DS 201 P

Electronic Pressure Switch with Flush Diaphragm

- ceramic sensor
- for viscous and pasteous media
- media temperatures up to 150 °C
- nominal pressure ranges from 0 ... 1 bar up to 0 ... 400 bar

The electronic pressure switch DS 201 P is the successful combination of:

- flush pressure transmitter
- intelligent pressure switch
- digital display

The DS 201 P is designed for applications in the machine-building industry and other industries where a flush stainless steel diaphragm is necessary. This can be the case, for example, with viscous or slightly contaminated fluids.

Basic element is a ceramic sensor. The 4-digit LED display shows the system pressure and supports programming the DS 201 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 201 P are rotatable, so that the position of the display can be easily adapted to unusual installation conditions.

All devices can be supplied with a cooling element for usage with higher media temperature. The pressure switch is suitable for explosive area.

Preferred areas of use are:

- pharmacy
- foodstuff industry

Functions

- configuration of display, including
  - current value
  - 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

CE Ex

DS 201 P
Electronic Pressure Switch

Input pressure range

Nominal pressure gauge	[bar]	-1 ... 0 [1]	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400
Nominal pressure abs. [1]	[bar]	-	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400
Permissible overpressure	[bar]	3	3	7	7	12	12	25	50	50	120	120	250	500	500	600

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	IEC 60770 [2]: ≤ ± 0.5 % FSO	BFSL: ≤ ± 0.25 % FSO
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02]\ \Omega$ voltage 3-wire: R_{min} = 10 kΩ	
Response time	< 10 msec [3]	
Contact [4,5]		
Number, types	1 or 2 independent PNP contacts	
Switching performance	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	IEC 60770 [2]: ≤ ± 0.5 % FSO	BFSL: ≤ ± 0.25 % FSO
Repeatability	≤ ± 0.2 % FSO	
Switching frequency	max. 10 Hz	
Switching cycles	> 100 x 10^6	
Delay time	0 ... 100 sec	

Thermal effects (Offset and Span) [7]

Thermal error	≤ ± 0.2 % FSO / 10 K
in compensated range	-25 ... 85 °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
Option Ex-protection only for 4 ... 20 mA / 2-wire AX11-DS 201 P	zone (0) 1: II (1) 2 G EEx ia IIC T4 safety technical maximum values: V_i = 28 V, ΣI_i = 93 mA, ΣP_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)

Mechanical stability

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

[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

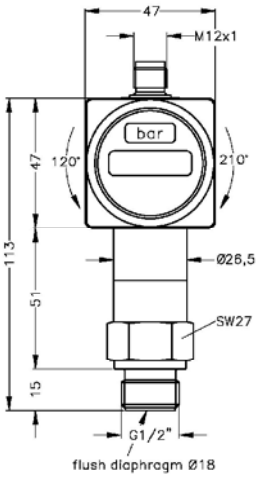
[7] an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

Permissible temperatures

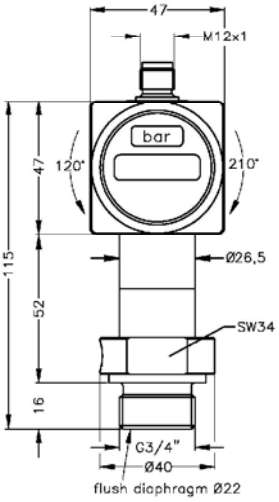
Medium	-25 ... 135 °C [1,8]	
Electronics / environment	-25 ... 85 °C	Ex-protection: -25 ... 70 °C
Storage	-40 ... 85 °C	

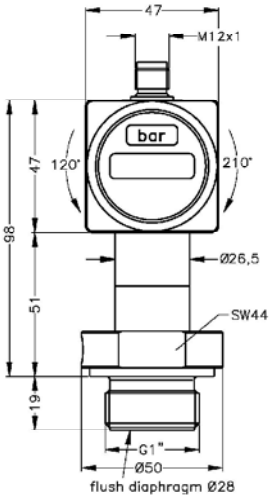
Mechanical connection

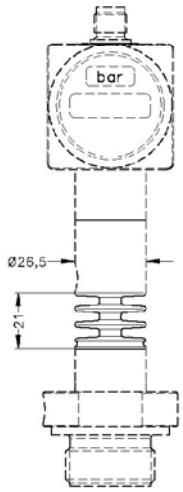
Standard

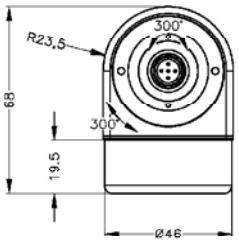


Options









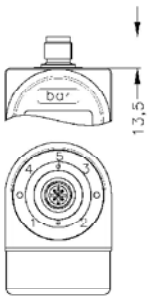
G1/2" flush [10]
M20 x 1.5

G3/4" flush
(DIN 3852)

