

Absolute pressure gauge with diaphragm and switch contact Type series BF2...



Application area

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

Features

- Absolute pressure gauge with diaphragm and switch contact
- Nominal ranges 0...60 mbar abs to 0...2500 mbar abs
- With integrated reference pressure chamber. Thus enabling absolute pressure to be measured.
- High quality case with bajonet ring NS 100/160 per EN 837-3 S1, alternative safety design per EN 837-1 S3
- Case and measuring flange of stainless steel, diaphragm of Duratherm
- High overload limit
- Accuracy class as per DIN 16085
- Switch contacts (electrical contact devices) per DIN 16085:
 - slow acting contact
 - magnetic snap contacts
 - inductive contact
 - inductive contact with integrated switching amplifier

Options

- Approvals/Certificates
 - Ex-protection (ATEX/UKEX)
 - Material certificate per EN 10204-3.1
 - Calibration certificate per EN 10204-3.1
- As per UKCA regulations
- Case with liquid filling
- Extended temperature range
- Connection to Zone 0 (upon request)

Application

Can be used as an excess pressure gauge with switch contact universal use in measurement and control systems for indicating and monitoring pre-selectable minimum and/or maximum pressure values. Suitable for measuring liquids and gases; with open measuring flange also designed for viscous media and media containing solids. Because of its robust design, it is suitable for use in tough environments.

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, S3 case: IP 66

Case filling: Labofin

Case seal: Material gasket: NBR

Pressure chamber seal: Material gasket: NBR

Vacuumreference: The device is fitted with a vacuum chamber which is sealed off from the process by a diaphragm. Thus, enabling absolute pressure to be measured.

Window: Non-splintering laminated glass.
 Option: Non-splintering plastic (Polycarbonate)

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 process connection

Electronical connection: Connection plug with cable gland M20 x 1.5 and removable test cover, material: Polycarbonate

Weights: NS 100:
 flange Ø 100 without filling: approx. 3.1 kg
 flange Ø 160 without filling: approx. 4.7 kg
 flange Ø 100 with filling: approx. 4.0 kg
 flange Ø 160 with filling: approx. 5.6 kg
 NS 160:
 flange Ø 100 without filling: approx. 3.4 kg
 flange Ø 160 without filling: approx. 6.0 kg
 flange Ø 100 with filling: approx. 5.5 kg
 flange Ø 160 with filling: approx. 7.1 kg

Process connection

Design: Per EN 837-3, G1/2 B, 1/2" NPT or open measuring flange. Further process connections upon request.

Material wetted parts

Measuring element: Diaphragm: Duratherm (similar resistance as mat.-no. 1.4571 (316Ti))
 Measuring flange: stainless steel mat.-no. 1.4571 (316Ti)

Nominal range

See order details, further ranges upon request

Overload limit: Nominal ranges up to 250 mbar abs: overload protected up to 5 bar
 Nominal ranges $\geq$ 250 mbar abs: overload protected up to 10 bar

For information on definitions of terms regarding the Pressure Equipment Directive, see Technical Instruction TA_068.

Accuracy

Accuracy class:	NS 100 / NS 160			
	nominal range (mbar)	no. of contacts		
		1	2	3
	≥ 60	cl. 1.6	cl. 2.5	-
	≥ 160	cl. 1.6	cl. 1.6	-
	≥ 400	cl. 1.6	cl. 1.6	cl. 2.5

Plus effect of switch function on indication per DIN 16085.

Temperature influence: Max. $\pm 0.8\%$ / 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:	<u>Magnetic snap contact:</u> Simple electrical apparatus per EN 60079-11 suitable for intrinsically safe circuits Ex IIC TX. <u>Inductive contact:</u> Contact device suitable for intrinsically safe circuits Ⓔ II 2G Ex ia IIC T4/T5/T6 Gb ATEX ■ PTB 99 ATEX 2219X ■ PTB 00 ATEX 2049X UKEX: ■ CML 21UKEX2893X ■ CML 21UKEX2977X <u>Ex-protection (ATEX/UKEX) for mechanical devices:</u> Ⓔ II 2G Ex h IIC T1...T6 Gb X Ⓔ II 2D Ex h IIIC Txx°C Db X
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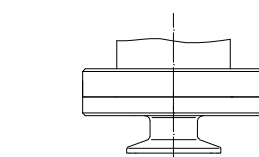
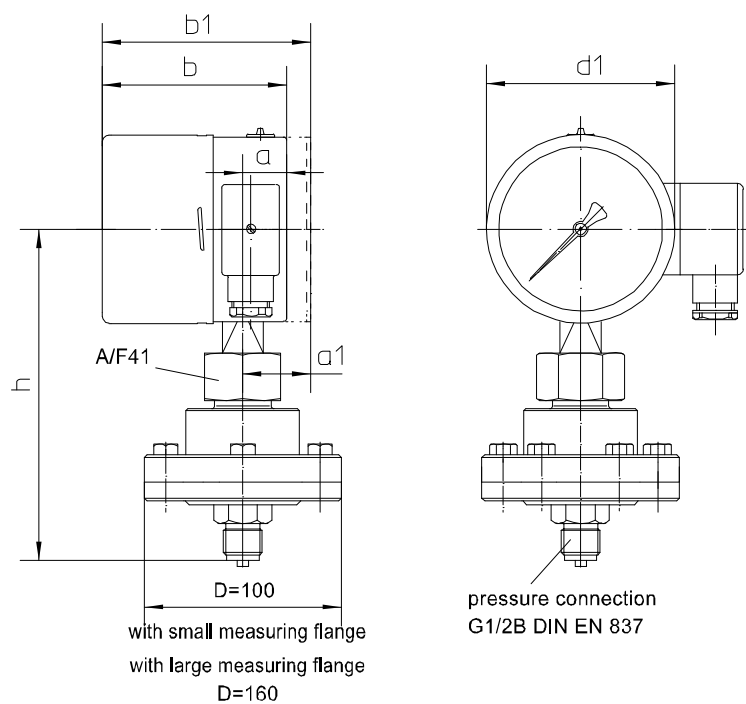
Further details see operation instruction BA_037 and Ex Instructions XA_005, XA_013 and XA_021.

