BD|SENSORS®
pressure measurement

x|act i

Precision Pressure Transmitter for Food Industry, Pharmacy and Biotechnology

- with integrated display and operating module
- hygienic version
- flush welded diaphragm
- nominal pressure ranges from 0 ... 350 mbar up to 0 ... 35 bar

DESIGN

Our piezoresistive silicon sensor DSP 111 is the basis for our xlact i. The sensor is – together with digital compensation electronics – directly mounted into the pressure port, and is connected to the intelligent display and operating module via a I^2C-interface of the compensation electronics. With the help of this innovative housing concept, precise and long-term stable pressure transmitters with flush-welded diaphragm and low thermal error can be produced.

OPERATING

The display and operating module allows an on-site setting of all xlact i functions, which can be easily and quickly parametrized via tree buttons:

- offset and span
- damping
- units
- display
- password

The device can be optionally equipped with HART® communication, and will then be delivered together with the appropriate configuration software (against additional charge).

Characteristics

- accuracy:
  0.05 % FSO BFSL
  (0.1 FSO IEC 60770)
- turn-down 1:10
- several process connections:
  - G1" cone
  - clamp
  - dairy pipe
  - Varivent®
  - flange
  - DRD
- high ingress protection IP 67
- optionally:
  - **HART®-communication**
  - **Ex-intrinsically safe version (zone 0)**
  - **cooling element for media temperatures up to 300 °C**
  - PROFIBUS PA
    (in preparation)

CE Ex HART

x|act i
Precision Pressure Transmitter

TÜV CERT DIN EN ISO 9001

BD SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein

Telefon +49 (0) 92 35 / 98 11- 0
Telefax +49 (0) 92 35 / 98 11- 11

www.bdsensors.com
info@bdsensors.de

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

[1] higher pressure ranges on request; on demand we adjust the devices by software on the required pressure ranges, within the turn-down-possibility (gauge starting at 0.1 bar, abs. starting at 0.35 bar)

Vacuum ranges						
Nominal pressure gauge	[bar]	-0.17 … 0.17	-0.35 … 0.35	-1 … 1	-1 … 2	-1 … 7
Permissible overpressure	[bar]	0.5	1	3	6	20

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V_S = 10 … 30 V_{DC}
Option	
Ex-protection	2-wire: 4 ... 20 mA / V_S = 10 … 28 V_{DC}
Ex-protection/ HART®	2-wire: 4 ... 20 mA with HART® communication / V_S = 10 … 28 V_{DC}
PROFIBUS PA	digital output signal (according to IEC 61158) / V_S = 10 ... 30 V_{DC} (in preparation)
Current consumption	max. 25 mA
Performance	
Accuracy [2, 3]	turn-down ≤ 1:5 ≤ ± 0.1 % FSO turn-down > 1:5 ≤ ± [0.1 + 0.015 x turn-down] % FSO with turn-down = nominal pressure range / adjusted range
Permissible load	R_{max} = [(V_S – $V_{S\,min}$) / 0.02] Ω 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 turn-down) % FSO / year
Response time	200 ms – without consideration of electronic damping measuring rate 5/sec
Adjustability	electronic damping: 0 … 100 sec offset: 0 ... 90 % FSO turn-down of span: max. 1:10 [4]

[2] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)
[3] for nominal pressure ranges ≤ 0.35 bar the accuracy is calculated as follows: ≤ ± [0.1 + 0.02 x turn-down] % FSO
[4] span minimal 0.1 bar (gauge) or 0.35 bar (absolute); turn-down with 35 bar maximal 1:2

Thermal errors / Permissible temperatures	
Thermal error [5]	≤ ± (0.1 x turn-down) % FSO / 10 K in compensated range -20 … 80 °C
Permissible temperatures [6]	medium: -40 ... 125 °C environment: -20 ... 70 °C storage: -30 ... 80 °C

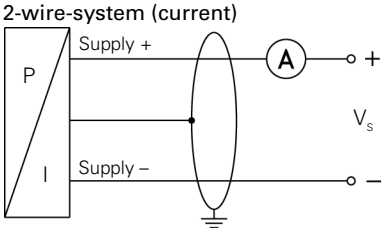
[5] an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions
[6] for vacuum ranges and absolute pressure the max. medium temperature is 70 °C;
max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 30 minutes with a max. environmental temperature of 50 °C (without cooling element); with optional cooling element its maximum permissible temperature is valid

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	5 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms
Materials / Filling fluids	
Pressure port	Varivent®, dairy pipe und clamp: stainless steel 1.4435 (316L) G1" cone, DRD and flange: stainless steel 1.4571 (316Ti)
Housing	stainless steel 1.4301 (304)
Viewing glass	laminated safety glass
Seals (media wetted)	none, not included in the scope of delivery
Diaphragm	stainless steel 1.4435 (316 L) options: Hastelloy®, Tantal (possible from 1 bar); others on request
Media wetted parts	pressure port, diaphragm, seal (if existing)
Filling fluids	standard: silicon oil options: food compatible oil (with FDA approval); Halocarbon and others on request

