

x|act i

Precision Pressure Transmitter for Food Industry, Pharmacy and Biotechnology with SIL2 (optionally)

Stainless Steel Sensor

accuracy according to IEC 60770:
0.1 % FSO



Nominal pressure

from 0 ... 400 mbar up to 0 ... 40 bar

Output signals

2-wire: 4 ... 20 mA
others on request

Special characteristics

- ▶ turn-down 1:10
- ▶ hygienic version
- ▶ flush welded diaphragm
- ▶ several process connections (G1" cone, Clamp, dairy pipe, etc.)
- ▶ integrated display and operating module



Optional versions

- ▶ IS-version
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL2 -version
according to IEC 61508 / IEC 61511
- ▶ HART®-communication
- ▶ cooling element for media temperatures up to 300 °C

The precise pressure transmitter x|act i has been especially designed for the food industry, pharmacy and biotechnology and measures vacuum, gauge and absolute pressure of gases, steam and fluids up to 40 bar.

Several process connections e.g. thread or hygienic versions like Varivent®, dairy pipe and Clamp with a flush welded diaphragm are available, which can be combined with a cooling element for media temperatures up to 300 °C. The robust stainless steel globe housing has a high ingress protection IP 67 and all characteristics for a residue-free and antibacterial cleaning.

Preferred areas of use are

-  Food industry
-  Pharmacy

Material and test certificates

- ▶ material mill test report according to DIN EN 10204-3.1.
- ▶ specific test report according to DIN EN 10204-2.2.



Pressure ranges ¹								
Nominal pressure gauge / abs. ²	[bar]	0.4	1	2	4	10	20	40
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure \geq	[bar]	3	7.5	15	25	50	120	210

¹ higher pressure ranges on request; on demand we adjust the devices within the turn-down-possibility by software on the required pressure ranges
² absolute pressure possible from 1 bar

Vacuum ranges						
Nominal pressure gauge	[bar]	-0.4 ... 0.4	-1 ... 1	-1 ... 2	-1 ... 4	-1 ... 10
Overpressure	[bar]	2	5	10	20	40
Burst pressure	[bar]	3	7.5	15	25	50

Output signal / Supply			
Standard	2-wire: 4 ... 20 mA	analog signal	$V_S = 12 \dots 30 V_{DC}$
Option	2-wire: 4 ... 20 mA	IS-version IS-version and HART® communication SIL2-version IS- and SIL2-version IS- and SIL2-version with HART® communication	$V_S = 12 \dots 28 V_{DC}$ $V_S = 12 \dots 28 V_{DC}$ $V_S = 12 \dots 30 V_{DC}$ $V_S = 12 \dots 28 V_{DC}$ $V_S = 12 \dots 28 V_{DC}$
Current consumption	max. 25 mA		

Performance	
Accuracy ³ performance after turn-down (TD)	$\leq \pm 0.1 \% \text{ FSO}$ no change of accuracy the accuracy is calculated as follows: $\leq 0.1 + 0.015 \times (\text{turn-down} - 5) \% \text{ FSO}$ e.g. turn-down 9: $\leq 0.1 + 0.015 \times (9 - 5) \% \text{ FSO} = 0.16 \% \text{ FSO}$
Permissible load	$R_{max} = [(V_S - V_{Smin}) / 0.02 A] \Omega$ load during HART® communication: $R_{min} = 250 \Omega$
Influence effects	supply: 0.05 % FSO / 10 V permissible load: 0.05 % FSO / k Ω
Long term stability	$\leq \pm (0.1 \times \text{turn-down}) \% \text{ FSO} / \text{year}$ at reference conditions
Response time	100 msec – without consideration of electronic damping measuring rate 10/sec
Adjustability	electronic damping: 0 ... 100 sec offset: 0 ... 90 % FSO turn-down of span: max. 1:10

³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (Offset and Span) / Permissible temperatures	
Tolerance band ^{4,5} in compensated range	$\leq \pm 0.2 \% \text{ FSO} \times \text{turn-down}$ -20 ... 85 °C
Permissible temperatures ⁶	medium: -40 ... 125 °C for filling fluid silicone oil -10 ... 125 °C for filling fluid food compatible oil environment: -20 ... 70 °C storage: -30 ... 80 °C
Permissible temperature medium for cooling element 300°C	filling fluid silicone oil overpressure: -40 ... 300 °C vacuum pressure: -40 ... 150 °C filling fluid food compatible oil overpressure: -10 ... 250 °C vacuum pressure: -10 ... 150 °C

⁴ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

⁵ for flange-, Varivent-, DRD-version: tolerance band offset $\leq \pm 1.6 \% \text{ FSO}$ / tolerance band span $\leq \pm 0.6 \% \text{ FSO}$

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 60 minutes with a max. environmental temperature of 50 °C (without cooling element).

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 (25 ... 2000 Hz) according to DIN EN 60068-2-6
Shock	100 g / 11 msec according to DIN EN 60068-2-27

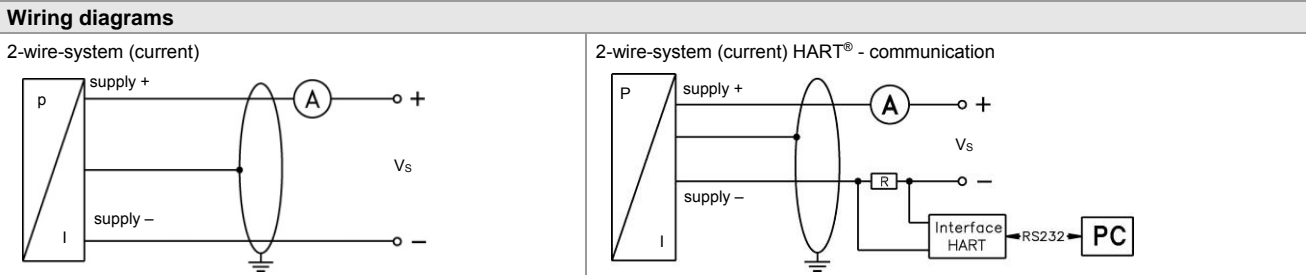
Filling fluids	
Standard	silicone oil
Options	food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) Halocarbon and others on request

Materials	
Pressure port	stainless steel 1.4435 (316 L)
Housing	stainless steel 1.4301 (304)
Viewing glass	laminated safety glass
Seals (media wetted)	none, not included in the scope of delivery
Diaphragm	standard: stainless steel 1.4435 (316 L) options: Hastelloy® C-276 (2.4819); tantalum (possible from 1 bar on) on request
Media wetted parts	pressure port, diaphragm, seals (if existing)

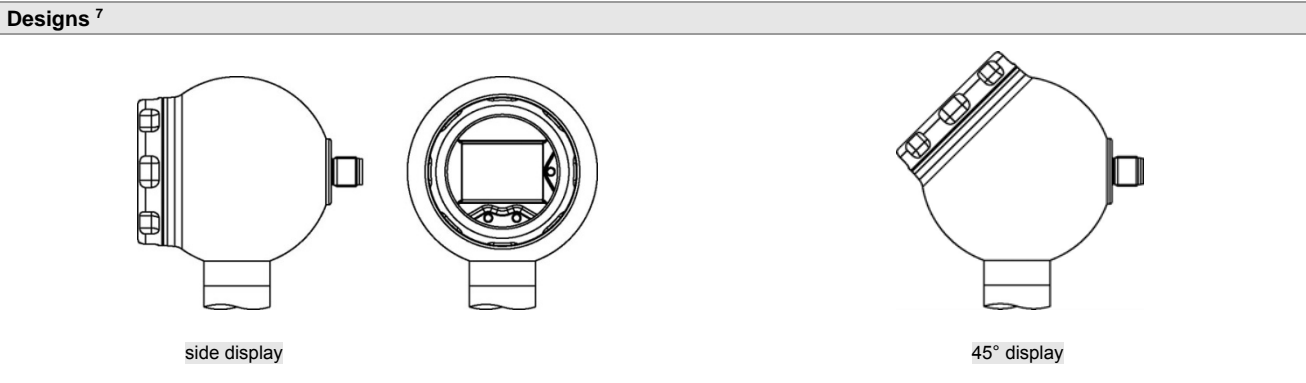
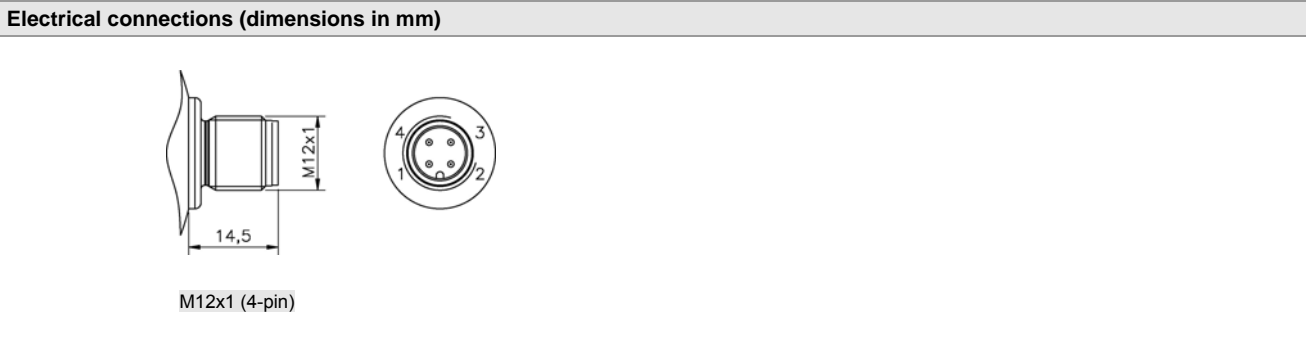
Explosion protection	
Approval AX12-x act i Approval AX2-x act i (with SIL2)	IBExU 05 ATEX 1106 X (IBExU 05 ATEX1105 X with SIL2) zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T85 °C Da
Safety technical maximum values	$U_i = 28\text{ V}$, $I_i = 98\text{ mA}$, $P_i = 680\text{ mW}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ }\mu\text{H}$, the supply connections have an inner capacity of max. 27 nF to the housing
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar in zone 20: -40 ... 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 $\mu\text{H}/\text{m}$

