



DS 200

Electronic Pressure Switch with Stainless Steel Sensor

- ▶ up to 4 independent contacts, configurable
- ▶ optional:
 - analogue output
 - Ex-protection (for 2-wire)
 - flush diaphragm
- ▶ nominal pressure range from 0 ... 100 mbar up to 0 ... 600 bar

Description

The electronic pressure switch DS 200 is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and is suitable for universal usage. Permissible medias are gases or liquids, compatible with the media wetted parts; with flush diaphragm clean fluids and viscous or pasty media are possible. As standard the DS 200 offers a PNP contact; optionally, depending on the version, the device could be equipped with max. four contacts as well as an analogue output.

Operation

The rotatable display module shows the system pressure and allows programming. The configuration is menu controlled and easy to handle without previous knowledge.

Applications

- ▶ machine and plant engineering
- ▶ test benches
- ▶ environmental engineering

- ▶ indication of measured values on a 4-digit LED display
- ▶ rotatable and configurable display module
- ▶ configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)
- ▶ option analogue output:
 - 4 ... 20 mA / 2-wire **Ex-protection optionally**
 - 4 ... 20 mA / 3-wire **with turn-down 1:5**
 - 0 ... 10 V / 3-wire
- ▶ special functions (access protection, min. / max. value memory)
- ▶ industrial standard in view of accuracy, thermal behaviour and long term stability

