

# Bourdon tube pressure gauge with switch contacts

## For the process industry, NS 63 [2 ½"]

### Models PGS23.063 and PGS26.063

WIKA data sheet PV 22.03



For further approvals,  
see page 11

**switchGAUGE**

#### Applications

- Control and regulation of processes
- Monitoring of plants and switching of circuits
- For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments
- Chemical industry, petrochemical industry, power plants, mining, on-/offshore, environmental technology, machine building and general plant construction

#### Special features

- Up to 2 switch contacts per instrument
- Instruments with inductive contacts for use in hazardous areas
- Instruments with contacts for PLC applications
- Safety version with solid baffle wall (Solidfront)



**Model PGS23.063 with switch contact model 830 E.21**

#### Description

Wherever the process pressure has to be indicated locally and, at the same time, circuits need to be switched, this 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.

Switch contacts consisting of 2 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 all requirements of the relevant international standards and regulations for the on-site indication 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.

## Specifications

Basic information	
<b>Standard</b>	
Bourdon tube pressure gauges	<ul style="list-style-type: none"> <li>■ EN 837-1</li> <li>■ ASME B40.100</li> </ul>
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>Further version</b>	<ul style="list-style-type: none"> <li>■ Oil- and grease-free</li> <li>■ For oxygen, oil- and grease-free</li> <li>■ Silicone-free</li> <li>■ Per NACE <sup>1)</sup> MR0175 / ISO 15156, use in H<sub>2</sub>S-containing environments in oil and gas production</li> <li>■ Per NACE <sup>1)</sup> MR0103 / ISO 17945, metals resistant to sulphide stress cracking</li> <li>■ With pre-volume deflagration flame arrester <sup>2)</sup> for mounting to zone 0 (EPL Ga); model 910.21, see data sheet AC 91.02</li> </ul>
<b>Nominal size (NS)</b>	Ø 63 mm [2 ½"]
<b>Connection location</b>	<ul style="list-style-type: none"> <li>■ Lower mount (radial)</li> <li>■ Lower back mount</li> </ul>
<b>Window</b>	<ul style="list-style-type: none"> <li>■ Polycarbonate</li> <li>■ Laminated safety glass</li> </ul>
<b>Case</b>	
Design	Safety level “S3” per EN 837-1: with solid baffle wall and blow-out back
Material	<ul style="list-style-type: none"> <li>■ Stainless steel 1.4301 (304)</li> <li>■ Stainless steel 1.4571 (316 Ti)</li> </ul>
<b>Ring</b>	Bayonet ring, stainless steel
<b>Mounting</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Panel mounting flange, polished stainless steel</li> <li>■ Surface mounting lugs on the back, stainless steel</li> </ul>
<b>Movement</b>	Stainless steel

1) For general information about NACE standards see technical information IN 00.21

2) Only for instruments with Ex approval

Measuring element	
<b>Type of measuring element</b>	Bourdon tube, C-type or helical type
<b>Material</b>	
Model PGS23	Stainless steel 1.4404 (316L)
Model PGS26	Monel 400 (2.4360)
<b>Leak tightness</b>	<ul style="list-style-type: none"> <li>■ Helium tested, leakage rate: &lt; 5 · 10<sup>-3</sup> mbar l/s</li> <li>■ Helium tested, leakage rate: &lt; 1 · 10<sup>-6</sup> mbar l/s</li> </ul>

Accuracy specifications	
<b>Accuracy class</b>	
EN 837-1	Class 1.6
ASME B40.100	±2 %   ±1 %   ±2 % of measuring span (grade A)
<b>Temperature error</b>	On deviation from the reference conditions at the measuring system: ≤ ±0.4 % per 10 °C [18 °F] of full scale value
<b>Switch hysteresis</b>	Depending on the type of contact used, see page 5
<b>Reference conditions</b>	
Ambient temperature	+20 °C [+68 °F]

