



Level



Pressure



Flow



Temperature



Liquid  
Analysis



Registration



Systems  
Components



Services

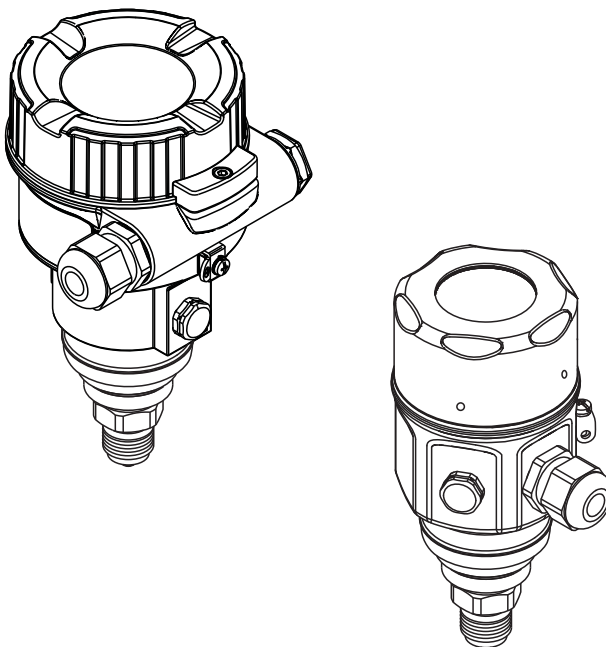


Solutions

## Operating Instructions

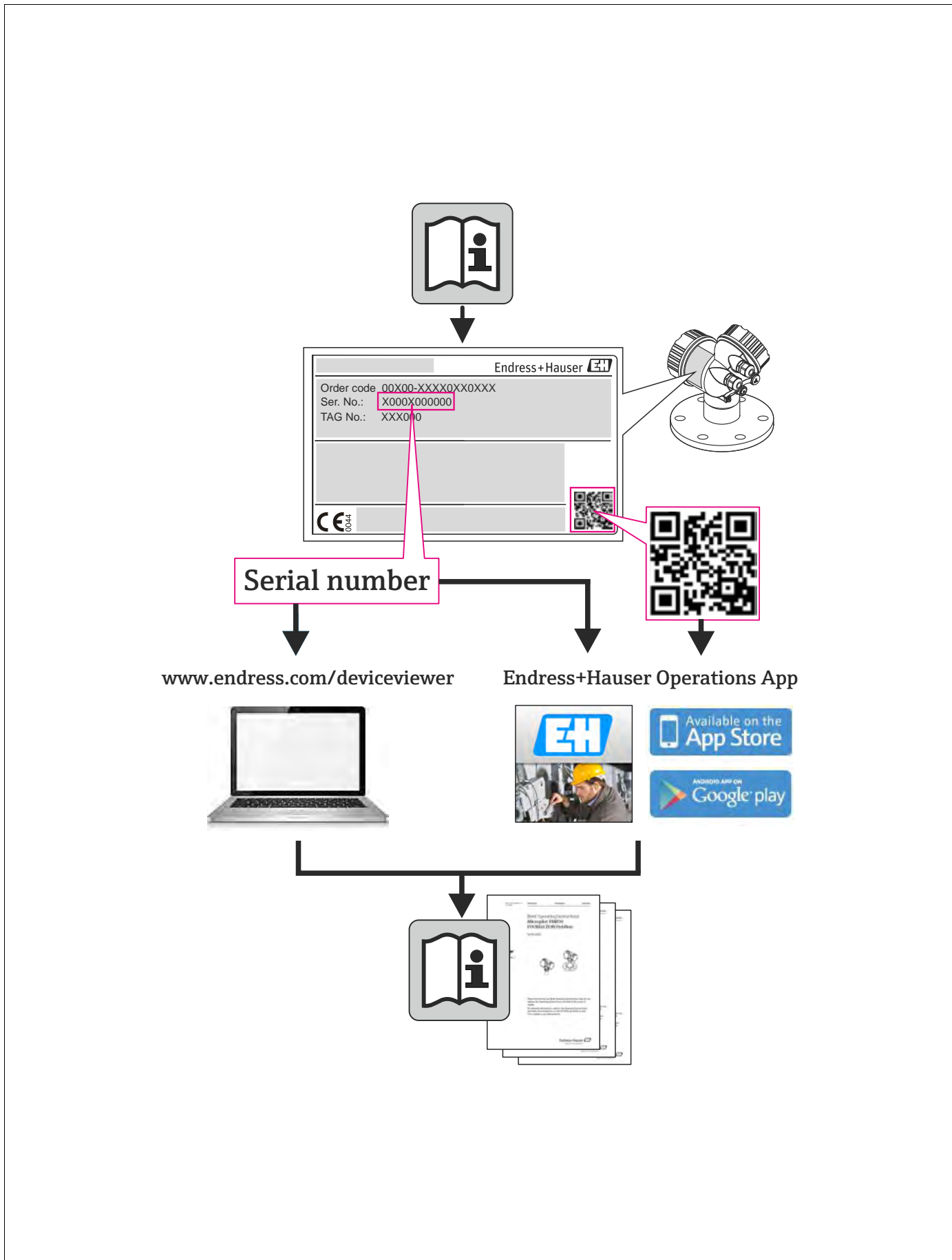
# Cerabar M PMC51, PMP51, PMP55

## Process pressure measurement



BA00385P/00/EN/19.14  
71269382

Valid from software version:  
01.00.zz



A0023555

## Table of contents

<b>1</b>	<b>Safety instructions</b> .....	<b>4</b>	<b>9</b>	<b>Technical data</b> .....	<b>33</b>
1.1	Designated use .....	4	<b>Index</b> .....	<b>34</b>	
1.2	Installation, commissioning and operation .....	4			
1.3	Operational and process safety .....	4			
1.4	Notes on safety conventions and icons .....	5			
<b>2</b>	<b>Identification</b> .....	<b>6</b>			
2.1	Product identification .....	6			
2.2	Device designation .....	6			
2.3	Scope of delivery .....	8			
2.4	CE mark, Declaration of Conformity .....	9			
2.5	Registered trademarks .....	9			
<b>3</b>	<b>Installation</b> .....	<b>10</b>			
3.1	Incoming acceptance, transport, storage .....	10			
3.2	Installation conditions .....	10			
3.3	Installation instructions .....	11			
3.4	Closing the housing cover .....	20			
3.5	Mounting of the profile seal for universal process mounting adapter .....	20			
3.6	Post-installation check .....	20			
<b>4</b>	<b>Wiring</b> .....	<b>21</b>			
4.1	Connecting the device .....	21			
4.2	Connecting the measuring unit .....	23			
4.3	Potential equalization .....	23			
4.4	Overvoltage protection (optional) .....	24			
4.5	Post-connection check .....	25			
<b>5</b>	<b>Operation</b> .....	<b>26</b>			
5.1	Position of operating elements .....	26			
5.2	Using the device display (optional) .....	27			
<b>6</b>	<b>Commissioning</b> .....	<b>29</b>			
6.1	Function check .....	29			
6.2	Commissioning .....	29			
<b>7</b>	<b>Maintenance</b> .....	<b>30</b>			
7.1	Cleaning instructions .....	30			
7.2	Exterior cleaning .....	30			
<b>8</b>	<b>Troubleshooting</b> .....	<b>31</b>			
8.1	Messages .....	31			
8.2	Measures .....	31			
8.3	Response of output to errors .....	31			
8.4	Repair .....	31			
8.5	Spare Parts .....	31			
8.6	Return .....	32			
8.7	Disposal .....	32			
8.8	Software history .....	32			

# 1 Safety instructions

## 1.1 Designated use

The Cerabar M is a pressure transmitter for measuring pressure and level.

The manufacturer accepts no liability for damages resulting from incorrect use or use other than that designated.

## 1.2 Installation, commissioning and operation

The device is designed to meet state-of-the-art safety requirements and complies with applicable standards and EU regulations. If used incorrectly or for applications for which it is not intended, however, it can be a source of application-related danger, e.g. product overflow due to incorrect installation or configuration. For this reason, installation, connection to the electricity supply, commissioning, operation and maintenance of the measuring system must only be carried out by trained, qualified specialists authorized to perform such work by the facility's owner-operator. The specialist staff must have read and understood these Operating Instructions and must follow the instructions they contain. Modifications and repairs to the devices are permissible only if they are expressly approved in the Operating Instructions. Pay particular attention to the technical data and information on the nameplate.

## 1.3 Operational and process safety

Alternative monitoring measures have to be taken while configuring, testing or servicing the device to ensure the operational and process safety.











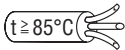
Warning!

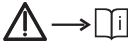
Dismantle device only when depressurized!

### 1.4 Notes on safety conventions and icons

In order to highlight safety-relevant or alternative operating procedures in the manual, the following conventions have been used, each indicated by a corresponding icon in the margin.

Symbol	Meaning
	<b>Warning!</b> A warning highlights actions or procedures which, if not performed correctly, will lead to serious personal injury, a safety hazard or the destruction of the device.
	<b>Caution!</b> Caution highlights actions or procedures which, if not performed correctly, can lead to personal injury or the incorrect operation of the device.
	<b>Note!</b> A note highlights actions or procedures which, if not performed correctly, can have an indirect effect on operation or trigger an unexpected response on the part of the device.

	<b>Direct current</b> A terminal to which DC voltage is applied or through which direct current flows.
	<b>Alternating current</b> A terminal to which alternating voltage (sine-wave) is applied or through which alternating current flows.
	<b>Ground connection</b> A grounded terminal, which as far as the operator is concerned, is already grounded by means of a grounding system.
	<b>Protective ground connection</b> A terminal which must be connected to ground prior to establishing any other connections.
	<b>Equipotential connection</b> A connection that has to be connected to the plant grounding system: This may be a potential equalization line or a star grounding system depending on national or company codes of practice.
	<b>Connecting cable immunity to temperature change</b> Indicates that the connecting cables have to withstand a temperature of 85°C at least.

