



DS 210

Electronic Pressure Switch

Without Media Isolation

accuracy according to IEC 60770:
0.35 % FSO

Nominal pressure

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

Contacts

1, 2 or 4 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, max. four contacts and an analogue output complete the profile.

Preferred areas of use are

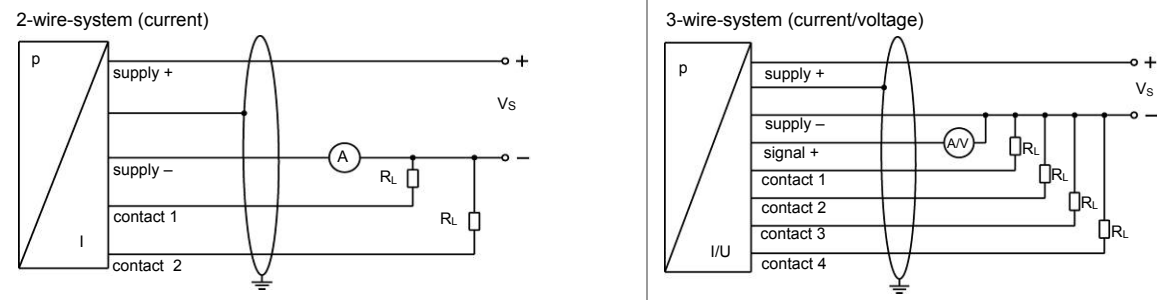
-  Plant and machine engineering
-  Heating and air conditioning
-  Laboratory techniques



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: 0 ... 10 V / 3-wire:						contact rating 125 mA, short-circuit resistant; $V_{switch} = V_S - 2V$ contact rating 125 mA, short-circuit resistant							
Accuracy of contacts ²		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 / $V_S = 13 \dots 36 V_{DC}$ 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 / $V_S = 15 \dots 28 V_{DC}$ permissible load: $R_{max} = [(V_S - V_{S,min}) / 0,02 A] \Omega$						response time: < 10 msec							
3-wire current signal		4 ... 20 mA / $V_S = 19 \dots 30 V_{DC}$ adjustable (turn-down of span max. 1:5) ³ 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 ²		standard: $\leq \pm 0.35\%$ FSO nominal pressure ≤ 100 mbar: $\leq \pm 0.5\%$ FSO													
² accuracy according to IEC 60770 – 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	[% 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 (connector) / II 2G Ex ia IIB T4 Gb (cable)													
Safety technical maximum values		$U_i = 28 V$, $I_i = 93 mA$, $P_i = 660 mW$, $C \approx 0 nF$, $L_i \approx 0 \mu H$													
Max. switching current ⁴		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 $\mu H/m$													
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 million load cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

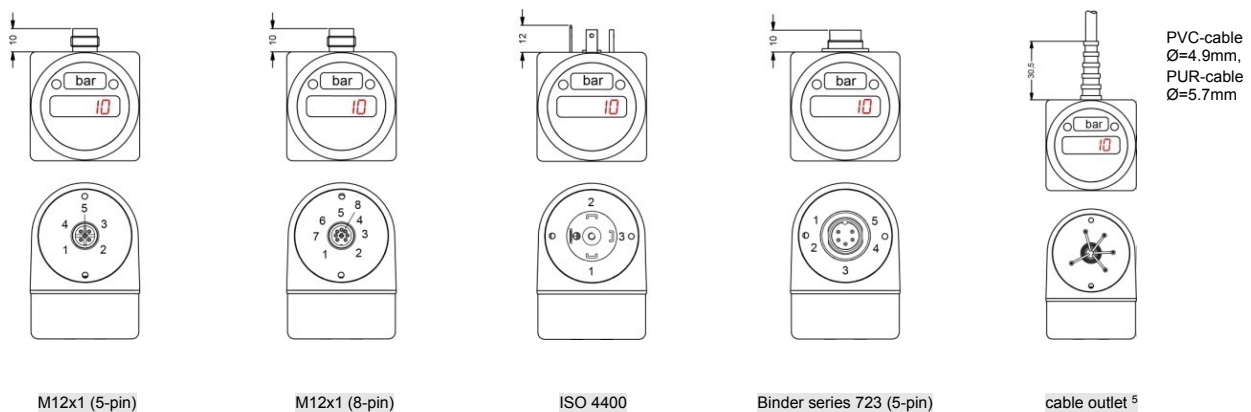
Wiring diagrams



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	-	-	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)



⁵ 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)

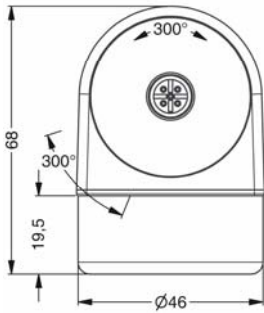
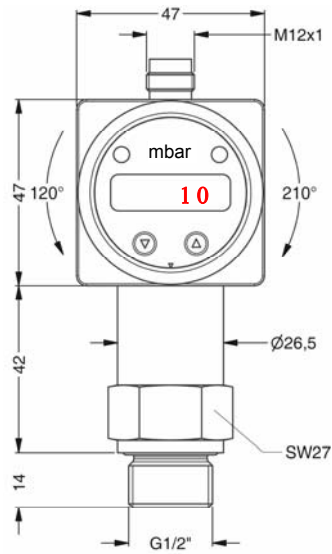
DS 210

Electronic Pressure Switch

Technical Data

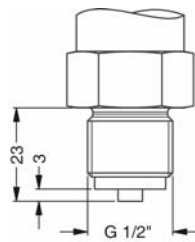
Mechanical connections (dimensions in mm)

standard

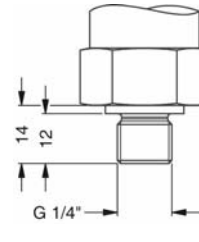


G1/2" DIN 3852

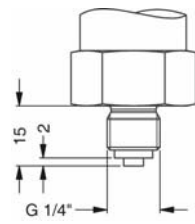
optionally



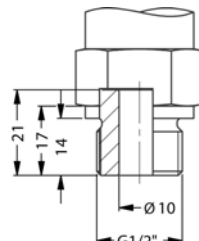
G1/2" EN 837



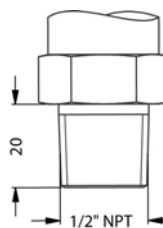
G1/4" DIN 3852



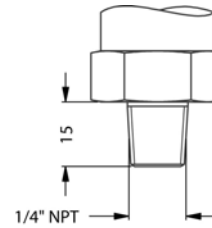
G1/4" EN 837



G1/2" open port



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

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DS210_E_010919

Ordering code DS 210

DS 210



Pressure		7		8		A													
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	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	4								
	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