



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											

DS 400

Electronic Pressure Switch

Technical Data

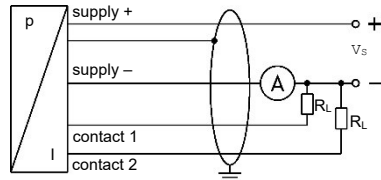
(without contacts)	3-wire signal output current: approx. 30 mA + signal current	
Ingress protection	IP 67	
Installation position	any ⁶	
Weight	approx. 400 g	
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) ⁷
ATEX Directive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

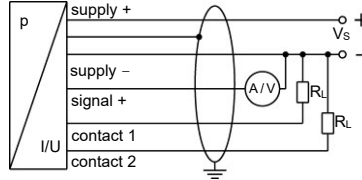
⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

2-wire-system (current)



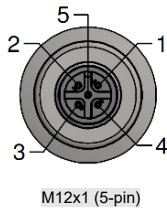
3-wire-system (current / voltage)



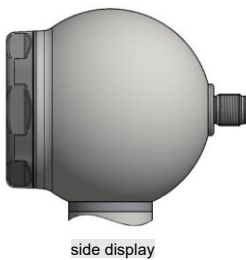
Pin configuration

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)



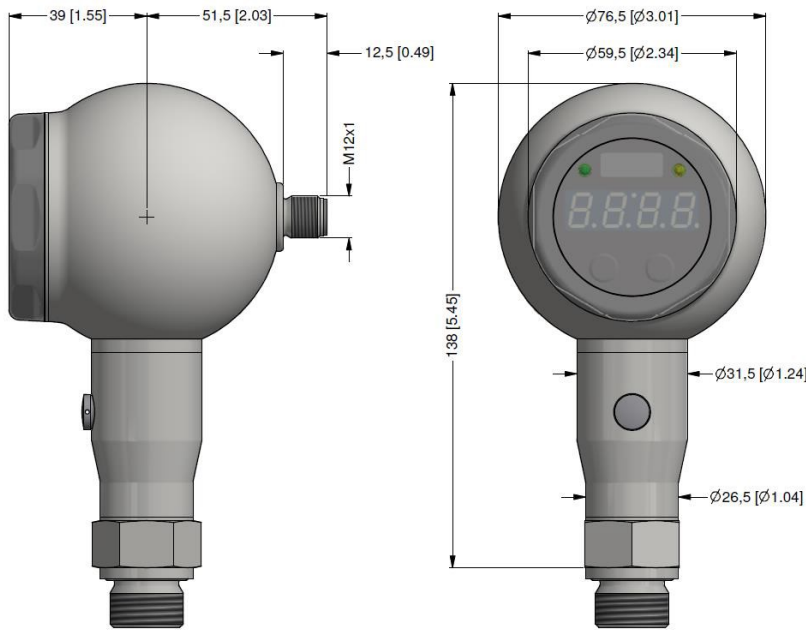
Designs⁸



⁸ all designs in horizontal rotatable housing as standard

Mechanical connections (dimensions in mm)

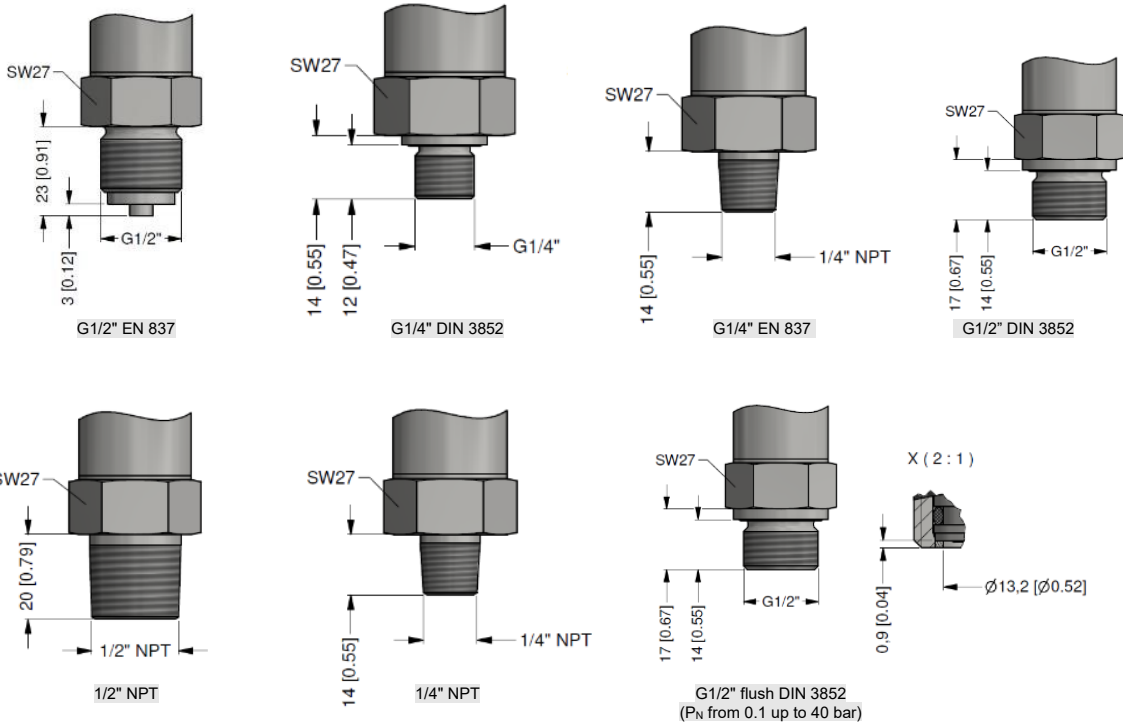
standard



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

23.08.2024

DS 400

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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
G 1/2" EN 837									2
G 1/4" DIN 3852									3
G 1/4" EN 837									4
G 1/2 " DIN 3852 with flush sensor ⁴									F
1/2" NPT									N
1/4" NPT									N
Customer									9
									9
									9
Seals									



Viton (FKM) ($P_N \leq 40$ bar)	1			
Without seals - welded (only with EN 837) ⁵ ($P_N \leq 40$ bar)	2			
Customer	9			
Special version				
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
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