	<b>Safety instructions</b> Observe the safety instructions in the associated Operating Instructions.
---	---

## 2 Identification

### 2.1 Product identification

The following options are available for identification of the measuring device:

- Nameplate specifications
- Order code with breakdown of the device features on the delivery note
- Enter serial numbers from nameplates in W@M Device Viewer ([www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)): All information about the measuring device is displayed.

For an overview of the technical documentation provided, enter the serial number from the nameplates in the W@M Device Viewer ([www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)).

### 2.2 Device designation

#### 2.2.1 Nameplate



Note!

- 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.
- The pressure values permitted at higher temperatures can be found in the following standards:
  - EN 1092-1: 2001 Tab. 18 <sup>1)</sup>
  - 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 (OPL) of the device =  $MWP \times 1.5$  <sup>2)</sup>.
- 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.

- 1) With regard to their stability-temperature property, the materials 1.4435 and 1.4404 are grouped together under 13EO in EN 1092-1 Tab. 18. The chemical composition of the two materials can be identical.
- 2) The equation does not apply for PMP51 and PMP55 with a 40 bar (600 psi) or a 100 bar (1500 psi) measuring cell.

**Aluminum housing**

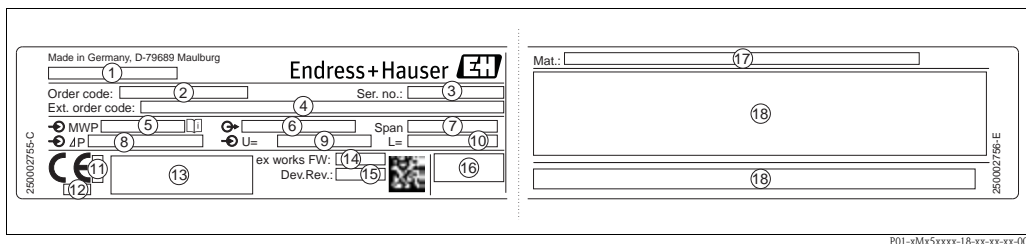


Fig. 1: Nameplate

- 1 Device name
- 2 Order code (for re-orders)
- 3 Serial number (for identification)
- 4 Extended order code (complete)
- 5 MWP (maximum working pressure)
- 6 Electronic version (output signal)
- 7 Min./max. span
- 8 Nominal measuring range
- 9 Supply voltage
- 10 Unit of length
- 11 No entry
- 12 ID number of notified body with regard to Pressure Equipment Directive (optional)
- 13 Approvals
- 14 Device version
- 15 Software version
- 16 Degree of protection
- 17 Wetted materials
- 18 Approval-specific information

Devices suitable for oxygen applications are fitted with an additional nameplate.

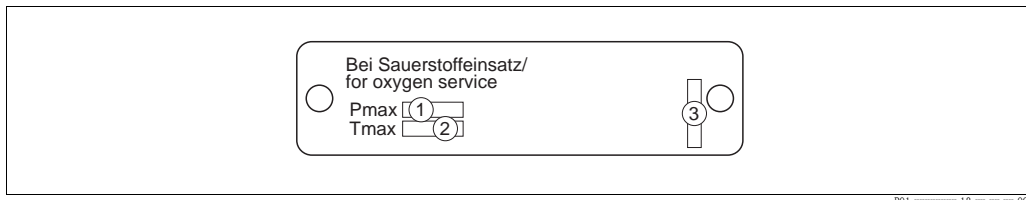


Fig. 2: Additional nameplate for devices suitable for oxygen applications

- 1 Maximum pressure for oxygen applications
- 2 Maximum temperature for oxygen applications
- 3 Layout identification of the nameplate

**Stainless steel housing, hygienic**

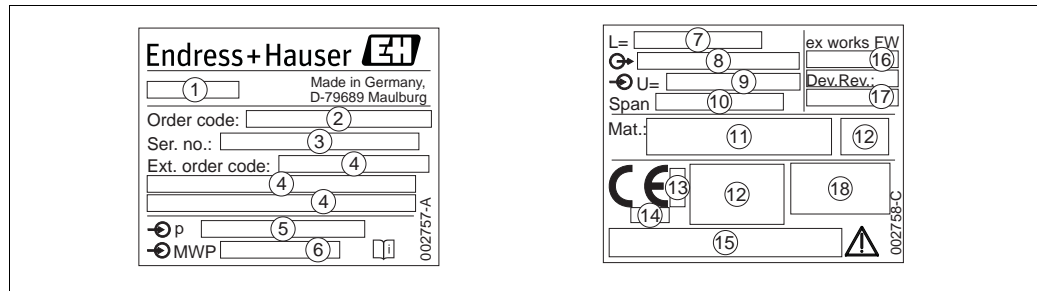


Fig. 3: Nameplate

- 1 Device name
- 2 Order code (for re-orders)
- 3 Serial number (for identification)
- 4 Extended order code (complete)
- 5 Nominal measuring range
- 6 MWP (maximum working pressure)
- 7 Length data
- 8 Electronic version (output signal)
- 9 Supply voltage
- 10 Min./max. span
- 11 Wetted materials
- 12 Approval-specific information
- 13 No entry
- 14 ID number of notified body with regard to Pressure Equipment Directive (optional)
- 15 No entry
- 16 Software version
- 17 Device version
- 18 Degree of protection

Devices with certificates are fitted with an additional plate.

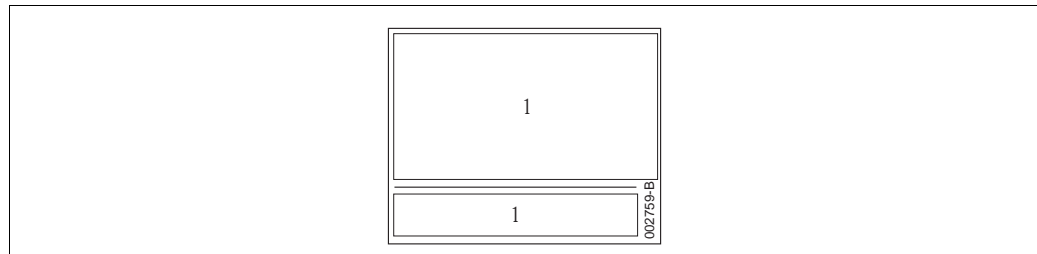


Fig. 4: Additional nameplate for devices with certificates

- 1 Approval-specific information

## 2.3 Scope of delivery

The scope of delivery comprises:

- Device
- Optional accessories

Documentation supplied:

- The Operating Instructions BA00385P is available on the Internet.  
→ See: [www.endress.com](http://www.endress.com) → Download
- Brief Operating Instructions: KA01036P
- Final inspection report
- Optional: factory calibration form, test certificates



## 2.4 CE mark, Declaration of Conformity

The devices are designed to meet state-of-the-art safety requirements, have been tested and left the factory in a condition in which they are safe to operate. The devices comply with the applicable standards and regulations as listed in the EC Declaration of Conformity and thus comply with the statutory requirements of the EC Directives. Endress+Hauser confirms the conformity of the device by affixing to it the CE mark.

## 2.5 Registered trademarks

KALREZ, VITON, TEFLON

Registered trademark of E.I. Du Pont de Nemours & Co., Wilmington, USA

TRI-CLAMP

Registered trademark of Ladish & Co., Inc., Kenosha, USA

GORE-TEX®

Registered trademark of W.L. Gore & Associates, Inc., USA

## 3 Installation

### 3.1 Incoming acceptance, transport, storage

#### 3.1.1 Incoming acceptance

- Check the packaging and the contents for damage.
- Check the shipment, make sure nothing is missing and that the scope of supply matches your order.

#### 3.1.2 Transport



Caution!

Follow the safety instructions and transport conditions for devices of more than 18 kg (39.69 lbs). Transport the measuring device to the measuring point in its original packaging or at the process connection.

#### 3.1.3 Storage

The device must be stored in a dry, clean area and protected against damage from impact (EN 837-2).

Storage temperature range:

See Technical Information for Cerabar M TI00436P.

### 3.2 Installation conditions

#### 3.2.1 Dimensions

→ For dimensions, please refer to the Technical Information for Cerabar M TI00436P, "Mechanical construction" section.

### 3.3 Installation instructions



Note!

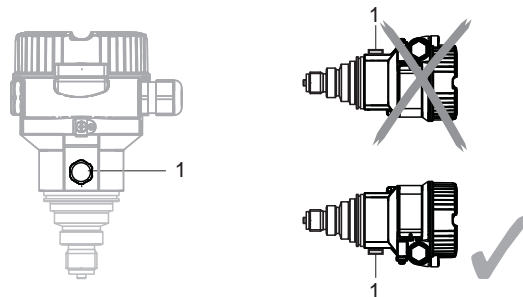
- Due to the orientation of the Cerabar M, there may be a shift in the zero point, i.e. when the container is empty or partially full, the measured value does not display zero. You can correct this zero point shift → § 27, Section 5.1.2 "Function of the operating elements".
- For PMP55, please refer to Section 3.3.2 "Installation instructions for devices with diaphragm seals – PMP55", → § 14.
- Endress+Hauser offers a mounting bracket for installing on pipes or walls. → § 17, Section 3.3.5 "Wall and pipe mounting (optional)".

#### 3.3.1 Installation instructions for devices without diaphragm seals – PMP51, PMC51

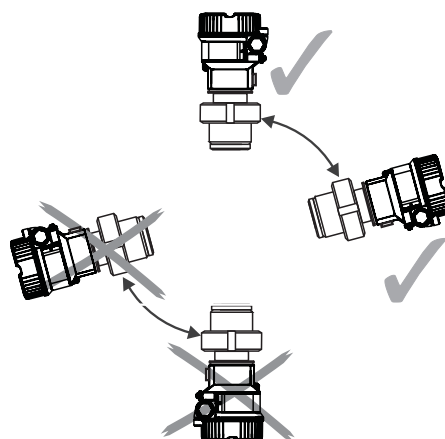


Note!

