

Brief Operating Instructions Cerabar M PMC51, PMP51, PMP55

Process pressure measurement
Pressure transmitter with ceramic and metal
sensors

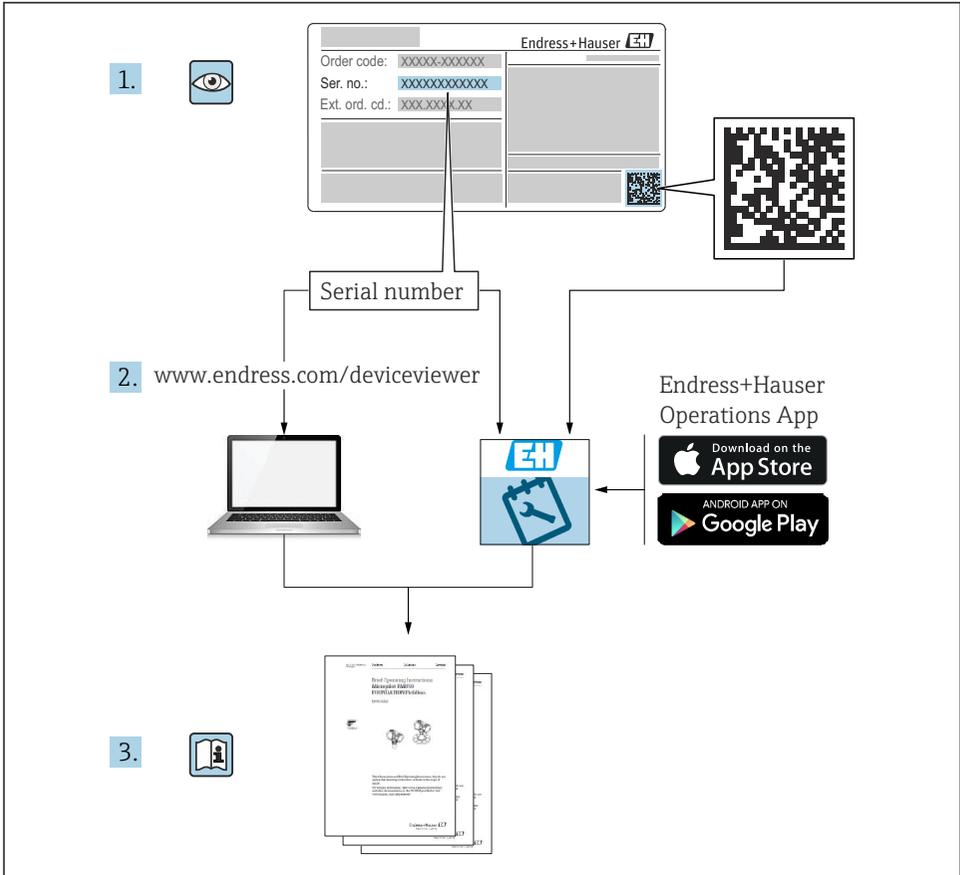


These Brief Operating Instructions are not a substitute for the Operating Instructions pertaining to the device.

Detailed information about the device can be found in the Operating Instructions and the additional documentation.

Available for all device versions via

- Internet: www.endress.com/deviceviewer
- Smartphone/tablet: *Endress+Hauser Operations app*



A0023555

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1 About this document

1.1 Document function

The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.

1.2 Symbols used

1.2.1 Safety symbols

Symbol	Meaning
	DANGER! This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
	WARNING! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
	CAUTION! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
	NOTICE! This symbol contains information on procedures and other facts which do not result in personal injury.

1.2.2 Electrical symbols

Symbol	Meaning	Symbol	Meaning
	Protective ground connection A terminal which must be connected to ground prior to establishing any other connections.		Ground connection A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

1.2.3 Tool symbols

Symbol	Meaning
 A0011221	Allen key
 A0011222	Open-ended wrench

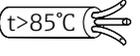
1.2.4 Symbols for certain types of information

Symbol	Meaning
	Permitted Procedures, processes or actions that are permitted.
	Preferred Procedures, processes or actions that are preferred.
	Forbidden Procedures, processes or actions that are forbidden.
	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
	Visual inspection

1.2.5 Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
	Series of steps
A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections

1.2.6 Symbols at the device

Symbol	Meaning
 →  A0019159	Safety instructions Observe the safety instructions contained in the associated Operating Instructions.
 A0029423	Connecting cable immunity to temperature change Indicates that the connecting cables have to withstand a temperature of 85°C at least.

1.3 Terms and abbreviations

See Operating Instructions.

1.4 Turn down calculation

See the Operating Instructions.

1.5 Registered trademarks

- KALREZ®
Registered label of E.I. Du Pont de Nemours & Co., Wilmington, USA
- TRI-CLAMP®
Registered label of Ladish & Co., Inc., Kenosha, USA
-  IO-Link
Registered trademark of the IO-Link Community.
- GORE-TEX® trademark of W.L. Gore & Associates, Inc., USA

2 Basic safety instructions

2.1 Requirements for personnel

Personnel must meet the following requirements for their tasks:

- ▶ Trained, qualified specialists must have a relevant qualification for this specific function and task
- ▶ Are authorized by the plant owner/operator
- ▶ Are familiar with federal/national regulations
- ▶ Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application)
- ▶ Follow instructions and comply with basic conditions

2.2 Designated use

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

2.2.1 Incorrect use

The manufacturer is not liable for damage caused by improper or non-designated use.

