



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services

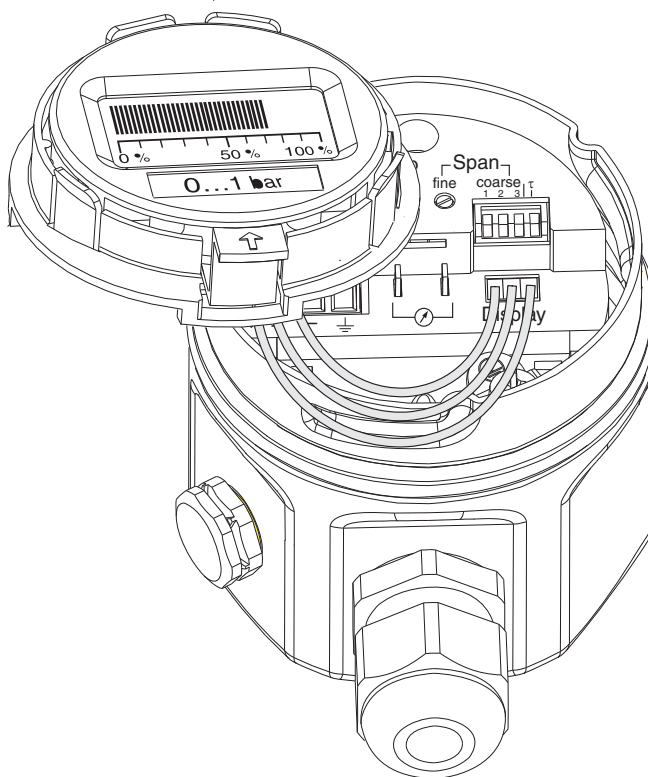


Solutions

Operating Instructions

Cerabar M PMC41/45, PMP41/45/46/48

Process pressure measurement



Overview of documentation

Device	Documentation	Contents
Cerabar M ANALOG	Technical Information TI399P	Technical data
	Operating Instructions BA200P	<ul style="list-style-type: none">- Identification- Installation- Wiring- Operation- Maintenance- Troubleshooting and spare parts

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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 EC regulations. If used incorrectly or for anything other than the designated use, the device can, however, be a source of danger e.g. product overflow due to incorrect installation or configuration. Consequently, installation, connection to the electricity supply, commissioning, operation and maintenance of the measuring system must be carried out by trained, qualified specialists authorized to perform such work by the facility's owner-operator. The specialists must have read and understood these Operating Instructions and must follow the instructions they contain. Modifications and repairs to the device are permissible only if they are expressly approved in the manual. Pay particular attention to the information and instructions on the nameplate.

1.3 Operational safety




1.3.1 Hazardous areas (optional)




Devices for use in hazardous areas are fitted with an additional nameplate (→ see from Page 6, Section 2.1.1 "Nameplates"). If the measuring system is to be used in hazardous areas, applicable national standards and regulations must be observed. The device is accompanied by separate "Ex documentation", which is an integral part of this documentation. The installation regulations, connection values and safety instructions listed in this Ex document must be observed. The documentation number of the related safety instructions is also indicated on the additional nameplate.






- Ensure that all personnel are suitably qualified.

1.4 Notes on safety conventions and icons

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

Symbol	Meaning
	Warning! 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.
	Caution! A caution highlights actions or procedures which, if not performed correctly, may lead to personal injury or the incorrect operation of the device.
	Note! 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.

	Explosion-protected, type-examined equipment If the device has this symbol embossed on its nameplate, it can be used in a hazardous area or a non-hazardous area, depending on the approval.
	Hazardous area Symbol used in drawings to indicate hazardous areas. – Devices used in hazardous areas must possess an appropriate type of protection.
	Safe area (non-hazardous area) Symbol used in drawings to indicate non-hazardous areas. – Devices used in hazardous areas must possess an appropriate type of protection. Cables used in hazardous areas must meet the necessary safety-related characteristic quantities.

	Direct current A terminal to which DC voltage is applied or through which direct current flows.
	Alternating current A terminal to which alternating voltage (sine-wave) is applied or through which alternating current flows.
	Ground connection A grounded terminal which, as far as the operator is concerned, is grounded by means of a grounding system.
	Protective ground terminal A terminal which must be connected to ground prior to establishing any other connections.
	Equipotential connection 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.

2 Identification

2.1 Device designation

2.1.1 Nameplates



Note!

- The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of 20°C (68°F), or a temperature of 100°F for ANSI flanges.
- The pressure values permitted at higher temperatures can be found in the following standards:
 - EN 1092-1: 2001 Tab. 18¹⁾
 - ASME B 16.5a – 1998 Tab. 2-2.2 F316
 - ASME B 16.5a – 1998 Tab. 2.3.8 N10276
 - JIS B2230
- The test pressure corresponds to the overpressure limit (OPL) of the device = MWP x 1.5²⁾.
- 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.

Nameplate of the aluminum housing

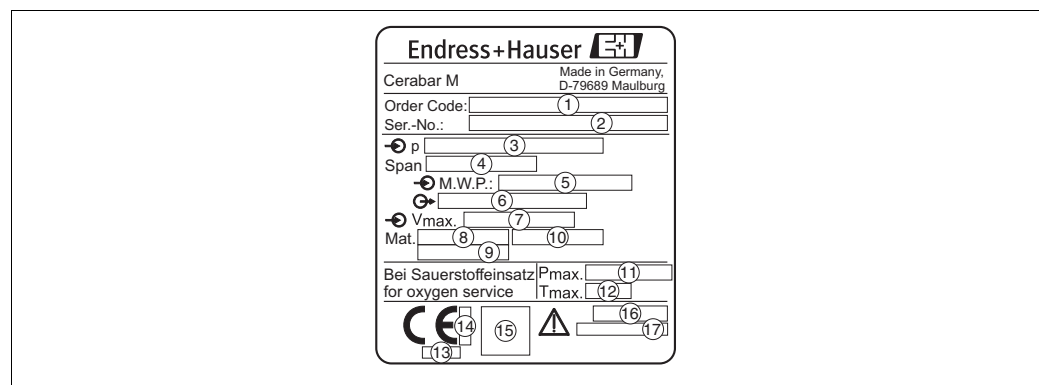
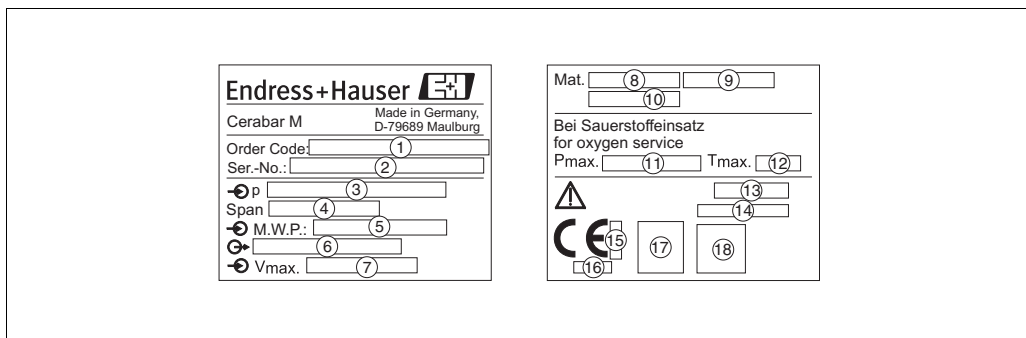


Fig. 1: Nameplate for Cerabar M with aluminium housing

- ① Order code
See the specifications on the order confirmation for the meanings of the individual letters and digits.
- ② Serial number
- ③ Nominal measuring range
- ④ Minimum/maximum span
- ⑤ MWP (Maximum working pressure)
- ⑥ Electronic version (output signal)
- ⑦ Supply voltage
- ⑧ Wetted materials
- ⑨ Wetted materials
- ⑩ Wetted materials
- ⑪ Maximum pressure for oxygen applications (optional for devices, suitable for oxygen applications)
- ⑫ Maximum temperature for oxygen applications (optional for devices, suitable for oxygen applications)
- ⑬ ID number of notified body with regard to Pressure Equipment Directive (optional)
- ⑭ ID number of notified body with regard to ATEX (optional)
- ⑮ not used
- ⑯ Degree of protection
- ⑰ CRN number (optional)

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 PMP41, PMP45 and PMP48 with a 100 bar measuring cell.

