



Level



Pressure



Flow



Temperature

Liquid
Analysis

Registration

Systems
Components

Services



Solutions

Technical Information

Cerabar S PMP71 with MID Parts Certificate

Process pressure measurement

Pressure transmitter with metal sensors; Overload-resistant and function-monitored; Communication via HART; Subcomponent suitable for custody transfer measurement with NMi approval



Application

Cerabar S serves as a component of a system suitable for custody transfer measurement, for highly accurate measurement of pressures, and finds application in custody transfer. It satisfies the applicable requirements in accordance with OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006.

The Parts Certificate is issued on the basis of the following standards:

- WELMEC guide 8.8 “General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID”.
- OIML R117-1 Edition 2007 (E) “Dynamic measuring systems for liquids other than water”.
- EN 12405-1/A1 Edition 2006 “Gas meters – Conversion devices – Part 1: Volume conversion”.

The Cerabar S pressure transmitter is used for the following measuring tasks:

- Absolute pressure in gases or liquids in all areas of process engineering and process measurement technology
- International usage thanks to a wide range of approvals

Your benefits

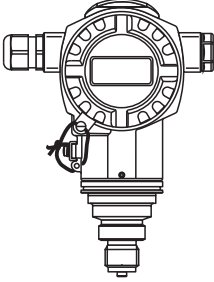
- Very good reproducibility and long-term stability
- High reference accuracy: up to $\pm 0.075\%$, as PLATINUM version: $\pm 0.05\%$
- Used for process pressure monitoring up to SIL3, certified to IEC 61508 by TÜV SÜD
- HistoROM®/M-DAT memory module
- Function-monitored from the measuring cell to the electronics
- Quick commissioning with Quick Setup menu
- Menu-guided operation

Table of contents

Function and system design	3	Degree of protection	14
Overview	3	Climate class	14
Measuring principle	4	Vibration resistance	14
Applications suitable for custody transfer measurement	4	Electromagnetic compatibility	14
Communication protocol	4	MID Parts Certificate	14
Input	4	Operating conditions (Process)	15
Measured variable	4	Process temperature range	15
Measuring range	4	Pressure specifications	15
Output	5	Mechanical construction	16
Output signal	5	Dimensions of T14 housing, optional display on the side	16
Signal range – 4 to 20 mA HART	5	Dimensions of T17 housing (hygienic), optional display on the side .	16
Signal on alarm	5	Process connections	17
Load – 4 to 20 mA HART	5	Wall and pipe mounting with mounting bracket	22
Resolution	5	Weight	22
Dead time, time constant	6	Material (not wetted)	23
Dynamic behavior, current output	6	Material (wetted)	25
Dynamic behavior, HART	6	Human interface	26
Damping	6	Operating elements	26
Power supply	7	Operating elements	27
Electrical connection	7	Local operation	28
Supply voltage	9	Remote operation	28
Cable entry	9	Hardware and software for onsite and remote operation	28
Cable specification	9	Certificates and approvals	30
Residual ripple	9	CE mark	30
Influence of power supply	9	Ex approvals	30
Performance characteristics	10	Marine certificate	30
Note!	10	Functional safety SIL/ IEC 61508 Declaration of Conformity	30
Reference operating conditions	10	(optional)	30
Uncertainty of measurement for small absolute pressure ranges ..	10	Pressure Equipment Directive (PED)	30
Long-term stability	10	Standards and guidelines	30
Influence of the installation position	10	Approvals for custody transfer	30
Proof of accuracy of the versions suitable for custody transfer	10	MID Parts Certificate	30
measurement	10	Drinking water approval	30
Software reliability	10	North-American practice for installation of process seals	30
Reference accuracy	11	Ordering information	31
Total performance	11	PMP71	31
Total error	11	Additional documentation	33
Warm-up period	11	Field of Activities	33
Thermal change of the zero output and the output span	11	Technical Information	33
Operating conditions (Installation)	12	Operating Instructions	33
General installation instructions	12	Brief Operating Instructions	33
Measuring arrangement	12	Functional safety manual (SIL)	33
Wall and pipe-mounting	12	MID Parts Certificate	33
Turning the housing	12	Safety Instructions	33
Oxygen applications	13	Installation/Control Drawings	33
Ultrapure gas applications	13	Operating conditions (Environment)	14
Sealing for the custody transfer	13	Ambient classes	14
Operating conditions (Environment)	14	Ambient temperature range	14
Ambient classes	14	Storage temperature range	14
Ambient temperature range	14		
Storage temperature range	14		

Function and system design

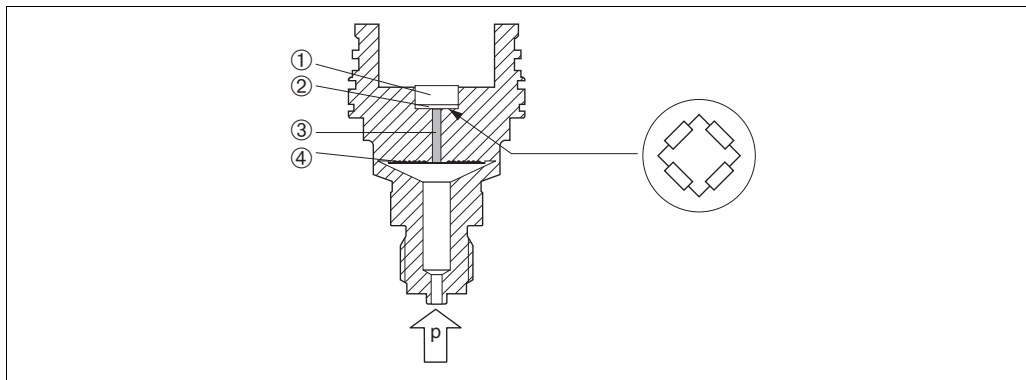
Overview

Cerabar S	<p>PMP71 MID</p>  <p style="text-align: right;">P01-PMP71MID-17-xx-xx-xx-001</p> <p>With piezoresistive measuring cell and metal welded process isolating diaphragm</p>
Field of application	Absolute pressure
Process connections	<ul style="list-style-type: none"> - Diverse thread - DN 25 – DN 80 - ANSI 1 1/2" – 4" - JIS 25 A – 100 A - Oval flange adapter
Measuring ranges	10 bar (150 psi), 50 bar (750 psi), 100 bar (1500 psi)
OPL ¹⁾	Max. 400 bar (6000 psi)
Process temperature range	–25 to +55 °C (-13 to +131 °F)
Ambient temperature range	–25 to +55 °C (-13 to +131 °F) ²⁾
Reference accuracy	<ul style="list-style-type: none"> - Up to ±0.075 % of the set span - PLATINUM version: up to ±0.05 % of the set span
Supply voltage	<ul style="list-style-type: none"> - Version for non-hazardous areas: 10.5 to 45 V DC - Ex ia: 10.5 to 30 V DC
Output	4 to 20 mA with superimposed HART protocol
Options	<ul style="list-style-type: none"> - NACE-compliant materials - inspection certificate 3.1 - HistorOM[®]/M-DAT memory module
Specialties	<ul style="list-style-type: none"> - Process connections with minimum oil volume - Gas-tight, elastomer-free

1) OPL: over pressure limit; depends on the lowest-rated element, with regard to pressure, of the selected components

2) Lower temperatures on request

Measuring principle



P01-PMP7xxxx-03-xx-xx-xx-000

Metal sensor

- 1 Silicon measuring element, substrate
- 2 Wheatstone bridge
- 3 Channel with fill fluid
- 4 Metal process isolating diaphragm

The operating pressure deflects the process isolating diaphragm and a fill fluid transfers the pressure to a resistance bridge (semiconductor technology). The pressure-dependent change in the bridge output voltage is measured and evaluated.

Advantages:

- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure (see "OPL" column in table on Page 4)
- Secondary containment for enhanced integrity

Applications suitable for custody transfer measurement

As a component of a system suitable for custody transfer measurement, Cerabar S can be used for custody transfer measurement. Onsite acceptance is subject to national custody transfer regulations. After being accepted, Cerabar S has to be sealed to prevent access to the electronics and changes to the software settings.

Communication protocol

4 to 20 mA with HART communication protocol

Input

Measured variable

Absolute pressure

Measuring range

Metallic process diaphragms for absolute pressure

Nominal value	Range limit		Min. WP for gas applications suitable for custody transfer measurement	Min. WP for liquid applications suitable for custody transfer measurement	MWP ¹⁾	OPL ²⁾	Vacuum resistance ³⁾ Silicone oil / inert oil	Versions in the order code ⁴⁾
	lower (LRL)	upper (URL) ⁵⁾						
[bar (psi)]	[bar (psi)]	[bar (psi)]	[bar (psi)]	[bar (psi)]	[bar (psi)]	[bar (psi)]	[bar (psi)]	
10 (150)	0	+10 (150)	0.5 (7.5)	0.5 (7.5)	26.7 (400.5)	40 (600)	0.01/0.04 (0.15/1)	MP
50 (750)	0	+50 (750)	10 (150)	2.5 (37.5)	100 (1500)	400 (6000)	0.01/0.04 (0.15/1)	MT
100 (1500)	0	+100 (1500)	5 (75)	5 (75)	100 (1500)	400 (6000)	0.01/0.04 (0.15/1)	MU

- 1) The MWP (maximum working pressure) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection (→ 16 ff) has to be taken into consideration in addition to the measuring cell (→ see Table above). Also observe pressure-temperature dependency. For the appropriate standards and further information, see → 15, "Pressure specifications" section.
- 2) OPL: over pressure limit depends on the lowest-rated element, with regard to pressure, of the selected components
- 3) The vacuum resistance applies for the measuring cell under reference operating conditions.
- 4) Version in the order code → 31 ff, feature 40 "Sensor range; sensor over pressure limit (= OPL)"
- 5) Max. WP for gas and liquid applications suitable for custody transfer measurement

Output

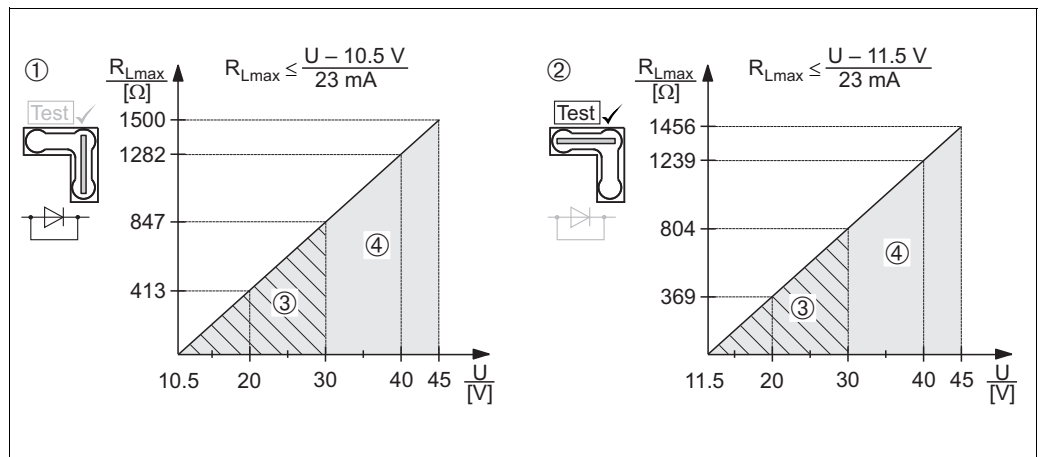
Output signal 4 to 20 mA with superimposed digital communication protocol HART 5.0, 2-wire

Signal range – 4 to 20 mA HART 3.8 mA to 20.5 mA

Signal on alarm As per NAMUR NE43
4 to 20 mA HART
Options:

- Max. alarm: adjustable from 21 to 23 mA (factory setting: 22 mA)
- Hold measured value: last measured value is held
- Min. alarm: 3.6 mA

Load – 4 to 20 mA HART



Load diagram, observe the position of the jumper and the explosion protection (→ See also Page 8, "Measuring a 4 to 20 mA test signal" section.)