## Scale ranges

bar	
0 ... 4	0 ... 60
0 ... 6	0 ... 70
0 ... 7	0 ... 100
0 ... 10	0 ... 140
0 ... 14	0 ... 160
0 ... 16	0 ... 200
0 ... 20	0 ... 250
0 ... 25	0 ... 315
0 ... 30	0 ... 400
0 ... 40	-

kPa	
0 ... 400	0 ... 6,000
0 ... 600	0 ... 7,000
0 ... 700	0 ... 8,000
0 ... 800	0 ... 10,000
0 ... 1,000	0 ... 14,000
0 ... 1,400	0 ... 16,000
0 ... 1,600	0 ... 20,000
0 ... 2,500	0 ... 25,000
0 ... 3,000	0 ... 31,500
0 ... 4,000	0 ... 40,000

psi	
0 ... 60	0 ... 600
0 ... 100	0 ... 800
0 ... 150	0 ... 1,000
0 ... 160	0 ... 1,500
0 ... 200	0 ... 2,000
0 ... 250	0 ... 3,000
0 ... 300	0 ... 4,000
0 ... 400	0 ... 5,000
0 ... 500	0 ... 6,000

kg/cm <sup>2</sup>	
0 ... 4	0 ... 60
0 ... 6	0 ... 70
0 ... 7	0 ... 100
0 ... 10	0 ... 140
0 ... 14	0 ... 160
0 ... 16	0 ... 200
0 ... 20	0 ... 250
0 ... 25	0 ... 315
0 ... 30	0 ... 400
0 ... 40	-

MPa	
0 ... 0.4	0 ... 7
0 ... 0.6	0 ... 7
0 ... 0.7	0 ... 10
0 ... 1	0 ... 14
0 ... 1.4	0 ... 16
0 ... 1.6	0 ... 20
0 ... 2	0 ... 25
0 ... 2.5	0 ... 31.5
0 ... 3	0 ... 40
0 ... 4	-

## Vacuum and compound scale ranges

bar	
-1 ... +3	-1 ... +10
-1 ... +4	-1 ... +15
-1 ... +5	-1 ... +24
-1 ... +7	-1 ... +30
-1 ... +9	-

kg/cm <sup>2</sup>	
-1 ... +3	-1 ... +10
-1 ... +4	-1 ... +15
-1 ... +5	-1 ... +24
-1 ... +7	-1 ... +30
-1 ... +9	-

kPa	
-100 ... +300	-100 ... +1,000
-100 ... +400	-100 ... +1,500
-100 ... +500	-100 ... +2,400
-100 ... +700	-100 ... +3,000
-100 ... +900	-

MPa	
-0.1 ... +0.3	-0.1 ... +1
-0.1 ... +0.4	-0.1 ... +1.5
-0.1 ... +0.5	-0.1 ... +2.4
-0.1 ... +0.7	-0.1 ... +3
-0.1 ... +0.9	-

psi	
-30 inHg ... +60	-30 inHg ... +200
-30 inHg ... +100	-30 inHg ... +300
-30 inHg ... +160	-

Further details on: scale ranges	
<b>Special scale ranges</b>	Other scale ranges on request
<b>Unit</b>	<ul style="list-style-type: none"> <li>■ bar</li> <li>■ psi</li> <li>■ kg/cm<sup>2</sup></li> <li>■ kPa</li> <li>■ MPa</li> </ul>
<b>Increased overload safety</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ 2 times</li> </ul> <p>The possibility of selection depends on scale range</p>
<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 colour	Black
Material	Aluminium
Special scale	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ With temperature scale for refrigerant, e.g. for NH<sub>3</sub>: R 717</li> </ul> <p>Other scales, e.g. with red mark, circular arcs or circular sectors, on request → Alternatively, adhesive label set for red and green circular arcs, see data sheet AC 08.03</p>
<b>Pointer</b>	
Instrument pointer	Aluminium, black
Set pointer	Aluminium, red

Process connection		
Standard	<div><div></div> EN 837-1</div> <div><div></div> ISO 7</div> <div><div></div> ANSI/B1.20.1</div>	
Size		
EN 837-1	<div><div></div> G ¼ B, male thread</div> <div><div></div> G ½ B, male thread</div>	
ISO 7	<div><div></div> R ¼, male thread</div> <div><div></div> R ½, male thread</div>	
ANSI/B1.20.1	<div><div></div> ¼ NPT, male thread</div> <div><div></div> ½ NPT, male thread</div>	
Restrictor	<div><div></div> Without</div> <div><div></div> Ø 0.6 mm [0.024"], stainless steel</div> <div><div></div> Ø 0.3 mm [0.012"], stainless steel</div> <div><div></div> Ø 0.6 mm [0.024"], Monel</div>	
Material (wetted)		
Process connection	Model PGS23	Stainless steel 1.4404 (316L)
	Model PGS26	Monel 400 (2.4360)
Bourdon tube	Model PGS23	Stainless steel 1.4404 (316L)
	Model PGS26	Monel 400 (2.4360)

