Differential pressure gauge with diaphragm

and switch contact

Type series BG2…

Application area

- General process technology
- Chemical and petrochemical industry
- Machinery construction
- Shipping

Features

- Differential pressure gauge with diaphragm and switch contact
- Nominal range -40...0 mbar to -1...24 bar, 0…40 mbar to 0…25 bar
- High quality case with bajonet ring NS 100/160 per EN 837-3 S1, alternative safety version per EN 837-1 S3
- Case and measuring flange of stainless steel, diaphragm of Duratherm
- High overload protection
- Working pressure up to 80 bar
- Accuracy class as per DIN 16085
- Switch contacts (electrical contact devices) per DIN 16085:
  - slow acting contact
  - magnetic snap contact
  - inductive contact
  - inductive contact with integrated switching amplifier

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
- Case with liquid filling
- Extended temperature range
- Oxygen free of oil and grease
- Connection to Zone 0
- 3-way valve block
- EAC declaration (upon request)

Application

Differential pressure gauges with switch contact are suited for level measuring, filter monitoring and flow measuring under severe operating conditions.

Technical data

Constructional design / case

Design:	High quality case with bajonet ring per EN 837-3 S1, material: stainless steel mat.-no. Nr. 1.4301 (304). With rear blow-out device, material: PUR, ventilation valve, material: PUR Alternative: Safety design with blow-out back and solid baffle wall per EN 837-1 S3, Material: Stainless steel 1.4301 (304)
Nominal size:	NS 100 or NS 160
Degree of protection per EN 60529:	■ Without filling: IP 65 ■ With filling S1 case: IP 65 ■ With filling S3 case: IP 66
Case filling:	Labofin
Atmosph. pressure compensation:	Via ventilation valve. Safety case, filled: with pressure compensation diaphragm, material: silicone
Case seal:	Material gasket: NBR
Pressure chamber seal:	Material gasket: NBR
Window:	Non-splintering laminated glass. Option: Non-splintering plastic (Macrolon)
Contact lock:	Stainless steel with NBR gasket
Measuring element:	Diaphragm
Movement:	Stainless steel segment
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
Mounting:	Via device holder per DIN 16281 from stainless steel, option: aluminium.
Electronical connection:	Connection plug with cable gland M20 x 1.5 and removable test cover, material: Macrolon

Weight:	NS 100:	
	flange Ø 100 without filling:	approx. 4.0 kg
	flange Ø 160 without filling:	approx. 6.4 kg
	flange Ø 100 with filling:	approx. 4.7 kg
	flange Ø 160 with filling:	approx. 7.0 kg
	NS 160:	
	flange Ø 100 without filling:	approx. 4.7 kg
	flange Ø 160 without filling:	approx. 7.0 kg
	flange Ø 100 with filling:	approx. 5.6 kg
	flange Ø 160 with filling:	approx. 8.1 kg

Process connection

Design:	Connection lateral 3/8" NPT, option: with straight or angular screw joint, for mounting on valve block.

Material wetted parts

Measuring element:	Diaphragm: Duratherm (similar resistance as mat.no. 1.4571 (316Ti))
Measuring flange:	Stainless steel mat.-no. 1.4571 (316Ti)
3-way valve block (option):	Stainless steel mat.-no. 1.4571 (316Ti) with PTFE-packing up to 200 °C

Nominal range

See order details, further ranges upon request

Overload-protection:	Standard: loading up to full scale Higher overload protection see order code.

Accuracy

Accuracy class:	class 1,6 per EN 837-3 Plus effect of switch function on indication per DIN 16085.
Temperature influence:	Max. ± 0.8% / 10K of measuring span per EN 837-3.

Temperature ranges

	without filling	with filling
Ambient:	-20…70 °C	-20…70 °C (60 °C)[1]
Medium:	-20…110 °C	-20…70 °C (60 °C)[1]
Storage:	-40…70 °C	-40…70 °C (-20...60 °C)[1]

Extended temperature range (optional): [2]

	without filling	with filling
Ambient:	-40…100 °C	-40…80 °C (60 °C)[1]
Medium:	-40…150 °C	-40…150 °C[3]

Devices with classification per SIL2:

	without filling	with filling
Ambient:	-20…60 °C	-20…60 °C(40 °C)[1]
Medium:	-20…60 °C	-20…60 °C(40 °C)[1]

[1] Safety case S3 (IP 66)

[2] Inductive safety initiator necessary

[3] Limitation: nominal range ≤ 1 bar up to 110 °C

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 Ex h IIC T1...T6 Gb X

II 2D Ex h IIIC Txx°C Db X

Further details see operation instruction BA_037 and Ex Instructions XA_005, XA_013, XA_014 and XA_021.

