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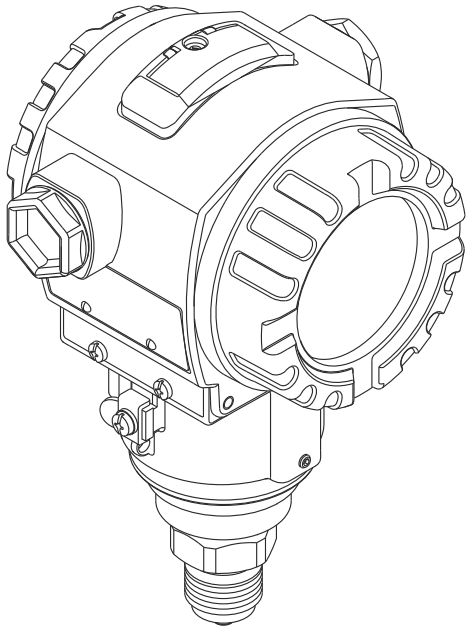
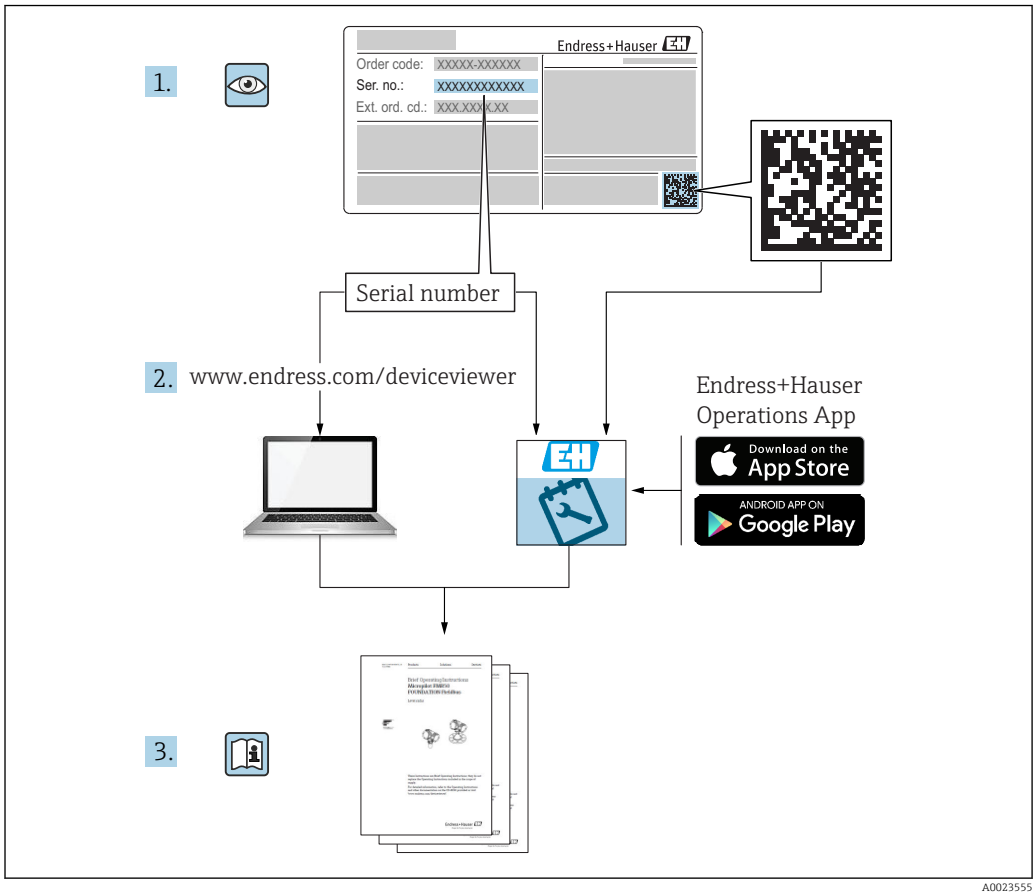
Operating Instructions
Cerabar S PMP71 Low Power 1-5V DC Output

Process pressure measurement
Low power pressure transmitter with metal sensors and 1-5V DC voltage output



Endress+Hauser
People for Process Automation



- Make sure the document is stored in a safe place such that it is always available when working on or with the device.
- To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.
- The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser distributor will supply you with current information and updates to these Instructions.

