automatyka

BD SENSORS
pressure measurement

x|act i

Precision Pressure Transmitter with LC Display for Food Industry and Pharmacy

- flush welded stainless steel diaphragm
- stainless steel ball housing
- HART® communication
- nominal pressure ranges from 0 ... 350 mbar up to 0 ... 35 bar

The precision pressure transmitter x|act i has been developed especially for industral applications, with high requirements on hygiene and cleaning.

Basic element is a piezoresistive sensor which is characterised by high signal stability. The digital amplifier electronic linearises the sensor signal and compensates the thermal errors.

Talking about functionality BD SENSORS applies a high standard to the xlact series. The integrated LC display shows the actual value, the corresponding text info and the tendency (via bargraph). The user-friendly control software provides an easy menu handling and unproblematic configuration.

Several flush welded process connections in stainless steel 1.4435 are available. The modern design of the housing (ball housing) convinces besides the high functionality by easy cleaning, because there is no gap in which bacteria or impurities can deposit.

Optionally the x|act i can be delivered with HART® communication, so that the parameterisation of the device can be done by remote access..

Characteristics

- accuracy:
  0.05 % FSO BFSL
  (0,1 % FSO IEC 60770)
- thermal error in compensated range –20 ... 80 °C:
  0,1 % FSO / 10 K
- output signal 4 ... 20 mA / 2-wire, optional with HART®
- integrated, multiline LC Display
- simple handling
- configuration in situ via push buttons in the display module or by remote access via HART® communication
- **option Ex version, zone 0 II 1G EEx ia IIC T4**

CE Ex HART

x|act i
Precision Pressure Transmitter

TÜV CERT DIN EN ISO 9001

Input pressure ranges

Nominal pressure gauge	[bar]	-1 ... 1 [1]	-0.35 ... 0.35 [1]	0 ... 0.35	0 ... 1	0 ... 2	0 ... 7	0 ... 17	0 ... 35 [2]
Nominal pressure abs. [1]	[bar]	-	-	-	0 ... 1	0 ... 2	0 ... 7	0 ... 17	0 ... 35 [2]
Permissible overpressure	[bar]	3	1	1	3	6	20	60	100

On customer request we adjust the devices by software on the standard pressure ranges, within the turn-down-possibility (gauge starting at 0.1 bar, abs. starting at 0.4 bar). Deviating pressure ranges are also possible on request.

Output signal / Supply

Standard	2-wire: 4 ... 20 mA / V_S = 10 ... 30 V_{DC}	Ex version: V_S = 10 ... 28 V_{DC}
Option	2-wire: 4 ... 20 mA with HART® communication (option HART® communication is delivered in Ex version as standard)	
	3-wire [3]: 0 ... 10 V / V_S = 15 ... 36 V_{DC}	

Performance

Accuracy	IEC 60770 [4]: ≤ ± 0.1 % FSO	BFSL: ≤ ± 0.05 % FSO relating to nominal range
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0{,}02]\ \Omega$	load during HART® communication: R_{min} = 250 Ω
Influence effects	supply: 0,05 % FSO / 10 V	permissible load: 0,05 % FSO / kΩ
Long term stability	≤ ± (0.1 x nominal range / adjusted range) % FSO / year	
Response time	200 ms – without consideration of the electronical damping	measuring rate 5/s
Adjustability	configuration of following parameters (via display module or HART® Interface) possible: - electronical damping: 0 ... 100 s - offset: 0 ... 80 % FSO - turn down of span: max. 1:10 [2] (lowest value gauge: 0,1 bar; lowest value abs.: 0,4 bar)	

Thermal errors (Offset and Span)

Thermal error	≤ ± (0.1 x nominal range / adjusted range) % FSO / 10 K
in compensated range	-20 ... 80 °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
Option Ex protection AX12-x|act i	II 1G EEx ia IIC T4 safety technical maximum values: V_i = 28 V, I_i = 93 mA, P_i = 660 mW

Display

Type	LC display, visible range 32.5 x 22.5 mm
Display for values	5-digit, 7-segment, digit size 8 mm, range of indication ± 9999
Additional display	8-digit, 14-segment, digit size 5 mm
Bargraph indication	52 segments (1 segment conforms approx. 2 % of set measuring range)
Accuracy	0.1 % ± 1 digit

