



DS 400P

Intelligent Electronic Pressure Switch Stainless Steel Version

Pressure ports and process connections with flush welded stainless steel diaphragm

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

Electronic Pressure Switch

DS 400P

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: 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
- ▶ 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
- ▶ 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 range¹																							
Nominal pressure gauge / abs.	[bar]	-1 ... 0	0.1	0.16	0.25	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 \geq	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210							
Vacuum resistance		$P_N \geq 1$ bar: unlimited vacuum resistance									$P_N < 1$ bar: on request												
¹ consider the pressure resistance of fitting and clamps																							
Contact²																							
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; $V_{switch} = V_S - 2V$								0 ... 10 V / 3-wire: contact rating 500 mA, short-circuit resistant													
Accuracy of contacts ³		standard: nominal pressure < 0.4 bar: $\leq \pm 0.5$ % FSO nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO								option 1: nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO													
Repeatability		$\leq \pm 0.1$ % FSO																					
Switching frequency		2-wire: max. 10 Hz								/ 3-wire: 50 Hz													
Switching cycles		$> 100 \times 10^8$																					
Delay time		0 ... 100 sec																					
¹ with IS-protection max. 1 contact possible																							
² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)																							
Analogue output (optionally) / Supply																							
2-wire current signal		4 ... 20 mA / $V_S = 13 \dots 36 V_{DC}$								permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02] \Omega$								response time: < 10 msec					
2-wire current signal with IS-protection		4 ... 20 mA / $V_S = 13 \dots 28 V_{DC}$								permissible load: $R_{max} = [(V_S - V_{Smin}) / 0.02] \Omega$								response time: < 10 msec					
3-wire current signal		4 ... 20 mA / $V_S = 24 V_{DC} \pm 10$ % adjustable (turn-down of span 1:5) ⁴																					
3-wire voltage signal		0 ... 10 V / $V_S = 24 V_{DC} \pm 10$ % adjustable (turn-down of span 1:5) ⁴								permissible load: $R_{min} = 10 k\Omega$								response time: < 30 msec					
Without analogue output		$V_S = 15 \dots 36 V_{DC}$																					
Accuracy ³		standard: nominal pressure < 0.4 bar: $\leq \pm 0.5$ % FSO nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO								option 1: nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO													
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]	$\leq \pm 0.75$					$\leq \pm 1.5$					$\leq \pm 0.75$											
in compensated range	[°C]	-20 ... 85					0 ... 50					-20 ... 85											
Permissible temperatures ⁶		medium: -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil electronics / environment: -40 ... 85 °C															storage: -40 ... 100 °C						
Permissible temperature medium for cooling element 300°C		filling fluid silicon 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 $P_{abs} \leq 1$ 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 according to 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 according to DIN EN 60068-2-27		G 1/2":					500 g / 1 msec					others except G 1/2":					100 g / 1 msec						
Filling fluids																							
Standard		Silicon oil																					
Optional		food compatible oil (with FDA approval) (Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662)															others on request						

DS 400P

Electronic Pressure Switch

Technical Data

Materials		
Pressure port / Housing	stainless steel 1.4404 (316 L)	others on request
Viewing glass	laminated safety glass	
Seals (media wetted)	standard: FKM (recommended for medium temperatures $\leq 200\text{ }^{\circ}\text{C}$) option: FFKM (recommended for medium temperatures $> 200\text{ }^{\circ}\text{C}$)	others on request
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)	
Safety technical maximum values	$U_i = 28\text{ V}$, $I_i = 93\text{ mA}$, $P_i = 660\text{ mW}$	
Max. switching current ⁸	70 mA	
Permissible temperatures for environment	in zone 0: $-20 \dots 60\text{ }^{\circ}\text{C}$ with p_{atm} 0.8 bar up to 1.1 bar in zone 1: $-20 \dots 70\text{ }^{\circ}\text{C}$	
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: $1\text{ }\mu\text{H/m}$	
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 $P_N \leq 4$ bar have to be specified in the order)	
Weight	min. 500 g (depending on mechanical connection)	
Operational life	$> 100 \times 10^8$ cycles	
CE-conformity	EMC Directive: 2004/108/EC	
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	gr (grey)
Contact 2	5	pn (pink)
Shield	plug housing / pressure port	gn/ye (green / yellow)
Designs ⁹		Electrical connections (dimensions in mm)
side display		M12x1 (5-pin)
45° display (others on request)		
⁹ different cable types and lengths available		