Switch contacts

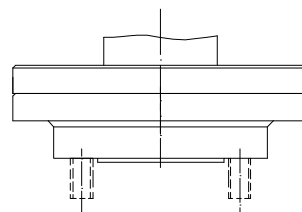
Slow acting contact:	<u>Type L2</u> ■ max. 3 touch contacts ■ Contact load: 10 W / 18 VA ■ Switching up to 230 V DC ■ Available with separate circuit (Type M2)
Magnetic snap contact:	<u>Type L4</u> ■ max. 3 touch contacts ■ Contact load: 30 W / 50 VA ■ Switching up to 230 V DC ■ Available with separate circuit (Type M4)
Inductive contact: (standard)	<u>Type N4</u> ■ max. 3 contacts, contactless ■ Control unit required
Inductive contact: (SN)	<u>Type N1</u> ■ Safety initiator ■ max. 3 contacts, contactless ■ Control unit required
Inductive contact inverse: (S1N)	<u>Type N2</u> ■ Safety initiator, inverse switching ■ max. 2 contacts, contactless ■ Control unit required
Inductive contact with integrated amplifier:	<u>Type N6</u> ■ 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



special design
small measuring flange DIN 28403
from nominal width 10 to nominal width 50
upon request



special design
open measuring flange per DIN or ASME
other versions upon request

dimensions (mm)						
					IP 66	
case	f	d1	a	b	b1	h
NS 100	89	100	19	108	112	178
NS 160	119	160	19	109	113	208

Order details

Absolute pressure gauge with diaphragm and switch contact

Type series BF2...

Order details BF2..			
BF220.	case	NS 100, IP 65 without liquid filling	
BF230.		NS 160, NP 65 without liquid filling	
BF254.		NS 100 safety pattern gauge per EN 873- S3, IP 66 with liquid filling	
BF264.		NS 160 safety pattern gauge per EN 873- S3, IP 66 with liquid filling	
0	design	standard	
1		Ex-protection	
A70	nominal range	measuring flange Ø 160 mm	0...60 mbar abs
A80			0...100 mbar abs
A90			0...160 mbar abs
A100			0...250 mbar abs
A110		measuring flange Ø 100 mm	0..400 mbar abs
A120			0...600 mbar abs
A130			0...1000 mbar abs
A140			0...1600 mbar abs
A150			0...2500 mbar abs
D...	overload protection	10 bar	for design with measuring flange Ø 100 mm
E...		5 bar	for design with measuring flange Ø 160 mm
1001	process connection	screwed connection	G1/2 B, material 1.4571 (316Ti)
1011			1/2" NPT, material 1.4571 (316Ti)
1041		open measuring flange PN10...40 mat.no. 1.4571 (316Ti), sealing surface DIN EN 1092- 1 model B1 (DIN 2526 model C)mForC)	DN 25, for studbolts
			measuring flange Ø 100 mm
1081			DN 50, for studbolts
1061			measuring flange Ø 160 mm
	switch contacts	type of contact	
L4 . 00		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	standard 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		inductive contact with integrated switching amplifier, 3-wire technology PNP ¹	single contact
N6 . . 0			double contact
...	switch function - per contact, replace point with number		
1	switch	rising measured value closes contact	
2		rising measured value opens contact	
4		falling measured value closes contact	
5		falling measured value opens contact	
3	change-over element ²	rising measured value switches	
6		falling measured value switches	

Example of order code switch contacts N4120:

Double inductive contact with initiator → type of contact = N4

1. Inductive contact closes on rising measured value → code number 1
2. Inductive contact opens on rising measured value → code number 2
3. Inductive contact not be used → code number 0

Additional features (to be indicated if required)		
T2	marking	on scale (pls specify)
W1020	material certificate	per EN 10204-3.1, wetted parts
W1204	calibration certificate	per EN 10204-3.1, 3 measuring points
W1201		per EN 10204-3.1, 5 measuring points
W2660	as per UKCA regulations	

Order code (example): BF2540 – A110 – D1041 - N4120 - ...

¹ not for devices with Ex-protection

² possible with touch contacts only (slow acting contact or magnetic snap contact)