- 1 Jumper for 4 to 20 mA test signal set to "Non-test" position
- 2 Jumper for 4 to 20 mA test signal set to "Test" position
- 3 Power supply 10.5 (11.5) to 30 V DC for 1/2 G, 1 GD, 1/2 GD, FM IS, CSA IS, IECEx ia, NEPSI Ex ia
- 4 Power supply 10.5 (11.5) to 45 V DC for devices for non-hazardous areas, 1/2 D, 1/3 D, 2 G Ex d, 3 G Ex nA, FM XP, FM DIP, FM NI, CSA XP, CSA dust ignition proof, NEPSI Ex d

R_{Lmax} Maximum load resistance
U Supply voltage

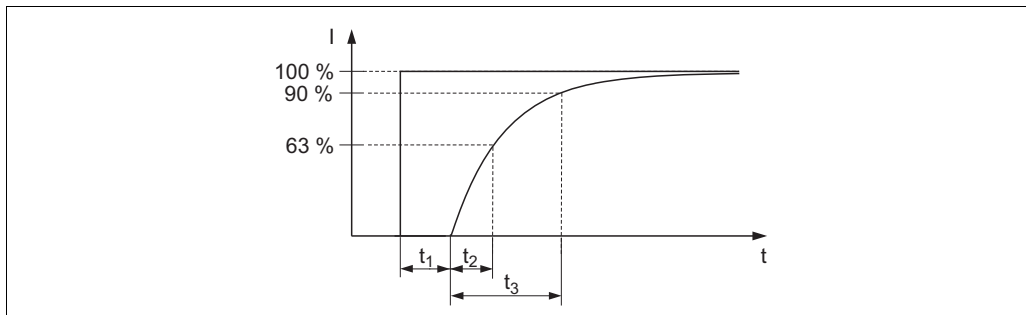
Note!

When operating via a handheld terminal or via a PC with an operating program, a minimum communication resistance of 250 Ω must exist within the loop.

Resolution

- Current output: 1 μ A
- Display: adjustable (factory setting: presentation of the maximum accuracy of the transmitter)

Dead time, time constant



P01-xxxxxxx-05-xx-xx-xx-030

Presentation of the dead time and the time constant

Dynamic behavior, current output

Dead time t_1	Time constant (T63), t_2	Time constant (T90), t_3
45 ms	35 ms	81 ms

Dynamic behavior, HART

Dead time t_1	Time constant (T63), t_2	Time constant (T90), t_3
295 ms	35 ms	81 ms

Reading cycle

HART command: average 3 to 4 per second.
 The Cerabar S commands the BURST MODE function for cyclic value transmission via the HART communication protocol.

Response time

≤ 250 ms

Cycle time (update time)

On average 250 to 330 ms.

Damping

A damping affects all outputs (output signal, display).

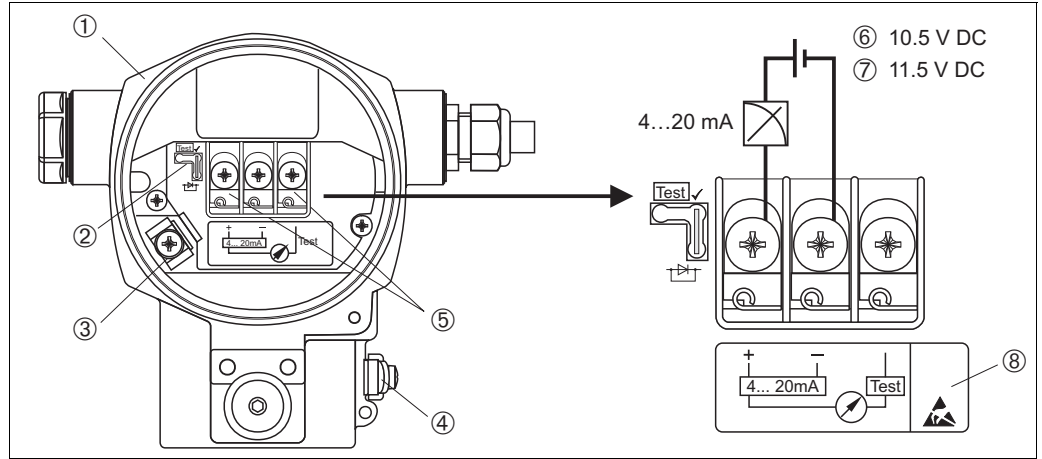
- Via onsite display, handheld terminal or PC with operating program, continuous from 0 to 999 s
- via DIP switch on the electronic insert, switch position "on" = set value and "off"
- Factory setting: 2 s

Power supply

Electrical connection

Note!

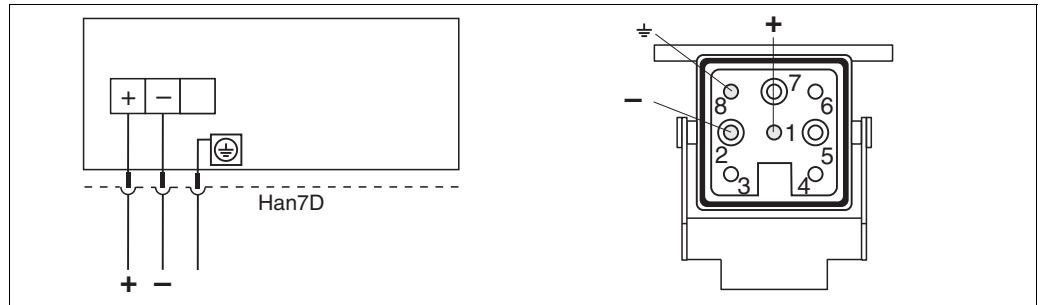
- When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.
→ 33 ff, "Safety Instructions" and "Installation/Control Drawings" sections.
- Protective circuits against reverse polarity, HF influences and overvoltage peaks are installed.



Electrical connection

- 1 Housing
- 2 Jumper for 4 to 20 mA test signal
→ 8, "Measuring a 4 to 20 mA test signal" section.
- 3 Internal ground terminal
- 4 External ground terminal
- 5 4 to 20 mA test signal between positive and test terminal
- 6 Minimum supply voltage = 10.5 V DC, jumper is set as illustrated in the diagram.
- 7 Minimum supply voltage = 11.5 V DC, jumper is set to "Test" position.
- 8 Not used

Devices with Harting plug Han7D

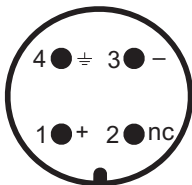


Left: Electrical connection for devices with Harting plug Han7D
Right: View of the plug connector at the device

Material: CuZn

Devices with M12 plug

PIN assignment for M12 plug

	PIN	Meaning
	1	Signal +
	2	Not assigned
	3	Signal -
	4	Ground

Endress+Hauser offers the following accessories for devices with an M12 plug:

Plug-in jack M 12x1, straight

- Material: body PA; thread adapter nut CuZn, nickel-plated
- Degree of protection (fully locked): IP67
- Order number: 52006263

Plug-in jack M 12x1, elbowed

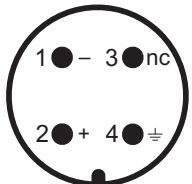
- Material: body PBT/PA; thread adapter nut GD-Zn, nickel-plated
- Degree of protection (fully locked): IP67
- Order number: 71114212

Cable 4x0.34 mm² (20 AWG) with M12 socket, elbowed, screw plug, length 5 m (16 ft)

- Material: body PUR; thread adapter nut CuSn/Ni; cable PVC
- Degree of protection (fully locked): IP67
- Order number: 52010285

Devices with 7/8" plug

PIN assignment for 7/8" plug

	PIN	Meaning
	1	Signal -
	2	Signal +
	3	Not assigned
	4	Ground

External thread: 7/8 - 16 UNC

- Material: housing / body CuZn, nickel-plated
- Degree of protection: IP68

Cable gland



Approval	Type	Clamping area
Standard, II1/2G Exia, IS	Plastic M20x1.5	5 to 10 mm (0.2 to 0.39 in)
ATEX II1/2D, II1/3D, II1/2GD Exia, II1GD Exia, II3G Ex nA	Metal M20x1.5 (Ex e)	7 to 10.5 mm (0.28 to 0.41 in)

Terminals

For wire cross-sections of 0.5 to 2.5 mm² (20 to 14 AWG)

Measuring a 4 to 20 mA test signal

A 4 to 20 mA test signal may be measured via the positive and test terminal without interrupting the measurement. The minimum supply voltage of the device can be reduced by simply changing the position of the jumper. As a result, operation is also possible with lower voltage sources. Observe the position of the jumper in accordance with the following table.

Jumper position for test signal	Description
	<ul style="list-style-type: none"> - Measuring 4 to 20 mA test signal via the plus and test terminal: possible. (Thus, the output current can be measured without interruption via the diode.) - Delivery status - Minimum supply voltage: 11.5 V DC
	<ul style="list-style-type: none"> - Measuring 4 to 20 mA test signal via the plus and test terminal: not possible. - Minimum supply voltage: 10.5 V DC

Supply voltage

- Version for non-hazardous areas, jumper for 4 to 20 mA test signal in "Test" position (delivery status): 11.5 to 45 V DC
- Version for non-hazardous areas, jumper for 4 to 20 mA test signal in "Non-test" position: 10.5 to 45 V DC

Note!

- When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.
- All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas. → 33 ff, "Safety Instructions" and "Installation/Control Drawings" sections.

Cable entry

→ 31 ff, feature 30 "Housing; cable entry; degree of protection".

Cable specification

- Endress+Hauser recommends using shielded, twisted-pair two-wire cables.
- Terminals for core cross-sections 0.5 to 2.5 mm² (20 to 14 AWG)
- Outer diameter of cable: 5 to 9 mm (0.2 to 0.35 in) depending on the cable gland used (→ 9)

Residual ripple

Without influence on 4 to 20 mA signal up to ± 5 % residual ripple within the permitted voltage range [according to HART hardware specification HCF_SPEC-54 (DIN IEC 60381-1)]

Influence of power supply

≤ 0.0006% of URL/1 V

Performance characteristics

Note! Accuracy for devices suitable for custody transfer measurement corresponding to weight & measurement standards in accordance with OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006. General operating / ambient conditions, → 14.

