



# DS 200P

## Electronic Pressure Switch

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:  
 standard: 0.35 % FSO  
 option: 0.25 % FSO

### Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 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
- ▶ configurable contacts (switch on/switch off points, hysteresis/window mode, switch on/switch off delay)

### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gases
- ▶ customer specific versions

The electronic pressure switch DS 200P is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and is suitable for the usage with viscous and pasty media.

As standard the DS 200P offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. 4 contacts and an analogue output complete the profile.

### Preferred areas of use are



Food industry



Pharmacy



74-06



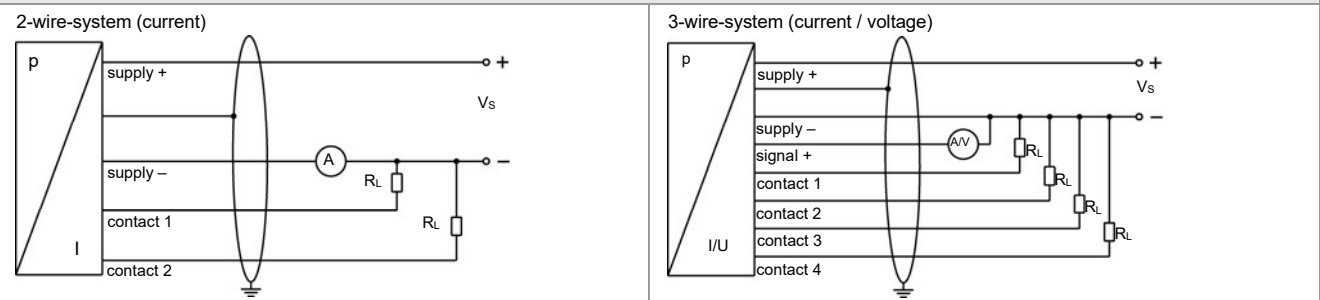
<b>Input pressure range<sup>1</sup></b>																		
Nominal pressure gauge	[bar]	-1 ... 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40		
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40		
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105		
Burst pressure $\geq$	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210		
Vacuum resistance		$P_N \geq 1$ bar: unlimited vacuum resistance								$P_N < 1$ bar: on request								
<sup>1</sup> consider the pressure resistance of fitting and clamps																		
<b>Contact<sup>2</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 125 mA, short-circuit resistant																
Accuracy of contacts <sup>3</sup>		standard: $P_N < 0.4$ bar: $\leq \pm 0.5$ % FSO								$P_N \geq 0.4$ bar: $\leq \pm 0.35$ % FSO								
		option: $P_N \geq 0.4$ bar: $\leq \pm 0.25$ % FSO																
Repeatability		$\leq \pm 0.1$ % FSO																
Switching frequency		max. 10 Hz																
Switching cycles		$> 100 \times 10^6$																
Delay time		0 ... 100 sec																
<sup>2</sup> max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with IS-protection no contact possible with 3-wire in combination with plug ISO 4400																		
<sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																		
<b>Analogue output (optionally) / Supply</b>																		
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 IS-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 1:5) <sup>4</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>3</sup>		standard: $P_N < 0.4$ bar: $\leq \pm 0.5$ % FSO								$P_N \geq 0.4$ bar: $\leq \pm 0.35$ % FSO								
		option: $P_N \geq 0.4$ bar: $\leq \pm 0.25$ % FSO																
<sup>4</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range																		
<b>Thermal errors (Offset and Span)<sup>5</sup> / Permissible temperatures</b>																		
Nominal pressure $P_N$	[bar]	-1 ... 0					$< 0.40$					$\geq 0.40$						
Tolerance band	[% FSO]	$\leq \pm 0.75$					$\leq \pm 1.5$					$\leq \pm 0.75$						
in compensated range	[°C]	-20 ... 85					0 ... 50					-20 ... 85						
Permissible temperatures <sup>6</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 <sup>7</sup>					filling fluid food compatible oil overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C											
<sup>5</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.																		
<sup>6</sup> max. temperature of the medium for nominal pressure gauge $> 0$ bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C																		
<sup>7</sup> also for $P_{abs} \leq 1$ bar																		
<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 (25 ... 2000 Hz)					according to DIN EN 60068-2-6											
Shock		100 g / 11 msec					according to DIN EN 60068-2-27											
<b>Filling fluids</b>																		
Standard		silicone oil																
Options		food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)																
<b>Materials</b>																		
Pressure port		stainless steel 1.4435 (316 L)										others on request						
Housing		stainless steel 1.4404 (316 L)																
Display housing		PA 6.6, Polycarbonate																
Seals (media wetted)		standard: FKM (recommended for medium temperatures $\leq 200$ °C) option: FFKM (recommended for medium temperatures $> 200$ °C) clamp, dairy pipe, Varivent®: without																
Diaphragm		standard: stainless steel 1.4435 (316 L) option: Hastelloy® C-276 (2.4819); Tantalum on request																
Media wetted parts		pressure port, seals, diaphragm																

