



# DS 201P

## Electronic Pressure Switch

Pressure Port with Flush Welded  
Stainless Steel Diaphragm

accuracy according to IEC 60770:  
0.5 % FSO

### Nominal pressure

from 0 ... 60 bar up to 400 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

### Optional versions



- ▶ **IS-version**  
**Ex ia = intrinsically safe for gases**
- ▶ cooling element up to 300 °C
- ▶ customer specific versions

The electronic pressure switch DS 201P 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 usage with higher media temperature  
optionally a cooling element up to 300 °C is  
available.

### Preferred areas of use are

-  Plant and machine engineering
-  Food industry

### Preferred used for

-  Viscous and pasty media



Input pressure ranges					
Nominal pressure gauge/abs. [bar]	60	100	160	250	400
Overpressure [bar]	100	200	400	400	600
Burst pressure $\geq$ [bar]	120	250	500	500	650

Contact <sup>1</sup>	
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-Leiter: contact rating 125 mA, short-circuit resistant
Accuracy of contacts <sup>2</sup>	$\leq \pm 0.5\%$ FSO
Repeatability	$\leq \pm 0.2\%$ FSO
Switching frequency	max. 10 Hz
Switching cycles	$> 100 \times 10^6$
Delay time	0 ... 100 sec

<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 in combination with plug ISO 4400

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

Analogue output (optionally) / Supply	
2-wire current signal	4 ... 20 mA / $V_S = 13 \dots 36 V_{DC}$ permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$ response time: $< 10$ msec
2-wire current signal with Ex-protection	4 ... 20 mA / $V_S = 15 \dots 28 V_{DC}$ permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$ 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>3</sup> permissible load: $R_{max} = 500 \Omega$ response time: $< 0.5$ 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 <sup>2</sup>	$\leq \pm 0.5\%$ FSO

<sup>3</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range

Thermal error (offset and span) <sup>4</sup> / Permissible temperatures	
Thermal error	$\leq \pm 0.2\%$ FSO / 10 K
in compensated range	-20 ... 85°C
Permissible temperatures <sup>5</sup>	medium: -40 ... 125 °C for filling fluid silicone 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 silicone oil overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C filling fluid food compatible oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °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> max. temperature of the medium for overpressure  $> 0$  bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °

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	silicone oil
Optional	food compatible oil with FDA approval (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request

Materials	
Pressure port	stainless steel 1.4435 (316 L)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, Polycarbonate
Seals	standard: FKM (for media temperature $\leq 200$ °C) option: FFKM <sup>6</sup> (for media temperature $> 200$ °C) others on request
Diaphragm	stainless steel 1.4435
Media wetted parts	pressure port, seals, diaphragm

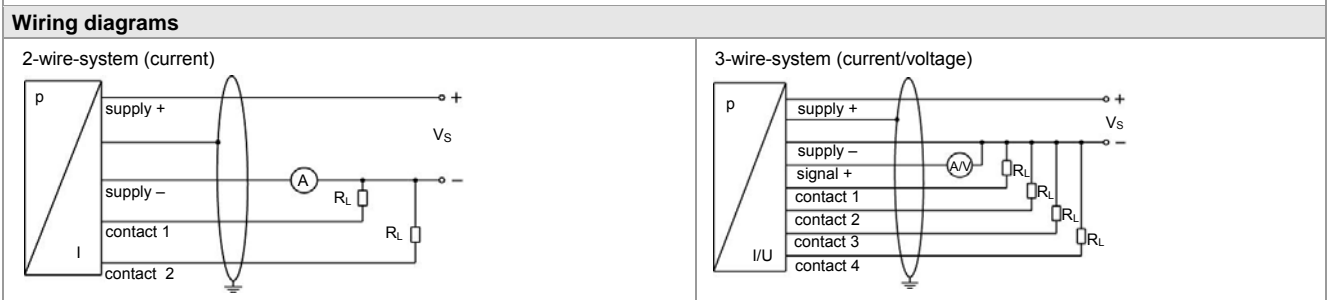
<sup>6</sup> for pressure ranges  $P_N \leq 100$  bar

<b>Explosion protection (only for 4 ... 20 mA / 2-wire)</b>	
Approval AX14-DS 201P	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 <sup>7</sup>	70 mA
Max. 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 μH/m

<sup>7</sup> the real switching current in the application depends on the power supply unit

