



DS 210

Electronic Pressure Switch

Without Media Isolation

accuracy according to IEC 60770:
0.35 % FSO



Electronic Pressure Switch

Nominal pressure

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

Contacts

1, 2 or 4 independent contacts
freely konfigurable

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

DS 210



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 vavuum 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, max. 4 contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and Machine Engineering



Heating and Air Conditioning



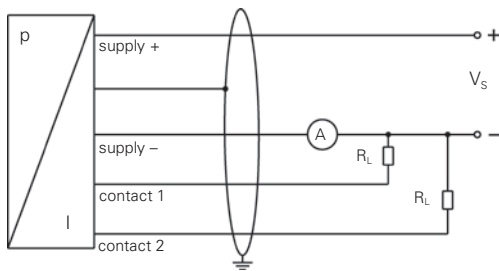
Laboratory Techniques

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 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; $V_{\text{switch}} = V_S - 2V$ 0 ... 10 V / 3-wire: contact rating 500 mA, short-circuit resistant											
Accuracy of contacts ³	standard: $\leq \pm 0.35$ % FSO nominal pressure ≤ 100 mbar: $\leq \pm 0.5$ % FSO											
Repeatability	$\leq \pm 0.1$ % FSO											
Switching frequency	max. 10 Hz											
Switching cycles	$> 100 \times 10^6$											
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 / $V_S = 18 \dots 41 V_{DC}$ permissible load: $R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0,02] \Omega$ response time: < 10 msec											
2-wire current signal with Ex-protection	4 ... 20 mA / $V_S = 17 \dots 28 V_{DC}$ permissible load: $R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0,02] \Omega$ response time: < 10 msec											
3-wire current signal	4 ... 20 mA / $V_S = 19 \dots 30 V_{DC}$ adjustable (turn-down of span max. 1:5) ² permissible load: $R_{\text{max}} = 500 \Omega$ response time: < 3 sec											
3-wire voltage signal	0 ... 10 V / $V_S = 15 \dots 36 V_{DC}$ permissible load: $R_{\text{min}} = 10 \text{ k}\Omega$ response time: < 3 msec											
without analogue output	$V_S = 15 \dots 36 V_{DC}$											
Accuracy	standard: $\leq \pm 0.35$ % FSO nominal pressure ≤ 100 mbar: $\leq \pm 0.5$ % FSO											
² with turn-down of span the analogue signal is adjusted automatically to the new measuring range ³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)												
Thermal effects (Offset and Span)												
Nominal pressure P_N [mbar]	-1000 ... 0		≤ 100		≤ 400		> 400					
Tolerance band [% FSO]	$\leq \pm 0.75$		$\leq \pm 1.5$		$\leq \pm 1$		$\leq \pm 0.75$					
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 AX14-DS 210	IBExU 06 ATEX 1050 X Zone 1: II 2G Ex ia IIC T4 Gb (Stecker) / II 2G Ex ia IIB T4 Gb (Kabel)											
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \mu\text{H}$											
Max. switching current ⁴	70 mA (max. permissible inductivity: 4.7 mH)											
Permissible temperatures for environment	-20 ... 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 $\mu\text{H}/\text{m}$											
⁴ the real switching current in the application depends on the power supply unit												

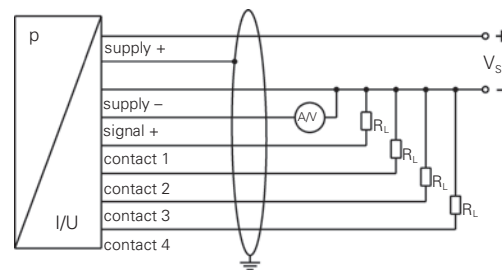
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: 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: 2004/108/EC

Wiring diagrams

2-wire-system (current)



