



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	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									

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

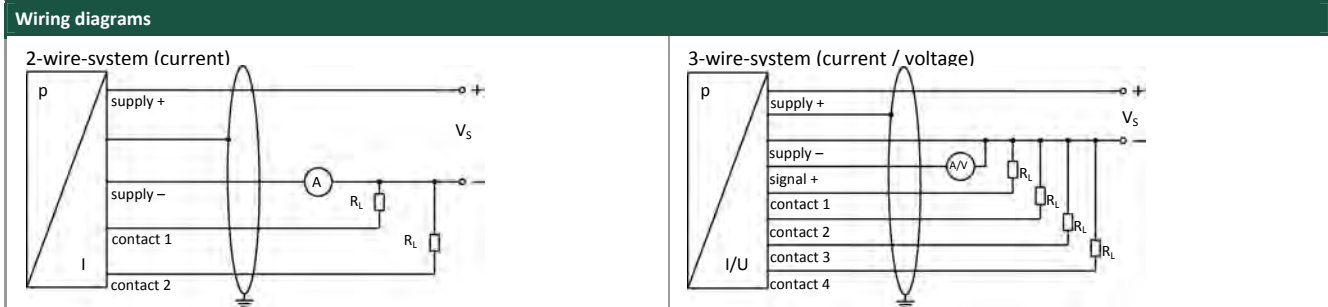
Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approval AX14-DS 200	IBExU 06 ATEX 1050 X; zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$
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

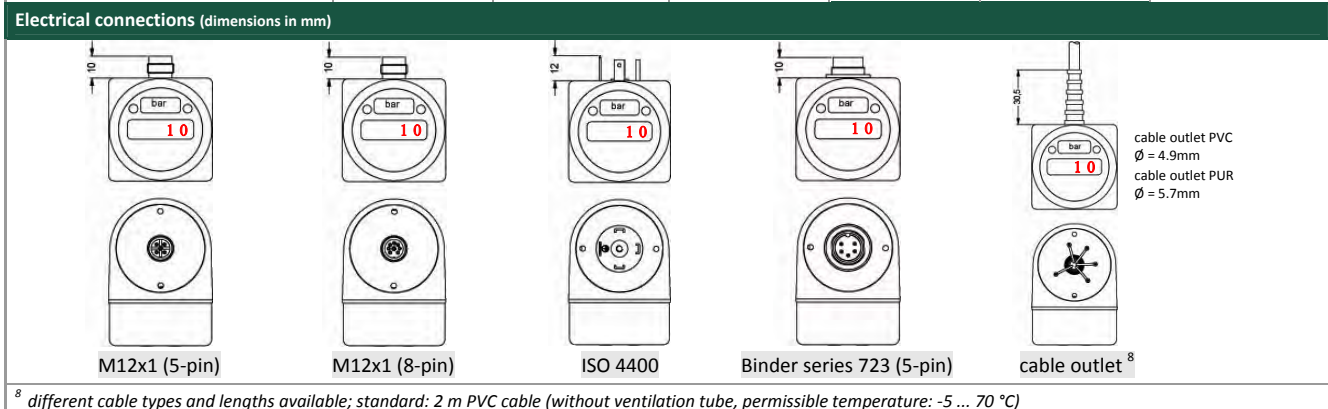
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % \pm 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output 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 ⁶ 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



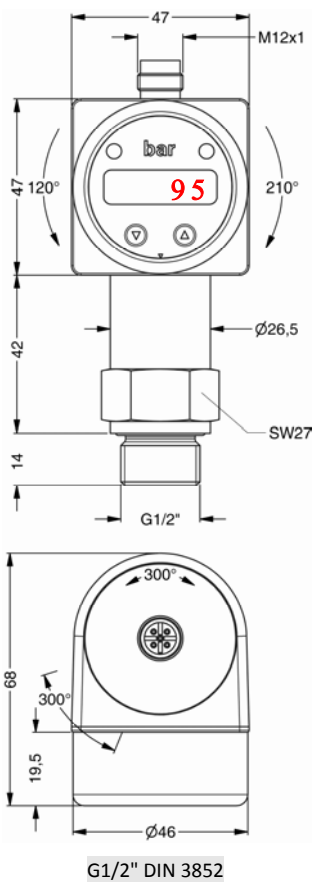
Pin configuration						
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable colours (DIN 47100)
Supply +	1	1	1	1	3	wh (white)
Supply -	3	3	3	2	4	bn (brown)
Signal + (only 3-wire)	2	2	2	3	5	gn (green)
Contact 1	4	4	4	3	2	gr (grey)
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)