Other process connections on request

Output signal	
Type of contact	<ul style="list-style-type: none"><li>■ Magnetic snap-action contact, model 821, see page 6</li><li>■ Inductive contact, model 831, see page 7</li><li>■ Electronic contact, model 830 E, see page 8</li><li>■ Reed switch, model 851, see page 9</li></ul>
Switching technology	
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>
Contact setting	<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>
Number of switch contacts	Max. 2 switch contacts
Switching function	<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 821.1	Normally open (clockwise pointer motion)
Model 821.2	Normally closed (clockwise pointer motion)
Model 821.3	Change-over contact; 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 <sup>1)</sup>
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) Permissible switch-on and switch-off current: $\leq 0.5$ A
Switching voltage <sup>2)</sup>	AC/DC 24 ... 250 V
Switching power	
Unfilled instruments	$\leq 30$ W, $\leq 50$ VA
Filled instruments	$\leq 20$ W, $\leq 20$ VA
Contact material	Silver-nickel, gold-plated

1) 0 ... 100 % of span on request

2) Increasing the switching power with contact protection relay, model 905 possible, see data sheet AC 08.05

### 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 technical information IN 00.48

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>■ Safety version available</li> </ul>
Number of switch contacts	Max. 2 switch contacts
Switching function	Contact versions: <ul style="list-style-type: none"> <li>■ 831-N</li> <li>■ 831-SN, safety version <sup>1)</sup></li> <li>■ 831-S1N, safety version <sup>1)</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	2 contacts can be set to an identical set point.
Switching current	Depending on the control unit used, see data sheet AC 08.04
Switching voltage	Depending on the control unit used, see data sheet AC 08.04
Switching power	Depending on the control unit used, see data sheet AC 08.04
Permissible temperature ranges in hazardous areas	
T6	-20 ... +60 °C
T5 ... T1	-20 ... +70 °C
T135°C	-20 ... +70 °C

1) Only operate with a corresponding control unit (model 904.3x)

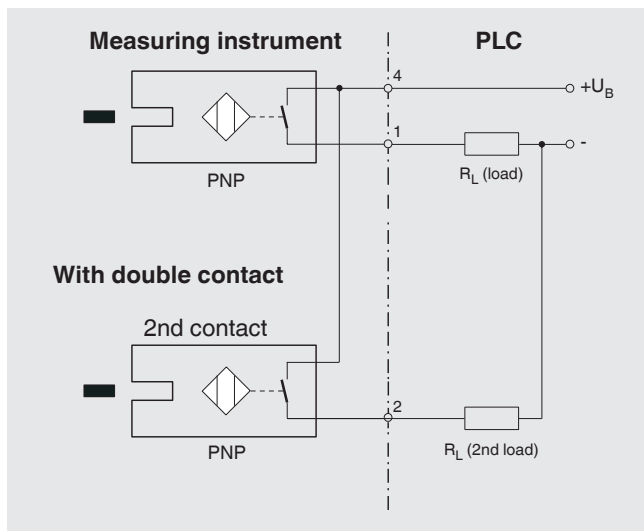
#### Associated control units

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

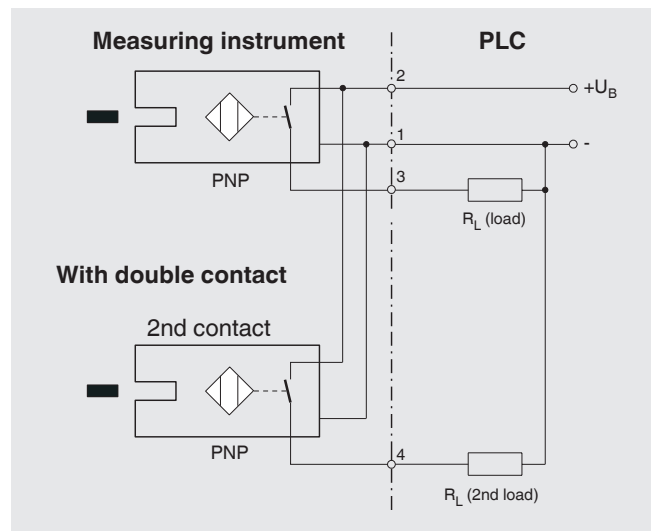
→ For further information on switch contacts, see technical information IN 00.48