<b>Explosion protection (only for 4 ... 20 mA / 2-wire)</b>	
Approval AX14-DS 200P	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>8</sup>	70 mA
Permissible 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 $\mu\text{H}/\text{m}$

<sup>8</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 % $\pm$ 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; different installation position for $P_N \leq 2 \text{ bar}$ have to be specified in the order)
Weight	approx. 160 ... 250 g
Operational life	> 100 x 10 <sup>6</sup> cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

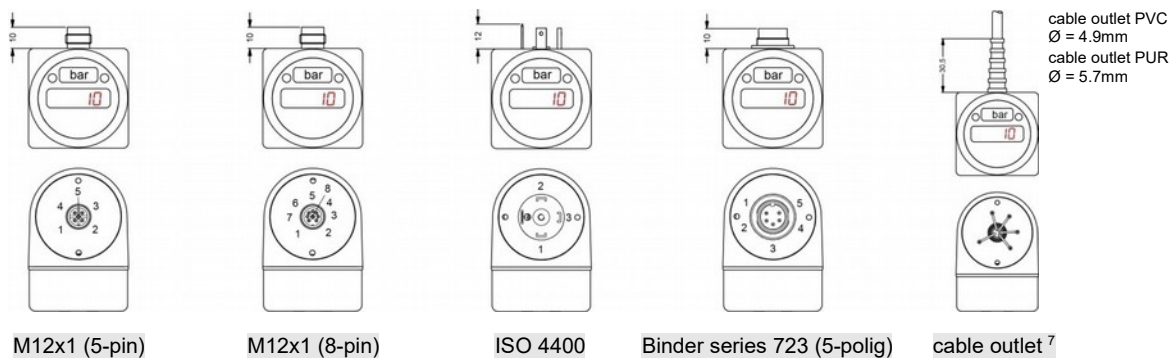
### Wiring diagrams



### 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	-	-	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)

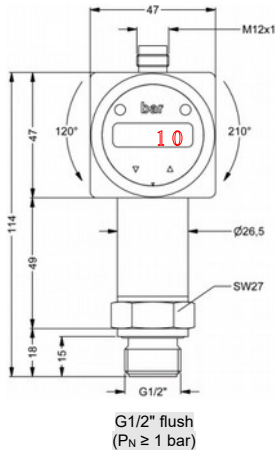
### Electrical connections (dimensions in mm)



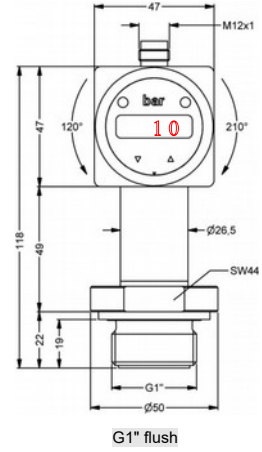
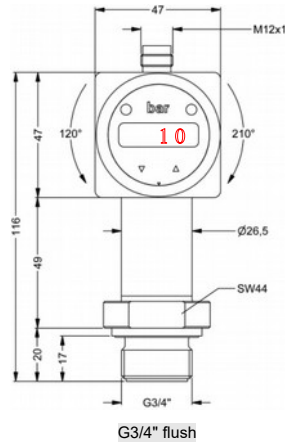
<sup>7</sup> different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