Nameplate of the stainless steel housing



P01-PMx4xF15-18-xx-xx-xx-000

Fig. 2: Nameplate for Cerabar M with stainless steel housing

- ① Order code
See the specifications on the order confirmation for the meanings of the individual letters and digits.
- ② Serial number
- ③ Nominal measuring range
- ④ Minimum/maximum span
- ⑤ MWP (maximum working pressure)
- ⑥ Electronic version (output signal)
- ⑦ Supply voltage
- ⑧ Wetted materials
- ⑨ Wetted materials
- ⑩ Wetted materials
- ⑪ Maximum pressure for oxygen applications (optional for devices, suitable for oxygen applications)
- ⑫ Maximum temperature for oxygen applications (optional for devices, suitable for oxygen applications)
- ⑬ Degree of protection
- ⑭ CRN number (optional)
- ⑮ ID number of notified body with regard to ATEX (optional)
- ⑯ ID number of notified body with regard to Pressure Equipment Directive (optional)
- ⑰ 3-A symbol for devices with 3-A (optional)
- ⑱ not used

Additional nameplate

Devices for use in hazardous areas are fitted with an additional nameplate.

2.2 Scope of delivery

The scope of delivery comprises:

- Cerabar M pressure transmitter
- Optional accessories

Documentation supplied:

- Operating Instructions BA200P (this document)
- Final inspection report
- Optional: factory calibration certificate
- Devices that are suitable for use in hazardous areas:
additional documentation such as Safety Instructions, Control or Installation Drawings

2.3 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 successful testing of the device by affixing to it the CE mark.

2.4 Registered trademarks

KALREZ, VITON, TEFLON

Registered trademarks 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 and 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 Storage

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

Storage temperature range:

- -40 to $+100^{\circ}\text{C}$ (-40 to $+212^{\circ}\text{F}$)
- Onsite display: -40 to $+80^{\circ}\text{C}$ (-40 to $+176^{\circ}\text{F}$)

3.2 Installation conditions

3.2.1 Dimensions

→ For dimensions, please refer to the Technical Information for Cerabar M TI399P, "Mechanical construction" section.

3.3 Installation instructions



Note!

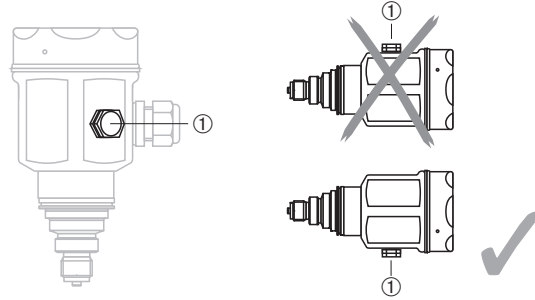
- Due to the orientation of the Cerabar M, there may be a shift in the zero point, i.e. when the container is empty, the measured value does not indicate zero. The position-dependent zero point shift can be corrected directly at the device by means of a potentiometer. → See Page 22, Section 5.2.1 "Position and function of the operating elements on the electronic insert".
- For PMP46 and PMP48, please pay attention to Page 13, Section 3.3.2 "Installation instructions for devices with diaphragm seals – PMP46, PMP48".
- The onsite display can be rotated in 90° stages.
- Endress+Hauser offers a mounting bracket for installation on pipes or walls. (→ See Page 16, Section 3.3.4 "Wall and pipe-mounting (optional)").

3.3.1 Installation instructions for devices without a diaphragm seal – PMC41, PMC45, PMP41, PMP45



Note!

- If a heated Cerabar M is cooled during a 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 dirt.
- Cerabar M devices 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 press the diaphragm with hard or pointed objects.

