



DS 200P

Electronic Pressure Switch

Pressure Ports And Process Connections With Flush Welded Stainless Steel Diaphragm

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

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: 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
- ▶ 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



Input pressure range ¹																
Nominal pressure (P _N) 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 _N ≥ 1 bar: unlimited vacuum resistance								P _N < 1 bar: on request						
¹ consider the pressure resistance of fitting and clamps																

Contact ²	
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 _{Switch} = V _S - 2V 0 ... 10 V / 3-wire: contact rating 500 mA, short-circuit resistant
Accuracy of contacts ³	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 ⁶
Delay time	0 ... 100 sec

² 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

³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Analogue output (optionally) / Supply	
2-wire current signal	4 ... 20 mA / V _S = 13 ... 36 V _{DC} permissible load: R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V _S = 13 ... 28 V _{DC} permissible load: R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω response time: < 10 msec
3-wire current signal	4 ... 20 mA / V _S = 19 ... 30 V _{DC} adjustable (turn-down of span 1:5) ⁴ permissible load: R _{max} = 500 Ω response time: < 0.5 sec
3-wire voltage signal	0 ... 10 V / V _S = 15 ... 36 V _{DC} permissible load: R _{min} = 10 kΩ response time: < 10 msec
Without analogue output	V _S = 15 ... 36 V _{DC}
Accuracy ³	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO
⁴ with turn-down of span the analogue signal is adjusted automatically to the new measuring range	

Thermal errors (Offset and Span) ⁵ / Permissible temperatures			
Nominal pressure P _N	[bar]	-1 ... 0	< 0.40
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 1.5
in compensated range	[°C]	-20 ... 85	0 ... 50
Permissible temperatures ⁶	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 ⁷
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C

⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.

⁶ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C

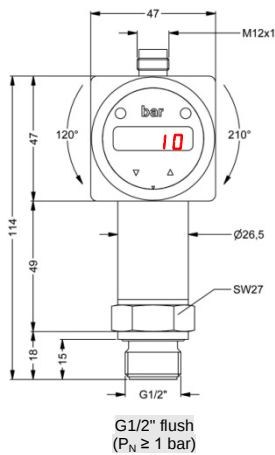
⁷ also for P_{abs} ≤ 1 bar

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 SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) 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	standard: stainless steel 1.4435 (316 L) option: Hastelloy® C-276 (2.4819); Tantalum on request
Media wetted parts	pressure port, seals, diaphragm