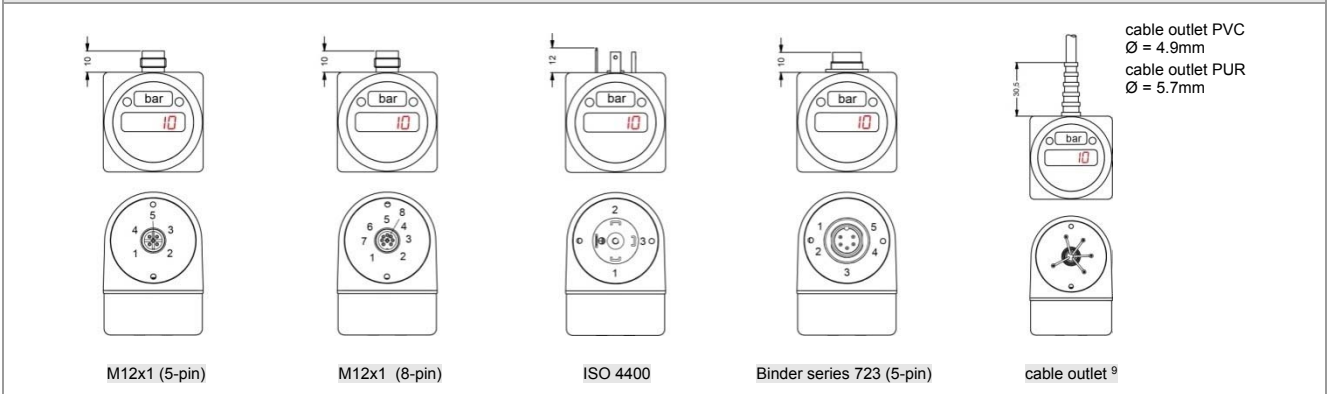
<b>Miscellaneous</b>	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output 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 (standard calibration in a vertical position with the pressure port connection down)
Weight	min. 200 g (depending on mechanical connection)
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) <sup>8</sup>
ATEX Directive	2014/34/EU

<sup>8</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar.



<b>Pin configuration</b>	M12x plastic (5-pin)	M12x metal (5-pin)	M12x plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable colours (IEC 60757)
Supply +	1	1	1	1	1	wh (white)
Supply -	3	3	3	2	3	bn (brown)
Signal + (only for 3-wire)	2	2	2	3	2	gn (green)
Contact 1	4	4	4	3	4	gy (grey)
Contact 2	5	5	5	-	5	pk (pink)
Contact 3	-	-	6	-	-	bu (blue)
Contact 4	-	-	7	-	-	rd (red)
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	gnye (green-yellow)

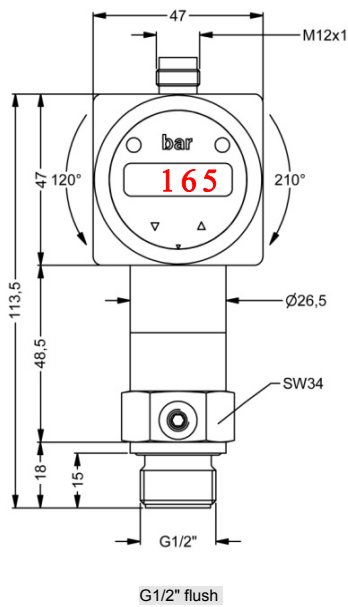
### Electrical connections (dimensions in mm)



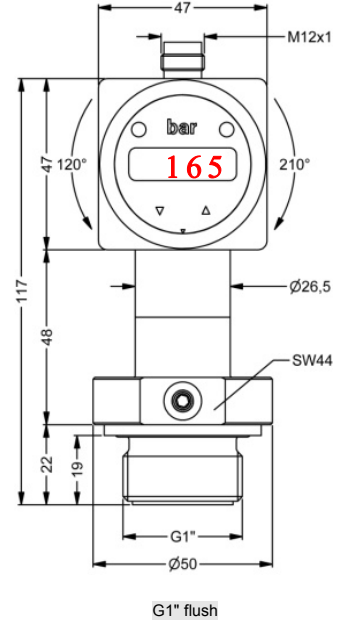
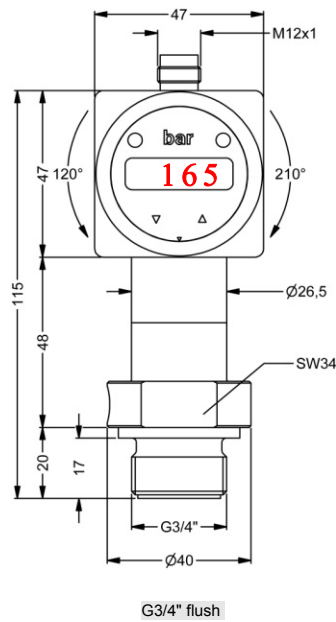
<sup>9</sup> different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70°C)

