SCHNEIDER
MESSTECHNIK

IDS 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
- rotable 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 IDS400P 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 IDS400P offers a PNP contact and a rotable 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.

74-06

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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: contact rating 125 mA, short-circuit resistant; $V_{switch} = V_S - 2V$ 0 ... 10 V / 3-wire: 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: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ response time: < 10 msec
2-wire current signal with IS-protection	4 ... 20 mA / V_S = 15 ... 28 V_{DC} permissible load: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ 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 storage: -40 ... 100 °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 $P_{abs} \leq 1$ 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 (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

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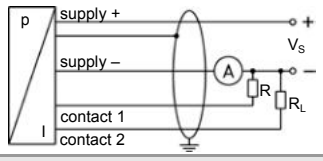
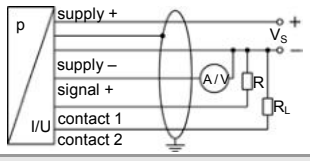
Explosion protection (only for 4 … 20 mA / 2-wire)	
Approval AX14-DS 400P	IBExU 06 ATEX 1050 X zone 0: II 1G Ex ia IIC T4 Ga (connector) / II 1G Ex ia IIB T4 Ga (cable) zone 20: II 1D Ex ia IIIC T135 °C Da
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C ≈ 0 nF, L_i ≈ 0 µH
Max. 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 µH/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% ± 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 ≤ 4 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: 2014/30/EU
ATEX Directive	94/9/EG

Wiring diagrams

2-wire-system (current)



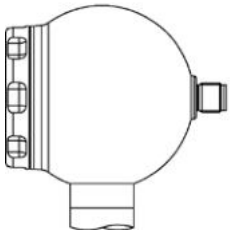
3-wire-system (current / voltage)



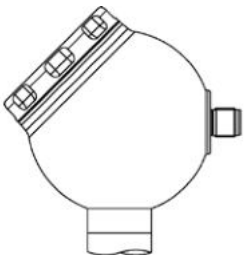
Pin configuration

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)

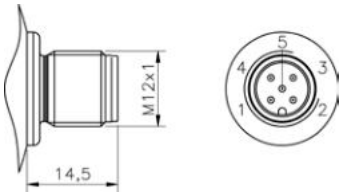
Designs [9] **Electrical connections (dimensions in mm)**



side display



45° display (others on request)

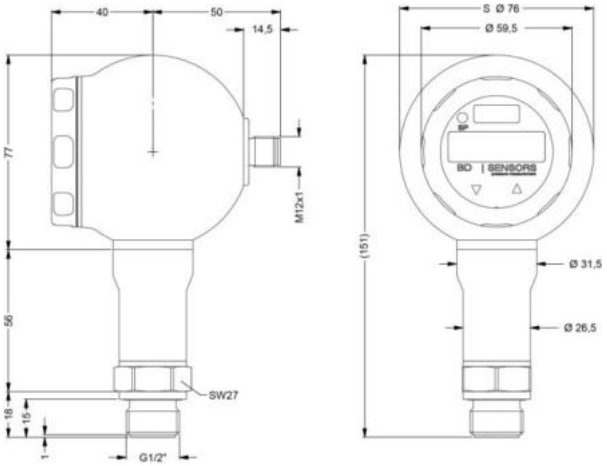


M12x1 (5-pin)

[9] all designs in horizontal rotatable housing as standard

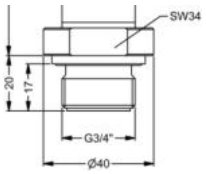
Mechanical connections (dimensions in mm)

Standard



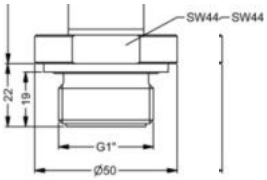
G1/2" flush DIN 3852
(PN ≥ 1 bar)

Option

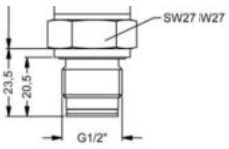


G 3/4" flush DIN 3852

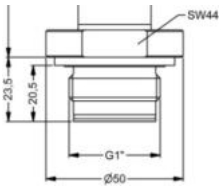
Option



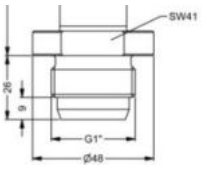
G1" flush DIN 3852



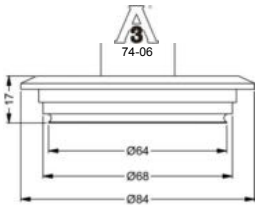
G1/2" flush
with radial o-ring



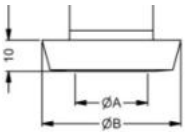
G1" flush
with radial o-ring (P_N ≤ 2 bar)



