



x|act ci

Precision Pressure Transmitter for Process Industry

- ▶ flush mounted, capacitive ceramic sensor optionally with diaphragm Al₂O₃ 99.9 %
- ▶ nominal pressure ranges from 0 ... 60 mbar up to 0 ... 20 bar

Description

The x|act ci is an intelligent pressure transmitter - precise and long term stable - for process industry. Possibility for configuration is given:

- ▶ either in situ via integrated display and operating module
- ▶ or by remote access via HART® interface

Among others offset, span and damping are configurable.

Applications

- ▶ **Stainless steel ball housing**
for applications with high requirements on hygiene in **food industry and pharmacy**
standard with display and operating module
- ▶ **Aluminium die cast case**
in two chamber version for **process industry**
- ▶ **Stainless steel field housing**
for extremely rough conditions in **chemical and heavy industry**
both optional with display and operating module

- ▶ electrical versions:
4...20 mA / 2-wire with **integrated display and operating module**
optional as Ex-version
4...20 mA / 2-wire with **HART®-communication**
Ex-version
optional with display and operating module
- ▶ turn-down 1:10
- ▶ accuracy according to IEC 60770: 0.2 % FSO
- ▶ thermal error 0.1 % FSO / 10 K
- ▶ **Ex-protection up to zone 0**
- ▶ several process connections:
inch thread, Clamp, dairy pipe, Varivent, flange

Characteristics



x|act ci
Precision Pressure Transmitter

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Pressure ranges								
Nominal pressure gauge [bar]	0,06	0,16	0,4	1	2	5	10	20
Permissible overpressure [bar]	2	4	6	8	15	25	35	60
Permissible vacuum [bar]	-0.2	-0.3	-0.5			-1		
On customer request we adjust the devices by software on the required pressure ranges (within the turn-down-possibility; starting at 0.02 bar).								
Supply								
Standard	2-wire: 4 ... 20 mA / $V_s = 10 \dots 30 V_{DC}$				Ex-protection: $V_s = 10 \dots 28 V_{DC}$			
Option	2-wire: 4 ... 20 mA with HART [®] communication (option HART [®] communication is delivered in Ex-version as standard)							
In preparation	3-wire: 0 ... 10 V / $V_s = 15 \dots 36 V_{DC}$							
Current consumption	signal output current: max. 25 mA							
Performance								
Accuracy ¹	turn-down $\leq 1:5$ IEC 60770 ² : $\leq \pm 0.2$ % FSO		BFSL: $\leq \pm 0.1$ % FSO		turn-down $> 1:5$ $\leq \pm [0.2 + 0.015 \times (\text{nominal range} / \text{adjusted range})]$ % FSO			
Permissible load	$R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ 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	$\leq \pm (0.1 \times \text{nominal range} / \text{adjusted range})$ % 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. $1:10^4$ (span min. 0.02 bar)							
¹ for nominal pressure ranges ≤ 0.4 bar the accuracy is calculated as follows: $\leq \pm [0.2 + 0.02 \times (\text{nominal range} / \text{adjusted range})]$ % FSO ² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)								
Thermal errors / Permissible temperatures								
Thermal error	$\leq \pm (0.1 \times \text{nominal range} / \text{adjusted range})$ % FSO / 10 K in compensated range 0 ... 80 °C							
Permissible temperatures ³	without display: medium: -25 ... 125 °C		environment: -40 ... 80 °C		storage: -40 ... 80 °C			
	with display: medium: -25 ... 125 °C		environment: -20 ... 70 °C		storage: -30 ... 80 °C			
³ for PVC pressure port the maximum permissible temperature is 50 °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							
Mechanical stability								
Vibration	5 g RMS (20 ... 2000 Hz)							
Shock	100 g / 11 msec							
Electrical connections								
Stainless steel ball housing	standard: M12x1 4-pin ($V_{s+} = 1, V_{s-} = 3$, ground = plug housing) on request: cable outlet (cable with air tube; cable colours according to DIN 47100)							
Aluminium die cast case	standard: terminal clamps in clamping chamber with cable gland M16x1.5 (IP 67, $\varnothing = 5 \dots 10$ mm; clamp section: 2.5 mm ²) on request: terminal clamps in clamping chamber with cable gland M20x1.5							
Stainless steel field housing	standard: terminal clamps in clamping chamber with cable gland M16x1.5 (IP 67, \varnothing -range 4 ... 11 mm; clamp section: 1.5 mm ²) option: M12x1 4-pin ($V_{s+} = 1, V_{s-} = 3$, ground = plug housing) on request: cable outlet (cable with air tube; cable colours according to DIN 47100)							

