



# DS 200P

## Electronic Pressure Switch Process Industry

### Pressure Ports And Process Connections With Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:  
standard: 0.35 % FSO  
option: 0.25 % FSO



Electronic Pressure Switch

DS 200P

#### **Nominal pressure**

from 0 ... 100 mbar up to 0 ... 40 bar

#### **Contacts**

1, 2 or 4 independent PNP contacts,  
freely configurable

#### **Analogue output**

2-wire: 4 ... 20 mA  
3-wire: 0 ... 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
- ▶ configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)

#### **Optional versions**

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



The electronic pressure switch DS 200P is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and is suitable for the usage with viscous and pasty media.

As standard the DS 200P offers a PNP contact and a rotatable display module with 4-digit LED display.

Optional versions like e.g. an intrinsically safe version, max. 4 contacts and an analogue output complete the profile.

#### **Preferred areas of use are**



Food industry



Pharmacy

#### **Material and test certificates**

- ▶ material test report according to DIN EN 10204-3.1.
- ▶ specific test report according to DIN EN 10204-2.2.

# DS 200P

## Electronic Pressure Switch

## Technical Data

Input pressure range <sup>1</sup>																
Nominal pressure (P <sub>N</sub> ) gauge / abs.	[bar]	-1 ... 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance									P <sub>N</sub> < 1 bar: on request					

<sup>1</sup> consider the pressure resistance of fitting and clamps

Contact <sup>2</sup>	
Standard	1 PNP contact
Options	2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 8-pin for 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request)
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 500 mA, short-circuit resistant
Accuracy of contacts <sup>3</sup>	standard: P <sub>N</sub> < 0.4 bar: ≤ ± 0.5 % FSO      P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.25 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 <sup>8</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 IEC 60770 – 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>Smin</sub> ) / 0.02 A] Ω      response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V <sub>S</sub> = 13 ... 28 V <sub>DC</sub> permissible load: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>Smin</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 1:5) <sup>4</sup> permissible load: R <sub>max</sub> = 500 Ω      response time: < 0.5 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: < 10 msec
Without analogue output	V <sub>S</sub> = 15 ... 36 V <sub>DC</sub>
Accuracy <sup>3</sup>	standard: P <sub>N</sub> < 0.4 bar: ≤ ± 0.5 % FSO      P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.25 % FSO

<sup>4</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range

Thermal errors (Offset and Span) <sup>6</sup> / Permissible temperatures			
Nominal pressure P <sub>N</sub>	[bar]	-1 ... 0	< 0.40      ≥ 0.40
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 1.5      ≤ ± 0.75
in compensated range	[°C]	-20 ... 85	0 ... 50      -20 ... 85
Permissible temperatures <sup>6</sup>		medium: -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -40 ... 85 °C      storage: -40 ... 100 °C	
Permissible temperature medium for cooling element 300°C		filling fluid silicon oil      overpressure: -40 ... 300 °C      vacuum: -40 ... 150 °C <sup>5</sup> filling fluid food compatible oil      overpressure: -10 ... 250 °C      vacuum: -10 ... 150 °C	

<sup>5</sup> also for P<sub>abs</sub> ≤ 1 bar

<sup>6</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.

<sup>7</sup> max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °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	5 g RMS (25 ... 2000 Hz)      according to DIN EN 60068-2-6
Shock	100 g / 11 msec      according to DIN EN 60068-2-27
Filling fluids	
Standard	silicon oil
Options	food compatible oil (with FDA approval) (Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662)      others on request
Materials	
Pressure port / Housing	stainless steel 1.4404 (316 L)      others on request
Display housing	PA 6.6, Polycarbonate
Seals (media wetted)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures > 200 °C) clamp and dairy pipe: without
Diaphragm	stainless steel 1.4435 (316 L) / Tantalum and Hastelloy <sup>®</sup> C-276 (2.4819) on request
Media wetted parts	pressure port, seals, diaphragm

# DS 200P

## Electronic Pressure Switch

## Technical Data

Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX14-DS 200P	IBExU 06 ATEX 1050 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>8</sup>	70 mA (max. permissible inductivity: 4.7 mH)					
Permissible temperatures for environment	-20 ... 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>8</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 (standard calibration in a vertical position with the pressure port connection down; different installation position for $P_N \leq 2\text{ bar}$ have to be specified in the order)					
Weight	approx. 160 ... 250 g					
Operational life	$> 100 \times 10^8$ cycles					
CE-conformity	EMC Directive: 2004/108/EC					
Wiring diagrams						
2-wire-system (current)			3-wire-system (current / voltage)			
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	3	wh (white)
Supply -	3	3	3	2	4	bn (brown)
Signal + (only 3-wire)	2	2	2	3	5	gn (green)
Contact 1	4	4	4	3	2	gr (grey)
Contact 2	5	5	5	-	1	pn (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	gn/ye (green/yellow)
Electrical connections (dimensions in mm)						
M12x1 (5-pin)	M12x1 (8-pin)	ISO 4400	Binder series 723 (5-polig)	cable outlet <sup>7</sup>		
<sup>7</sup> different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70°C)						