SIL2: Functional safety per EN 61508, Classification per SIL2.

For detailed information see SIL declaration HE_138.

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

Switch contacts

Slow acting contact: Type L2
- max. 3 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. 3 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. 3 contacts, contactless
- Control unit required, see product group M7

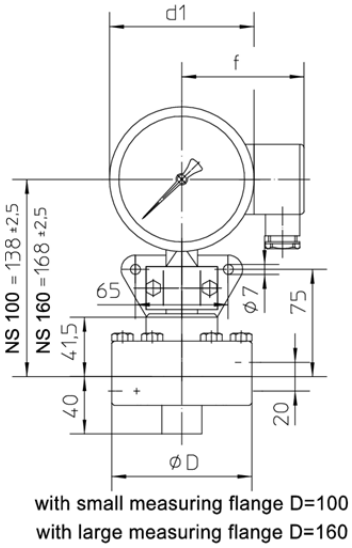
Inductive contact: (SN) Type N1
- Safety initiator
- max. 3 contacts, contactless
- Control unit required, see product group M7

Inductive contact inverse: (S1N) Type N2
- Safety initiator, inverse switching
- max. 2 contacts, contactless
- Control unit required, see product group M7

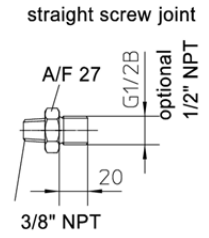
Inductive contact with integrated amplifier: Type N6
- max. 2 contacts, contactless
- 100 mA
- 3-wire technology, suitable for direct activation at a PLC

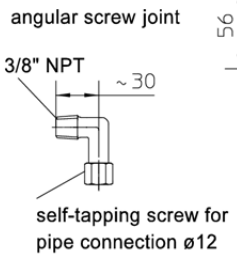
Further information see operating instruction BA_037 and Technical Information TA_039.

Dimensions

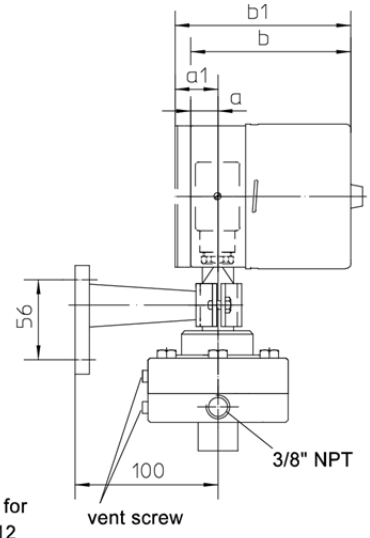


with small measuring flange D=100
with large measuring flange D=160

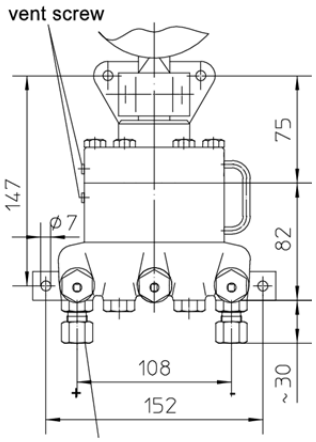




self-tapping screw for
pipe connection ø12

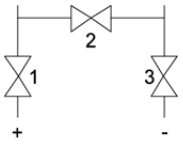


vent screw



self-tapping screw for
pipe connection ø12

operating instruction of the valves



1. before device mounting:
   valve 1 and 3 are closed, valve 2 is open
2. commisioning after device mounting:
   open valve 1 slowly
   close valve 2
   open valve 3 slowly, the device is now operable