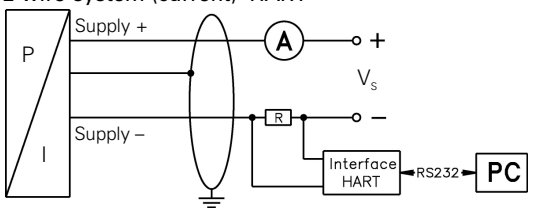
Explosion protection (optionally)	
Approval AX12-x|act i	zone 0: II 1 G EEx ia IIC T4
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar in zone 1: -20 ... 70 °C
Connecting cables (by factory)	capacitance: signal line/shield also signal line/signal line: 160 pF/m inductance: signal line/shield also signal line/signal line: 1 µH/m
Miscellaneous	
Display	LC display, visible range 32.5 x 22.5 mm; 5-digit 7-segment main display, digit height 8 mm, range of indication ±9999; 8-digit 14-segment additional display, digit height 5 mm; 52-segement bargraph; accuracy 0.1% ± 1 digit
Ingress protection	IP 67
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position have to be specified in the order)
Weight	min. 400 g (depending on mechanical connection)
Operational life	> 100 x 10^6 pressure cycles

Wiring diagrams

2-wire-system (current)



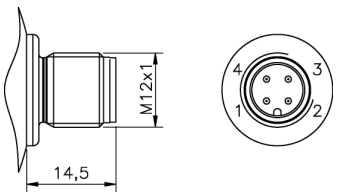
2-wire-system (current) HART®



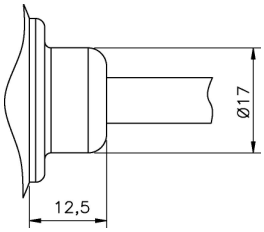
Pin configuration

Electrical connections	M12x1 (4-pin)	cable colour (DIN 47100)
Supply + Supply –	1 3	white brown
Ground	plug housing	yellow / green (shield)

Electrical connections



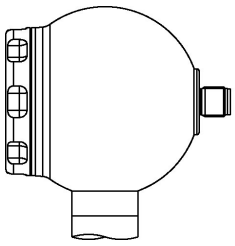
M12x1 (4-pin)



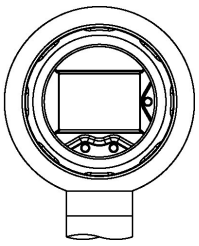
cable outlet [7]

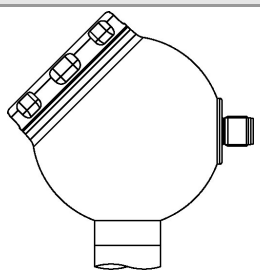
[7] *different cable types and lengths available*

Designs [8]

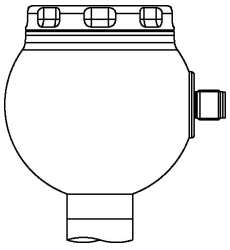


side display





45° display

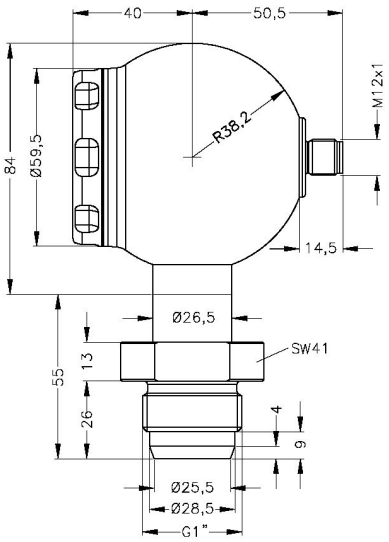


top display

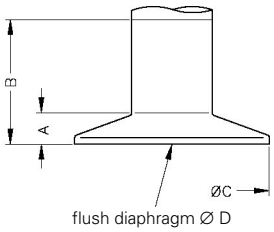
[8] *all designs in combination with G1" cone in horizontal rotatable housing as standard; other mech. connections in rotatable housing on request*

Dimensions (in mm)

G1" cone

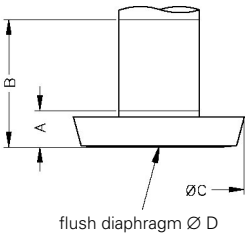


Clamp (ISO 2852)



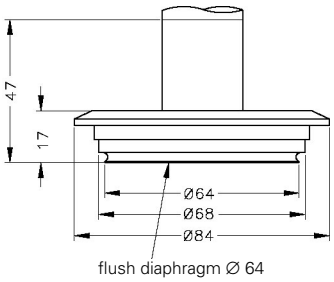
dimensions in mm			
size	1"	1 1/2"	2"
A	11	11	22
B	41	41	22
C	50.5	50.5	64
D	24	32	45

Dairy pipe [9] (DIN 11851)



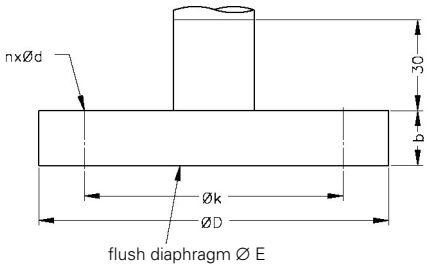
dimensions in mm			
size	DN 25	DN 40	DN 50
A	14	23	23.5
B	44	23	23.5
C	44	56	68.5
D	24	32	45

