



# DS 200

## Electronic Pressure Switch

Stainless Steel Sensor

accuracy according to EN IEC 62828-2:  
standard: 0.35 % span  
option: 0.25 % span

### Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

### Contacts

1 or 2 independent PNP contacts, freely configurable

### Analogue output

2-wire: 4 ... 20 mA  
3-wire: 4 ... 20 mA / 0 ... 10 V  
others on request

### Special characteristics

- ▶ indication of measured values on a 4-digit LED display
- ▶ rotatable and configurable display module

### Optional versions

- ▶ **IS-version**  
**Ex ia = intrinsically safe for gases**
- ▶ pressure sensor welded
- ▶ customer specific versions




The electronic pressure switch DS 200 is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 200 offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version and an analogue output complete the profile.

### Preferred areas of use are

-  Plant and Machine Engineering
-  Heating and Air Conditioning
-  Environmental Engineering  
(water – sewage – recycling)



Input pressure range												
Nominal pressure gauge <sup>1</sup>	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6
Level gauge <sup>1</sup>	[mH <sub>2</sub> O]	-	1	1.6	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50

Nominal pressure gauge <sup>1</sup> / abs.	[bar]	10	16	25	40	60	100	160	250	400	600
Level gauge <sup>1</sup>	[mH <sub>2</sub> O]	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	40	80	80	105	210	210	600	1000	1000	1000
Burst pressure ≥	[bar]	50	120	120	210	420	420	1000	1250	1250	1250
Vacuum resistance	P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance; P <sub>N</sub> < 1 bar: on request										
<sup>1</sup> from 60 bar: measurement starts with ambient pressure											

Contact <sup>2</sup>	
Standard	1 PNP contact
Options	2 independent PNP contacts
Max. switching current	4 ... 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V <sub>switch</sub> = V <sub>S</sub> - 2V 0 ... 10 V / 3-wire: contact rating 125 mA, short-circuit resistant
Accuracy of contacts <sup>3</sup>	standard: P <sub>N</sub> < 0.4 bar: ≤ ± 0.5 % span P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.35 % span option: P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.25 % span
Repeatability	≤ ± 0.1 % span
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 <sup>6</sup>
Delay time	0 ... 100 sec
<sup>2</sup> max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with IS-protection no contact possible with 3-wire in combination with plug ISO 4400	
<sup>3</sup> accuracy according to EN IEC 62828-2 – limit point adjustment (non-linearity, hysteresis, repeatability)	

Analogue output (optionally) / Supply	
2-wire current signal	4 ... 20 mA / V <sub>S</sub> = 13 ... 36 V <sub>DC</sub> permissible load: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V <sub>S</sub> = 15 ... 28 V <sub>DC</sub> permissible load: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω response time: < 10 msec
3-wire current signal	4 ... 20 mA / V <sub>S</sub> = 19 ... 30 V <sub>DC</sub> adjustable (turn-down of span 5:1) <sup>4</sup> permissible load: R <sub>max</sub> = 500 Ω response time: < 3 sec
3-wire voltage signal	0 ... 10 V / V <sub>S</sub> = 15 ... 36 V <sub>DC</sub> permissible load: R <sub>min</sub> = 10 kΩ response time: < 3 msec
Accuracy <sup>3</sup>	standard: P <sub>N</sub> < 0.4 bar: ≤ ± 0.5 % span; P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.35 % span option: P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.25 % span
<sup>4</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range	

Thermal effects (Offset and Span)				
Nominal pressure P <sub>N</sub>	[bar]	-1 ... 0	< 0.40	≥ 0.40
Tolerance band	[% span]	≤ ± 0.75	≤ ± 1	≤ ± 0.75
in compensated range	[°C]	-20 ... 85	0 ... 70	-20 ... 85

Permissible temperatures			
Permissible temperatures	medium: -40 ... 125 °C	electronics / environment: -40 ... 85 °C	storage: -40 ... 100 °C