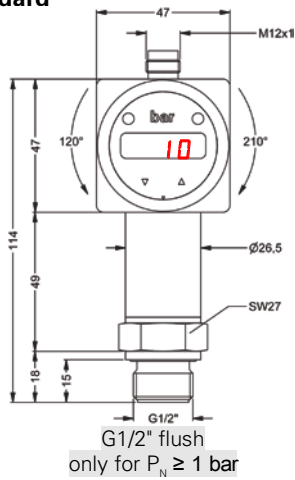
# DS 200P

Electronic Pressure Switch

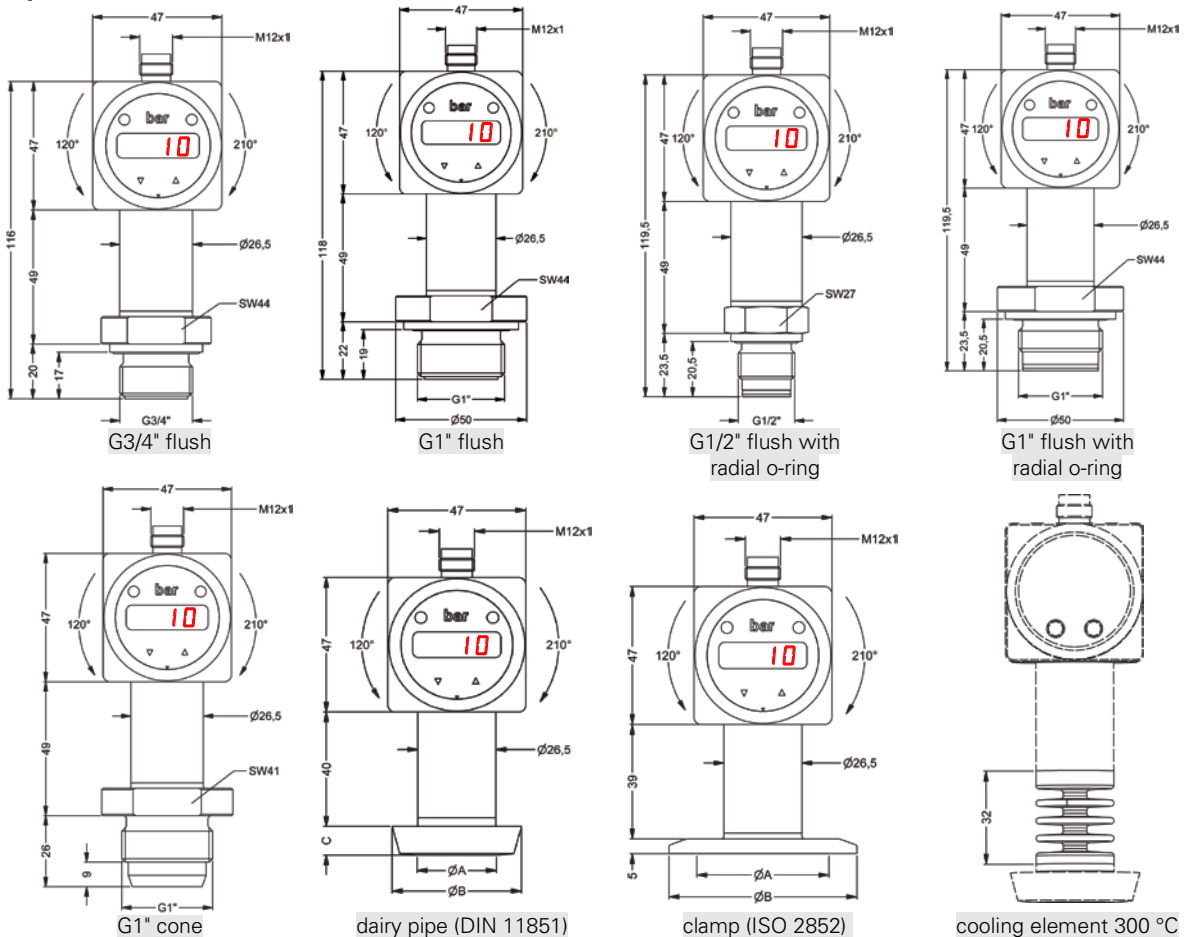
Technical Data

## Mechanical connections (dimensions in mm)

### Standard



### Option



dimension in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5

dimension in mm			
size	DN 25	DN 38	DN 51
A	23	32	45
B	50.5	50.5	64

⇕ **SIL- and SIL-Ex version: total length increases by 26.5 mm!**  
 ⇕ **metric threads and other versions on request**

