



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. four contacts and an analogue output complete the profile.

Preferred areas of use are



Food industry



Pharmacy



Input pressure range¹																
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																
Contact²																
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 _{S min}) / 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 _{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																
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				
⁵ 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 ⁶		-40 ... 125 °C							-10 ... 125 °C							
Medium with cooling element ⁷		overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ⁸							overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ⁸							
Electronics / environment		-40 ... 85 °C														
Storage		-40 ... 100 °C														
⁶ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C																
⁷ max. temperature depends on the used sealing material, type of seal and installation																
⁸ 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 according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)														

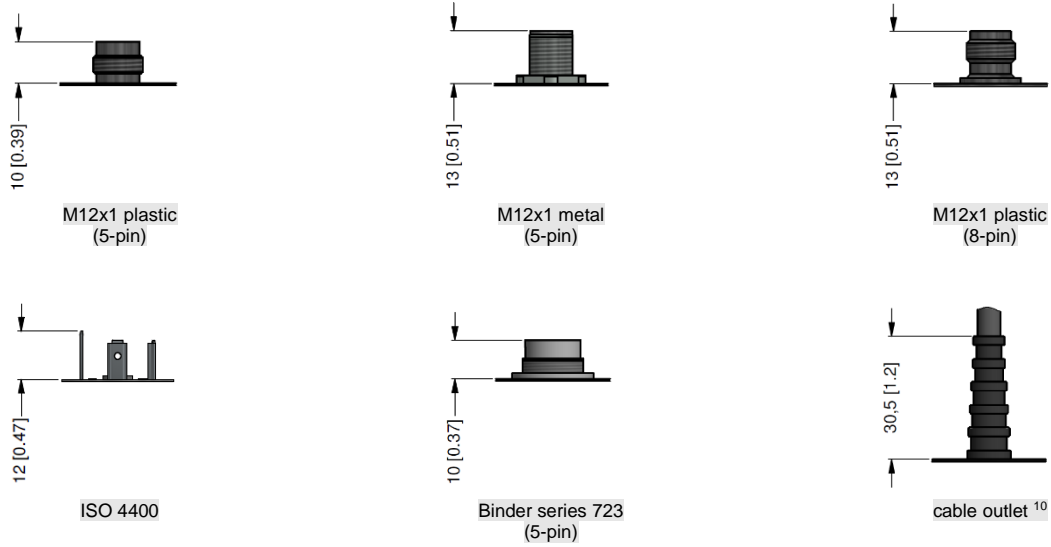
Materials						
Pressure port	inch thread: stainless steel 1.4404 (316 L) G1" cone, Clamp, dairy pipe, Varivent®: stainless steel 1.4435 (316 L)					
Housing	stainless steel 1.4404 (316 L)					
Display housing	PA 6.6, Polycarbonate					
Seals (media wetted)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) others on request 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 ⁹	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 $\mu\text{H}/\text{m}$					
⁹ the real switching current in the application depends on the power supply unit						
Miscellaneous						
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent® (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH					
Display	4-digit, red 7-segment-LED display; digit height 7 mm; range of indication -1999 ... +9999; accuracy 0.1 % ± 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 voltage: approx. 45 mA 3-wire signal output current: approx. 45 mA + signal current					
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)					
Surface roughness	pressure port $R_a < 0.8 \text{ }\mu\text{m}$ (media wetted parts) diaphragm $R_a < 0.15 \text{ }\mu\text{m}$ weld seam $R_a < 0.8 \text{ }\mu\text{m}$					
Weight	approx. 160 ... 250 g					
Operational life	100 million load cycles					
CE-conformity	EMC Directive: 2014/30/EU					
ATEX Directive	2014/34/EU					
Wiring diagrams						
2-wire-system (current)			3-wire-system (current/voltage)			
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)