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

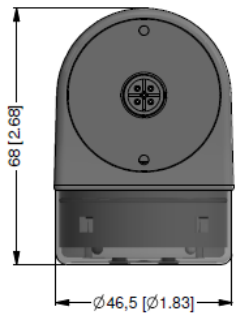
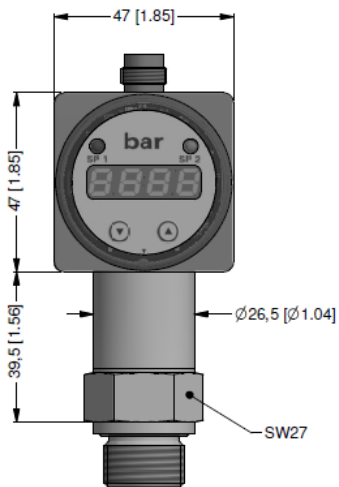
Mechanical stability	
Vibration	10 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6
Shock	500 g / 1 msec according to DIN EN 60068-2-27

Materials	
Pressure port	stainless steel 1.4404 (316 L)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	standard: FKM option: NBR; welded version <sup>5</sup> others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm
<sup>5</sup> welded version only for pressure ports according to EN 837; possible for nominal pressure ranges P <sub>N</sub> ≤ 40 bar	

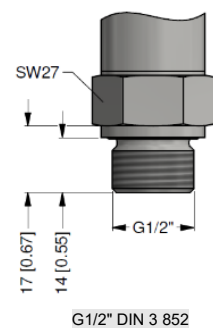
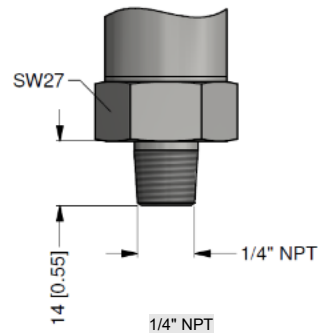
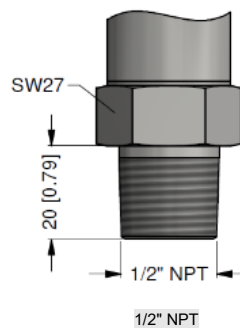
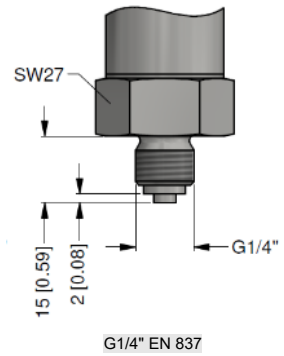
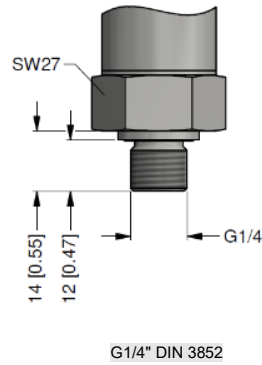
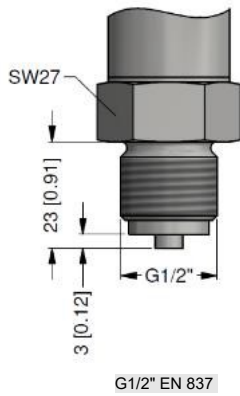
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX4-DS 200	IBExU06ATEX1049 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)					
Safety technical maximum values	$U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C \approx 0 \text{ nF}$ , $L_i \approx 0 \text{ }\mu\text{H}$					
Max. switching current <sup>6</sup>	70 mA (max. permissible inductivity: 4.7 mH)					
Permissible temperatures for environment	-25 ... 70 °C					
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu\text{H}/\text{m}$					
<sup>6</sup> the real switching current in the application depends on the power supply unit						
Miscellaneous						
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % $\pm$ 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)					
Current consumption (without contacts)	2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 45 mA + signal current 3-wire signal output voltage: approx. 45 mA					
Ingress protection	IP 65					
Installation position	any <sup>7</sup>					
Weight	min. 160 g (depending on mechanical connection)					
Operational life	> 100 x 10 <sup>6</sup> cycles					
CE-conformity	EMC Directive: 2014/30/EU			Pressure Equipment Directive: 2014/68/EU (module A) <sup>8</sup>		
ATEX Directive	2014/34/EU					
<sup>7</sup> Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $P_N \leq 1 \text{ bar}$ .						
<sup>8</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar						
Wiring diagrams						
<p>2-wire-system (current)</p>			<p>3-wire-system (current / voltage)</p>			
Pin configuration						
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable colours (DIN 47100)
Supply +	1	1	1	1	1	wh (white)
Supply -	3	3	3	2	3	bn (brown)
Signal + (only 3-wire)	2	2	2	3	2	gn (green)
Contact 1	4	4	4	3	4	gy (grey)
Contact 2	5	5	5	-	5	pk (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	ye/gn (yellow/green)
Electrical connections (dimensions in mm)						
						<p>cable outlet PVC <math>\varnothing = 4.9\text{mm}</math> cable outlet PUR <math>\varnothing = 5.7\text{mm}</math></p>
M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable outlet <sup>9</sup>	
<sup>9</sup> different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)						