Verification for borderline cases:

- ▶ For special fluids and fluids for cleaning, Endress+Hauser is glad to provide assistance in verifying the corrosion resistance of fluid-wetted materials, but does not accept any warranty or liability.

2.3 Workplace safety

For work on and with the device:

- ▶ Wear the required personal protective equipment according to federal/national regulations.
- ▶ Switch off the supply voltage before connecting the device.

2.4 Operational safety

Risk of injury!

- ▶ Operate the device in proper technical condition and fail-safe condition only.
- ▶ The operator is responsible for interference-free operation of the device.

Conversions to the device

Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers:

- ▶ If, despite this, modifications are required, consult with Endress+Hauser.

Repair

To ensure continued operational safety and reliability:

- ▶ Carry out repairs on the device only if they are expressly permitted.
- ▶ Observe federal/national regulations pertaining to repair of an electrical device.
- ▶ Use original spare parts and accessories from Endress+Hauser only.

Hazardous area

To eliminate a danger for persons or for the facility when the device is used in the hazardous area (e.g. explosion protection, pressure vessel safety):

- ▶ Based on the nameplate, check whether the ordered device is permitted for the intended use in the hazardous area.
- ▶ Observe the specifications in the separate supplementary documentation that is an integral part of these Instructions.

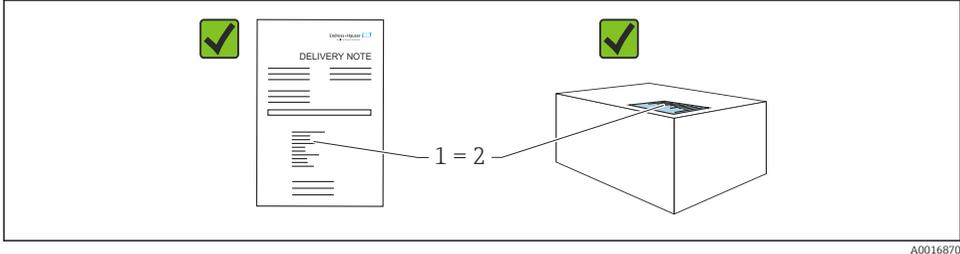
2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which they are safe to operate.

It fulfills general safety requirements and legal requirements. It also conforms to the EC directives listed in the device-specific EC declaration of conformity. Endress+Hauser confirms this fact by applying the CE mark.

3 Incoming acceptance and product identification

3.1 Incoming acceptance



- Is the order code on the delivery note (1) identical to the order code on the product sticker (2)?
- Are the goods undamaged?
- Do the data on the nameplate correspond to the order specifications and the delivery note?
- Is the documentation available?
- If required (see nameplate): Are the safety instructions (XA) present?



If one of these conditions is not fulfilled, please contact your Endress+Hauser sales office.

3.2 Product identification

The following options are available to identify the measuring device:

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

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

3.2.1 Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Place of manufacture: See nameplate.

3.3 Nameplate

See operating instructions.

3.4 Identifying the sensor type

In the case of gauge pressure sensors, the "Pos. zero adjust" parameter appears in the operating menu ("Setup" -> "Pos. zero adjust").

In the case of absolute pressure sensors, the "Calib. offset" parameter appears in the operating menu ("Setup" -> "Calib. offset").

3.5 Storage and transport

3.5.1 Storage conditions

Use original packaging.

Store the measuring device in clean and dry conditions and protect from damage caused by shocks (EN 837-2).

Storage temperature range

See the Technical Information for Cerabar M TI00436P.

3.5.2 Transporting the product to the measuring point



Incorrect transport!

Housing and membrane may become damaged, and there is a risk of injury!

- ▶ Transport the measuring device to the measuring point in its original packaging or by the process connection.
- ▶ Follow the safety instructions and transport conditions for devices weighing more than 18 kg (39.6 lbs).
- ▶ Do not use capillaries as a carrying aid for the diaphragm seals.

3.6 Scope of delivery

The scope of delivery comprises:

- Device
- Optional accessories

Accompanying documentation:

- Operating Instructions BA02136P is available on the Internet. See: www.de.endress.com → Download
- Brief Operating Instructions: KA01522P Cerabar M
- Final inspection report
- Additional Safety Instructions for ATEX, IECEx and NEPSI devices
- Optional: factory calibration certificate, inspection certificates

4 Installation

4.1 Installation conditions

4.1.1 Dimensions

Dimensions → see the Technical Information for Cerabar M TI00436P, "Mechanical construction" section.

4.2 General installation instructions

- Devices with a G 1 1/2 thread:
 - When screwing the device into the tank, the flat seal has to be positioned on the sealing surface of the process connection. To avoid additional strain on the process isolating diaphragm, the thread should never be sealed with hemp or similar materials.
- Devices with NPT threads:
 - Wrap Teflon tape around the thread to seal it.
 - Tighten the device at the hexagonal bolt only. Do not turn at the housing.
 - Do not overtighten the thread when screwing. Max. torque: 20 to 30 Nm (14.75 to 22.13 lbf ft)
- For the following process connections a tightening torque of max. 40 Nm (29.50 lbf ft) is required:
 - Thread ISO228 G1/2 (Order option "GRC" or "GRJ" or "G0J")
 - Thread DIN13 M20 x 1.5 (Order option "G7J" or "G8J")

4.3 Mounting sensor modules with PVDF thread

WARNING

Risk of damage to process connection!

