



# DS 201 P

## Electronic Pressure Switch with Flush Diaphragm

- ▶ ceramic sensor
- ▶ up to 4 independent contacts, configurable
- ▶ optional:
  - analogue output
  - Ex-protection (for 2-wire)
  - cooling element up to 150 °C
- ▶ nominal pressure ranges from 0 ... 1 bar up to 0 ... 400 bar

### Description

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

- ▶ intelligent pressure switch
- ▶ digital display

and is designed for universal applications in the mechanical engineering and other industries where a flush stainless steel diaphragm is necessary. This can be the case, for example, with higher viscous or slightly contaminated fluids. For the usage with higher media temperature optionally a cooling element up to 150 °C is available.

### 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

- ▶ 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 201 P**  
Electronic Pressure Switch

<b>Input pressure range</b>															
Nominal pressure gauge [bar]	-1 ... 0	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400
Nominal pressure abs. [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
<b>Contact <sup>1</sup></b>															
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: $\leq \pm 0.5\%$ FSO										BFSL: $\leq \pm 0.25\%$ FSO				
Repeatability	$\leq \pm 0.2\%$ FSO														
Switching frequency	max. 10 Hz														
Switching cycles	$> 100 \times 10^6$														
Delay time	0 ... 100 s														
<sup>1</sup> 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															
<b>Analogue output (optionally) / Supply</b>															
2-wire current signal	4 ... 20 mA / $V_s = 18 \dots 41 V_{DC}$ permissible load: $R_{max} = [(V_s - V_{s,min}) / 0,02] \Omega$ response time: < 10 msec														
2-wire current signal with Ex-protection	4 ... 20 mA / $V_s = 17 \dots 28 V_{DC}$ permissible load: $R_{max} = [(U_B - U_{B,min}) / 0,02] \Omega$ response time: < 10 msec														
3-wire current signal	4 ... 20 mA / $V_s = 19 \dots 30 V_{DC}$ adjustable (turn-down of span max. 1:5) <sup>2</sup> permissible load: $R_{max} = 500 \Omega$ response time: < 1 sec														
3-wire voltage signal	0 ... 10 V / $V_s = 15 \dots 36 V_{DC}$ permissible load: $R_{min} = 10 k\Omega$ response time: < 10 msec														
without analogue output	$V_s = 15 \dots 36 V_{DC}$														
Accuracy	IEC 60770 <sup>3</sup> : $\leq \pm 0.5\%$ FSO										BFSL: $\leq \pm 0.25\%$ FSO				
<sup>2</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range <sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)															
<b>Thermal error (offset and span) <sup>4</sup> / Permissible temperatures</b>															
Thermal error	$\leq \pm 0.2\%$ FSO / 10 K in compensated range -25 ... 85 °C														
Permissible temperatures	medium: -25 ... 135 °C <sup>5</sup> electronics / environment: -25 ... 85 °C storage: -40 ... 85 °C														
<sup>4</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions <sup>5</sup> for vacuum ranges and nominal pressure abs. the max. medium temperature is 70 °C; with optional cooling element its maximum permissible temperature is valid															
<b>Electrical protection</b>															
Short-circuit protection	permanent														
Reverse polarity protection	no damage, but also no function														
Electromagnetic compatibility	emission and immunity according to EN 61326														
<b>Mechanical stability</b>															
Vibration	5 g RMS (20 ... 2000 Hz)														
Shock	100 g / 11 msec														
<b>Filling fluids</b>															
Standard	silicon oil														
Optional	food compatible oil (with FDA approval) / Halocarbon and others on request														
<b>Materials</b>															
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 / $P_N \geq 100$ bar: NBR / others on request														
Diaphragm	stainless steel 1.4435 (316L)														
Media wetted parts	pressure port, seals, diaphragm														
<b>Explosion protection (for 2-wire current signal with Ex-protection)</b>															
Approval AX11-DS 201P	zone (0) 1: II (1) 2 G Ex ia IIC T4														
Safety technical maximum values	$U_i = 28 V$ , $I_i = 93 mA$ , $P_i = 660 mW$														
Max. switching current <sup>6</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 $\mu$ H/m														
<sup>6</sup> the real switching current in the application depends on the power supply unit															

