



# x|act i

## Precision Pressure Transmitter for Food Industry, Pharmacy and Biotechnology

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
- ▶ 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

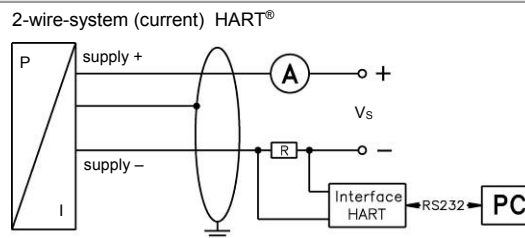
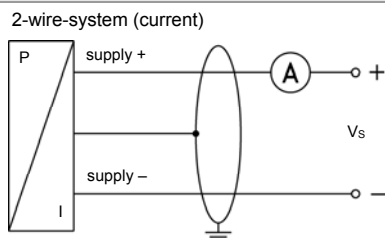
- ▶ material mill test report according to DIN EN 10204-3.1.
- ▶ specific test report according to DIN EN 10204-2.2.



Pressure ranges <sup>1</sup>								
Nominal pressure gauge / abs. <sup>2</sup>	[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
<sup>1</sup> higher pressure ranges on request; on demand we adjust the devices within the turn-down-possibility by software on the required pressure ranges								
<sup>2</sup> 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				V <sub>S</sub> = 12 ... 30 V <sub>DC</sub>		
Option		IS-version 2-wire: 4 ... 20 mA				V <sub>S</sub> = 12 ... 28 V <sub>DC</sub>		
		IS-version 2-wire: 4 ... 20 mA with HART® communication				V <sub>S</sub> = 12 ... 28 V <sub>DC</sub>		
Current consumption		max. 25 mA						
Performance								
Accuracy <sup>3</sup>		$\leq \pm 0.1$ % FSO						
performance after turn-down (TD)		no change of accuracy						
- TD $\leq$ 1:5		the accuracy is calculated as follows: $\leq 0.1 + 0.015 \times (\text{turn-down} - 5)$ % FSO						
- TD > 1:5		e.g. turn-down 9: $\leq 0.1 + 0.015 \times (9 - 5)$ % FSO = 0.16 % FSO						
Permissible load		R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] $\Omega$				load during HART® communication: R <sub>min</sub> = 250 $\Omega$		
Influence effects		supply: 0.05 % FSO / 10 V				permissible load: 0.05 % FSO / k $\Omega$		
Long term stability		$\leq \pm (0.1 \times \text{turn-down})$ % FSO / 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						
<sup>3</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)								
Thermal effects (Offset and Span) / Permissible temperatures								
Tolerance band <sup>4,5</sup>		$\leq \pm 0.2$ % FSO x turn-down						
in compensated range		-20 ... 85 °C						
Permissible temperatures <sup>6</sup>		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		
<sup>4</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions								
<sup>5</sup> for flange-, Varivent-, DRD-version: tolerance band offset $\leq \pm 1.6$ % FSO / tolerance band span $\leq \pm 0.6$ % FSO								
<sup>6</sup> 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	IBExU 05 ATEX 1106 X 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 $p_{\text{atm}}$ 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 $\mu\text{H}/\text{m}$
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 $\pm 9999$ ; 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 x 10 <sup>6</sup> pressure cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

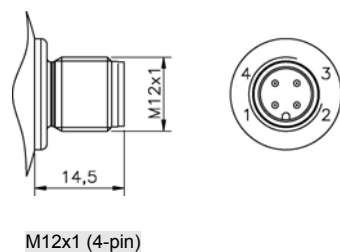
### Wiring diagrams



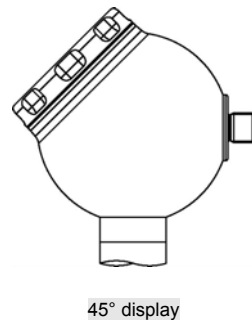
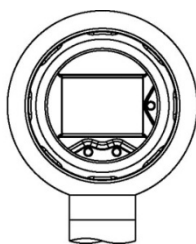
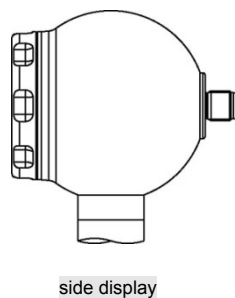
### Pin configuration

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

### Electrical connections (dimensions in mm)



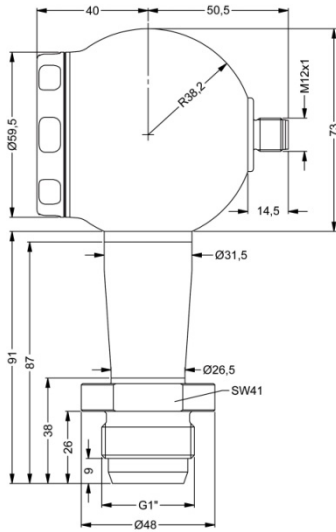
### Designs <sup>7</sup>



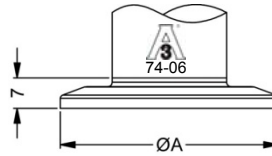
<sup>7</sup> all designs in combination with G1" cone in horizontal rotatable housing as standard; other mech. connections in rotatable housing on request