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>
Number of switch contacts	Max. 2 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 <sup>1)</sup>
Distance between switch points	2 contacts can be set to an identical set point.
Switching current	≤ 100 mA
Switching voltage	DC 10 ... 30 V

#### 2-wire system



#### 3-wire system



→ For further information on switch contacts, see technical information IN 00.48



Output signal: reed switch, model 851	
Type of contact	Bistable reed switch
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> <li>■ For direct triggering of a programmable logic controller (PLC)</li> <li>■ Free from wear as without contact</li> </ul>
Number of switch contacts	1 switch contact
Switching function	The switching function of the switch is indicated by index 1, 2 or 3
Model 851.1	Normally open (clockwise pointer motion)
Model 851.2	Normally closed (clockwise pointer motion)
Model 851.3	Change-over contact; 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)	10 ... 90 % of span
Switch hysteresis	3 ... 5 %
Switching current	$\leq$ AC/DC 1 A
Switching voltage	$\leq$ AC/DC 250 V
Switching power	$\leq$ 60 W, 60 VA
Contact material	Rhodium
Transport current	AC/DC 2 A
Inductive load $\cos \varphi$	1
Contact resistance (static)	100 m $\Omega$
Insulation resistance	10 <sup>9</sup> $\Omega$
Breakdown voltage	DC 1,000 V
Switching time incl. contact chatter	4.5 ms


→ For further information on switch contacts, see technical information IN 00.48

Electrical connection	
Connection type	Cable, length 2 m [79 in], facing downwards and to the right
Wire cross-section	0.14 mm <sup>2</sup> (AWG 26)
Cable diameter	28 mm [1.1 in]
Material	PVC









→ Other electrical connections on request

Operating conditions	
Medium temperature	-20 ... +100 °C [-4 ... +212 °F]
Ambient temperature	-20 ... +60 °C [-4 ... +140 °F]
Pressure limitation	
Steady	Full scale value
Fluctuating	0.9 x full scale value
Short time	1.3 x full scale value
Ingress protection per IEC/EN 60529	IP54

## Approvals

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

## Optional approvals

Logo	Description	Region
 	<b>EU declaration of conformity</b>	European Union
	ATEX directive <sup>1)</sup> Hazardous areas	
	Gas II 2G Ex ia IIC T6/T5/T4 Gb	
	Dust II 2D Ex ia IIIB T135°C Db	
	<b>IECEx <sup>1)</sup></b> Hazardous areas	International
	Gas Ex ia IIC T6/T5/T4 Gb	
	Dust Ex ia IIIB T135°C Db	
	<b>EAC</b>	Eurasian Economic Community
	EMC directive	
	Low voltage directive	
	Hazardous areas <sup>1)</sup>	
	<b>Ex Ukraine</b> Hazardous areas <sup>1)</sup>	Ukraine
	<b>NEPSI</b> Hazardous areas <sup>1)</sup>	China
-	<b>MChS</b> Permission for commissioning	Kazakhstan
	<b>PAC Ukraine</b> Metrology, measurement technology	Ukraine
	<b>PAC Uzbekistan</b> Metrology, measurement technology	Uzbekistan

