



DS 200

Electronic Pressure Switch

Stainless Steel Sensor

accuracy according to IEC 61298-2:
standard: 0.35 % FSO
option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 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
- ▶ pressure sensor welded
- ▶ customer specific versions

The electronic pressure switch DS 200 is the
successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and has been specially designed for numerous
applications in various industrial sectors.

As standard the DS 200 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



Plant and machine engineering



Heating and air conditioning



Environmental engineering
(water – sewage – recycling)



Input pressure range												
Nominal pressure gauge ¹	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6
Level gauge ¹	[mH ₂ O]	-	1	1.6	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50

Nominal pressure gauge ¹ / absolute	[bar]	10	16	25	40	60	100	160	250	400	600
Level gauge ¹	[mH ₂ O]	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	40	80	80	105	210	210	600	1000	1000	1000
Burst pressure ≥	[bar]	50	120	120	210	420	420	1000	1250	1250	1250

Vacuum resistance $p_N \geq 1$ bar: unlimited vacuum resistance; $p_N < 1$ bar: on request

¹ from 60 bar: measurement starts with ambient pressure

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: $\leq \pm 0.5$ % 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

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

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 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) ⁴ permissible load: $R_{max} = 500 \Omega$ response time: < 3 sec
3-wire voltage signal	0 ... 10 V / $V_S = 15 \dots 36 V_{DC}$ permissible load: $R_{min} = 10 k\Omega$ response time: < 3 msec
without analogue output	$V_S = 15 \dots 36 V_{DC}$
Accuracy ³	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

³ accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)

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

Thermal effects (offset and span)			
Nominal pressure p_N	[bar]	-1 ... 0	< 0.40 ≥ 0.40
Tolerance band	[% FSO]	$\leq \pm 0.75$	$\leq \pm 1$ $\leq \pm 0.75$
in compensated range	[°C]	-20 ... 85	0 ... 70 -20 ... 85

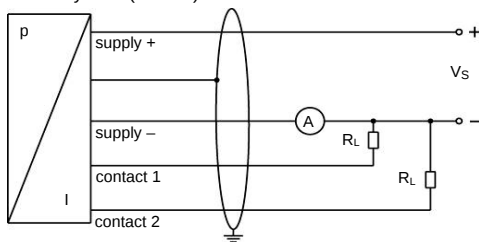
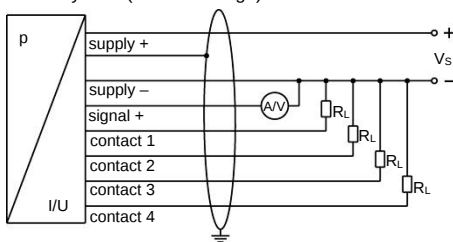
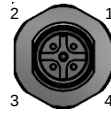
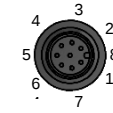
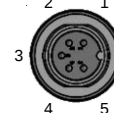
Permissible temperatures	
Medium	-40 ... 125 °C
Electronics / environment	-40 ... 85 °C
Storage	-40 ... 100 °C

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

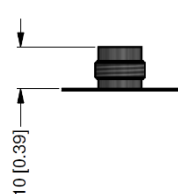
Mechanical stability	
Vibration	20 g RMS / 10 ... 2000 Hz according to DIN EN 60068-2-6
Shock	500 g / 1 msec half sine according to DIN EN 60068-2-27

Materials	
Pressure port	stainless steel 1.4404 (316 L)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	standard: FKM option: welded version ⁵ others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

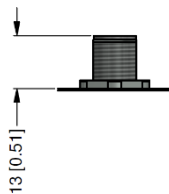
⁵ welded version only for pressure ports according to EN 837 and NPT; possible for nominal pressure ranges $p_N \leq 40$ bar

Explosion protection (only for 4 ... 20 mA / 2-wire)					
Approval AX14-DS 200	IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb				
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 ⁶	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 $\mu\text{H}/\text{m}$				
⁶ 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 ⁷				
Weight	min. 160 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) ⁸				
ATEX Directive	2014/34/EU				
⁷ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $p_N \leq 1 \text{ bar}$. ⁸ This directive is only valid for devices with maximum permissible overpressure > 200 bar					
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)
					
Supply +	1	1	1	1	1
Supply -	3	3	3	2	3
Signal + (only 3-wire)	2	2	2	3	2
Contact 1	4	4	4	3	4
Contact 2	5	5	5	-	5
Contact 3	-	-	6	-	-
Contact 4	-	-	7	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact 	plug housing/pressure port

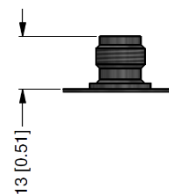
Electrical connections (dimensions mm / in)



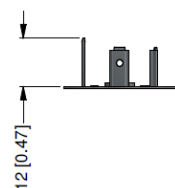
M12x1 plastic
(5-pin)