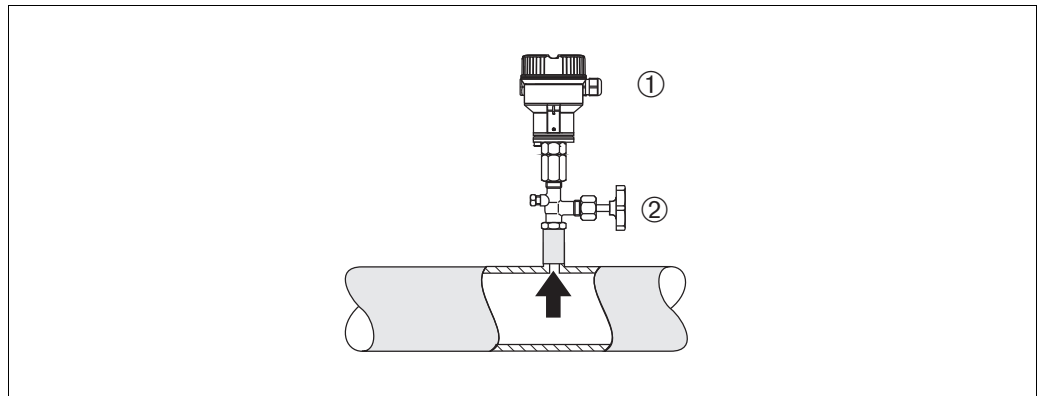
- If a heated Cerabar M is cooled during the cleaning process (e.g. by cold water), a vacuum develops for a short time, whereby moisture can penetrate the sensor through the pressure compensation (1). If this is the case, mount the Cerabar M with the pressure compensation (1) pointing downwards.



- Keep the pressure compensation and GORE-TEX® filter (1) free from contamination.
- Cerabar M 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.
- Do not clean or touch process isolating diaphragms with hard or pointed objects.
- The device must be installed as follows in order to comply with the cleanability requirements of the ASME-BPE (Part SD Cleanability):



### Pressure measurement in gases



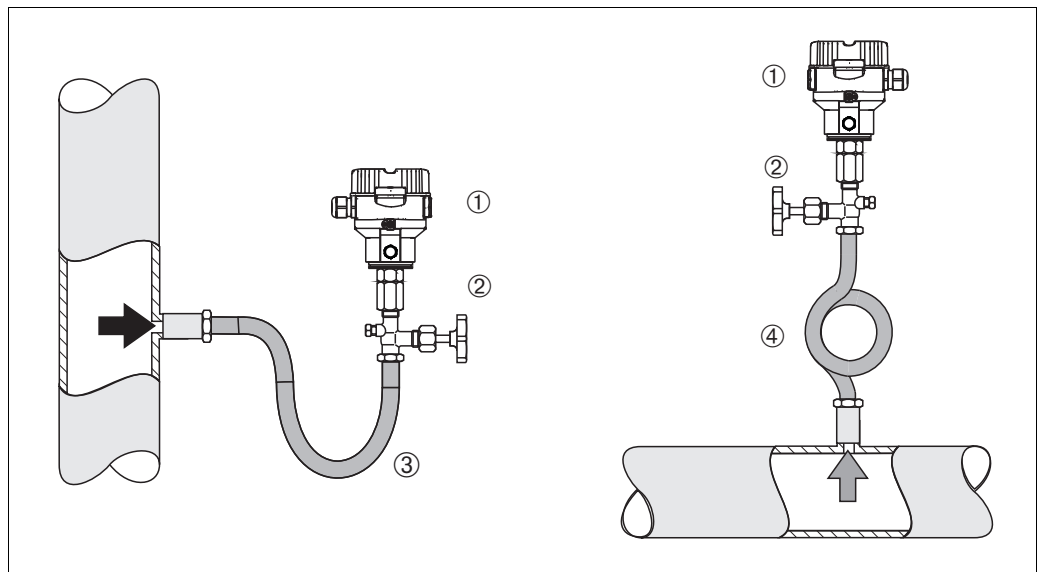
P01-PMx5xxxx-11-xx-xx-xx-003

Fig. 5: Measuring arrangement for pressure measurement in gases

- 1 Cerabar M
- 2 Shutoff device

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

### Pressure measurement in steams



P01-PMx5xxxx-11-xx-xx-xx-004

Fig. 6: Measuring arrangement for pressure measurement in steams

- 1 Cerabar M
- 2 Shutoff device
- 3 U-shaped siphon
- 4 Circular siphon

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

### Pressure measurement in liquids

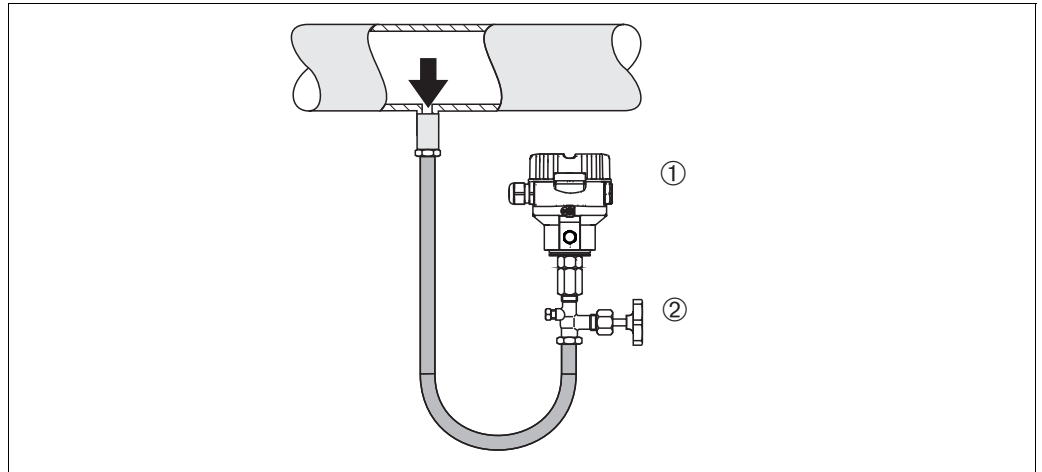


Fig. 7: Measuring arrangement for pressure measurement in liquids

- 1 Cerabar M
- 2 Shutoff device

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

### Level measurement

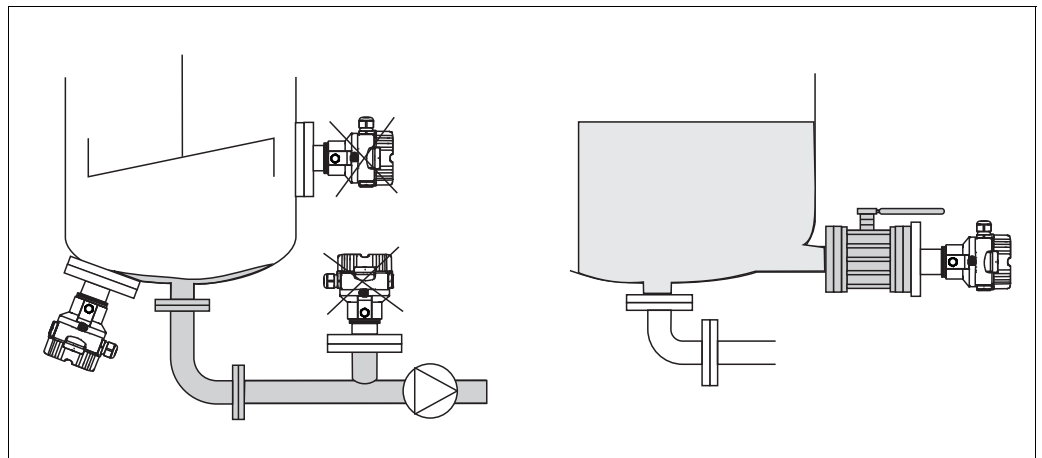


Fig. 8: Measuring arrangement for level

- Always install the Cerabar M below the lowest measuring point.
- Do not mount the device in the filling curtain or at a point in the tank which could be affected by pressure pulses from an agitator.
- Do not mount the device in the suction area of a pump.
- The calibration and functional test can be carried out more easily if you mount the device downstream of a shutoff device.

### PVDF interchangeable threaded boss



Note!

A maximum torque of 7 Nm (5.16 lbs ft) is permitted for devices with a PVDF interchangeable threaded boss. The thread connection may become loose at high temperatures and pressures. This means that the integrity of the thread must be checked regularly and may need to be tightened using the torque given above. Teflon tape is recommended for sealing the 1/2 NPT thread.

### 3.3.2 Installation instructions for devices with diaphragm seals – PMP55



Note!

- Cerabar M devices with diaphragm seals are screwed in, flanged or clamped, depending on the type of diaphragm seal.
- A diaphragm seal and the pressure transmitter together form a closed, oil-filled calibrated system. The fill fluid hole is sealed and may not be opened.
- Do not clean or touch the process isolating diaphragm of the diaphragm seal with hard or pointed objects.
- Do not remove process isolating diaphragm protection until shortly before installation.
- When using a mounting bracket, sufficient strain relief must be ensured for the capillaries in order to prevent the capillary bending down (bending radius  $\geq 100$  mm (3.94 in)).
- Please note that the hydrostatic pressure of the liquid columns in the capillaries can cause zero point shift. The zero point shift can be corrected.
- Please observe the application limits of the diaphragm seal filling oil as detailed in the Technical Information for Cerabar M TI00436P, "Planning instructions for diaphragm seal systems" section.