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

## Ordering code DS 200P

### DS 200P

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Pressure		7	8	5													
	gauge	7	8	5													
	absolute <sup>1</sup>	7	8	6													
Input [bar]																	
	0.10	1	0	0	0												
	0.16	1	6	0	0												
	0.25	2	5	0	0												
	0.40	4	0	0	0												
	0.60	6	0	0	0												
	1.0	1	0	0	1												
	1.6	1	6	0	1												
	2.5	2	5	0	1												
	4.0	4	0	0	1												
	6.0	6	0	0	1												
	10	1	0	0	2												
	16	1	6	0	2												
	25	2	5	0	2												
	40	4	0	0	2												
	-1 ... 0	X	1	0	2												
	customer	9	9	9	9												
Analogue output																	
	without					0											
	4 ... 20 mA / 2-wire					1											
	0 ... 10 V / 3-wire					3											
	4 ... 20 mA / 3-wire, adjustable					7											
	Intrinsic safety 4 ... 20 mA / 2-wire <sup>2</sup>					E											
	customer					9											
Contact																	
	1 contact <sup>2,3</sup>					1											
	2 contacts <sup>2,3</sup>					2											
	4 contacts <sup>4</sup>					4											
Accuracy																	
	standard for P <sub>N</sub> > 0,4 bar	0.35				3											
	standard for P <sub>N</sub> ≤ 0,4 bar	0.5				5											
	option for P <sub>N</sub> ≥ 0,4 bar	0.25				2											
	customer					9											
Electrical connection																	
	Male plug M12x1 (5-pin) / plastic version					N	0	0									
	Male plug M12x1 (8-pin) / plastic version <sup>4</sup>					M	5	0									
	Male plug M12x1 (5-pin) / metal version					N	1	0									
	Male and female plug ISO 4400 <sup>3</sup>					1	0	0									
	Male plug Binder series 723 (5-pin)					2	0	0									
	Cable outlet incl. cable <sup>5</sup>					T	A	0									
	customer					9	9	9									
Mechanical connection																	
	G1/2" with flush welded diaphragm (DIN 3852) <sup>6</sup>					Z	0	0									
	G3/4" with flush welded diaphragm (DIN 3852)					Z	3	0									
	G1" with flush welded diaphragm (DIN 3852)					Z	3	1									
	G1" DIN 3852 with rad. o-ring and flush diaphragm					Z	5	7									
	G1/2" DIN 3852 with rad. o-ring and flush diaphragm					Z	6	1									
	G 1" cone					K	3	1									
	Clamp DN 25 (ISO 2852)					C	6	1									
	Clamp DN 38 (ISO 2852)					C	6	2									
	Clamp DN 51 (ISO 2852)					C	6	3									
	Dairy pipe DN 25 (DIN 11851) <sup>7</sup>					M	7	3									
	Dairy pipe DN 40 (DIN 11851) <sup>7</sup>					M	7	5									
	Dairy pipe DN 50 (DIN 11851) <sup>7</sup>					M	7	6									
	customer					9	9	9									
Diaphragm																	
	Stainless steel 1.4435 (316L)					1											
	Tantal					T											
	Hastelloy® C-276 (2.4819)					H											
	customer					9											
Seals																	
	for clamp or dairy pipe: without					0											
	for inch thread: FKM					1											
	FFKM					7											
	customer					9											
Filling Fluids																	
	Silicon oil					1											
	food compatible oil					2											
	customer					9											
Special version																	
	standard					0	0	0									
	with cooling element up to 300°C					2	0	0									
	customer					9	9	9									

<sup>1</sup> nominal pressure absolute not possible for P<sub>N</sub> < 0.6 bar  
<sup>2</sup> with Ex version max. 1 contact is possible  
<sup>3</sup> with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible  
<sup>4</sup> 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request  
<sup>5</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request  
<sup>6</sup> possible only for P<sub>N</sub> ≥ 1 bar  
<sup>7</sup> The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position.

informs product specification; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.