



DS 400

Intelligent Electronic Pressure Switch Stainless Steel

Stainless Steel Sensor

accuracy according to EN IEC 62828-2:
standard: 0.35 % span
option: 0.25 % span

Nominal pressure

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

Contacts

1 or 2 independent PNP contacts,
freely configurable

Analogue output

2-wire: 4 ... 20 mA
3-wire: 4 ... 20 mA
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 400 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 400 offers a PNP contact and a display module, which is mounted rotatable in the ball housing. Additional optional versions like e.g. an intrinsically safe version, a second contact 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	[bar]	-1 ... 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6	
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		
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													
Number, type		standard: 1 PNP contact						option: 2 independent PNP contacts					
Max. switching current		4 ... 20 mA / 2- and 3-wire:						contact rating 125 mA, short-circuit resistant; V _{switch} = V _S - 2V					
Accuracy of contacts ²		≤ ± 0.25 % span											
Repeatability		≤ ± 0.1 % span											
Switching frequency		2-wire: max. 10 Hz					/ 3-wire: 50 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 _{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 = 24 V _{DC} ± 10 % adjustable (turn-down of span 5:1) ³						permissible load: R _{max} = 500 Ω					response time: < 30 msec
Accuracy ²		standard: nominal pressure < 0.4 bar: ≤ ± 0,5 % span nominal pressure ≥ 0.4 bar: ≤ ± 0,35 % span option: nominal pressure ≥ 0.4 bar: ≤ ± 0,25 % span											
² accuracy according to EN IEC 62828-2- limit point adjustment (non-linearity, hysteresis, repeatability)													
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	[% span]	≤ ± 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 (316L)											
Housing		stainless steel 1.4301 (304)											
Housing cap		standard: plastic HDPE						for option IS-protection: stainless steel 1.4301 (304)					
Viewing glass		laminated safety glass											
Seals (media wetted)		standard: FKM						option: NBR; welded version ⁴ on request			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 AX4-DS 400		IBExU06ATEX1049 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIC T135°C Da											
Safety techn. maximum values		U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C _i ≈ 0 pF, L _i ≈ 0 μH											
Max. switching current ⁵		70 mA											
Permissible temperatures for environment		in zone 0: -20 ... 60 °C			with p _{atm} 0.8 bar up to 1.1 bar								
		in zone 1 or higher: -25 ... 70 °C											
⁵ the real switching current in the application depends on the power supply unit													
Miscellaneous													
Display		4-digit, 7-segment-LED display, visible range 37.2 x 11 mm; digit height 10 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		2-wire signal output current: max. 25 mA											

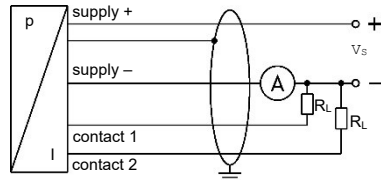
(without contacts)	3-wire signal output current: approx. 30 mA + signal current	
Ingress protection	IP 67	
Installation position	any ⁶	
Weight	approx. 400 g	
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) ⁷
ATEX Directive	2014/34/EU	

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 $P_N \pm 1$ bar.

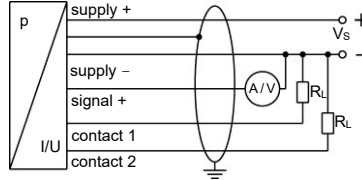
⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



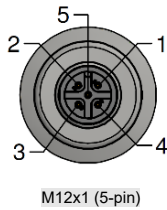
3-wire-system (current / voltage)



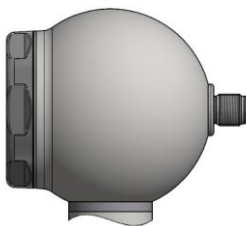
Pin configuration

Electrical connection	M12x1 metal (5-pin)
Supply +	1
Supply -	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	plug housing / pressure port

Electrical connection (dimensions in mm)



Designs ⁸



side display

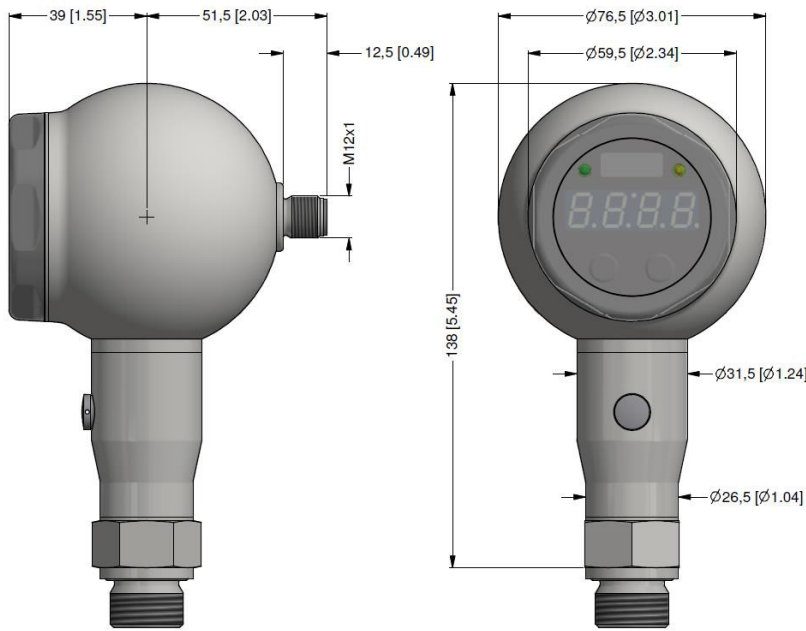


45° display (on request)

⁸ all designs in horizontal rotatable housing as standard

Mechanical connections (dimensions in mm)

