



DS 200

Electronic Pressure Switch

Stainless Steel Sensor

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

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: 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
- ▶ 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)



Input pressure range												
Nominal pressure gauge ¹ / abs.	[bar]	-1...0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Level gauge ¹	[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 ¹ / abs.	[bar]	10	16	25	40	60	100	160	250	400	600
Level gauge ¹	[mH ₂ O]	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	40	80	80	105	210	210	600	1000	1000	1000
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										
¹ from 60 bar: measurement starts with ambient pressure											

Contact ²	
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 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
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 ⁶
Delay time	0 ... 100 sec

² 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

Analogue output (optionally) / Supply	
2-wire current signal	4 ... 20 mA / V _S = 13 ... 36 V _{DC} permissible load: R _{max} = [(V _S - V _{Smin}) / 0.02 A] Ω 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 _{Smin}) / 0.02 A] 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) ⁴ 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 accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

⁴ 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

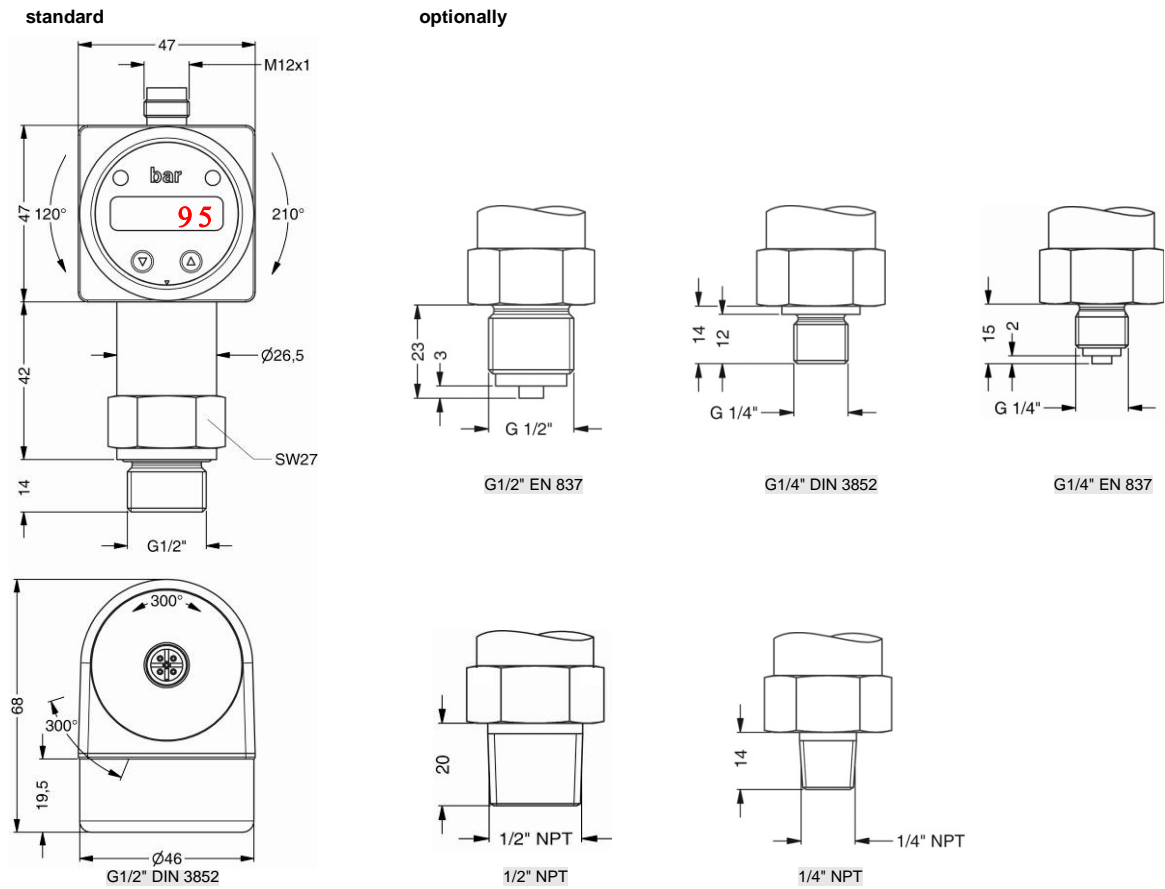
Mechanical stability	
Vibration	10 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6
Shock	500 g / 1 msec according to DIN EN 60068-2-27