Table of contents

1 About this document

1.1 Document function

These Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

1.2 Symbols used

1.2.1 Safety symbols

Symbol	Meaning
DANGER	**DANGER!** This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
WARNING	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
CAUTION	**CAUTION!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE	**NOTE!** 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.
	**Forbidden** Procedures, processes or actions that are forbidden.

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

1.3 Documentation

The document types listed are available:
In the Download Area of the Endress+Hauser Internet site: www.endress.com → Download

1.3.1 Technical Information (TI): planning aid for your device

TI00383P:

The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.

1.3.2 Brief Operating Instructions (KA): getting the 1st measured value quickly

KA01258P:

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

1.3.3 Safety Instructions (XA)

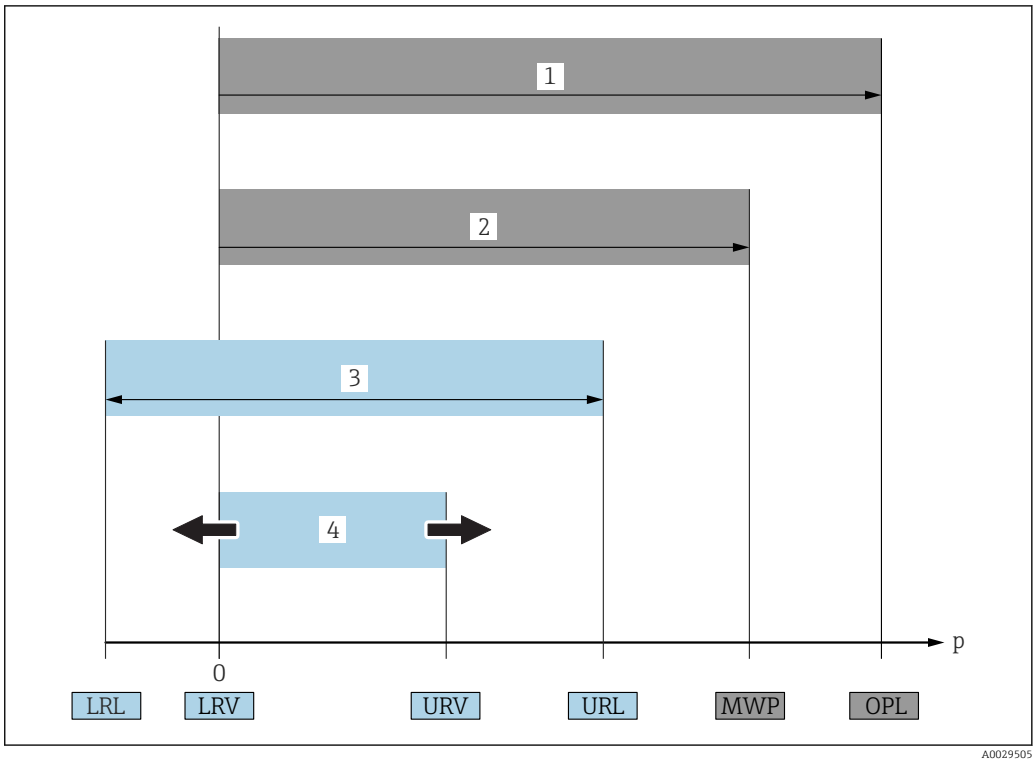
Depending on the approval, the following Safety Instructions (XA) are supplied with the device. They are an integral part of the Operating Instructions.