**Mechanical connections (dimensions in mm)**

**standard**

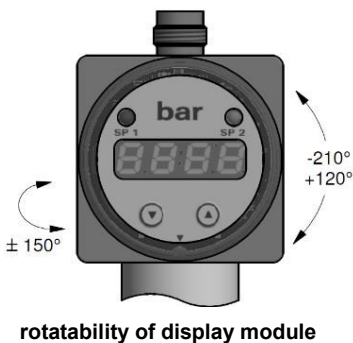


**optionally**

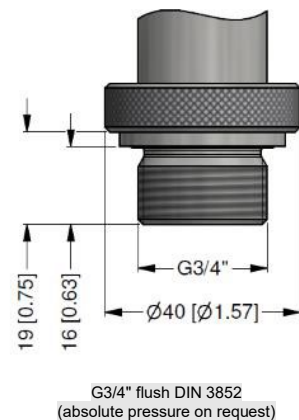
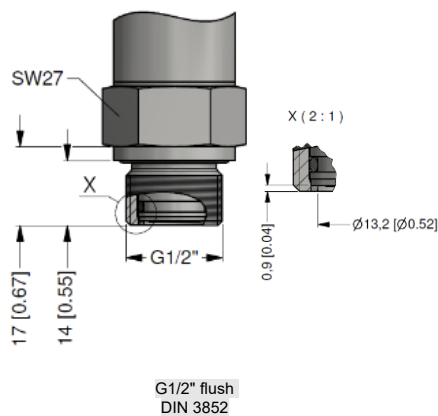


→ for nominal pressure  $P_N > 400$  bar increases the length of devices without IS-version by 19 mm and of devices with IS-version by 39 mm

**optionally for  $P_N$  from 0.1 up to 40 bar**



**rotatability of display module**



→ **metric threads and other versions on request**

This data sheet contains product specification. properties are not guaranteed. Subject to change without notice.