Risk of injury!

- ▶ Sensor modules with PVDF thread must be installed with the mounting bracket provided!

WARNING

Material fatigue from pressure and temperature!

Risk of injury if parts burst! The thread can become loose if exposed to high pressure and temperature loads.

- ▶ The integrity of the thread must be checked regularly. Also, the thread may need to be re-tightened with the maximum tightening torque of 7 Nm (5.16 lbf ft). Teflon tape is recommended for sealing the 1/2" NPT thread.

4.4 Installing the

- 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 → ☰ 20 "Funktion der Bedienelemente".
- The local display can be rotated in 90° stages.
- For PMP55, please refer to Section "Installation instructions for devices with diaphragm seals – PMP55" → ☰ 13.
- Endress+Hauser offers a mounting bracket for installing on pipes or walls. → ☰ 14, Section "Wall and pipe mounting (optional)".

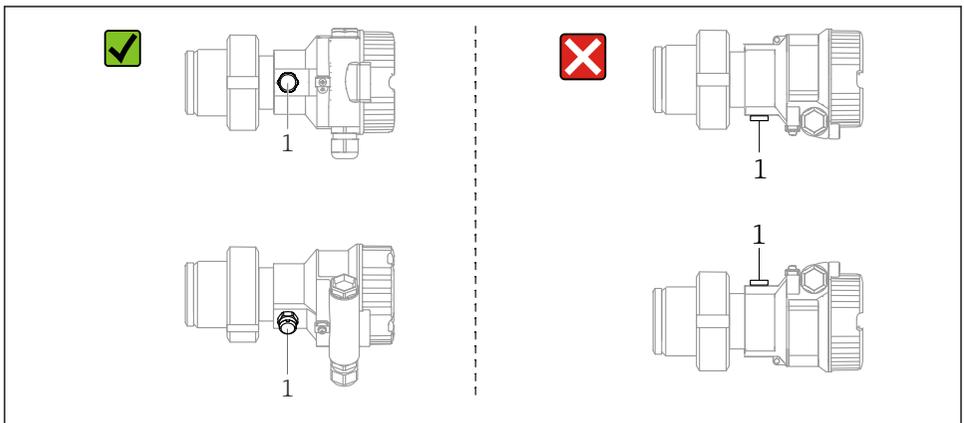
4.4.1 Installation instructions for devices without diaphragm seals – PMP51, PMC51

NOTICE

Damage to the device!

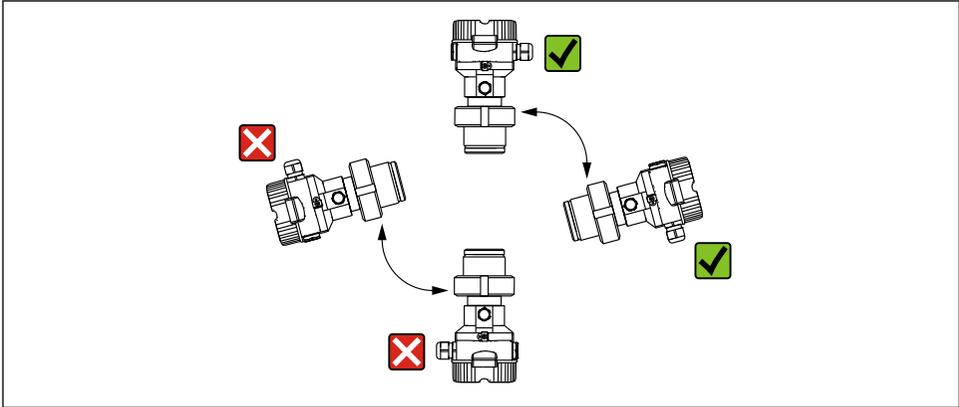
If a heated device is cooled during a cleaning process (e.g. by cold water), a vacuum develops for a short time and, as a result, moisture can enter the sensor through the pressure compensation element (1).

- ▶ Mount the device with the pressure compensation element (1) pointing diagonally downwards or to the side as much as possible.



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- 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 membranes 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):



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Pressure measurement in gases

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

Pressure measurement in vapors

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

Pressure measurement in liquids

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

Level measurement

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

4.4.2 Installation instructions for devices with diaphragm seals – PMP55

- Cerabar M devices with diaphragm seals are screwed in, flanged or clamped, depending on the type of diaphragm seal.
- 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.
- Do not clean or touch the process membrane of the diaphragm seal with hard or pointed objects.
- Do not remove the protection on the process membrane until just before installation.

NOTICE

Improper handling!

Damage to the device!

- ▶ 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.
- ▶ If a mounting bracket is used, sufficient strain relief must be ensured for the capillaries in order to prevent them from buckling (bending radius ≥ 100 mm (3.94 in)).
- ▶ 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.

NOTICE

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
- ▶ Mount with a bending radius ≥ 100 mm (3.94 in)!
- ▶ Do not use the capillaries as a carrying aid for the diaphragm seals!

Vacuum applications

See Operating Instructions.

Mounting with temperature isolator

See Operating Instructions.

Heat insulation

See Operating Instructions.

4.4.3 Seal for flange mounting

NOTICE

Corrupted measurement results.

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

- ▶ Ensure that the seal is not touching the process isolating diaphragm.

