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 rotable 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

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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 ≥	[bar]	80	125	200	300	500	800	1400	2000	3000
Vacuum resistance		unlimited								

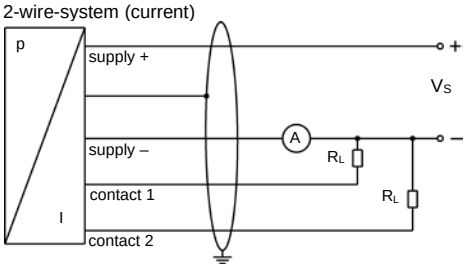
Contact [1]	
Number, type	standard: 1 PNP contact option: 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1 8-pin for 4 … 20 mA / 3-wire)
Max. switching current	4 ... 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; $V_{switch} = V_S - 2V$ 0 ... 10 V / 3-wire: contact rating 125 mA, short-circuit resistant
Accuracy of contacts [2]	≤ ± 0.5 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 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 ... 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 IS-protection	4 ... 20 mA / V_S = 15 ... 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 ... 30 V_{DC} adjustable (turn-down of span up to 1:5) [3] permissible load: R_{max} = 500 Ω response time: < 0.5 sec
3-wire voltage signal	0 … 10 V / V_S = 15 ... 36 V_{DC} permissible load: R_{min} = 10 kΩ response time: < 3 msec
Without analogue output	V_S = 15 ... 36 V_{DC}
Accuracy [2]	≤ ± 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	± 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	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 1.4571 (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 (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 ≈ 0 nF, L_i ≈ 0 µH
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 µH/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

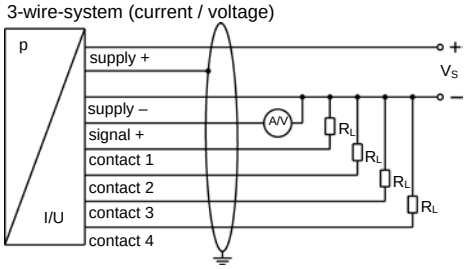
[5] *This directive is only valid for devices with maximum permissible overpressure > 200 bar*

Wiring diagrams

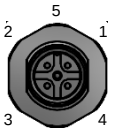
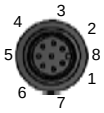
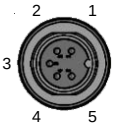
2-wire-system (current)



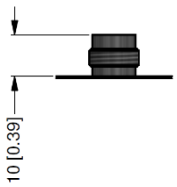
3-wire-system (current / voltage)



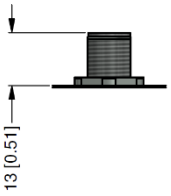
Pin configuration

Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)	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	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/ pressure port	via pressure port	ground contact ⏚	plug housing/ pressure port	GNYE (green-yellow)

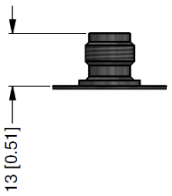
Electrical connections (dimensions mm / in)



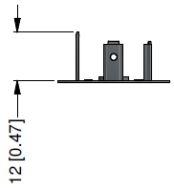
M12x1 plastic
(5-pin)



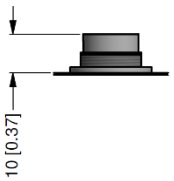
M12x1 metal
(5-pin)



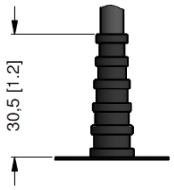
M12x1 plastic
(8-pin)



ISO 4400



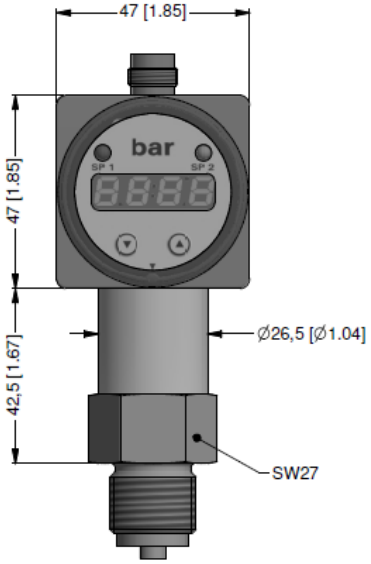
Binder series 723
(5-pin)

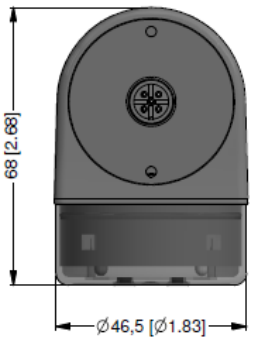


cable outlet [6]

[6] *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)*

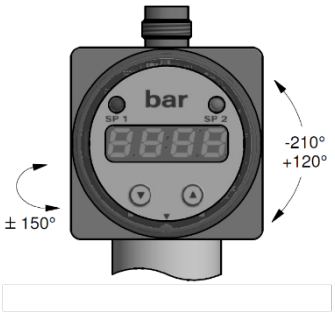
Dimensions (mm / in)



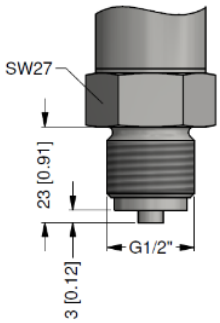


top view

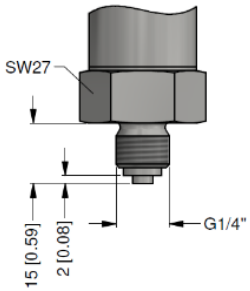
rotatability of display module



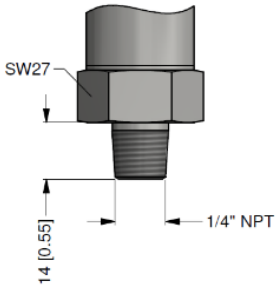
Mechanical connection (dimensions mm / in)



G1/2" EN 837



G1/4" EN 837



1/4" NPT

⇨ **metric threads and other versions on request**

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BD|SENSORS pressure measurement

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Ordering code DS 202

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Pressure																									
gauge in bar [1]	7	8	4																						
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) / [3] plastic version											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												
cable outlet with PVC cable [5]											T	A	0												
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

[5] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request

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