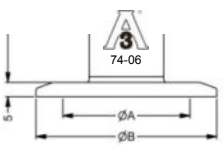
G1" cone



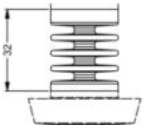
Varivent®
PN ≤ 25 bar



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
P_N [bar]	≥ 0,25 ≤ 40	≥ 0,25 ≤ 40	≥ 0,25 ≤ 25

dimension in mm				
size	¾“	DN 25	DN 32	DN 50
A	14	23	32	45
B	25	50.5	50.5	64
P_N [bar]	≥ 4 ≤ 8	≥ 0,25 ≤ 16	≤ 16	≤ 16

⇨ metric threads and other versions on request

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Ordering code IDS 400P

IDS 400P □□□-□□□□-□□-□-□-□-□□□-□□□-□-□-□-□□□

	Code	
Pressure		
gauge	7 A 5	
absolute [1]	7 A 6	
Input [bar]		
0.10	1 0 0 0	
0.16	1 6 0 0	
0.25	2 5 0 0	
0.40	4 0 0 0	
0.60	6 0 0 0	
1.0	1 0 0 1	
1.6	1 6 0 1	
2.5	2 5 0 1	
4.0	4 0 0 1	
6.0	6 0 0 1	
10	1 0 0 2	
16	1 6 0 2	
25	2 5 0 2	
40	4 0 0 2	
-1 … 0	X 1 0 2	
customer	9 9 9 9	consult
Design		
Stainless steel globe housing (side display)	K H	
Stainless steel globe housing (45° display)	K 4	consult
Analogue output		
without	0	
4 … 20 mA / 2-wire	1	
0 … 10 V / 3-wire, adjustable	3	
4 … 20 mA / 3-wire, adjustable	7	
Intrinsic safety 4 … 20 mA / 2-wire [2]	E	
customer	9	consult
Contact		
1 contact	1	
2 contacts [2]	2	
Accuracy		
standard for $P_N \geq 0,4$ bar 0.35 %	3	
standard for $P_N < 0,4$ bar 0.5 %	5	
option for $P_N \geq 0,4$ bar 0.25 %	2	
customer	9	consult
Electrical connection		
Male plug M12x1 (5-pin) / metal version	N 1 1	
customer	9 9 9	consult
Mechanical connection		
G1/2" with flush welded diaphragm (DIN 3852) [3]	Z 0 0	
G3/4" with flush welded diaphragm (DIN 3852)	Z 3 0	
G1" with flush welded diaphragm (DIN 3852)	Z 3 1	
G1" DIN 3852 with rad. o-ring and flush diaphragm [4]	Z 5 7	
G1/2" DIN 3852 with rad. o-ring and flush diaphragm	Z 6 1	
G 1" cone	K 3 1	
Clamp DN 25 (DIN 32676) / 3A	C 6 1	
Clamp DN 32 (DIN 32676) / 3A	C 6 2	
Clamp DN 50 (DIN 32676) / 3A	C 6 3	
Clamp 3/4" (DIN 32676) / 3A	C 6 9	
Dairy pipe DN 25 (DIN 11851) [5]	M 7 3	
Dairy pipe DN 40 (DIN 11851) [5]	M 7 5	
Dairy pipe DN 50 (DIN 11851) [5]	M 7 6	
Varivent® DN 40/50 / 3A	P 4 1	
customer	9 9 9	consult
Diaphragm		
Stainless steel 1.4435 (316L)	1	
customer	9	consult
Seals		
for clamp, dairy pipe, Varivent®: none	0	
for inch thread: FKM	1	
FFKM	7	consult
customer	9	consult
Filling Fluids		
Silicone oil	1	
food compatible oil (FDA) / 3A	2	
customer	9	consult
Special version		
standard	0 0 0	
with cooling element up to 300°C / 3A	2 0 0	
customer	9 9 9	consult

absolute pressure possible from 1 bar

with Ex version max. 1 contact is possible

only possible for nominal pressure ranges $P_N \geq 1$ bar

only possible for nominal pressure ranges $P_N \leq 2$ bar

The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position.

Varivent® is a brand name of GEA Tuchenhagen GmbH

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