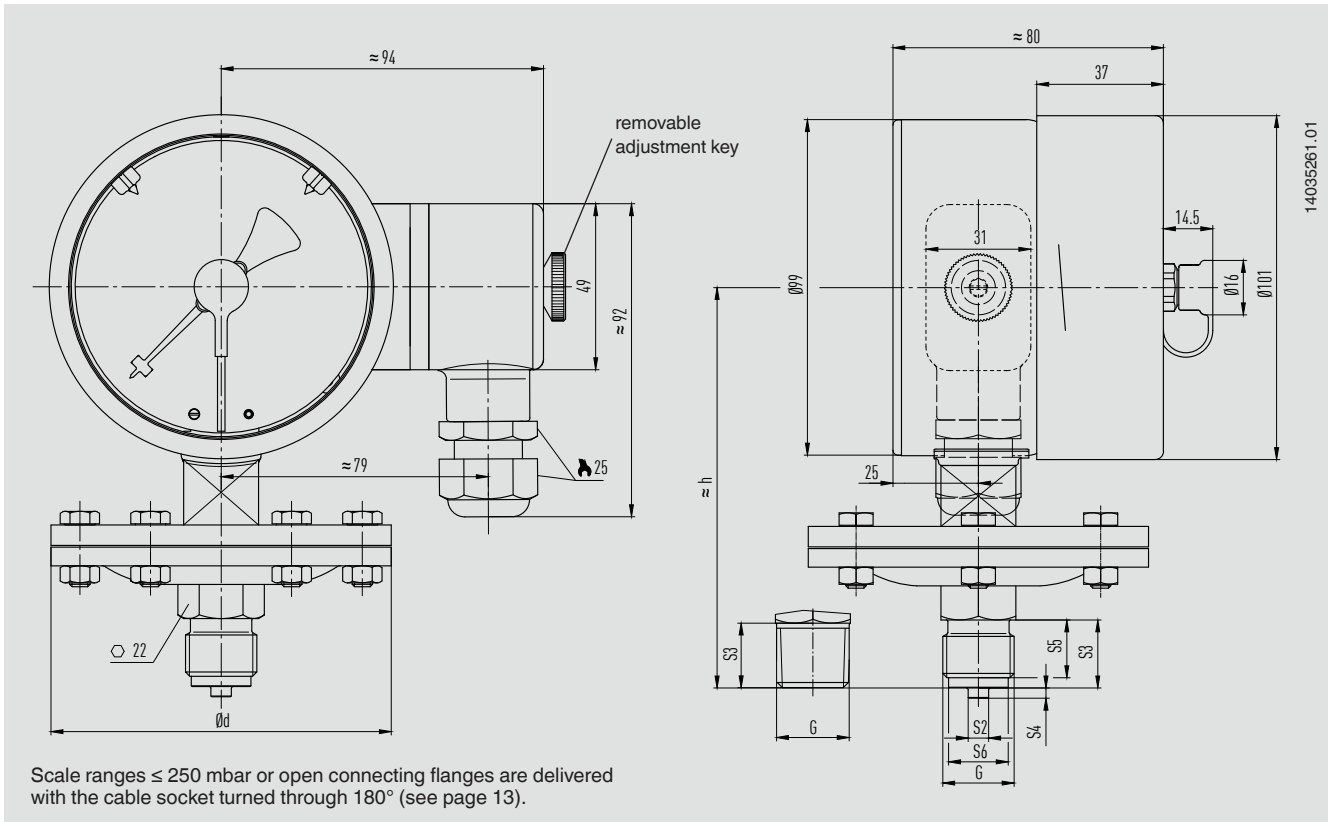
| Type of contact          | Dimensions in mm |      |
|--------------------------|------------------|------|
|                          | X                | Y    |
| Single or double contact | 141              | 48   |
| Triple contact           | 153.5            | 60.5 |

switchGAUGE model PGS43.100, safety level "S1", with switch contact model 851.3 or 851.33