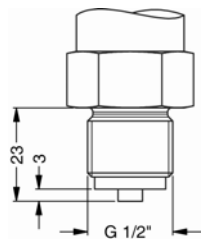
⁸ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

Mechanical connections (dimensions in mm)

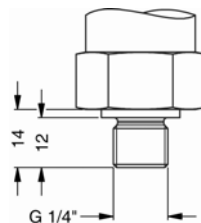
standard



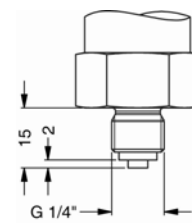
optionally



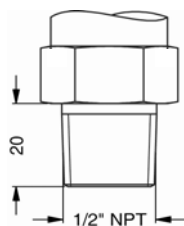
G1/2" EN 837



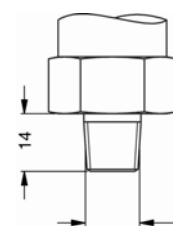
G1/4" DIN 3852



G1/4" EN 837



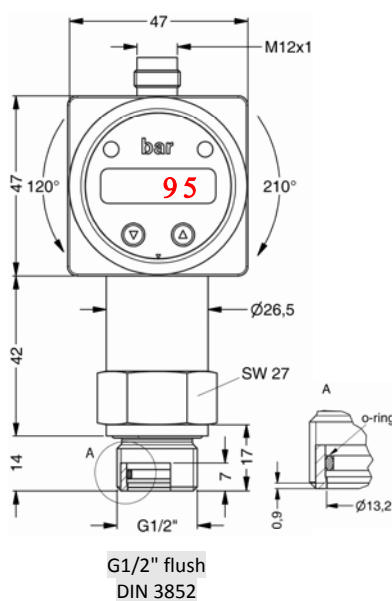
1/2" NPT



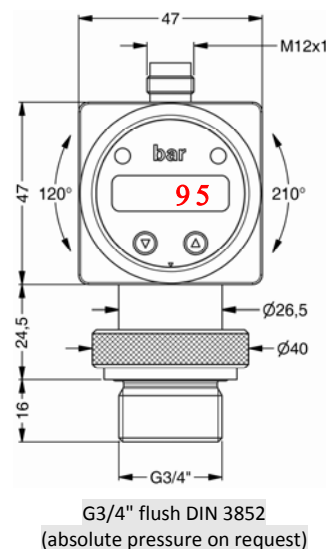
1/4" NPT

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

optionally for P_N from 0.1 up to 40 bar



G1/2" flush
DIN 3852



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

⇒ 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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Messgröße		Pressure																				
		relativ in bar	gauge in bar	1		7	8	0														
		relativ in mH ₂ O	gauge in mH ₂ O	1		7	8	H														
		absolut in bar	absolute in bar	2		7	8	1														
Eingang	[mH ₂ O]	[bar]	Input	[mH ₂ O]	[bar]																	
1		0,10	1	0,10	2	1	0	0	0													
1,6		0,16	1,6	0,16	2	1	6	0	0													
2,5		0,25	2,5	0,25	2	2	5	0	0													
4		0,40	4	0,40	2	4	0	0	0													
6		0,60	6	0,60	2	6	0	0	0													
10		1,0	10	1,0	2	1	0	0	1													
16		1,6	16	1,6	2	1	6	0	1													
25		2,5	25	2,5	2	2	5	0	1													
40		4,0	40	4,0	2	4	0	0	1													
60		6,0	60	6,0	2	6	0	0	1													
100		10	100	10	2	1	0	0	2													
160		16	160	16	2	1	6	0	2													
250		25	250	25	2	2	5	0	2													
400		40	400	40	2	4	0	0	2													
600		60	600	60	2	6	0	0	2													
		100		100	2	1	0	0	3													
		160		160	2	1	6	0	3													
		250		250	2	2	5	0	3													
		400		400	2	4	0	0	3													
		600		600	2	6	0	0	3													
		-1 ... 0		-1 ... 0	2	X	1	0	2													
		Sondermessbereiche		customer	2	9	9	9	9													
Analogausgang		Analogue output																				
		ohne	without													0						
		4 ... 20 mA / 2-Leiter	4 ... 20 mA / 2-wire													1						
		0 ... 10 V / 3-Leiter	0 ... 10 V / 3-wire													3						
		4 ... 20 mA / 3-Leiter, verstellbar	4 ... 20 mA / 3-wire, adjustable													7J						
		Ex-Schutz 4 ... 20 mA / 2-Leiter	intrinsic safety 4 ... 20 mA / 2-wire													E						
		andere	customer													9						
Schaltausgang		Contact																				
		1 Schaltausgang	1 contact													3,4						
		2 Schaltausgänge	2 contacts													3,4						
		4 Schaltausgänge	4 contacts													5						
Genauigkeit		Accuracy																				
		Standard für P _N > 0,4 bar	0,35 % standard for P _N > 0,4 bar													0,35 %						
		Standard für P _N ≤ 0,4 bar	0,5 % standard for P _N ≤ 0,4 bar													0,5 %						
		Option für P _N ≥ 0,4 bar	0,25 % option for P _N ≥ 0,4 bar													0,25 %						