**Mechanical connections (dimensions in mm)**

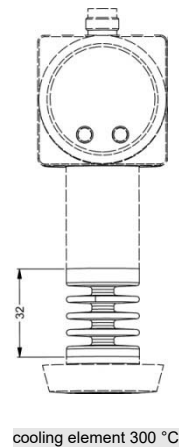
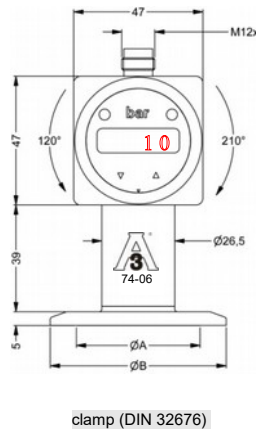
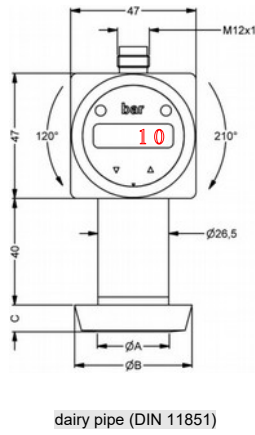
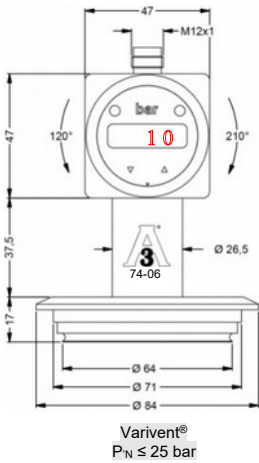
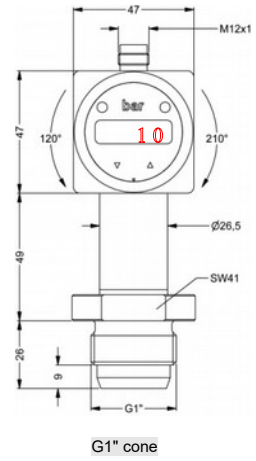
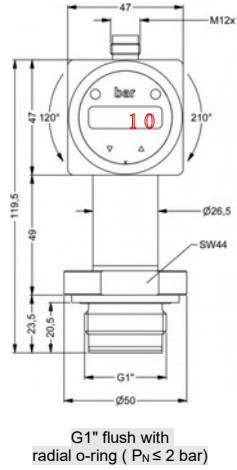
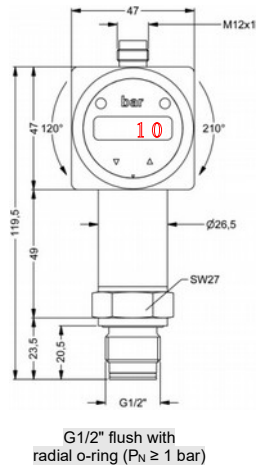
**Standard**



**Option**



**Option**



dimensions in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68,5
C	10	10	11
$P_N$ [bar]	$\geq 0,25$ $\leq 40$	$\geq 0,25$ $\leq 40$	$\geq 0,25$ $\leq 25$

dimensions in mm				
size	3/4"	DN 25	DN 32	DN 50
A	14	23	32	45
B	25	50,5	50,5	64
$P_N$ [bar]	$\geq 4$ $\leq 8$	$\geq 0,25$ $\leq 16$	$\leq 16$	$\leq 16$

⇕ **SIL- and SIL-Ex version: total length increases by 26.5 mm!**  
⇕ **metric threads and other versions on request**

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