

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



Input pressure range ¹																	
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 ≥	[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 125 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 _{Smin}) / 0.02 A] Ω response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V _S = 15 ... 28 V _{DC} permissible load: R _{max} = [(V _S - V _{Smin}) / 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: electronics / environment: storage:	-40 ... 125 °C for filling fluid silicone oil -10 ... 125 °C for filling fluid food compatible oil -40 ... 85 °C -40 ... 100 °C	
Permissible temperature medium for cooling element 300°C		filling fluid silicone oil filling fluid food compatible oil	overpressure: -40 ... 300 °C overpressure: -10 ... 250 °C	vacuum: -40 ... 150 °C ⁷ 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

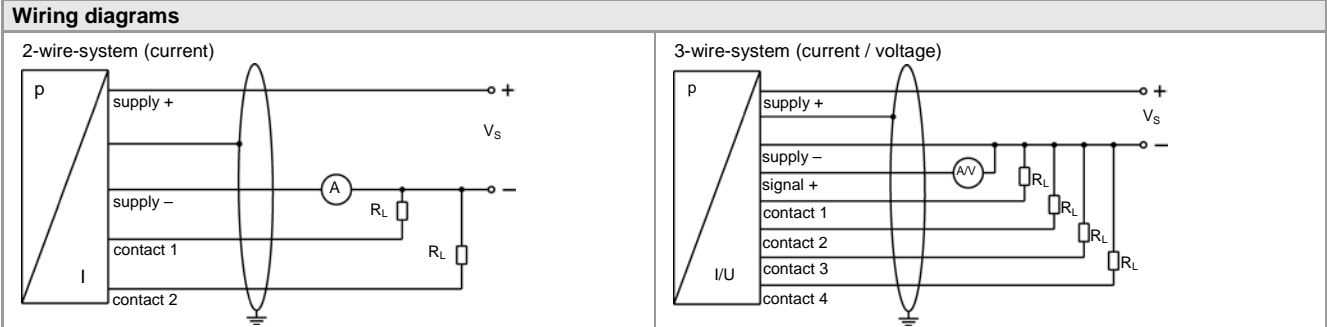
⁷ also for P_{abs} ≤ 1 bar

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	silicone 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, 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

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 ^b	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 $\mu\text{H/m}$

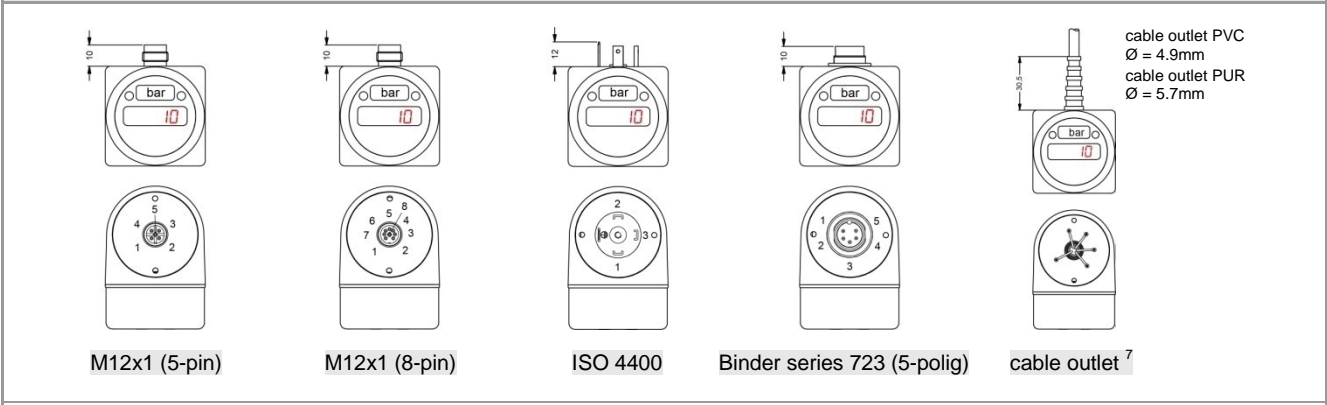
^b the real switching current in the application depends on the power supply unit

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 ⁶ cycles
CE-conformity	EMC Directive: 2014/30/EU



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	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	ye/gn (yellow / green)

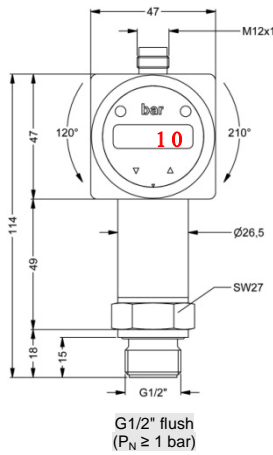
Electrical connections (dimensions in mm)



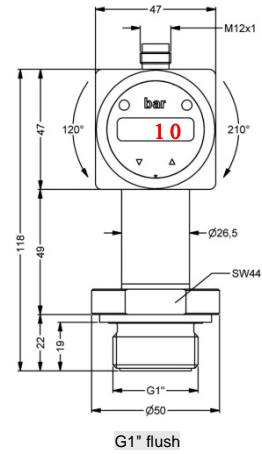
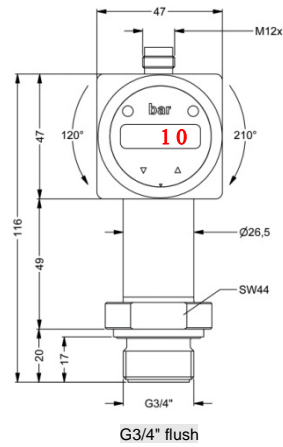
⁷ different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70°C)

