



DS 200 P

Electronic Pressure Switch with Flush Process Connection

- ▶ piezoresistive pressure sensor
- ▶ for foodstuff industry, pharmacy, chemical industry, etc.
- ▶ medium temperature up to 300 °C
- ▶ nominal pressure ranges from 0 ... 100 mbar up to 0 ... 40 bar

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

- precise process pressure transmitter
- intelligent pressure switch
- digital display

Any viscous and pasty media can be used which are compatible with stainless steel 1.4435 (316L).

Basic element of the DS 200 P is a piezoresistive stainless steel sensor. The 4-digit LED display shows the system pressure and supports programming the DS 200 P using the foil keys. Set and reset points are freely configurable in the range 0 to 100 % of the nominal pressure. Display and housing of the DS 200 P are rotatable, so that the position of the display can be easily adapted to unusual installation conditions.

All devices can be supplied with an optional cooling element for use with higher media temperature. 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.

Preferred areas of use are:

- ▶ pharmacy
- ▶ chemical industry
- ▶ foodstuff industry

- ▶ configuration of display, including
 - current values
 - decimal point
- ▶ contacts adjustable, including
 - switch on / switch off points
 - hysteresis / window mode
 - switch on /switch off delay
- ▶ special functions / administration
 - access protection
 - min. / max. value memory

Functions

DS 200 P
Electronic Pressure Switch



Input pressure range

Nominal pressure gauge [bar]	-1 ... 0 ¹	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40
Nominal pressure abs. ¹ [bar]	-	-	-	-	-	0.6	1	1.6	2.5	4	6	10	16	25	40
Permissible overpressure [bar]	3	1	1	1	1	3	3	6	6	20	20	60	60	60	100

Output signal / Supply

Analogue output

Standard	2-wire: 4 ... 20 mA / $V_s = 18 ... 41 V_{DC}$	Ex-protection: $V_s = 17 ... 28 V_{DC}$	
Optional	3-wire: 0 ... 10 V / $V_s = 15 ... 36 V_{DC}$	4 ... 20 mA / $V_s = 19 ... 30 V_{DC}$ (on request)	
Accuracy	standard: nominal pressure > 0.4 bar: nominal pressure ≤ 0.4 bar: option: nominal pressure > 0.4 bar:	IEC 60770 ²	BFSL
		≤ ± 0.35 % FSO	≤ ± 0.175 % FSO
		≤ ± 0.50 % FSO	≤ ± 0.250 % FSO
	≤ ± 0.25 % FSO	≤ ± 0.125 % FSO	
Permissible load	current 2-wire: $R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$		
Response time	< 10 msec ³		
Contact ^{4,5}			
Number, types	1 or 2 independent PNP contacts		
Switching current	standard: contact rating max. 125 mA, short-circuit resistance Ex-protection: max. switching current ⁶ : 70 mA; max. permissible inductivity: 4.7 mH		
Accuracy of contacts	standard: nominal pressure > 0.4 bar: nominal pressure ≤ 0.4 bar: option: nominal pressure > 0.4 bar:	IEC 60770 ²	BFSL
		≤ ± 0.35 % FSO	≤ ± 0.175 % FSO
		≤ ± 0.50 % FSO	≤ ± 0.250 % FSO
	≤ ± 0.25 % FSO	≤ ± 0.125 % FSO	
Repeatability	≤ ± 0.1 % FSO		
Switching frequency	max. 10 Hz		
Switching cycles	> 100 x 10 ⁶		
Delay time	0 ... 100 sec		

Thermal errors (Offset and Span)⁷

Nominal pressure P_N [bar]	-1 ... 0	≤ 0.1	≤ 0.25	≤ 0.4	≤ 1.0	> 1.0
Tolerance band [% FSO]	≤ ± 0.75	≤ ± 2	≤ ± 1.5	≤ ± 1	≤ ± 1	≤ ± 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

Electrical protection

Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Option Ex-protection only for 4 ... 20 mA / 2-wire AX11-DS 200 P	zone (0) 1: II (1) 2 G EEx ia IIC T4 safety technical maximum values: $V_i = 28 V$, $\Sigma I_i = 93 mA$, $\Sigma P_i = 660 mW$

Display

Type	4-digit, red LED display, digit height 7 mm, digit width 4.85 mm (angle 10 °)
Range	-1999 ... +9999
Accuracy	0.1 % ± 1 digit
Digital damping	0.3 ... 30 sec (programmable)
Measured value update	0.0 ... 10 sec (programmable)