Mechanical stability

Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

[1] for vacuum ranges and nominal pressure abs. the max. medium temperature is 70 °C

[2] limited turn-down-possibility of span with nominal pressure 35 bar: 1:2

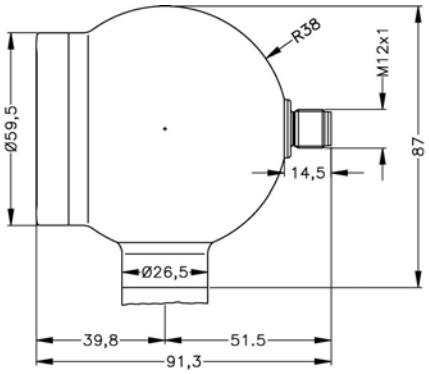
[3] in preparation

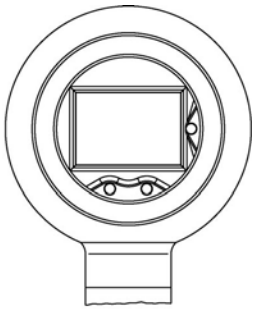
[4] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability) relating to nominal range

Permissible temperatures

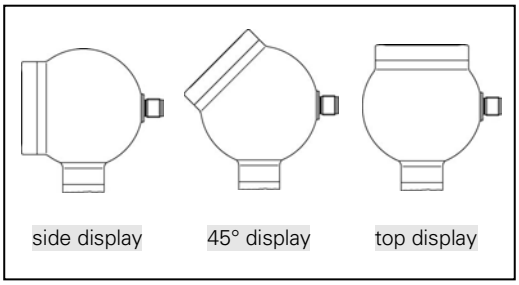
Medium	-25 ... 125 °C [1,5]
Electronics / environment	-20 ... 70 °C
Storage	-30 ... 80 °C

Dimensions



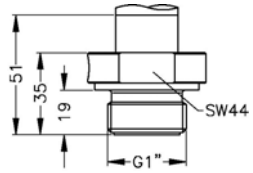


Design



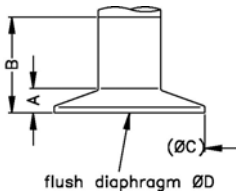
Mechanical connections

Inch thread



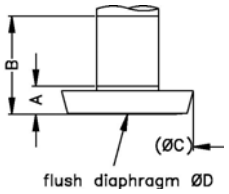
G1“ flush
(DIN 3852)

Clamp



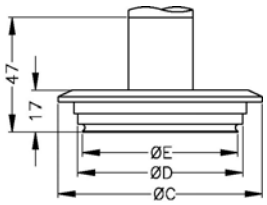
dimensions in mm			
size	1“	1 1/2“	2“
A	11	11	22
B	41	41	22
C	50,5	50,5	64
D	24	32	45

Dairy pipe [6]



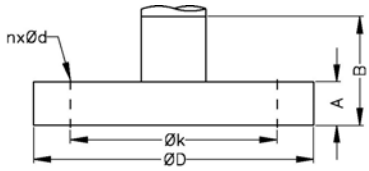
dimensions in mm			
size	DN 25	DN 40	DN 50
A	14	23	23,5
B	44	23	23,5
C	44	56	68,5
D	24	32	45

Varivent



dimensions in mm	
size	DN 40/50
C	84
D	68
E	64

Flange [7]



dimensions in mm			
size	DN25/ PN40	DN50/ PN40	DN80/ PN16
D	115	165	200
k	85	125	160
A	18	20	20
B	48	50	50
n	4	4	8
d	14	18	18

[5] max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 30 minutes with a max. environmental temperature of 50 °C

[6] cup nut for dairy pipe is included in the delivery (already pre-assembled)

[7] DN80/PN16 possible for nominal pressure ranges up to 16 bar

Electrical connections

Standard	M12x1 4pin
Option [8]	cable outlet (cable with air tube) cable capacitance: signal line/shield: 150 pF/m signal line/signal line: 100 pF/m cable inductance: signal line/shield: 1.0 µH/m signal line/signal line: 1.0 µH/m

Filling fluids

Standard	silicon oil
Options	food compatible oil (with FDA approval) / Halocarbon / others on request