All dimensions are in millimeter

Order details

Differential pressure gauge with diaphragm and switch contact
Type series BG2…

Order details BG2…			
BG220.	case	NS 100	IP 65 without liquid filling
BG222.			IP 65 with liquid filling
BG230.		NS 160	IP 65 without liquid filling
BG232.			IP 65 with liquid filling
BG250		NS 100, safety case per EN 873-1 S3	IP 65 without liquid filling
BG254.			IP 66 with liquid filling
BG260.		NS 160, safety case per EN 873-1 S3	IP 65 without liquid filling
BG264.			IP 66 with liquid filling

0	design	standard
1		ex-protection
A6…	working pressure	BD 25 bar (standard)
A3…		BD 2.5 bar
A4…		BD 6 bar
A5…		BD 10 bar
A1…		BD 40 bar (≥ 1.6 bar nominal range)
A2…		BD 80 bar (≥ 2.5 bar nominal range)

023	nominal range	measuring flange Ø 160 mm	-40...0 mbar
024			-60...0 mbar
025			-100...0 mbar
026			-160...0 mbar
027			-250...0 mbar
006			0...40 mbar
007			0...60 mbar
008			0...100 mbar
009			0...160 mbar
010			0...250 mbar
028		measuring flange Ø 100 mm	-400...0 mbar
085			-0.6...0 bar
086			-1...0 bar
087			-1...0.6 bar
088			-1...1.5 bar
089			-1...3 bar
090			-1...5 bar
091			-1...9 bar
092			-1...15 bar
093			-1...24 bar
011			0... 400 mbar
052			0...0.6 bar
053			0...1 bar
054			0...1.6 bar
055			0...2.5 bar
056			0...4 bar
057			0...6 bar
058			0...10 bar
059			0...16 bar
060			0...25 bar

C1..	overload protection	plus-/minus sides up to max. working pressure	measuring flange Ø 100 mm
C2..		plus sides up to max. working pressure	
C3..		5times range, plus sides, max. 80 bar	
D1..		plus-/minus sides up to max. working pressure	measuring flange Ø 160 mm
D2..		plus sides up to max. working pressure	
D3..		1.3times range, plus sides	
01	process connection	lateral threaded connection 3/8 NPT	
02		angular screw joint for pipe Ø 12 mm	
03		lateral with straight screw joint G1/2	
04		lateral with straight screw joint 1/2 NPT	
05		prepared for connection of valve block	
06		bottom with angular connection G1/2	
08		bottom with angular connection 1/2" NPT	
11		with flange valve block of stainless steel for pipe Ø 12 mm	

	switch contacts	contact type	count
L4 . 00	touch contact	magnetic snap contact	single contact
L4 . . 0			double contact
L4 . . .			triple contact
L2 . 00		slow acting contact [1]	single contact
L2 . . 0			double contact
L2 . . .			triple contact
M4 . . 0		magnetic snap contact separated circuits	double contact
M4 . . .			triple contact
M2 . . 0		slow acting contact [1] separated circuits	double contact
M2...			triple contact

N4 . 00	inductive contact	initiator (N)	single contact
N4 . . 0			double contact
N4 . . .			triple contact
N1 . 00		safety initiator (SN)	single contact
N1 . . 0			double contact
N1 . . .			triple contact
N2 . 00		safety initiator invers (S1N)	single contact
N2 . . 0			double contact
N6 . 00		with integrated switching amplifier in 3 -wire technology PNP [1]	single contact
N6 . . 0			double contact

. . .	**switch function - per contact, replace point with number**	
1	switch	increasing pressure makes contact
2		increasing pressure breaks contact
4		decreasing pressure makes contact
5		decreasing pressure breaks contact
3	change-over element	increasing pressure makes or breaks contact
6		decreasing pressure makes or breaks contact

Additional features (to be indecated if required)		
H2	wall bracket	material aluminium
H3		material stainless steel
T2	marking	on scale (please specify)
W1020	material certificate	per EN 10204-3.1, wetted parts
W2603	functional safety per EN 61508, classification per SIL2 [2]	
W2673	certificate of measuring equipment for Russian Federation	
W4090	extended temperature range	
Z1	connection to zone 0 [3]	with zone 0 adapter (coupler element KF6)

Order code (example): BG2321 – A5028 – C301 - L4200 - …

[1] not for devices with Ex-protection
[2] not for devices with valve block
[3] for devices with Ex-protection, only - not for devices with magnetic snap contact