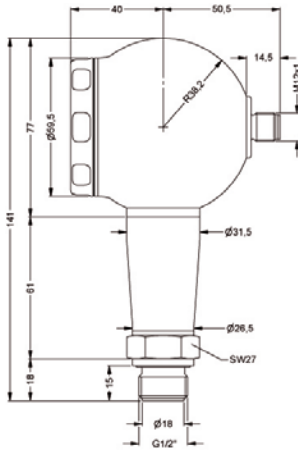
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Electronic Pressure Switch

Technical Data

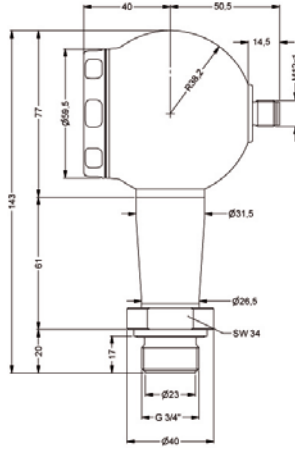
Mechanical connections (dimensions in mm)

standard

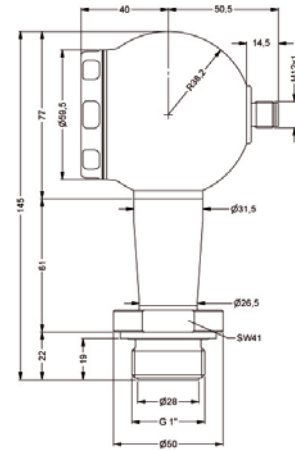


G1/2" flush only for $P_N \leq 40$ bar

optionally

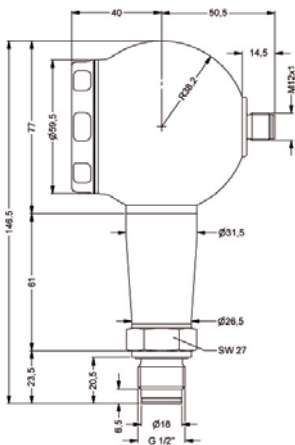


G3/4" flush

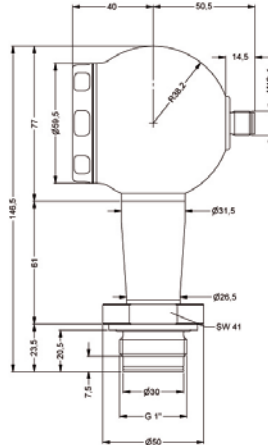


G1" flush

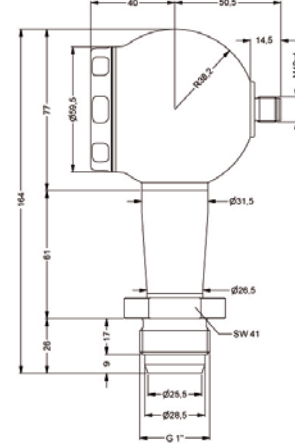
Optional



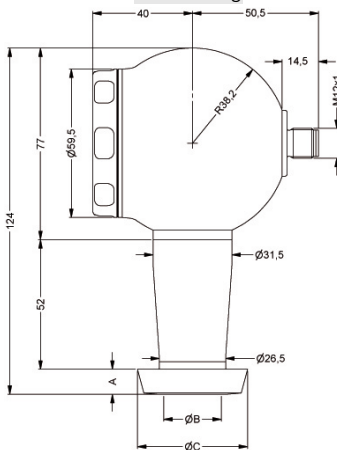
G1/2" flush with radial o-ring



G1" flush with radial o-ring

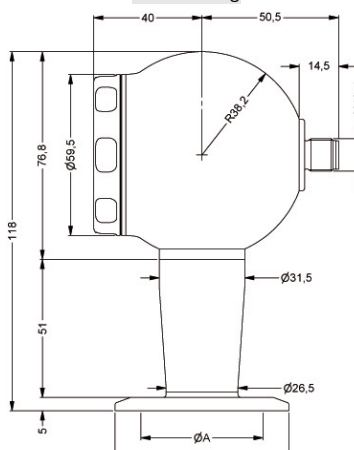


G1" cone



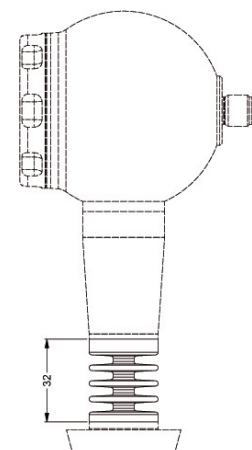
dairy pipe (DIN 11851)

dimensions in mm			
size	DN 25	DN 40	DN 50
A	23	32	45
B	44	56	68.5



clamp (ISO 2852)

dimensions in mm			
size	DN 25	DN 38	DN 51
A	23	32	45
B	50.5	50.5	64



cooling element 300 °C

⇒ metric threads and other versions on request

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