Reference operating conditions

OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006:

- Ambient temperature T_U = constant, in range: +21 to +33 °C (+70 to 91 °F)
- Humidity φ = constant, in the range of: 5 to 80 % RH
- Ambient pressure p_U = constant, in range: 860 to 1060 mbar (12.47 to 15.37 psi)
- Position of the measuring cell = constant, in range: horizontal $\pm 1^\circ$
- Input of LOW SENSOR TRIM and HIGH SENSOR TRIM for lower range value and upper range value
- Zero based span
- Material of the process diaphragms: AISI 316L/1.4435
- Filling oil: silicone oil
- Supply voltage: 24 V DC \pm 3 V DC
- Load with HART: 250 Ω

Uncertainty of measurement for small absolute pressure ranges

The smallest extended uncertainty of measurement that can be returned by our standards is:

- in the range 1 to 30 mbar (0.0145 to 0.435 psi): 0.4% of the measured value
- in the range < 1 mbar (0.0145 psi): 1% of the measured value.

Long-term stability

	1 year	5 years	10 year
Measuring ranges [bar (psi)]	% of URL		
10 (150)	±0.025	±0.050	±0.075
50 (750)	±0.025	±0.075	±0.100
100 (1500)	±0.050	±0.150	±0.200

Influence of the installation position

- Process connections thread G 1 A, G 1 1/2, G 2, 1 1/2 MNPT, 2 MNPT, M 44x1.25, EN/DIN, ANSI, and JIS flange: \leq 10 mbar (0.15 psi)
- Process connections thread: G 1/2, 1/2 MNPT, JIS G 1/2, JIS R 1/2, M20x1.5: \leq 4 mbar (0.06 psi)

Device rotated 180°, process connection pointing upwards. The value is doubled for devices with inert oil.

Note!

Position-dependent zero shift can be corrected. See → 12, "General installation instructions" section.

Proof of accuracy of the versions suitable for custody transfer measurement

The accuracy of each Cerabar S is proven by a calibration certificate that logs the absolute and relative measuring error of 10 measuring points during the final test.

Software reliability

The software of Cerabar S fulfills the requirements of OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006. In particular, this includes:

- A cyclical check of the data consistency
- Non-volatile memory
- Segmented data storage

Cerabar S continuously checks that the accuracy required for custody transfer measurements is maintained in accordance with OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006.

Reference accuracy

The reference accuracy comprises the non-linearity according to limit point setting, hysteresis and non-reproducibility as per IEC 60770. The data refer to the calibrated span.

Measuring cell	Sensor	Accuracy	
		standard	Platinum
10 bar (150 psi)	Absolute pressure	±0.075 %	±0.05 % ¹⁾
50 bar (750 psi)			
100 bar (1500 psi)			

1) Platinum version not for flush-mounted process connections G 1/2 and M20.

Total performance

The "Total performance" specification comprises the non-linearity including hysteresis, non-reproducibility as well as the thermal change of the zero point.

All information applies for the temperature range -10 to +60 °C (+14 to 140 °F).

Measuring cell	% of URL
10 bar (150 psi)	±0.15
50 bar (750 psi)	±0.25
100 bar (1500 psi)	±0.25

Total error

The total error comprises the total performance and long-term stability.

All information applies for the temperature range -10 to +60 °C (+14 to 140 °F).

Measuring cell	% of URL/year
10 bar (150 psi)	±0.2
50 bar (750 psi)	±0.2
100 bar (1500 psi)	±0.3

Warm-up period

4 to 20 mA HART: < 10 s

Thermal change of the zero output and the output span

Measuring cell	-10 to +60 °C (+14 to +140 °F)	-40 to -10 °C, +60 to +85 °C (-40 to +14 °F, +140 to +185 °F)
	% of the set span	
10 bar (150 psi)	±(0.1 x TD + 0.01)	±(0.4 x TD + 0.02)
50 bar (750 psi)	±(0.1 x TD + 0.01)	±(0.4 x TD + 0.02)
100 bar (1500 psi)	±(0.2 x TD + 0.015)	±(0.4 x TD + 0.03)

Operating conditions (Installation)

General installation instructions

- The position-dependent zero point shift can be corrected directly at the device via operating keys, and also in hazardous areas in the case of devices with external operation.
- The housing of the Cerabar S can be rotated 380°. See → § 12, "Turning the housing" section.
- Endress+Hauser offers a mounting bracket for installing the device on pipes or walls.
→ See also → § 12, "Wall and pipe-mounting" section.

Measuring arrangement

Cerabar S transmitters without diaphragm seals are mounted as per the norms for a manometer (DIN EN 837-2). We recommend the use of shutoff devices and siphons. The orientation depends on the measuring application.

Pressure measurement in gases

- Mount Cerabar S with shutoff device above the tapping point so that any condensate can flow into the process.

Pressure measurement in steams

- Mount Cerabar S with siphon above the tapping point.
The siphon reduces the temperature to almost the ambient temperature.
- Fill the siphon with liquid before commissioning.

Pressure measurement in liquids

- Mount Cerabar S with shutoff device below or at the same level as the tapping point.

Wall and pipe-mounting

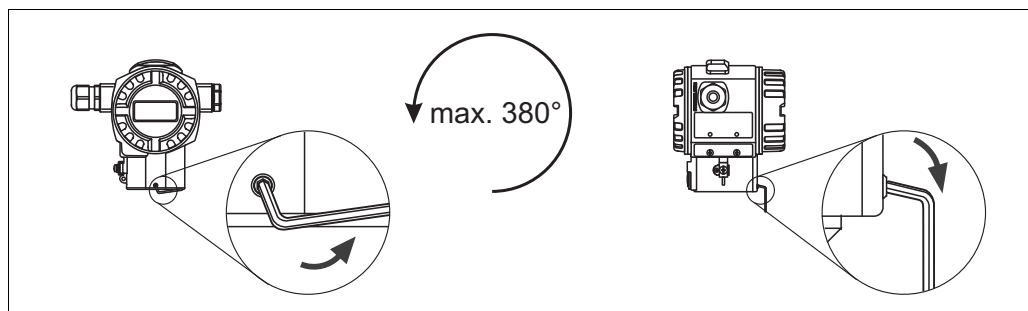
Endress+Hauser offers a mounting bracket for installing the device on pipes or walls.
See also → § 31 ff, feature 110, "Additional option 2" or as a separate accessory (part number: 71102216).
For the dimensions, see → § 22.

Turning the housing

The housing can be rotated 380° by loosening the Allen screw.

Your benefits

- Simple mounting by optimally aligning the housing
- Good, accessible device operation
- Optimum readability of the onsite display (optional).



*Aligning the housing by releasing the setscrew
T14 housing: 2 mm Allen screw; T17 housing: 3 mm Allen screw*

Oxygen applications

Oxygen and other gases can react explosively to oils, grease and plastics, such that, among other things, the following precautions must be taken:

- All components of the system, such as measuring devices, must be cleaned in accordance with the BAM (DIN 19247) requirements.
- Dependent on the materials used, a certain maximum temperature and a maximum pressure for oxygen applications must not be exceeded.


The devices suitable for gaseous oxygen applications are listed in the following table with the specification p_{max} .

Order code for devices ¹⁾ cleaned for oxygen applications	p_{max} for oxygen applications	T_{max} for oxygen applications
PMP71 - * * * * * * * * N * *	Depends on the lowest-rated element, with regard to pressure, of the selected components: over pressure limit (OPL) of the sensor ¹ , process connection (1.5 x PN) or fill fluid (160 bar)	85 °C (185 °F)

1) Only devices, not accessories or enclosed accessories.

Ultrapure gas applications

Endress+Hauser also offers devices for special applications, such as ultrapure gas, cleaned from oil and grease. No special restrictions regarding the process conditions apply to these devices.

→  32, "Order information", feature 90 "Fill fluid".

Sealing for the custody transfer

If the local authorities require it for custody transfer, seal the housing cover at the sealing screws with seal wire and seals.

Sealing screws are provided for on the housing covers to make the seal. The seal wires have to be attached in the direction opposite of the way the housing cover screws were unscrewed. We recommend attaching at least two seal wires (with seal).

Operating conditions (Environment)

Ambient classes M3 / E3

Ambient temperature range -25 to +55 °C (-13 to +131 °F)
For devices for use in hazardous areas, see Safety Instructions, Installation or Control Drawing (→ 33 ff, sections "Safety Instructions" and "Installation/Control Drawings").

Storage temperature range

- -40 to +90 °C (-40 to +194 °F)
- On-site display: -40 to +85 °C (-40 to +185 °F)

Degree of protection

- → See Page 31 ff, feature 30 "Housing; cable entry; degree of protection".
- Degree of protection IP 68 for T17 housing; 1.83 mH₂O for 24

Climate class Class 4K4H (air temperature: -20 to 55 °C (-4 to +131 °F), relative humidity: 4 to 100 %) fulfilled as per DIN EN 60721-3-4 (condensation possible)

Vibration resistance

Device/accessory	Test standard	Vibration resistance
PMP71	GL	Guaranteed for 3 to 25 Hz: ±1.6 mm (0.063 in); 25 to 100 Hz: 4 g in all 3 axes
With mounting bracket	IEC 61298-3	Guaranteed for 10 to 60 Hz: ±0.15 mm (0.0059 in); 60 to 500 Hz: 2 g in all 3 axes

Electromagnetic compatibility

- Electromagnetic compatibility to EN 61326 and NAMUR recommendation EMC (NE21). For details refer to the Declaration of Conformity.
- With enhanced immunity against electromagnetic fields as per EN 61000-4-3:
30 V/m with closed cover¹
- Maximum deviation: < 0.5 % of span

1) For devices with T14 housing

MID Parts Certificate All aspects of OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006 are fulfilled.

Operating conditions (Process)

Process temperature range -25 to +55 °C (-13 to +131 °F)

Pressure specifications

- The maximum pressure for the measuring device depends on the lowest-rated element with regard to pressure.

See the following sections:

- → 4 ff, "Measuring range" section
- "Mechanical construction" section.

The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of 20°C (68°F), or 100°F (38 °C) for ANSI flanges, and may be applied to the device for an unlimited time. Observe the temperature dependency of the MWP.

- The pressure values permitted at higher temperatures can be found in the following standards:
 - EN 1092-1: 2001 Tab. 18 ¹
 - ASME B 16.5a – 1998 Tab. 2-2.2 F316
 - ASME B 16.5a – 1998 Tab. 2.3.8 N10276
 - JIS B 2220
- The test pressure corresponds to the over pressure limit of the device ($OPL = 1.5 \times MWP^2$) and may be applied for only a limited time period in order to avoid permanent damage.
- The Pressure Equipment Directive (EC Directive 97/23/EC) uses the abbreviation "PS". The abbreviation "PS" corresponds to the MWP (maximum working pressure) of the measuring device.
- In the case of sensor range and process connections where the over pressure limit (OPL) of the process connection is smaller than the nominal value of the sensor, the device is set at the factory, at the very maximum, to the OPL value of the process connection. If you want to use the entire sensor range, select a process connection with a higher OPL value ($1.5 \times PN$; $MWP = PN$).
- In oxygen applications, the values for p_{max} and T_{max} for oxygen applications" as per → 13, "Oxygen applications" may not be exceeded.