DS 200P

Electronic Pressure Switch

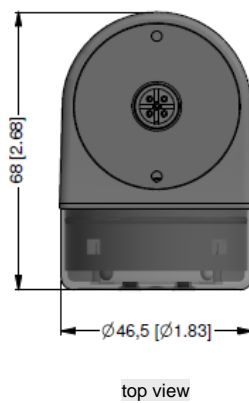
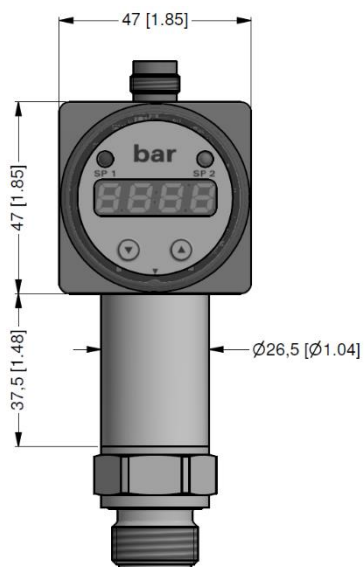
Technical Data

Electrical connections (dimensions mm / in)

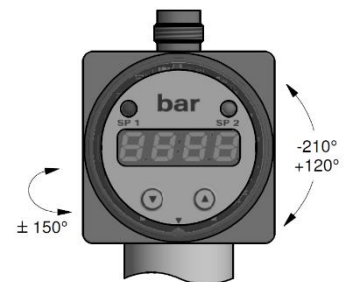


¹⁰ different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

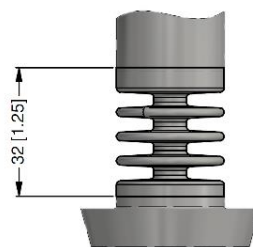
Dimensions (mm / in)



rotatability of display module

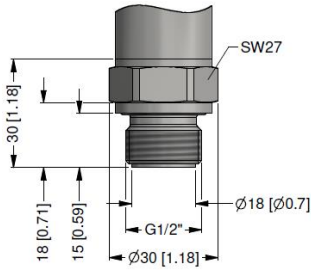


Cooling element up to 300 °C ⁷ (optionally)

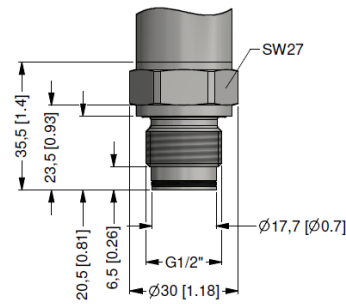


⁷ max. temperature depends on the used sealing material, type of seal and installation

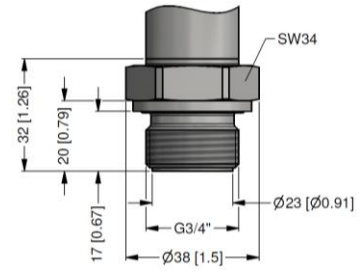
Mechanical connection (dimensions mm / in)



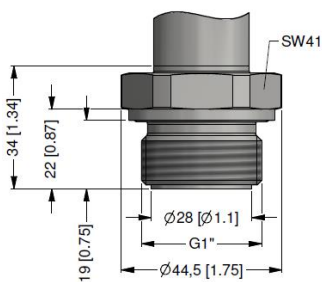
G1/2" flush DIN 3852
p_N ≥ 1 bar



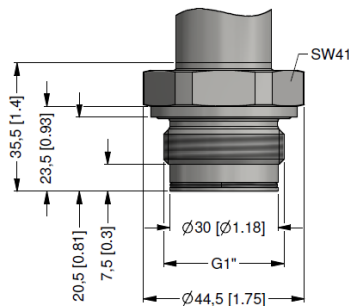
G1/2" flush with radial o-ring
p_N ≥ 1 bar



