

Compact Pressure Transmitter DAN-HH



Application / Specified Usage

- Pressure measurement in pipes and vessels
- High Temperature applications up to 150 °C permanent

Application Examples

- Sanitary pressure monitoring for breweries, dairies and food & beverage production

Hygienic Design / Process Connection

- Front-flush, hygienic and easy sterilizable installation by sleeve EMZ-352 or build-in system EHG-.../1"
- Conforms to 3-A Sanitary Standard 74-05, Third Party Verified (when supplied with fixed Tri-Clamp fitting only).
- EHEDG certified hygienic CLEANadapt process connection
- CIP-/ SIP-cleanable up to 150 °C
- Sensor material and actuating fill are FDA compliant
- Sensor completely made of stainless steel
- Additional process connections in combination with CLEANadapt: diary flange (DIN 11851), Varivent, APV, DRD et al.

Features

- Extremely durable in high temperature applications up to 150 °C permanent
- Fast response time 200 microseconds
- Vacuum-proof
- Easy to operate
- Electrical connection with M12 plug-in connector
- Selectively as relative or absolute measuring sensor available
- Integrated two-wire measurement transmitter 4...20 mA

Options / Accessories

- Special pressure ranges, customized adjustment ex works
- Preassembled cable for M12 plug-in connector

Measuring Principle of the Pressure Sensor

This unit utilizes an internal piezoelectric transducer to convert the process measurement into a corresponding mV signal. The mV signal then passes through custom linearization and conditioning circuitry. The resulting signal is an industry standard 4...20 mA. This mA signal is factory set over the specified range of the unit.

With relative (gauge) pressure sensor the back of the transducer is vented to atmospheric pressure, i.e. this sensor measures the gauge pressure and/or vacuum relative to the atmospheric pressure. With absolute pressure sensor the back of the transducer is subject to full vacuum and then permanently sealed, i.e. this sensor measures pressure relative to an absolute vacuum.