Option	
SIL2-version	according to IEC 61508 / IEC 61511

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% \pm 1 digit
Ingress protection	IP 67
Installation position	any (standard calibration in a vertical position with the pressure port connection down; differing installation position for $P_N \leq 2\text{ bar}$ have to be specified in the order)
Weight	min. 400 g (depending on mechanical connection)
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU



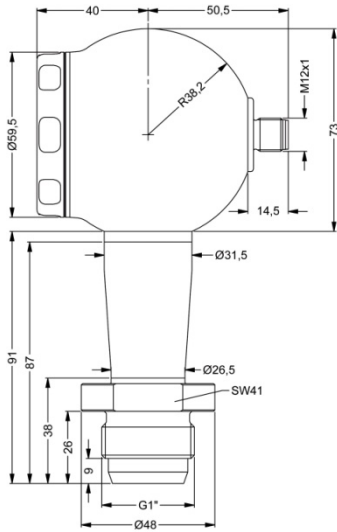
Pin configuration	
Electrical connections	M12x1 (4-pin), metal
Supply +	1
Supply -	3
Shield	plug housing



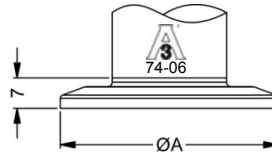
⁷ all designs in combination with G1" cone in horizontal rotatable housing as standard; other mech. connections in rotatable housing on request

Dimensions (in mm)

G1" cone

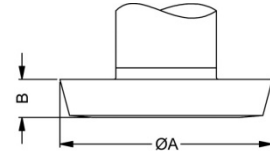


Clamp (DIN 32676)



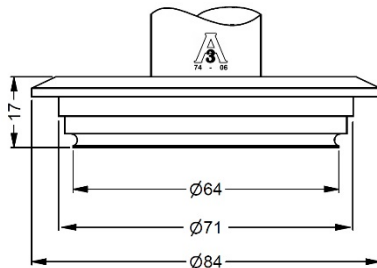
dimensions in mm				
size	3/4"	DN25	DN32	DN50
A	25	50.5	50.5	64
P _N [bar]	≥ 4 ≤ 8	≥ 0.25 ≤ 16	≤ 16	≤ 16

Dairy pipe⁸ (DIN 11851)



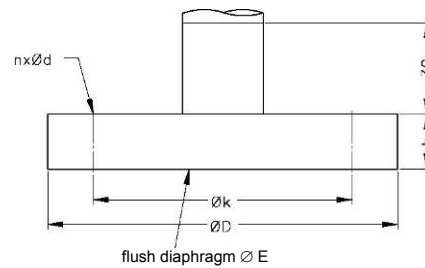
dimensions in mm			
size	DN25	DN40	DN50
A	44	56	68.5
B	10	10	11
P _N [bar]	≥ 0.25 ≤ 40	≥ 0.25 ≤ 40	≥ 0.25 ≤ 25

Varivent[®]



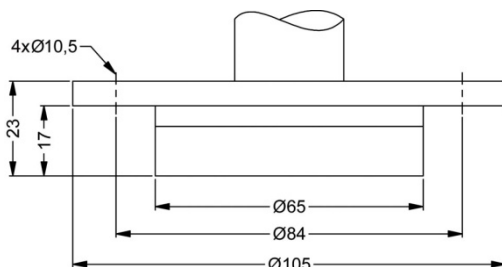
DN40/50
P_N ≤ 25 bar

Flange (DIN 2501)



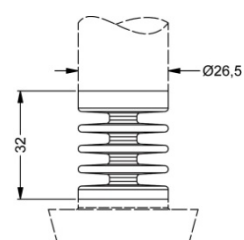
dimensions in mm			
size	DN25	DN50	DN80
D	115	165	200
E	30	89	89
k	85	125	160
b	18	20	20
n	4	4	8
d	14	18	18
P _N	≤ 40 bar	≤ 40 bar	≤ 16 bar

DRD⁸



P_N ≤ 25 bar

Cooling element



temperature range 300 °C

⁸ cup nut resp. mounting flange is included in the delivery (already pre-assembled)

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