4.4.4 Wall and pipe mounting (optional)

See Operating Instructions.

4.4.5 Assembling and mounting the "separate housing" version

See operating instructions.

4.4.6 PMP51, version prepared for diaphragm seal mount – welding recommendation

See the Operating Instructions.

4.5 Mounting of the profile seal for universal process mounting adapter

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

4.6 Closing the housing cover

NOTICE

Devices with EPDM cover seal - transmitter leakiness!

Mineral-based, animal-based or vegetable-based lubricants cause the EPDM cover seal to swell and the transmitter to become leaky.

- ▶ The thread is coated at the factory and therefore does not require any lubrication.

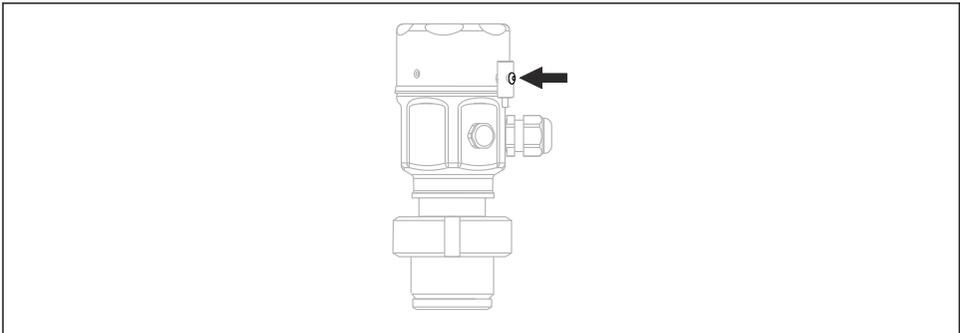
NOTICE

The housing cover can no longer be closed.

Damaged thread!

- ▶ 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.

4.6.1 Closing the cover on the stainless steel housing



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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).

5 Electrical connection

5.1 Connecting the device

⚠ WARNING

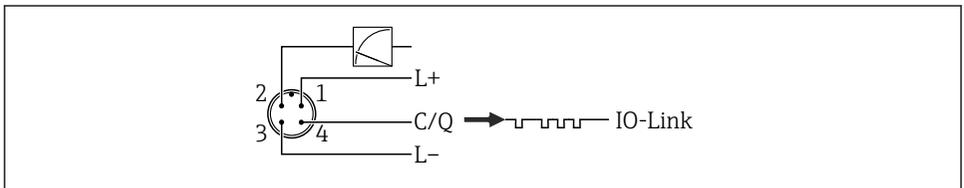
Supply voltage might be connected!

Risk of electric shock and/or explosion!

- ▶ Make sure that no uncontrolled processes are triggered on the system.
- ▶ Switch off the supply voltage before connecting the device.
- ▶ When using the measuring device in hazardous areas, ensure compliance with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.
- ▶ 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 power unit must be tested to ensure it meets safety requirements (e.g., PELV, SELV, Class 2).

Connect the device in the following order:

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. Connect the device in accordance with the following diagram.
4. Switch on the supply voltage.



A0045628

- 1 Supply voltage +
- 2 4-20 mA
- 3 Supply voltage -
- 4 C/Q (IO-Link communication)

5.2 Connecting the measuring unit

5.2.1 Supply voltage

IO-Link

- 11.5 to 30 V DC if only the analog output is used
- 18 to 30 V DC if IO-Link is used

5.2.2 Current consumption

IO-Link < 60 mA

5.3 Terminals

- Supply voltage: 0.5 to 2.5 mm² (20 to 14 AWG)
- External ground terminal: 0.5 to 4 mm² (20 to 12 AWG)

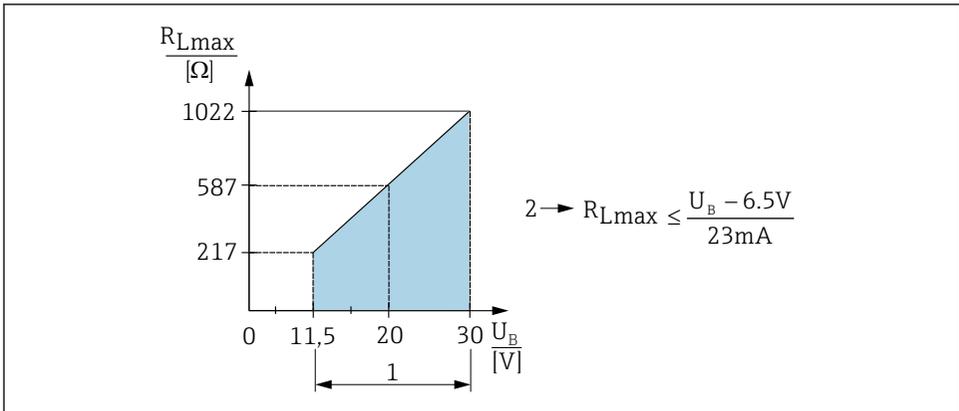
5.4 Cable specification

5.4.1 IO-Link

Endress+Hauser recommends using twisted, four-core cable.

5.5 Load for current output

In order to guarantee sufficient terminal voltage, a maximum load resistance R_L (including line resistance) must not be exceeded depending on the supply voltage U_B of the supply unit.



