

Product Information HA7

PHARMA

Mini Pressure Transmitter HA7

Application/Specified usage

- Pressure measurement in pipes and vessels
- High Temperature applications up to 150 °C permanent
- Suitable for pressure applications in the Bio-Pharmaceutical and life-science industries

Application examples

- Ideal for OEM skids such as:
 - Filtration
 - Chromatography
 - Blending
 - CIP/SIP
- Bioreactors
- Fermenters
- Pressure vessels
- Blending and mixing
- All critical process control

Hygienic design/Process connection

- Conforms to ASME-BPE 2012 standards
- CIP-/SIP-cleaning up to 150 °C
- Sensor material and actuating fill are FDA compliant
- Sensor and product contact surfaces made of stainless steel
- Additional process connections: 3/4", 1", 1½", 2" Tri-Clamp, Standard & Mini CPM

Features

- Extremely durable in high temperature applications up to 150 °C permanent
- Fast response time, less than 200 milliseconds
- 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 atmosphere, 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

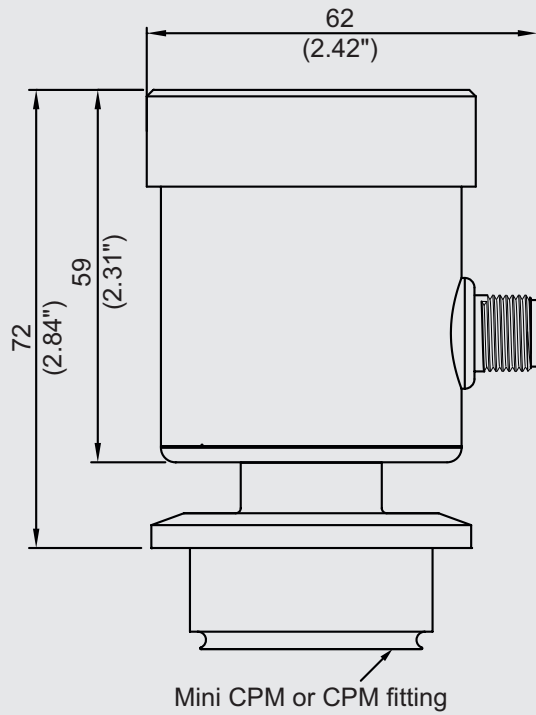

**ASME BPE
2012**

HA7 with Tri-Clamp

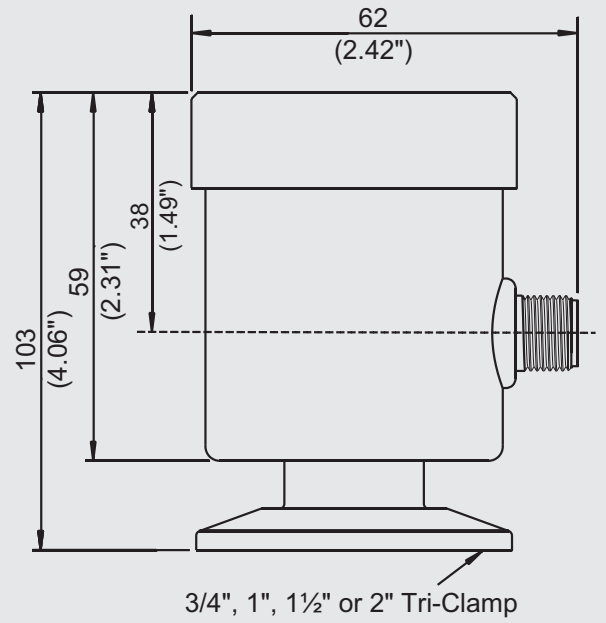


Specification		
Pressure ranges	relative [bar]	0...1,0/2,0/3,0/4,0/6,0/7,0/10,0/14,0/20,0/30,0/34,0/35,0/50,0/60,0/70,0
	absolute [bar]	-1...1,0/2,5/3,0/4,0/5,0/6,0/7,0/13,0
	relative [psi]	0...2,0/3,0/7,0/14,0/20,0
	absolute [psi]	0...15/20/30/50/60/100/150/200/300/500/1000 30"Hg...0/15/30/60/100/185 0...20/30/50/60/100/150/200/300
Electrical connection	cable connection supply	M12-plug, 5 pin (1.4305) 12...36 V DC
Output	signal	4...20 mA DC, 2 wire loop with non-interrupting circuit verification test points
	burden	700 Ω at 24 V
Process	connection	Tri-Clamp 3/4", 1", 1½" and 2" Tri-Clamp Standard and Mini CPM (DIRECTadapt)
Materials	wetted parts housing	stainless steel 1.4404 (316L), R _a ≤ 0.38 μm electropolished stainless steel 1.4305 (304)
Protection class		IP 69 K / NEMA 4X
