

## Bourdon tube pressure gauge for diaphragm seals and switch function, Type series BR42..



### Application area

- Pharmaceutical industry
- Food industry
- Biotechnology

### Features

- Bourdon tube pressure gauge for diaphragm seal and switch function
- Nominal range -1...3 bar to -1...15 bar, 0...4 bar to 0...400 bar
- High quality case with bajonet ring NS 100
- Case, measuring element and pressure connection of stainless steel
- Instrument connection welded with diaphragm seal
- Small temperature error by means of reduced-volume measuring element
- Process connection via diaphragm seal product group D5
- Switch functions (electrical contact devices) per DIN 16085:
  - slow acting contact
  - magnetic snap contact
  - inductive contact
  - inductive contact with integrated switching amplifier
- EAC declaration (upon request)

### Options

- Approvals/Certificates
  - Explosion protection
  - Classification per SIL2
  - Certificate of measuring equipment for Russian Federation
  - Material certificate per EN 10204
  - Calibration certificate per EN 10204
- Higher overload protection
- Case with liquid filling
- Damping of movement
- Electronical angle-of-rotation sensor, see data sheet D6-020

### Application

This bourdon tube pressure gauge with switch function (electrical contact device) has been especially constructed for the operation with diaphragm seals. A custom bourdon tube that is reduced in volume produces a very slight temperature error. Diaphragm seals with reduced diaphragm surface areas may also be used. A large selection of diaphragm seals – D5 product category – is available for a variety of applications.

## Technical data

### Constructional design / case

Design:	High quality case with bayonet ring, material: st. steel mat.-no. 1.4301 (304) ventilation valve, material: PUR	
Nominal size:	NS 100	
Degree of protection per EN 60529:	IP 65	
Case filling:	Labofin	
Atmosph. pressure compensation:	Standard case, filled, ≤ 10 bar: with ventilation valve > 10 bar: filling plug, material: PUR	
Case seal:	Material gasket: NBR	
Window:	Non splintering laminated glass	
Contact lock:	Stainless steel with NBR gasket	
Measuring element:	Bourdon tube  < 40 bar: c-type > 40 bar: spiral	
Movement:	Stainless steel segment Optional: movement with integrated damping system	
Scale:	Pure aluminium, white with black inscription. Option: with red marking, special scale upon request.	
Pointer:	Pure aluminium, black. With micro adjustment for zero point correction.	
Electronical connection:	Connection plug with cable gland M20 x 1.5 and removable test cover, material: Macrolon	
Weight:	NS 100 without filling:	approx. 1.0 kg
	NS 100 with filling:	approx. 1.5 kg

### Process connection

Design:	Via diaphragm seal technology, see order details and product group D5
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### Nominal range

See order details, other ranges upon request

Overload-protection:	standard: 1.3 times higher overload protection see order details
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### Accuracy

Accuracy class:	number of contacts	
	1	2
	cl. 1	cl. 1

Plus effect of switch function on indication per DIN 16085.

Temperature influence:	Max. ± 0,4% / 10K of measuring span per EN 837-1
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Temperature-influence:	Temperature error due to diaphragm seal system.
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dM 22.6...24 mm	≤ 45 mbar / 10 K
dM 27...30 mm	≤ 25 mbar / 10 K
dM 34...36 mm	≤ 8 mbar / 10 K
dM 40...46 mm	≤ 5 mbar / 10 K
dM 51...58 mm	≤ 2 mbar / 10 K

A detailed calculation of accuracy can be submitted upon request.

Deviations in case of special materials.