A0045615

- 1 Power supply 11.5 to 30 V_{DC}
 - 2 R_{Lmax} maximum load resistance
- U_B Supply voltage

- Output of failure current and display of "M803" (Output: MIN alarm current)
- Periodic checking to establish if it is possible to quit fault state

5.6 Field Xpert SMT70, SMT77

See Operating Instructions.

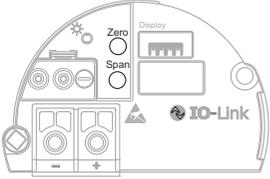
5.7 FieldPort SFP20

See Operating Instructions.

6 Operation

6.1 Operation methods

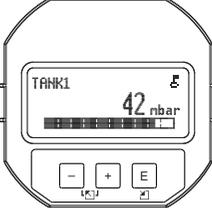
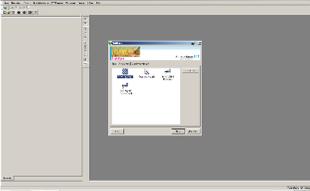
6.1.1 Operation without an operating menu

Operation methods	Explanation	Graphic	Description
Local operation without device display	The device is operated using the operating keys on the electronic insert.	 <p>A0045577</p>	→  19

6.1.2 Operation with an operating menu

Operation with an operating menu is based on an operation concept with "user roles"

→  20.

Operation methods	Explanation	Graphic	Description
Local operation with device display	The device is operated using the operating keys on the device display.	 <p style="text-align: right; font-size: small;">A0029999</p>	→  20
Remote operation via FieldCare	The device is operated using the FieldCare operating tool.	 <p style="text-align: right; font-size: small;">A0030002</p>	→  25

6.1.3 IO-Link

IO-Link information

IO-Link Smart Sensor Profile 2nd Edition

Supports

- Identification
- Diagnosis
- Digital Measuring Sensor (as per SSP 4.3.3)

IO-Link is a point-to-point connection for communication between the measuring device and an IO-Link master. The measuring device features an IO-Link communication interface type 2 (pin 4) with a second IO function on pin 2. This requires an IO-Link-compatible assembly (IO-Link master) for operation. The IO-Link communication interface enables direct access to the process and diagnostic data. It also provides the option of configuring the measuring device while in operation.

Characteristics of the IO-Link interface:

- IO-Link specification: Version 1.1
- IO-Link Smart Sensor Profile 2nd Edition
- Speed: COM2; 38.4 kBaud
- Minimum cycle time: 10 ms
- Process data width: 14 Byte

- IO-Link data storage: Yes
- Block configuration: Yes
- Device operational: The measuring device is operational 5 seconds after the supply voltage is applied

IO-Link download

<http://www.endress.com/download>

- Select "Software" as the media type
- Select "Device Driver" as the software type
Select IO-Link (IODD)
IODD for Cerabar M PMC51, PMP51, PMP55
- In the "Text Search" field enter the device name.

<https://ioddfinder.io-link.com/>

Search by

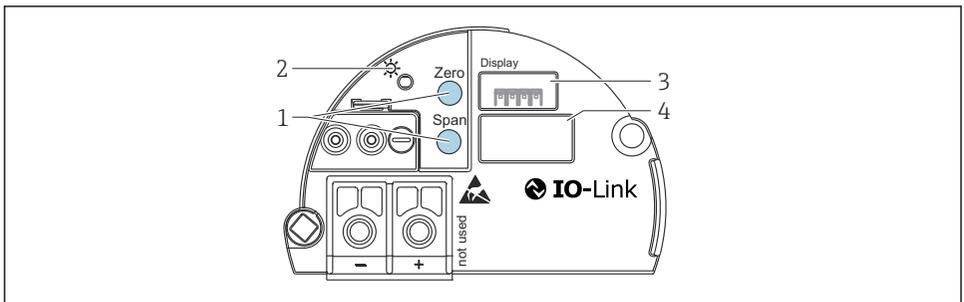
- Manufacturer
- Article number
- Product type

6.2 Operation without an operating menu

6.2.1 Position of operating elements

The operating keys are located in the measuring device on the electronic insert.

IO-Link



A0045576

- 1 Operating keys for lower range value (zero) and upper range value (span)
- 2 Green LED to indicate successful operation
- 3 Slot for optional onsite display
- 4 Slot for M12 plug

Function of the operating elements

Operating key(s)	Meaning
"Zero" pressed for at least 3 seconds	Get LRV <ul style="list-style-type: none"> ▪ "Pressure" measuring mode The pressure present is accepted as the lower range value (LRV). ▪ "Level" measuring mode, "In pressure" level selection, "Wet" calibration mode The pressure present is assigned to the lower level value ("Empty calibration").
"Span" pressed for at least 3 seconds	Get URV <ul style="list-style-type: none"> ▪ "Pressure" measuring mode The pressure present is accepted as the upper range value (URV). ▪ "Level" measuring mode, "In pressure" level selection, "Wet" calibration mode The pressure present is assigned to the upper level value ("Full calibration").
"Zero" and "Span" pressed simultaneously for at least 3 seconds	Position adjustment The sensor characteristic is shifted in parallel so that the pressure present becomes the zero value.
"Zero" and "Span" pressed simultaneously for at least 12 seconds	Reset All the parameters are reset to the order configuration.

6.2.2 Locking/unlocking operation

See the Operating Instructions.