Mechanical connections (dimensions in mm)

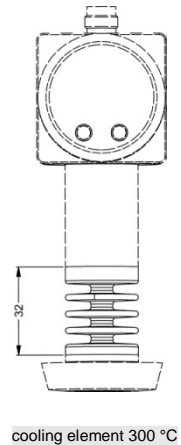
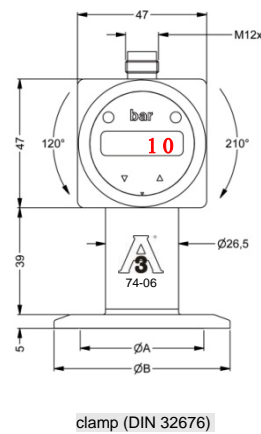
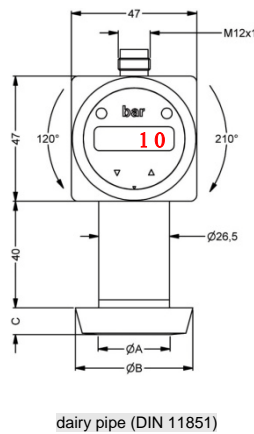
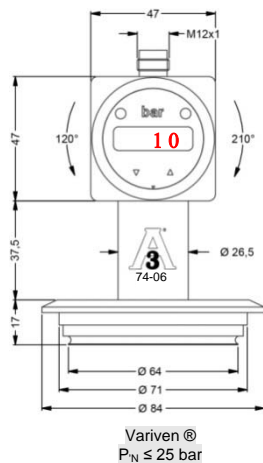
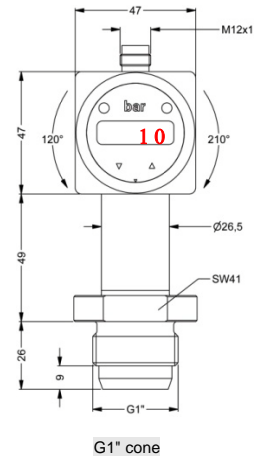
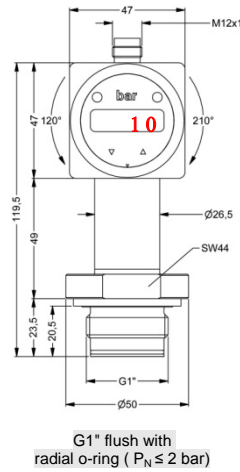
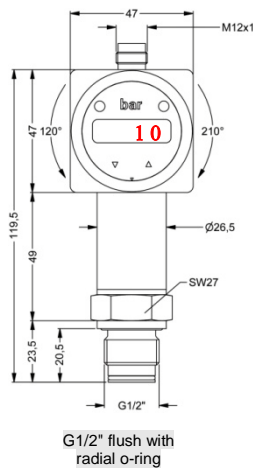
Standard



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]	$\geq 0,25$ ≤ 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

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Ordering code DS 200P

DS 200P									
Pressure									
gauge	7	8	5						
absolute	7	8	6						
Input									
[bar]									
0.10	1	0	0	0					
0.16	1	6	0	0					
0.25	2	5	0	0					
0.40	4	0	0	0					
0.60	6	0	0	0					
1.0	1	0	0	1					
1.6	1	6	0	1					
2.5	2	5	0	1					
4.0	4	0	0	1					
6.0	6	0	0	1					
10	1	0	0	2					
16	1	6	0	2					
25	2	5	0	2					
40	4	0	0	2					
-1 ... 0	X	1	0	2					
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 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	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	0	
Cable outlet incl. cable ⁴						T	A	0	
customer						9	9	9	consult
Mechanical connection									
G1/2" with flush welded diaphragm (DIN 3852) ⁵						Z	0	0	
G3/4" with flush welded diaphragm (DIN 3852)						Z	3	0	
G1" with flush welded diaphragm (DIN 3852)						Z	3	1	
G1" DIN 3852 with rad. o-ring and flush diaphragm ⁶						Z	5	7	
G1/2" DIN 3852 with rad. o-ring and flush diaphragm						Z	6	1	
G 1" cone						K	3	1	
Clamp DN 25 / 1" (DIN 32676) / 3A						C	6	1	
Clamp DN 32 / 1 1/2" (DIN 32676) / 3A						C	6	2	
Clamp DN 50 / 2" (DIN 32676) / 3A						C	6	3	
Clamp 3/4" (DIN 32676) / 3A						C	6	9	
Dairy pipe DN 25 (DIN 11851) ⁷						M	7	3	
Dairy pipe DN 40 (DIN 11851) ⁷						M	7	5	
Dairy pipe DN 50 (DIN 11851) ⁷						M	7	6	
Varivent® DN 40/50 / 3A						P	4	1	
customer						9	9	9	consult
Diaphragm									
Stainless steel 1.4435 (316L)						1			
Tantalum						T			consult
Hastellov® C-276 (2.4819)						H			consult
customer						9			consult
Seals									
for clamp, dairy pipe, Varivent®: without						0			
for inch thread: FKM						1			
FFKM						7			
customer						9			consult
Filling Fluids									
Silicone oil						1			
food grade oil (FDA) / 3A						2			
customer						9			consult
Special version									
standard						0	0	0	
with cooling element up to 300°C / 3A						2	0	0	
customer						9	9	9	consult

This document contains product specification; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.

with Ex version max. 1 contact is possible
 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
 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
 standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request
 possible only for P_N ≥ 1 bar
 possible only for P_N ≤ 2 bar
 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.
 Varivent® is a brand name of GEA Tuchemhagen GmbH, Hastellov® is a brand name of Haynes International Inc.

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