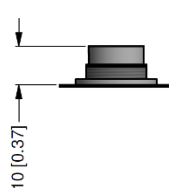
M12x1 metal
(5-pin)



M12x1 plastic
(8-pin)

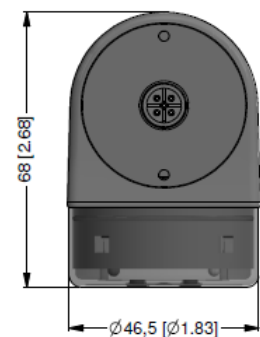
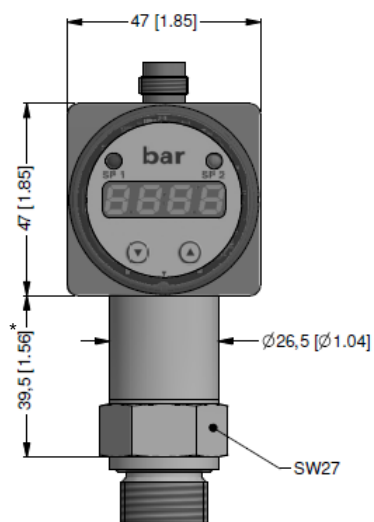


ISO 4400

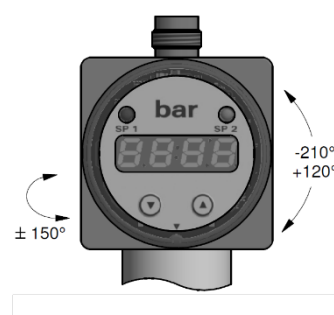


Binder series 723
(5-pin)

Dimensions (mm / in)

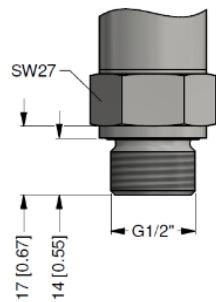


rotatability of display module

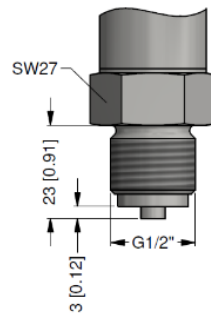


* for nominal pressure $p_N > 400$ bar increases the length of device by 19 mm (without explosion protection) or by 39 mm (with explosion protection)

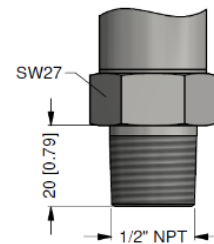
Mechanical connection (dimensions mm / in)



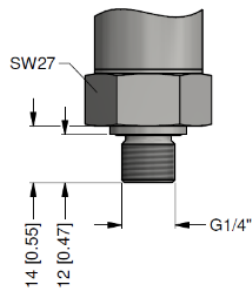
G1/2" DIN 3852



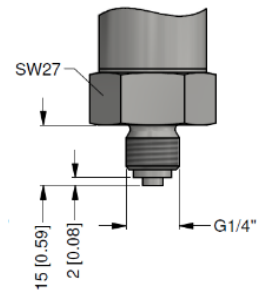
G1/2" EN 837



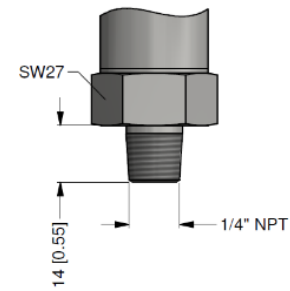
1/2" NPT



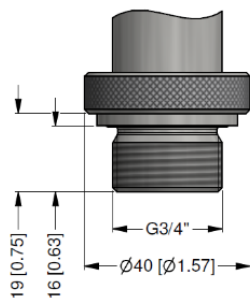
G1/4" DIN 3852



G1/4" EN 837

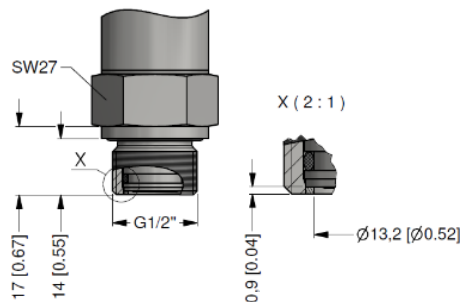


1/4" NPT



G3/4" flush DIN 3852
(0.1 bar ≤ p_N ≤ 40 bar)

length of device: 87.5 mm (without plug)



G1/2" flush DIN 3852
(0.1 bar ≤ p_N ≤ 40 bar)

length of device: 103 mm (without plug)

⇒ metric threads and other versions on request

The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and materials.

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consult

⁷ welded version only with pressure ports according to EN 837 and NPT: possible for nominal pressure ranges $p_N \leq 40$ bar