Accuracy		±0.25 % of full scale
Repeatability		±0.1 % of full scale
Hysteresis		±0.1 % of full scale
Linearity		±0.1 % of full scale
Stability		±0.15 % of calibrated range for 6 months
Temperature ranges	ambient process storage	-18...50 °C (0 °F...120 °F) -1...150 °C (30 °F...300 °F) -40...65 °C (-40 °F...149 °F)
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 milliseconds
Adjustment	span	-50 % of range, except 15 psi / 1 bar rel. and 20 psi / 2 bar abs. cell: -10 %
	zero	±10 %
Weight		490 g (Tri-Clamp 1.5") 550 g (Tri-Clamp 2") 640 g (CPM)

Dimensional drawing HA7 with CPM



Dimensional drawing HA7 with Tri-Clamp

**Conventional usage**

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



Startup

- Connect the sensor with power supply (12...36 V DC) -> see "Electrical Connection HA7"
- 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 HA7/057)
- 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 HA7.

Electrical Connection / Installation

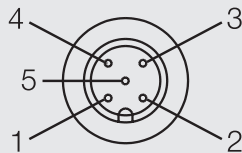


Although no interaction between zero and span occurs, when making adjustments you should be as close to the top and bottom transmitter range as possible. This will ensure the best possible linearity in the final signal output.

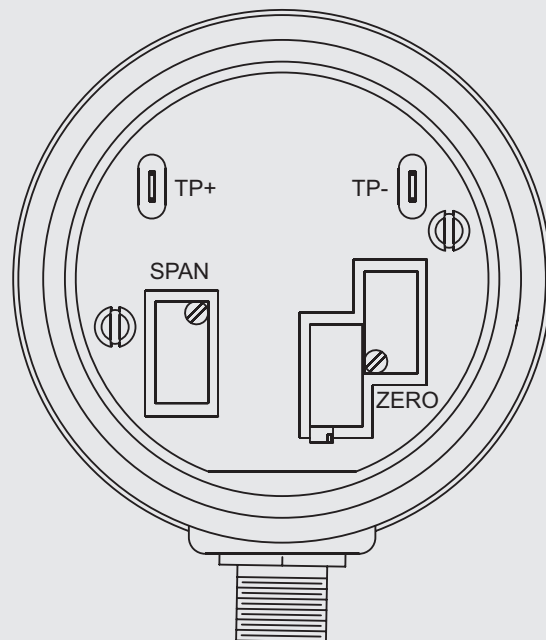
Electrical Connection HA7

Configuration M12-plug

- 1: + 24 V DC
- 2: Output 4...20 mA
- 3: not connected
- 4: not connected
- 5: not connected



HA7 shown with cap removed





Adjustment of sensor

The standard setting of the HA7 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

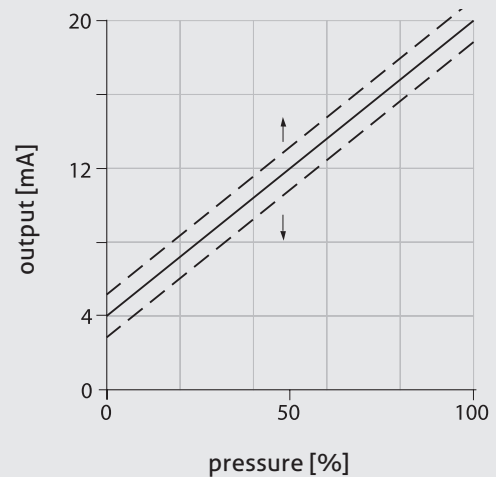
- Connect ammeter to the current loop (to the terminals TP+ and TP-). If the ammeter displays 4,0 mA no adjustment is necessary.
- In other cases adjust the transmitter "ZERO" until you have the 4,0 mA at the output.
- If you use absolute pressure sensors the expected mA-signal of the zero point has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

