



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; $V_{switch} = V_S - 2V$ 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: $R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$ 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) ³ 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 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	$\leq \pm 0.2\%$ FSO / 10 K
In compensated range	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 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 / housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, Polycarbonate
Seals	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM ⁷ (recommended for medium temperatures < 260 °C) others on request
Diaphragm	stainless steel 1.4435
Media wetted parts	pressure port, seals, diaphragm

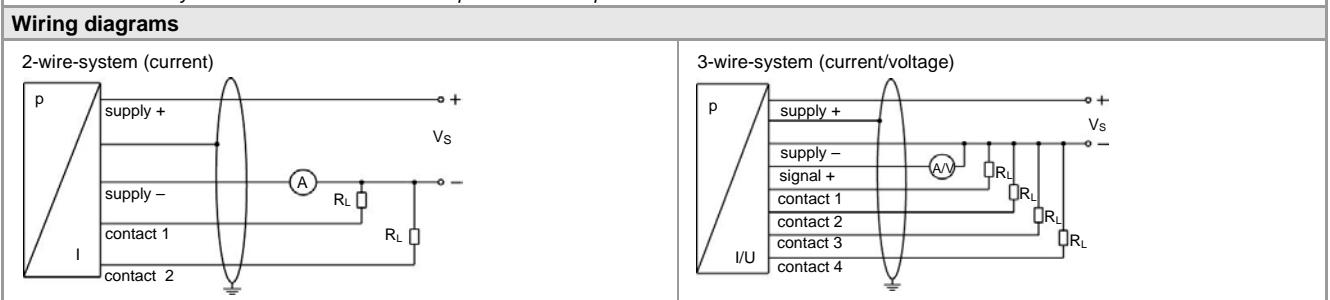
⁷ for pressure ranges $p_N \leq 100$ bar

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.



Pin configuration						
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 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 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	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	GNYE (green-yellow)

Electrical connections (dimensions mm / in)



10 [0.39]

M12x1 plastic
(5-pin)



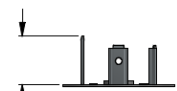
13 [0.51]

M12x1 metal
(5-pin)



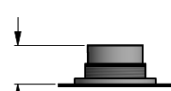
13 [0.51]

M12x1 plastic
(8-pin)



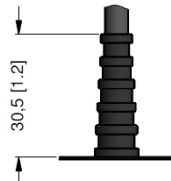
12 [0.47]

ISO 4400



10 [0.37]

Binder series 723
(5-pin)

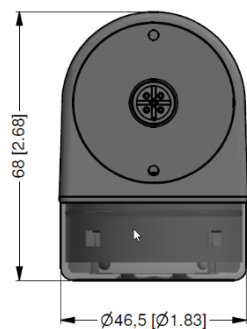
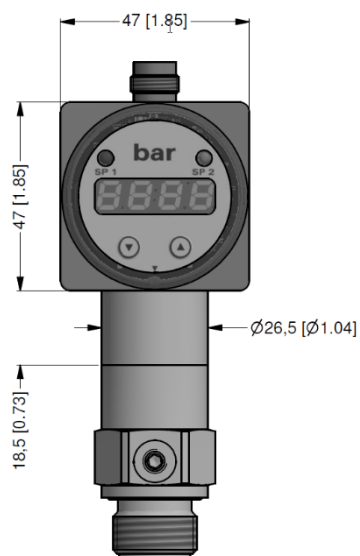


30.5 [1.2]

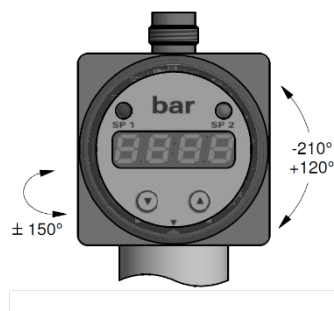
cable outlet ¹⁰

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)

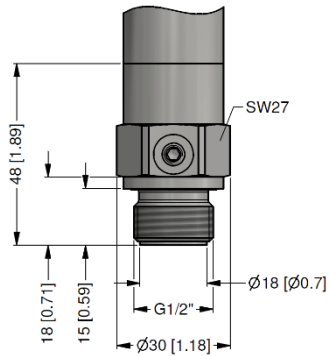
Dimensions (mm / in)



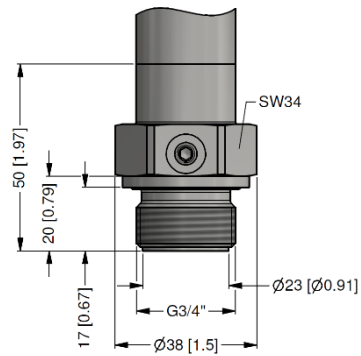
rotatability of display module



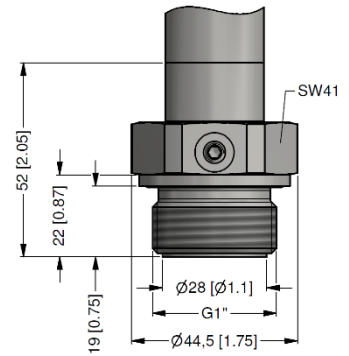
Mechanical connection (dimensions mm / in)



G1/2" flush DIN 3852



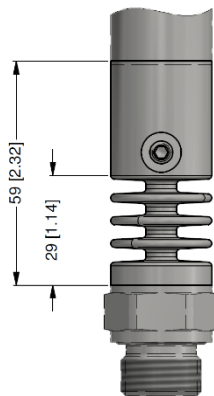
G3/4" flush DIN 3852



G1" flush DIN 3852

⇒ metric threads and other versions on request

Cooling element up to 300 °C ⁶ (optionally)

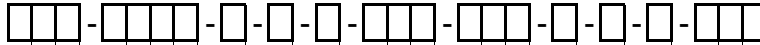


possible for $p_N \leq 160$ bar

⁶ 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	consult
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	consult
Mechanical connection										
G1/2" DIN 3852 with flush diaphragm									Z 0 0	
G3/4" DIN 3852 with flush diaphragm									Z S 0	
G1" DIN 3852 with flush diaphragm									Z S 1	
customer									9 9 9	consult
Diaphragm										
stainless steel 1.4435 (316L)									1	
customer									9	
Seal										
FKM									1	
FFKM ⁵									7	
customer									9	consult
Filling fluid										
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	consult

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