



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
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 dusts
- ▶ 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. two contacts and an analogue output complete the profile.

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- ▶ Inspection certificate 3.1 according to EN 10204
- ▶ Test report 2.2 according to EN 10204



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 absolute [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	contact rating 125 mA, short-circuit resistant; V _{switch} = V _S - 2V																
Accuracy of contacts ³	standard: nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO / nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO option: 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 _{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 1:5) ⁴ permissible load: R _{max} = 500 Ω										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: 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																	
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						
⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions																	
Permissible temperatures																	
Filling fluid	silicone oil								food compatible oil								
Medium ⁶	-40 ... 125 °C								-10 ... 125 °C								
Medium with cooling element ⁷	overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C ⁸								overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C ⁸								
Electronics / environment	-40 ... 85 °C																
Storage	-40 ... 100 °C																
⁶ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C ⁷ max. temperature depends on the used sealing material, type of seal and installation ⁸ 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 according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)										others on request						
Materials																	
Pressure port	inch thread: G1" cone, Clamp, dairy pipe, Varivent [®] :								stainless steel 1.4404 (316 L) stainless steel 1.4435 (316 L)								
Diaphragm	stainless steel 1.4435 (316L)																
Housing / cap	stainless steel 1.4301 (304)																
Viewing glass	laminated safety glass																
Seals	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) Clamp, dairy pipe, Varivent [®] : without										others on request						
Media wetted parts	pressure port, seals, diaphragm																

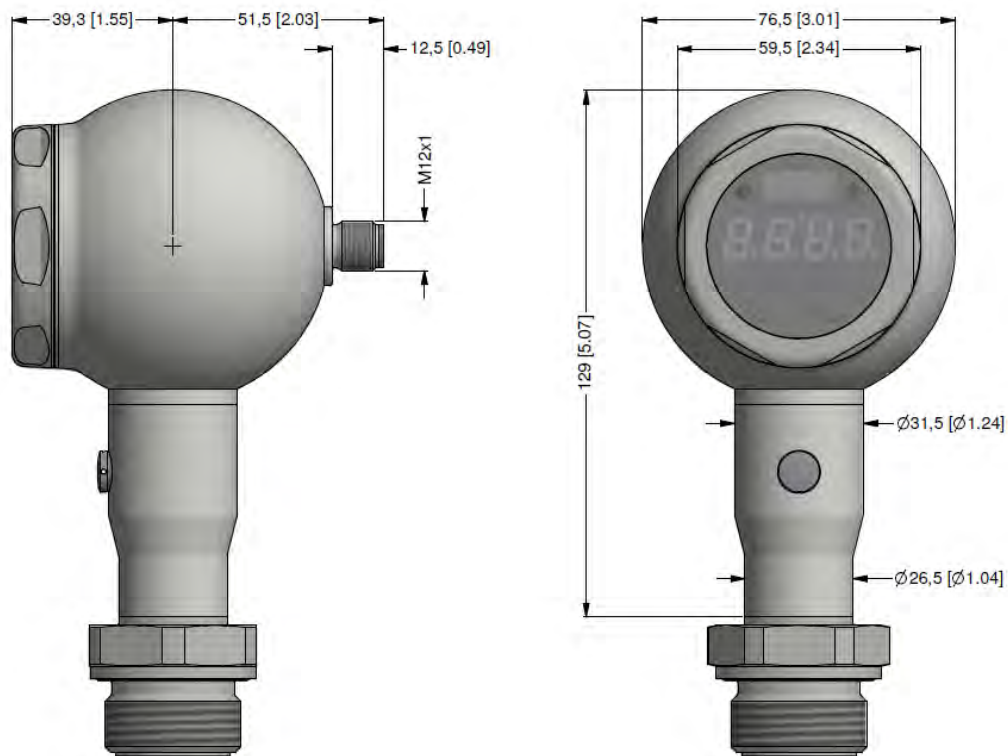
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approval AX14-DS 400P	IBExU 06 ATEX 1050 X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da	
Safety technical maximum values	$U_i = 28 \text{ V}$, $I_i = 93 \text{ mA}$, $P_i = 660 \text{ mW}$, $C \approx 0 \text{ nF}$, $L_i \approx 0 \text{ }\mu\text{H}$	
Max. switching current ⁹	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	
⁹ the real switching current in the application depends on the power supply unit		
Miscellaneous		
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent® (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH	
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 (without contacts)	2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 30 mA + signal current	
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)	
Surface roughness	pressure port $R_a < 0.8 \text{ }\mu\text{m}$ (media wetted parts) diaphragm $R_a < 0.15 \text{ }\mu\text{m}$ weld seam $R_a < 0.8 \text{ }\mu\text{m}$	
Weight	min. 500 g (depending on mechanical connection)	
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	
ATEX Directive	2014/34/EU	
Wiring diagrams		
<p>2-wire-system (current)</p>	<p>3-wire-system (current)</p>	
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	
Designs ¹⁰		
¹⁰ all designs in horizontal rotatable housing as standard		