1-5V DC

Directive	Device	Electronics	Documentation	Option [1]
CSA C/US XP Cl.I Div.1 Gr.B-D, Ex d, Zone 1,2	PMP71	1-5V DC	XA00599P	V

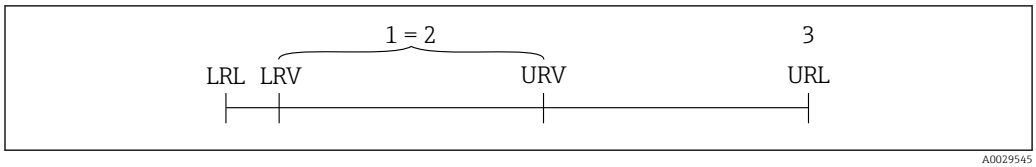
1) Product Configurator, order code for "Approval"

1.4 Terms and abbreviations



Item	Term/abbreviation	Explanation
1	OPL	The OPL (over pressure limit = sensor overload limit) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. For the relevant standards and additional notes, see the "Pressure specifications" section . The OPL may only be applied for a limited period of time.
2	MWP	The MWP (maximum working pressure) for the sensors depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. For the relevant standards and additional notes, see the "Pressure specifications" section . The MWP may be applied at the device for an unlimited period. The MWP can also be found on the nameplate.
3	Maximum sensor measuring range	Span between LRL and URL This sensor measuring range is equivalent to the maximum calibratable/adjustable span.
4	Calibrated/adjusted span	Span between LRV and URV Factory setting: 0 to URL Other calibrated spans can be ordered as customized spans.
p	-	Pressure
-	LRL	Lower range limit
-	URL	Upper range limit
-	LRV	Lower range value
-	URV	Upper range value
-	TD (turn down)	Turn down Example - see the following section.

1.5 Turn down calculation



1 Calibrated/adjusted span
2 Zero point-based span
3 URL sensor

Example

- Sensor:10 bar (150 psi)
- Upper range value (URL) = 10 bar (150 psi)

Turn down (TD):

$$TD = \frac{URL}{|URV - LRV|}$$

$$TD = \frac{10\ bar\ (150\ psi)}{|5\ bar\ (75\ psi) - 0\ bar\ (0\ psi)|} = 2$$

In this example, the TD is 2:1.
This span is based on the zero point.

- Calibrated/adjusted span: 0 to 5 bar (0 to 75 psi)
- Lower range value (LRV) = 0 bar (0 psi)
- Upper range value (URV) = 5 bar (75 psi)

1.6 Registered trademarks

KALREZ®, VITON®, TEFLON® trademark of E.I. Du Pont de Nemours & Co., Wilmington, USA

TRI-CLAMP® trademark of Ladish & Co., Inc., Kenosha, USA

GORE-TEX® trademark of W.L. Gore & Associates, Inc., USA

2 Basic safety instructions

2.1 Requirements concerning the staff

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:
- 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 beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates (depending on the application)
- Following instructions and basic conditions

The operating personnel must fulfill the following requirements:
- Being instructed and authorized according to the requirements of the task by the facility's owner-operator
- Following the instructions in these Operating Instructions

2.2 Designated use

2.2.1 Application and media

The Cerabar S is a pressure transmitter for measuring the pressure. If the limit values specified in the "Technical Data" and the conditions listed in the instructions and additional documentation are observed, the measuring device may be used for the following measurements (process variables):

Measured process variables

- Absolute pressure
- Gauge pressure

Calculated values

Level (level, volume or mass)

2.2.2 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.

2.2.3 Residual risks

Due to heat transfer from the process as well as power loss in the electronics, the temperature of the electronics housing and the assemblies contained therein (e.g. display module, main electronics module and I/O electronics module) may rise up to 80 °C (176 °F). When in operation, the sensor can reach a temperature close to the medium temperature.

Danger of burns from contact with surfaces!
- For elevated fluid temperature, ensure protection against contact to prevent burns.

