

## Pressure switch with bourdon tube for plants requiring special supervision Type series BN4...



### Application area

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

### Features

- Pressure switch with bourdon tube for plants requiring special supervision,
- Nominal ranges -1...0 bar to -1...24 bar, 0...1 to 0...400 bar
- High quality case with bajonet ring NS 100/160 per EN 837-1 S1, alternative 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. They come under the remit of PED 1G Category IV and have been subjected to an EC type-examination. The requirements of Approval Certificate Pressure 100 from the German Technical Inspection Authority (VdTÜV) are met. 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. The pressure switch is composed of the pressure measuring device and electrical evaluation unit. 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) <sup>1</sup>
Media:	-20...70 °C	-20...70 °C (40 °C) <sup>1</sup>
Storage:	-40...70 °C	-20...70 °C

<sup>1</sup> 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.

Ⓔ II 2G Ex ia IIC T4/T5/T6 Gb

Reg.-no.: 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 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 0001/14/D/01, piece of equipment with safety function cat. IV VdTÜV-component identification number:

- TÜV.SDW.14-234
- TÜV.SDWF.14-234
- TÜV.SDWFS.14-234

## Switch contacts

Inductive contact: Type N4  
(SN)

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

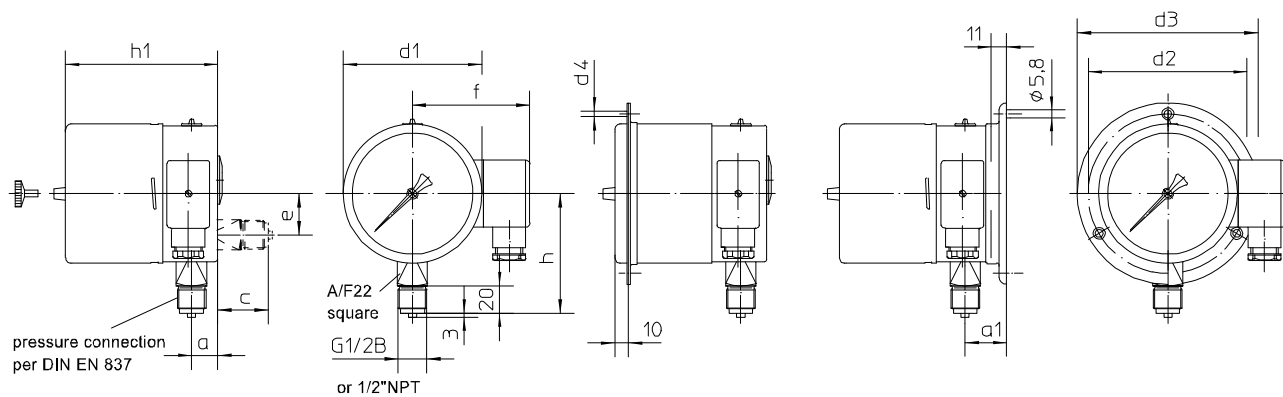
Further information see operating instruction BA\_037.

Induktive contact inverse: Type N5  
(S1N)

- 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

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

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

### 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 for plants requiring special supervision

#### Type series BN4...

Order details BN4...				
BN4200	standard case IP 65	NS 100	without liquid filling	process connection bottom
BN4210				process connection back
BN4220			with liquid filling	process connection bottom
BN4230				process connection back
BN4300		NS 160	without liquid filling	process connection bottom
BN4310				process connection back
BN4320			with liquid filling	process connection bottom
BN4330				process connection back
BN4500	safety case IP 65, per EN 873-1 S3	NS 100	without liquid filling	process connection bottom
BN4600		NS 160	without liquid filling	process connection bottom
BN4540	safety case IP 66, per EN 873-1 S3	NS 100	with liquid filling	process connection bottom
BN4640		NS 160	with liquid 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 <sup>1</sup>		
087		-1...0.6 <sup>1</sup>		
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-inverse (S1N)		single contact
N5 . . 0				double contact
...	switch function - per contact, replace point with number			
2	switch	rising measured value opens contact		
5		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 indicated if required)		
V2	mounting	rear flange for surface mounting <sup>2</sup>
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): BN4200 – A2056 – N4250 - ..**

<sup>1</sup> not with case filling

<sup>2</sup> standard case, only