Characteristics

DS 200
Electronic Pressure Switch



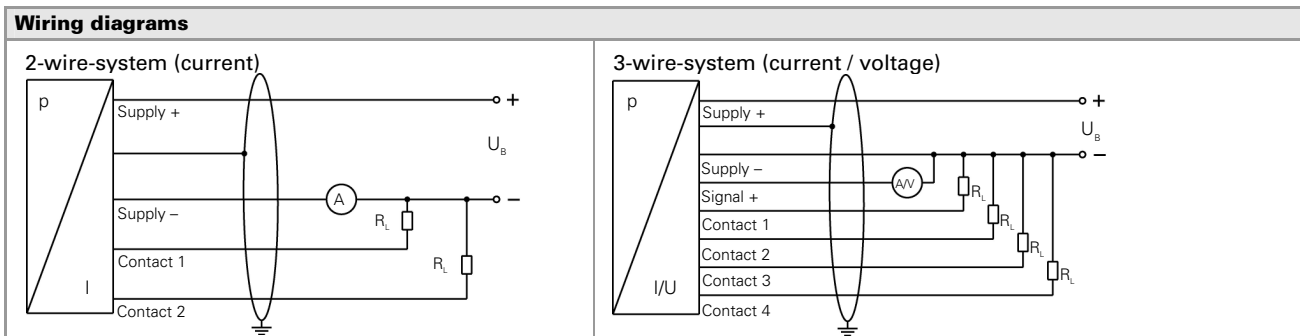
DS 200

Electronic Pressure Switch

Technical Data

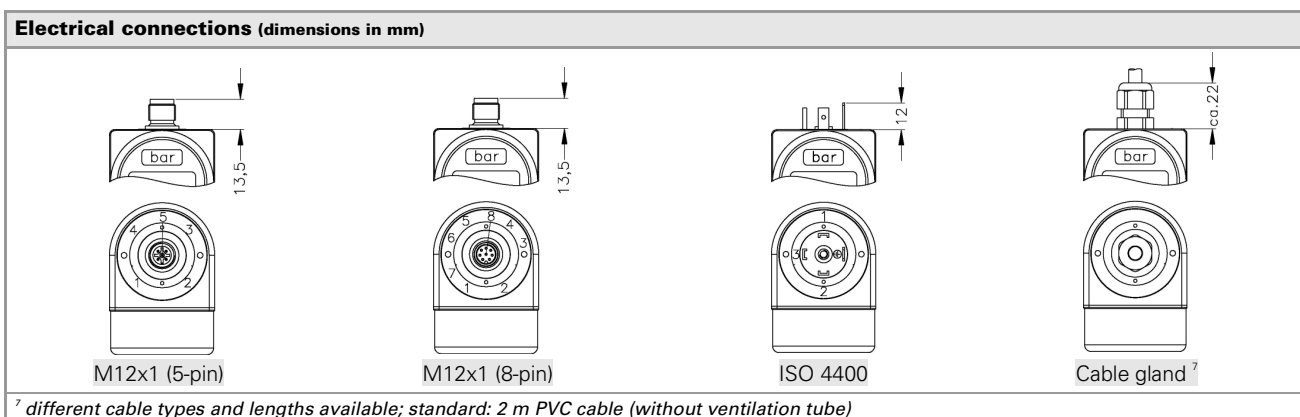
Input pressure range ¹																	
Nominal pressure gauge / abs. [bar]	-1 ... 0	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40		
Level gauge [mH ₂ O]	-	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400		
Permissible overpressure [bar]	3	1	1	1	1	3	3	6	6	20	20	60	60	60	100		
Nominal pressure gauge / abs. [bar]	60		100		160		250		400		600						
Permissible overpressure [bar]	140		340		340		600		600		1000						
¹ nominal pressure range abs. from 0.1 bar; measurement for pressure ranges ≥ 60 bar 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	standard: nominal pressure > 0.4 bar: nominal pressure ≤ 0.4 bar: option: nominal pressure > 0.4 bar:						IEC 60770 ≤ ± 0.35 % FSO ≤ ± 0.50 % FSO ≤ ± 0.25 % FSO			BFSL ≤ ± 0.175 % FSO ≤ ± 0.250 % FSO ≤ ± 0.125 % FSO							
Repeatability	≤ ± 0.1 % FSO																
Switching frequency	max. 10 Hz																
Switching cycles	> 100 x 10 ⁶																
Delay time	0 ... 100 s																
² max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with Ex-protection no contact possible with 3-wire voltage signal with plug ISO 4400																	
Analogue output (optionally) / Supply																	
2-wire current signal	4 ... 20 mA / V _s = 18 ... 41 V _{DC} permissible load: R _{max} = [(V _s - V _{s,min}) / 0.02] Ω										response time: < 5 ms						
2-wire current signal with Ex-protection	4 ... 20 mA / V _s = 17 ... 28 V _{DC} permissible load: R _{max} = [(V _s - V _{s,min}) / 0.02] Ω										response time: < 5 ms						
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: < 1 s						
3-wire voltage signal without analogue output	0 ... 10 V / V _s = 15 ... 36 V _{DC}										permissible load: R _{min} = 10 kΩ			response time: < 5 ms			
Accuracy	standard: nominal pressure > 0.4 bar: nominal pressure ≤ 0.4 bar: option: nominal pressure > 0.4 bar:						IEC 60770 ⁴ ≤ ± 0.35 % FSO ≤ ± 0.50 % FSO ≤ ± 0.25 % FSO			BFSL ≤ ± 0.175 % FSO ≤ ± 0.250 % FSO ≤ ± 0.125 % FSO							
³ with turn-down of span the analogue signal is adjusted automatically to the new measuring range																	
⁴ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																	
Thermal errors (offset and span) / Permissible temperatures																	
Nominal pressure P _N [bar]	-1 ... 0		0.1		≤ 0.25		0.4		≤ 1		> 1						
Tolerance band [% FSO]	≤ ± 0.75		≤ ± 2		≤ ± 1.5		≤ ± 1		≤ ± 1		≤ ± 0.75						
TC, average [% FSO / 10 K]	± 0.07		± 0.3		± 0.2		± 0.14		± 0.1		± 0.07						
in compensated range [°C]	0 ... 70				0 ... 50						0 ... 70						
Permissible temperatures	medium: -25 ... 125 °C				electronics / environment: -25 ... 85 °C				storage: -40 ... 85 °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	5 g RMS (20 ... 2000 Hz)																
Shock	100 g / 11 msec.																
Materials																	
Pressure port	stainless steel 1.4571 (316Ti)																
Housing	stainless steel 1.4301 (304)																
Display housing	PA 6.6, polycarbonate																
Seals (media wetted)	standard: P _N ≤ 40 bar: FKM / P _N > 40 bar: NBR option: welded version for pressure ports according to EN 837 with pressure ranges P _N between 0.25 bar and 40 bar; others on request																
Diaphragm	stainless steel 1.4435 (316L)																
Media wetted parts	pressure port, seals, diaphragm																

Explosion protection (for 2-wire current signal with Ex-protection)	
Approval AX11-DS 200	zone (0) 1: II (1) 2 G Ex ia IIC T4
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$
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 µH/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 % ± 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 ⁶ cycles
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 ≤ 1 bar.	