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 ⁵ others on request
Diaphragm	stainless steel 1.4435 (316 L)
Media wetted parts	pressure port, seals, diaphragm

⁵ welded version only for pressure ports according to EN 837; possible for nominal pressure ranges P_N ≤ 40 bar

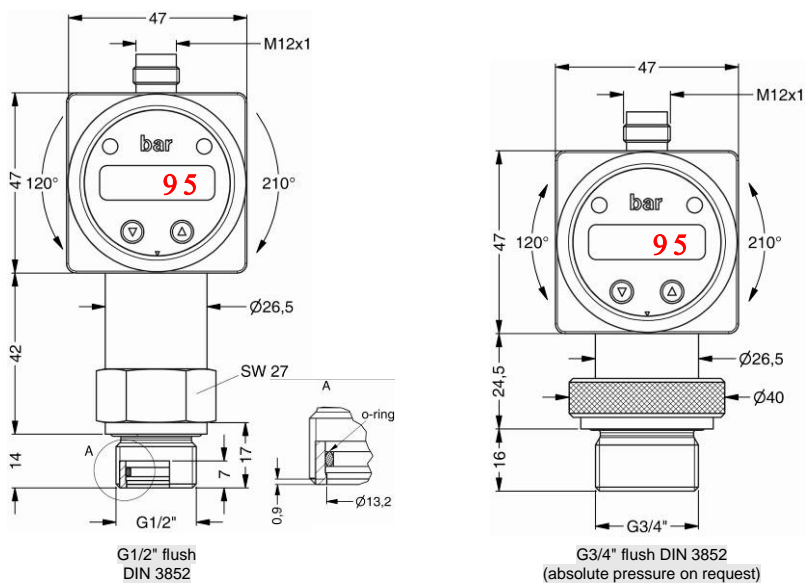
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval AX14-DS 200	IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)					
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$					
Max. switching current ⁶	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 $\mu\text{H}/\text{m}$					
⁶ 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 ⁷					
Weight	min. 160 g (depending on mechanical connection)					
Operational life	> 100 x 10 ⁶ cycles					
CE-conformity	EMC Directive: 2004/108/EC		Pressure Equipment Directive: 97/23/EC (module A) ⁸			
⁷ 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 $P_N \leq 1 \text{ bar}$.						
⁸ 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	gy (grey)
Contact 2	5	5	5	-	1	pk (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/pressure port	via pressure port	ground contact	pressure port	ye/gn (yellow/green)
Electrical connections (dimensions in mm)						
⁹ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)						

Mechanical connections (dimensions in mm)



⇒ for nominal pressure $P_N > 400$ bar increases the length of devices without IS-version by 19 mm and of devices with IS-version by 39 mm

optionally for P_N from 0.1 up to 40 bar

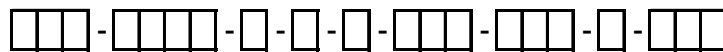


⇒ metric threads and other versions on request

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

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	100		1	0	0	3										
	160	160		1	6	0	3										
	250	250		2	5	0	3										
	400	400		4	0	0	3										
	600	600		6	0	0	3										
	-1 ... 0			X	1	0	2										
	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, 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	1						
	Male plug M12x1 (8-pin) / plastic version ⁴								M	5	0						
	Male plug M12x1 (5-pin) / metal version								N	1	1						
	Male and female plug ISO 4400 ³								1	0	0						
	Male plug Binder series 723 (5-pin)								2	0	2						
	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

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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