Authorizations

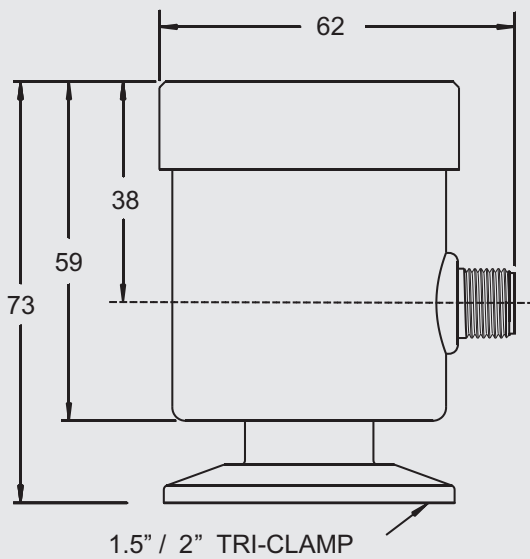


DAN-HH with EMZ-352

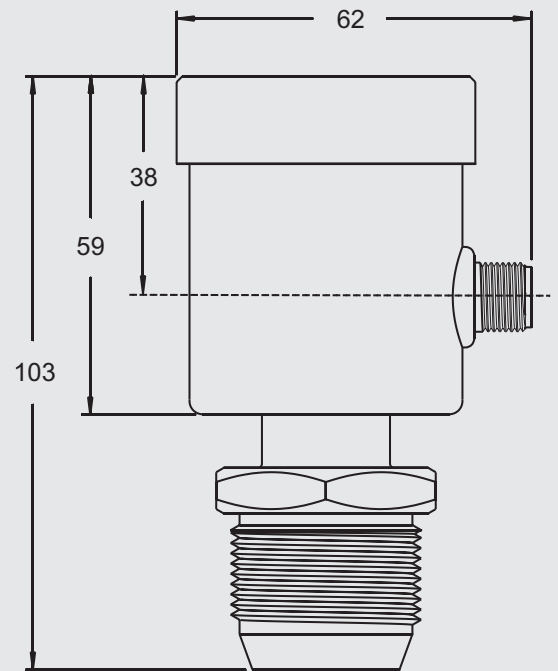


Specification		
Pressure ranges	relative, standard [bar]	0...1,0 / 2,0 / 3,0 / 7,0 / 14,0 / 20,0 / 34,0 -1...1,0 / -1...2,5 / -1...6,0 / -1...13,0
	absolute, standard [bar]	0...2,0 / 3,0 / 7,0 / 14,0 / 20,0
Electrical connection	cable connection supply	M12-plug stainless steel 12...36 VDC
Output		4...20 mA DC, 2 wire with non-interrupting circuit verification test points
Process	connection	thread G1" sensor, combined with Negele-weld-in- sleeves, build-in systems, adapter sleeves, or fixed Tri-Clamp 1,5" and 2" DIRECTadapt maximum 20 Nm for G1" CLEANadapt only
	torque	
Materials	wetted parts housing	stainless steel 1.4404 (316L), $R_a \leq 0,6 \mu\text{m}$ stainless steel 1.4305 (304)
Protection Class		IP 69 K
Accuracy		± 0.5 % of full scale
Repeatability		± 0.3 % of full scale
Hysteresis		± 0.10 % of full scale
Linearity		± 0.10 % of full scale
Stability		± 0.30 % of calibrated range for 6 months
Temperature ranges	ambient	-20...50 °C
	process storage	0...150 °C -40...65 °C
Effect of temperature change		± 0.1 psig/10 °F (± 7 mbar/5,5 °C) typical
Over-range rating	factor	Minimum of 2 times base range
Response time		200 μs
Adjustment	span	-50 % of range, except 1 bar rel. and 2 bar abs. cell: -10 %
	zero	± 10 %
Weight		640 g CLEANadapt G1" 490 g Tri-Clamp 1,5" 550 g Tri-Clamp 2"

Dimensioned Drawing DAN-HH with TriClamp



Dimensioned Drawing DAN-HH with G1"



Mechanical Connection / Installation



For G1" CLEANadapt only

- Attention: The maximum torque for mounting is 20 Nm!
- Use Negele **CLEANadapt** system for safe operation of measuring point.
- Use a welding mandril for correct installation of **CLEANadapt** weld-in-fittings. Please pay attention to the weld-in and installation details in the **CLEANadapt** product information.

Conventional Usage



- Not suitable for applications in explosive areas.
- Not suitable for applications in security-relevant equipments (SIL).

Conditions for a measuring point according to 3-A Sanitary Standard 74-05



- The sensors with Tri-Clamp process connection conforming to the 3-A Sanitary Standard.
- The sensors are designed for CIP-/ SIP-cleaning. Maximum 150 °C / 120 minutes.
- Only with 3-A conforming Tri-Clamp connection allowed.
- Mounting position: mounting position, self draining and the position of the leakage hole must be in accordance to current 3-A Sanitary Standard.

Startup

- Connect the sensor with power supply (12...36 V DC) -> see "Electrical Connection DAN-HH"
- Note: Factory-provided 0...100% of the complete measuring range are always adjusted to 4...20 mA at the output (for example 0...2 bar at the DAN-HH/2REL)
- Adjustments of the sensor are made via the potentiometers "ZERO" und "SPAN". Zero point (ZERO) and Span (SPAN) are non-interactive, meaning changing the zero will not change the span.
- As general maintenance to the unit, a zero check is recommended at approximately 6 month intervals.
- Other maintenance tasks are not necessary for the pressure sensor DAN-HH.

Electrical Connection / Installation

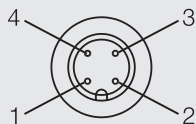


Although no interaction between zero and span occurs, when making adjustments you should be as close to the top and bottom transmitter range as possible. This will ensure the best possible linearity in the final signal output.

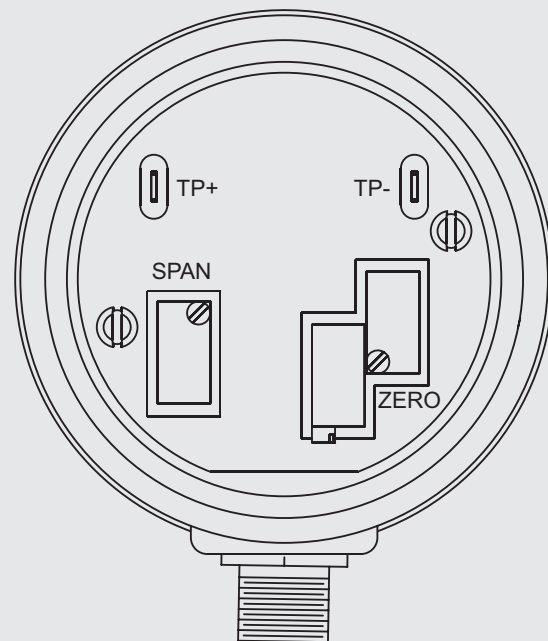
Electrical Connection DAN-HH

Configuration M12-plug

- 1: + supply
- 2: - supply 4...20 mA
- 3: not connected
- 4: not connected



DAN-HH shown with cap removed





Adjustment of sensor

The standard setting of the DAN-HH is: 0...100 % of the measurement range (for example 0...2 bar) are equivalent to 4...20 mA at the current output. If it necessary to change these settings for special measurement tasks, perform the following steps:

Adjustment of zero

- Connect ammeter to the current loop (to the terminals TP+ and TP-). If the ammeter displays 4,0 mA no adjustment is necessary.
- In other cases adjust the transmitter "ZERO" until you have the 4,0 mA at the output.
- If you use absolute pressure sensors the expected mA-signal of the zero point has to be calculated in the following way:

$$\text{mA output} = 16 \left[\frac{\text{Applied pressure} - \text{Low end of range}}{\text{Transmitter span}} \right] + 4 \text{ mA}$$

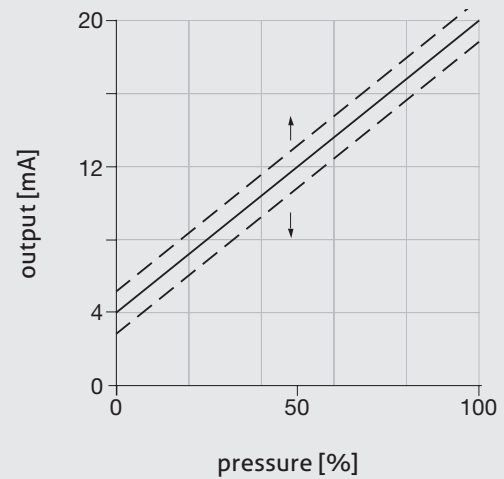
For example:

Applied pressure: 2 bar
 Low end of range: 0 bar
 Transmitter span: 7 bar
 mA output: 8,57 mA

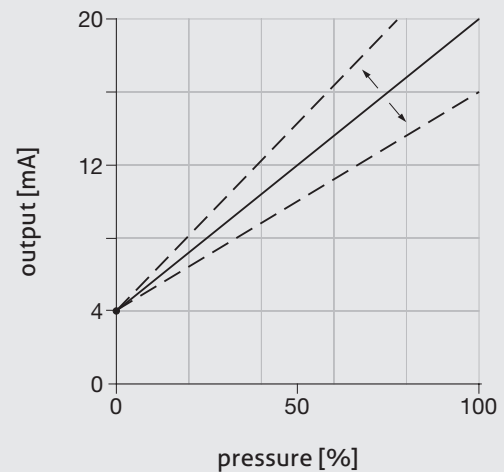
Adjustment of span

- Set the pressure to desired value.
- Connect ammeter to the current loop (to the terminals TP+ and TP-).
- Adjust the transmitter "ZERO" until you have the 20,0 mA you need at the output.
- Factory-provided standard measuring ranges may be turned down to a maximum of 50 % (for example DAN-HH/14REL with measuring range 0...14 bar may be turned down to 0...7 bar)
 Exception: 1 bar rel. and 2 bar abs.: -10 % max.

Adjustment of zero



Adjustment of span



Cleaning and Maintenance

- Don't use sharp items or aggressive detergents for cleaning.
- In case of using pressure washers, don't point nozzle directly to electrical connection!

Transport

- Sensors shall be clean and must not be contaminated with dangerous media!
- Use suitable transport packaging only to avoid damage of the equipment!

Transport / Storage

- No outdoor storage
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration
- Storage temperature 0...40 °C
- Relative humidity max. 80 %

Standards and Guidelines

- You have to comply with applicable regulations and directives.


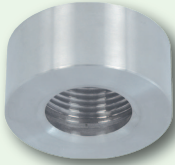


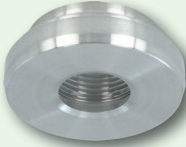
Disposal

- This Instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws.
- Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points.

Conformity declaration**Applicable directives:**

- EMC Directive 2004/108/EC
 - Low Voltage Directive 2006/95/EC
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- The CE label confirms compliance of this product with the applicable EC directives.
 - The operator is responsible for ensuring compliance with the directives that are applicable to the overall system.

Overview of deliverable process connections (basic device and adapters must be ordered separately!)
The complete overview of all available adapters you will find at product information **CLEANadapt**.

