



DS 200 P

Electronic Pressure Switch with Flush Process Connection

- ▶ piezoresistive pressure sensor
- ▶ up to 4 independent contacts, configurable
- ▶ optional:
 - analogue output
 - Ex-protection (for 2-wire)
 - cooling element up to 300 °C
- ▶ nominal pressure ranges from 0 ... 100 mbar up to 0 ... 40 bar

Description

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

- ▶ intelligent pressure switch
- ▶ digital display

and is suitable for the usage with viscous and pasty media which are compatible with stainless steel 1.4435 (316L) and the sealing material. The DS 200 P has a flush diaphragm and can be delivered with inch thread, as well as with different process connections like clamp or dairy pipe. For use with higher media temperature the DS 200 P can optionally be supplied with a cooling element.

Operation

The rotatable display module shows the system pressure and allows programming. The configuration is menu controlled and easy to handle without previous knowledge.

Applications

- ▶ foodstuff industry
- ▶ pharmacy
- ▶ chemical industry

- ▶ 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)
- ▶ option analogue output:
 - 4 ... 20 mA / 2-wire
Ex-protection optionally
 - 4 ... 20 mA / 3-wire
with turn-down 1:5
 - 0 ... 10 V / 3-wire
- ▶ special functions (access protection, min. / max. value memory)
- ▶ industrial standard in view of accuracy, thermal behaviour and long term stability

