



# 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 configurable

#### **Analogue output**

2-wire: 4 ... 20 mA  
3-wire: 0 ... 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. 4 contacts and an analogue output complete the profile.

#### **Preferred areas of use are**



Plant and Machine Engineering



Heating and Air Conditioning

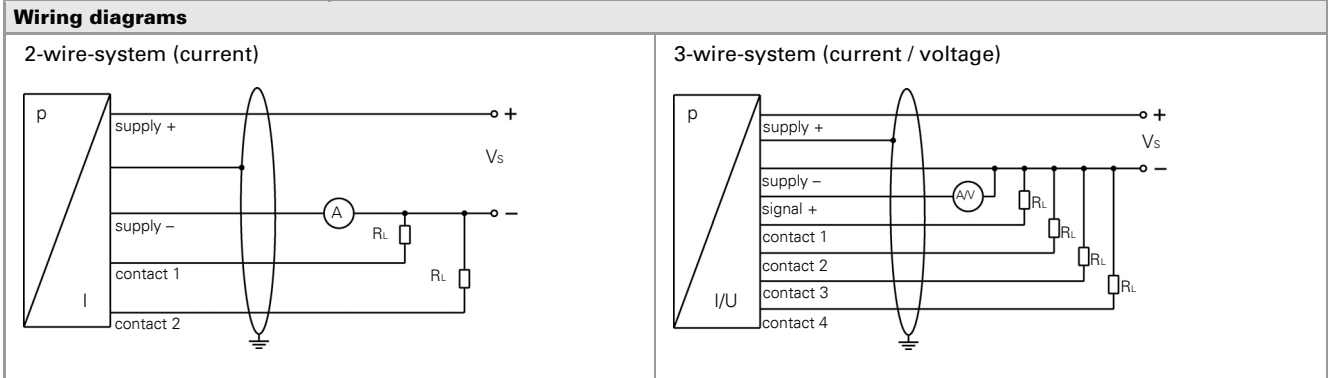


Laboratory Techniques

DS 210

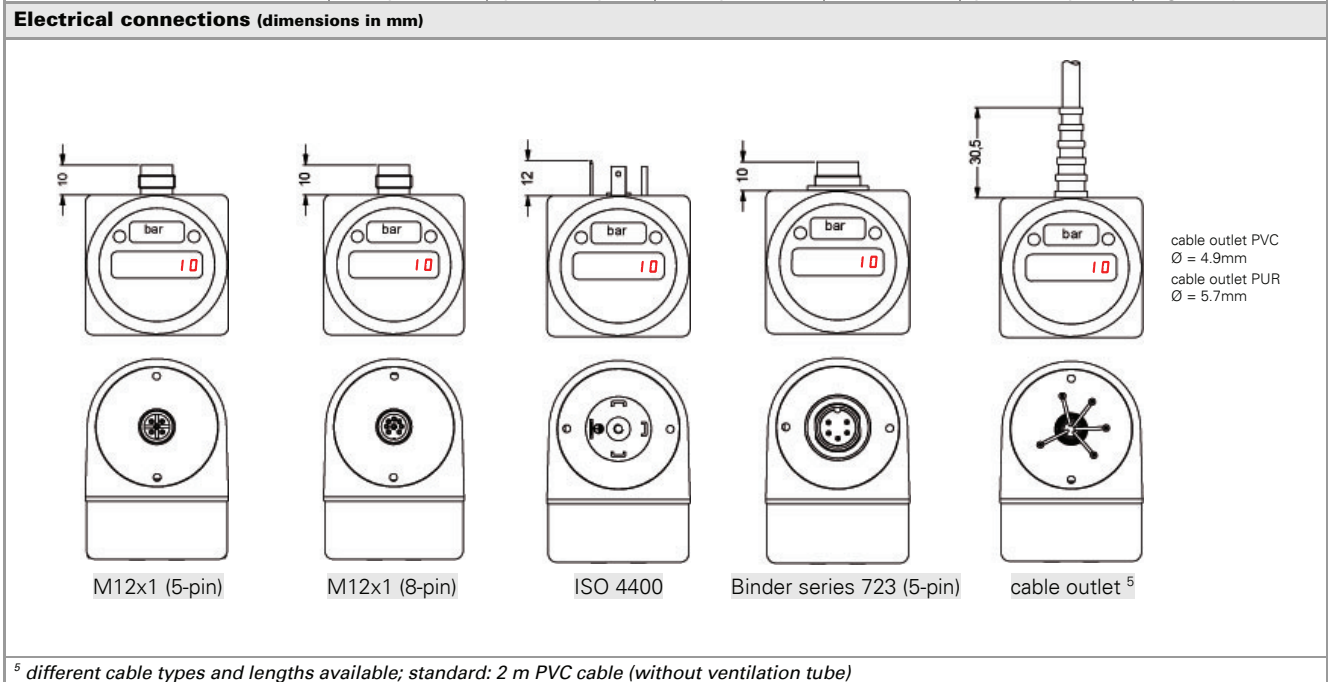
Input pressure range												
Nominal pressure gauge [mbar]	-1000 ... 0	10	16	25	40	60	100	160	250	400	600	1000
Overpressure [bar]	3	0.2	0.2	0.5	0.5	0.5	1	2	3	3	3	3
Burst pressure [bar]	5	0.3	0.3	0.75	0.75	0.75	1.5	3	5	5	5	5
Contact <sup>1</sup>												
Standard	1 PNP contact											
Options	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 500 mA, short-circuit resistant											
Accuracy of contacts <sup>3</sup>	standard: $\leq \pm 0.35\%$ FSO nominal pressure $\leq 100$ 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											
<sup>1</sup> 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: $R_{max} = [(V_s - V_{s,min}) / 0,02] \Omega$ response time: $< 10$ msec											
2-wire current signal with Ex-protection	4 ... 20 mA / $V_s = 17 \dots 28 V_{DC}$ permissible load: $R_{max} = [(V_s - V_{s,min}) / 0,02] \Omega$ 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) <sup>2</sup> permissible load: $R_{max} = 500 \Omega$ response time: $< 3$ sec											
3-wire voltage signal without analogue output	0 ... 10 V / $V_s = 15 \dots 36 V_{DC}$ permissible load: $R_{min} = 10$ k $\Omega$ response time: $< 3$ msec											
Accuracy	standard: $\leq \pm 0.35\%$ FSO nominal pressure $\leq 100$ mbar: $\leq \pm 0.5\%$ FSO											
<sup>2</sup> with turn-down of span the analogue signal is adjusted automatically to the new measuring range <sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)												
Thermal effects (Offset and Span)												
Nominal pressure $P_N$ [mbar]	-1000 ... 0		$\leq 100$		$\leq 400$		$> 400$					
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 AX11-DS 210	TÜV 02 ATEX 1841 zone (0) 1: II (1) 2 G Ex ia IIC T4											
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 <sup>4</sup>	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 $\mu$ H/m											
<sup>4</sup> the real switching current in the application depends on the power supply unit												