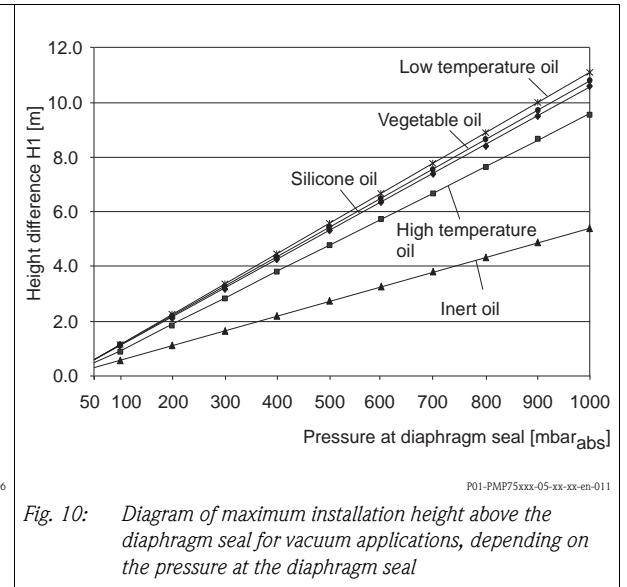
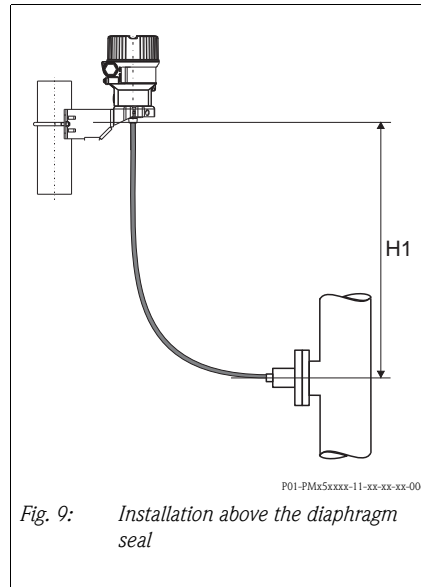
In order to obtain more precise measurement results and to avoid a defect in the device, mount the capillaries as follows:

- Vibration-free (in order to avoid additional pressure fluctuations)
- Not in the vicinity of heating or cooling lines
- Insulate if the ambient temperature is below or above the reference temperature
- With a bending radius of  $\geq 100$  mm (3.94 in).

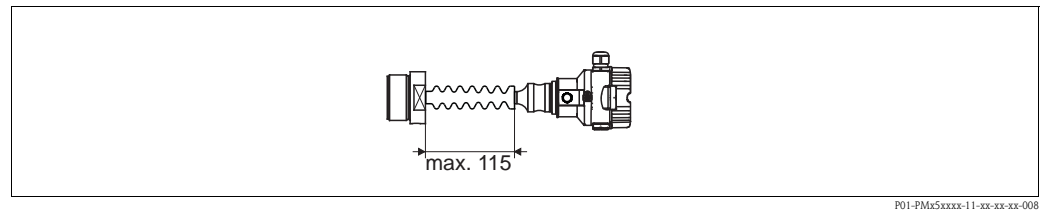
**Vacuum application**

For applications under vacuum, Endress+Hauser recommends mounting the pressure transmitter below the diaphragm seal. This prevents vacuum loading of the diaphragm seal caused by the presence of filling oil in the capillaries.

When the pressure transmitter is mounted above the diaphragm seal, the maximum height difference H1 in accordance with the illustration below left must not be exceeded. The maximum height difference depends on the density of the filling oil and the smallest ever pressure that is permitted to occur at the diaphragm seal (empty container), see illustration below right.



**Mounting with temperature isolator**



Endress+Hauser recommends the use of temperature isolators in the event of constant extreme medium temperatures which lead to the maximum permissible electronics temperature of +85°C (+185°F) being exceeded. To minimize the influence of rising heat, Endress+Hauser recommends the device be mounted horizontally or with the housing pointing downwards. The additional installation height also brings about a zero point shift of approx. 21 mbar (0.315 psi) due to the hydrostatic column in the temperature isolator. You can correct this zero point shift. → 27 "Function of the operating elements".

### 3.3.3 Seal for flange mounting

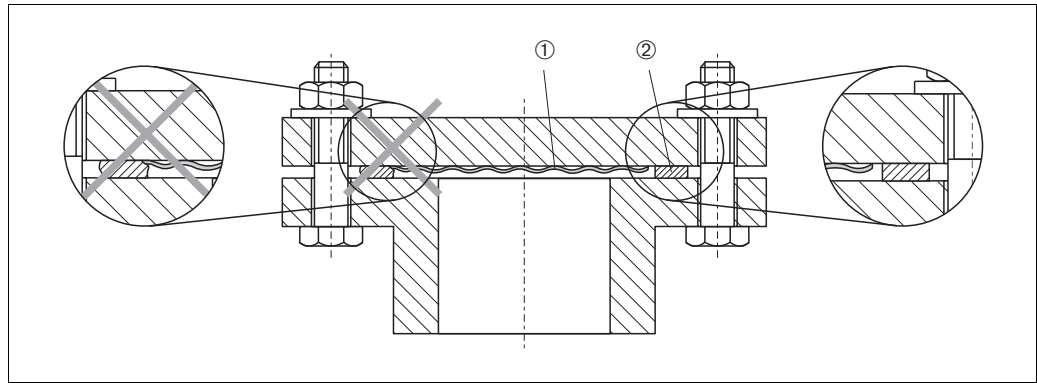


Fig. 11: Mounting the versions with a flange

- 1 Process isolating diaphragm
- 2 Seal



Warning!

The seal is not allowed to press against the process isolating diaphragm as this could affect the measurement result.

### 3.3.4 Thermal insulation – PMP55

The PMP55 may only be insulated up to a certain height. The maximum permitted insulation height is indicated on the devices and applies to an insulation material with a heat conductivity  $\leq 0.04 \text{ W}/(\text{m} \times \text{K})$  and to the maximum permitted ambient and process temperature (→ see table below). The data were determined under the most critical application "quiescent air".

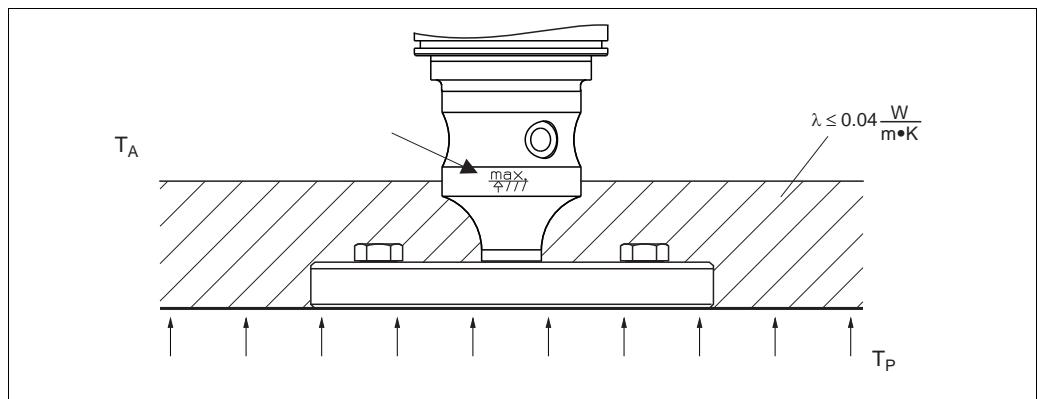


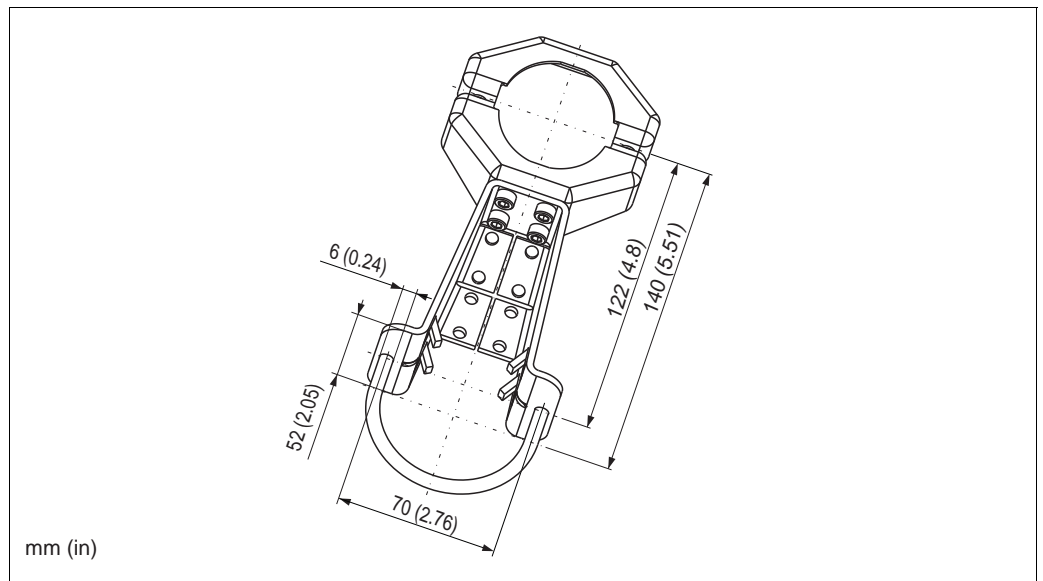
Fig. 12: Maximum permitted insulation height, here indicated on a PMP55 with a flange

	PMP55
Ambient temperature ( $T_A$ )	$\leq 70^\circ\text{C}$ (158°F)
Process temperature ( $T_P$ )	Max. 400°C (752°F), depending on the diaphragm seal filling oil used (see TI00436PEN)



### 3.3.5 Wall and pipe mounting (optional)

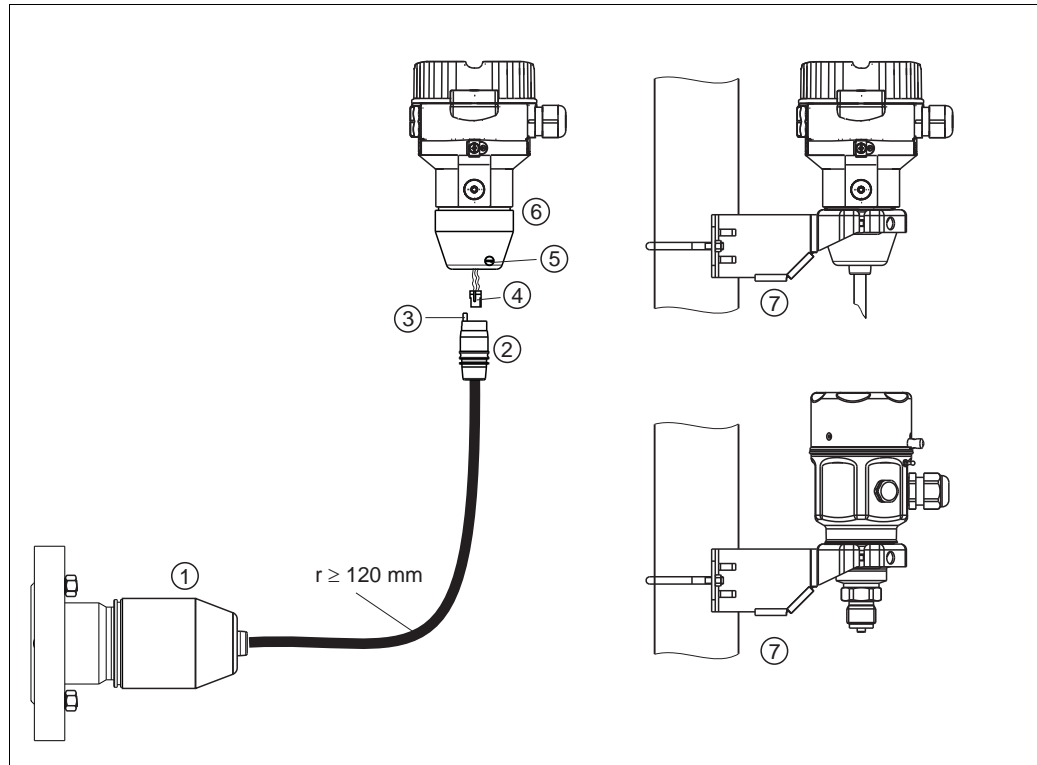
Endress+Hauser offers a mounting bracket for installing on pipes or walls (for pipes from 1 1/4" up to 2" diameter).



