



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



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Technical Data

Input pressure range ¹																
Nominal pressure (P _N) gauge / abs.	[bar]	-1 ... 0	0.10	0.16	0.25	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 ≥	[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 ≥ 1 bar: unlimited vacuum resistance							P _N < 1 bar: on request							

¹ consider the pressure resistance of fitting and clamps

Contact ²	
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 ³	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 ⁶
Delay time	0 ... 100 sec

² 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

³ 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 ... 36 V _{DC} permissible load: R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V _S = 13 ... 28 V _{DC} permissible load: R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω response time: < 10 msec
3-wire current signal	4 ... 20 mA / V _S = 19 ... 30 V _{DC} adjustable (turn-down of span 1:5) ⁴ permissible load: R _{max} = 500 Ω response time: < 0.5 sec
3-wire voltage signal	0 ... 10 V / V _S = 15 ... 36 V _{DC} permissible load: R _{min} = 10 kΩ response time: < 10 msec
Without analogue output	V _S = 15 ... 36 V _{DC}
Accuracy ³	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO

⁴ with turn-down of span the analogue signal is adjusted automatically to the new measuring range

Thermal errors (Offset and Span) ⁵ / Permissible temperatures				
Nominal pressure P _N	[bar]	-1 ... 0	< 0.40	≥ 0.40
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 1.5	≤ ± 0.75
in compensated range	[°C]	-20 ... 85	0 ... 50	-20 ... 85
Permissible temperatures ⁶	medium:	-40 ... 125 °C for filling fluid silicon 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 silicon oil	overpressure: -40 ... 300 °C	vacuum: -40 ... 150 °C ⁷	
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C	

⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.

⁶ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C

⁷ also for P_{abs} ≤ 1 bar

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	silicon oil
Options	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) others on request
Display housing	PA 6.6, Polycarbonate
Seals (media wetted)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures > 200 °C) clamp and dairy pipe: 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

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Explosion protection (only for 4 ... 20 mA / 2-wire)						
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 ¹⁾	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 $\mu\text{H}/\text{m}$					
¹⁾ 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; 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 ⁹ cycles					
CE-conformity	EMC Directive: 2004/108/EC					
Wiring diagrams						
<p>2-wire-system (current)</p>	<p>3-wire-system (current / voltage)</p>					
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 (DIN 47100)
Supply +	1	1	1	1	3	wh (white)
Supply -	3	3	3	2	4	bn (brown)
Signal + (only 3-wire)	2	2	2	3	5	gn (green)
Contact 1	4	4	4	3	2	gy (grey)
Contact 2	5	5	5	-	1	pk (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/ pressure port	via pressure port	ground contact	pressure port	ye/gn (yellow / green)
Electrical connections (dimensions in mm)						
<p>M12x1 (5-pin)</p>	<p>M12x1 (8-pin)</p>	<p>ISO 4400</p>	<p>Binder series 723 (5-polig)</p>	<p>cable outlet ²⁾</p>	<p>cable outlet PVC $\varnothing = 4.9\text{ mm}$ cable outlet PUR $\varnothing = 5.7\text{ mm}$</p>	
<p>²⁾ 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)</p>						