<b>Miscellaneous</b>	
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 <sup>6</sup> cycles
CE-conformity	EMC Directive: 2004/108/EC



**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)



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

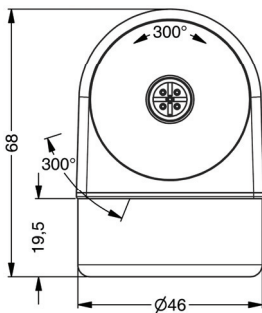
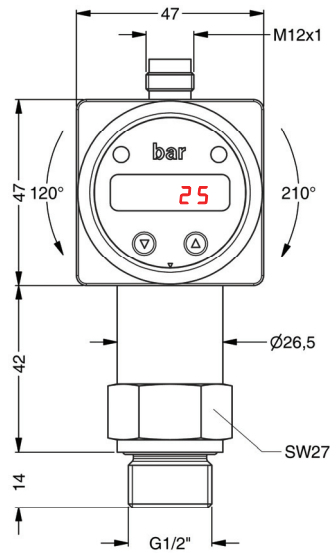
# DS 210

Electronic Pressure Switch

Technical Data

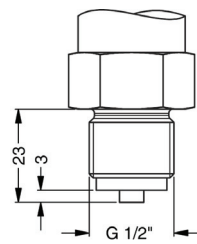
## Mechanical connections (dimensions in mm)

### standard

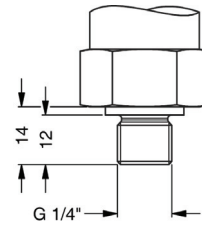


G1/2" DIN 3852

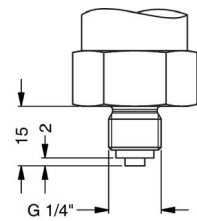
### optionally



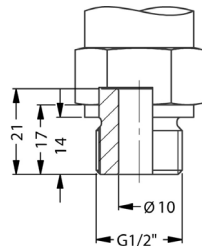
G1/2" EN 837



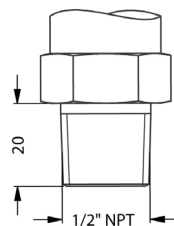
G1/4" DIN 3852



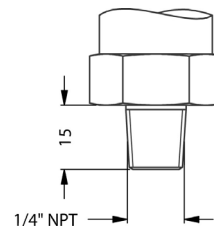
G1/4" EN 837



G1/2" open port



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

# Price list DS 210

## DS 210



Pressure		7	8	A																
Input	gauge [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
<b>Analogue output</b>																				
	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 <sup>1</sup>					E														
	customer					9														consult
<b>Contact</b>																				
	1 contact <sup>1,2</sup>																			1
	2 contacts <sup>1,2</sup>																			2
	4 contacts <sup>3</sup>																			4
<b>Accuracy</b>																				
	standard for $P_N > 0.1$ bar	0.35	%																	3
	standard for $P_N \leq 0.1$ bar	0.5	%																	5
	customer																			9
<b>Electrical connection</b>																				
	Male plug M12x1 (5-pin) / plastic version																			N 0 0
	Male plug M12x1 (8-pin) / plastic version <sup>3</sup>																			M 5 0
	Male plug M12x1 (5-pin) / metal version																			N 1 0
	Male and female plug ISO 4400 <sup>2</sup>																			1 0 0
	Male plug Binder series 723 (5-pin)																			2 0 0
	Cable outlet incl. cable <sup>4</sup>																			T A 0
	customer																			9 9 9
<b>Mechanical connection</b>																				
	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 <sup>3</sup>																			9 9 9
<b>Seals</b>																				
	FKM																			1
	customer																			9
<b>Special version</b>																				
	standard																			0 0 0
	customer																			9 9 9

<sup>1</sup> with Ex version max. 1 contact is possible

<sup>2</sup> with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

<sup>3</sup> 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

<sup>4</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request

## Website

[www.SensorsONE.co.uk](http://www.SensorsONE.co.uk)

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