DRUCK & TEMPERATUR
LEITENBERGER GMBH

DS 202

Electronic Pressure Switch

Welded, oil-free
Stainless Steel Sensor

accuracy according to IEC 60770:
0.5 % FSO

Electronic Pressure Switch

DS 202

Nominal pressure:

from 0 ... 6 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

CE Ex

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]	6	10	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	14	35	35	70	140	140	350	350	700	1200	1200
Burst pressure ≥	[bar]	35	85	85	175	350	350	850	850	1750	2800	2800
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 500 mA, short-circuit resistant
Accuracy of contacts	≤± 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 = 13 ... 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} permissible load: R_{max} = 500 kΩ adjustable (turn-down of span up to 1:5)[2]
3-wire voltage signal	0 … 10 V / V_S = 15 ... 36 V_{DC} permissible load: R_{min} = 10 kΩ
without analogue output	V_S = 15 ... 36 V_{DC}
Accuracy [3]	≤± 0.5 % FSO
[2] *with turn-down of span the analogue signal is adjusted automatically to the new measuring range* [3] *accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)*	

Thermal effects (Offset and Span)	
Thermal error	± 0.3 % FSO / 10 K
in compensated range	0 … 70 °C

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 1.4571 (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, $C_i \approx 0$ nF, $L_i \approx 0$ µH
Max. switching current [4]	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 µH/m
[4] *the real switching current in the application depends on the power supply unit*	

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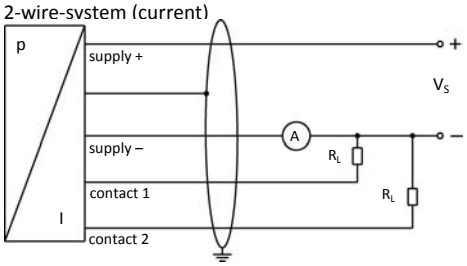
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, digit width 4.85 mm (angle 10°); range of indication -1999 ... +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 … 30 sec (programmable); measured value update 0.0 … 10 sec (programmable)
Current consumption (without contacts)	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)
CE-conformity	EMC Directive: 2004/108/EC Pressure Equipment Directive: 97/23/EC (module A) [5]

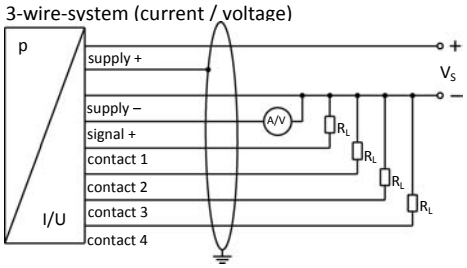
[5] *This directive is only valid for devices with maximum permissible overpressure > 200 bar*

Wiring diagrams

2-wire-system (current)



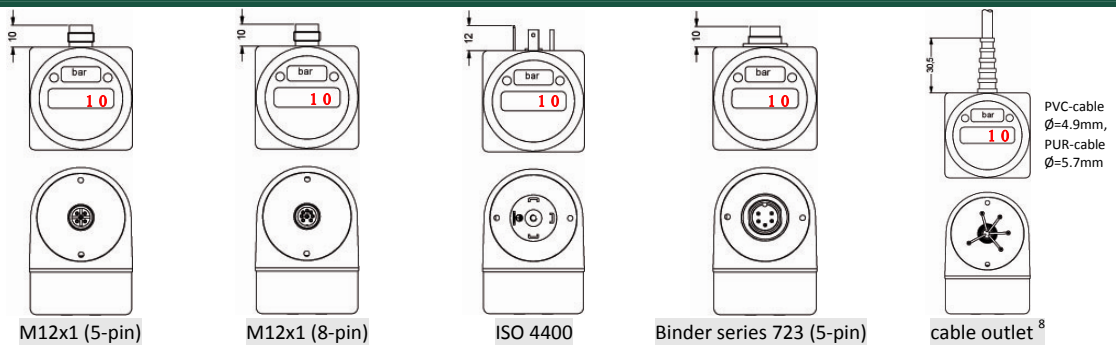
3-wire-system (current / voltage)



Pin configuration

Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	cable colours (DIN 47100)
Supply +	1	1	1	1	wh (white)
Supply –	3	3	3	2	bn (brown)
Signal + (only 3-wire)	2	2	2	3	gn (green)
Contact 1	4	4	4	3	gr (grey)
Contact 2	5	5	5	-	pn (pink)
Contact 3	-	-	6	-	-
Contact 4	-	-	7	-	-
Shield	via pressure port	plug housing / pressure port	via pressure port	ground contact	gn/ye (green / yellow)

