Pressure switch with bourdon tube, special design

Type series BP4…

Application area

- Chemical and petrochemical industry
- Machinery construction
- Shipping

Features

- Pressure switch with bourdon tube, special design
- Nominal range -1…0 up to -1…24 bar, 0…1 up to 0…400 bar
- High quality case with bayonet ring NS 100/160 per EN 837-1 S1, alternative in safety design per EN 837-1 S3
- Ex-proof design
- Case and measuring element of stainless steel
- Accuracy class as per DIN 16085
- Inductive contact

Options

- Approvals/Certificates
  - Classification per SIL2
  - Material certificate per EN 10204
  - Calibration certificate per EN 10204
- Case with liquid filling
- Oxygen free of oil and grease
- Connection to Zone 0 by using the flame arrester MF21xx, see data sheet D6-025

Application

Pressure switches with bourdon tubes are pieces of equipment with safety functions as set down in the Pressure Equipment Directive (PED). They are suitable for protecting the pressure device should the pressure rise above, or drop below, the approved boundary limits. These pressure measuring devices may only be operated with the electrical evaluation units set out below, and within the area of application of this certificate and the VdTÜV component identification number. Because of its robust design, it is suitable for use in tough environments.

Technical data

Constructional design / case

Design:	High quality case with bayonet ring per EN 837-1 S1, material: stainless steel mat.-no.-1.4301 (304) ; with 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
Window:	Non splintering laminated glass
Contact lock:	Stainless steel with NBR gasket, sealable
Measuring element:	Bourdon tube < 60 bar: c-type ≥ 60 bar: spiral
Movement:	Stainless steel segment
Scale:	Pure aluminium, white with black inscription
Pointer:	Pure aluminium, black, with micro adjustment for zero point correction
Mounting:	Via process connection. Optional with flange for surface mounting or for flush mounting with DIN mounting flange.
Electronical connection:	Connection plug with cable gland M20 x 1.5 and removable test cover, material: Macrolon
Electrical evaluation unit:	The following evaluation units conform to the requirements of the Association of Technical Inspection Agencies (VdTÜV) Fact Sheet No. 100. Pepperl+Fuchs, switching amplifier: ■ Typ KHA6-SH-Ex1, PTB 00 ATEX 2043 ■ Typ KFD2-SH-Ex1, PTB 00 ATEX 2042 The use of alternative evaluation units is within the responsibility of the operator. The data sheets of the electrical evaluation units are to be observed.

Weight:	NS 100 without filling:	approx. 0.9 kg
	NS 160 without filling:	approx. 1.8 kg
	NS 100 with filling:	approx. 1.5 kg
	NS 160 with filling:	approx. 3.6 kg

Process connection

Design:	Per EN 837-1. G1/2 B, 1/2" NPT or M20 x 1.5, bottom or back eccentric connection. Optional with throttle screw for system damping, further process connections upon request

Material wetted parts

Measuring element:	Bourdon tube and shanks stainless steel mat.-no. 1.4571 / 1.4404 (316Ti / 316L)

Nominal range

See order details, further ranges upon request

Overload protection	Standard: 1.3 times

Accuracy

Accuracy class:

NS 100

Nominal-range (bar)	no. of contacts 1	2
1	cl. 1	cl. 1.6
≥ 1,6	cl. 1	cl. 1

NS 160

Nominal-range (bar)	no. of contacts 1	2
1	cl. 1	cl. 1.6
1,6	cl. 1	cl. 1.6
≥ 2,5	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

Temperature ranges

	without filling	with filling
Ambient:	-20…70 °C	-20…70 °C (40 °C)[1]
Media:	-20…70 °C	-20…70 °C (40 °C) [1]
Storage:	-40…70 °C	-20…70 °C

[1] For safety case S3 design (IP 66) and classification per SIL2

Tests and certificates

Ex-protection: Inductive contact device:

Contact device suitable for intrinsically safe circuits.

⟨Ex⟩ II 2G Ex ia IIC T4/T5/T6 Gb

Reg.-no.: PTB 00 ATEX 2049X

Ex-protection (ATEX) for mechanical devices:

⟨Ex⟩ II 2G Ex h IIC T1...T6 Gb X

⟨Ex⟩ II 2D Ex h IIIC Txx°C Db X

Further details see operating instruction BA_037 and Ex Instructions XA_005 and XA_013.

SIL 2: Functional safety:

per EN 61508, classification per SIL 2, TÜV-Reg.-Nr. 44 799 13190203.

EC-Type Examination: EC-Type Examination per Directive 2014/68/EU, certificate no. 07 202 1321 Z 0002/14/D/01, piece of equipment with safety function cat. IV VdTÜV-component identification number:

- TÜV.SDB.14-234
- TÜV.SDBF.14-234
- TÜV.SDBFS.14-234

Switch contacts

Inductive contact: (SN) Type N4

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

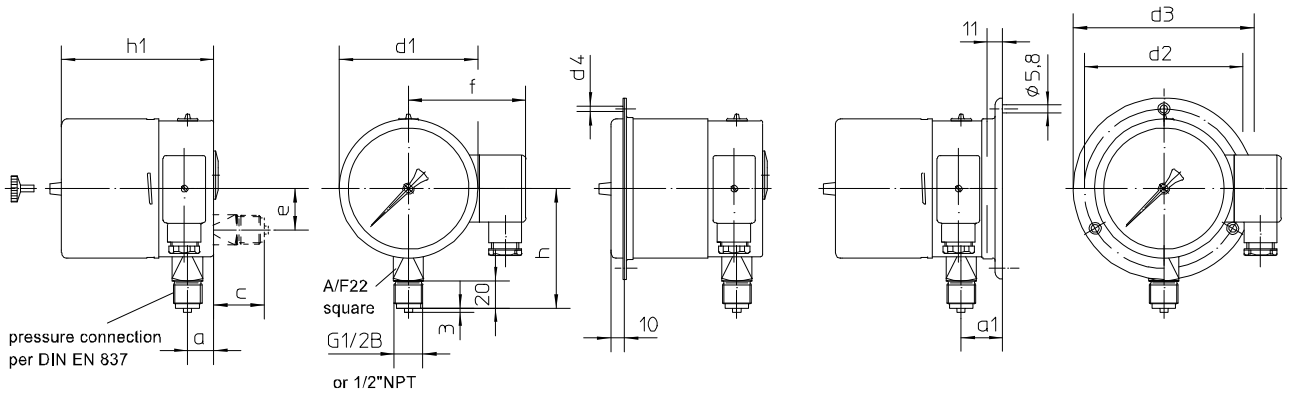
Further information see operating instruction BA_037.

Induktive contact inverse: (S1N) Type N5

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

Further information see operating instruction BA_037 and Technical Information TA_039.

Dimensions



Standard design for flush mounting for surface mounting

dimensions standard design (mm)											
case	d1	h1	a	c	e	f	h	d2	d3	d4	a1
NS 100	100	111	19	37	30	89	83	116	132	4.8	30
NS 160	160	112	19	37	60	119	113	178	196	5.8	30

dimensions safety case (mm)											
case	d1	h1	a	c	e	f	h	d2	d3	d4	a1
NS 100	100	123	37	-	-	89	83	116	132	4.8	-
NS 160	160	133	37	-	-	119	113	178	196	5.8	-

Contact settings:

The contacts can be adjusted over the entire indicating range. The black scale section may only be used for pressure-limiting applications. Adjustment is carried out by pressing in, and rotating the internal adjusting finger, using the accompanying adjusting key at the adjustment lock.

Signal evaluation:

The fitted inductive proximity switches are suitable for connection to switch units with normalized input, according to DIN 19234.

Order details

Pressure switch with bourdon tube, special design
Type series BP4...

Order details BP4…				
BP4200	standard case IP 65	NS 100	without case filling	process connection bottom
BP4210				process connection back
BP4220			with case filling	process connection bottom
BP4230				process connection back
BP4300		NS 160	without case filling	process connection bottom
BP4310				process connection back
BP4320			with case filling	process connection bottom
BP4330				process connection back
BP4500	safety case IP 65, per EN 873-1 S3	NS 100	without case filling	process connection bottom
BP4600		NS 160	without case filling	process connection bottom
BP4540	safety case IP 66, per EN 873-1 S3	NS 100	with case filling	process connection bottom
BP4640		NS 160	with case filling	process connection bottom

A2…	process connection	G1/2 B
B2…		1/2" NPT
C2…		M20 x 1,5
086	nominal range [bar]	-1...0 [1]
087		-1...0.6 [1]
088		-1...1.5
089		-1...3
090		-1...5
091		-1...9
092		-1...15
093		-1...24
053		0...1
054		0...1.6
055		0...2.5
056		0...4
057		0...6
058		0...10
059		0...16
060		0...25
061		0...40
062		0...60
063		0...100
064		0...160
065		0...250
066		0...400

	switch contacts	type of contact	number
N4 . 00	inductive contact	safety-initiator (SN)	single contact
N4 . . 0			double contact
N5 . 00		safety-initiator-invers (S1N)	single contact
N5 . . 0			double contact

. . .	**switch function - per contact, replace point with number**
2	switch: rising measured value opens contact
5	switch: falling measured value opens contact

Example of order code switch contacts N4250:
Double inductive contact with initiator → type of contact = N4
1. Inductive contact opens on rising measured value → code number 2
2. Inductive contact opens on falling measured value → code number 5

Additional features (to be indecated if required)		
V2	mounting	rear flange for surface mounting[2]
V3		front flange for flush mounting
W2603	functional safety per EN 61508, classification per SIL2	
W4001	free of oil and grease for oxygen application	

Order code (example): BP4200 – A2056 – N4250 - …

[1] not with case filling
[2] standard case, only