### Temperature ranges

	without filling	with filling
Ambient:	-20...60 °C	-20...50 °C
Medium:	-40...140 °C (-20...70 °C) <sup>1</sup>	-20...140 °C (-20...70 °C) <sup>1</sup>
Storage:	-40...70 °C	-40...70 °C

<sup>1</sup>For devices with classification per SIL2

The maximum values can be restricted by the following parameters:

- Diaphragm size
- Measuring range
- Pressure transmission fluid

Extended temperature range upon request. (Inductive safety initiator necessary)

**For measuring devices with inductive contact type SJ2-S1N (NS 100, double contact): For safe operation refer to TA\_044!**

## Approvals/Certificates

Ex-protection: Magnetic snap contact:  
Simple electrical apparatus per IEC/DIN EN 60079-11 suitable for intrinsically safe circuits Ex IIC TX.

Inductive contact:

Contact device suitable for intrinsically safe circuits

Ⓢ II 2G Ex ia IIC T4/T5/T6 Gb

- Reg.-no.: ■ PTB 99 ATEX 2219X  
■ PTB 00 ATEX 2049X

Ex-protection (ATEX) for mechanical devices:

Ⓢ II 2G c Tx

Ⓢ II 2D c Tx

Further details see operation instruction BA\_037 and Ex Safety Instructions XA\_005, XA\_013, XA\_014 and XA\_021.

SIL 2: Functional safety:  
per EN 61508, classification per SIL 2, TÜV-Reg.-Nr. 44 799 13190203.  
For devices with inductive contact only (Typ N1, N2 and N4).

- EAC declaration (upon request)
- Certificate of measuring equipment for Russian Federation

## Switch functions

Slow acting contact:

Type L2

- max. 2 touch contacts
- Contact load: 10 W / 18 VA
- Switching up to 230 V DC
- Available with separate circuit (Type M2)

Magnetic snap contact:

Type L4

- max. 2 touch contacts
- Contact load: 30 W / 50 VA
- Switching up to 230 V DC
- Available with separate circuit (Type M4)

Inductive contact:  
(standard)

Type N4

- max. 2 contacts
- Control unit required, see product group M7

Inductive contact:  
(SN)

Type N1

- Safety initiator
- max. 2 contacts, contactless
- Control unit required, see product group M7

Inductive contact inverse:  
(S1N)

Type N2

- Safety initiator, inverse switching
- max. 2 contacts, contactless
- Control unit required, see product group M7

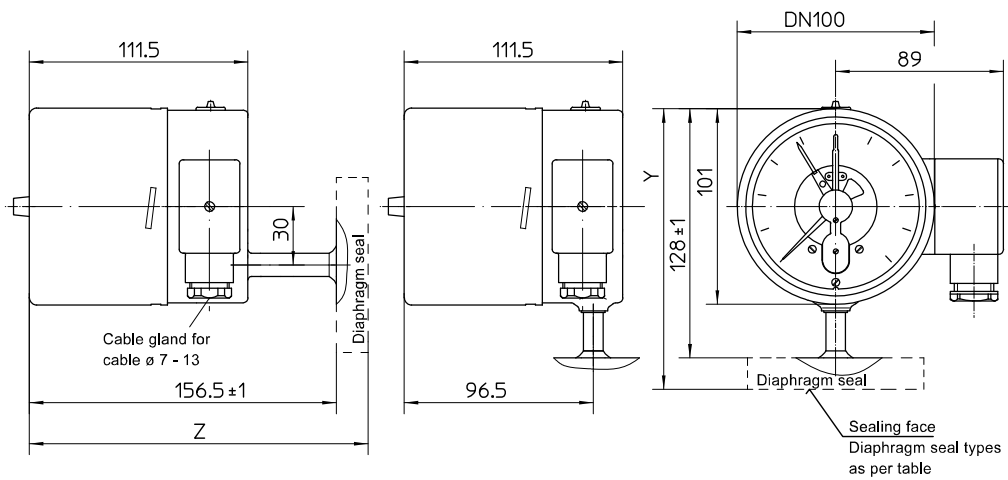
Inductive contact with integrated amplifier:

Type N6

- max. 2 contacts, contactless
- 100 mA
- 3-wire technology, suitable for direct activation at a PLC

Further information see operating instruction BA\_037 and Technical Information TA\_039.