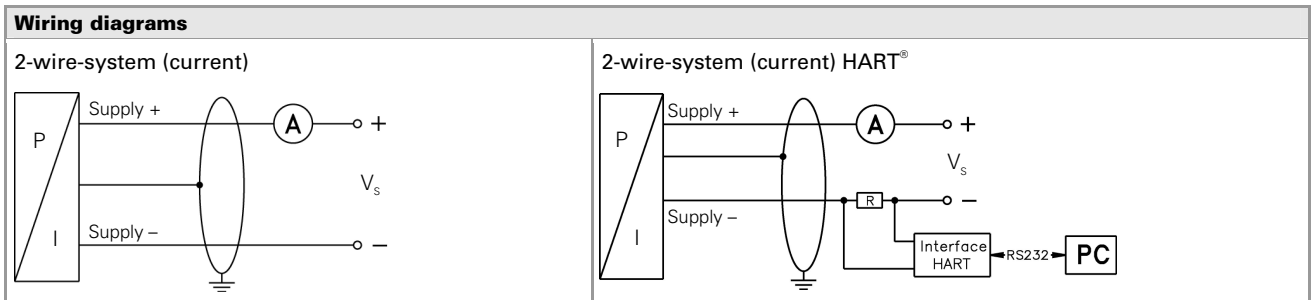


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Precision Pressure Transmitter

Technical Data

Materials / Filling fluids	
Pressure port	stainless steel 1.4435 (316L) / PVC ⁴ / PVDF ⁴
Housing	stainless steel 1.4301 (304) / aluminium die cast, powder-coated
Viewing glass	laminated safety glass
Seals (media wetted)	FKM / EPDM / others on request
Diaphragm	standard: ceramics Al ₂ O ₃ 96 % option for pressure ranges 0.16 bar, 0.4 bar and 1 bar: ceramics Al ₂ O ₃ 99.9 %
Media wetted parts	pressure port, seals, diaphragm
	⁴ only possible with mech. connection G1 1/2" flush (DIN 3852)
Miscellaneous	
Ingress protection	IP 67
Installation position	any
Weight	min. 400 g (depending on housing and mechanical connection)
Operational life	> 100 x 10 ⁶ cycles
Explosion protection	
Approval AX12-x act ci	stainless steel housing with stainless steel pressure port: zone 0: II 1 G EEx ia IIC T4 stainless steel housing with PVC or PVDF pressure port: zone 0/1 ⁵ : II 1/2G EEx ia IIC T4 aluminium die cast case with stainless steel pressure port: zone 0: II 1 G EEx ia IIB T4 aluminium die cast case with PVC or PVDF pressure port: zone 0/1 ⁵ : II 1/2G EEx ia IIB T4
Safety technical maximum values	V _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)	cable capacitance: signal line/shield also signal line/signal line: 150 pF/m cable inductance: signal line/shield also signal line/signal line: 1.0 µH/m
	⁵ The designation depends on the nominal pressure range. Nominal pressure ranges ≤ 60 mbar are marked with „2G“. For nominal pressure ranges > 60 mbar and < 10 bar see note under item 17 in the EC type-examination certificate!



Pin configuration		stainless steel ball housing / field housing	stainless steel field housing	aluminium die cast case
Electrical connection		M12x1 (4-pin)	cable colours (DIN 47100)	terminal clamps
2-wire-system	Supply +	1	white	1
	Supply -	3	brown	2
	Test ⁸	-	-	4
	Ground	plug housing	yellow / green (shield)	6
				3
				1
⁸ by connecting a ampere meter between the terminals Supply + and Test, the output signal can be measured without disconnecting the power supply				

