



DS 202

Electronic Pressure Switch

Welded, Dry Stainless Steel Sensor

accuracy according to IEC 60770:
0.5 % FSO

Nominal pressure

from 0 ... 16 bar up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP 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
- ▶ oxygen application
- ▶ customer specific versions





The electronic pressure switch DS 202 is the successful combination of

- ▶ robust pressure transmitter
- ▶ digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 202 offers a PNP contact and a rotatable display module with 4-digit LED display. The transmitters are suitable for an unrestricted use in oxygen applications up to 600 bar and an intrinsically safe IS-Version.

Preferred areas of use are

-  Medical technology
-  Plant and machine engineering
-  Refrigeration
-  Oxygen application



Input pressure range										
Nominal pressure gauge	[bar]	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	32	50	80	120	200	320	500	800	1200
Burst pressure \geq	[bar]	80	125	200	300	500	800	1400	2000	3000
Vacuum resistance		unlimited								

Contact ¹	
Number, type	standard: 1 PNP contact option: 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1 8-pin for 4 ... 20 mA / 3-wire)
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 125 mA, short-circuit resistant
Accuracy of contacts ²	$\leq \pm 0.5\%$ FSO
Repeatability	$\leq \pm 0.1\%$ FSO
Switching frequency	max. 10 Hz
Switching cycles	$> 100 \times 10^6$
Delay time	0 ... 100 sec

¹ with IS-protection max. 1 contact possible

Analogue output (optionally) / Supply	
2-wire current signal	4 ... 20 mA / $V_S = 13 \dots 36 V_{DC}$ permissible load: $R_{\text{max}} = [(V_S - V_{S\text{min}}) / 0.02 \text{ A}] \Omega$ response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / $V_S = 15 \dots 28 V_{DC}$ permissible load: $R_{\text{max}} = [(V_S - V_{S\text{min}}) / 0.02 \text{ A}] \Omega$ response time: < 10 msec
3-wire current signal	4 ... 20 mA / $V_S = 19 \dots 30 V_{DC}$ adjustable (turn-down of span up to 1:5) ³ permissible load: $R_{\text{max}} = 500 \Omega$ response time: < 0.5 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 ²	$\leq \pm 0.5\%$ 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)	
Thermal error	$\pm 0.3\%$ FSO / 10 K
in compensated range	0 ... 70 °C

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 1.4571 (316 Ti)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	none (welded)
Diaphragm	stainless steel 1.4542 (17-4PH)
Media wetted parts	pressure port, diaphragm

Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approval AX14-DS 202	IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb
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
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 $\mu\text{H}/\text{m}$

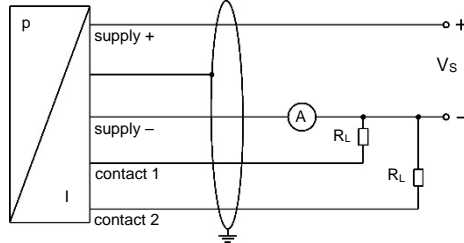
⁴ the real switching current in the application depends on the power supply unit

Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, digit width 4.85 mm (angle 10°); 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	min. 160 g (depending on mechanical connection)
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁵
ATEX Directive	2014/34/EU

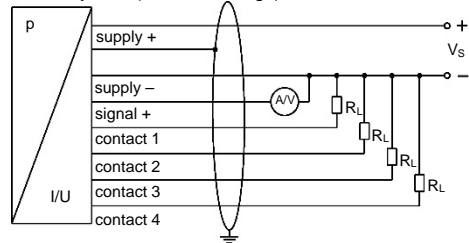
⁵ This directive is only valid for devices with maximum permissible overpressure > 200 bar

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)




10 [0.39]

M12x1 plastic
(5-pin)




13 [0.51]

M12x1 metal
(5-pin)




13 [0.51]

M12x1 plastic
(8-pin)



12 [0.47]