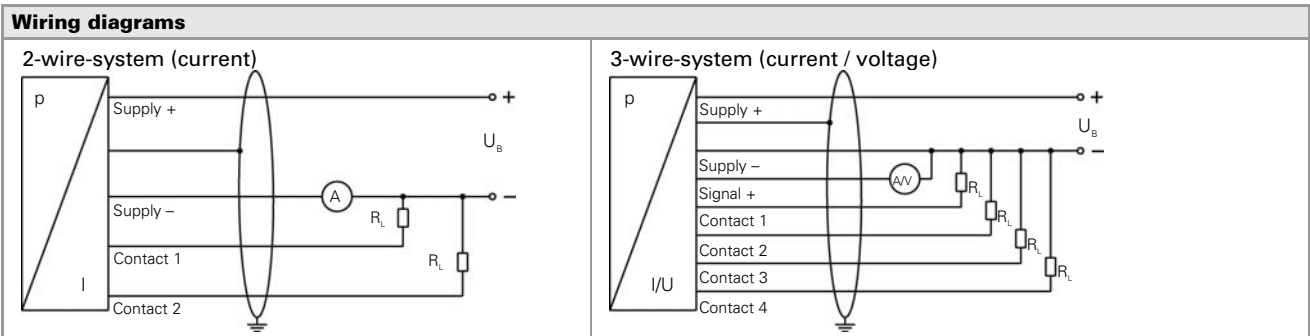
Characteristics



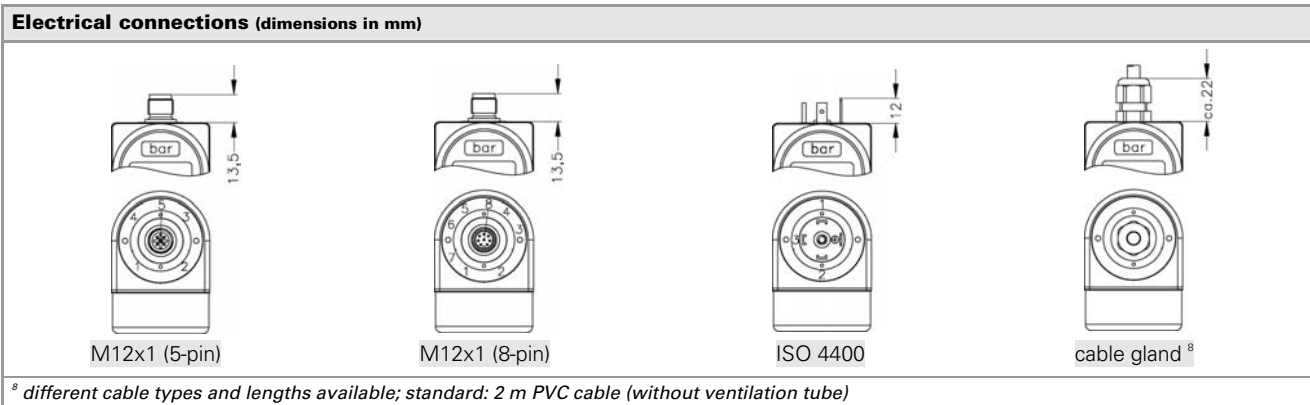
DS 200 P
Electronic Pressure Switch

Input pressure range																	
Nominal pressure gauge [bar]	-1 ... 0	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40		
Nominal pressure abs. [bar]	-	-	-	-	-	0.6	1	1.6	2.5	4	6	10	16	25	40		
Level [bar]	3	1	1	1	1	3	3	6	6	20	20	60	60	60	100		
Contact ¹																	
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									IEC 60770				BFSL				
	standard: nominal pressure > 0.4 bar:								$\leq \pm 0.35\%$ FSO				$\leq \pm 0.175\%$ FSO				
	option: nominal pressure > 0.4 bar:								$\leq \pm 0.25\%$ FSO				$\leq \pm 0.125\%$ FSO				
Repeatability	$\leq \pm 0.1\%$ FSO																
Switching frequency	max. 10 Hz																
Switching cycles	$> 100 \times 10^5$																
Delay time	0 ... 100 s																
¹ max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with Ex-protection no contact possible with 3-wire voltage signal with plug ISO 4400																	
Analogue output (optionally) / Supply																	
2-wire current signal	4 ... 20 mA / $V_s = 18 \dots 41 V_{DC}$ permissible load: $R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ response time: < 10 ms																
2-wire current signal with Ex-protection	4 ... 20 mA / $V_s = 17 \dots 28 V_{DC}$ permissible load: $R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ response time: < 10 ms																
3-wire current signal	4 ... 20 mA / $V_s = 19 \dots 30 V_{DC}$ adjustable (turn-down of span 1:5) ² permissible load: $R_{max} = 500 \Omega$ response time: < 1 s																
3-wire voltage signal	0 ... 10 V / $V_s = 15 \dots 36 V_{DC}$ permissible load: $R_{min} = 10 k\Omega$ response time: < 10 ms																
Without analogue output	$V_s = 15 \dots 36 V_{DC}$																
Accuracy									IEC 60770 ³				BFSL				
	standard: nominal pressure > 0.4 bar:								$\leq \pm 0.35\%$ FSO				$\leq \pm 0.175\%$ FSO				
	option: nominal pressure > 0.4 bar:								$\leq \pm 0.25\%$ FSO				$\leq \pm 0.125\%$ FSO				
² with turn-down of span the analogue signal is adjusted automatically to the new measuring range																	
³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																	
Thermal errors (offset and span) ⁴ / Permissible temperatures																	
Nominal pressure P_N [bar]	-1 ... 0	≤ 0.1			≤ 0.25			≤ 0.4			≤ 1			> 1			
Tolerance band [% FSO]	$\leq \pm 0.75$		$\leq \pm 2$			$\leq \pm 1.5$			$\leq \pm 1$			$\leq \pm 1$			$\leq \pm 0.75$		
TC, average [% FSO / 10 K]	± 0.12		± 0.4			± 0.3			± 0.2			± 0.15			± 0.12		
in compensated range [°C]	0 ... 70				0 ... 50				0 ... 70								
Permissible temperatures	medium: -25 ... 125 °C ⁵					electronics / environment: -25 ... 85 °C					storage: -40 ... 85 °C						
⁴ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions																	
⁵ for vacuum ranges and nominal pressure abs. the max. medium temperature is 70 °C; with optional cooling element its maximum permissible temperature is valid																	
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 (20 ... 2000 Hz)																
Shock	100 g / 11 msec																
Filling fluids																	
Standard	silicon oil																
Optional	food compatible oil (with FDA approval) / Halocarbon and others on request																
Materials																	
Pressure port	stainless steel 1.4435 (316L)																
Housing	stainless steel 1.4301 (304)																
Display housing	PA 6.6, Polycarbonate																
Seals (media wetted)	inch thread: standard: FKM (recommended for medium temperatures ≤ 200 °C) optionally: FFKM (recommended for medium temperatures > 200 °C) others on request																
	clamp and dairy pipe: without																
Diaphragm	stainless steel 1.4435 (316L)																
Media wetted parts	pressure port, seals, diaphragm																