## Dimensions



### Overall height "Y" and "Z"

diaphragm seal	type	see data sheet	Y				Y				Z				Z			
			DN 25	DN 32	DN 40	DN 80	¾"	1"	1 ½"	2"	DN 25	DN 32	DN 40	DN 80	¾"	1"	1 ½"	2"
sanitary connection	DL1	D5-025	144	144	144	145	-	-	-	-	172.5	172.5	172.5	172.5	-	-	-	-
clamp connection	DL3	D5-026	-	-	-	-	-	-	140	142	-	-	-	-	-	-	117	119
screw-in thread	DE1	D5-032	-	-	-	-	143	143	146	146	-	-	-	-	120	120	123	123
flange connection	DA2	D5-030	148	-	-	149	-	-	-	-	125	-	-	126	-	-	-	-

## Order details

### Bourdon tube pressure gauge with diaphragm seal connection and switch function Type series BR42..

Order code BR42..			
BR420 .	case design	IP 65 without liquid filling	process connection bottom
BR421 .			process connection at back
BR422 .		IP 65 with liquid filling	process connection bottom
BR423 .			process connection at back
0	design	standard	
1		Ex-protection	
A56	nominal range [bar]	0...4 <sup>1</sup>	
A57		0...6 <sup>1</sup>	
A58		0...10	
A59		0...16	
A60		0...25	
A61		0...40	
A62		0...60	
A63		0...100	
A64		0...160	
A65		0...250	
A66		0...400	
A89		-1...3 <sup>1</sup>	
A90		-1...5 <sup>1</sup>	
A91		-1...9	
A92		-1...15	
	switch functions	type of contact	number
L4 . 00	touch contact	magnetic snap contact	single contact
L4 . . 0			double contact
L2 . 00		slow acting contact <sup>2</sup>	single contact
L2 . . 0			double contact
M4 . . 0		magnetic snap contact, separated circuits	double contact
M2 . . 0		slow acting contact <sup>2</sup> , separated circuits	double contact
N4 . 00	Inductive contact	initiator (N)	single contact
N4 . . 0			double contact
N1 . 00		safety initiator (SN)	single contact
N1 . . 0			double contact
N2 . 00		safety initiator invers (S1N) <sup>3</sup>	single contact
N2 . . 0			double contact
N6 . 00		inductiv contact with integrated switching amplifier, 3-wire technology PNP <sup>2</sup>	single contact
N6 . . 0			double contact
...	<b>switch function - per contact, replace point with number</b>		
1	switch	increasing pressure makes contact	
2		increasing pressure breakes contact	
4		decreasing pressure makes contact	
5		decreasing pressure breakes contact	
3	change-over element	increasing pressure makes or breaks contact	
6		decreasing pressure makes or breaks contact	

Additional features (to be indicated if required)		
H2	overload protection	2 times, measuring ranges > 25 bar
H3		2.5 times, measuring ranges < 16 bar
PL1100-...	output signal	4...20mA (20...4 mA) with electr. angle-of-rotation sensor ( see M2-030 )
W1020	material certificate	per EN 10204-3.1, wetted parts
W2603	functional safety per EN 61508, classification per SIL2 <sup>4</sup>	
W2673	certificate of measuring equipment for Russian Federation <sup>1</sup>	
W4102	Damping of movement	with integrated damping system
<b>Process connection</b>		
D...	diaphragm seals see product group D5, welded with instrument connection	

**Order code (example): BR4200 – A56 – L4100 - ...**

<sup>1</sup> not possible for magnetic snap contact and accuracy class 1 (only for pressure above 10 bar)

<sup>2</sup> not for devices with Ex-protection

<sup>3</sup> **with NS 100, double contact: for safety operation refer to TA\_044!**

<sup>4</sup> for devices with inductive contact only