



DS 200

Electronic Pressure Switch

Stainless Steel Sensor

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO

Electronic Pressure Switch

Nominal pressure

from 0 ... 100 mbar
up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP 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
- ▶ pressure sensor welded
- ▶ customer specific versions

The electronic pressure switch DS 200 is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

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

As standard the DS 200 offers a PNP contact and a rotatable display module with 4-digit LED display.

Optional versions 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



Environmental Engineering
(water – sewage – recycling)

DS 200



Input pressure range												
Nominal pressure gauge / abs.	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Level gauge	[mH ₂ O]	-	1	1.6	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50

Nominal pressure gauge / abs.	[bar]	10	16	25	40	60	100	160	250	400	600
Level gauge	[mH ₂ O]	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	40	80	80	105	210	210	600	1050	1050	1250
Burst pressure ≥	[bar]	50	120	120	210	420	420	1000	1250	1250	1250
Vacuum resistance		P _N ≥ 1 bar: unlimited vacuum resistance P _N < 1 bar: on request									

Contact ¹	
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 ²	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 ⁶
Delay time	0 ... 100 sec

¹ max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with IS-protection

no contact possible with 3-wire in combination with plug ISO 4400

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

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] Ω 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] Ω response time: < 10 msec
3-wire current signal	4 ... 20 mA / V _s = 19 ... 30 V _{DC} adjustable (turn-down of span 1:5) ³ permissible load: R _{max} = 500 Ω response time: < 3 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 ³	standard: P _N < 0.4 bar: ≤ ± 0.5 % FSO; P _N ≥ 0.4 bar: ≤ ± 0.35 % FSO option: P _N ≥ 0.4 bar: ≤ ± 0.25 % FSO

³ 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	[bar]	-1 ... 0	< 0.40	≥ 0.40
Tolerance band	[% FSO]	≤ ± 0.75	≤ ± 1	≤ ± 0.75
in compensated range	[°C]	-20 ... 85	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 (316 L)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	standard: FKM option: NBR; welded version ⁴ others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

⁴ welded version only for pressure ports according to EN 837; possible for nominal pressure ranges P_N ≤ 40 bar

Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX14-DS 200	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	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$					
Max. switching current ⁵	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 $\mu\text{H}/\text{m}$					
⁵ 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 % \pm 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 ⁶					
Weight	min. 160 g (depending on mechanical connection)					
Operational life	> 100 x 10 ⁵ cycles					
CE-conformity	EMC Directive: 2004/108/EC		Pressure Equipment Directive: 97/23/EC (module A) ⁷			
⁶ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $P_n \leq 1 \text{ bar}$.						
⁷ 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 (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)
Electrical connections (dimensions in mm)						
M12x1 (5-pin)	M12x1 (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable outlet ⁸ cable outlet PVC $\varnothing = 4.9\text{mm}$ cable outlet PUR $\varnothing = 5.7\text{mm}$		
⁸ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)						

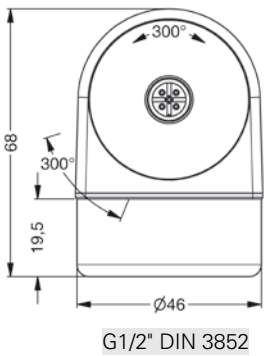
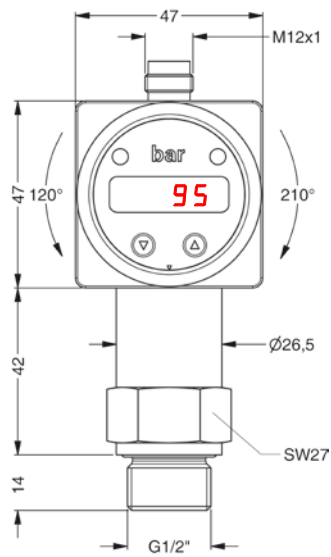
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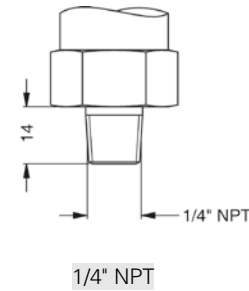
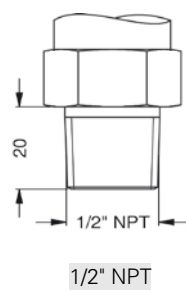
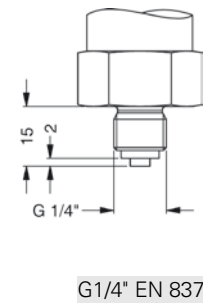
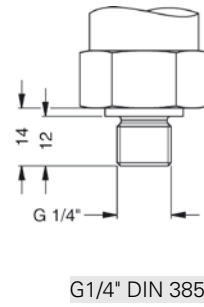
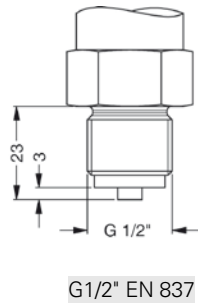
Technical Data