					
DAN-HH					
Process Connection	Build-in system EHG (DIN 11850 series 2)	Negele weld-in sleeve	Negele weld-in sleeve with leakage hole	Negele weld-in sleeve	DRD (press ring optional)
DN40	EHG-40/1"	EMZ-352 suitable for installation in vessels	EMZ-351 suitable for installation in vessels	EMS-352 suitable for installation in pipes	AMK-352/50 (only one size)
DN50	EHG-50/1"				
DN65	EHG-65/1"				
DN80	EHG-80/1"				
DN100	EHG-100/1"				

Overview of further possible process connections (adapter must be ordered separately!)

						
G1"						
Diameter	Dairy flange (DIN 11851)	Tri-Clamp	Varivent-Inline	APV-Inline	Adapter	
DN25	1"	AMK-352/DN25	AMC-352/DN25	AMV-352/DN25	-	AMG-352 G1½" (G1½" to G1" hygienic)
DN32		AMK-352/DN32	AMC-352/DN25	AMV-352/DN25	AMA-352	
DN40	1½"	AMK-352/DN40	AMC-352/DN25	AMV-352/DN40	AMA-352	
DN50	2"	AMK-352/DN50	AMC-352/DN50	AMV-352/DN40	AMA-352	
	2½"	AMK-352/DN65	AMC-352/2½"	AMV-352/DN40	-	
DN65		AMK-352/DN65	AMC-352/DN65	AMV-352/DN40	AMA-352	
	3"	-	AMC-352/DN65	AMV-352/DN40	-	
DN80		AMK-352/DN80	AMC-352/DN80	AMV-352/DN40	AMA-352	
DN100		AMK-352/DN100	AMC-352/DN100	AMV-352/DN40	AMA-352	

Order Code

DAN-HH

Compact Pressure Sensor

Process Connection

TC1,5 (Tri-Clamp 1,5"; incl. 3-A TPV verification)
TC2 (Tri-Clamp 2"; incl. 3-A TPV verification)
S (CLEANadapt G1"; without 3-A TPV verification)

Measurement Range Absolute

2ABS (absolute pressure cell 0...2 bar)
3ABS (absolute pressure cell 0...3 bar)
7ABS (absolute pressure cell 0...7 bar)
14ABS (absolute pressure cell 0...14 bar)
20ABS (absolute pressure cell 0...20 bar)
[end value] ABS other absolute pressure range, specify required range in "bar" with "ABS"

Messbereich Relativ

1REL (relative pressure cell 0...1 bar)
2REL (relative pressure cell 0...2 bar)
3REL (relative pressure cell 0...3 bar)
7REL (relative pressure cell 0...7 bar)
14REL (relative pressure cell 0...14 bar)
20REL (relative pressure cell 0...20 bar)
34REL (relative pressure cell 0...34 bar)
-1...1REL (relative pressure cell -1...1 bar)
-1...2,5REL (relative pressure cell -1...2,5 bar)
-1...6REL (relative pressure cell -1...6 bar)
-1...13REL (relative pressure cell -1...13 bar)
[end value] REL other relative pressure range, specify required range in "bar" with "REL"

Electrical Connection

M12 (M12-Stecker 1.4305)

DAN-HH /

S /

14ABS /

M12

Accessories

PVC-cable with M12-connection, 1.4305 (303), IP 69 K, unshielded

M12-PVC / 4-5m PVC-cable 4-pin, length 5 m
M12-PVC / 4-10m PVC-cable 4-pin, length 10 m
M12-PVC / 4-25m PVC-cable 4-pin, length 25 m
M12-PVC / 5-5m PVC-cable 5-pin, length 5 m
M12-PVC / 5-10m PVC-cable 5-pin, length 10 m
M12-PVC / 5-25m PVC-cable 5-pin, length 25 m

PVC-cable with M12-connection, brass nickel-plated, IP 67, shielded

M12-PVC / 4G-5m PVC-cable 4-pin, length 5 m
M12-PVC / 4G-10m PVC-cable 4-pin, length 10 m
M12-PVC / 4G-25m PVC-cable 4-pin, length 25 m
M12-PVC / 5G-5m PVC-cable 5-pin, length 5 m
M12-PVC / 5G-10m PVC-cable 5-pin, length 10 m
M12-PVC / 5G-25m PVC-cable 5-pin, length 25 m

CERT / 2.2

factory certification 2.2 acc. to EN10204
(only product contacting surface)

PVC-cable with M12-connection