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	white
Supply -	3	3	3	2	brown
Signal + (only 3-wire)	2	2	2	3	green
Contact 1	4	4	4	3	grey
Contact 2	5	5	5	-	pink
Contact 3	-	-	6	-	-
Contact 4	-	-	7	-	-
Ground	via pressure port	plug housing / pressure port	via pressure port	ground contact	yellow / green (shield)

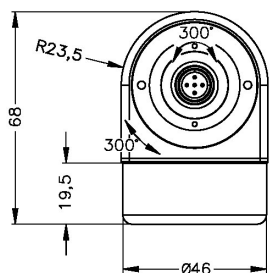
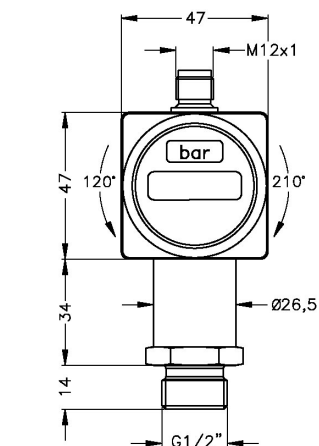


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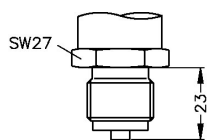
Electronic Pressure Switch

Technical Data

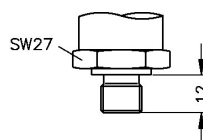
Mechanical connections (dimensions in mm)



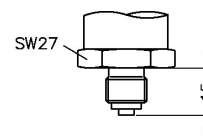
G1/2" DIN 3852
M20x1.5



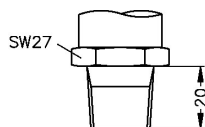
G1/2" EN 837
M20x1.5



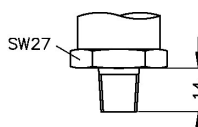
G1/4" DIN 3852
M10x1; M12x1; M12x1.5
(only up to 100 bar)



G1/4" EN 837

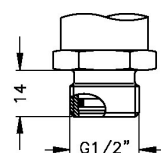


1/2" NPT

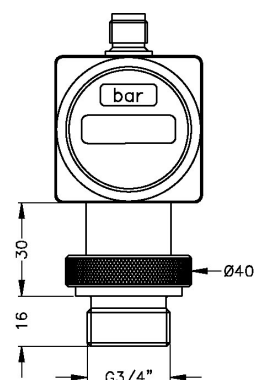


1/4" NPT

Optionally for P_N from 0.1 up to 40 bar



G1/2" flush DIN 3852
M20x1.5



G3/4" flush DIN 3852
(absolute pressure on request)

- ⇒ With pressure ranges $P_N > 40$ bar total length increases by 14 mm!
- ⇒ With Ex-protection total length increases by 20 mm

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

Ordering code DS 200

DS 200

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Pressure		7	8	0																
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													
		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														on request
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																on request
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																on request
Electrical connection																				
	M12x1 (5-pin) / plastic version			N	0	0														
	M12x1 (8-pin) / plastic version ⁴			M	5	0														
	M12x1 (5-pin) / metal version			N	1	0														
	Male and female plug ISO 4400 ³			1	0	0														
	Cable gland incl. cable ⁵			4	0	0														
	customer			9	9	9														on request
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 ⁶			F	0	0														
	flush sensor																			
	G3/4" DIN 3852 with ⁶			K	0	0														
	flush sensor																			
	1/2" NPT			N	0	0														
	1/4" NPT			N	4	0														
	customer			9	9	9														on request
Seals																				
	for P _N ≤ 40 bar	FKM		1																
	without (welded version) ⁷			2																
	for P _N > 40 bar	NBR		5																
	customer			9																on request
Special version																				
	standard			0	0	0														
	customer			9	9	9														on request

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 different cable types and lengths deliverable, standard: 2 m PVC cable without ventilation tube, optionally cable with ventilation tube
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; not available with pressure ranges ≤ 0.16 bar and > 40 bar

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