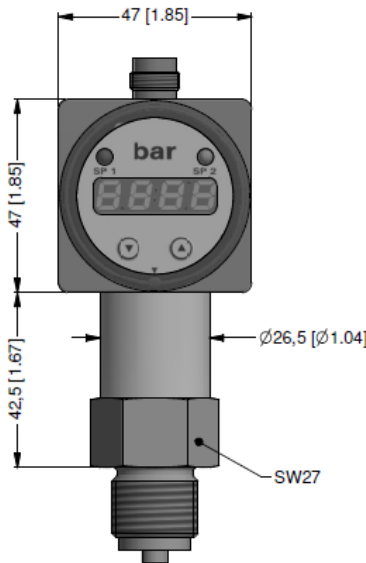
ISO 4400



10 [0.37]

Binder series 723
(5-pin)

Dimensions (mm / in)



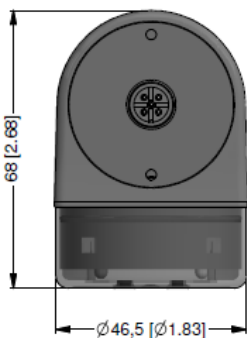
47 [1.85]

47 [1.85]

42,5 [1.67]

Ø26,5 [Ø1.04]

SW27

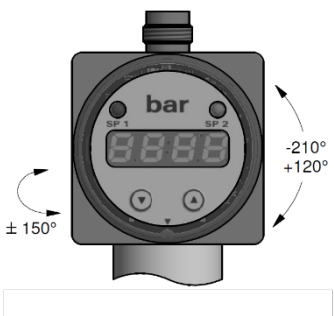


68 [2.68]

Ø46,5 [Ø1.83]

top view

rotatability of display module

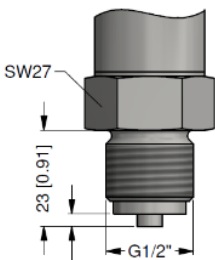


±150°

-210°

+120°

Mechanical connection (dimensions mm / in)



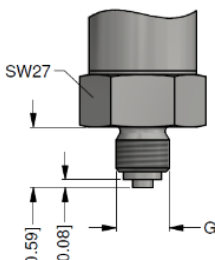
SW27

23 [0.91]

3 [0.12]

G1/2"

G1/2" EN 837



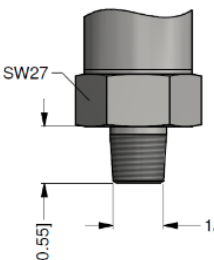
SW27

15 [0.59]

2 [0.08]

G1/4"

G1/4" EN 837



SW27

14 [0.55]

1/4" NPT

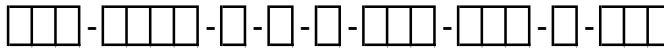
1/4" NPT

↪ metric threads and other versions on request

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Ordering code DS 202

DS 202



Pressure		7	8	4																
gauge in bar ¹																				
Input	[bar]																			
	16				1	6	0	2												
	25				2	5	0	2												
	40				4	0	0	2												
	60				6	0	0	2												
	100				1	0	0	3												
	160				1	6	0	3												
	250				2	5	0	3												
	400				4	0	0	3												
	600				6	0	0	3												
	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							7												
	intrinsic safety 4 ... 20 mA / 2-wire ²							E												
	customer							9												consult
Contact																				
	1 contact ²							1												
	2 contacts							2												
	4 contacts							4												consult
Accuracy																				
	0.5 % FSO							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 ⁴							1	0	0										
	male plug Binder series 723 (5-pin)							2	0	4										
	customer							9	9	9										consult
Mechanical connection																				
	G1/2" EN 837							2	0	0										
	G1/4" EN 837							4	0	0										
	1/4" NPT							N	4	0										
	customer							9	9	9										consult
Seal																				
	without (welded version)									2										
	customer									9										consult
Special version																				
	standard									0	0	0								
	oxygen application									0	0	7								
	customer									9	9	9								consult

¹ from 60 bar: measurement starts with ambient pressure

² with IS version max. 1 contact is 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 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible