



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 polluted 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 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; $V_{\text{switch}} = V_S - 2V$ 0 ... 10 V / 3-Leiter: contact rating 125 mA, short-circuit resistant
Accuracy of contacts ²	$\leq \pm 0.5\%$ FSO
Repeatability	$\leq \pm 0.2\%$ FSO
Switching frequency	max. 10 Hz
Switching cycles	$> 100 \times 10^6$
Delay time	0 ... 100 sec

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 in combination with plug ISO 4400

² 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: $R_{\text{max}} = [(V_S - V_{S\text{min}}) / 0.02 \text{ A}] \Omega$ response time: $< 10 \text{ msec}$
2-wire current signal with Ex-protection	4 ... 20 mA / $V_S = 15 \dots 28 V_{DC}$ permissible load: $R_{\text{max}} = [(V_S - V_{S\text{min}}) / 0.02 \text{ A}] \Omega$ response time: $< 10 \text{ msec}$
3-wire current signal	4 ... 20 mA / $V_S = 19 \dots 30 V_{DC}$ adjustable (turn-down of span max. 1:5) ³ permissible load: $R_{\text{max}} = 500 \Omega$ response time: $< 0.5 \text{ sec}$
3-wire voltage signal	0 ... 10 V / $V_S = 15 \dots 36 V_{DC}$ permissible load: $R_{\text{min}} = 10 \text{ k}\Omega$ response time: $< 10 \text{ msec}$
Without analogue output	$V_S = 15 \dots 36 V_{DC}$
Accuracy ²	$\leq \pm 0.5\%$ FSO

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

Thermal error (offset and span) ⁴	
Thermal error in compensated range	$\leq \pm 0.2\%$ FSO / 10 K 0 ... 85°C

⁴ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

Permissible temperatures		
Filling fluid	silicone oil	food compatible oil
Medium ⁵	-40 ... 125 °C	-10 ... 125 °C
Medium with cooling element ⁶	overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C	overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C
Electronics / environment	-40 ... 85 °C	
Storage	-40 ... 100 °C	

⁵ max. temperature of the medium for overpressure $> 0 \text{ bar}$: 150 °C for 60 minutes with a max. environmental temperature of 50 °C

⁶ max. temperature depends on the used sealing material, type of seal and installation

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

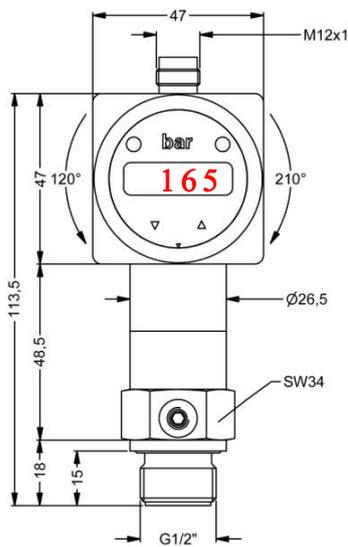
Materials	
Pressure port	stainless steel 1.4435 (316 L)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, Polycarbonate
Seals	standard: FKM (recommended for medium temperatures $\leq 200 \text{ }^\circ\text{C}$) option: FFKM ⁷ (recommended for medium temperatures $< 260 \text{ }^\circ\text{C}$) others on request
Diaphragm	stainless steel 1.4435
Media wetted parts	pressure port, seals, diaphragm

⁷ for pressure ranges $p_N \leq 100 \text{ bar}$

Explosion protection (only for 4 ... 20 mA / 2-wire)						
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 ⁸	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 $\mu\text{H}/\text{m}$					
⁸ 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 % \pm 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) ⁹		
ATEX Directive	2014/34/EU					
⁹ This directive is only valid for devices with maximum permissible overpressure > 200 bar.						
Wiring diagrams						
2-wire-system (current)			3-wire-system (current/voltage)			
Pin configuration						
Electrical connection	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	GN (grey)
Contact 2	5	5	5	-	5	PK (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground pin \oplus	plug housing/pressure port	GNYE (green-yellow)
Electrical connections (dimensions in mm)						
					cable outlet PVC $\varnothing = 4.9\text{mm}$ cable outlet PUR $\varnothing = 5.7\text{mm}$	
M12x1 (5-pin)	M12x1 (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable outlet ¹⁰		
¹⁰ 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)						

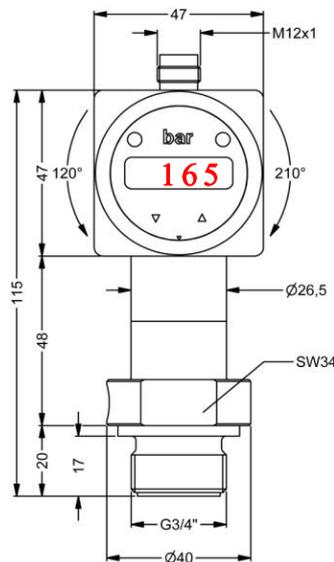
Mechanical connection (dimensions in mm)

Standard

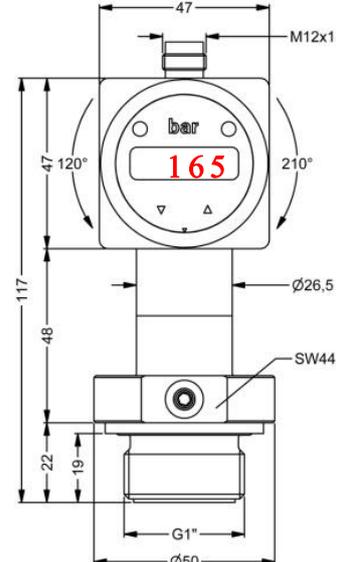


G1/2" flush

Optional

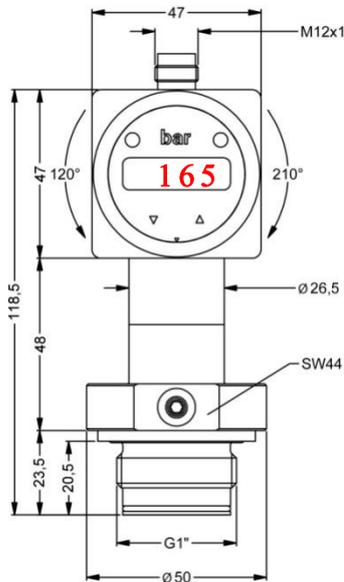


G3/4" flush

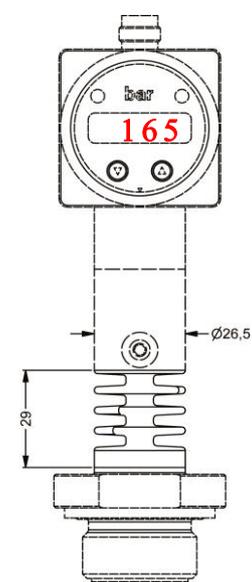


G1" flush

Optional



G1" flush
with radial o-ring



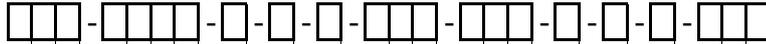
cooling element
300 °C ¹¹

⇒ metric threads and other versions on request

¹¹ for pressure ranges $p_N \leq 160$ bar; max. temperature depends on the used sealing material, type of seal and installation

Ordering code DS 201P

DS 201P



Pressure											
gauge	7	8	7								
absolute	7	8	8								
Input											
[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
Analogue output											
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 ¹				E							
customer				9							consult
Contact											
1 contact ^{1,2}										1	
2 contacts ^{1,2}										2	
4 contacts										4	
Accuracy											
0.5 % FSO										5	
customer										9	consult
Electrical connection											
male plug M12x1 (5-pin) / plastic version										N	0 1
male plug M12x1 (8-pin) / plastic version ³										M	5 0
male plug M12x1 (5-pin) / metal version										N	1 1
male and female plug ISO 4400 ²										1	0 0
male plug Binder series 723 (5-pin)										2	0 4
cable outlet with PVC cable ⁴										T	A 0
customer										9	9 9
Mechanical connection											
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
Diaphragm											
stainless steel 1.4435 (316L)										1	
customer										9	
Seals											
FKM										1	
FFKM ⁵										7	
customer										9	consult
Filling fluids											
silicone oil										1	
food compatible oil										2	
customer										9	consult
Special version											
standard										0	0 0
with cooling element up to 300°C ⁶										2	0 0
customer										9	9 9

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¹ with IS version max. 1 contact is possible

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

³ 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

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

⁵ possible for nominal pressure ranges $p_N \leq 100$ bar

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