Please note the following when mounting:

- Devices with capillary tubes: mount capillaries with a bending radius  $\geq 100$  mm (3.94 in).
- When mounting on a pipe, tighten the nuts on the bracket uniformly with a torque of at least 5 Nm (3.69 lbs ft).

### 3.3.6 Assembling and mounting the "separate housing" version



P01-XMx5xxxx-11-xx-xx-xx-009

Fig. 13: "Separate housing" version

- 1 In the case of the "separate housing" version, the sensor is delivered with the process connection and cable ready mounted.
- 2 Cable with connection jack
- 3 Pressure compensation
- 4 Connector
- 5 Locking screw
- 6 Housing mounted with housing adapter, included
- 7 Mounting bracket provided, suitable for pipe and wall mounting (for pipes from 1 1/4" up to 2" diameter)

#### Assembly and mounting

1. Insert the connector (item 4) into the corresponding connection jack of the cable (item 2).
2. Plug the cable into the housing adapter (item 6).
3. Tighten the locking screw (item 5).
4. Mount the housing on a wall or pipe using the mounting bracket (item 7).  
When mounting on a pipe, tighten the nuts on the bracket uniformly with a torque of at least 5 Nm (3.69 lbs ft).  
Mount the cable with a bending radius ( $r$ )  $\geq$  120 mm (4.72 in).

### 3.3.7 PMP51, version prepared for diaphragm seal mount – welding recommendation

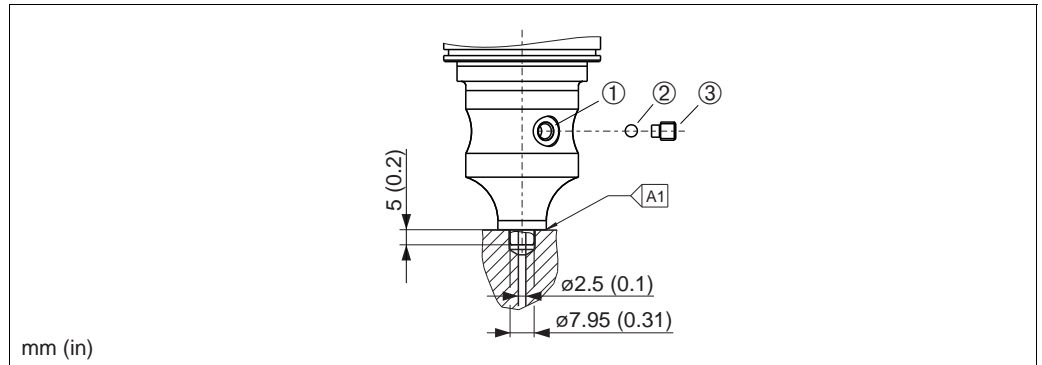


Fig. 14: Version U1: prepared for diaphragm seal mount

- 1 Hole for fill fluid
- 2 Bearing
- 3 Setscrew
- A1 See the "Welding recommendation" table below

Endress+Hauser recommends welding on the diaphragm seal as follows for the "XSJ - Prepared for diaphragm seal mount" version in feature 110 "Process connections" in the order code up to, and including, 40 bar (600 psi) sensors: the total welding depth of the fillet weld is 1 mm (0.04 in) with an outer diameter of 16 mm (0.63 in). Welding is performed according to the WIG method.

Consecutive seam no.	Sketch/welding groove shape, dimension as per DIN 8551	Base material matching	Welding process DIN EN ISO 24063	Welding position	Inert gas, additives
A1 for sensors ≤ 40 bar (600 psi)	<p>P01-PMP71xxx-11-xx-xx-xx-001</p>	Adapter made of AISI 316L (1.4435) to be welded to diaphragm seal made of AISI 316L (1.4435 or 1.4404)	141	PB	Inert gas Ar/H 95/5  Additive: ER 316L Si (1.4430)

#### Information on filling

The diaphragm seal must be filled as soon as it has been welded on.

- After welding into the process connection, the sensor assembly must be properly filled with a filling oil and sealed gas-tight with a sealing ball and lock screw. Once the diaphragm seal has been filled, the device display should not exceed 10% of the full scale value of the cell measuring range at the zero point. The internal pressure of the diaphragm seal must be corrected accordingly.
- Adjustment / calibration:
  - The device is operational once it has been fully assembled.
  - Perform a reset. The device then has to be calibrated to the process measuring range as explained in the Operating Instructions.

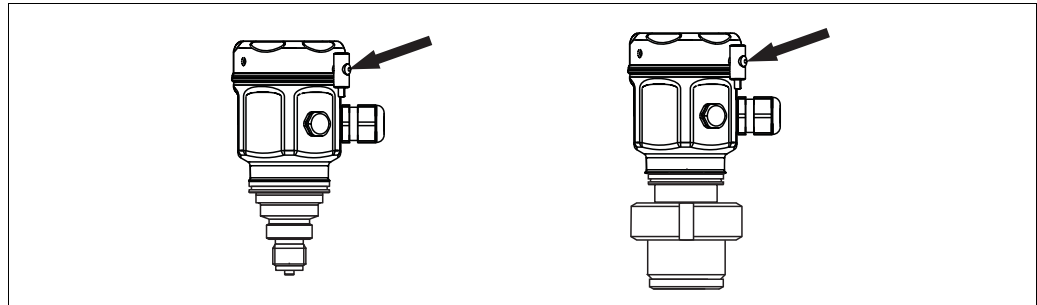
### 3.4 Closing the housing cover



Note!

When closing the housing cover, please ensure that the thread of the cover and housing are free from dirt, e.g. sand. If you feel any resistance when closing the cover, check the thread on both again to ensure that they are free from dirt.

#### 3.4.1 Closing the cover on the stainless steel housing



P01-XMx5xxxx-17-xx-xx-xx-001

Fig. 15: Closing the cover

The cover for the electronics compartment is tightened by hand at the housing until the stop. The screw serves as DustEx protection (only available for devices with DustEx approval).

### 3.5 Mounting of the profile seal for universal process mounting adapter

For details on mounting, see KA00096F/00/A3.

### 3.6 Post-installation check

After installing the device, carry out the following checks:

- Are all screws firmly tightened?
- Is the housing cover screwed down tight?

## 4 Wiring

### 4.1 Connecting the device



#### Warning!

Risk of electric shock and/or explosion in hazardous areas! In a wet environment, do not open the cover if voltage is present.

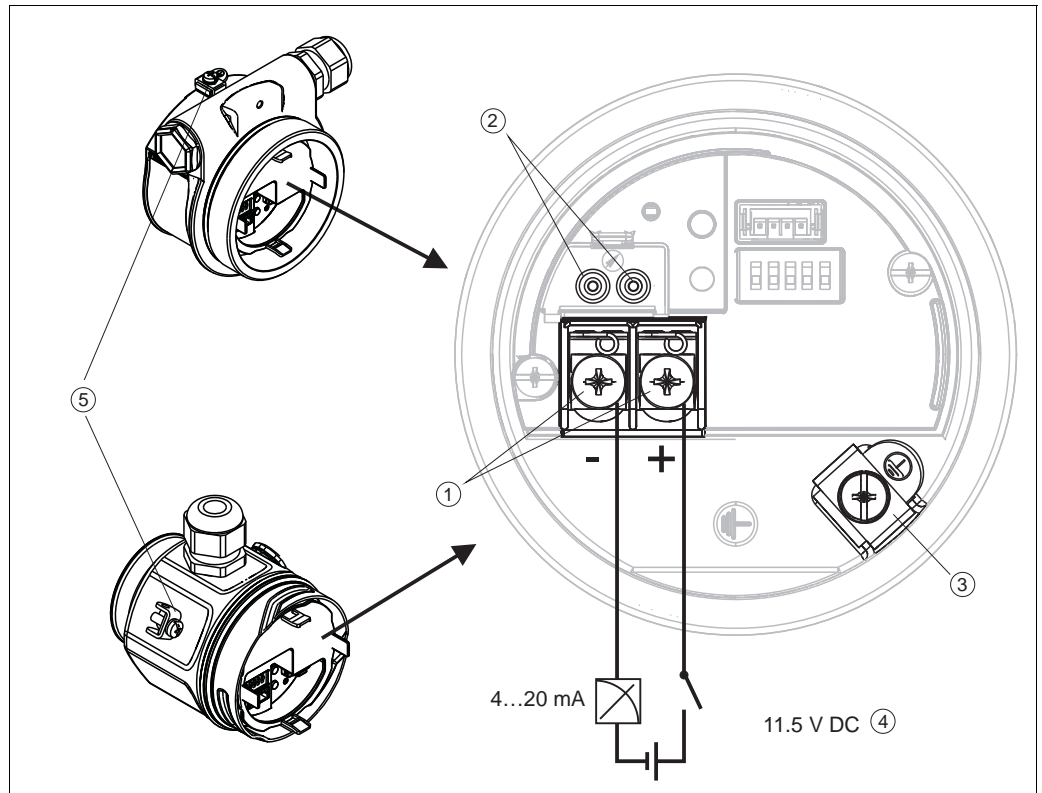


#### Note!

- A suitable circuit breaker must be provided for the device in accordance with IEC/EN61010.
- Devices with integrated overvoltage protection must be grounded.
- Protective circuits against reverse polarity, HF influences and overvoltage peaks are integrated.

