



DS 400P

Intelligent Electronic Pressure Switch Stainless Steel

Pressure ports and process connections with flush welded stainless steel diaphragm

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

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Contacts

1 or 2 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
- ▶ configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)
- ▶ hygienical version

Optional versions

- ▶ **IS-version**
Ex ia = intrinsically safe for gases and dust
- ▶ customer specific versions

The electronic pressure switch DS 400P is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and has been developed for process industry; especially for food industry and pharmacy.

As standard the DS 400P offers a PNP contact and a rotatable display module with 4-digit LED display.

Optional versions like e.g. an intrinsically safe version, max. 2 contacts and an analogue output complete the profile.

Preferred areas of use are



Food Industry



Pharmacy

Material and test certificates

- ▶ material test report according to DIN EN 10204-3.1.
- ▶ specific test report according to DIN EN 10204-2.2.

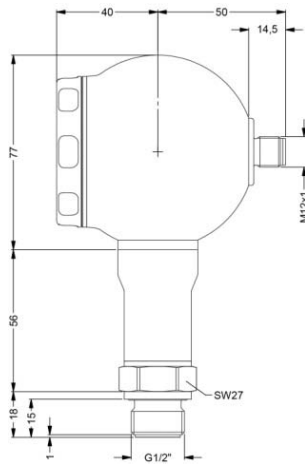


Input pressure range ¹																										
Nominal pressure gauge	[bar]	-1 ... 0	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40										
Nominal pressure abs.	[bar]	-	-	-	-	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40										
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105										
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210										
Vacuum resistance		P _N ≥ 1 bar: unlimited vacuum resistance								P _N < 1 bar: on request																
¹ consider the pressure resistance of fitting and clamps																										
Contact ²																										
Number, type		standard: 1 PNP contact								option: 2 independent PNP contacts																
Max. switching current		4 ... 20 mA / 2- and 3-wire: 0 ... 10 V / 3-wire:								contact rating 125 mA, short-circuit resistant; V _{switch} = V _S - 2V contact rating 125 mA, short-circuit resistant																
Accuracy of contacts ³		standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO								option 1: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO																
Repeatability		≤ ± 0.1 % FSO																								
Switching frequency		2-wire: max. 10 Hz								/ 3-wire: 50 Hz																
Switching cycles		> 100 x 10 ⁶																								
Delay time		0 ... 100 sec																								
² 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 _{S min}) / 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 _{S min}) / 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 1:5) ⁴ permissible load: R _{max} = 500 Ω								response time: < 30 msec																
3-wire voltage signal		0 ... 10 V / V _S = 24 V _{DC} ± 10 % adjustable (turn-down of span 1:5) ⁴ permissible load: R _{min} = 10 kΩ								response time: < 30 msec																
Without analogue output		V _S = 15 ... 36 V _{DC}																								
Accuracy ³		standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO								option 1: nominal pressure ≥ 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 errors (offset and span) ⁵ / Permissible temperatures																										
Nominal pressure P _N	[bar]	-1 ... 0					< 0.40					≥ 0.40														
Tolerance band	[% FSO]	≤ ± 0.75					≤ ± 1.5					≤ ± 0.75														
in compensated range	[°C]	-20 ... 85					0 ... 50					-20 ... 85														
Permissible temperatures ⁶		medium: -40 ... 125 °C for filling fluid silicone oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -40 ... 85 °C																								
Permissible temperature medium for cooling element 300°C		filling fluid silicone oil				overpressure: -40 ... 300 °C				vacuum: -40 ... 150 °C ⁷				filling fluid food compatible oil					overpressure: -10 ... 250 °C				vacuum: -10 ... 150 °C			
⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions																										
⁶ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C																										
⁷ also for P _{abs} ≤ 1 bar																										
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 (DIN EN 60068-2-6)		G 1/2": 20 g RMS (25 ... 2000 Hz)				others except G 1/2":				10 g RMS (25 ... 2000 Hz)																
Shock (DIN EN 60068-2-27)		G 1/2":				500 g / 1 msec				others except G 1/2":				100 g / 1 msec												
Filling fluids																										
Standard		Silicone oil																								
Optional		food compatible oil (with FDA approval) (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)											others on request													
Materials																										
Pressure port / Housing		stainless steel 1.4404 (316 L)								others on request																
Viewing glass		laminated safety glass																								
Seals		standard: FKM (recommended for medium temperatures ≤ 200 °C)				option: FFKM (recommended for medium temperatures > 200 °C)				others on request																
		clamp and dairy pipe, Varivent [®] : without																								
Diaphragm		stainless steel 1.4435 (316L)																								
Media wetted parts		pressure port, seals, diaphragm																								