DS 400P

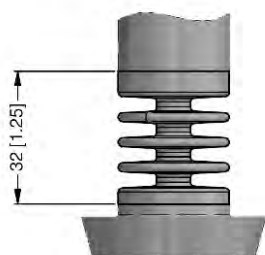
Electronic Pressure Switch

Technical Data

Dimensions (mm / in)

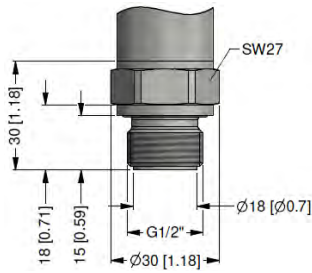


Cooling element up to 300 °C ⁷ (optionally)

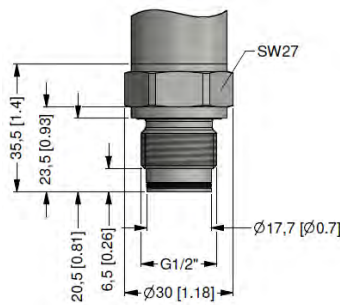


⁷ max. temperature depends on the used sealing material, type of seal and installation

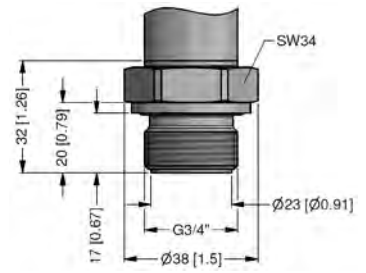
Mechanical connections (dimensions mm / in)



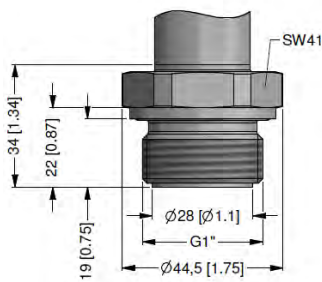
G1/2" flush DIN 3852
p_N ≥ 1 bar



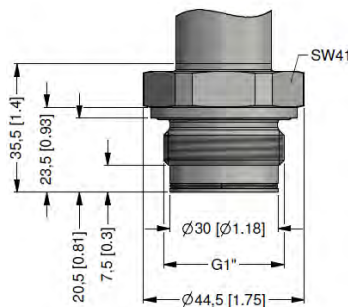
G1/2" flush with radial o-ring
p_N ≥ 1 bar



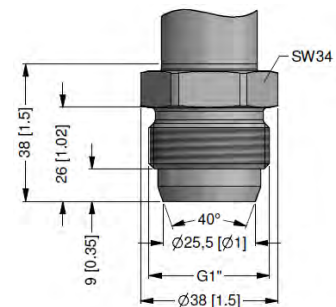
G3/4" flush DIN 3852



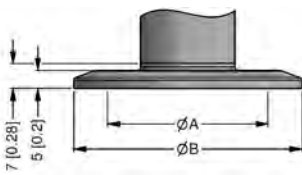
G1" flush DIN 3852



G1" flush with radial o-ring

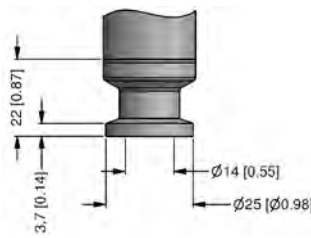


G1" cone

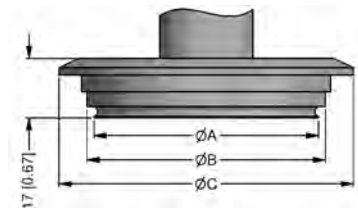


dimensions in mm [in]			
size	DN 25	DN 32	DN 50
A	23.0 [0.91]	23.0 [0.91]	45 [1.77]
B	50.5 [1.99]	50.5 [1.99]	64 [2.52]
p _N [bar]	0.25 ... 16	≤ 16	≤ 16

Clamp (DIN 32676)

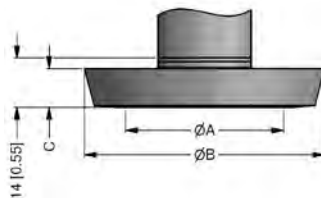


Clamp 3/4" (DIN 32676)
4 bar ≤ p_N ≤ 8 bar



dimensions in mm [in]	
size	DN 40/50
A	64 [2.52]
B	68 [2.68]
C	84 [3.31]

Varivent® DN 40/50
p_N ≤ 25 bar



dimensions in mm [in]			
size	DN 25	DN 40	DN 50
A	23 [0.91]	32 [1.26]	45 [1.77]
B	44 [1.73]	56 [1.20]	68.5 [2.70]
C	10 [0.39]	10 [0.39]	11 [0.43]
p _N [bar]	≤ 40	≤ 40	≤ 25

dairy pipe (DIN 11851)

⇒ metric threads and other versions on request

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