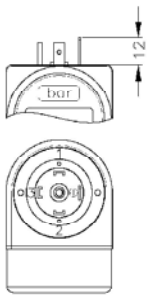
G1" flush
(DIN 3852)

cooling element
150 °C [9]

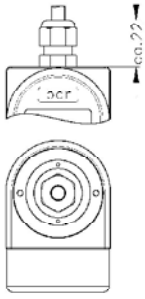
Electrical connection



M12x1 5-pin



DIN 43650 [4]



Cable gland [11]

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[8] with optional cooling element its maximum permissible temperature is valid

[9] for max. 100 bar

[10] only possible for nominal pressure ranges $P_N \geq 1.6$ bar

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

Filling fluids

Standard	silicon oil
Optional	food compatible oil (with FDA approval) / Halocarbon / others on request

Materials

Pressure port	stainless steel 1.4571 (316Ti)
Housing	stainless steel 1.4301 (304)
Display housing	PA 6.6, Polycarbonate
Seals (media wetted)	P_N < 100 bar: FKM / P_N ≥ 100 bar: NBR / 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	min. 200 g (depending on pressure port)
Installation position	any [12]
Ingress protection	IP 65

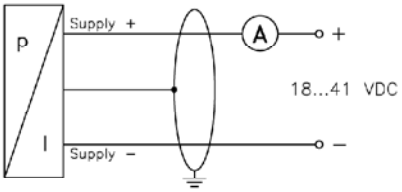
Pin configuration

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)

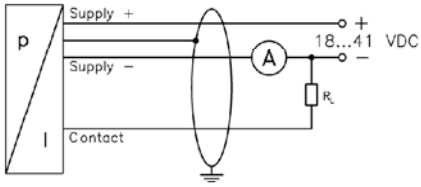
Wiring diagrams

2-wire-system (current) (for Ex protection: supply V_S = 17 ... 28 V_{DC}; max. 1 contact possible)

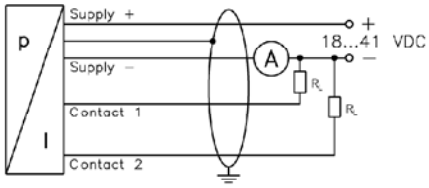
without contact



1 contact

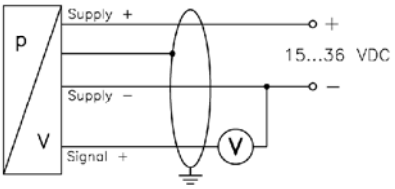


2 contacts

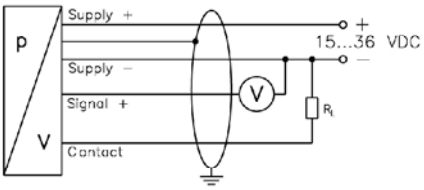


3-wire-system (current)

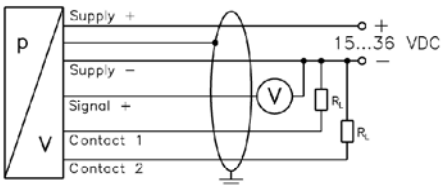
without contact



1 contact



2 contacts



[12] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges ≤ 1 bar.

BD | SENSORS
pressure measurement

Ordering code DS 201P

DS 201P ☐☐☐-☐☐☐☐-☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

Pressure		
gauge	7 8 7	
absolute [1]	7 8 8	
Input	[bar]	
1,0 [2]	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	
60	6 0 0 2	
100	1 0 0 3	
160	1 6 0 3	
250	2 5 0 3	
400	4 0 0 3	
-1 ... 0 [1]	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		
0,5 %		5
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		
G1/2" DIN 3852 with flush diaphragm [2]		Z 0 0
G3/4" DIN 3852 with flush diaphragm		Z 3 0
G1" DIN 3852 with flush diaphragm		Z 3 1
customer		9 9 9
Diaphragm		
Stainless steel 1.4435 (316L)		1
customer		9
Seals		
for P_N < 100 bar FKM		1
for P_N ≥ 100 bar NBR		5
customer		9
Filling Fluids		
Silicon oil		1
food compatible oil [6]		2
Halocarbon		C
customer		9
Special version		
standard		0 0 0
with cooling element up to 150°C [7]		1 5 0
customer		9 9 9

[1] for vacuum and nominal pressure abs. the max. medium temperature is 70 °C
[2] pressure ranges P_N < 1,6 bar not with mechanical connection G1/2"
[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] Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662
[7] cooling element up to 150°C not with pressure range P_N > 100 bar

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