#### The procedure

1. Check that the supply voltage corresponds to the supply voltage indicated on the nameplate.
2. Switch off the supply voltage before connecting the device.
3. Remove housing cover.
4. Guide the cable through the gland. Preferably use a twisted, shielded two-wire cable.
5. Connect the device in accordance with the following diagram.
6. Screw down the housing cover.
7. Switch on the supply voltage.



P01-PMD55xxx-04-xx-xx-xx-010

Electrical connection 4 to 20 mA

- 1 Terminals for supply and signal
- 2 Test terminals
- 3 Ground terminal
- 4 Supply voltage: 11.5 to 45 VDC (versions with plug-in connectors: 35 V DC)
- 5 External ground terminal

### 4.1.1 Devices with Harting connector Han7D

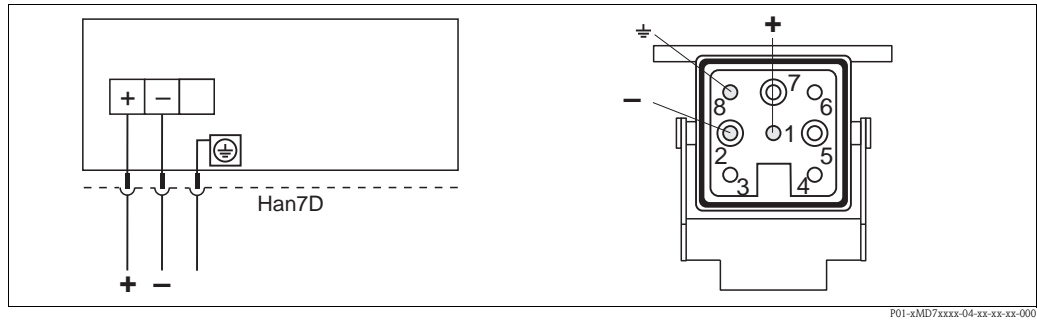
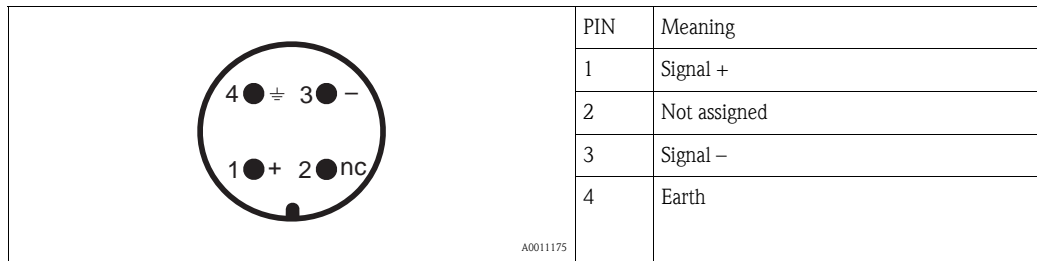


Fig. 16: Left: electrical connection for devices with a Harting connector Han7D  
Right: view of the connection at the device

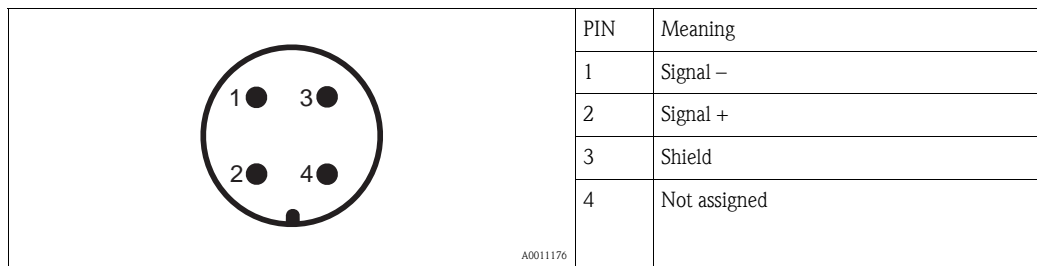
### 4.1.2 Connecting devices with an M12 connector

#### PIN assignment for M12 connector



### 4.1.3 Devices with 7/8" plug

#### PIN assignment for 7/8" connector



### 4.1.4 Devices with valve connector

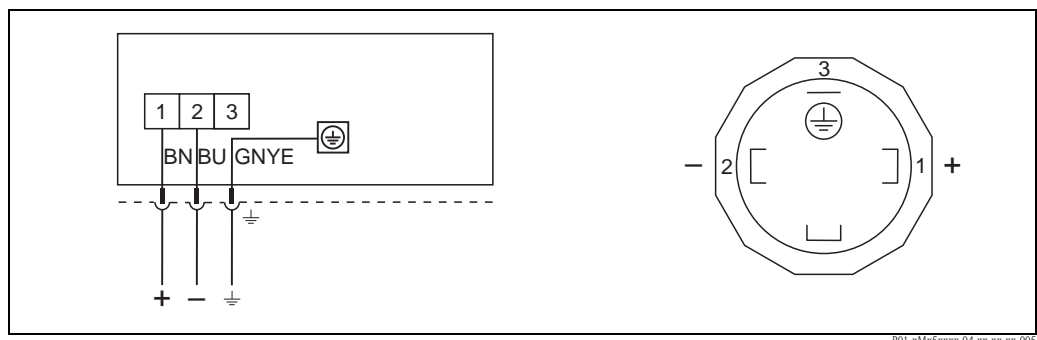


Fig. 17: BN = brown, BU = blue, GNYE = green/yellow; Left: electrical connection for devices with a valve connector  
Right: view of the connector at the device

## 4.2 Connecting the measuring unit

### 4.2.1 Supply voltage

Electronic version	
4 to 20 mA	11.5 to 45 V DC (Versions with plug-in connectors: 35 V DC)

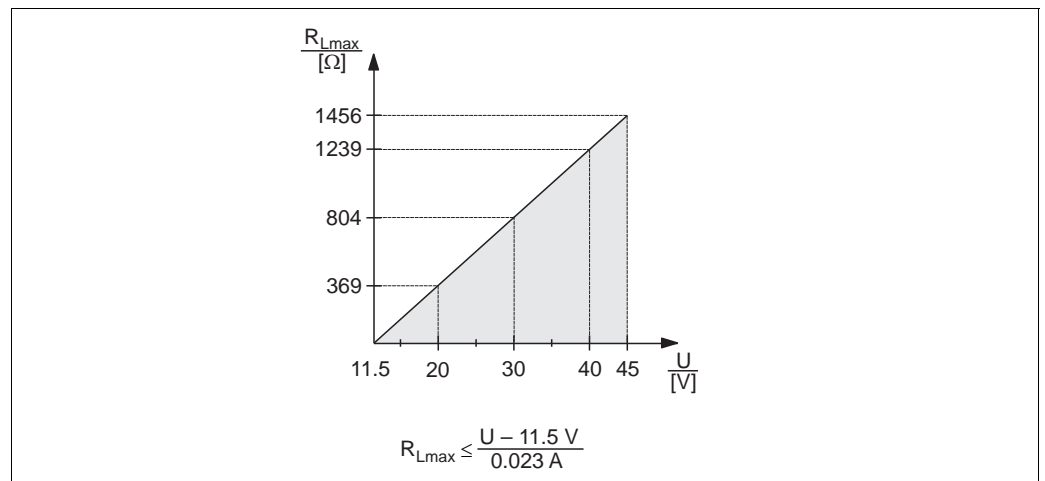
#### Taking 4 to 20 mA test signal

A 4 to 20 mA test signal may be measured via the test terminals without interrupting the measurement. To keep the corresponding measured error below 0.1 %, the current measuring device should exhibit an internal resistance of < 0.7 Ω.

### 4.2.2 Cable specification

- Endress+Hauser recommends using twisted, shielded two-wire cables.
- Terminals for wire cross-sections 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG)
- Cable outer diameter: 5 to 9 mm (0.2 to 0.35 in) depends on the used cable gland (see technical information)

### 4.2.3 Load



Load diagram

Power supply 11.5 to 45 V DC (versions with plug connectors: 35 V DC) for other types of protection and for uncertified device versions

$R_{Lmax}$  Maximum load resistance  
 $U$  Supply voltage

### 4.2.4 Shielding/potential equalization

You achieve optimum shielding against disturbances if the shielding is connected on both sides (in the cabinet and on the device). If potential equalization currents are expected in the plant, only ground shielding on one side, preferably at the transmitter.

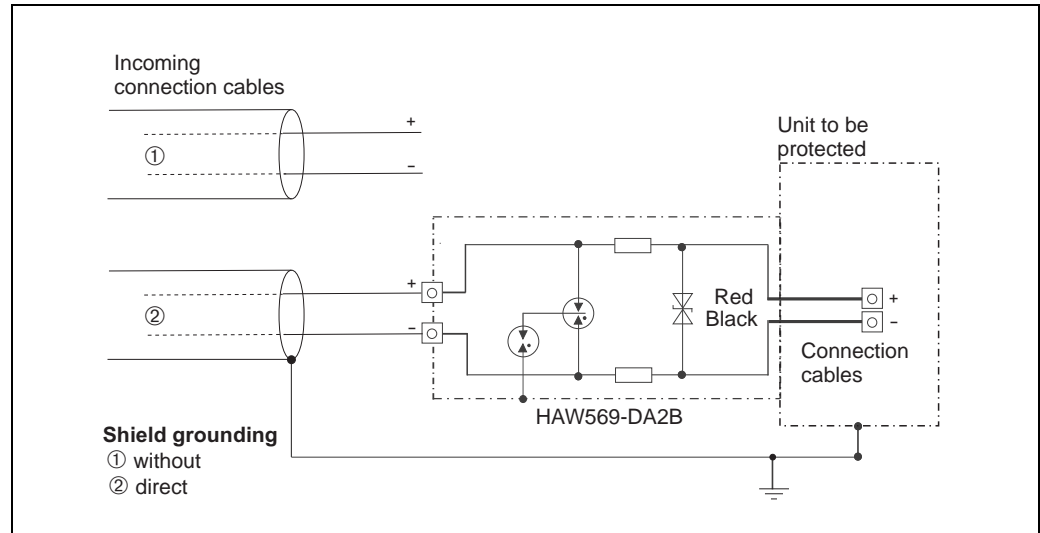
## 4.3 Potential equalization

Observe the applicable regulations.