Pressure measurement in gases

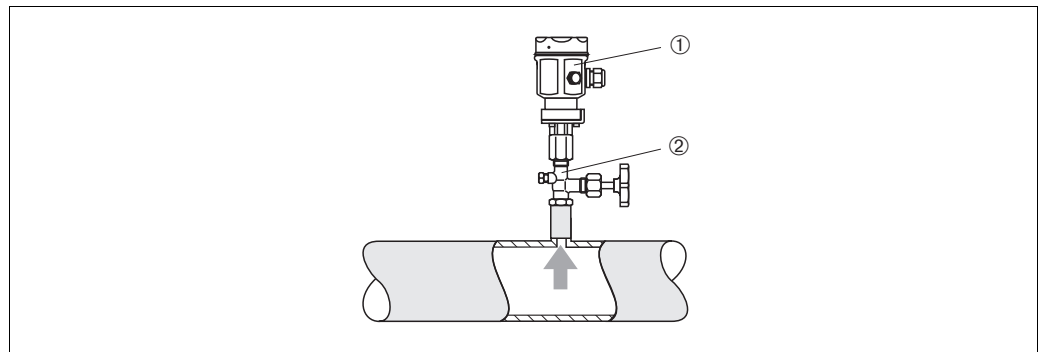


Fig. 3: Measuring arrangement for pressure measurement in gases

- ① Cerabar M
- ② Shutoff device

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

Pressure measurement in steam

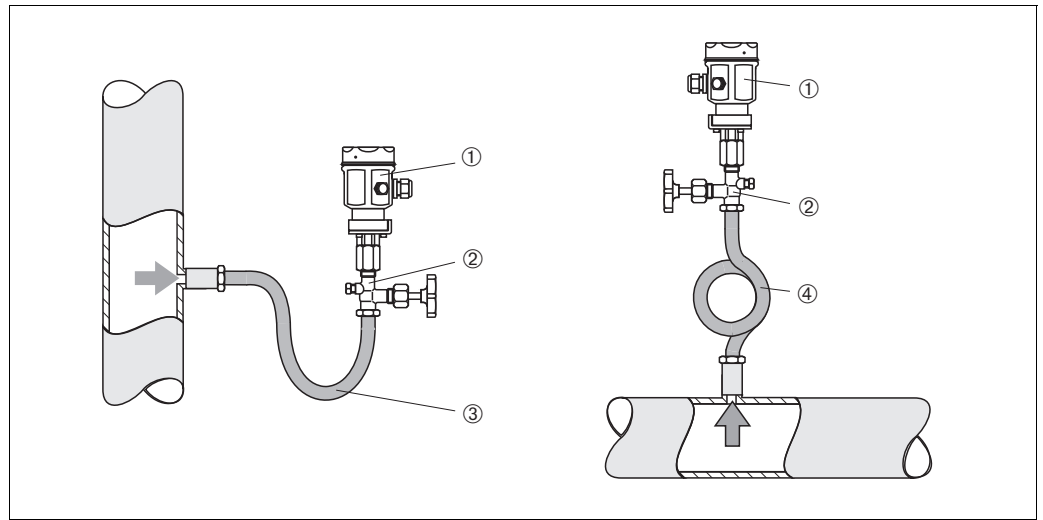


Fig. 4: Measuring arrangement for pressure measurement in steam

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

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

Pressure measurement in liquids

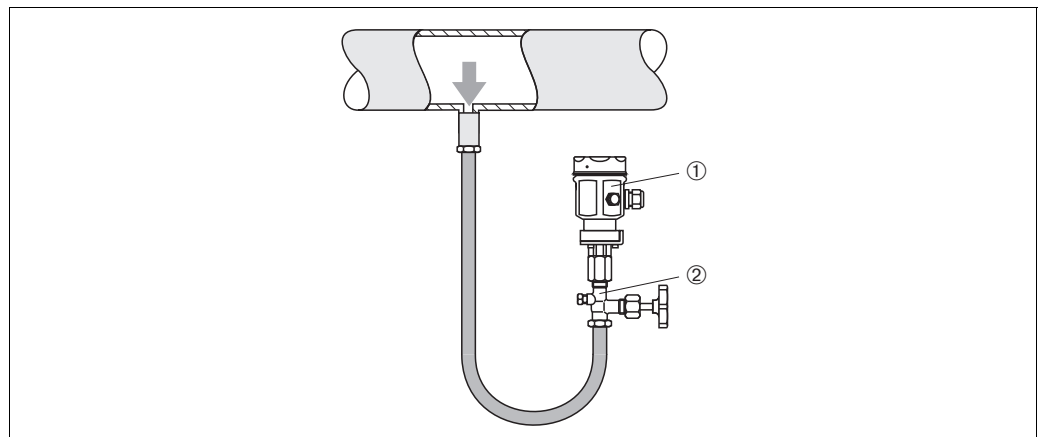


Fig. 5: Measuring arrangement for pressure measurement in liquids

- ① Cerabar M
- ② Shutoff device

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

Level measurement

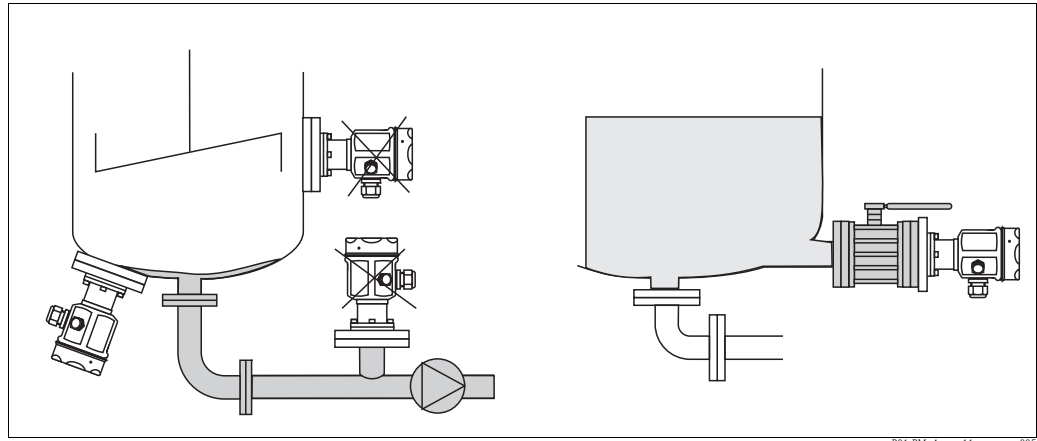


Fig. 6: Measuring arrangement for level

- Always mount Cerabar M below the lowest measuring point.
- Do not mount the device at the following positions:
In the filling curtain, in the tank outlet 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 after a shutoff device.

PMP41 mounting

PMP41 is available with a flush-mounted diaphragm or an adapter and an internal diaphragm. The adapter can be screwed on or welded in. A seal is enclosed depending on the version and material used.

Threaded version:

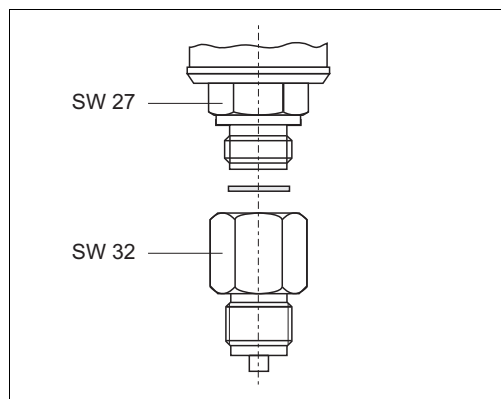


Fig. 7: The flush-mounted version is screwed together with the adapter using a torque of 50 Nm. Screw the complete device into the process thread with max. 80 Nm (at AF 32).

Welded version:

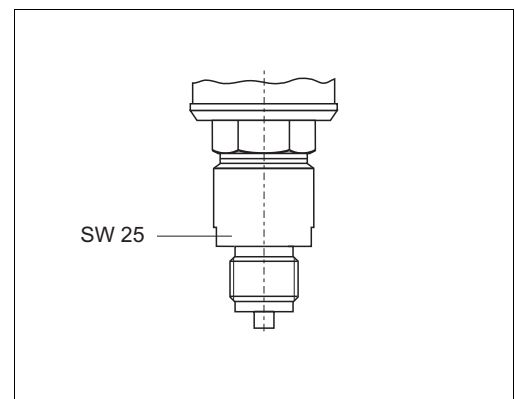


Fig. 8: Screw the complete device into the process thread with max. 80 Nm (at AF 25).

Threaded connection, flush-mounted diaphragm

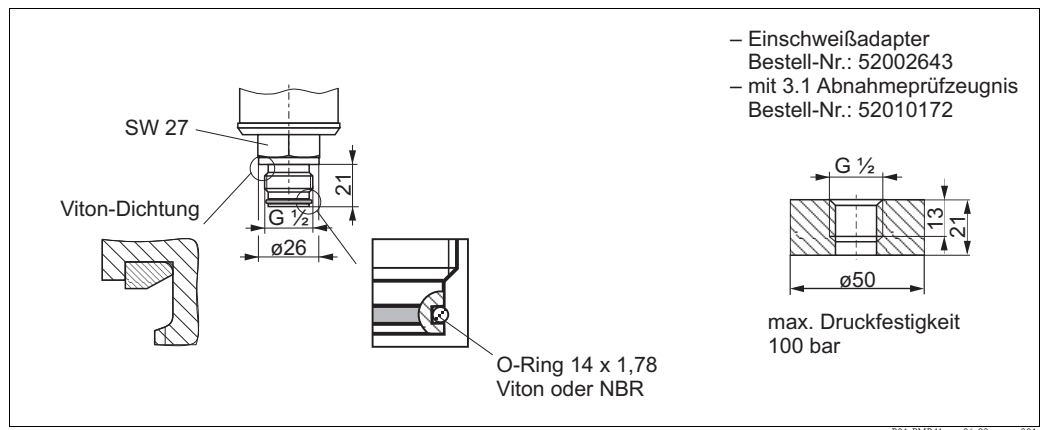


Fig. 9: The flush-mounted version is screwed into the process thread with max. 50 Nm ± 5 Nm (at AF 27).

3.3.2 Installation instructions for devices with diaphragm seals – PMP46, PMP48



Note!

- The Cerabar M with a diaphragm seal is screwed in, flanged or clamped, depending on the type of diaphragm seal.
- Together, a diaphragm seal and the pressure transmitter form a closed, calibrated system which is filled with oil. The filling hole is sealed and should not be opened.
- Do not clean or press the diaphragm of the diaphragm seals with hard or pointed objects.
- Do not remove 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 from buckling (bending radius ≥ 100 mm).
- 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 note the application limits of the diaphragm seal filling oil as detailed in the Technical Information for Cerabar M TI399P, "Planning instructions for diaphragm seal systems" section.

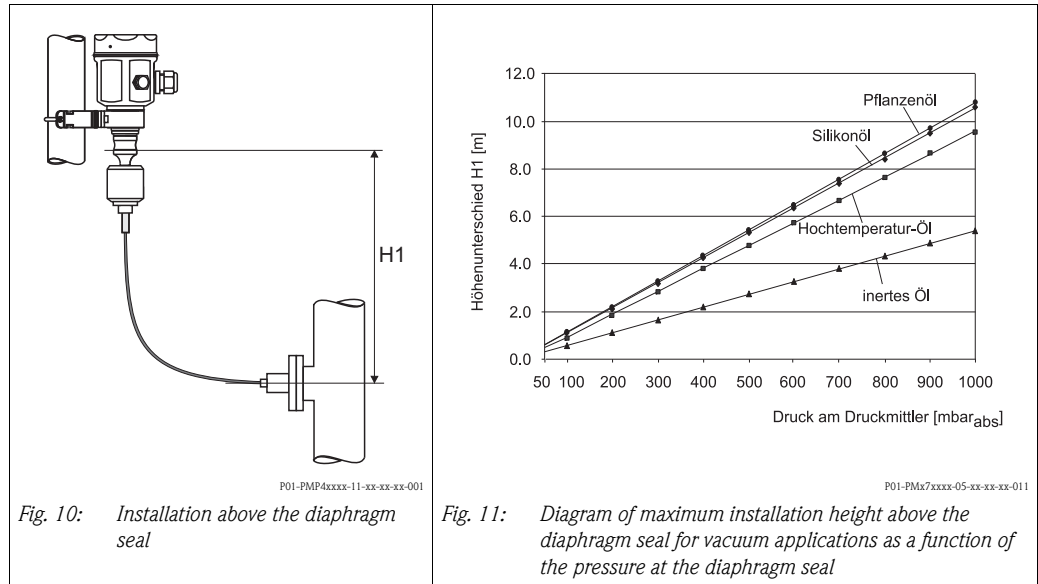
In order to obtain more precise measurement results and to avoid a defect in the device, mount the capillaries as follows:

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

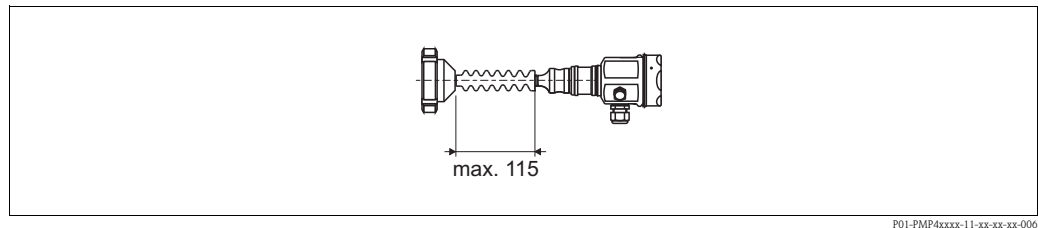
Vacuum application

For applications under vacuum, Endress+Hauser recommends mounting the pressure transmitter below the diaphragm seal. This prevents a vacuum load 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 H_1 - as illustrated in the diagram below left - must not be exceeded. The maximum height difference depends on the density of the filling oil and the lowest pressure that is permitted to occur at the diaphragm seal (empty tank), see the following illustration.



