



# DS 210

## Electronic Pressure Switch

Without Media Isolation

accuracy according to IEC 61298-2:  
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 <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 125 mA, short-circuit resistant
Accuracy of contacts <sup>2</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 / $V_S = 13 \dots 36 V_{DC}$ permissible load: $R_{max} = [(V_S - V_{Smin}) / 0,02 A] \Omega$ response time: $< 10$ msec
2-wire current signal with Ex-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 max. 1:5) <sup>3</sup> 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 <sup>2</sup>	standard: $\leq \pm 0.35\%$ FSO nominal pressure $\leq 100$ mbar: $\leq \pm 0.5\%$ FSO

<sup>2</sup> accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>3</sup> 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	$\leq 100$	$\leq 400$	$> 400$
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	
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 (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

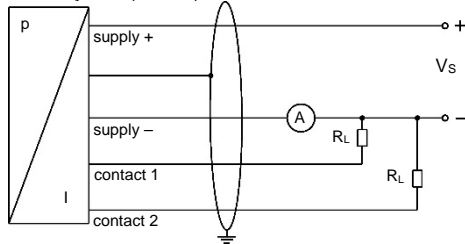
Explosion protection (for 2-wire current signal)	
Approval AX14-DS 210	IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)
Safety technical maximum values	$U_i = 28 V$ , $I_i = 93 mA$ , $P_i = 660 mW$ , $C \approx 0 nF$ , $L_i \approx 0 \mu H$
Max. switching current <sup>4</sup>	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 $\mu H/m$

<sup>4</sup> the real switching current in the application depends on the power supply unit

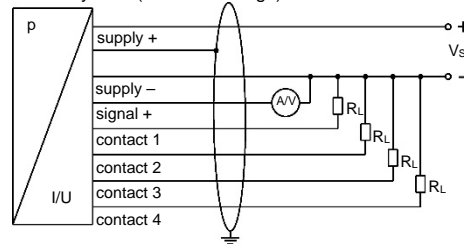
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: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

2-wire-system (current)



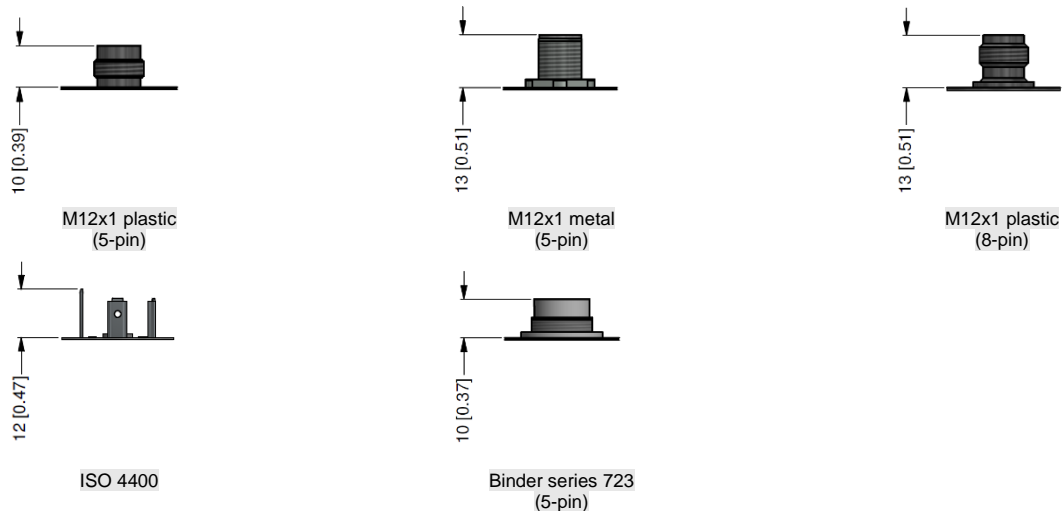
3-wire-system (current / voltage)



### 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)



# DS 210

Electronic Pressure Switch

Technical Data

**Dimensions (mm / in)**

Front view dimensions: width 47 [1.85], height 47 [1.85], mounting height 39,5 [1.56], diameter  $\varnothing 26,5$  [ $\varnothing 1.04$ ], SW 27.

Top view dimensions: height 68 [2.68], diameter  $\varnothing 46,5$  [ $\varnothing 1.83$ ].

rotatability of display module:  $\pm 150^\circ$ ,  $-210^\circ$  to  $+120^\circ$ .

**Mechanical connection (dimensions mm / in)**

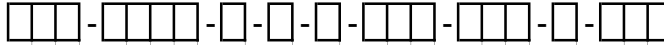
Connection options and dimensions:

- G1/2" DIN 3852:** 17 [0.67] total height, 14 [0.55] to SW27.
- G1/2" EN 837:** 23 [0.91] total height, 3 [0.12] to SW27.
- 1/2" NPT:** 20 [0.79] total height.
- G1/4" DIN 3852:** 14 [0.55] total height, 12 [0.47] to SW27.
- G1/4" EN 837:** 15 [0.59] total height, 2 [0.08] to SW27.
- 1/4" NPT:** 14 [0.55] total height.
- G1/2" open port:** 17 [0.67] total height, 14 [0.55] to SW27, diameter  $\varnothing 10$  [ $\varnothing 0.39$ ].

⇒ metric threads and other versions on request

## Ordering code DS 210

DS 210



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
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 <sup>1</sup>		E
	customer		9
Contact			
	1 contact <sup>1,2</sup>		1
	2 contacts <sup>1,2</sup>		2
	4 contacts <sup>3</sup>		4
Accuracy			
	standard for p <sub>N</sub> > 0.1 bar:	0.35 % FSO	3
	standard for p <sub>N</sub> ≤ 0.1 bar:	0.5 % FSO	5
	customer		9
Electrical connection			
	male plug M12x1 (5-pin) / plastic version		N 0 1
	male plug M12x1 (8-pin) / plastic version <sup>3</sup>		M 5 0
	male plug M12x1 (5-pin) / metal version		N 1 1
	male and female plug ISO 4400 <sup>2</sup>		1 0 0
	male plug Binder series 723 (5-pin)		2 0 4
	customer		9 9 9
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
Seal			
	FKM		1
	customer		9
Special version			
	standard		0 0 0
	customer		9 9 9

<sup>1</sup> with IS 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

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