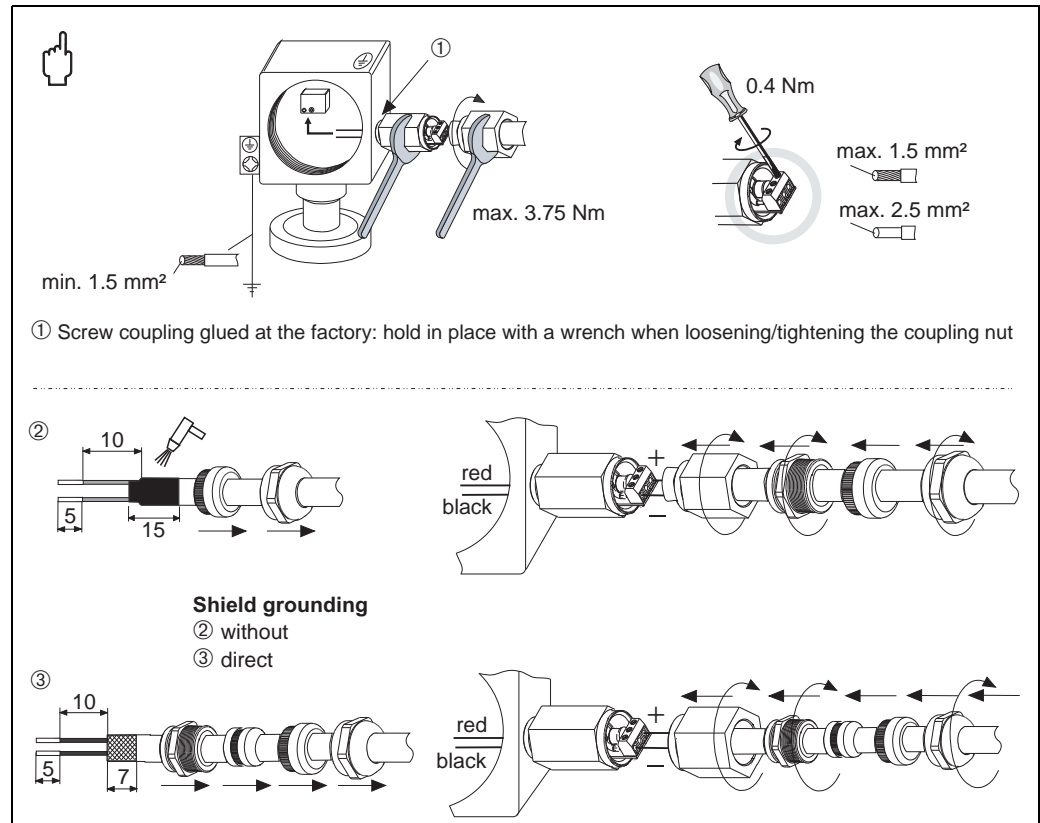
## 4.4 Overvoltage protection (optional)

Devices showing version "NA" in feature 610 "Accessory mounted" in the order code are equipped with overvoltage protection (→ see also Technical Information TI00436P "Ordering information"). The overvoltage protection is mounted at the factory on the housing thread for the cable gland and is approx. 70 mm (2.76 in) in length (take additional length into account when installing). The device is connected as specified in the following graphic. For details, see TI001013KEN, XA01003KA3 and BA00304KA2.

### 4.4.1 Wiring



### 4.4.2 Installation





## 4.5 Post-connection check

Perform the following checks after completing electrical installation of the device:

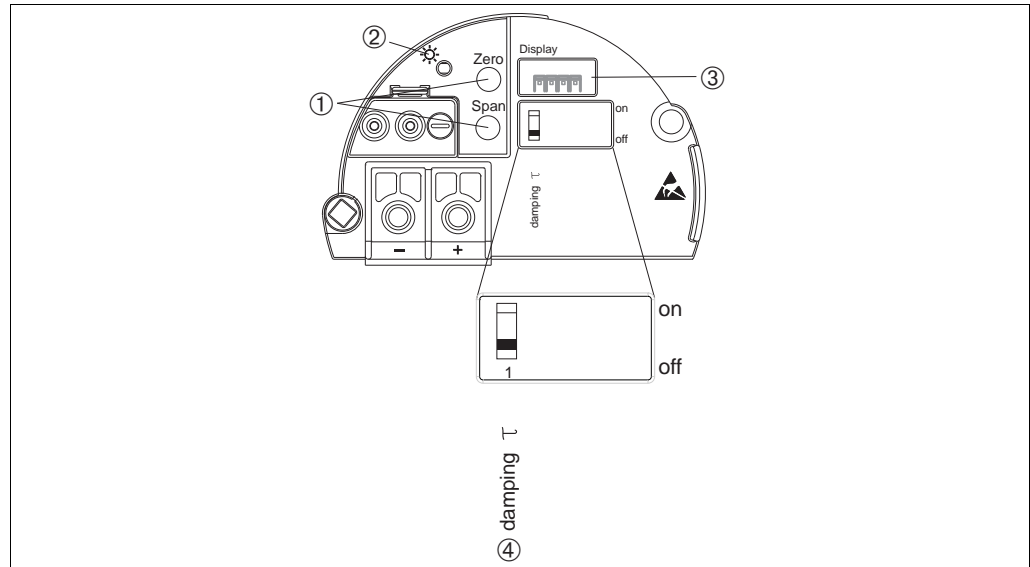
- Does the supply voltage match the specifications on the nameplate?
- Is the device connected as per Section 4.1?
- Are all screws firmly tightened?
- Is the housing cover screwed down tight?

As soon as voltage is applied to the device, the green LED on the electronic insert lights up for a few seconds or the connected local display lights up.

## 5 Operation

### 5.1 Position of operating elements

The operating keys and DIP switch are located on the electronic insert in the device.



P01-Mxxxxxxx-19-xx-xx-xx-010

Fig. 18: Electronic insert

- 1 Operating keys for lower range value (zero) and upper range value (span)
- 2 Green LED to indicate successful operation
- 3 Slot for optional local display
- 4 DIP switch for switching damping on/off

#### 5.1.1 Function of the DIP switch

Switch position	
"off"	"on"
Damping is switched off. The output signal follows measured value changes without any delay.	Damping is switched on. The output signal follows measured value changes with the delay time $\tau$ (Factory setting: $\tau = 2$ s or as per order specifications).

### 5.1.2 Function of the operating elements

Operating key(s)	Meaning
"Zero" pressed briefly	<b>Display lower range value</b>
"Zero" pressed for at least 3 seconds	<b>Get lower range value</b> The pressure present is accepted as the lower range value (LRV).
"Span" pressed briefly	<b>Display upper range value</b>
"Span" pressed for at least 3 seconds	<b>Get upper range value</b> The pressure present is accepted as the upper range value (LRV).
"Zero" and "Span" pressed together briefly	<b>Display position adjustment</b>
"Zero" and "Span" pressed simultaneously for at least 3 seconds	<b>Position adjustment</b> The sensor characteristic curve is shifted parallel to itself, so that the pressure present becomes the zero value.
"Zero" and "Span" pressed simultaneously for at least 12 seconds	<b>Reset</b> All parameters are reset to the order configuration.

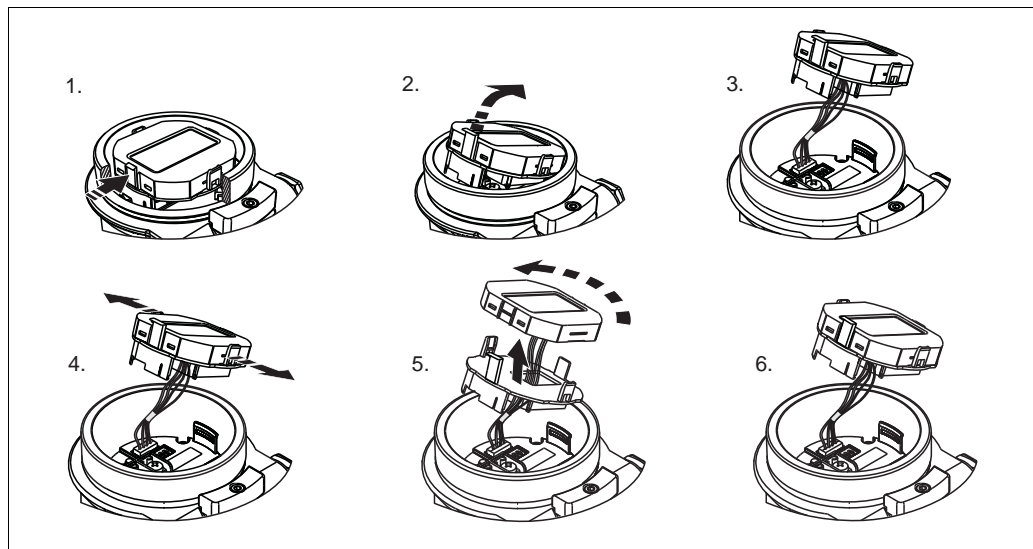
### 5.2 Using the device display (optional)

A 4-line liquid crystal display (LCD) is used. The local display shows measured values, fault messages and notice messages.

The display can be removed for easy operation (see diagram, steps 1 - 3). It is connected to the device via a 90 mm (3.54 in) long cable.