**Mechanical connection (dimensions in mm)**

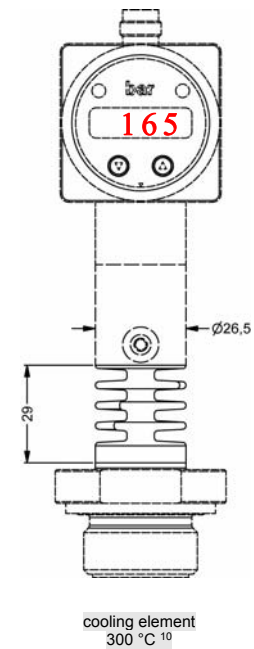
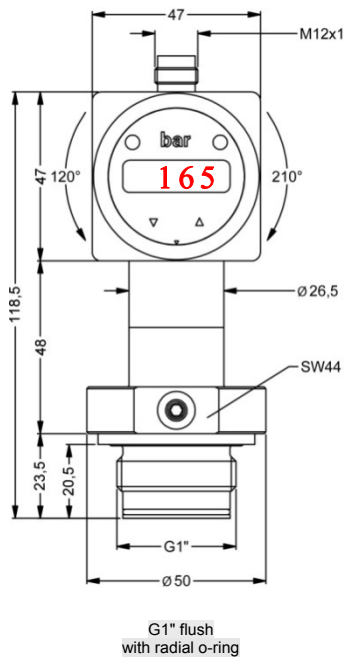
**Standard**



**Optional**



**Optional**



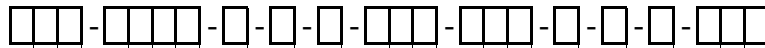
⇒ metric threads and other versions on request

<sup>10</sup> for pressure ranges  $P_N \leq 160$  bar

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## Ordering code DS 201P

DS 201P



<b>Pressure</b>											
gauge	7	8	7								
absolute	7	8	8								
<b>Input</b>											
[bar]											
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							
customer	9	9	9	9							consult
<b>Analogue output</b>											
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 <sup>1</sup>				E							
customer				9							consult
<b>Contact</b>											
1 contact <sup>1,2</sup>										1	
2 contacts <sup>1,2</sup>										2	
4 contacts										4	
<b>Accuracy</b>											
0.5 % FSO										5	
customer										9	consult
<b>Electrical connection</b>											
male plug M12x1 (5-pin) / plastic version										N	0 1
male plug M12x1 (8-pin) / plastic version <sup>3</sup>										M	5 0
male plug M12x1 (5-pin) / metal version										N	1 1
male and female plug ISO 4400 <sup>2</sup>										1	0 0
male plug Binder series 723 (5-pin)										2	0 4
cable outlet with PVC cable <sup>4</sup>										T	A 0
customer										9	9 9
<b>Mechanical connection</b>											
G1/2" DIN 3852 with flush diaphragm										Z	0 0
G3/4" DIN 3852 with flush diaphragm										Z	3 0
G1" DIN 3852 with flush diaphragm										Z	3 1
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm										Z	6 1
customer										9	9 9
<b>Diaphragm</b>											
stainless steel 1.4435 (316L)										1	
customer										9	
<b>Seals</b>											
FKM										1	
FFKM <sup>5</sup>										7	
customer										9	consult
<b>Filling fluids</b>											
silicone oil										1	
food compatible oil										2	
customer										9	consult
<b>Special version</b>											
standard										0	0 0
with cooling element up to 300°C <sup>6</sup>										2	0 0
customer										9	9 9
<b>consult</b>											

<sup>1</sup> with IS version max. 1 contact is possible

<sup>2</sup> with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

<sup>3</sup> 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

<sup>4</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request

<sup>5</sup> possible for nominal pressure ranges  $p_N \leq 100$  bar

<sup>6</sup> cooling element up to 300°C not possible for pressure range  $p_N > 160$  bar