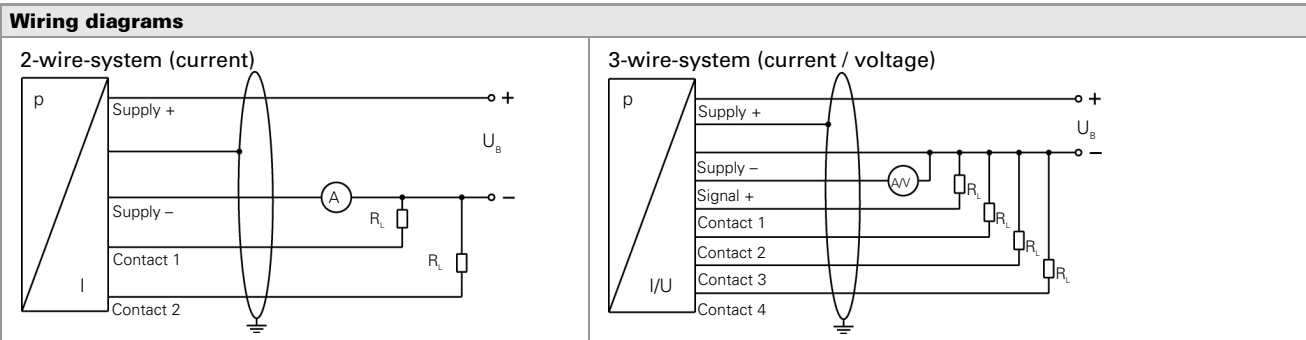
# DS 201 P

## Electronic Pressure Switch

## Technical Data

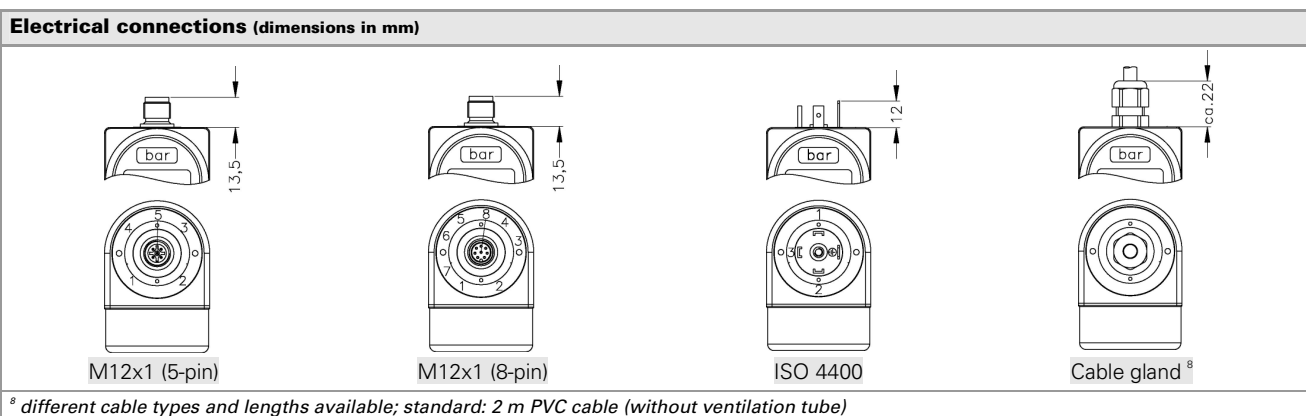
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: 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 <sup>7</sup>
Weight	min. 200 g (depending on mechanical connection)
Operational life	> 100 x 10 <sup>6</sup> cycles

<sup>7</sup> 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)



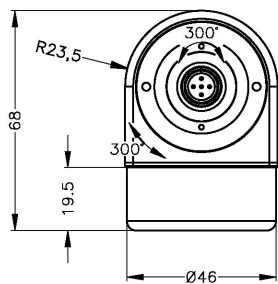
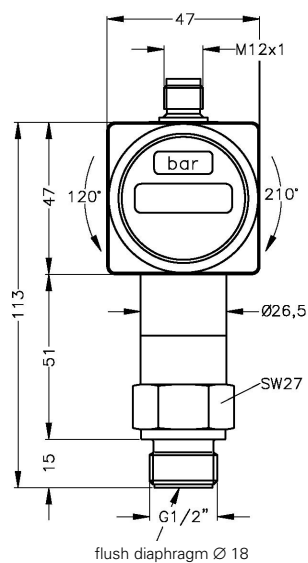
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Electronic Pressure Switch

Technical Data

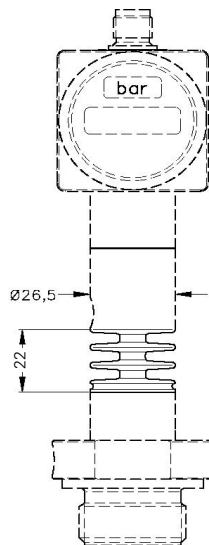
## Mechanical connections (dimensions in mm)

### Standard



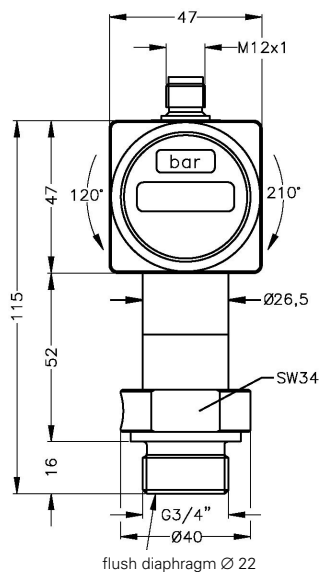
G1/2" flush (DIN 3852); M20x1,5  
(possible for  $P_N \geq 1,6$  bar)

### Cooling element up to 150 °C (up to 100 bar)

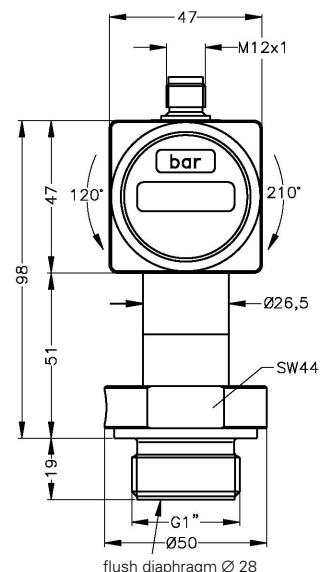


⇒ Ex-protection: total length increases by 26.5 mm!

### Options



G3/4" flush (DIN 3852)



G1" flush (DIN 3852)

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