The device display can be rotated in 90 ° stages (see diagram, steps 4 - 6).

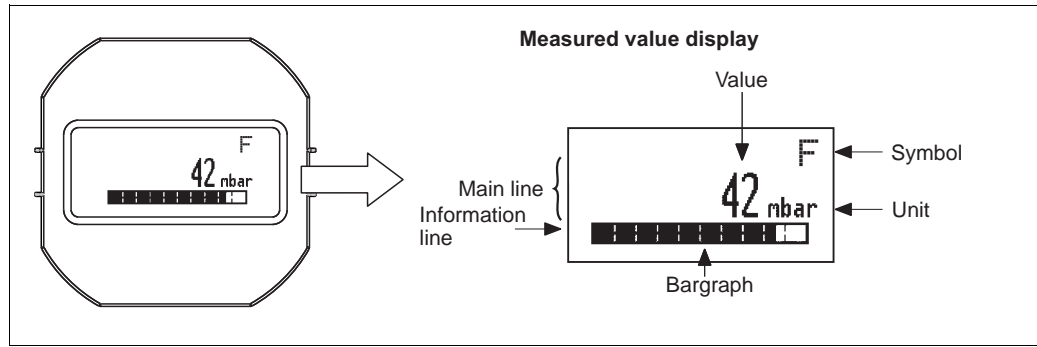
Depending on the orientation of the device, this makes it easy to read the measured values.



P01-Mxxxxxxx-19-xx-xx-xx-011

Functions:

- 8-digit measured value display including sign and decimal point, bar graph for 4 to 20 mA as current display.
- Diagnostic functions (fault and warning message etc.)



The following table illustrates the symbols that can appear on the local display. Four symbols can occur at one time.

Symbol	Meaning
S	<b>Error message "Out of specification"</b> The device is being operated outside its technical specifications (e.g. during warmup or cleaning processes).
C	<b>Error message "Service mode"</b> The device is in the service mode (during a simulation, for example).
M	<b>Error message "Maintenance required"</b> Maintenance is required. The measured value remains valid.
F	<b>Error message "Failure detected"</b> An operating error has occurred. The measured value is no longer valid.

## 6 Commissioning



Warning!

- If the pressure present at the device is less than the permitted minimum pressure or greater than the permitted maximum pressure, the message "S" and "Warning" are output alternately.



Caution!

The measuring range and the unit in which the measured value is displayed correspond to the specifications on the nameplate.

### 6.1 Function check

Carry out a post-installation and a post-connection check as per the checklist before commissioning the device.

- "Post-installation check" → 20 checklist
- "Post-connection check" → 25 checklist

### 6.2 Commissioning

The following functions are possible via the keys on the electronic insert:

- Position adjustment (zero point correction) A pressure shift resulting from the orientation of the measuring device can be corrected by performing the position adjustment.
- Setting lower range value and upper range value
- Device reset



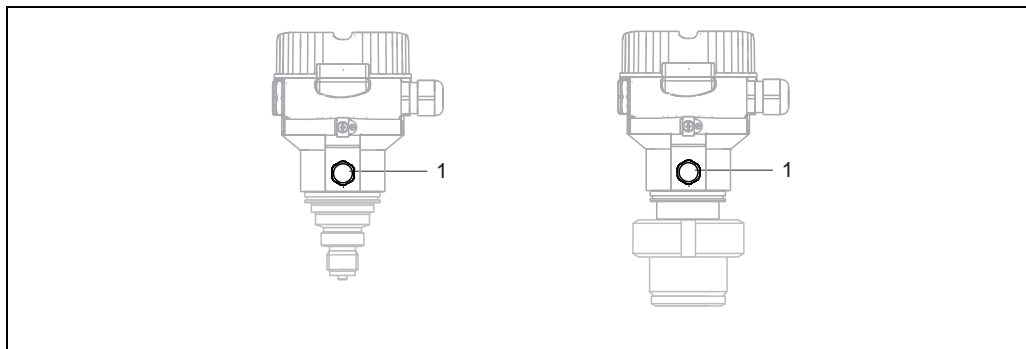
Note!

- The pressure applied must be within the nominal pressure limits of the sensor. See information on the nameplate.

1.) Carrying out position adjustment		2.) Setting lower range value		3.) Setting upper range value		4.) Check configuration	
Pressure is present at device.		Desired pressure for lower range value is present at device.		Desired pressure for upper range value is present at device.		Press "Zero" key briefly to display the lower range value.	
↓		↓		↓		↓	
Press the "Zero" and "Span" keys simultaneously for at least 3 s.		Press the "Zero" key for at least 3 s.		Press the "Span" key for at least 3 s.		Press "Span" key briefly to display the upper range value.	
↓		↓		↓		↓	
Does the LED on the electronic insert light up briefly?		Does the LED on the electronic insert light up briefly?		Does the LED on the electronic insert light up briefly?		Press "Zero" and "Span" keys together briefly to display the calibration offset.	
Yes	No	Yes	No	Yes	No		
↓	↓	↓	↓	↓	↓		
Applied pressure for position adjustment has been accepted.	Applied pressure for position adjustment has not been accepted. Observe the input limits.	Applied pressure for lower range value has been accepted.	Applied pressure for lower range value has not been accepted. Observe the input limits.	Applied pressure for upper range value has been accepted.	Applied pressure for upper range value has not been accepted. Observe the input limits.		

## 7 Maintenance

Keep the pressure compensation and GORE-TEX® filter (1) free from contamination.



P01-xMx5xxxx-17-xx-xx-xx-000.

### 7.1 Cleaning instructions

Endress+Hauser offer flushing rings as accessories to clean process isolating diaphragms without taking the transmitters out of the process.


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

#### 7.1.1 Cerabar M PMP55

We recommend you perform CIP (cleaning in place (hot water)) before SIP (sterilization in place (steam)) for pipe diaphragm seals. A frequent use of sterilization in place (SIP) will increase the stress on the process isolating diaphragm. Under unfavorable circumstances in the long term view we cannot exclude that a frequent temperature change could lead to a material fatigue of the process isolating diaphragm and possibly to a leakage.

### 7.2 Exterior cleaning

Please note the following points when cleaning the device:

- The cleaning agents used should not corrode the surface and the seals.
- Mechanical damage to the diaphragm, e.g. due to sharp objects, must be avoided.
- Observe the degree of protection of the device. See the nameplate if necessary (Ø  6 ff).

## 8 Troubleshooting

### 8.1 Messages

The following is a list of the messages that can occur. The device has four different status information codes in accordance with NE107:

- F = failure
- M (warning) = maintenance required
- C (warning) = function check
- S (warning) = out of specification (deviations from the permitted ambient or process conditions determined by the device with the self-monitoring function, or errors in the device itself indicate that the measuring uncertainty is greater than what would be expected under normal operating conditions).

### 8.2 Measures

When a message is displayed, the following steps can be taken:


- Check cable/pressure value
- Restart device
- Perform a reset

If these steps do not correct the error, please contact your Endress+Hauser subsidiary.

### 8.3 Response of output to errors

In the event of an error, the current output assumes a value of 3.6mA.

### 8.4 Repair

The Endress+Hauser repair concept provides for measuring devices to have a modular design and that the customer can also carry out repairs (see →  31, on Section 8.5 "Spare Parts").



Note!

- For more information on service and spare parts, contact Endress+Hauser Service.  
→ See [www.endress.com/worldwide](http://www.endress.com/worldwide).

### 8.5 Spare Parts

- Some replaceable measuring device components are identified by means of a spare part nameplate. This contains information about the spare part.
- All the spare parts for the measuring device along with the order code are listed in the W@M Device Viewer ([www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)) and can be ordered. If available, users can also download the associated Installation Instructions.



Note!

Measuring device serial number:

- Located on the device and spare part nameplate.

## 8.6 Return

The measuring device must be returned if repairs or a factory calibration are required, or if the wrong measuring device has been ordered or delivered. According to legal regulations, Endress+Hauser, as a ISO-certified company, is required to follow certain procedures when handling returned products that are in contact with process fluids. To ensure swift, safe and professional device returns, please read the return procedures and conditions on the Endress+Hauser website at [www.services.endress.com/return-material](http://www.services.endress.com/return-material).

## 8.7 Disposal

When disposing, separate and recycle the device components based on the materials.

## 8.8 Software history

Date	Software version	Software modifications	Documentation
			Operating Instructions
10.2009	01.00.zz	Original software.	BA385P/00/EN/10.09 71102503
			BA00385P/00/EN/13.10 71125888
			BA00385P/00/EN/15.11 71134887
			BA00385P/00/EN/16.12 71157152
			BA00385P/00/EN/17.12 71191314
			BA00385P/00/EN/18.14 71241498



## **9 Technical data**

For the technical data, please refer to the Technical Information TI00436P.

# Index

## Numerics

4 to 20 mA test signal. . . . . 23

## C

Cable specification . . . . . 23

## D

Diaphragm seals, installation instructions . . . . . 14

Diaphragm seals, vacuum application . . . . . 15

Display. . . . . 27

## E

Electrical connection . . . . . 21

## I

Incoming acceptance . . . . . 10

Installation instructions for devices with diaphragm seals. . 14

Installation instructions for devices without diaphragm seals . . 11

## K

Keys, local, function . . . . . 27

## L

Load . . . . . 23

Local display . . . . . 27

## M

Measuring arrangement for level measurement . . . . . 13

Measuring arrangement for pressure measurement . . . 12–13

## N

Nameplate . . . . . 6

## O

Operating elements, function . . . . . 27

Operating elements, position . . . . . 26

Operating keys, position . . . . . 26

Overvoltage protection . . . . . 24

## P

Pipe mounting . . . . . 17

Potential equalization . . . . . 23

## R

Repair . . . . . 31

Returning devices. . . . . 32

## S

Scope of delivery . . . . . 8

Separate housing, assembly and mounting . . . . . 18

Shielding . . . . . 23

Software history . . . . . 32

Spare Parts . . . . . 31

Storage. . . . . 10

Supply voltage . . . . . 23

## T

Temperature isolator, installation instructions . . . . . 15

## W

Wall mounting . . . . . 17

Welding recommendation. . . . . 19



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