Mounting with temperature isolator



Endress+Hauser recommends the use of temperature isolators in the event of constant extreme fluid 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 due to the hydrostatic column in the temperature isolator. You can correct this zero point shift via a potentiometer. (→ See Page 22, Section 5.2.1 "Position and function of the operating elements on the electronic insert").

Mounting with capillary tube

The housing of the Cerabar M can be mounted with a capillary tube to one side of the measuring point to protect from high temperatures, moisture or vibration, or in cases where the mounting point is not easily accessible.

A bracket for mounting on a wall or pipe is available for this purpose.

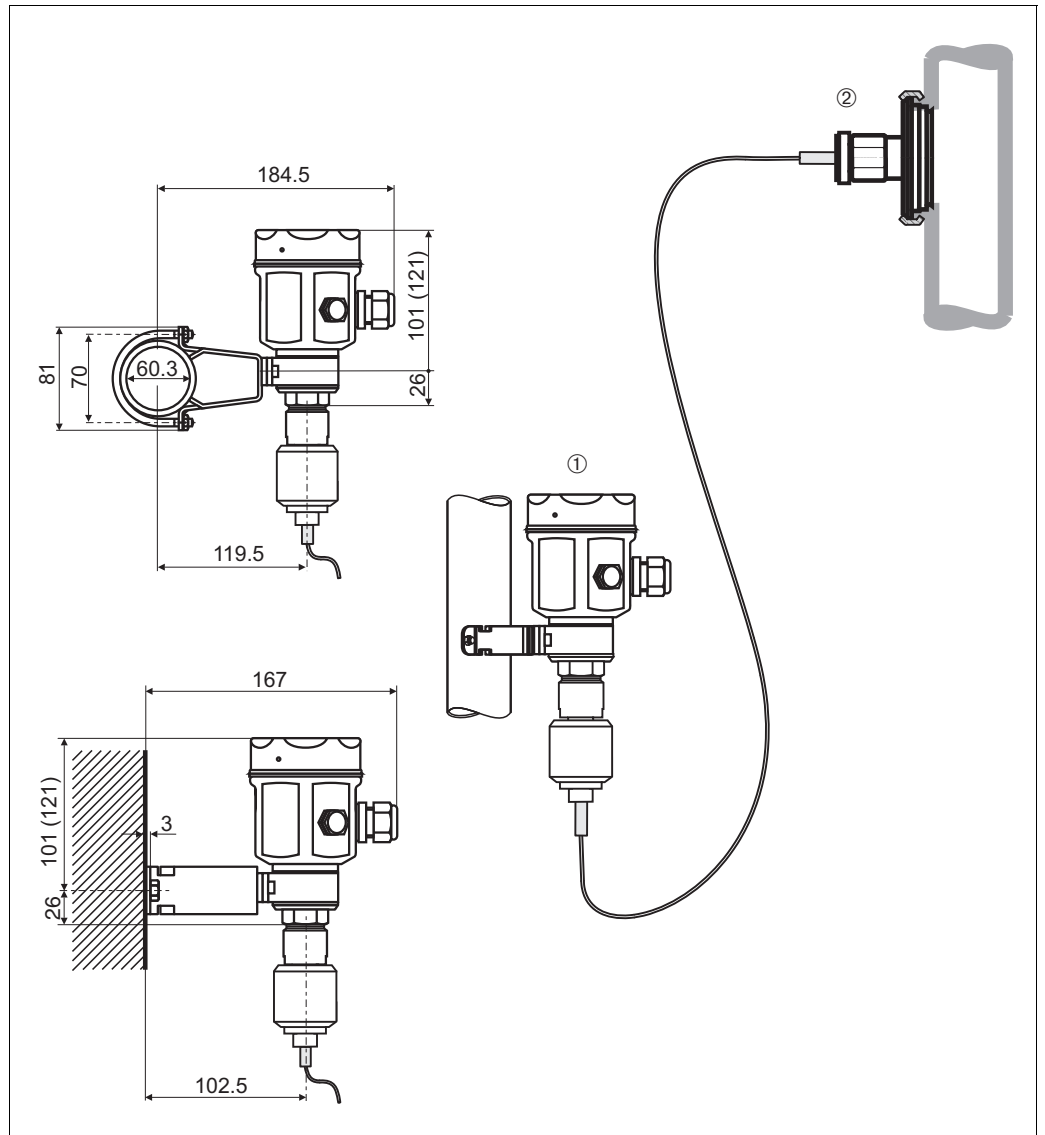


Fig. 12: Mounting with capillary tube and bracket away from the measuring point. Values in brackets apply to devices with a raised cover.

- ① Mounting location away from the measuring point.
- ② Measuring point: very humid, hot, with strong vibrations or difficult to access

3.3.3 Seal for flange mounting

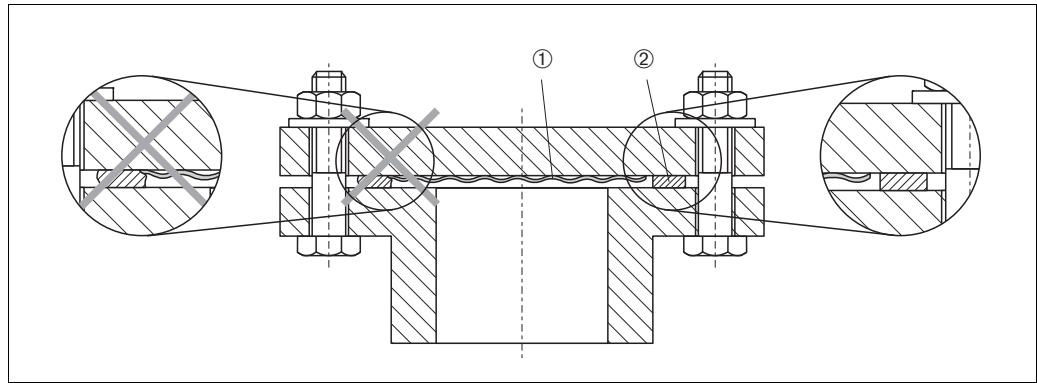


Fig. 13: Mounting the versions with flange or diaphragm seal

- ① Diaphragm
- ② Seal



Warning!

The seal is not allowed to press down on the diaphragm as this could affect the measurement result.

3.3.4 Wall and pipe-mounting (optional)

Endress+Hauser offers a mounting bracket for installation on pipes or walls for PMC41, PMP41, PMP46 and PMP48. You can order the mounting brackets either via the order code or separately as an accessory.