2.3 Occupational 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.

Modifications 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 the risk of danger to persons or the facility when the device is used in the approval-related area (e.g. explosion protection, pressure equipment safety):
- ▶ Check the nameplate to verify if the device ordered can be put to its intended use in the approval-related area.
- ▶ Observe the specifications in the separate supplementary documentation that is an integral part of these Instructions.

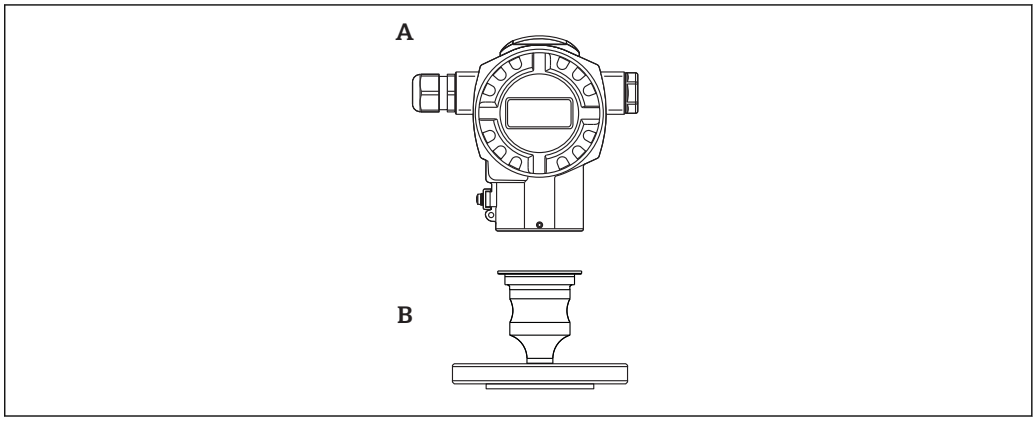
2.5 Product safety

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 it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

3 Product description

3.1 Product design



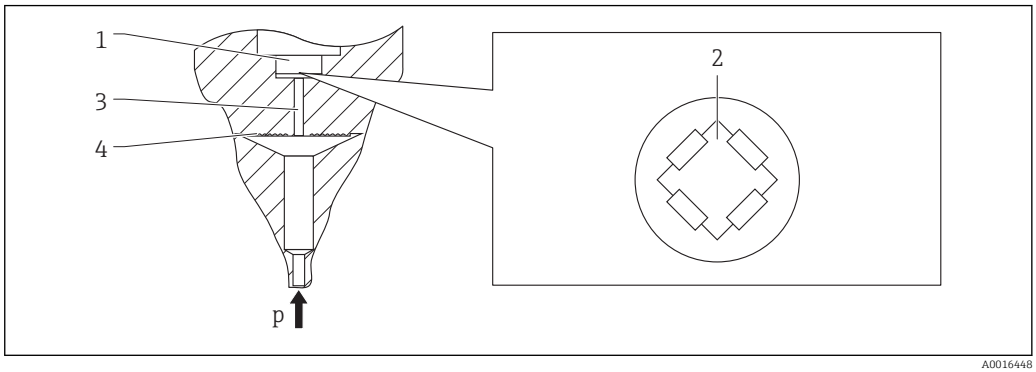
A Housing
B Process connection (e.g. flange)

3.2 Mode of operation

3.2.1 Calculating the pressure

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

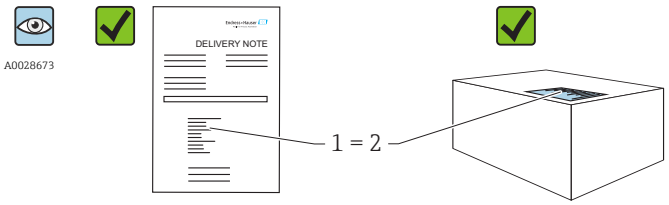
Advantages:
- Can be used for high process pressures
- Fully welded sensor
- Slim, flush-mounted process connections available



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

4 Incoming acceptance and product identification

4.1 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 provided?
If required (see nameplate): Are the safety instructions (XA) present?

