



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, Type series PL1100, 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: Via ventilation valve.

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

Nominal range

See order details, further ranges upon request

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

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. $\pm 0.4\%$ / 10K of measuring span per EN 837-1

Temperature-influence:	Temperature error due to diaphragm seal system.
	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) ¹	-20...140 °C (-20...70 °C) ¹
Storage:	-40...70 °C	-40...70 °C

¹For 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)

Tests and 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

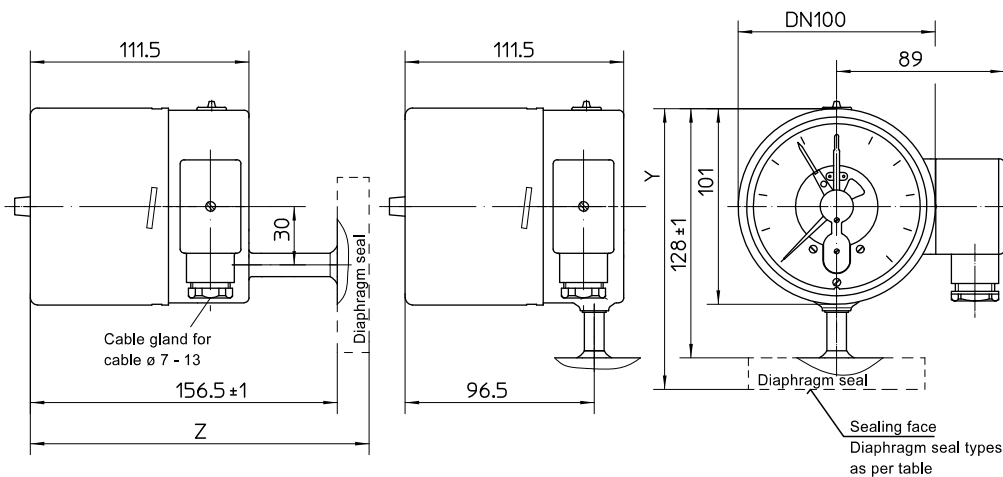
Inductive contact with integrated amplifier:

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 ¹	
A57		0...6 ¹	
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 ¹	
A90		-1...5 ¹	
A91		-1...9	
A92		-1...15	
		switch functions	type of contact
L4 . 00	touch contact	magnetic snap contact	single contact
L4 . . 0			double contact
L2 . 00		slow acting contact ²	single contact
L2 . . 0			double contact
M4 . . 0		magnetic snap contact, separated circuits	double contact
M2 . . 0		slow acting contact ² , 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)	single contact
N2 . . 0			double contact
N6 . 00		inductiv contact with integrated switching amplifier, 3-wire technology PNP ²	single contact
N6 . . 0			double contact
...	switch function - per contact, replace point with number		
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 ³	
W2673	certificate of measuring equipment for Russian Federation ¹	
W4102	Damping of movement	with integrated damping system
Process connection		
D...	diaphragm seals see product group D5, welded with instrument connection	

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

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

² not for devices with Ex-protection

³ for devices with inductive contact only