**Dimensions (in mm)**

**G1" cone**

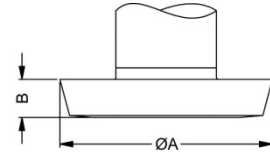


**Clamp (DIN 32676)**



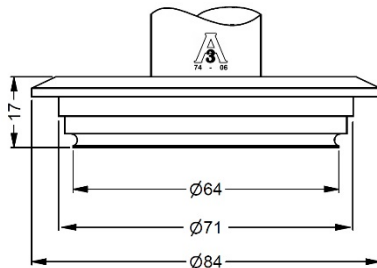
dimensions in mm				
size	3/4"	DN25	DN32	DN50
A	25	50.5	50.5	64
P <sub>N</sub> [bar]	≥ 4 ≤ 8	≥ 0.25 ≤ 16	≤ 16	≤ 16

**Dairy pipe<sup>8</sup> (DIN 11851)**



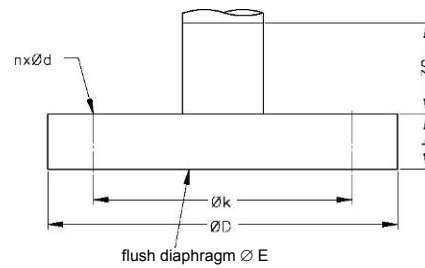
dimensions in mm			
size	DN25	DN40	DN50
A	44	56	68.5
B	10	10	11
P <sub>N</sub> [bar]	≥ 0.25 ≤ 40	≥ 0.25 ≤ 40	≥ 0.25 ≤ 25

**Varivent<sup>®</sup>**



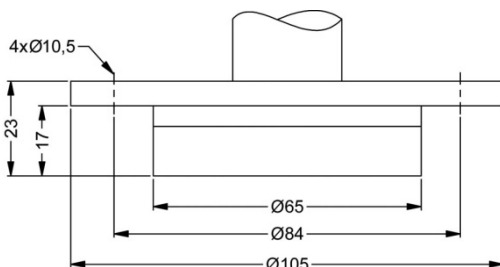
DN40/50  
P<sub>N</sub> ≤ 25 bar

**Flange (DIN 2501)**



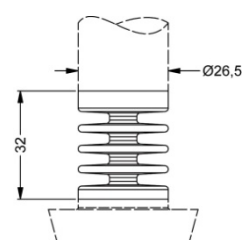
dimensions in mm			
size	DN25	DN50	DN80
D	115	165	200
E	30	89	89
k	85	125	160
b	18	20	20
n	4	4	8
d	14	18	18
P <sub>N</sub>	≤ 40 bar	≤ 40 bar	≤ 16 bar

**DRD<sup>8</sup>**



P<sub>N</sub> ≤ 25 bar

**Cooling element**



temperature range 300 °C

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

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

## Ordering code x|act i

x|act i

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Pressure										
gauge	5	1	1							
absolute <sup>1</sup>	5	1	2							
Input										
[bar] <sup>△</sup>										
0 ... 0.4 <sup>1</sup>	4	0	0	0						
0 ... 1	1	0	0	1						
0 ... 2	2	0	0	1						
0 ... 4	4	0	0	1						
0 ... 10	1	0	0	2						
0 ... 20	2	0	0	2						
0 ... 40	4	0	0	2						
-0.4 ... 0.4	S	4	0	0						
-1 ... 1	S	1	0	2						
-1 ... 2	V	2	0	2						
-1 ... 4	V	4	0	2						
-1 ... 10	V	1	0	3						
customer	9	9	9	9					consult	
Design										
side display					K	H				
45° display					K	4				
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				consult	
Accuracy										
0.1 % FSO					1					
Electrical connection										
male plug M12x1 (4-pin), metal					M	1	0			
customer	9	9	9						consult	
Mechanical connection										
G1" cone					K	3	1			
Clamp DN 25 / 1" (DIN 32676) / 3A					C	6	1			
Clamp DN 32 / 1 1/2" (DIN 32676) / 3A					C	6	2			
Clamp DN 50 / 2" (DIN 32676) / 3A					C	6	3			
Clamp 3/4" (DIN 32676) / 3A					C	6	9			
dairy pipe DN 25 (DIN 11851) <sup>2</sup>					M	7	3			
dairy pipe DN 40 (DIN 11851) <sup>2</sup>					M	7	5			
dairy pipe DN 50 (DIN 11851) <sup>2</sup>					M	7	6			
Varivent® DN 40/50 / 3A					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)					F	1	4			
DRD Ø 65 mm <sup>2</sup>					D	R	D			
Diaphragm										
stainless steel 1.4435 (316L)								1		
Hastelloy® C-276 (2.4819)								H		
tantalum <sup>3</sup>								T	consult	
Seals										
without								0		
Filling Fluids										
silicone oil								1		
food grade oil (FDA) / 3A								2		
Halocarbon								C	consult	
customer								9	consult	
Special version										
standard								0	0	0
with cooling element up to 300°C / 3A								2	0	0

<sup>△</sup> if setting range shall be different from nominal range please specify in your order

<sup>1</sup> absolute pressure possible from 1 bar

<sup>2</sup> cup nut resp. mounting flange is included in the delivery (already pre-assembled)

<sup>3</sup> tantalum diaphragm possible with nominal pressure ranges from 1 bar

HART® is a registered trade mark of HART Communication Foundation; Hastelloy® is a brand name of Haynes International Inc.

Varivent® is a brand name of GEA Tuuchenhagen GmbH

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