Materials

Pressure port	stainless steel 1.4435 (316L)
Housing	stainless steel 1.4301 (304)
Viewing glass	laminated safety glass
Seals (media wetted)	inch thread: FKM / EPDM clamp, dairy pipe, flange, Varivent: none others on request; delivery of process seals on request
Diaphragm	stainless steel 1.4435 (316L) / Hastelloy / others on request
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

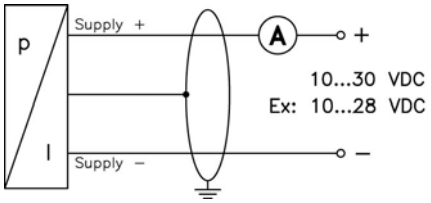
Current consumption	max. 25 mA
Ingress protection	IP 67
Weight	min. 400 g (depending of process connection)
Installation position	any [9]
Operational life	> 100 x 10^6 pressure cycles

Pin configuration

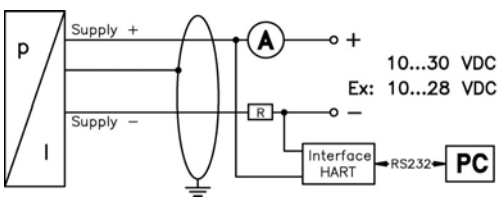
Electrical connection		M12x1 (4pin)	cable colours (DIN 47100)
2-wire-system	Supply +	1	white
	Supply –	3	brown
	Measuring point	-	-
	Ground	plug housing	cable shield

Wiring diagram

2-wire-system (current)



2-wire-system (current) HART®



[8] in preparation

[9] Pressure transmitters are calibrated in a vertical position with the pressure port connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges ≤ 1 bar. Therefore installation position should be specified.

Ordering code xlact i

xlact i □□□-□□□□-□□-□-□-□□□-□□□-□-□-□-□□□

Field	Option	Code
Pressure		
	gauge	5 1 1
	absolute [1]	5 1 2
Input ⚠	**[bar]**	
	0,35 [1]	3 5 0 0
	1	1 0 0 1
	2	2 0 0 1
	7	7 0 0 1
	17	1 7 0 2
	35	3 5 0 2
	-1 ... 1 [2]	S 1 0 2
	-0,35 ... 0,35 [2]	S 3 5 0
	customer	X X X X
Design		
	Stainless steel ball housing (side display)	K H
	Stainless steel ball housing (45° display)	K 4
	Stainless steel ball housing (top display)	K V
Output		
	4 ... 20 mA / 2-wire	1
	Intrinsic safety for zone 0 / 4 ... 20 mA / 2-wire	E
	HART®-communication Intrinsic safety for zone 0 / 4 ... 20 mA / 2-wire	I
	customer	X
Accuracy		
	0.1 % [3]	1
	customer	X
Electrical connection		
	male plug M12x1 (4-pin)	M 1 0
	customer	X X X
Mechanical connection		
	G1" DIN 3852 with flush welded diaphragm	Z 3 1
	Clamp 1"	C 6 1
	Clamp 1 1/2"	C 6 2
	Clamp 2"	C 6 3
	Dairy pipe DN 25 [4]	M 7 3
	Dairy pipe DN 40 [4]	M 7 5
	Dairy pipe DN 50 [4]	M 7 6
	Varivent DN 40/50	P 4 1
	Flange (DIN) DN 25 / PN 40	F 2 0
	Flange (DIN) DN 50 / PN 40	F 2 3
	Flange (DIN) DN 80 / PN 16 [5]	F 1 4
	customer	X X X
Diaphragm		
	Stainless steel 1.4435 (316L)	1
	Hastelloy	H
	customer	X
Seals		
	Process connections: without	0
	inch thread: FKM	1
	inch thread: EPDM	3
Filling Fluids		
	Silicon oil	1
	food compatible oil [6]	2
	Halocarbon	C
	customer	X
Special version		
	standard	0 0 0
	customer	X X X

⚠ **if setting range shall be different from nominal range please specify in your order**

[1] Nominal pressure absolute not possible for $P_N < 1$ bar
[2] for vacuum ranges max. medium temperature is 70 °C
[3] related to nominal range
[4] cup nut for dairy pipe included and pre-assembled
[5] DN80/PN16 possible for nominal pressure ranges up to 16 bar
[6] Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662

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