PMC41

- Order number: 919806-0000
- Material: AISI 304 (1.4301)

PMP41, PMP46 and PMP48

- Order number: 52001402
- Material: AISI 304 (1.4301)

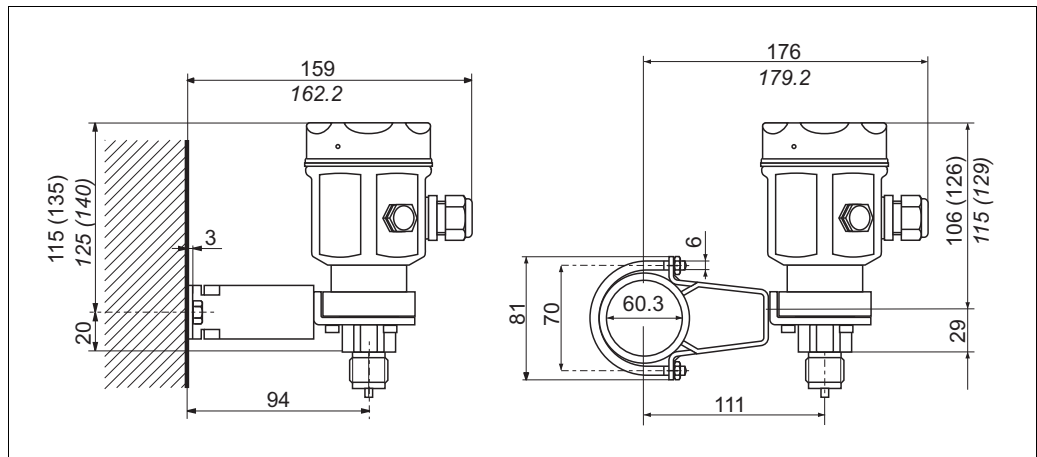


Fig. 14: Wall and pipe-mounting PMC41

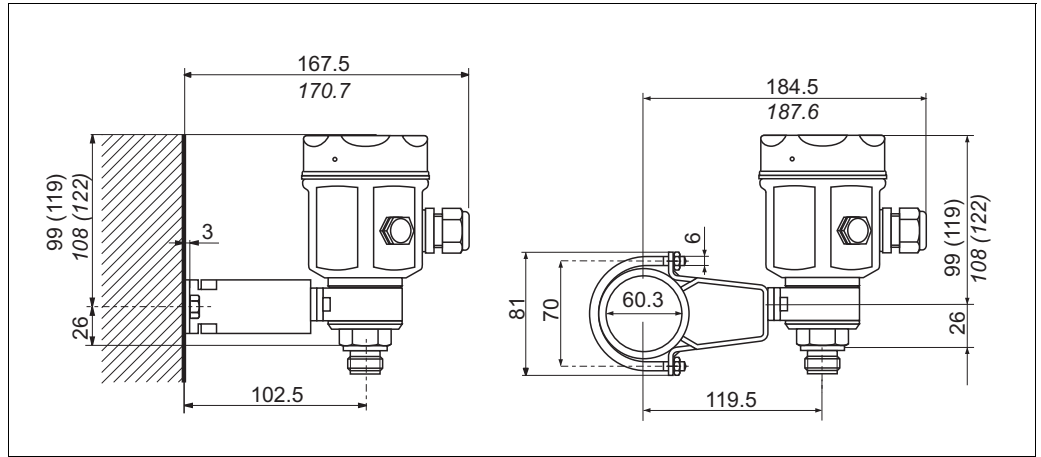


Fig. 15: Wall and pipe-mounting PMP41

The dimensions in brackets apply to housings with a raised cover (for optional display). Dimensions written in italics apply to devices with an aluminum housing.

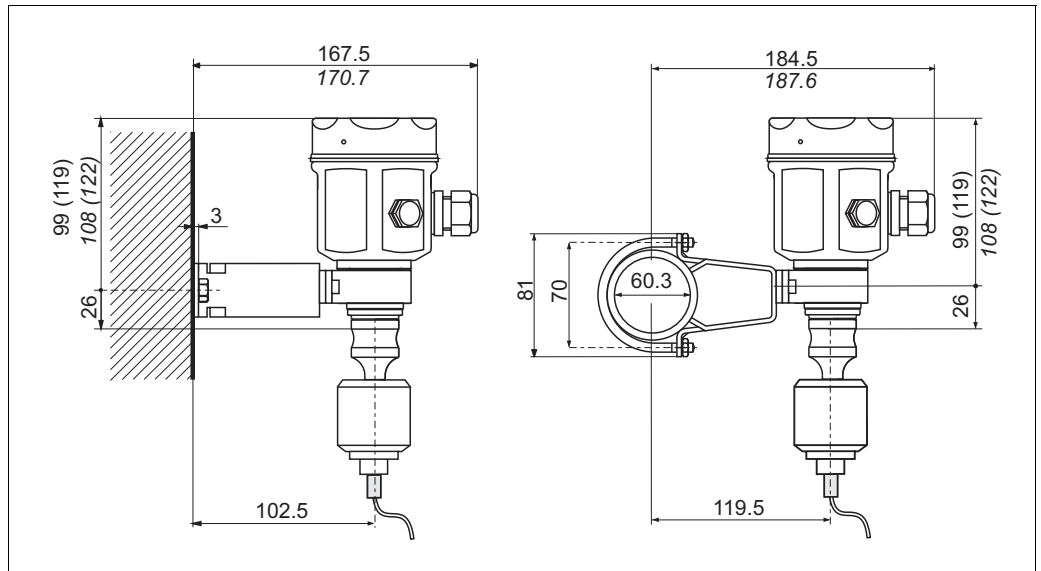


Fig. 16: Wall and pipe-mounting PMP46/PMP48

The dimensions in brackets apply to housings with a raised cover (for optional display). Dimensions written in italics apply to devices with an aluminum housing.

3.4 Post-installation check

After installing the device, carry out the following checks:

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

4 Wiring

4.1 Connecting the device



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.
- Protective circuits to prevent reverse polarity, HF influences and overvoltage peaks are installed.
- The shield or grounding (if present) must always be connected to the internal ground terminal ⑤ in the housing.
- The supply voltage must match the power supply on the nameplate. (→ See also Page 6, Section 2.1.1 "Nameplates".)
- Switch off the supply voltage before connecting the device.
- Unscrew the housing cover.
- If present, remove the retaining ring with the onsite display.
 - Push up the latch with the arrow until the grip of the retaining ring is audibly released.
 - Release the retaining ring carefully to prevent damage to the display cables. The connector of the display can remain plugged in.
- Guide the cable through the gland. Preferably use twisted, shielded two-wire cable.
- Connect the device in accordance with the following diagram.
- Where applicable, refit the retaining ring with the onsite display. The grip of the retaining ring clips in with an audible click.
- Screw down housing cover.
- Switch on supply voltage.

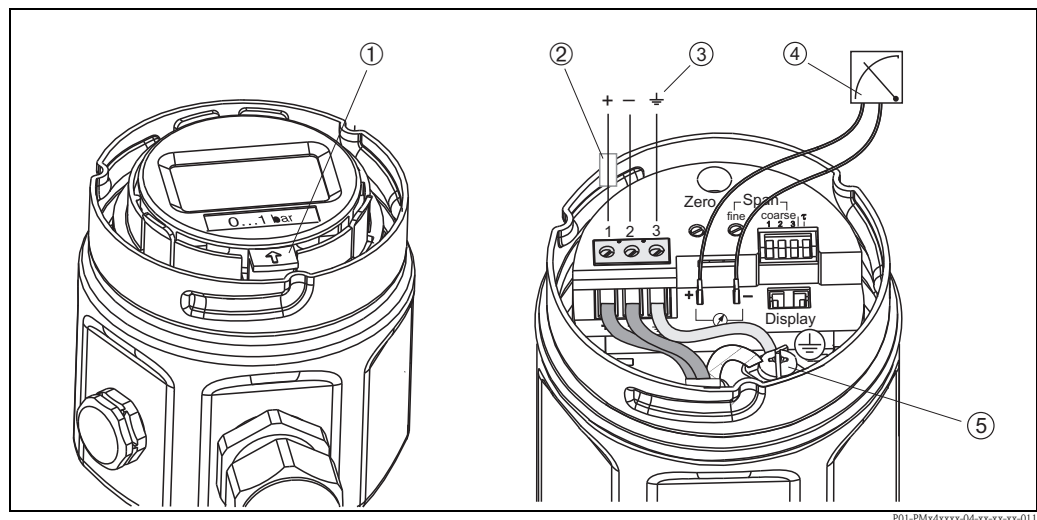


Fig. 17: Electrical connection 4 to 20 mA

- ① Disassembling the onsite display: To release the retaining ring from the electronic insert, push up the latch with the arrow.
- ② Devices with an ATEX II 1/3 D certificate (non-Ex-powered) must be protected with a 50 mA fuse (slow-blow).
- ③ The terminal ③ on the electronic insert is for grounding and is already wired internally. If the connecting cable also has a shielding or ground cable within it, then this may only be connected to the internal ground terminal ⑤ of the housing, not to terminal ③. The terminals are designed to take one wire each.
- ④ 4 to 20 mA test signal: you can take a 4 to 20 mA test signal via the terminal lugs without interrupting the measurement.