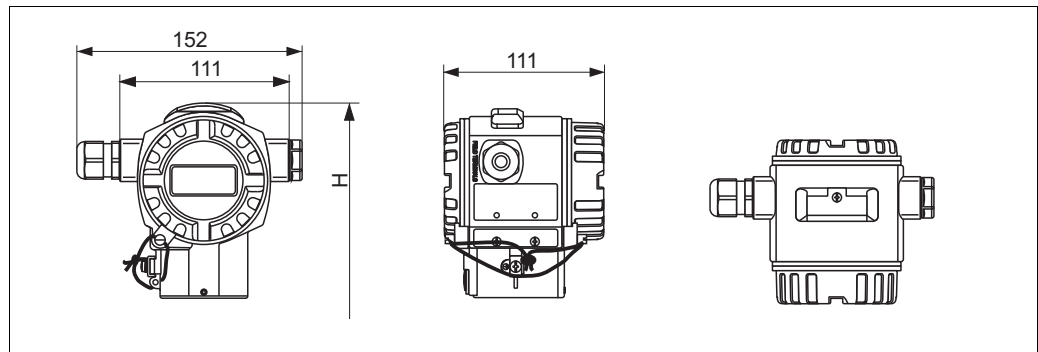
- 1) With regard to their stability-temperature property, the materials 1.4435 and 1.4404 are grouped together under 13E0 in EN 1092-1: 2001 Tab. 18. The chemical composition of the two materials can be identical.
- 2) The equation does not apply for PMP71 with a 50 bar (750 psi) or 100 bar (1500 psi) measuring cell.

Mechanical construction

Note!

For custody transfer applications, the cover clamp screws have to be locked with seal wire.

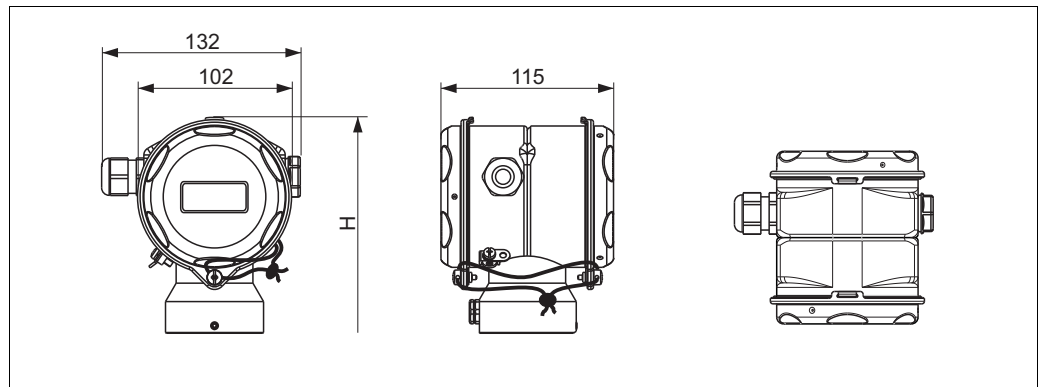
Dimensions of T14 housing, optional display on the side



Front view, left-hand side view, top view.

→ Installation height H , see process connection in question. Housing weight → 22.

Dimensions of T17 housing (hygienic), optional display on the side

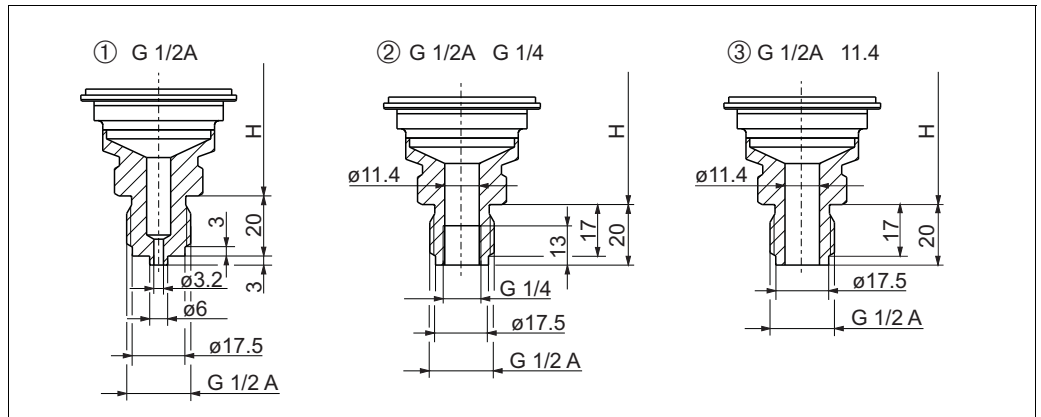


Front view, left-hand side view, top view.

→ Installation height H , see process connection in question. Housing weight → 22.

Process connections

Thread, internal process isolating diaphragm

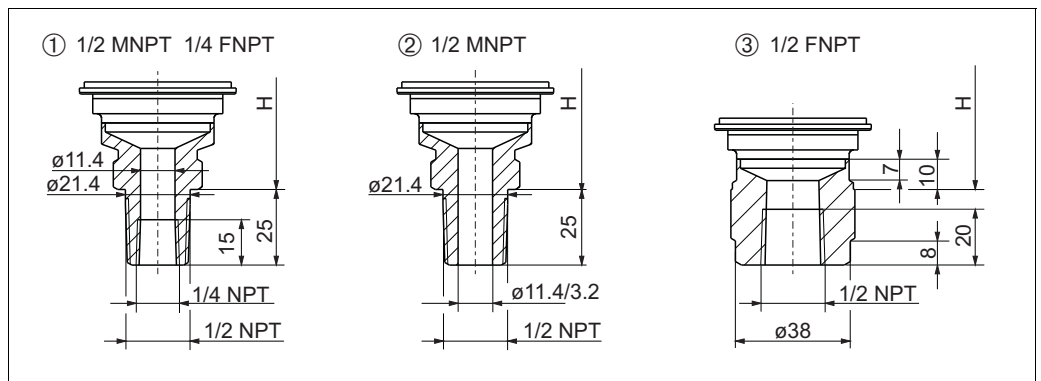


P01-PMP71xxxx-06-09-xx-xx-000

Process connections PMP71, thread ISO 228

Installation height $H \rightarrow$ 18.

- 1 Thread ISO 228 G 1/2 A EN 837;
material version GA: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 2 Thread ISO 228 G 1/2 A G 1/4 (female);
material version GE: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 3 Thread ISO 228 G 1/2 A bore 11.4 mm (0.45 in);
material version GH: AISI 316L; weight: 0.6 kg (1.32 lbs)

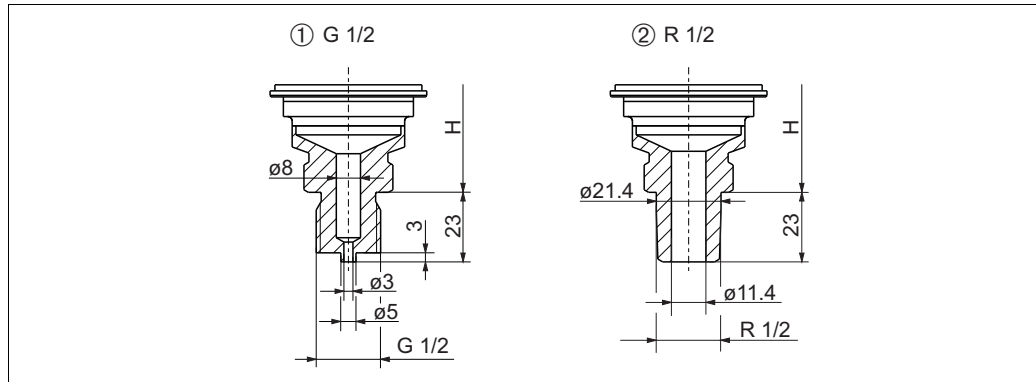


P01-PMP71xxxx-06-09-xx-xx-001

Process connections PMP71, thread ANSI

Installation height $H \rightarrow$ 18.

- 1 Thread ANSI 1/2 MNPT 1/4 FNPT;
material version RA: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 2 Thread ANSI 1/2 MNPT bore: 400 bar (6000 psi) = 11.4 mm (0.45 in);
700 bar (10500 psi) = 3.2 mm (0.13 in)
material version RD: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 3 Thread ANSI 1/2 FNPT;
material version RH: AISI 316L; weight: 0.7 kg (1.54 lbs)

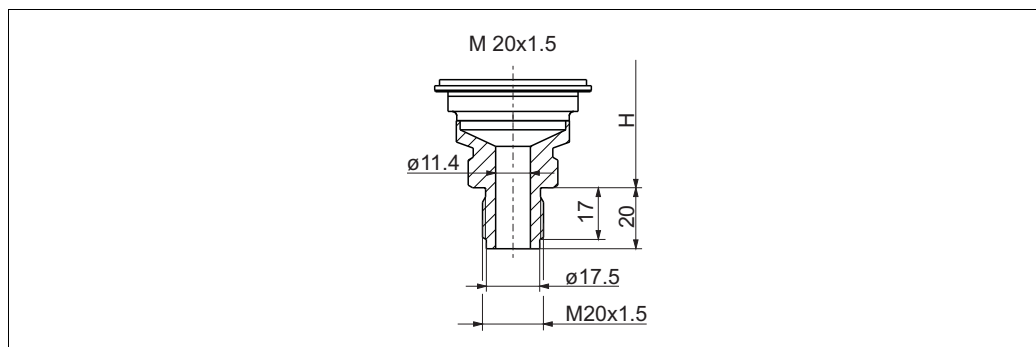


P01-PMP71xxx-06-09-xx-xx-002

Process connections PMP71, thread JIS

→ Installation height H see table below.

- 1 Version GL: Thread JIS B0202 G 1/2 (male), material: AISI 316L; weight: 0.6 kg (1.32 lbs)
- 2 Version RL: Thread JIS B0203 R 1/2 (male), material: AISI 316L; weight: 0.6 kg (1.32 lbs)



P01-PMP71xxx-06-09-xx-xx-003

Process connections PMP71 thread DIN 13 M 20x1.5 bore 11.4 mm (0.45 in)

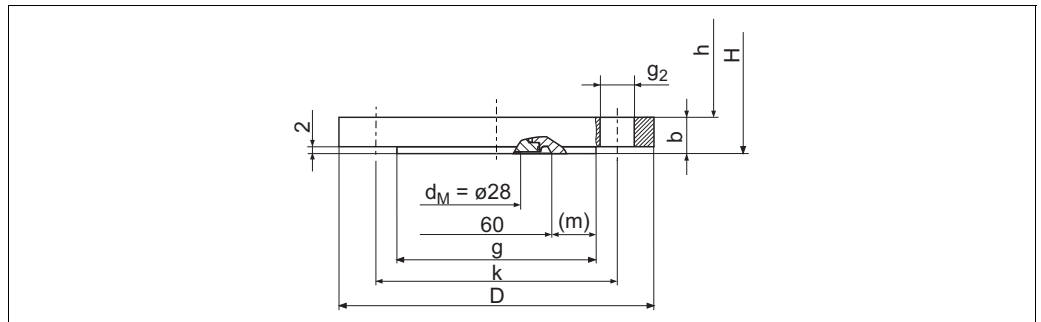
material version GP: AISI 316L; weight: 0.6 kg (1.32 lbs)

→ Installation height H see Table below.