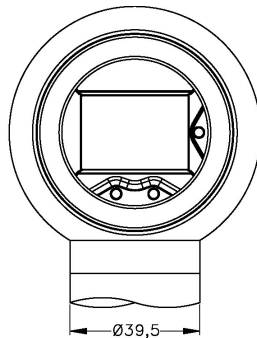
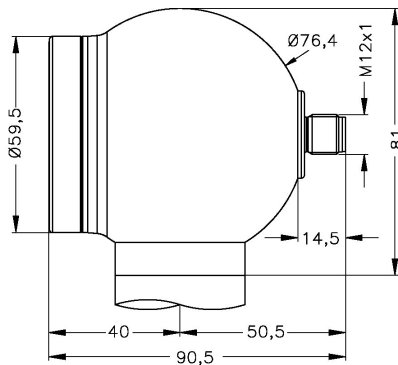
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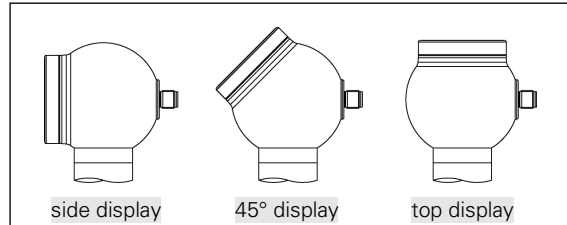
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Housings

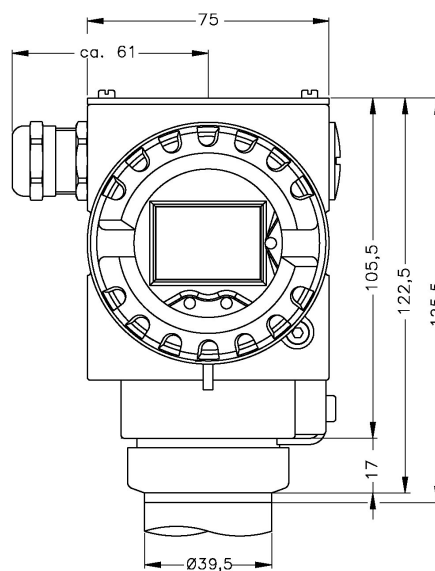
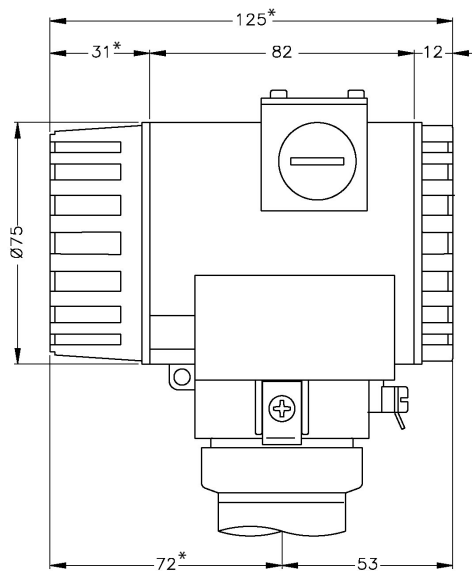
Stainless steel ball housing



