BD SENSORS®
pressure measurement

DS 210

Electronic Pressure Switch

Without Media Isolation

accuracy according to EN IEC 62828-2:
0.35 % span

Nominal pressure

from 0 ... 10 mbar up to 0 ... 1000 mbar

Contacts

1 or 2 independent 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
- customer specific versions

The electronic pressure switch DS 210 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for measuring of very small overpressure and for vacuum applications. Permissible media are gases, pressurized air and thin non aggressive media.

As standard the DS 210 offers a PNP-contact and a rotatable display module. Additional features like e.g. an intrinsically safe version and an analogue output complete the profile.

Preferred areas of use are

- Plant and Machine Engineering
- Heating and Air Conditioning
- Laboratory Techniques

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Input pressure range												
Nominal pressure gauge	[mbar]	-1000 ... 0	10	16	25	40	60	100	160	250	400	600	1000
Overpressure	[bar]	3	0.2	0.2	0.5	0.5	0.5	1	2	3	3	3	3
Burst pressure	[bar]	5	0.3	0.3	0.75	0.75	0.75	1.5	3	5	5	5	5

Contact [1]		
Standard	1 PNP contact	
Options	2 independent PNP contacts	
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 [2]	standard:	≤ ± 0.35 % span
	nominal pressure ≤ 100 mbar:	≤ ± 0.5 % span
Repeatability	≤ ± 0.1 % span	
Switching frequency	max. 10 Hz	
Switching cycles	> 100 x 10^6	
Delay time	0 ... 100 sec	

[1] max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with Ex-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 = 15 ... 36 V_{DC}	
	permissible load: $R_{max} = [(V_S - V_{S\,min}) / 0{,}02\ A]\ \Omega$	response time: < 10 msec
2-wire current signal with Ex-protection	4 ... 20 mA / V_S = 17 ... 28 V_{DC}	
	permissible load: $R_{max} = [(V_S - V_{S\,min}) / 0{,}02\ A]\ \Omega$	response time: < 10 msec
3-wire current signal	4 ... 20 mA / V_S = 19 ... 30 V_{DC} adjustable (turn-down of span max. 5:1) [3]	
	permissible load: R_{max} = 500 Ω	response time: < 3 sec
3-wire voltage signal	0 ... 10 V / V_S = 15 ... 36 V_{DC}	permissible load: R_{min} = 10 k Ω response time: < 3 msec
Accuracy [2]	standard:	≤ ± 0.35 % span
	nominal pressure ≤ 100 mbar:	≤ ± 0.5 % span

[2] accuracy according to EN IEC 62828-2– limit point adjustment (non-linearity, hysteresis, repeatability)
[3] 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	[mbar]	-1000 ... 0	≤ 100	≤ 400	> 400
Tolerance band	[% span]	≤ ± 0.75	≤ ± 1.5	≤ ± 1	≤ ± 0.75
in compensated range	[°C]	-20 ... 85	0 ... 50	0 … 70	-20 ... 85

Permissible temperatures			
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	10 g RMS (25 ... 2000 Hz)	according to DIN EN 60068-2-6
Shock	500 g / 1 msec	according to DIN EN 60068-2-27

Materials	
Pressure port	stainless steel 1.4404 (316L)
Housing	stainless steel 1.4404 (316L)
Display housing	PA 6.6, Polycarbonate
Seal (media wetted)	FKM
Sensor	stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass
Media wetted parts	pressure port, seal, sensor

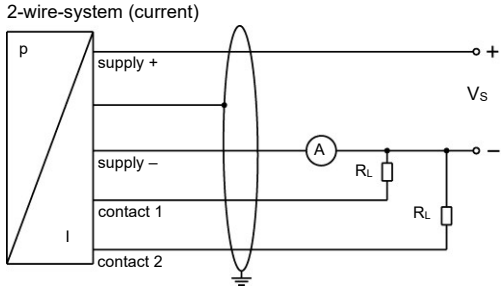
Explosion protection (for 2-wire current signal)	
Approval AX4-DS 210	IBExU06ATEX1049 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C ≈ 0 nF, L_i ≈ 0 µH
Max. switching current [4]	70 mA (max. permissible inductivity: 4.7 mH)
Permissible temperatures for environment	-25 ... 70 °C
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m