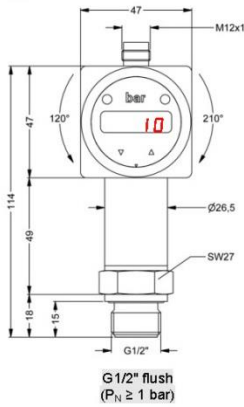
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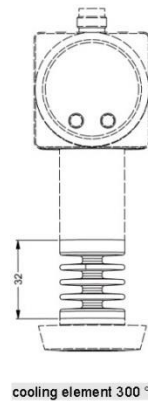
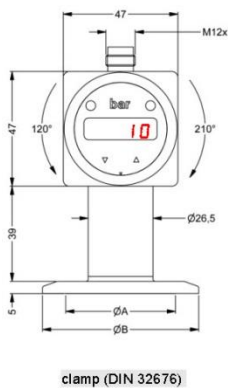
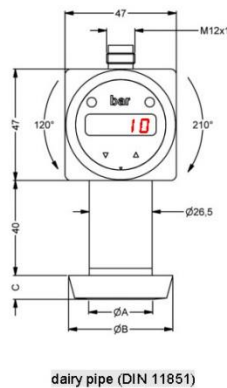
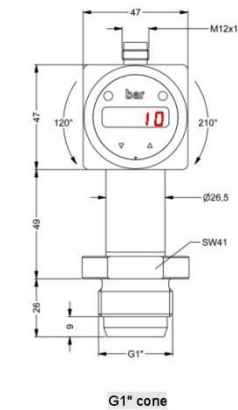
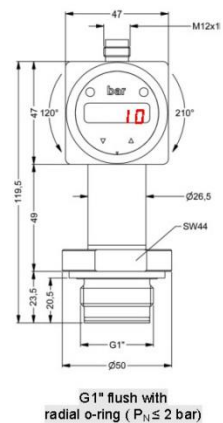
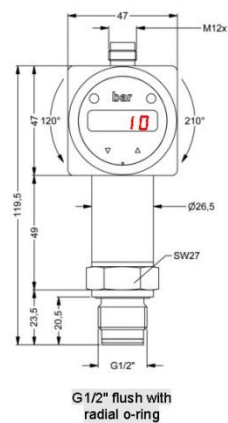
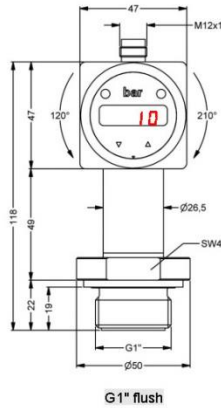
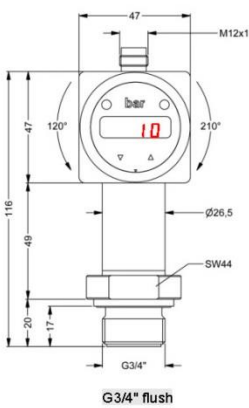
Technical Data

Mechanical connections (dimensions in mm)

Standard



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]	$\geq 0,25$ ≤ 40	$\geq 0,25$ ≤ 40	$\geq 0,25$ ≤ 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]	≥ 4 ≤ 8	$\geq 0,25$ ≤ 16	≤ 16	≤ 16

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

Ordering code DS 200P

DS 200P

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Pressure				
	gauge	7	8	5
	absolute	7	8	6
Input				
	[bar]			
	0.10	1	0	0
	0.16	1	6	0
	0.25	2	5	0
	0.40	4	0	0
	0.60	6	0	0
	1.0	1	0	1
	1.6	1	6	1
	2.5	2	5	1
	4.0	4	0	1
	6.0	6	0	1
	10	1	0	2
	16	1	6	2
	25	2	5	2
	40	4	0	2
	-1 ... 0	X	1	0
	customer	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 ³			4
Accuracy				
	standard for P _N > 0.4 bar	0.35 %		3
	standard for P _N ≤ 0.4 bar	0.5 %		5
	option for P _N ≥ 0.4 bar	0.25 %		2
	customer			9
				consult
Electrical connection				
	Male plug M12x1 (5-pin) / plastic version		N	0
	Male plug M12x1 (8-pin) / plastic version ³		M	5
	Male plug M12x1 (5-pin) / metal version		N	1
	Male and female plug ISO 4400 ²		1	0
	Male plug Binder series 723 (5-pin)		2	0
	Cable outlet incl. cable ⁴		T	A
	customer		9	9
				consult
Mechanical connection				
	G1/2" with flush welded diaphragm (DIN 3852) ⁵		Z	0
	G3/4" with flush welded diaphragm (DIN 3852)		Z	3
	G1" with flush welded diaphragm (DIN 3852)		Z	3
	G1" DIN 3852 with rad. o-ring and flush diaphragm ⁶		Z	5
	G1/2" DIN 3852 with rad. o-ring and flush diaphragm		Z	6
	G 1" cone		K	3
	Clamp DN 25 / 1" (DIN 32676)		C	6
	Clamp DN 32 / 1 1/2" (DIN 32676)		C	6
	Clamp DN 50 / 2" (DIN 32676)		C	6
	Clamp 3/4" (DIN 32676)		C	6
	Dairy pipe DN 25 (DIN 11851) ⁷		M	7
	Dairy pipe DN 40 (DIN 11851) ⁷		M	7
	Dairy pipe DN 50 (DIN 11851) ⁷		M	7
	customer		9	9
				consult
Diaphragm				
	Stainless steel 1.4435 (316L)			1
	Tantalum			T
	Hastelloy® C-276 (2.4819)			H
	customer			9
				consult
Seals				
	for clamp or dairy pipe:			0
	for inch thread: FKM			1
	FFKM			7
	customer			9
				consult
Filling Fluids				
	Silicon oil			1
	food compatible oil			2
	customer			9
				consult
Special version				
	standard			0
	with cooling element up to 300°C			2
	customer			9
				consult

¹ with Exversion 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 only for P_N ≥ 1 bar
⁶ possible only for P_N ≤ 2 bar
⁷ The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position.