6.3 Operation with an operating menu

6.3.1 Operating concept

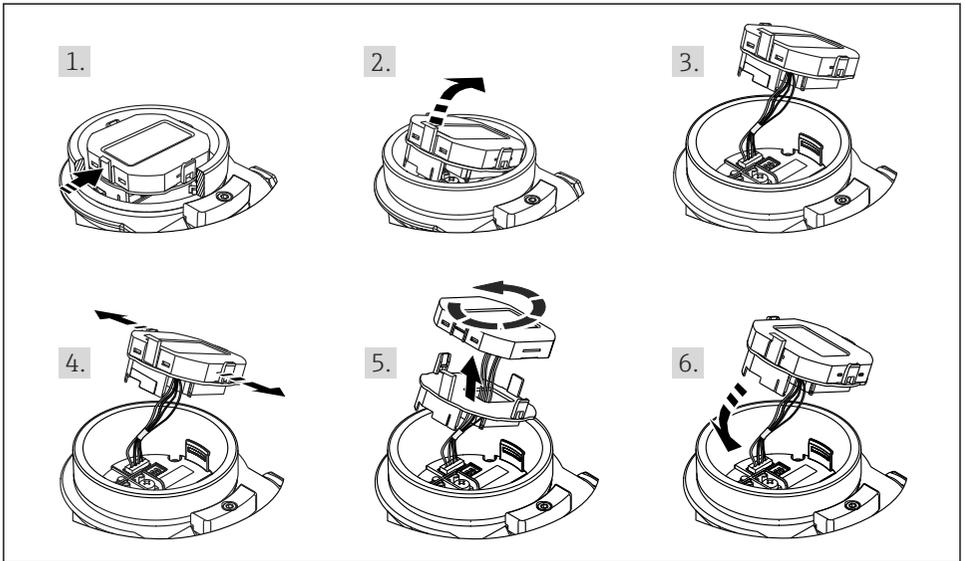
See the Operating Instructions.

6.3.2 Structure of the operating menu

See the Operating Instructions.

6.4 Operation with device display (optional)

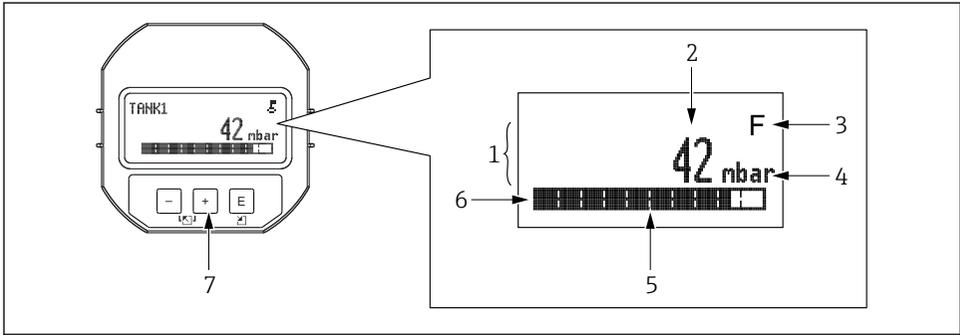
A 4-line liquid crystal display (LCD) is used for display and operation. The local display shows measured values, dialog texts, fault messages and notice messages. For easy operation the display can be taken out of the housing (see figure steps 1 to 3). It is connected to the device via a 90 mm (3.54 in) long cable. The display of the device can be turned in 90° stages (see figure steps 4 to 6). Depending on the installation position of the device, this makes it easy to operate the device and read the measured values.



A0028500

Functions:

- 8-digit measured value display incl. sign and decimal point, bar graph for 4 to 20 mA as current display.
- Three keys for operation.
- Easy and complete menu guidance by dividing the parameters into several levels and groups
- Each parameter is given a 3-digit parameter code for easy navigation.
- Comprehensive diagnostic functions (fault and warning message etc.).



A0030013

- 1 Main line
- 2 Value
- 3 Symbol
- 4 Unit
- 5 Bar graph
- 6 Information line
- 7 Operating keys

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

Symbol	Meaning
 A0018154	Lock symbol The operation of the device is locked. Unlock the device, → 25.
 A0018155	Communication symbol Data transfer via communication
 A0013958	Error message "Out of specification" The device is being operated outside its technical specifications (e.g. during startup or cleaning).
 A0013959	Error message "Service mode" The device is in the Service mode (e.g. during a simulation).
 A0013957	Error message "Maintenance required" Maintenance is required. The measured value remains valid.
 A0013956	Error message "Failure detected" An operating error has occurred. The measured value is no longer valid.

6.4.1 Operating keys on the display and operating module

Operating key(s)	Meaning
 A0017879	<ul style="list-style-type: none"> Navigate downwards in the picklist Edit the numerical values and characters within a function
 A0017880	<ul style="list-style-type: none"> Navigate upwards in the picklist Edit the numerical values and characters within a function
 A0017881	<ul style="list-style-type: none"> Confirm entry Jump to the next item Select a menu item and activate the edit mode
 and  A0017879 and A0017881	Contrast setting of local display: darker
 and  A0017880 and A0017881	Contrast setting of local display: brighter
 and  A0017879 and A0017880	<p>ESC functions:</p> <ul style="list-style-type: none"> Exit edit mode for a parameter without saving the changed value You are in a menu at a selection level. Each time you press the keys simultaneously, you go up a level in the menu.

6.4.2 Operating example: Parameters with a picklist

Example: selecting "Deutsch" as the language of the menu.