Installation height H for devices with threaded connection and internal process isolating diaphragm

	T14 housing	T17 housing
Height H	165 mm (6.5 in)	181 mm (7.13 in)

EN/DIN flanges, connection dimensions as per EN 1092-1/DIN 2527



P01-PMP71 xxx-06-09-xx-xx-008

Process connection PMP71, EN/DIN flange with raised face, material AISI 316L

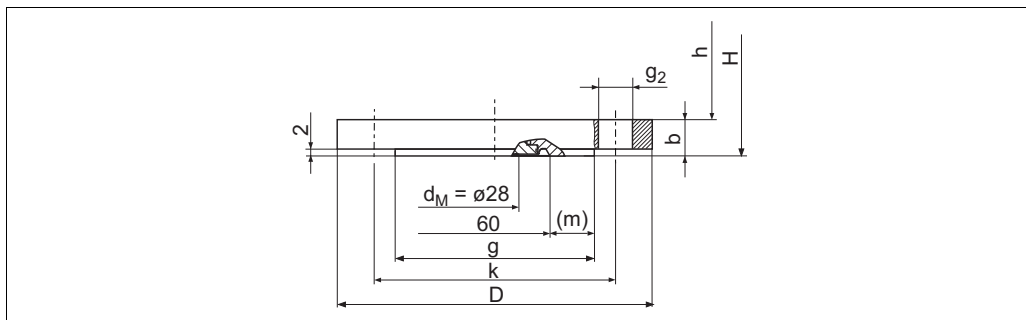
H: device height = height of the device without flange h + flange thickness b

Height h → 21.

Version	Flange ¹⁾							Boltholes			
	Nominal diameter	Nominal pressure	Shape ²⁾	Diame-ter D [mm]	Thick-ness b [mm]	Raised face g [mm]	Width of raised face (m) [mm]	Quantity	Diameter g ₂ [mm]	Hole circle k [mm]	Flange weight ³⁾ [kg]
CN	DN 25	PN 10-40	B1 (D)	115	18	68 ⁴⁾	4	4	14	85	1.2
CP	DN 32	PN 10-40	B1 (D)	140	18	78 ⁴⁾	9	4	18	100	1.9
CQ	DN 40	PN 10-40	B1 (D)	150	18	88 ⁴⁾	14	4	18	110	2.2
B3	DN 50	PN 10-40	B1 (D)	165	20	102	-	4	18	125	3.0
B4	DN 80	PN 10-40	B1 (D)	200	24	138	-	8	18	160	5.3

- 1) The roughness of the surface in contact with the medium, including the raised face of the flanges (all standards) made of Alloy C, Monel or tantalum, is Ra 0.8 µm (31.5 µin). Lower surface roughness on request.
- 2) Designation as per DIN 2527 in brackets
- 3) Housing weight → 22
- 4) With these process connections the raised face is smaller than described in the standard. Due to a smaller raised face a special seal must be used. Refer to a manufacturer of seals or your local Endress+Hauser Sales Center.

ANSI flanges, connection dimensions as per ANSI B 16.5, raised face RF
JIS flanges, connection dimensions as per B 2220 BL, raised face RF



P01-PMP71xxx-06-09-xx-xx-009

Process connection PMP71, ANSI flange or JIS flange with raised face RF (see table below)

H: device height = height of device without flange h + flange thickness b. For the height h → 21.

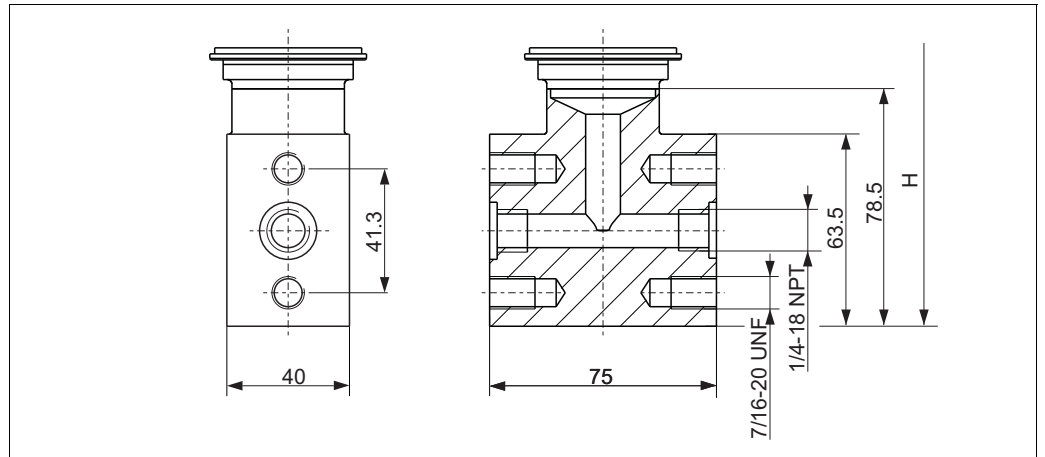
Version	Flange ¹⁾							Boltholes			Flange weight ²⁾ [kg]
	Material	Nominal diameter	Class/nominal pressure	Diameter	Thickness	Diameter of raised face	Width of raised face	Quantity	Diameter	Hole circle	
				D [in (mm)]	b [in (mm)]	g [in (mm)]	(m) [in (mm)]		g ₂ [in (mm)]	k [in (mm)]	
ANSI flanges											
AN	AISI 316/316L ³⁾	1 in	300 lb./sq.in	4.88 (124)	0.69 (17.5)	2.76 ⁴⁾ (70)	0.2 (5)	4	0.75 (19.1)	3.5 (88.9)	1.3
AE	AISI 316/316L ³⁾	1 1/2 in	150 lb./sq.in	5 (127)	0.69 (17.5)	2.88 ⁴⁾ (73.2)	0.52 (6.6)	4	0.62 (15.7)	3.88 (98.6)	1.5
AQ	AISI 316/316L ³⁾	1 1/2 in	300 lb./sq.in	6.12 (155.4)	0.81 (20.6)	2.88 ⁴⁾ (73.2)	0.52 (6.6)	4	0.88 (22.4)	4.5 (114.3)	2.6
AF	AISI 316/316L ³⁾	2 in	150 lb./sq.in	6 (152.4)	0.75 (19.1)	3.62 (91.9)	-	4	0.75 (19.1)	4.75 (120.7)	2.4
AR	AISI 316/316L ³⁾	2 in	300 lb./sq.in	7.5 (190.5)	0.88 (22.3)	3.62 (91.9)	-	8	0.75 (19.1)	5 (127)	3.2
AG	AISI 316/316L ³⁾	3 in	150 lb./sq.in	7.5 (190.5)	0.94 (23.9)	5 (127)	-	4	0.75 (19.1)	6 (152.4)	4.9
AS	AISI 316/316L ³⁾	3 in	300 lb./sq.in	8.25 (209.5)	1.12 (28.6)	5 (127)	-	8	0.88 (22.4)	6.62 (168.1)	6.7
AH	AISI 316/316L ³⁾	4 in	150 lb./sq.in	9 (228.6)	0.94 (23.9)	6.19 (157.2)	-	8	0.75 (19.1)	7.5 (190.5)	7.1
AT	AISI 316/316L ³⁾	4 in	300 lb./sq.in	10 (254)	1.25 (31.8)	6.19 (157.2)	-	8	0.88 (22.4)	7.88 (200.2)	11.6
JIS flanges											
KA	AISI 316L	25 A	20 K	125	16	67 ⁴⁾	0.14 (3.5)	4	19	90	1.5
KF	AISI 316L	50 A	10 K	155	16	96	-	4	19	120	2.0
KL	AISI 316L	80 A	10 K	185	18	127	-	8	19	150	3.3
KH	AISI 316L	100 A	10 K	210	18	151	-	8	19	175	4.4

- 1) The roughness of the surface in contact with the medium, including the raised face of the flanges (all standards) made of Alloy C, Monel or tantalum, is Ra 0.8 µm (31.5 µin). Lower surface roughness on request.
- 2) Housing weight → 22
- 3) Combination of AISI 316 for required pressure resistance and AISI 316L for required chemical resistance (dual rated)
- 4) With these process connections the raised face is smaller than described in the standard. Due to a smaller raised face a special seal must be used. Refer to a manufacturer of seals or your local Endress+Hauser Sales Center.

Height h for devices with flange

	T14 housing	T17 housing
Height h	165 mm (6.5 in)	181 mm (7.13 in)

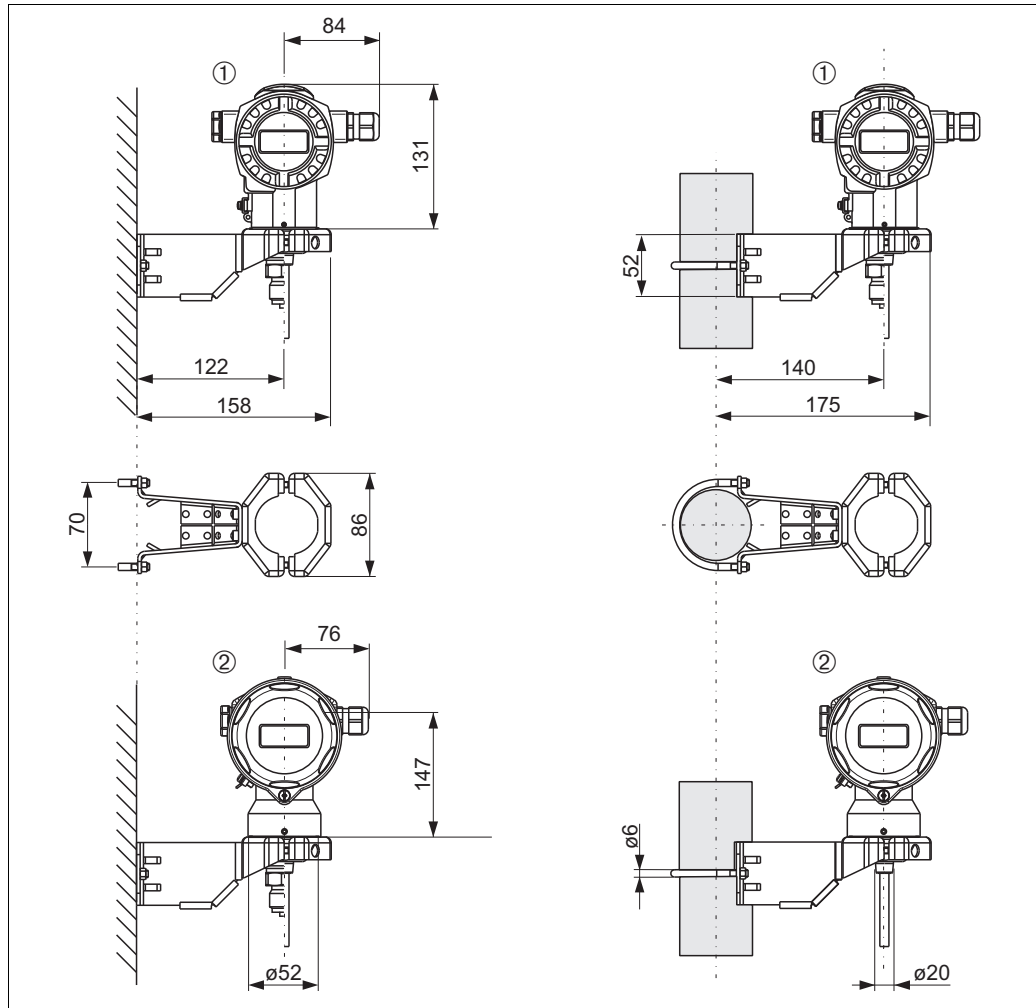
Oval flange



Version UR: oval flange adapter 1/4-18 NPT as per IEC 61518, material 316L (1.4404), mounting: 7/16-20 UNF; weight: 1.9 kg (4.19 lbs)

	T14 housing	T17 housing
Height H	199 mm (7.83 in)	215 mm (8.46 in)

Wall and pipe mounting with mounting bracket



① Dimensions of T14 housing, optional display on the side. For the weight, see the following section.