¹ for vacuum ranges and nominal pressure abs. the max. medium temperature is 70 °C

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ with 3-wire version 4 ... 20 mA the response time is 1 sec

⁴ with connector DIN 43650 and output 4 ... 20 mA / 2-wire max. 1 contact possible; with 0 ... 10 V / 3-wire no contact possible

⁵ with Ex-protection max. 1 contact possible

⁶ the real switching current in the application depends on the power supply unit

⁷ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

DS 200 P

Electronic Pressure Switch

Technical Data

Mechanical stability

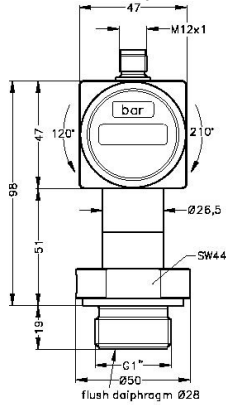
Vibration	5 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec

Permissible temperatures

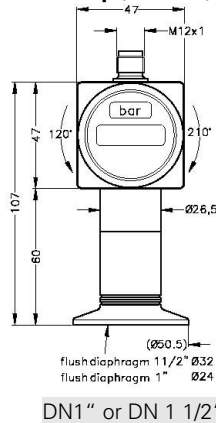
Medium	-25 ... 125 °C ^{1,8}	
Electronics / environment	-25 ... 85 °C	Ex-protection: -25 ... 70 °C
Storage	-40 ... 85 °C	

Mechanical connection

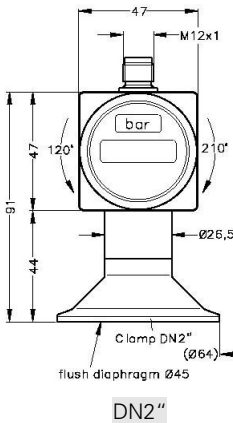
Inch thread (DIN 3852)



Clamp (ISO 2852)

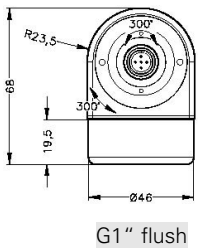
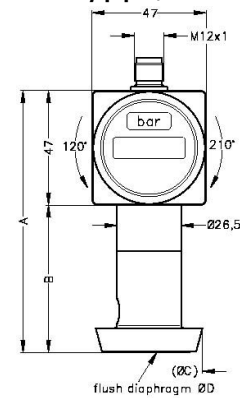


DN1" or DN 1 1/2"



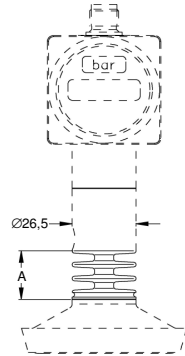
DN2"

Dairy pipe (DIN 11851)



G1" flush

Cooling element



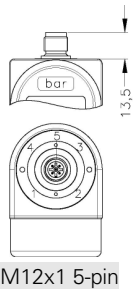
dimension in mm

size	150° C	300° C
A	22	34

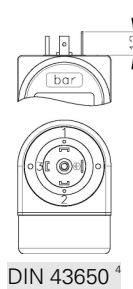
dimensions in mm			
size	DN 25	DN 40	DN 50
A	107	89	89
B	71	53	53
C	44	56	68,5
D	24	32	45

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

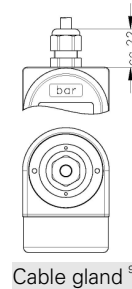
Electrical connection



M12x1 5-pin



DIN 43650 ⁴



Cable gland ⁹

⁸ with optional cooling element its maximum permissible temperature is valid

⁹ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube

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Technical Data

Filling fluids

Standard	silicon oil
Optional	food compatible oil (with FDA approval) / Halocarbon / 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: FKM / clamp and dairy pipe: without / others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

Current consumption (without contacts)	signal output current: max. 25 mA signal output voltage: max. 18 mA
Weight	approx. 160 ... 250 g
Installation position	any ¹⁰
Operational life	> 100 x 10 ⁶ cycles
Ingress protection	IP 65