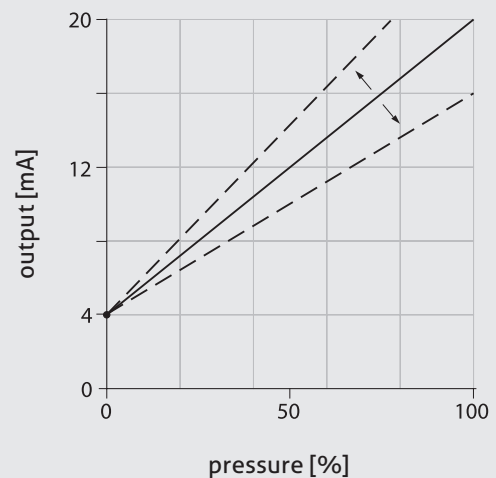
Adjustment of zero



Adjustment of span

- Set the pressure to desired value.
- Connect ammeter to the current loop (to the terminals TP+ and TP-).
- Adjust the transmitter "SPAN" 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 HA7/14REL with measuring range 0...14 bar may be turned down to 0...7 bar)
 Exception:
 15 psi / 1 bar rel. and 20psi / 2 bar abs.: -10 % max.

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!

Storage



- No outdoor storage
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration
- Storage temperature -40...+65 °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
 - 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.