1) Only for instruments with inductive contact model 831

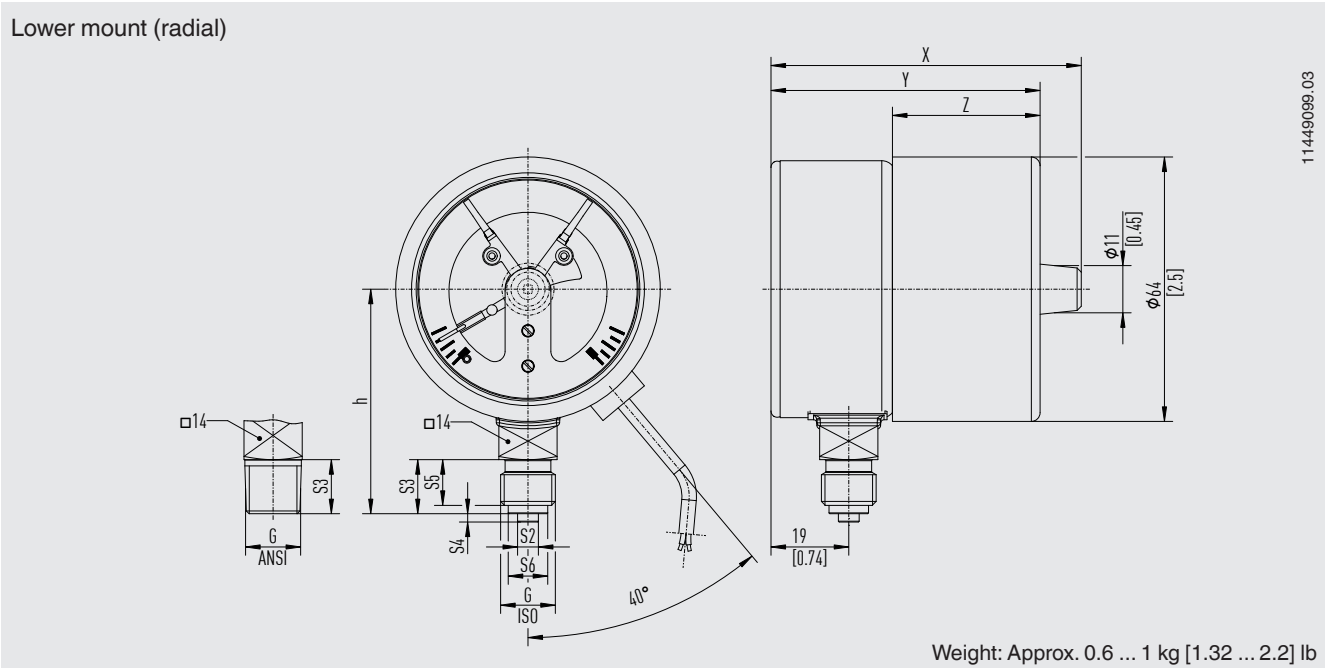
## Certificates (option)

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 calibration interval</b>	1 year (dependent on conditions of use)

→ Approvals and certificates, see website

# Dimensions in mm [in]

switchGAUGE model PGS23.063 with switch contact model 821, 831 or 830 E



## Process connection with thread per EN 837-1

G	Dimensions in mm [in]					
	h ±1 [0.04]	S2	S3	S4	S5	S6
G ⅜ B	51 [2.01]	-	10 [0.39]	-	8 [0.31]	8 [0.31]
G ¼ B	54 [2.13]	5 [0.2]	13 [0.51]	2 [0.08]	11 [0.43]	9.5 [0.37]

## Process connection with thread per ISO 7

G	Dimensions in mm [in]	
	h ±1 [0.04]	S3
R ⅜	51 [2.01]	10 [0.39]
R ¼	54 [2.13]	13 [0.51]

## Process connection with thread per ANSI/B1.20.1

G	Dimensions in mm [in]	
	h ±1 [0.04]	S3
⅜ NPT	51 [2.01]	10 [0.39]
¼ NPT	54 [2.13]	13 [0.51]

## Case dimensions

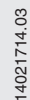
Contact model, version	Dimensions in mm [in]		
	X	Y	Z
821, single contact	73.5 [2.89]	64 [2.52]	36 [1.42]
821, double (change-over) contact	83.5 [3.29]	74 [2.91]	46 [1.81]
83x, single contact	83.5 [3.29]	74 [2.91]	46 [1.81]
83x, double contact	89 [3.5]	79.5 [3.13]	51.5 [2.03]

Lower back mount



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Lower mount (radial)



### Process connection with thread per EN 837-1

## Process connection with thread per ISO 7






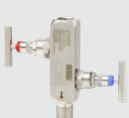


## Process connection with thread per ANSI/B1.20.1

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Lower back mount



## Accessories and spare parts

Model	Description	
	<b>910.33</b>	Adhesive label set for red and green circular arcs → See data sheet AC 08.03
	<b>910.17</b>	Seals → See data sheet AC 09.08
	<b>910.15</b>	Syphons → See data sheet AC 09.06
	<b>910.13</b>	Overpressure protector → See data sheet AC 09.04
	<b>IV1</b>	Needle valve and multiport valve → See data sheet AC 09.22
	<b>IV2</b>	Block-and-bleed valve → See data sheet AC 09.19
	<b>IVM</b>	Monoflange, process and instrument version → See data sheet AC 09.17
	<b>BV</b>	Ball valve, process and instrument version → See data sheet AC 09.28

### Ordering information

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

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