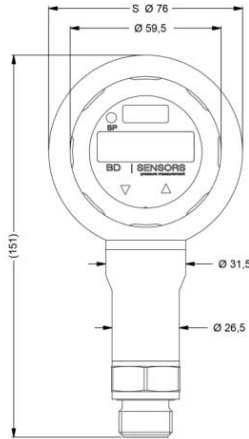
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approval AX14-DS 400P	IBExU 06 ATEX 1050 X zone 0: II 1G Ex ia IIC T4 Ga (connector) / II 1G Ex ia IIB T4 Ga (cable) zone 20: II 1D Ex ia IIC T135 °C Da	
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$	
Max. switching current ⁸	70 mA	
Permissible temperatures for environment	0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar	
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 $\mu\text{H}/\text{m}$	
⁸ 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% \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. 30 mA + signal current 3-wire signal output voltage: approx. 30 mA	
Ingress protection	IP 67	
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position for $P_N \leq 4 \text{ bar}$ have to be specified in the order)	
Weight	min. 500 g (depending on mechanical connection)	
Operational life	> 100 x 10 ⁸ cycles	
CE-conformity	EMC Directive: 2004/108/EC	
ATEX Directive	94/9/EG	
Wiring diagrams		
2-wire-system (current)	3-wire-system (current / voltage)	
Pin configuration		
Electrical connection	M12x1 metal (5-pin)	cable colours (DIN 47100)
Supply +	1	wh (white)
Supply -	3	bn (brown)
Signal + (only 3-wire)	2	gn (green)
Contact 1	4	gy (grey)
Contact 2	5	pk (pink)
Shield	plug housing / pressure port	ye/gn (yellow / green)
Designs ⁹		Electrical connections (dimensions in mm)
side display	45° display (others on request)	M12x1 (5-pin)
⁹ all designs in horizontal rotatable housing as standard		

Mechanical connections (dimensions in mm)

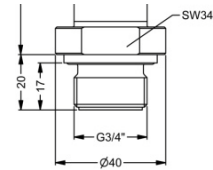
Standard



G1/2" flush DIN 3852
(PN ≥ 1 bar)

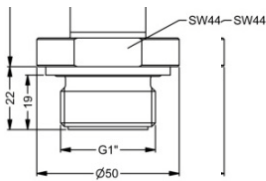


Option

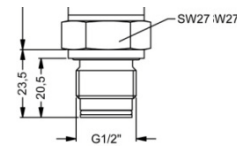


G 3/4" flush DIN 3852

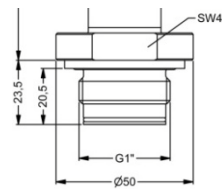
Option



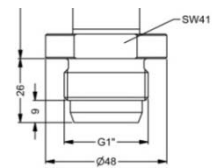
G1" flush DIN 3852



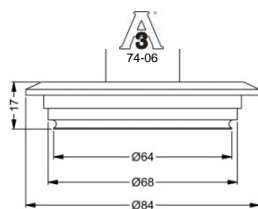
G1/2" flush
with radial o-ring



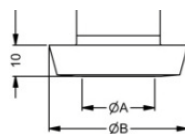
G1" flush
with radial o-ring (PN ≤ 2 bar)



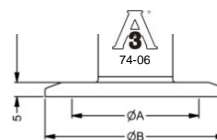
G1" cone



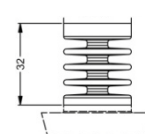
Varivent®
PN ≤ 25 bar



dairy pipe (DIN 11851)



clamp (DIN 32676)



cooling element 300 °C

	dimension in mm		
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5
PN [bar]	≥ 0,25 ≤ 40	≥ 0,25 ≤ 40	≥ 0,25 ≤ 25

	dimension in mm			
size	3/4"	DN 25	DN 32	DN 50
A	14	23	32	45
B	25	50.5	50.5	64
PN [bar]	≥ 4 ≤ 8	≥ 0,25 ≤ 16	≤ 16	≤ 16

⇒ metric threads and other versions on request

© 2018 BD/SENSORS GmbH – The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and materials.