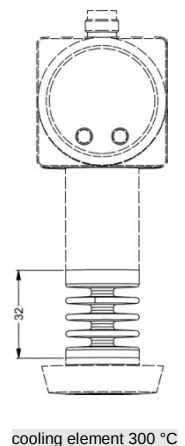
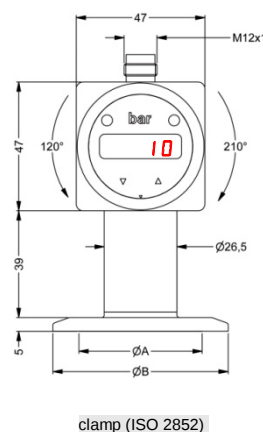
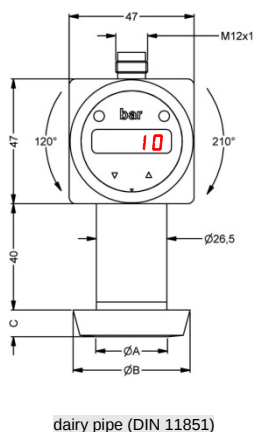
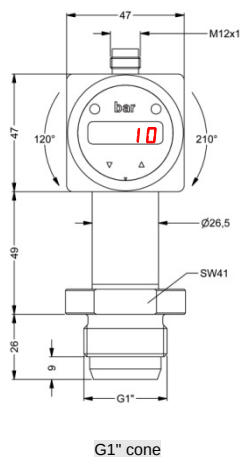
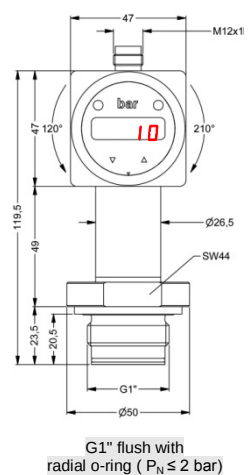
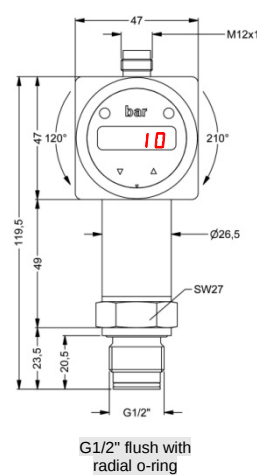
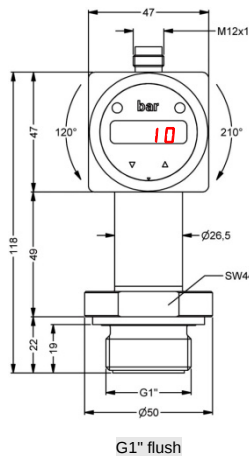
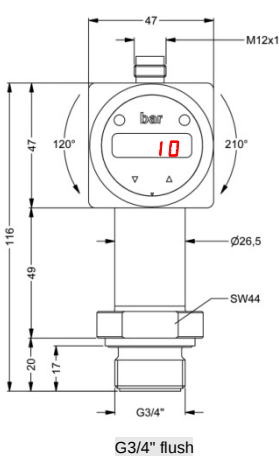
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX14-DS 200P	IBExU06ATEX1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)					
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$					
Max. switching current ⁸	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: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu\text{H}/\text{m}$					
⁸ 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	$> 100 \times 10^6$ 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	gy (grey)
Contact 2	5	5	5	-	1	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)						
M12x1 (5-pin)	M12x1 (8-pin)	ISO 4400	Binder series 723 (5-polig)	cable outlet ⁷		
⁷ 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)						

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
PN	≤ 40	≤ 40	≤ 25

	dimension in mm		
size	DN 25	DN 38	DN 51
A	23	32	45
B	50.5	50.5	64
PN	≤ 16	≤ 16	≤ 16

⇒ **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									
	gauge	7	8	5					
	absolute	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	consult
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 ¹				E				
	customer				9				consult
Contact									
	1 contact ^{1,2}				1				
	2 contacts ^{1,2}				2				
	4 contacts ³				4				
Accuracy									
	standard for P _N > 0,4 bar				0.35 %				3
	standard for P _N ≤ 0,4 bar				0.5 %				5
	option for P _N ≥ 0,4 bar				0.25 %				2
	customer								9
									consult
Electrical connection									
	Male plug M12x1 (5-pin) / plastic version				N	0	1		
	Male plug M12x1 (8-pin) / plastic version ³				M	5	0		
	Male plug M12x1 (5-pin) / metal version				N	1	1		
	Male and female plug ISO 4400 ²				1	0	0		
	Male plug Binder series 723 (5-pin)				2	0	0		
	Cable outlet incl. cable ⁴				T	A	0		
	customer				9	9	9		consult
Mechanical connection									
	G1/2" with flush welded diaphragm (DIN 3852) ⁵				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 ⁶				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) ⁷				M	7	3		
	Dairy pipe DN 40 (DIN 11851) ⁷				M	7	5		
	Dairy pipe DN 50 (DIN 11851) ⁷				M	7	6		
	customer				9	9	9		consult
Diaphragm									
	Stainless steel 1.4435 (316L)							1	
	Tantal							T	consult
	Hastelloy ® C-276 (2.4819)							H	
	customer							9	consult
Seals									
	for clamp or dairy pipe: without							0	
	for inch thread: FKM							1	
	FFKM							7	
	customer							9	consult
Filling Fluids									
	Silicon oil							1	
	food compatible oil							2	
	customer							9	consult
Special version									
	standard							0	0
	with cooling element up to 300°C							2	0
	customer							9	9
									consult

¹ with Ex version max. 1 contact is possible
² with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
³ 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
⁴ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request
⁵ possible only for P_N ≥ 1 bar
⁶ possible only for P_N ≤ 2 bar
⁷ 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.