② Dimensions of T17 housing, optional display on the side. For the weight, see the following section.

Weight

Housing

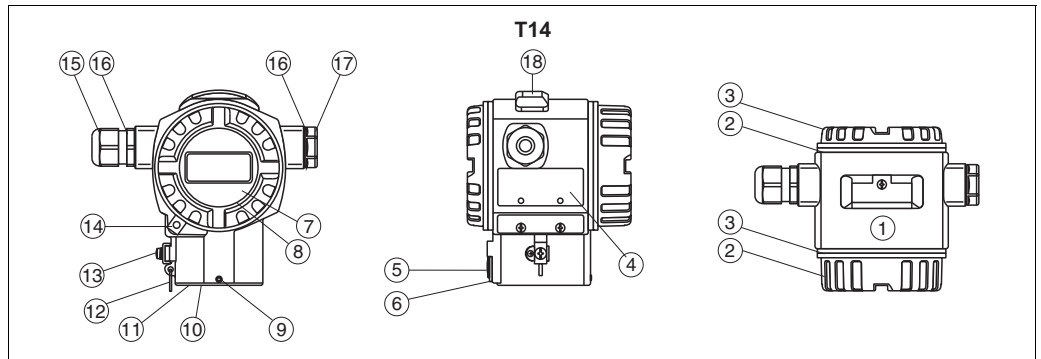
	T14		T17
	Aluminum	AISI 316L	AISI 316L
With electronic insert and display	1.2 kg (2.65 lbs)	2.1 kg (4.63 lbs)	1.2 kg (2.65 lbs)
With electronic insert without display	1.1 kg (2.43 lbs)	2.0 kg (4.41 lbs)	1.1 kg (2.43 lbs)

Process connections

Process connections: → 17 ff

Material (not wetted)

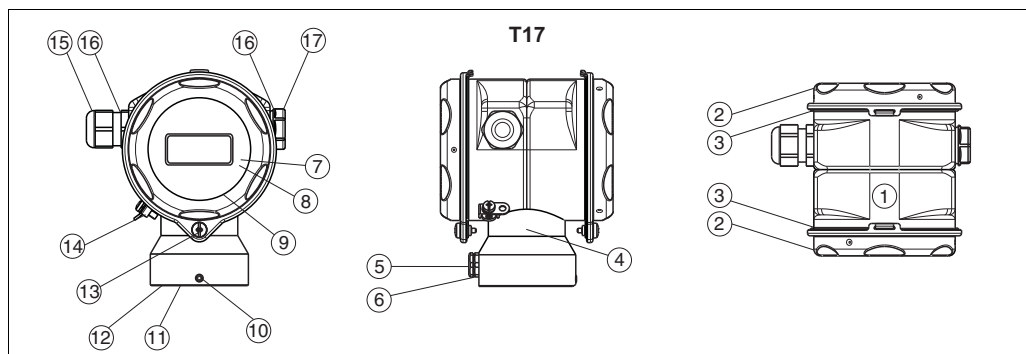
Housing



P01-xMxx3xxx-14-xx-xx-xx-000

Front view, left-hand side view, top view.

Item number	Component part	Material
1	T14 housing, RAL 5012 (blue)	Die-cast aluminum with protective powder-coating on polyester base
	T14 housing	Precision cast AISI 316L (1.4435)
2	Cover, RAL 7035 (gray)	Die-cast aluminum with protective powder-coating on polyester base
	Cover	Precision cast AISI 316L (1.4435)
3	Cover seal	EPDM
4	Nameplates	AISI 304 (1.4301)
	Calibration nameplates	AISI 304 (1.4301)
5	Pressure compensation filter	PA6 GF10
6	Pressure compensation filter, O-ring	Silicone (VMQ)
7	Sight glass	Mineral glass
8	Sight glass seal	Silicone (VMQ)
9	Screw	A4
10	Sealing ring	EPDM
11	Snap ring	PA66-GF25
12	Snap ring for nameplates	AISI 304 (1.4301)/ AISI 316 (1.4401)
13	External ground terminal	AISI 304 (1.4301)
14	Cover clamp	Clasp AISI 316L (1.4435), screw 1.4404
15	Cable gland	Polyamide (PA)
16	Seal of cable gland and blind plug	Silicone (VMQ)
17	Blind plug	PBT-GF30 FR, for dust ignition-proof: AISI 316L (1.4435)
18	External operation (keys and key cover), RAL 7035 (gray)	Polycarbonate PC-FR, screw A4
	Seal wire	DIN 1367-0 St/Zn (soft galvanized steel)
	Seals	Pb (lead)



P01-xlMxx3xxx-14-xx-xx-xx-002

Front view, left-hand side view, top view.

Item number	Component part	Material
1	T17 housing	AISI 316L (1.4404)
2	Cover	AISI 316L (1.4404)
3	Cover seal	EPDM
4	Nameplates	Lasered
	Calibration nameplates	AISI 304 (1.4301)
5	Pressure compensation filter	PA6 GF10
6	Pressure compensation filter, O-ring	Silicone (VMQ)
7	Sight glass for non-hazardous area, ATEX Ex ia, NEPSI Zone 0/1 Ex ia, IECEx Zone 0/1 Ex ia, FM NI, FM IS, CSA IS	Polycarbonate (PC)
8	Sight glass for ATEX 1/2 D, ATEX 1/3 D, ATEX 1 GD, ATEX 1/2 GD, ATEX 3 G, FM DIP, CSA dust ignition-proof	Mineral glass
9	Sight glass seal	EPDM
10	Screw	A2-70
11	Sealing ring	EPDM
12	Snap ring	PA6
13	Screw	1.4404
14	External ground terminal	AISI 304 (1.4301)
15	Cable gland	Polyamide PA, for dust ignition-proof: CuZn nickel-plated
16	Seal of cable gland and blind plug	Silicone (VMQ)
17	Blind plug	PBT-GF30 FR, for dust ignition-proof: AISI 316L (1.4435)
	Seal wire	DIN 1367-0 St/Zn (soft galvanized steel)
	Seals	Pb (lead)

Connecting parts

Connection between the housing and process connection: AISI 316L (1.4404)

Filling oil

See "Ordering information" (→ [31](#))

Material (wetted)

Note!

Process-wetted device components are listed in the "Mechanical construction" (→ 16) and "Ordering information" (→ 31) sections.

TSE Certificate of Suitability (Transmissible Spongiform Encephalopathy)

The following applies to all process wetted device components:

- They do not contain any materials derived from animals.
- No additives or operating materials derived from animals are used in production or processing.

Process connections

Endress+Hauser supplies process connections with threaded connections and DIN/ EN flanges made of stainless steel as per AISI 316L (DIN/EN material number 1.4404 (AISI 316) or 1.4435). With regard to their stability-temperature property, the materials 1.4404 and 1.4435 are grouped together under 13E0 in EN 1092-1: 2001 Tab. 18. The chemical composition of the two materials can be identical.

Process isolating diaphragm

AISI 316L (DIN/EN material number 1.4435)

Human interface

Operating elements

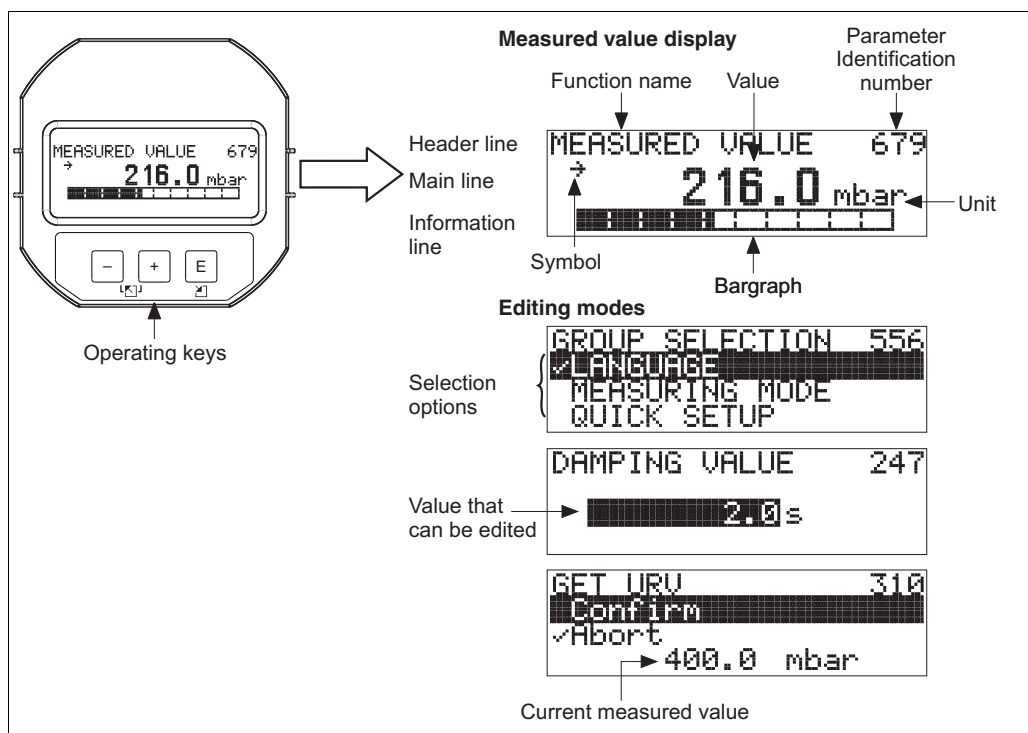
Onsite display (optional)

A 4-line liquid crystal display (LCD) is used for display and operation. The onsite display shows measured values, dialog text as well as fault and notice messages in plain text, thereby supporting the user in every stage of operation. The display of the device can be turned in 90° steps.

Depending on the installation position of the device, this makes it easy to operate the device and read the measured value.

Functions:

- Eight-digit measured value display incl. sign and decimal point, bar graph for 4 to 20 mA HART as current display.
- Simple and complete menu guidance thanks to separation of the parameters into several levels and groups.
- Menu guidance in 8 languages (DE, EN, FR, ES, IT, NL, JP, CH) for HART.
- Each parameter is given a 3-digit ID number for easy navigation.
- Option for configuring the display according to individual requirements and preferences, such as language, alternating display, display of other measured values such as sensor temperature, contrast setting.
- Comprehensive diagnostic functions (fault and warning message, peak-hold indicators, etc.).
- Rapid and safe commissioning with the Quick Setup menus.