	Language	000	Operation
1	<ul style="list-style-type: none"> ✓ English Deutsch 		<p>"English" is set as the menu language (default value). A ✓ in front of the menu text indicates the option that is currently active.</p>
2	<ul style="list-style-type: none"> Deutsch ✓ English 		Select "Deutsch" with  or  .
3	<ul style="list-style-type: none"> ✓ Deutsch English 		<ul style="list-style-type: none"> Select  to confirm. A ✓ in front of the menu text indicates the active option ("Deutsch" is now selected as the menu language). Use  to exit the edit mode for the parameter.

6.4.3 Operating example: User-definable parameters

Example: Setting the "Set URV (014)" parameter from 100 mbar (1.5 psi) to 50 mbar (0.75 psi).

Menu path: Setup → Extended setup → Current output → Set URV

	Set URV	014	Operation
1		mbar	The local display shows the parameter to be changed. The "mbar" unit is defined in another parameter and cannot be changed here.
2		mbar	Press or to enter the edit mode. The first digit is highlighted in black.
3		mbar	Use the key to change "1" to "5". Press the key to confirm "5". The cursor jumps to the next position (highlighted in black). Confirm "0" with (second position).
4		mbar	The third digit is highlighted in black and can now be edited.
5		mbar	Use the key to change to the "↵" symbol. Use to save the new value and exit edit mode. See next graphic.
6		mbar	The new value for the upper range value is 50 mbar (0.75 psi). Use to exit the edit mode for the parameter. Use or to return to the edit mode.

6.4.4 Operating example: Accepting the pressure present

Example: Setting pos. zero adjustment.

Menu path: Main menu → Setup → Pos. zero adjust

	Pos. zero adjust	007	Operation
1	✓ Cancel Confirm		The pressure for pos. zero adjustment is present at the device.
2	Cancel ✓ Confirm		Use or to switch to the "Confirm" option. The active option is highlighted in black.
3	Adjustment has been accepted!		Use the key to accept the applied pressure as zero adjustment. The device confirms the adjustment and goes back to the "Pos. zero adjust" parameter.
4	✓ Cancel Confirm		Use to exit the edit mode for the parameter.

6.5 Operation using Endress+Hauser operating program

See the Operating Instructions.

6.6 Locking/unlocking operation

See the Operating Instructions.

6.7 Resetting to factory settings (reset)

See Operating Instructions.

7 System integration

See the Operating Instructions.

8 Commissioning

The device is configured for the "Pressure" measuring mode as standard.

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

WARNING

The permitted process pressure is exceeded!

Risk of injury if parts burst! Warnings are displayed if the pressure is too high.

- ▶ If a pressure smaller than the minimum permitted pressure or greater than the maximum permitted pressure is present at the device, the following messages are output in succession (depending on the setting in the "Alarm behavior" (050) parameter): "S140 Working range P" or "F140 Working range P" "S841 Sensor range" or "F841 Sensor range" "S971 Adjustment"
- ▶ Only operate the device within the sensor range limits!

NOTICE

The permitted process pressure is undershot!

Messages are displayed if the pressure is too low.

- ▶ If a pressure smaller than the minimum permitted pressure or greater than the maximum permitted pressure is present at the device, the following messages are output in succession (depending on the setting in the "Alarm behavior" (050) parameter): "S140 Working range P" or "F140 Working range P" "S841 Sensor range" or "F841 Sensor range" "S971 Adjustment"
- ▶ Only operate the device within the sensor range limits!

8.1 Unlocking/locking configuration

See the Operating Instructions.

8.2 Commissioning without an operating menu

8.2.1 Pressure measuring mode

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

- Position adjustment (zero point correction)
- Setting the lower range value and upper range value
- Device reset →  25



- Operation must be unlocked →  25
- The device is configured for the "Pressure" measuring mode as standard. You can change the measuring mode via the "Measuring mode" parameter →  28.
- The pressure applied must be within the nominal pressure limits of the sensor. See information on the nameplate.

WARNING

Changing the measuring mode affects the span (URV)!

This can result in product overflow.

- ▶ If the measuring mode is changed, the span setting (URV) must be verified and, if necessary, reconfigured!

Perform position adjustment (see the information at the start of the "Commissioning" section)	
1	Pressure is present at the device.
2	Press the "Zero" and "Span" keys simultaneously for at least 3 s.
3	Does the LED on the electronic insert light up briefly?
4	Yes No
5	Applied pressure for position adjustment has been accepted. Applied pressure for position adjustment has not been accepted. Observe the input limits.

Setting the lower range value	
1	The desired pressure for the lower range value is present at the device.
2	Press the "Zero" key for at least 3 s.
3	Does the LED on the electronic insert light up briefly?
4	Yes No
5	Applied pressure for lower range value has been accepted. Applied pressure for lower range value has not been accepted. Observe the input limits.

Setting the upper range value	
1	The desired pressure for the upper range value is present at the device.
2	Press the "Span" key for at least 3 s.
3	Does the LED on the electronic insert light up briefly?

Setting the upper range value		
4	Yes	No
5	Applied pressure for upper range value has been accepted.	Applied pressure for upper range value has not been accepted. Observe the input limits.

8.2.2 Level measuring mode

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

- Position adjustment (zero point correction)
- Setting the lower and upper pressure value and assigning to the lower and upper level value
- Device reset →  25



- The "Zero" and "Span" keys only have a function with the following setting:

"Level selection" = "In pressure", "Calibration mode" = "Wet"

In other settings, the keys do not have a function.