[4] the real switching current in the application depends on the power supply unit

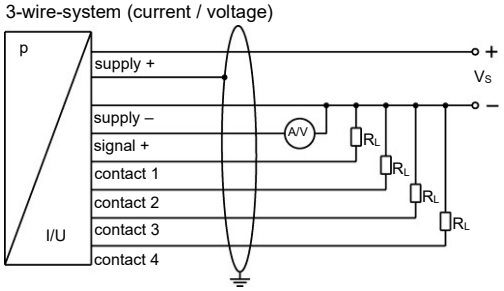
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 … 30 sec (programmable); measured value update 0.0 … 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: 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
Weight	approx. 180 g
Operational life	> 100 x 10^6 cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

Wiring diagram/s

2-wire-system (current)



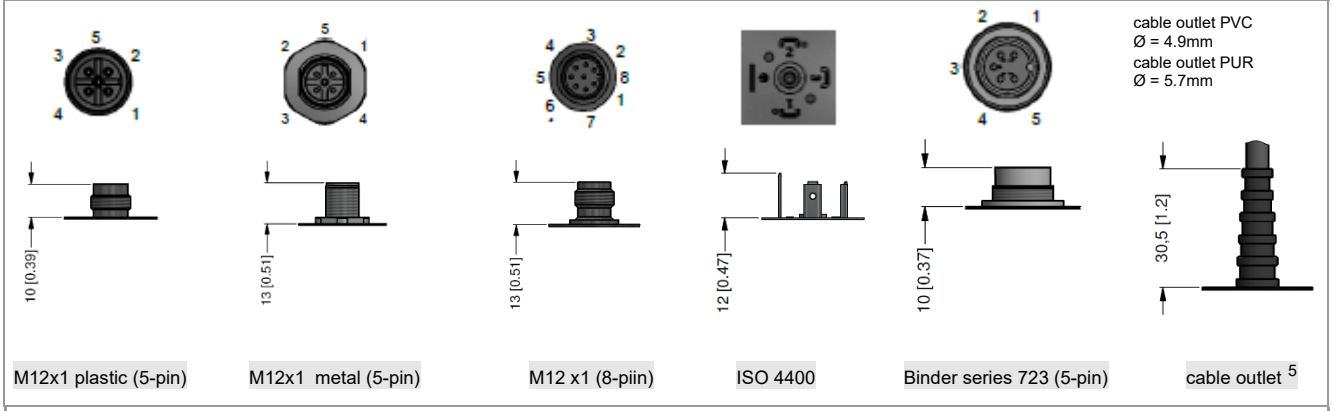
3-wire-system (current / voltage)



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 (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	gnye (green-yellow)

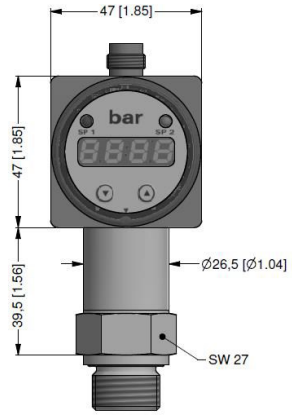
Electrical connections (dimensions in mm)

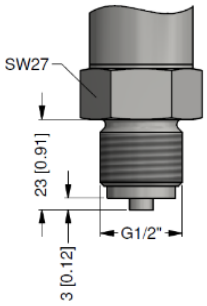


M12x1 plastic (5-pin) | M12x1 metal (5-pin) | M12 x1 (8-piin) | ISO 4400 | Binder series 723 (5-pin) | cable outlet [5]

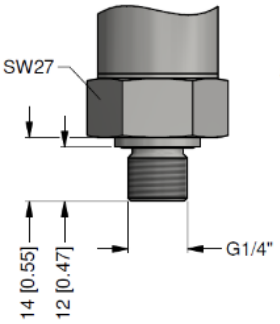
[5] *different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube)*

Mechanical connections (dimensions in mm)

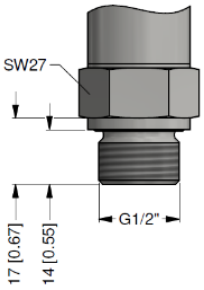




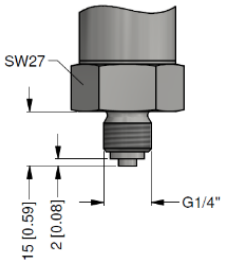
G1/2" EN 837



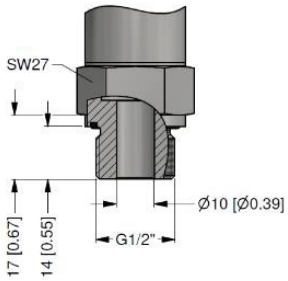
G1/4" DIN 3852



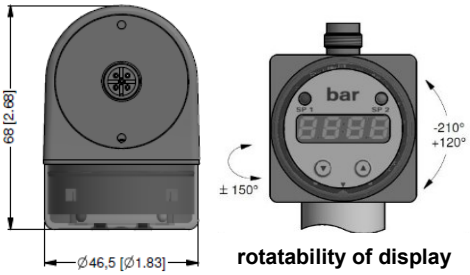
G1/2" DIN 3852



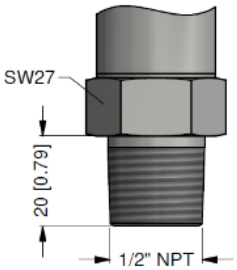
G1/4" EN 837



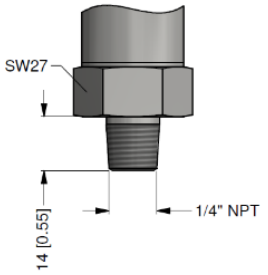
G1/2" open port



rotatability of display



1/2" NPT



1/4" NPT

⇨ metric threads and other versions on request

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BD SENSORS®
tlakoměrná technika

Ordering code DS 210

15.01.2024

DS 210 ☐☐☐-☐☐☐☐-☐-☐-☐-☐☐☐-☐☐☐-☐-☐☐☐

Pressure	
Gauge	7 8 A
Input [mbar]	
0 … 10	0 1 0 0
0 … 16	0 1 6 0
0 … 25	0 2 5 0
0 … 40	0 4 0 0
0 … 60	0 6 0 0
0 … 100	1 0 0 0
0 … 160	1 6 0 0
0 … 250	2 5 0 0
0 … 400	4 0 0 0
0 … 600	6 0 0 0
0 … 1000	1 0 0 1
-1000…0	X 1 0 2
Customer	9 9 9 9
Electrical output / Analog output	
4 … 20 mA / 2-wire	1
0 … 10 V / 3-wire	3
4 … 20 mA / 3-wire (adjustable)	7
Intrinsic safety Ex ia 4 … 20 mA / 2-wire (max. 1 switch. contact)[1]	E
Customer	9
Contact	
1 switching contact (version 3-wire only with 5-pin connector)[1,2]	1
2 switching contacts (only with 5-pin connector)[1,2]	2
Accuracy	
0,5 % (P_N ≤ 0,4 bar)	5
0,35 % (P_N > 0,4 bar)	3
Customer	9
Electrical connection	
Connector DIN 43650 (ISO 4400) (IP 65)[2]	1 0 0
Connector M 12 x 1 (5-pin) (IP 65)	N 0 1
Connector M 12 x 1 (5-pin) (IP 65) - metal	N 1 1
Cable outlet incl.cable (standard: 2 m PVC cable without ventilation tube, permissible temperature: -5 … 70 °C)	T A 0
Customer	9 9 9
Mechanical connection	
G 1/2" DIN 3852	1 0 0
G 1/2" EN 837	2 0 0
G 1/4" DIN 3852	3 0 0
G 1/4" EN 837	4 0 0
G 1/2 " DIN 3852 open port	H 0 0
1/2" NPT	N 0 0
1/4" NPT	N 4 0
Customer	9 9 9
Seals	
Viton (FKM) (P_N ≤ 40 bar)	1
Customer	9
Special version	
Standard	0 0 0
Customer	9 9 9

0,-…without additional charge
On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.
This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet. BD SENSORS reserves the right to change sensor specifications without further notice.

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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