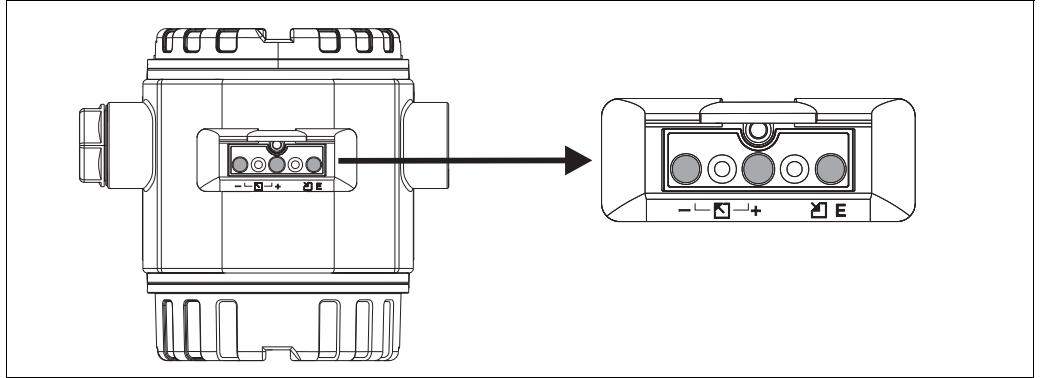


P01-xMx7xxxx-07-xx-xx-es-001

Operating elements

Operating keys on the exterior of the device

With the T14 housing (aluminum or stainless steel), the operating keys are located either outside of the housing, under the protection cap or inside on the electronic insert. With the T17 housing (stainless steel), the operating keys are located inside the housing on the electronic insert.

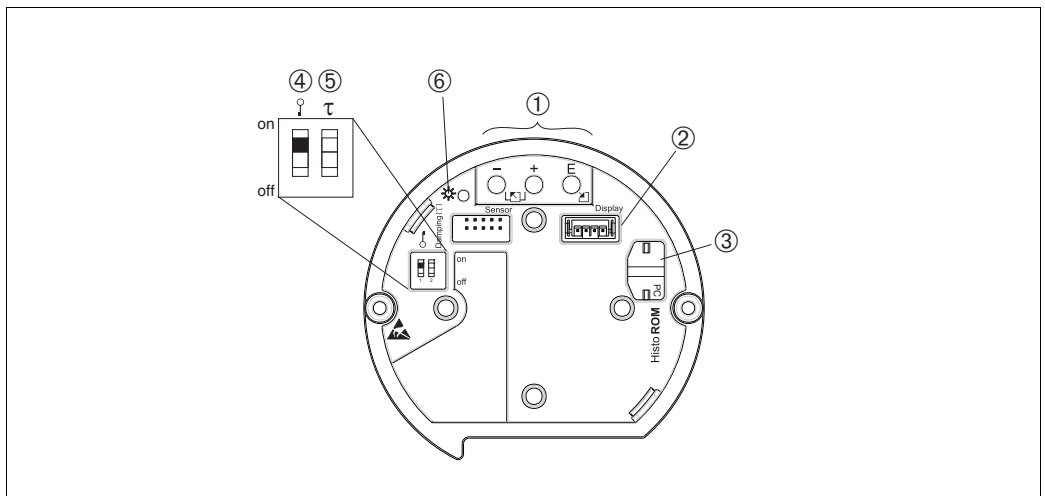


P01-xxxx-19-xx-xx-xx-050

The operating keys located externally on the device work on the Hall sensor principle. As a result, no additional openings are required in the device. This guarantees:

- Complete protection against environmental influences such as moisture and contamination.
- Simple operation without any tools.
- No wear.

Operating keys and elements located internally on the electronic insert



P01-xxxx-19-xx-xx-xx-178

Electronic insert

- 1 Operating keys
- 2 Slot for optional display
- 3 Slot for optional HistoROM®/M-DAT
- 4 DIP switch for locking/unlocking parameters relevant to the measured values
The lead-sealing of the housing cover is designed for use in custody transfer.
The DIP switch has to be used to prevent access to the electronics and to lock the configuration of the device.
- 5 DIP-switch for damping on/off
- 6 Green LED to indicate value being accepted

Local operation

Function	External operation (operating keys, optional, not T17 housing)	Internal operation (electronic insert)	Display (optional)
Position adjustment (zero point correction)	X	X	X
Setting lower-range value and upper-range value - reference pressure present at the device	X	X	X
Device reset	X	X	X
Locking and unlocking parameters relevant to the measured value	---	X	X
Value acceptance indicated by green LED	X	X	X
Switching damping on and off	---	X	X

Remote operation

Depending on the position of the write protection switch on the device, all software parameters are accessible.

Remote operation via:

- Handheld terminal Field Communicator 375 (see "Hardware and software for onsite and remote operation" section → 28)
- FieldCare (see "Hardware and software for onsite and remote operation" → 28 ff section) with Commubox FXA195 (see "Hardware and software for onsite and remote operation" section → 28 ff)
- Field Xpert:
Field Xpert is an industrial PDA with integrated 3.5" touchscreen from Endress+Hauser based on Windows Mobile. It communicates via wireless with the optional VIATOR Bluetooth modem connected to a HART device point-to-point or wireless via WiFi and Endress+Hauser's Fieldgate FXA520. Field Xpert also works as a stand-alone device for asset management applications. For details, refer to BA00060S/04/EN.

Note!

For further information please contact your local Endress+Hauser Sales Center.

Hardware and software for onsite and remote operation**Commubox FXA195**

For intrinsically safe HART communication with FieldCare via the USB interface. For details refer to TI00404F/00/EN.

Commubox FXA291

The Commubox FXA291 connects Endress+Hauser field devices with a CDI interface (=Endress+Hauser Common Data Interface) to the USB interface of a personal computer or a notebook. For details refer to TI00405C/07/EN.

Note!

For the following Endress+Hauser devices you need the "ToF adapter FXA291" as an additional accessory:

- Cerabar S PMC71, PMP7x
- Deltabar S PMD7x, FMD7x
- Deltapilot S FMB70

ToF adapter FXA291

The ToF adapter FXA291 connects the Commubox FXA291 with devices of the ToF platform, pressure equipment and the Gammapilot via the USB port of a computer or laptop. For details refer to KA00271F.

Field Communicator 375


With a handheld terminal, all the parameters can be configured anywhere along the bus line via menu operation.

HistoROM®/M-DAT (optional)

HistoROM®/M-DAT is a memory module which can be attached to every electronic insert. The HistoROM®/M-DAT can be retrofitted at any stage (order number: 52027785).

Your benefits

- Quick and safe commissioning of the same measuring points by copying the configuration data of one transmitter to another transmitter.
- Reliable process monitoring thanks to cyclical recording of pressure and sensor temperature measured values.
- Simple diagnosis by recording diverse events such as alarms, configuration changes, counters for measuring range undershoot and overshoot for pressure and temperature as well as user limit overshoot and undershoot for pressure and temperature etc.
- Analysis and graphic evaluation of the events and process parameters via software (contained in scope of supply).

HistoROM®/M-DAT can be ordered via feature 100 "Additional option 1" or feature 110 "Additional option 2" or as a spare part. →  31 ff. A CD with an Endress+Hauser operating program is also included in the scope of delivery.

FieldCare

FieldCare is an Endress+Hauser asset management tool based on FDT technology. With FieldCare, you can configure all Endress+Hauser devices as well as devices from other manufacturers that support the FDT standard.

FieldCare supports the following functions:

- Configuration of transmitters in offline and online mode
- Loading and saving device data (upload/download)
- HistoROM®/M-DAT analysis
- Documentation of the measuring point

Connection options:

- HART via Commubox FXA195 and the USB port on a computer
- Service interface with Commubox FXA291 and ToF adapter FXA291 (USB).

For further information → www.endress.com

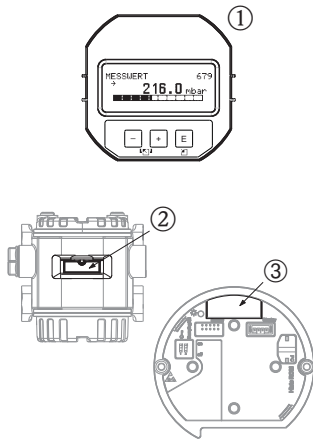
Certificates and approvals

CE mark	The device meets the legal requirements of the relevant EC directives. Endress+Hauser confirms that the device has been successfully tested by applying the CE mark.
Ex approvals	<ul style="list-style-type: none"> ■ ATEX ■ FM ■ CSA ■ NEPSI ■ IECEX ■ TIIS ■ GOST ■ Also combinations of different approvals <p>All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas. → 33 ff, "Safety Instructions" and "Installation/Control Drawings" sections.</p>
Marine certificate	<ul style="list-style-type: none"> ■ GL ■ ABS
Functional safety SIL/ IEC 61508 Declaration of Conformity (optional)	<p>The Cerabar S devices with a 4 to 20 mA output signal have been developed in accordance with the IEC 61508 standard. These devices can be used to monitor the process pressure up to SIL 3.</p> <p>For a detailed description of the safety functions with Cerabar S, settings and functional safety data, see the "Functional safety manual - Cerabar S" SD00190P.</p> <p>For devices up to SIL 3 / IEC 61508 Declaration of Conformity, see → 31 ff, feature 100 "Additional option 1" and feature 110 "Additional option 2" version E "SIL / IEC 61508 Declaration of Conformity".</p>
Pressure Equipment Directive (PED)	<p>The device corresponds to Article 3 (3) of the EC directive 97/23/EC (Pressure Equipment Directive) and has been designed and manufactured according to good engineering practice.</p> <p>The following also applies: Suitable for stable gases in group 1, category I</p>
Standards and guidelines	<p>DIN EN 60770 (IEC 60770): Transmitters for use in industrial-process control systems Part 1: Methods for performance evaluation</p> <p>DIN 16086: Electrical pressure measuring instruments, pressure sensors, pressure transmitters, pressure measuring instruments, concepts, specifications on data sheets</p> <p>EN 61326-X: EMC product family standard for electrical equipment for measurement, control and laboratory use.</p> <p>OIML R117-1 Edition 2007 (E) (Organisation Internationale de Métrologie Légale)</p> <p>EN 12405-1/A1 Edition 2006</p>
Approvals for custody transfer	All aspects of OIML R117-1 Edition 2007 (E) and EN 12405-1/A1 Edition 2006 are fulfilled.
MID Parts Certificate	TC7975
Drinking water approval	NSF 61 - Approval
North-American practice for installation of process seals	<p>Endress+Hauser instruments are designed according to ANSI/ISA 12.27.01 either as single seal or dual seal devices with annunciation, allowing the user to waive the use and save the cost of installing external secondary process seals in the conduit as required by the process sealing sections of ANSI/NFPA 70 (NEC) and CSA 22.1 (CEC). These instruments comply with the North-American installation practice and provide a very safe and cost-saving installation for pressurized applications with hazardous fluids.</p> <p>Further information can be found in the control drawings of the relevant devices.</p>

Ordering information

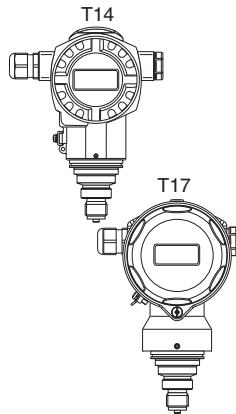
PMP71

This overview does not mark options which are mutually exclusive.