		andere	customer													9						
Elektrischer Anschluss		Electrical connection																				
		Stecker M12x1 (5-polig) / Kunststoffausführung	male plug M12x1 (5-pin) / plastic version													N	0	1				
		Stecker M12x1 (8-polig) / Kunststoffausführung	male plug M12x1 (8-pin) / plastic version													M	5	0				
		Stecker M12x1 (5-polig) / Metallausführung	male plug M12x1 (5-pin) / metal version													N	1	1				
		Stecker und Kabeldose ISO 4400	male and female plug ISO 4400													1	0	0				
		Stecker Binder Serie 723 (5-polig)	male plug Binder series 723 (5-pin)													2	0	4				
		Kabelausgang mit PVC-Kabel	male plug Binder series 723 (5-pin) cable outlet incl. cable													T	A	0				
		andere	customer													9	9	9				
Mechanischer Anschluss		Mechanical connection																				
		G1/2" DIN 3852	G1/2" DIN 3852													1	0	0				
		G1/2" EN 837	G1/2" EN 837													2	0	0				
		G1/4" DIN 3852	G1/4" DIN 3852													3	0	0				
		G1/4" EN 837	G1/4" EN 837													4	0	0				
		G1/2" DIN 3852 mit frontbündiger Messzelle	G1/2" DIN 3852 with flush sensor													F	0	0				
		G3/4" DIN 3852 mit frontbündiger Messzelle	G3/4" DIN 3852 with flush sensor													K	0	0				
		1/2" NPT	1/2" NPT													N	0	0				
		1/4" NPT	1/4" NPT													N	4	0				
		andere	customer													9	9	9				
Dichtung		Seals																				
		FKM	FKM													1						
		ohne (Schweißversion)	without (welded version)													2						
		andere	customer													9						
Sonderausführungen		Special version																				
		Standard	standard													0	0	0				
		andere	customer													9	9	9				

¹ ab 60 bar: Messanfang bei Umgebungsdruck
from 60 bar: measurement starts with ambient pressure

² Absolutdruck möglich ab 0,4 bar
absolute pressure possible from 0,4 bar

³ bei Ex-Ausführung ist max. 1 Schaltausgang möglich
with Ex version max. 1 contact is possible

⁴ mit Stecker ISO 4400 ist bei 2-Leiter Ausführung nur max. 1 Schaltausgang möglich; bei 3-Leiter Ausführung ist kein Schaltausgang möglich
with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

⁵ 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 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request

⁶ Standard: 2 m PVC-Kabel ohne Belüftungsschlauch; andere auf Anfrage
standard: 2 m PVC cable without ventilation tube, others on request

⁷ nicht möglich für Nenndruckbereich P_N > 40 bar; für G3/4" frontbündig Absolutdruck auf Anfrage
not possible for nominal pressure P_N > 40 bar; for G3/4" flush nominal pressure abs. on request

⁸ Schweißversion nur Anschlüsse nach EN 837; möglich für Nenndruckbereiche P_N ≤ 40 bar
welded version only with pressure ports according to EN 837; possible for nominal pressure ranges P_N ≤ 40 bar