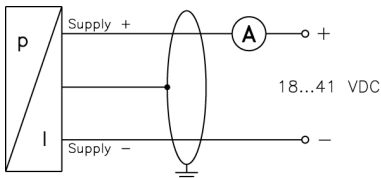
Pin configuration

Electrical connection		M12x1 plastic (5-pin)	M12x1 metal (5-pin)	DIN 43650	cable colours (DIN 47100)
2-wire-system	Supply +	1	1	1	white
	Supply -	3	3	2	brown
	Contact 1	4	4	3	grey
	Contact 2	5	5	-	pink
	Ground	via pressure port	plug housing	ground contact	yellow / green (shield)
3-wire-system	Supply +	1	1	1	white
	Supply -	3	3	2	brown
	Signal +	2	2	3	green
	Contact 1	4	4	-	grey
	Contact 2	5	5	-	pink
	Ground	via pressure port	plug housing	ground contact	yellow / green (shield)

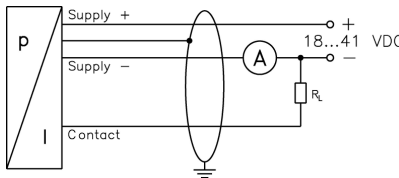
Wiring diagrams

2-wire-system (current) (for Ex-protection supply is $V_s = 17 \dots 28 V_{DC}$; max. 1 contact possible)

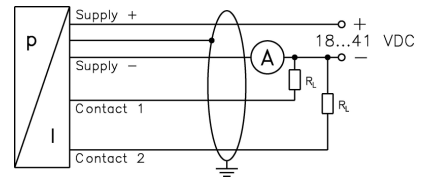
without contact



1 contact

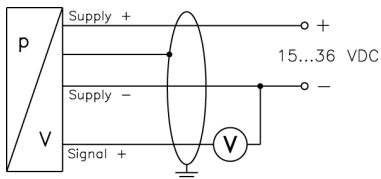


2 contacts

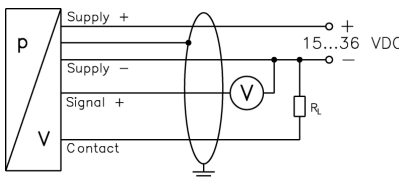


3-wire-system (current)

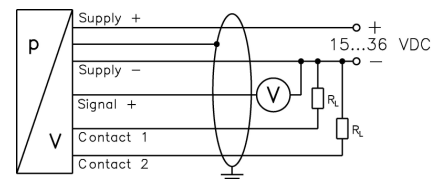
without contact



1 contact



2 contacts



¹⁰ 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.

Ordering Code DS 200P

DS 200P

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Pressure									
gauge	7	8	5						
absolute 1, 2	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 ²				X	1	0	2		
customer				9	9	9	9		
Analogue output									
4 ... 20 mA / 2-wire								1	
0 ... 10 V / 3-wire								3	
4 ... 20 mA / 3-wire								7	
Intrinsic safety 4 ... 20 mA / 2-wire ³								E	
customer								9	
Contact									
1 contact ^{3, 4}								1	
2 contacts ^{3, 4}								2	
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	
Electrical connection									
M12x1 (5-pin) / plastic version						N	0	0	
M12x1 (5-pin) / metal version						N	1	0	
Male and female plug DIN 43650 ⁴						1	0	0	
Cable gland incl. cable ⁵						4	0	0	
customer						9	9	9	
Mechanical connection									
G1" with flush welded diaphragm (DIN 3852)						Z	3	1	
Clamp 1" (ISO 2852)						C	6	1	
Clamp 1 1/2" (ISO 2852)						C	6	2	
Clamp 2" (ISO 2852)						C	6	3	
Dairy pipe DN 25 (DIN 11851) ⁶						M	7	3	
Dairy pipe DN 40 (DIN 11851) ⁶						M	7	5	
Dairy pipe DN 50 (DIN 11851) ⁶						M	7	6	
customer						9	9	9	
Diaphragm									
Stainless steel 1.4435 (316L)								1	
customer								9	
Seals									
for Clamp or Dairy pipe	keine							0	
for inch thread	FKM							1	
customer								9	
Filling Fluids									
Silicon oil								1	
food compatible oil ⁷								2	
Halocarbon								C	
customer								9	
Special version									
standard								0	0
with cooling element up to 150°C								1	5
with cooling element up to 300°C								2	0
customer								9	9

¹ nominal pressure absolute not possible for P_N < 0.6 bar
² for vacuum and nominal pressure abs. the max. medium temperature is 70 °C
³ with Ex version max. 1 contact is possible
⁴ with connector DIN 43650 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
⁵ different cable types and lengths deliverable, standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
⁶ The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut for dairy pipe has to be ordered as separate position.
⁷ Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662

This ordering code contains product specification; properties are not guaranteed. Subject to change without notice.