Designs

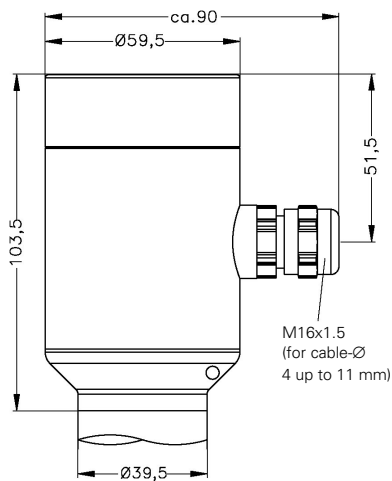


Aluminium die cast case

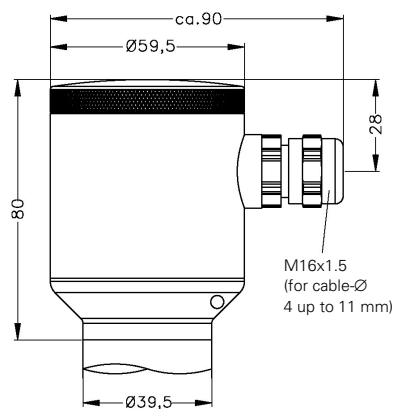


* without display and operating module marked dimensions decrease by 19 mm

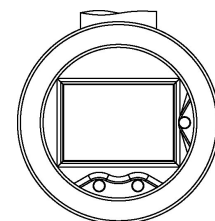
Stainless steel field housing



with display and operating module



without display and operating module





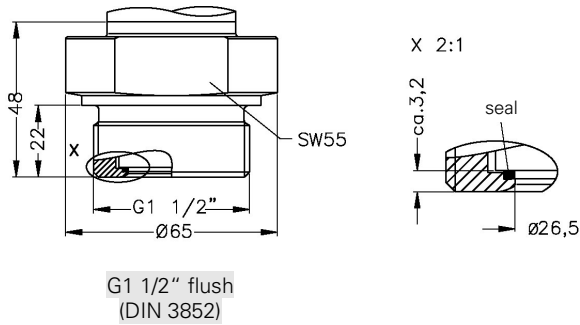
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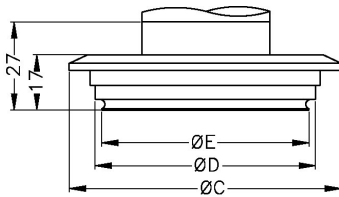
Mechanical connections

Process connections

Inch thread

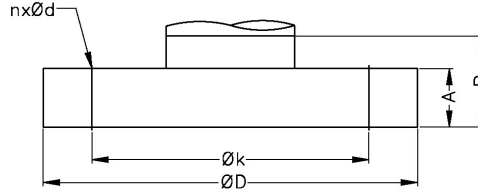


Varivent ⁷



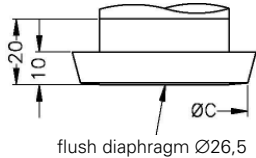
dimensions in mm	
size	DN 40/50
C	84
D	68
E	64

Flange ^{7,8}



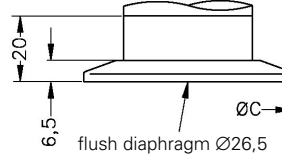
dimensions in mm			
size	DN25/PN40	DN50/PN40	DN80/PN16
D	115	165	200
k	85	125	160
A	18	20	20
B	28	30	30
n	4	4	8
d	14	18	18

Dairy pipe ⁹



dimensions in mm		
size	DN 40	DN 50
C	56	68.5

Clamp



dimensions in mm		
size	1 1/2"	2"
C	50.5	64

⇒ further process connections on request

⁷ on request

⁸ DN80/PN16 possible for nominal pressure ranges up to 16 bar

⁹ cup nut is included in the delivery (already pre-assembled)

Operation

Configuration of the precision pressure transmitter x|act ci is possible in situ via push buttons on the display module or by remote access via HART® interface.

Display and operating module

The indication of the measured value as well as the configuration of the individual parameters occurs through a menu via the LC display. The individual functions can be set with the help of three miniature push buttons located under the cap. Besides in the display a bargraph is shown, which indicates the current pressure input in per cent to the specified pressure range.

Among others following parameters could be configured:

- ▶ initial value
- ▶ terminal value
- ▶ damping
- ▶ pressure unit
- ▶ configuration of display
- ▶ password protection
- ▶ maximum pressure display
- ▶ minimum pressure display
- ▶ HART®-ID

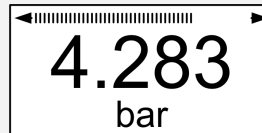
HART® communication

Via HART®-protocol the possibility of setting initial and terminal value is given. In addition simple configuration of the parameters and transmitting of process measured values is offered. By HART®-communication, which can run via PC, notebook, HART®-communicator or process leading systems, measured values and parameters become transparent and are available on every step of the signal circuit.

Configuration software

For the simple and time-saving configuration of the x|act ci offer a special configuration software. The software also uses the HART® interface and is compatible with all Windows® systems (Windows 98 and higher).

Displays



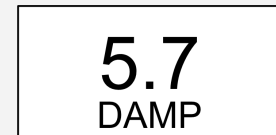
measured values



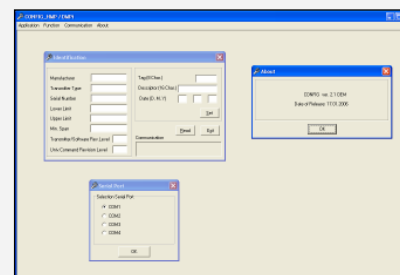
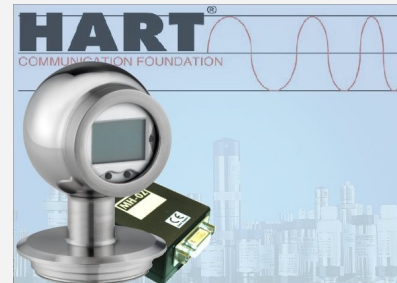
measured values pressure / temperature



maximum pressure display



configuration of damping



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