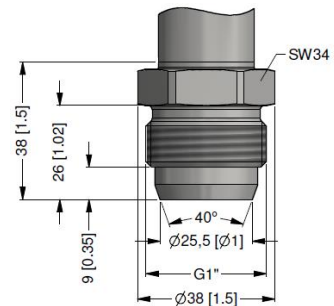
G3/4" flush DIN 3852



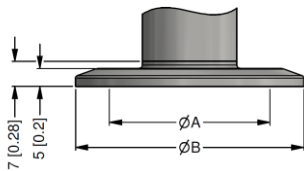
G1" flush DIN 3852



G1" flush with radial o-ring

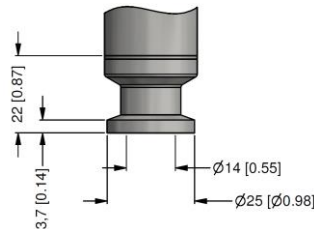


G1" cone

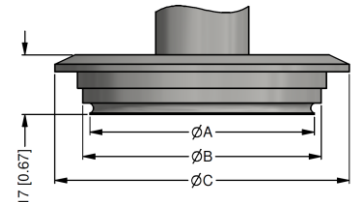


dimensions in mm [in]			
size	DN 25	DN 32	DN 50
A	23.0 [0.91]	23.0 [0.91]	45 [1.77]
B	50.5 [1.99]	50.5 [1.99]	64 [2.52]
p _N [bar]	0.25 ... 16	≤ 16	≤ 16

Clamp (DIN 32676)

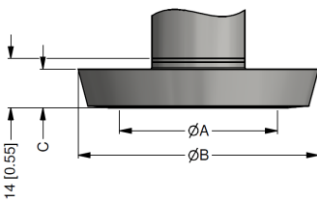


Clamp 3/4" (DIN 32676)
4 bar ≤ p_N ≤ 8 bar



dimensions in mm [in]	
size	DN 40/50
A	64 [2.52]
B	68 [2.68]
C	84 [3.31]

Varivent® DN 40/50
p_N ≤ 25 bar



dimensions in mm [in]			
size	DN 25	DN 40	DN 50
A	23 [0.91]	32 [1.26]	45 [1.77]
B	44 [1.73]	56 [1.20]	68.5 [2.70]
C	10 [0.39]	10 [0.39]	11 [0.43]
p _N [bar]	≤ 40	≤ 40	≤ 25

diary pipe (DIN 11851)

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

Varivent® is a brand name of GEA Tuchenhausen GmbH, Hastelloy® is a brand name of Haynes International Inc.

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Ordering code DS 200P

DS 200P



Pressure		7	8	5																		
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															consult	
Accuracy																						
standard for p _N > 0,4 bar:	0.35 % FSO					3																
standard for p _N ≤ 0,4 bar:	0.50 % FSO					5																
option for p _N ≥ 0,4 bar:	0.25 % FSO					2																
customer						9															consult	
Electrical connection																						
male plug M12x1 (5-pin) / plastic						N	0	1														
male plug M12x1 (8-pin) / plastic ³						M	5	0														
male plug M12x1 (5-pin) / metal						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" with flush welded diaphragm (DIN 3852) for p _n ≥ 1 bar							Z	0	0													
G3/4" with flush welded diaphragm (DIN 3852)							Z	S	0													
G1" with flush welded diaphragm (DIN 3852)							Z	S	1													
G1" DIN 3852 with rad. o-ring and flush diaphragm							Z	S	7													
G1/2" DIN 3852 with rad. o-ring and flush diaphragm (for p _n ≥ 1 bar)							Z	6	1													
G 1" cone							K	S	1													
Clamp DN 25 / 1" (DIN 32676) / 3A ⁵							C	6	1													
Clamp DN 32 / 1 1/2" (DIN 32676) / 3A ⁵							C	6	2													
Clamp DN 50 / 2" (DIN 32676) / 3A ⁵							C	6	3													
Clamp 3/4" (DIN 32676) / 3A ⁵							C	6	9													
dairy pipe DN 25 (DIN 11851) ⁶							M	7	3													
dairy pipe DN 40 (DIN 11851) ⁶							M	7	5													
dairy pipe DN 50 (DIN 11851) ^{5,6}							M	7	6													
Varivent® DN 40/50 / 3A ⁵							P	4	1													
customer							9	9	9												consult	
Diaphragm																						
stainless steel 1.4435 (316L)																					1	
tantalum																					T	
Hastelloy® C-276 (2.4819)																					H	
customer																					9	
Seals																						
for Clamp, dairy pipe, Varivent®:	without																				0	
for inch thread:	FKM																				1	
	FFKM																				7	
customer																					9	
Filling fluids																						
silicone oil																					1	
food compatible oil (FDA) / 3A																					2	
customer																					9	
Special version																						
standard																					0	
with cooling element up to 300°C / 3A																					2	
customer																					9	

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 nominal pressure ranges according to data sheet
⁶ 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 Tuchenhaagen GmbH. Hastelloy® is a brand name of Haynes International Inc.