4.1.1 Connecting devices with Harting connector Han7D

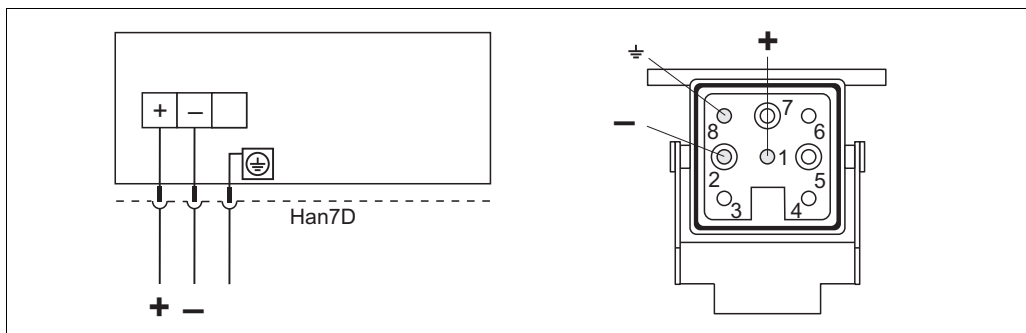


Fig. 18: Left: electrical connection for devices with Harting connector Han7D
 Right: view of the connector at the device

4.1.2 Connecting devices with M12 connector

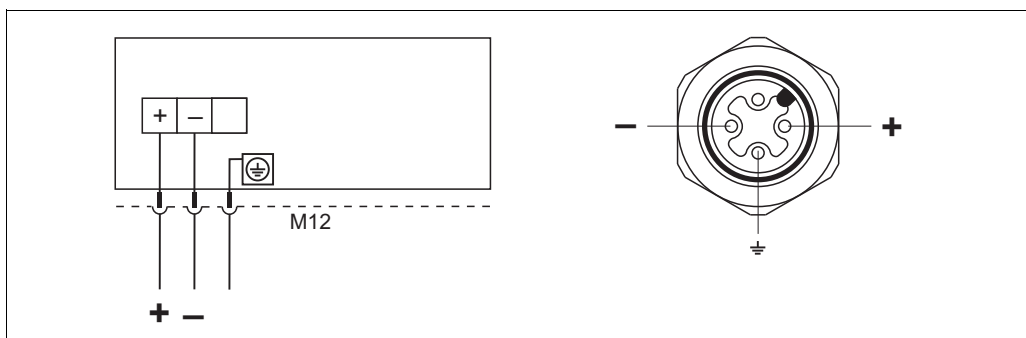


Fig. 19: Left: electrical connection for devices with M12 connector
 Right: view of the connector at the device

4.1.3 Connecting the cable version

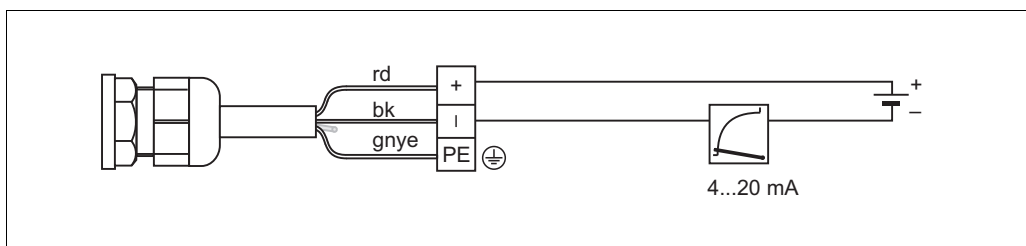


Fig. 20: rd = red, bk = black, gnye = green-yellow

4.1.4 Connecting the valve connector M16, ISO4400

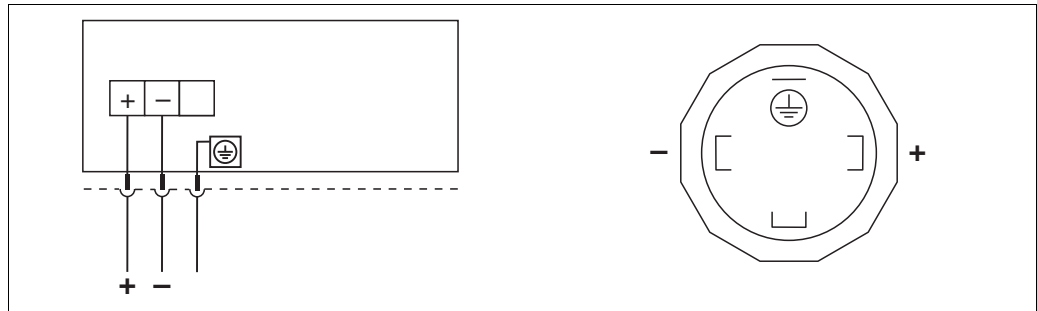


Fig. 21: Left: electrical connection for devices with a valve connector
Right: view of the connector at the device

P01-xiMx5xxxx-04-xx-xx-xx-005

4.2 Connecting the measuring unit

4.2.1 Supply voltage



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 hazardous areas.

Supply voltage

- For non-hazardous areas: 11.5 to 45 V DC

4.2.2 Cable specification

- Endress+Hauser recommends using twisted, shielded two-wire cables.
- Terminals for wire cross-sections: 0.14 to 2.5 mm²
- Cable outer diameter: 5 to 9 mm

4.2.3 Load

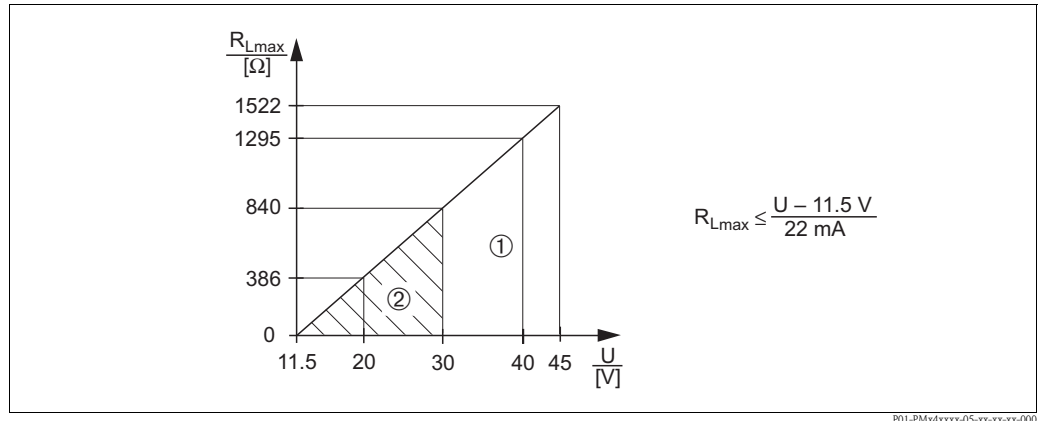


Fig. 22: Load diagram, observe explosion protection.

- ① Power supply 11.5 to 45 V DC for devices for non-hazardous areas, 1/3 D, EEx d, EEx nA, FM XP, FM DIP, CSA XP and CSA Dust-Ex
 - ② Power supply 11.5 to 30 V DC for EEx ia, 1 D, 1/2 D 1/2G, FM IS and CSA IS
- R_{Lmax} Maximum load resistance
 U Supply voltage

4.2.4 Shielding/potential matching

- You achieve optimum shielding against interference influences if the shielding is connected on both sides (in the cabinet and at the device). If potential equalization currents are expected in the plant, only ground the shielding on one side, preferably at the transmitter.
- When using in hazardous areas, you must observe the applicable regulations. Separate Ex documentation with additional technical data and instructions is included with all Ex devices as standard.

4.3 Potential equalization

Ex applications: Connect all devices to the local potential equalization system. Observe the applicable regulations.

4.4 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 the screws firmly tightened?
- Are the housing covers screwed down tight?

The connected onsite display lights up as soon as voltage is applied to the device.

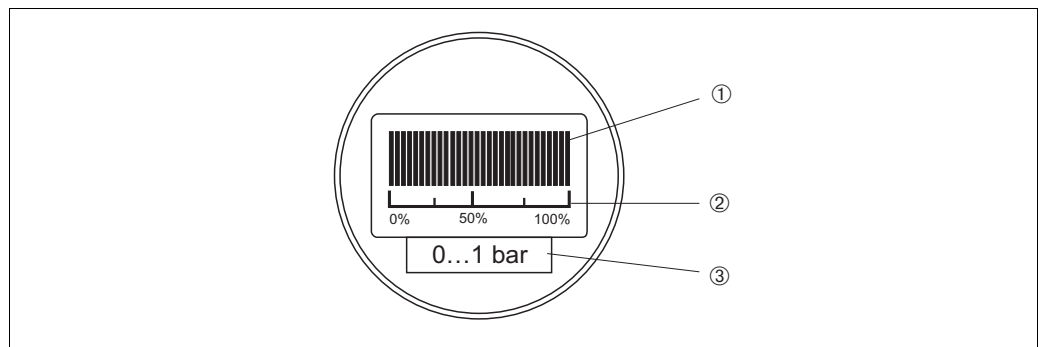
5 Operation

5.1 Onsite display (optional)

A plug-in onsite display is used as the display unit. The display can be rotated in 90° stages.