Explosion protection (for 2-wire current signal with Ex-protection)	
Approval AX11-DS 200 P	zone (0) 1: II (1) 2 G Ex ia IIC T4
Safety technical maximum values	$U_i = 28\text{ V}$, $I_i = 93\text{ mA}$, $P_i = 660\text{ mW}$
Max. switching current ⁶	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 µH/m
⁶ 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 % ± 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 ⁷
Weight	approx. 160 ... 250 g
Operational life	> 100 x 10 ⁶ cycles
⁷ 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 ≤ 1 bar. Therefore installation position has to be given in this case.	



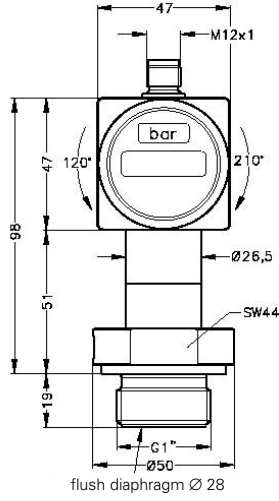
Pin configuration					
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	cable colours (DIN 47100)
Supply +	1	1	1	1	white
Supply -	3	3	3	2	brown
Signal + (only 3-wire)	2	2	2	3	green
Contact 1	4	4	4	3	grey
Contact 2	5	5	5	-	pink
Contact 3	-	-	6	-	-
Contact 4	-	-	7	-	-
Ground	via pressure port	plug housing / pressure port	via pressure port	ground contact	yellow / green (shield)



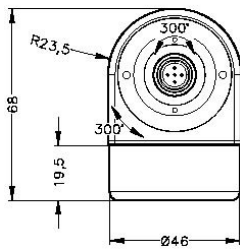
⁸ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube)

Mechanical connections (dimensions in mm)

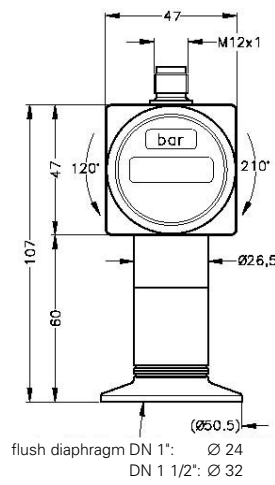
Inch thread (DIN 3852)



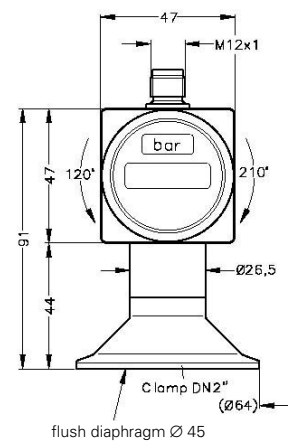
G1" flush



Clamp (ISO 2852)

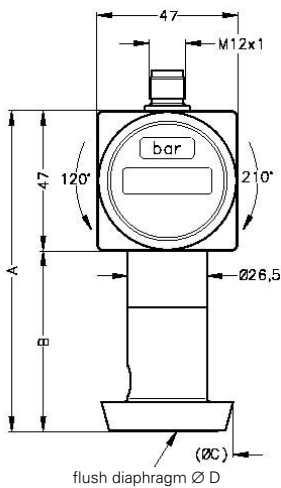


DN 1" or DN 1 1/2"



DN2"

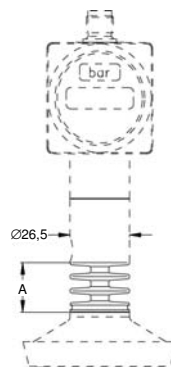
Dairy pipe (DIN 11851)



flush diaphragm Ø D

dimensions in mm			
size	DN 25	DN 40	DN 50
A	107	89	89
B	71	53	53
C	44	56	68,5
D	24	32	45

Cooling element



temperature range	150° C	300° C
size A	22	34
number of cooling fins	2	3

⇒ Ex-protection: total length increases by 20 mm!

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