## ORD.Code DS 200

15.01.2024

DS 200

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Pressure																			
Gauge <sup>1</sup>	7	8	0																
Absolute <sup>2</sup>	7	8	1																
Input [bar]																			
0 ... 0,1 <sup>2</sup>				1	0	0	0												
0 ... 0,16 <sup>2</sup>				1	6	0	0												
0 ... 0,25 <sup>2</sup>				2	5	0	0												
0 ... 0,4				4	0	0	0												
0 ... 0,6				6	0	0	0												
0 ... 1				1	0	0	1												
0 ... 1,6				1	6	0	1												
0 ... 2,5				2	5	0	1												
0 ... 4				4	0	0	1												
0 ... 6				6	0	0	1												
0 ... 10				1	0	0	2												
0 ... 16				1	6	0	2												
0 ... 25				2	5	0	2												
0 ... 40				4	0	0	2												
0 ... 60				6	0	0	2												
0 ... 100				1	0	0	3												
0 ... 160				1	6	0	3												
0 ... 250				2	5	0	3												
0 ... 400				4	0	0	3												
0 ... 600				6	0	0	3												
-1 ... 0				X	1	0	2												
Customer				9	9	9	9												
Customer - underpressure				X	X	X	X												
Electrical output / Analog output																			
4 ... 20 mA / 2-wire																			1
0 ... 20 mA / 3-wire																			2
0 ... 10 V / 3-wire																			3
4 ... 20 mA / 3-wire																			7
Intrinsic safety Ex ia 4 ... 20 mA / 2-wire <sup>3</sup>																			E
Customer																			9
Contact																			
Without switching contact																			0
1 switching contact (version 3-wire only with 5-pin connector) <sup>3,4</sup>																			1
2 switching contacts (only with 5-pin connector) <sup>3,4</sup>																			2
Accuracy																			
0,5 % (P <sub>N</sub> ≤ 0,4 bar)																			5
0,35 % (P <sub>N</sub> > 0,4 bar)																			3
0,25 % (P <sub>N</sub> > 0,4 bar)																			2
0,5 % including Calibration Certificate (P <sub>N</sub> ≤ 0,4 bar)																			T
0,35 % including Calibration Certificate (P <sub>N</sub> > 0,4 bar)																			S
0,25 % including Calibration Certificate (P <sub>N</sub> > 0,4 bar)																			R
Table of measured values for accuracy 0,5 %																			N
Table of measured values for accuracy 0,35 %																			M
Customer																			9
Electrical connection																			
Connector DIN 43650 (ISO 4400) (IP 65) <sup>4</sup>																			1 0 0
Cable gland PG7 / cable length specify (IP 67)																			4 0 0
+ PVC cable / 1 m																			
Connector M 12 x 1 (5-pin) (IP 65)																			N 0 1
Connector M 12 x 1 (5-pin) (IP 65) - metal																			N 1 1
Connector Binder 723 7-pin (IP 65)																			A 0 0
Customer																			9 9 9
Mechanical connection																			
G 1/2" DIN 3852																			1 0 0
G 1/2" EN 837																			2 0 0



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Společnost BD SENSORS s.r.o. je certifikována společností TÜV SÜD Czech dle normy ISO 9001.

G 1/4" DIN 3852	3	0	0				
G 1/4" EN 837	4	0	0				
M 20 x 1,5 DIN 3852	5	0	0				
M 12 x 1 DIN 3852	6	0	0				
M 10 x 1 DIN 3852	7	0	0				
M 20 x 1,5 EN 837	8	0	0				
M 12 x 1,5 DIN 3852	C	0	0				
G 1/2" DIN 3852 with flush sensor diaphragm <sup>5</sup>	F	0	0				
G 3/4" DIN 3852 with flush sensor diaphragm <sup>5</sup>	K	0	0				
1/2" NPT	N	0	0				
1/4" NPT	N	4	0				
Customer	9	9	9				
<b>Seals</b>							
Viton (FKM) ( $P_N \leq 40$ bar)				1			
Without seals - welded (only with EN 837) <sup>6</sup>				2			
EPDM ( $P_N < 160$ bar)				3			
NBR ( $P_N > 40$ bar)				5			
Customer				9			
<b>Special version</b>							
Standard					0	0	0
Customer					9	9	9

0,-...without additional charge

On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the BD SENSORS reserves the right to change sensor specifications without further notice.

1 from 60 bar: measurement starts with ambient pressure

2 absolute pressure possible from 0.4 bar

3 with IS version max. 1 contact is possible

4 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

5 not possible for nominal pressure  $P_N > 40$  bar; for G3/4" flush nominal pressure abs. on request

6 welded version only with pressure ports according to EN 837; possible for nominal pressure ranges  $P_N \leq 40$  bar



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Společnost BD SENSORS s.r.o. je certifikována společností TÜV SÜD Czech dle normy ISO 9001.