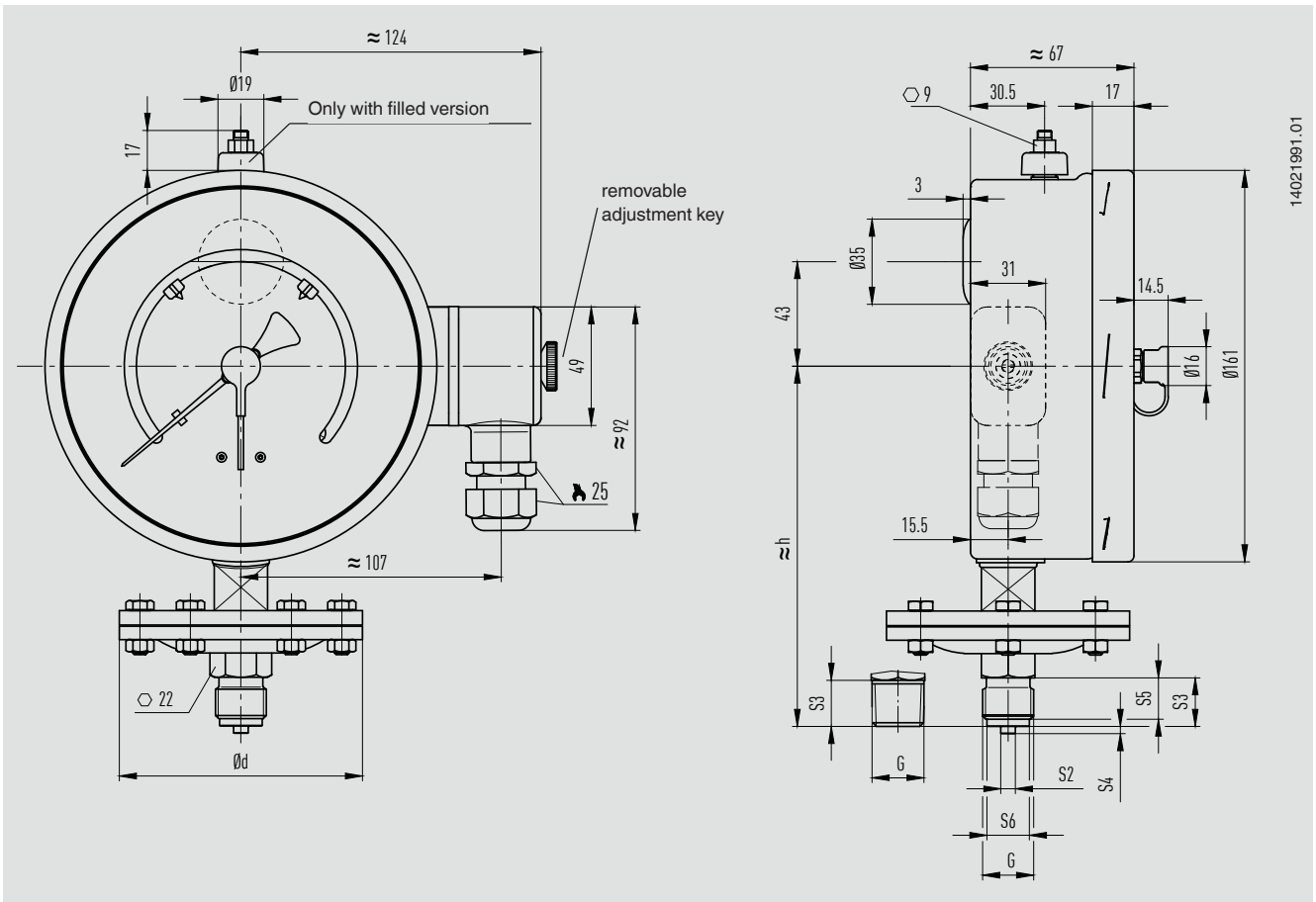
| Process connection G | Scale range     | Dimensions in mm |     |                 |    |    |    |                    |
|----------------------|-----------------|------------------|-----|-----------------|----|----|----|--------------------|
|                      |                 | $\varnothing d$  | h   | S2              | S3 | S4 | S5 | S6                 |
| G 1/2 B              | $\leq 250$ mbar | 160              | 119 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| G 1/2 B              | $> 250$ mbar    | 100              | 117 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| 1/2 NPT              | $\leq 250$ mbar | 160              | 118 | -               | 19 | -  | -  | -                  |
| 1/2 NPT              | $> 250$ mbar    | 100              | 116 | -               | 19 | -  | -  | -                  |

switchGAUGE model PGS43.100, safety level "S3", with switch contact model 851.3 or 851.33



| Process connection G | Scale range     | Dimensions in mm |     |                 |    |    |    |                    |
|----------------------|-----------------|------------------|-----|-----------------|----|----|----|--------------------|
|                      |                 | $\varnothing d$  | h   | S2              | S3 | S4 | S5 | S6                 |
| G ½ B                | $\leq 250$ mbar | 160              | 119 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| G ½ B                | $> 250$ mbar    | 100              | 117 | $\varnothing 6$ | 20 | 3  | 17 | $\varnothing 17.5$ |
| ½ NPT                | $\leq 250$ mbar | 160              | 118 | -               | 19 | -  | -  | -                  |
| ½ NPT                | $> 250$ mbar    | 100              | 116 | -               | 19 | -  | -  | -                  |

switchGAUGE model PGS43.160, safety level "S1", with switch contact model 851.3 or 851.33



| Process connection G | Scale range | Dimensions in mm |     |     |    |    |    |        |
|----------------------|-------------|------------------|-----|-----|----|----|----|--------|
|                      |             | Ø d              | h   | S2  | S3 | S4 | S5 | S6     |
| G ½ B                | ≤ 250 mbar  | 160              | 149 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| G ½ B                | > 250 mbar  | 100              | 147 | Ø 6 | 20 | 3  | 17 | Ø 17.5 |
| ½ NPT                | ≤ 250 mbar  | 160              | 148 | -   | 19 | -  | -  | -      |
| ½ NPT                | > 250 mbar  | 100              | 146 | -   | 19 | -  | -  | -      |

## Accessories and spare parts

| Model  | Description  | Data sheet |
|--------|--|------------|
| 910.33 | Adhesive label set for red and green circular arcs | AC 08.03   |
| 910.17 | Sealings   | AC 09.08   |
| 910.15 | Syphons  | AC 09.06   |
| 910.32 | Cooling element                                    | AC 09.21   |
| IV20   | Block-and-bleed valve, 2-valve, square version     | AC 09.19   |
| IV21   | Block-and-bleed valve, 2-valve, flat form          | AC 09.19   |

### Ordering information

Model / Nominal size / Contact model / Contact version / Scale range / Connection location / Process connection / Options

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