Functions:

- Bar graph to indicate the measured value from 0 to 100%. This corresponds to a signal current of 4 to 20 mA.
- The scale flashes to indicate signal undershoot (current < 3.8 mA).
- The bar graph and scale flash to indicate signal overshoot (current > 20.5 mA).



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Fig. 23: Onsite display

- ① Bar graph (the bar graph refers to the set measuring range)
- ② Scale
- ③ Cell measuring range

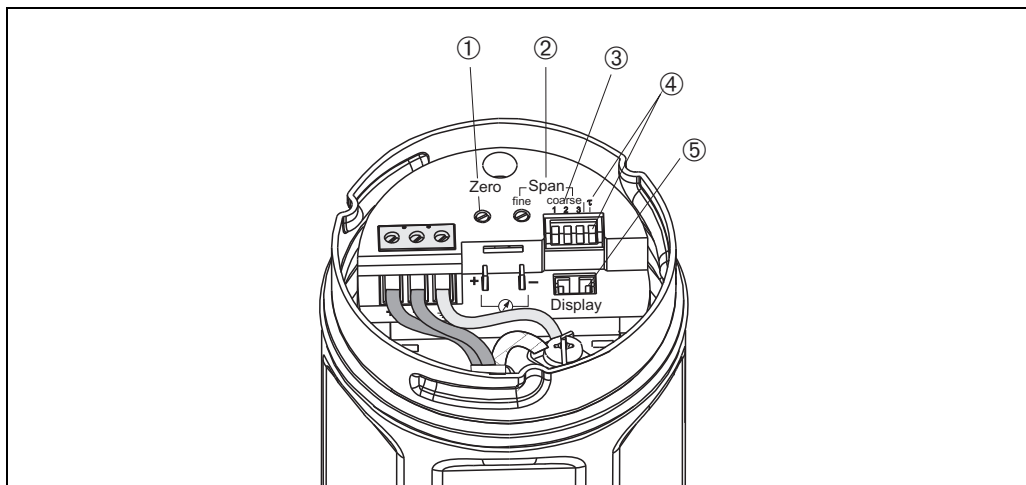
5.2 Operating elements

5.2.1 Position and function of the operating elements on the electronic insert

The onsite display is supplied ready-mounted if it is ordered with the device. In such instances, the onsite display with the retaining ring must be released from the electronic insert before operating.

Removing the display:

- Push up the latch with the arrow until the grip of the retaining ring on the electronic insert is audibly released.
- Release the retaining ring and lift off carefully to prevent damage to the display cables.
- During operation, you can fit the display onto the edge of the housing.



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Fig. 24: Position of operating elements

- ① Potentiometer for calibrating the lower-range value (Zero)
- ② Potentiometer for fine adjustment of the span
- ③ DIP switches 1 to 3 for coarse adjustment of the span
- ④ DIP switch for damping on/off
- ⑤ Slot for optional onsite display

5.2.2 Function of the operating elements

No.	Operating element	Function
①	Potentiometer for zero-point adjustment	Sets the zero point $\pm 10\%$
②	Potentiometer for fine adjustment of the span	Fine adjustment of the span
③	DIP switches for coarse adjustment of the span	<p>A turn down between 1:1 and 10:1 can be selected for span coarse adjustment</p> <p>Switch positions:</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1:1</p> </div> <div style="text-align: center;"> <p>6:1</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>3:1</p> </div> <div style="text-align: center;"> <p>10:1</p> </div> </div>
④	DIP switch for setting the damping	<p>Off: damping 0 s</p> <p>On: damping 2 s</p> <div style="text-align: right; margin-top: 10px;"> </div>

If the display does not show zero after calibrating the lower-range value at zero operating pressure (position-dependent), it can be corrected to zero by adopting a bias pressure.

6 Commissioning

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" checklist (→ see Page 17, Section 3.4 "Post-installation check")
- "Post-connection check" checklist (→ see Page 21, Section 4.4 "Post-connection check")

6.2 Configuring the damping

The damping τ affects the speed at which the output signal and the onsite display react to changes in pressure. The DIP switch for setting the damping is located on the electronic insert. (→ See also Page 22, Section 5.2.1 "Position and function of the operating elements on the electronic insert".)

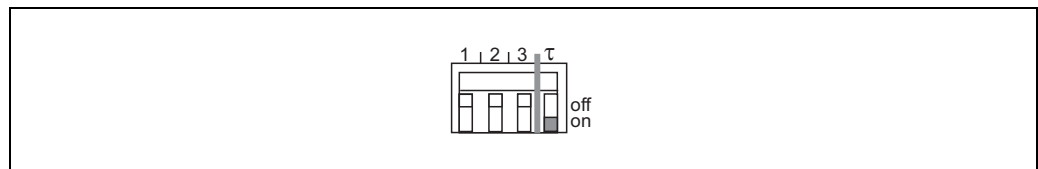


Fig. 25: Switch position **off**: damping 0 s; switch position **on**: damping 2 s

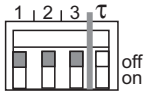
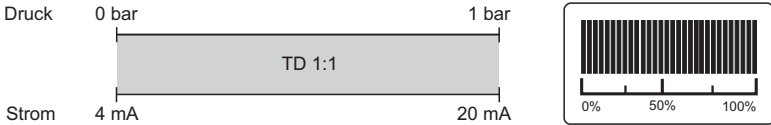
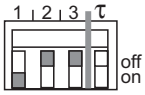
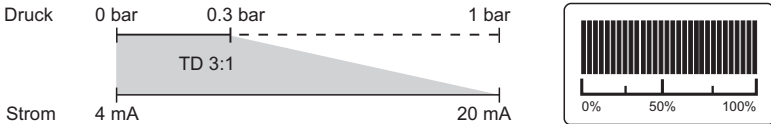
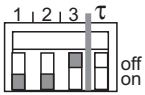
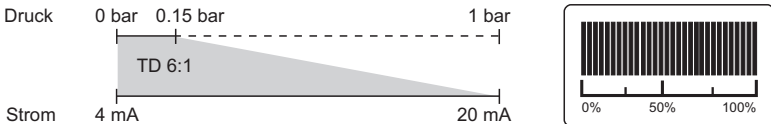
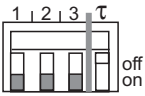
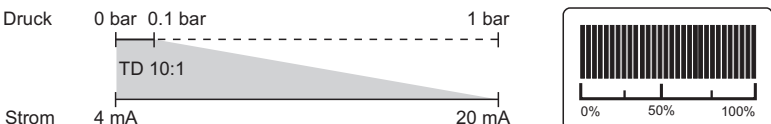
6.3 Configuring the span/upper-range value

Three DIP switches are available for course adjustment of the span. Depending on the switch position, a turn down of 1:1, 3:1, 6:1 or 10:1 can be selected. Fine adjustment is carried out using the potentiometer for span fine adjustment. (→ See also Page 22, Section 5.2.1 "Position and function of the operating elements on the electronic insert".)