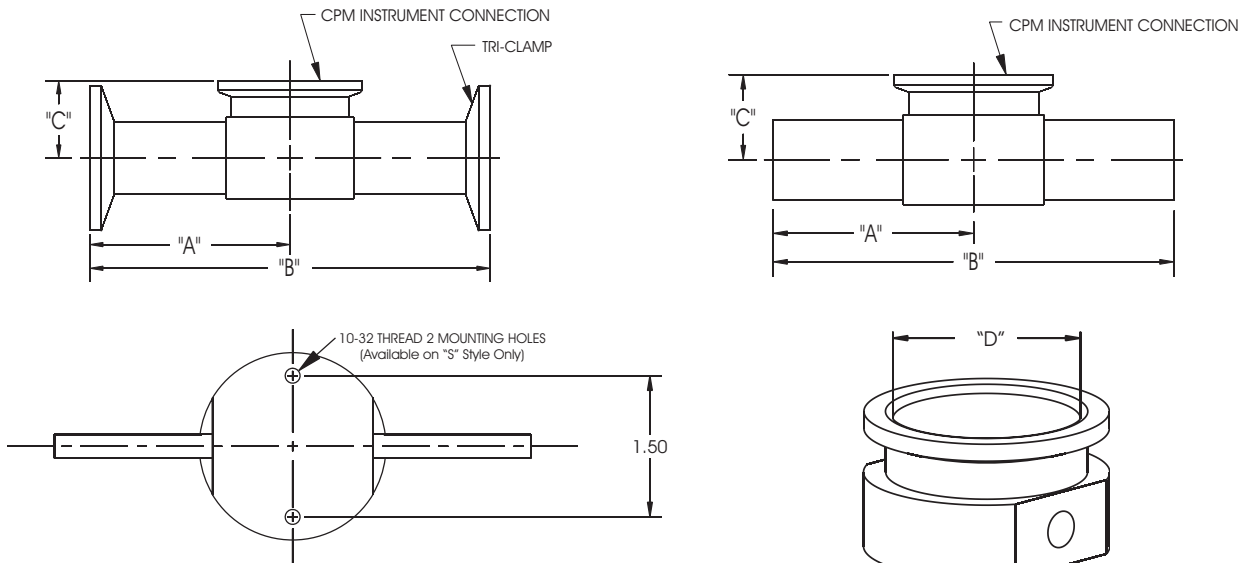
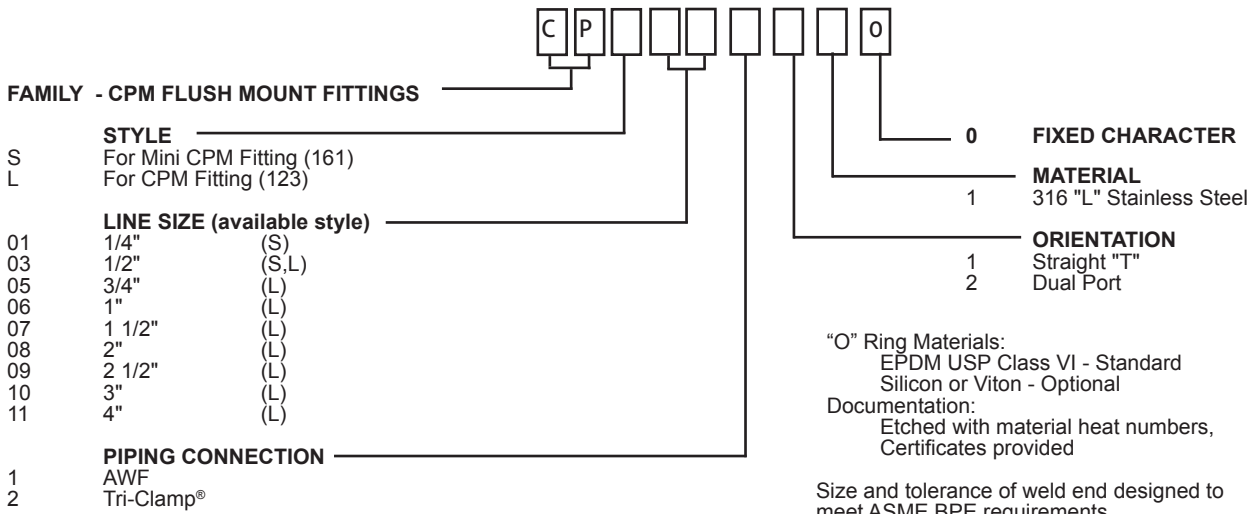
Accessories

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

- 42117K0025 Molded w/25' cable
- 42117K0050 Molded w/50' cable
- 42117K0100 Molded w/100' cable

PVC-cable with M12-connection, 1.4305 (303), IP 69 K, shielded to nut

- 42117H0025 5-Conductor Molded w/25' cable
- 42117H0050 5-Conductor Molded w/50' cable
- 42117H0100 5-Conductor Molded w/100' cable



Standard Dimensions

Line Size	Size Code	Piping Connection	Product Contact Finish*	"A"	"B"	"C"	"D"
1/4"	01 (S)	AWF	SFT 5	2"	4"	3/4"	≈ 7/8"
1/2"	03 (S)	AWF	SFT 4	2"	4"	13/16"	≈ 7/8"
	03 (S)	Tri-Clamp®	SFT 4	3"	6"	13/16"	≈ 7/8"
1/2"	03 (L)	AWF	SFT 4	2-5/8"	5-1/4"	13/16"	≈ 1-1/2"
	03 (L)	Tri-Clamp®	SFT 4	2-1/4"	4-1/2"	13/16"	≈ 1-1/2"
3/4"	05 (L)	AWF	SFT 4	2-5/8"	5-1/4"	15/16"	≈ 1-1/2"
	05 (L)	Tri-Clamp®	SFT 4	2-3/8"	4-3/4"	15/16"	≈ 1-1/2"
1"	06 (L)	AWF	SFT 4	2-3/8"	4-3/4"	1-1/16"	≈ 1-1/2"
	06 (L)	Tri-Clamp®	SFT 4	2-5/8"	5-1/4"	1-1/16"	≈ 1-1/2"
1-1/2"	07 (L)	AWF	SFT 4	2-3/4"	5-1/2"	1-5/16"	≈ 1-1/2"
	07 (L)	Tri-Clamp®	SFT 4	2-7/8"	5-3/4"	1-5/16"	≈ 1-1/2"
2"	08 (L)	AWF	SFT 4	3-1/2"	7"	1-9/16"	≈ 1-1/2"
	08 (L)	Tri-Clamp®	SFT 4	3-3/8"	6-3/4"	1-9/16"	≈ 1-1/2"
2-1/2"	09 (L)	AWF or Tri-Clamp®	SFT 2	3-5/8"	7-1/4"	2"	≈ 1-1/2"
3"	10 (L)	AWF or Tri-Clamp®	SFT 2	3-7/8"	7-3/4"	2-1/4"	≈ 1-1/2"
4"	11 (L)	AWF or Tri-Clamp®	SFT 2	4-3/4"	9-1/2"	2-3/4"	≈ 1-1/2"