Electrical connections (dimensions in mm)



M12x1 (5-pin) | M12x1 (8-pin) | ISO 4400 | Binder series 723 (5-pin) | cable outlet [8]

[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)

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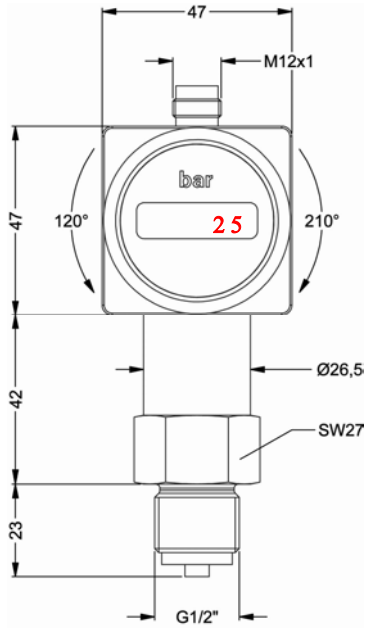
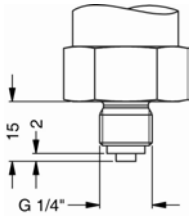
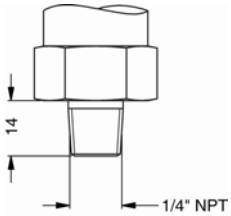
Mechanical connections (dimensions in mm)

standard **option**







G1/2" EN 837 G1/4" EN 837 1/4" NPT

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

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Spezifikationsblatt / *specification sheet*

DS 202

DS 202 ☐☐☐-☐☐☐☐-☐-☐-☐-☐☐☐-☐☐☐-☐-☐☐☐

	Code	
Messgröße		
relativ in bar [1]	7 8 4	
Eingang [bar]		
6,0	6 0 0 1	
10	1 0 0 2	
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	
Sondermessbereiche	9 9 9 9	auf Anfrage
Analogausgang		
ohne	0	
4 ... 20 mA / 2-Leiter	1	
0 ... 10 V / 3-Leiter	3	
4 ... 20 mA / 3-Leiter	7	
Ex-Schutz 4 ... 20 mA / 2-Leiter [2]	E	
andere	9	auf Anfrage
Schaltausgang		
1 Schaltausgang [2]	1	
2 Schaltausgänge	2	
4 Schaltausgänge	4	
Genauigkeit		
Standard 0,5 %	5	
andere	9	auf Anfrage
Elektrischer Anschluss		
Stecker M12x1 (5-polig) / Kunststoffausführung	N 0 0	
Stecker M12x1 (8-polig) / [3] Kunststoffausführung	M 5 0	
Stecker M12x1 (5-polig) / Metallausführung	N 1 0	
Stecker und Kabeldose ISO 4400 [4]	1 0 0	
Stecker Binder Serie 723 (5-polig)	2 0 0	
Kabelausgang mit Kabel [5]	T A 0	
andere	9 9 9	auf Anfrage
Mechanischer Anschluss		
G1/2" EN 837	2 0 0	
G1/4" EN 837	4 0 0	
1/4" NPT	N 4 0	
andere	9 9 9	auf Anfrage
Dichtung		
ohne (Schweißversion)	2	
andere	9	auf Anfrage
Sonderausführungen		
Standard	0 0 0	
Sauerstoff-Ausführung	0 0 7	
andere	9 9 9	auf Anfrage

[1] ab 60 bar: Messanfang bei Umgebungsdruck

[2] bei Ex-Ausführung ist max. 1 Schaltausgang möglich

[3] 4 Schaltausgänge und M12x1, 8-polig nur in Kombination miteinander und mit 4 ... 20 mA/3-Leiter erhältlich; 0 ... 10 V/3-Leiter auf Anfrage

[4] mit Stecker ISO 4400 ist bei 2-Leiter Ausführung nur max. 1 Schaltausgang möglich; bei 3-Leiter Ausführung ist kein Schaltausgang möglich

[5] Kabel in verschiedenen Ausführungen und Längen lieferbar; Standard: 2 m PVC-Kabel ohne Belüftungsschlauch, optional Kabel mit Belüftungsschlauch

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