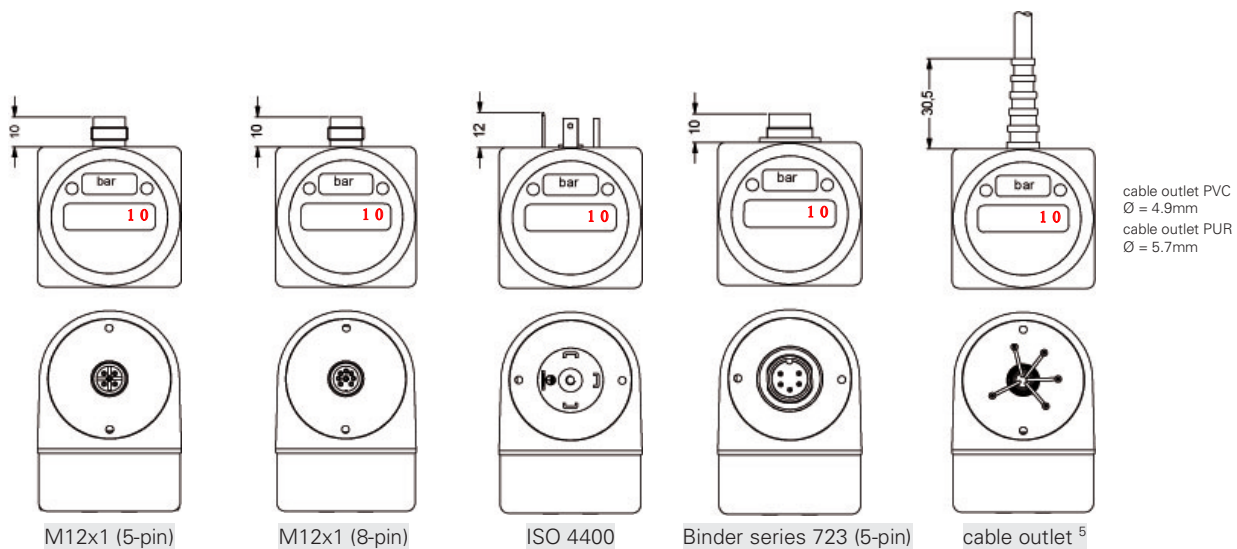
3-wire-system (current / voltage)



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 (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	gr (grey)
Contact 2	5	5	5	-	1	pn (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	plug housing/pressure port	gn/ye (green/yellow)

Electrical connections (dimensions in mm)



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

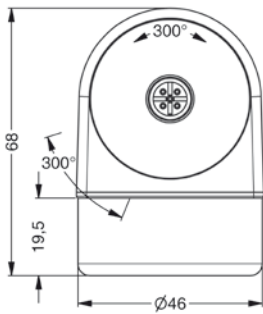
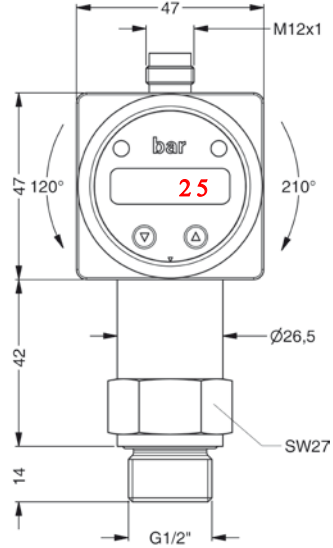
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Technical Data

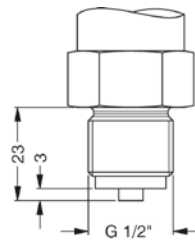
Mechanical connections (dimensions in mm)

standard

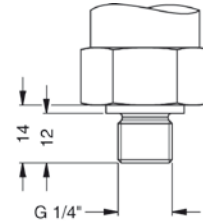


G1/2" DIN 3852

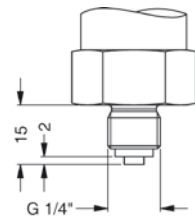
optionally



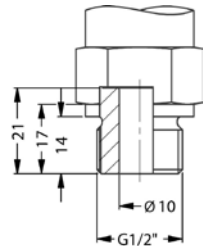
G1/2" EN 837



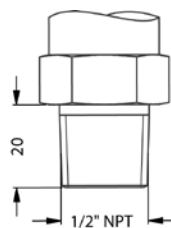
G1/4" DIN 3852



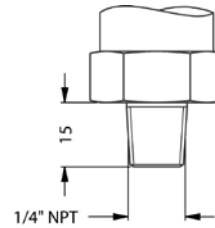
G1/4" EN 837



G1/2" open port



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

Ordering code DS 210

DS 210

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Pressure		
gauge	7 8 A	
Input		
[mbar]		
10	0 1 0 0	
16	0 1 6 0	
25	0 2 5 0	
40	0 4 0 0	
60	0 6 0 0	
100	1 0 0 0	
160	1 6 0 0	
250	2 5 0 0	
400	4 0 0 0	
600	6 0 0 0	
1000	1 0 0 1	
-1000 ... 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 > 0.1 bar	0.35 %	3
standard for P _N ≤ 0.1 bar	0.5 %	5
customer		9
		consult
Electrical connection		
Male plug M12x1 (5-pin) / plastic version		N 0 0
Male plug M12x1 (8-pin) / plastic version ³		M 5 0
Male plug M12x1 (5-pin) / metal version		N 1 0
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" DIN 3852		1 0 0
G1/2" EN 837		2 0 0
G1/4" DIN 3852		3 0 0
G1/4" EN 837		4 0 0
G1/2" DIN 3852 open pressure port		H 0 0
1/2" NPT		N 0 0
1/4" NPT		N 4 0
customer		9 9 9
		consult
Seals		
FKM		1
customer		9
		consult
Special version		
standard		0 0 0
customer		9 9 9
		consult

¹ with Ex 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