Mechanical connections (dimensions in mm)

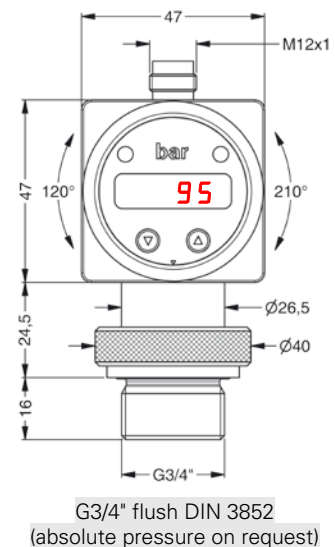
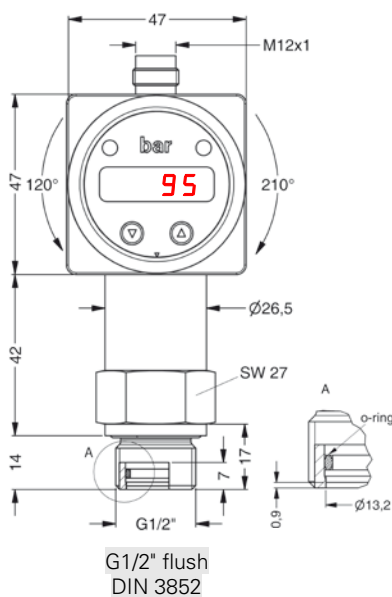
standard



optionally



optionally for P_N from 0.1 up to 40 bar



↕ metric threads and other versions on request

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

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BD SENSORS[®]
pressure measurement

Ordering code DS 200

DS 200



Pressure					
gauge in bar ¹	7	8	0		
gauge in mH ₂ O ¹	7	8	H		
absolute in bar	7	8	1		
Input					
[mH ₂ O]	[bar]				
1	0.10	1	0	0	0
1.6	0.16	1	6	0	0
2.5	0.25	2	5	0	0
4	0.40	4	0	0	0
6	0.60	6	0	0	0
10	1.0	1	0	0	1
16	1.6	1	6	0	1
25	2.5	2	5	0	1
40	4.0	4	0	0	1
60	6.0	6	0	0	1
100	10	1	0	0	2
160	16	1	6	0	2
250	25	2	5	0	2
400	40	4	0	0	2
600	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
-1 ... 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 ²				E	
customer				9	consult
Contact					
1 contact ^{2,3}				1	
2 contacts ^{2,3}				2	
4 contacts ⁴				4	
Accuracy					
standard for P _N > 0,4 bar	0.35 %			3	
standard for P _N ≤ 0,4 bar	0.5 %			5	
option for P _N ≥ 0,4 bar	0.25 %			2	
customer				9	consult
Electrical connection					
Male plug M12x1 (5-pin) / plastic version				N 0 0	
Male plug M12x1 (8-pin) / plastic version ⁴				M 5 0	
Male plug M12x1 (5-pin) / metal version				N 1 0	
Male and female plug ISO 4400 ³				1 0 0	
Male plug Binder series 723 (5-pin)				2 0 0	
Cable outlet incl. cable ⁵				T A 0	
customer				9 9 9	consult
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 with flush sensor ⁶				F 0 0	
G3/4" DIN 3852 with flush sensor ⁶				K 0 0	
1/2" NPT				N 0 0	
1/4" NPT				N 4 0	
customer				9 9 9	consult
Seals					
FKM				1	
without (welded version) ⁷				2	
NBR				5	
customer				9	consult
Special version					
standard				0 0 0	
customer				9 9 9	consult

Prices EXW Thierstein, excluding package

¹ from 60 bar: measurement starts with ambient pressure
² with Ex version max. 1 contact is possible
³ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
⁴ 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
⁵ standard: 2 m PVC cable without ventilation tube, others on request
⁶ not possible for nominal pressure P_N > 40 bar; also not possible for vacuum ranges; for G3/4" flush nominal pressure abs. on request
⁷ welded version only with pressure ports according to EN 837; possible for nominal pressure ranges P_N ≤ 40 bar

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