10	Approval:
	<p>A For non-hazardous areas</p> <p>1 ATEX II 1/2 G Ex ia IIC T6</p> <p>6 ATEX II 1/2 G Ex ia IIC T6, overfill protection WHG</p> <p>5 ATEX II 2 G Ex d IIC T6</p> <p>7 ATEX II 3 G Ex nA II T6</p> <p>S FM IS, Class I, II, III Division 1, Groups A – G; NI Class I Division 2, Groups A – D; AEx ia</p> <p>T FM XP, Class I Division 1, Groups A – D; AEx d</p> <p>R FM NI, Class I, Division 2, Groups A – D</p> <p>U CSA IS, Class I, II, III Division 1, Groups A – G; Class I Division 2, Groups A – D, Ex ia</p> <p>V CSA XP, Class I Division 1, Groups B – D; Ex d</p> <p>G NEPSI Ex d IIC T6</p> <p>H NEPSI Ex ia IIC T6</p> <p>L THS Ex d IIC T6</p> <p>I IECEx Zone 0/1 Ex ia IIC T6</p> <p>B Combined certificate: ATEX II 1/2 G Ex ia IIC T6 + II 2 G Ex d IIC T6</p> <p>C Combined certificate: FM IS and XP Class I Division 1, Groups A – D</p> <p>D Combined certificate: CSA IS and XP Class I Division 1, Groups A – D</p> <p>E Combined certificate: FM/CSA IS and XP Class I Division 1, Groups A – D</p> <p>F Combined certificates: ATEX II Ex ia / Ex d + FM/CSA IS + XP ATEX II 1/2G Ex ia IIC T6+ ATEX II 2G Ex d IIC T6+ FM/CSA IS + XP Cl.I Div.1 Gr.A-D</p>

20	Output; operation:
	<p>A 4 to 20 mA HART, operation outside, LCD (→ see Fig. ①, ②)</p> <p>B 4 to 20 mA HART, operation inside, LCD (→ see Fig. ①, ③)</p> <p>C 4 to 20 mA HART, operation inside (→ see Fig. ③)</p>



30	Housing; cable entry; degree of protection:
	<p>A Aluminum T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Gland M 20x1.5</p> <p>B Aluminum T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Thread G 1/2</p> <p>C Aluminum T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Thread 1/2 NPT</p> <p>D Aluminum T14 housing, optional display on the side, IP66/67/NEMA 4X/ 6P, M 12x1 PA plug,</p> <p>E Aluminum T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, 7/8" FF plug</p> <p>F Aluminum T14 housing, optional display on the side, IP 65/NEMA 4X, Han7D plug, 90°</p> <p>1 AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Gland M 20x1.5</p> <p>2 AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Thread G 1/2</p> <p>3 AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, Thread 1/2 NPT</p> <p>4 AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, M 12x1 PA plug</p> <p>5 AISI 316L T14 housing, optional display on the side, IP 66/67/NEMA 4X/ 6P, 7/8" FF plug</p> <p>6 AISI 316L T14 housing, optional display on the side, IP 65/NEMA 4X, Han7D plug, 90°</p> <p>R T17 316L Hygiene IP66/68 NEMA6P; M20 cable gland, T17 = side cover</p> <p>S T17 316L Hygiene IP66/68 NEMA6P; G1/2 thread, T17 = side cover</p> <p>T T17 316L Hygiene IP66/68 NEMA6P; NPT1/2 thread, T17 = side cover</p> <p>U T17 316L Hygiene IP66/67 NEMA6P; M12 plug, T17 = side cover</p> <p>V T17 316L Hygiene IP66/68 NEMA6P; 7/8" plug, T17 = side cover</p>

40	Sensor range; Sensor over pressure limit (= OPL):												
	<p>Sensors for absolute pressure</p> <table border="1"> <thead> <tr> <th></th> <th>Sensor rated value (URL)</th> <th>OPL (over pressure limit)</th> </tr> </thead> <tbody> <tr> <td>MP</td> <td>10 bar</td> <td>40 bar</td> </tr> <tr> <td>MT</td> <td>50 bar</td> <td>400 bar</td> </tr> <tr> <td>MU</td> <td>100 bar</td> <td>400 bar</td> </tr> </tbody> </table>		Sensor rated value (URL)	OPL (over pressure limit)	MP	10 bar	40 bar	MT	50 bar	400 bar	MU	100 bar	400 bar
	Sensor rated value (URL)	OPL (over pressure limit)											
MP	10 bar	40 bar											
MT	50 bar	400 bar											
MU	100 bar	400 bar											

50	Calibration; unit:
	1 Sensor range; mbar/bar

60	Material of the process isolating diaphragm:
	1 AISI 316L

70	Process connection; material:
	<p>Thread, internal process isolating diaphragm:</p> <p>GA Thread ISO 228 G 1/2 A EN 837, AISI 316L</p> <p>GE Thread ISO 228 G 1/2 A G 1/4 (female), AISI 316L</p> <p>GH Thread ISO 228 G 1/2 A hole 11.4 mm, AISI 316L</p> <p>RA Thread ANSI 1/2 MNPT 1/4 FNPT, AISI 316L</p>

70	Process connection; material:
	RD Thread ANSI 1/2 MNPT hole, AISI 316L RH Thread ANSI 1/2 FNPT, AISI 316L GL Thread JIS B0202 G 1/2 (male), AISI 316L RL Thread JIS B0203 R 1/2 (male), AISI 316L Thread, internal process isolating diaphragm: GP Thread DIN 13 M 20x1.5 EN 837 hole 11.4 mm, AISI 316L EN/DIN flanges, flush-mounted process isolating diaphragm CN DN 25 PN 10-40 B1, AISI 316L CP DN 32 PN 10-40 B1, AISI 316L CQ DN 40 PN 10-40 B1, AISI 316L B3 DN 50 PN 10-40 B1, AISI 316L B4 DN 80 PN 10-40 B1, AISI 316L ANSI flanges, flush-mounted process isolating diaphragm AN 1" 300 lbs RF, AISI 316/316L AE 1 1/2" 150 lbs RF, AISI 316/316L AQ 1 1/2" 300 lbs RF, AISI 316/316L AF 2" 150 lbs RF, AISI 316/316L AR 2" 300 lbs RF, AISI 316/316L AG 3" 150 lbs RF, AISI 316/316L AS 3" 300 lbs RF, AISI 316/316L AH 4" 150 lbs RF, AISI 316/316L AT 4" 300 lbs RF, AISI 316/316L JIS flanges, flush-mounted process isolating diaphragm KA 20K 25A RF, AISI 316L KF 10K 50A RF, AISI 316L KL 10K 80A RF, AISI 316L KH 10K 100A RF, AISI 316L Other UR Oval flange adapter 1/4-18 NPT, mounting: 7/16-20 UNF, AISI 316L
90	Fill fluid:
	A Silicone oil F Inert oil K Inert oil, cleaned from oil and grease N Inert oil, cleaned for oxygen service (observe application limits pressure/temperature)
100	Additional option 1:
	A Not selected E SIL/IEC 61508 Declaration of Conformity B Material test certificate for wetted components, inspection certificate as per EN 10204 3.1 acc. to specification 52005759 C NACE MR0175 (wetted parts) D Material test certificate for wetted components as per EN 10204 3.1 and NACE MR0175 material, inspection certificate as per EN 10204 acc. to specification 52010806 V Mounting on shut-off valve from above N HistoROM/M-DAT S GL/ABS marine certificate 3 Routine test with certificate, inspection certificate as per EN 10204 3.1 4 Overpressure test with certificate, inspection certificate as per EN 10204 3.1
110	Additional option 2:
	A Not selected E SIL/IEC 61508 Declaration of Conformity F NSF Drinking water approval N HistoROM/M-DAT S GL/ABS marine certificate U Mounting bracket for wall/pipe, AISI 304 3 Individual testing with test certificate, inspection certificate as per EN 10204 3.1 4 Overpressure test with certificate, inspection certificate as per EN 10204 3.1 5 Helium leak test EN 1528 with test certificate, inspection certificate as per EN 10204 3.1
995	Identification:
	1 Measuring point TAG, see additional specification 2 Bus address, see additional specification
PMP71	Order code

Additional documentation

Field of Activities Pressure measurement, powerful instruments for process pressure, differential pressure, level and flow:
FA00004P/00/DE

Technical Information ■ EMC test procedures TI00241F/00/EN

Operating Instructions ■ BA00412P/00/EN
■ Description of Device Functions: BA00413P/00/DE

Brief Operating Instructions KA01095P/00/EN

Functional safety manual (SIL) SD00190P/00/EN

MID Parts Certificate ZE00276P/00/EN

Safety Instructions

Certificate/type of protection	Electronics	Documentation	Version in the order code
ATEX II 1/2 G Ex ia IIC T6	- 4 to 20 mA HART	- XA00244P	1
ATEX II 2 G Ex d IIC T6	- 4 to 20 mA HART	- XA00249P	5
ATEX II 3 G Ex nA II T6	- 4 to 20 mA HART	- XA00251P	7
ATEX II 1/2 G Ex ia IIC T6 + ATEX II 2 G Ex d IIC T6	- 4 to 20 mA HART	- XA00252P	B

Certificate/type of protection	Electronic insert	Documentation	Version in the order code
IECEx Zone 0/1 Ex ia IIC T6	- 4 to 20 mA HART	- XB00005P	I

Certificate/type of protection	Electronic insert	Documentation	Version in the order code
NEPSI Ex ia IIC T6	- 4 to 20 mA HART	- XC00003P	H
NEPSI Ex d IIC T6	- 4 to 20 mA HART	- XC00005P	G

Certificate/type of protection	Electronic insert	Documentation	Version in the order code
TIIS Ex d IIC T6	- 4 to 20 mA HART	- TC17446	L

Installation/Control Drawings

Certificate/type of protection	Electronics	Documentation	Version in the order code
FM IS Class I, II, III, Division 1, Groups A – G; NI, Class I Division 2, Groups A – D; AEx ia	- 4 to 20 mA HART	- ZD00147P	S
CSA IS Class I, II, III, Division 1, Groups A – G; Class I Division 2, Groups A – G	- 4 to 20 mA HART	- ZD00148P	U
FM IS + XP Class I, Division 1, Groups A – D	- 4 to 20 mA HART	- ZD00187P	C
CSA IS + XP Class I, Division 1, Groups A – D	- 4 to 20 mA HART	- ZD00154P	D
FM/CSA IS + XP Class I, Division 1, Groups A – D	- 4 to 20 mA HART	- ZD00154P + ZD00187P	E
CSA +XP Class I, Division 1, Groups B – D, Class II, Division 1, Groups E – G, Class III	- 4 to 20 mA HART	- Under development	-

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