* Product Contact Finish Table	
SFT 2	R _a max = 25 microinch
SFT 4	R _a max = 15 microinch Electropolished
SFT 5	R _a max = 20 microinch Electropolished NOTE: Tube to body weld Electropolished as welded

REPLACEMENT O-RINGS (1 supplied w/ each instrument, replacements supplied 6 per package)

	Standard CPM(123)	Mini CPM(161)
EPDM USP Class VI (Standard)	56096A0001	56096B0001
Silicone (clear)	56096A0002	56096B0002
Viton 3107	56096A0003	56096B0003

Order code

HA7 Compact pressure transmitter

Measurement range bar (0...URL)

Compatible with range types B & T unless noted

- 246 (0...1 bar)
- 057 (0...2 bar)
- 235 (0...3 bar)
- 192 (0...4 bar)
- 060 (0...6 bar)
- 309 (0...7 bar)
- 061 (0...10 bar)
- 062 (0...14 bar)
- 065 (0...20 bar)
- 066 (0...30 bar) (range B only)
- 491 (0...34 bar) (range B only)
- 224 (0...35 bar) (range B only)
- 068 (0...50 bar) (range B only)
- 069 (0...60 bar) (range B only)
- 206 (0...70 bar) (range B only)

Measurement range bar (-1...URL)

Compatible with range types B

- 418 (-1...0 bar)
- 251 (-1...1 bar)
- 286 (-1...2.5 bar)
- 217 (-1...3 bar)
- 056 (-1...4 bar)
- 356 (-1...5 bar)
- 475 (-1...6 bar)
- 304 (-1...7 bar)
- 495 (-1...13 bar)

Range type

- G PSI gauge (no vacuum)
- C PSI Relative
- A PSI Absolute
- B BAR Relative
- T BAR Absolute
- M 30"Hg (range 025 only)

Process connection/fitting

- 002 (Tri-Clamp 3/4")
- 003 (Tri-Clamp 1")
- 004 (Tri-Clamp 1½")
- 005 (Tri-Clamp 2")
- 123 (CPM)
- 161 (mini CPM)

Sensor type

- 0 Standard

Diaphragm material

- 1 316L Stainless

Finish

- 3 Electropolished R_a 3.8 micron

Electrical connection

- A0 (M12-plug 1.4305 / QDR with no cable)
- A1 (QDR & Field wirable connector (FWC) with no cable)

Measurement range psi (0...URL)

Compatible with range types G & A unless noted

- 063 (0...15 psi)
- 065 (0...20 psi)
- 066 (0...30 psi)
- 068 (0...50 psi)
- 069 (0...60 psi)
- 071 (0...100 psi)
- 073 (0...150 psi)
- 075 (0...200 psi)
- 077 (0...300 psi)
- 081 (0...500 psi) (range G only)
- 084 (0...1000 psi) (range G only)

Measurement range psi (30"Hg...URL)

Compatible with range types C unless noted

- 025 (30"Hg...0) (range M only)
- 028 (30"Hg...15 psig)
- 029 (30"Hg...30 psig)
- 031 (30"Hg...60 psig)
- 032 (30"Hg...100 psig)
- 494 (30"Hg...185 psig)

HA7 246 / B / 004 / 0 / 1 / 3 / A0