Configuring/calibrating the span:

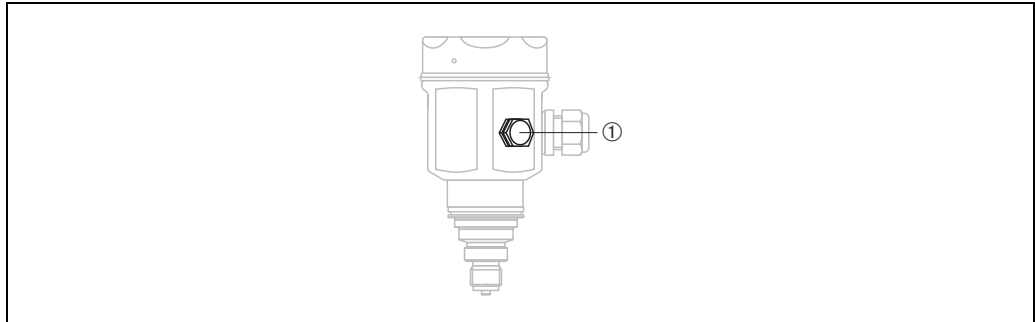
- (Connect Cerabar M to the power supply).
- Connect the multimeter (4 to 20 mA) to the terminal lugs on the electronic insert.
- Specify the exact desired pressure for the upper-range value.
- Set the DIP switches for coarse adjustment and the potentiometer for fine adjustment in such a way that the multimeter displays 20 mA and, where applicable, the onsite display shows 100 %.
 - First of all, coarsely set the desired span/upper-range value by selecting a suitable turn down via the DIP switches.
 - Then precisely set the desired span/upper-range value at the potentiometer.

The bar graph and scale flash on the onsite display as soon as the current output exceeds a value of 20.5 mA, i.e. in such instances, the pressure present either has to be reduced or another turn down setting has to be selected via the DIP switches or potentiometer.

DIP switch position	Examples
<p>TD 1:1</p> 	<ul style="list-style-type: none"> ■ Sensor measuring range: 0 to 1 bar ■ Set measuring range: 0 to 1 bar (TD 1:1) ■ At the upper-range value, here 1 bar, the bar graph indicates 100 %. The current output is 20 mA. <p>Druck 0 bar 1 bar</p> <p>Strom 4 mA 20 mA</p>  <p style="text-align: right;"><small>P01-PMs4xxxx-19-xx-xx-xx-008</small></p>
<p>TD 3:1</p> 	<ul style="list-style-type: none"> ■ Sensor measuring range: 0 to 1 bar ■ Coarsely set measuring range: 0 to 0.3 bar (TD 4:1) ■ At the upper-range value, here 0.3 bar, the bar graph indicates 100 %. The current output is 20 mA. <p>Druck 0 bar 0.3 bar 1 bar</p> <p>Strom 4 mA 20 mA</p>  <p style="text-align: right;"><small>P01-PMs4xxxx-19-xx-xx-xx-009</small></p>
<p>TD 6:1</p> 	<ul style="list-style-type: none"> ■ Sensor measuring range: 0 to 1 bar ■ Coarsely set measuring range: 0 to 0.15 bar (TD 6:1) ■ At the upper-range value, here 0.15 bar, the bar graph indicates 100 %. The current output is 20 mA. <p>Druck 0 bar 0.15 bar 1 bar</p> <p>Strom 4 mA 20 mA</p>  <p style="text-align: right;"><small>P01-PMs4xxxx-19-xx-xx-xx-010</small></p>
<p>TD 10:1</p> 	<ul style="list-style-type: none"> ■ Sensor measuring range: 0 to 1 bar ■ Coarsely set measuring range: 0 to 0.1 bar (TD 10:1) ■ At the upper-range value, here 0.1 bar, the bar graph indicates 100 %. The current output is 20 mA. <p>Druck 0 bar 0.1 bar 1 bar</p> <p>Strom 4 mA 20 mA</p>  <p style="text-align: right;"><small>P01-PMs4xxxx-19-xx-xx-xx-011</small></p>

7 Maintenance

Keep the pressure compensation and GORE-TEX® filter ① free from dirt.



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7.1 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 pointed objects, must be avoided.
- Observe the degree of protection of the device. → Where applicable, see → Page 2, "Overview of documentation".

8 Troubleshooting

8.1 Repair

The Endress+Hauser repair concept provides for measuring devices to have a modular design and that the customer may also carry out repairs.

The "Spare parts" section contains all the spare parts, and their order numbers, which you can order from Endress+Hauser to repair the Cerabar M. Where necessary, the spare parts also include replacement instructions.



Note!

- For certified devices, please refer to the "Repair of Ex-certified devices" section.
- For more information on service and spare parts contact Endress+Hauser Service.
→ See www.endress.com/worldwide.
- Only the process connection on the PMC41 can be exchanged by the customer. For all other models, a device without a display and housing can be ordered. → See Technical Information TI399P, "Ordering information" section.

8.2 Repair of Ex-certified devices



Warning!

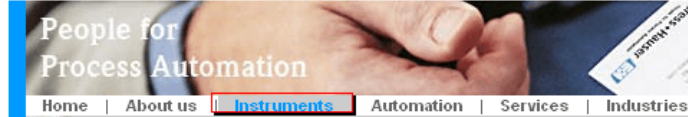
When repairing Ex-certified devices, please note the following:

- Only specialist personnel or Endress+Hauser may undertake repairs to certified devices.
- Relevant standards, national hazardous area regulations and safety instructions and certificates must be observed.
- Only use genuine spare parts from Endress+Hauser.
- When ordering spare parts, please check the device designation on the nameplate. Identical parts may only be used as replacements.
- Electronic inserts or sensors already in use in a standard device may not be used as spare parts for a certified device.
- Carry out repairs according to the instructions. After a repair, the device must fulfill the requirements of the specified individual tests.
- A certified device may only be converted to another certified device version by Endress+Hauser.
- All repairs and modifications must be documented.

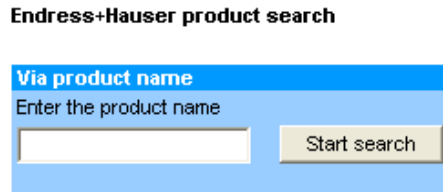
8.3 Spare Parts

An overview of the spare parts for your device is available in the internet at www.endress.com. To obtain information on the spare parts, proceed as follows:

1. Go to "www.endress.com" and select your country.
2. Click "Instruments".



3. Enter the product name into the "product name" field.



4. Select the device.
5. Click the "Accessories/Spare parts" tab.



6. Select the required spare parts (You may also use the overview drawing on the right side of the screen.)

When ordering spare parts, always quote the serial number indicated on the nameplate. As far as necessary, the spare parts also include replacement instructions.

8.4 Return

Before you send in a device for repair or inspection, perform the following:

- Remove all traces of the fluid. Pay special attention to the grooves for seals and crevices which could contain fluid residues. This is especially important if the fluid is hazardous to health. Please refer also to the "Declaration of Hazardous Material and Decontamination".

Please enclose the following when returning the device:

- The duly completed and signed "Declaration of Hazardous Material and Decontamination". Only then can Endress+Hauser inspect or repair the returned device.
- The chemical and physical properties of the fluid.
- A description of the application.
- A description of the error which occurred.
- Special instructions on handling, if necessary, e.g. safety data sheet as per EN 91/155/EEC.

8.5 Disposal

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

9 Technical data

For technical data, please refer to the Technical Information TI399P for Cerabar M.

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Declaration of Hazardous Material and De-Contamination

Erklärung zur Kontamination und Reinigung

RA No.

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.

Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.

Type of instrument / sensor

Geräte-/Sensortyp _____

Serial number

Seriennummer _____

Used as SIL device in a Safety Instrumented System / Einsatz als SIL Gerät in Schutzeinrichtungen

Process data / Prozessdaten

Temperature / Temperatur _____ [°F] _____ [°C] Pressure / Druck _____ [psi] _____ [Pa]
Conductivity / Leitfähigkeit _____ [µS/cm] Viscosity / Viskosität _____ [cp] _____ [mm²/s]

Medium and warnings

Warnhinweise zum Medium



	Medium / concentration <i>Medium / Konzentration</i>	Identification CAS No.	flammable <i>entzündlich</i>	toxic <i>giftig</i>	corrosive <i>ätzend</i>	harmful/ irritant <i>gesundheitsschädlich/ reizend</i>	other * <i>sonstiges*</i>	harmless <i>unbedenklich</i>
Process medium <i>Medium im Prozess</i>								
Medium for process cleaning <i>Medium zur Prozessreinigung</i>								
Returned part cleaned with <i>Medium zur Endreinigung</i>								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive

* *explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv*

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.

Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / Fehlerbeschreibung _____

Company data / Angaben zum Absender

Company / Firma _____	Phone number of contact person / Telefon-Nr. Ansprechpartner: _____
Address / Adresse _____	Fax / E-Mail _____
_____	Your order No. / Ihre Auftragsnr. _____

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge. We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."

"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefahrbringender Menge sind."

(place, date / Ort, Datum)

Name, dept./ Abt. (please print / bitte Druckschrift)

Signature / Unterschrift

www.endress.com/worldwide

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