- The device is configured for the "Pressure" measuring mode as standard. You can change the measuring mode via the "Measuring mode" parameter →  28.

The following parameters are set to the following values at the factory:

- "Level selection" = "In pressure"
- "Calibration mode": wet
- "Unit before lin": %
- "Empty calib.": 0.0
- "Full calib.": 100.0
- "Set LRV": 0.0 (corresponds to 4 mA value)
- "Set URV": 100.0 (corresponds to 20 mA value)
- Operation must be unlocked →  25.
- The pressure applied must be within the nominal pressure limits of the sensor. See information on the nameplate.



Changing the measuring mode affects the span (URV)!

This can result in product overflow.

- ▶ If the measuring mode is changed, the span setting (URV) must be verified and, if necessary, reconfigured!

Perform position adjustment (see the information at the start of the "Commissioning" section)		
1	Pressure is present at the device.	
2	Press the "Zero" and "Span" keys simultaneously for at least 3 s.	
3	Does the LED on the electronic insert light up briefly?	
4	Yes	No
5	Applied pressure for position adjustment has been accepted.	Applied pressure for position adjustment has not been accepted. Observe the input limits.

Setting lower pressure value	
1	Desired pressure for lower pressure value ("empty pressure") is present at device.
2	Press the "Zero" key for at least 3 s.
3	Does the LED on the electronic insert light up briefly?
4	Yes No
5	The pressure present was saved as the lower pressure value ("empty pressure") and assigned to the lower level value ("empty calibration"). Applied pressure was not saved as the lower pressure value. Observe the input limits.

Setting upper pressure value	
1	Desired pressure for upper pressure value ("full pressure") is present at device.
2	Press the "Span" key for at least 3 s.
3	Does the LED on the electronic insert light up briefly?
4	Yes No
5	The pressure present was saved as the upper pressure value ("full pressure") and assigned to the upper level value ("full calibration"). Applied pressure was not saved as the upper pressure value. Observe the input limits.

8.3 Commissioning with an operating menu

Commissioning comprises the following steps:

- Function check
- Selection of the language, measuring mode and pressure unit →  28
- Position adjustment/zero adjustment →  30
- Configuring measurement:
 - Pressure measurement →  31
 - Level measurement →  31

8.3.1 Selecting the language, measuring mode and pressure unit

Language (000)

Navigation

  Main menu → Language

Write permission

Operators/Service engineers/Expert

Description

Select the menu language for the local display.

Options	<ul style="list-style-type: none"> ▪ English ▪ Another language (as selected when ordering the device) ▪ Possibly a third language (language of the manufacturing plant)
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Factory setting	English
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Measuring mode (005)

Write permission	Operator/Maintenance/Expert
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Description	<p>Select the measuring mode. The operating menu is structured differently depending on the measuring mode selected.</p>
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⚠ WARNING

Changing the measuring mode affects the span (URV)

This situation can result in product overflow.

- ▶ If the measuring mode is changed, the setting for the span (URV) must be checked in the "Setup" operating menu and readjusted if necessary.

Selection	<ul style="list-style-type: none"> ▪ Pressure ▪ Level
------------------	---

Factory setting	Pressure or according to order specifications
------------------------	---

Press. eng. unit (125)

Write permission	Operator/Maintenance/Expert
-------------------------	-----------------------------

Description	Select the pressure unit. If a new pressure unit is selected, all pressure-specific parameters are converted and displayed with the new unit.
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Selection	<ul style="list-style-type: none"> ■ mbar, bar ■ mmH₂O, mH₂O ■ inH₂O, ftH₂O ■ Pa, kPa, MPa ■ psi ■ mmHg, inHg ■ kgf/cm²
Factory setting	mbar or bar depending on the nominal measuring range of the sensor, or as per order specifications.

8.3.2 Pos. zero adjust

Corrected press. (172)

Navigation	  Setup → Corrected press.
Write permission	Operators/Service engineers/Expert
Description	Displays the measured pressure after sensor trim and position adjustment.
Note	If this value is not equal to "0", it can be corrected to "0" by the position adjustment.

Pos. zero adjust (007) (gauge pressure sensors)

Write permission	Operator/Maintenance/Expert
Description	Pos. zero adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.
Example	<ul style="list-style-type: none"> ■ Measured value = 2.2 mbar (0.033 psi) ■ You correct the measured value via the "Pos. zero adjust" parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. ■ Measured value (after pos. zero adjustment) = 0.0 mbar ■ The current value is also corrected.

Selection	<ul style="list-style-type: none"> ▪ Confirm ▪ Cancel
Factory setting	Cancel

Pos. zero adjust (007) (gauge pressure sensors)

Write permission	Operator/Maintenance/Expert
Description	Pos. zero adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.
Example	<ul style="list-style-type: none"> ▪ Measured value = 2.2 mbar (0.033 psi) ▪ You correct the measured value via the "Pos. zero adjust" parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present. ▪ Measured value (after pos. zero adjustment) = 0.0 mbar ▪ The current value is also corrected.
Selection	<ul style="list-style-type: none"> ▪ Confirm ▪ Cancel
Factory setting	Cancel

8.4 Configuring level measurement

See the Operating Instructions.

8.5 Configuring pressure measurement

See the Operating Instructions.

8.6 Backing up or duplicating the device data

See the Operating Instructions.



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