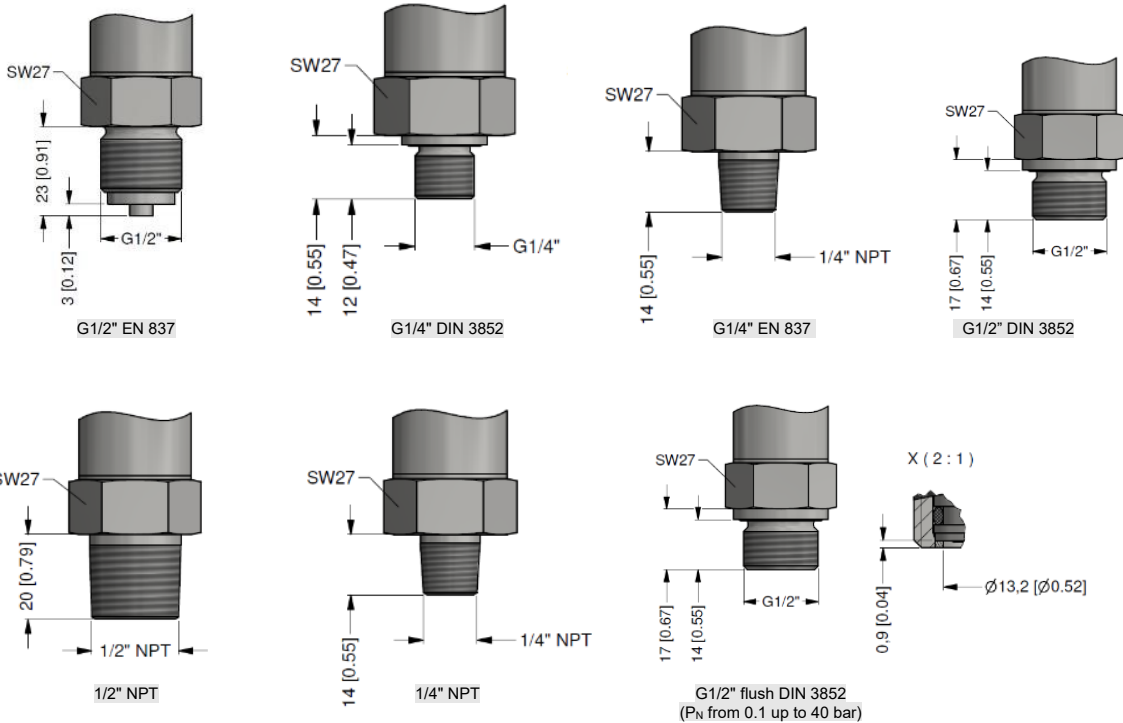
standard



G1/2" DIN 3852

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

optionally



⇒ 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 400

15.01.2024

DS 400

Pressure										
Gauge ¹	7	A	0							
Absolut ²	7	A	1							
Input [bar]										
0 ... 0,1 ²				1	0	0	0			
0 ... 0,16 ²				1	6	0	0			
0 ... 0,25 ²				2	5	0	0			
0 ... 0,40				4	0	0	0			
0 ... 0,60				6	0	0	0			
0 ... 1				1	0	0	1			
0 ... 1,6				1	6	0	1			
0 ... 2,5				2	5	0	1			
0 ... 4				4	0	0	1			
0 ... 6				6	0	0	1			
0 ... 10				1	0	0	2			
0 ... 16				1	6	0	2			
0 ... 25				2	5	0	2			
0 ... 40				4	0	0	2			
0 ... 60				6	0	0	2			
0...100				1	0	0	3			
0...160				1	6	0	3			
0...250				2	5	0	3			
0...400				4	0	0	3			
0...600				6	0	0	3			
-1...0				X	1	0	2			
Customer				9	9	9	9			
Customer underpressure				X	X	X	X			
Design										
Stainless steel globe housing (side display)					K	H				
Stainless steel globe housing (45° display)					K	4				
Output										
4 ... 20 mA / 2-wire										1
4 ... 20 mA / 3-wire (adjustable)										7
Intrinsic safety Ex ia 4 ... 20 mA / 2-wire (max. 1 switch. contact) ³										E
Customer										9
Contact										
1 switching contact (version 3-wire only with 5-pin connector)										1
2 switching contacts (only with 5-pin connector) ³										2
Accuracy										
0,5 % (P _N ≤ 0,4 bar)										5
0,35 % (P _N > 0,4 bar)										3
0,25 % (P _N > 0,4 bar)										2
Customer										9
Electrical connection										
Connector M12 x 1, 5-pin (IP 67) - metal									N	1 1
Customer									9	9 9
Mechanical connection										
G 1/2" DIN 3852										1 0 0
G 1/2" EN 837										2 0 0
G 1/4" DIN 3852										3 0 0
G 1/4" EN 837										4 0 0
G 1/2" " DIN 3852 with flush sensor ⁴										F 0 0
1/2" NPT										N 0 0
1/4" NPT										N 4 0
Customer										9 9 9
Seals										
Viton (FKM) (P _N ≤ 40 bar)										1
Without seals - welded (only with EN 837) ⁵										2
Customer										9
Special version										



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Společnost BD SENSORS s.r.o. je certifikována společností TÜV SÜD Czech dle normy ISO 9001.

Standard	0	0	0
Customer	9	9	9

0,-...without additional charge

On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.

This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet. BD SENSORS reserves the right to change sensor specifications without further notice.

1 from 60 bar: measurement starts with ambient pressure

2 absolute pressure possible from 0.4 bar

3 with IS version max. 1 contact is possible

4 only possible for nominal pressure ranges $p_N \leq 40$ bar

5 welded version only with pressure ports according to EN 837; possible for nominal pressure ranges $p_N \leq 40$ bar



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