Varivent®



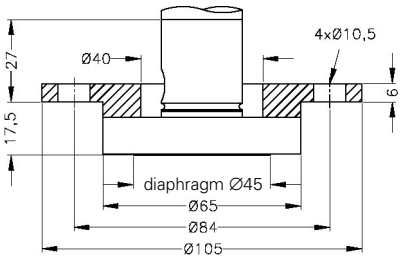
DN 40/50

Flange [10] (DIN 2501)

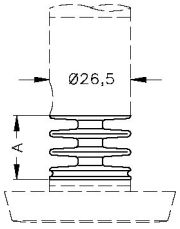


dimensions in mm			
size	DN25/PN40	DN50/PN40	DN80/PN16
D	115	165	200
E	30	89	89
k	85	125	160
b	18	20	20
n	4	4	8
d	14	18	18

DRD [9]



Cooling element



temperature range	150° C	300° C
size A	22	34
number of cooling fins	2	3

[9] *cup nut resp. mounting flange is included in the delivery (already pre-assembled)*
[10] *DN80/PN16 possible for nominal pressure ranges $P_N \leq 7$ bar*

HART® is a registered trade mark of HART Communication Foundation; Hastelloy® is a trademark of Haynes International Inc.; Varivent® is a trademark of GEA Tuchenhagen GmbH; Windows® is a registered trade mark of Microsoft Corporation

Telefon +49 (0) 92 35 / 98 11- 0
Telefax +49 (0) 92 35 / 98 11- 11
www.bdsensors.com
info@bdsensors.de

Fax: +49 (0) 92 35 / 98 11 -11

BD SENSORS® pressure measurement

Ordering code xlact i

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

Pressure																												
gauge	5	1	1																									
absolute [1]	5	1	2																									
Input ⚠ [bar]																												
0 ... 0,35 [1]				3	5	0	0																					
0 ... 1				1	0	0	1																					
0 ... 2				2	0	0	1																					
0 ... 7				7	0	0	1																					
0 ... 17				1	7	0	2																					
0 ... 35				3	5	0	2																					
-0,17 ... 0,17				S	1	7	0																					
-0,35 ... 0,35				S	3	5	0																					
-1 ... 1				S	1	0	2																					
-1 ... 2				V	2	0	2																					
-1 ... 7				V	7	0	2																					
customer				9	9	9	9																					on request
Design																												
side display								K	H																			
45° display								K	4																			
top display								K	V																			
Output																												
4 ... 20 mA / 2-wire										1																		
Intrinsic safety 4 ... 20 mA / 2-wire										E																		
Intrinsic safety 4 ... 20 mA / 2-wire with HART®-communication										I																		
customer										9																		on request
Accuracy																												
0.1 %												1																
Electrical connection																												
male plug M12x1 (4-pin)														M	1	0												
cable outlet [2]														T	R	1												
customer														9	9	9												on request
Mechanical connection																												
G1" cone																	K	3	1									
Clamp 1" (ISO 2852)																	C	6	1									
Clamp 1 1/2" (ISO 2852)																	C	6	2									
Clamp 2" (ISO 2852)																	C	6	3									
Dairy pipe DN 25 (DIN 11851) [3]																	M	7	3									
Dairy pipe DN 40 (DIN 11851) [3]																	M	7	5									
Dairy pipe DN 50 (DIN 11851) [3]																	M	7	6									
Varivent® DN 40/50																	P	4	1									
Flange DN 25 / PN 40 (DIN 2501)																	F	2	0									
Flange DN 50 / PN 40 (DIN 2501)																	F	2	3									
Flange DN 80 / PN 16 (DIN 2501) [4]																	F	1	4									
DRD Ø 65 mm [3]																	D	R	D									
Diaphragm																												
Stainless steel 1.4435 (316L)																				1								
Hastelloy®																				H								
Tantal [5]																				T								on request
Seals																												
without																					0							
Filling Fluids																												
Silicon oil																						1						
food compatible oil [6]																						2						
Halocarbon																						C						on request
customer																						9						on request
Special version																												
standard																							0	0	0			
with cooling element up to 150°C																							1	5	0			
with cooling element up to 300°C																							2	0	0			

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

[1] absolute pressure possible from 1 bar
[2] different cable types and lengths deliverable (not encluded in the price); code for PUR cable with ventilation tube
[3] cup nut resp. mounting flange is included in the delivery (already pre-assembled)
[4] DN80/PN16 possible for nominal pressure ranges up to 7 bar
[5] tantal diaphragm possible with nominal pressure ranges from 1 bar
[6] Name of oil: Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662
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This ordering code contains product specification; properties are not guaranteed. Subject to change without notice.

TÜV CERT DIN EN ISO 9001
BD SENSORS GmbH
BD-Sensors-Straße 1
D - 95199 Thierstein
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info@bdsensors.de