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

4.2 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): All information about the measuring 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)

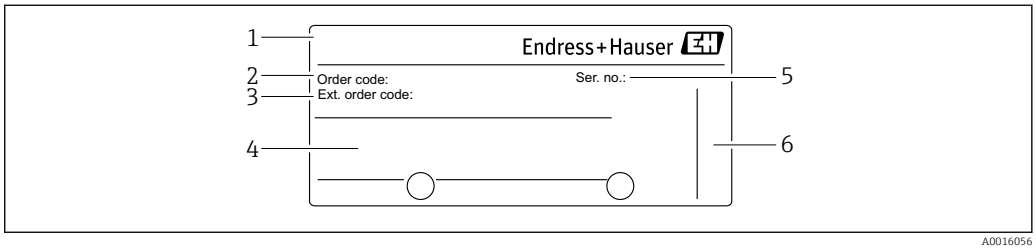
4.2.1 Manufacturer address

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

Address of the manufacturing plant: See nameplate.

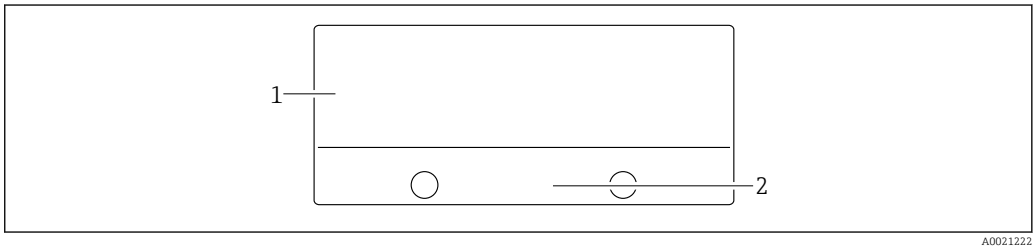
4.3 Nameplates

4.3.1 T14 aluminum housing



1 *Device name*
2 *Order number (shortened for re-ordering)*
3 *Extended order number (complete)*
4 *Technical data*
5 *Serial number (for clear identification)*
6 *Manufacturer's address*

Additional nameplate for devices with Ex approval



1 *Approval-specific information*
2 *Document number of Safety Instructions or drawing number*

4.4 Identification of sensor type

See the "Sensor measurement type" parameter in the parameter description.

4.5 Storage and transport

4.5.1 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

−40 to +80 °C (−40 to +176 °F)

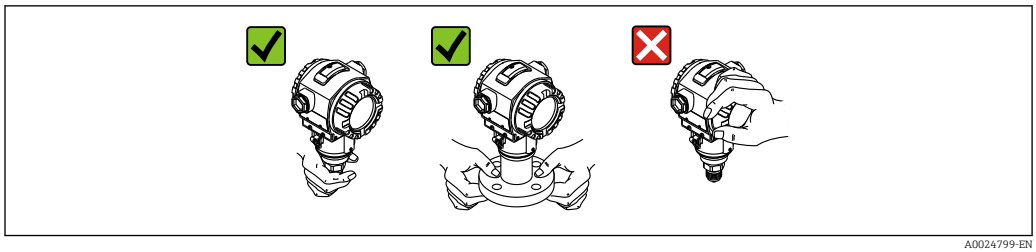
4.5.2 Transporting the product to the measuring point

⚠ WARNING

Incorrect transport!

Housing and diaphragm 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.



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4.6 Scope of delivery

The scope of delivery comprises:
- Device
- Optional accessories

Accompanying documentation:
- Brief Operating Instructions
- Fold-out brochure
- Final inspection report
- Additional safety instructions for devices for hazardous areas
- Optional: factory calibration certificate, test certificates

5 Installation

5.1 Mounting dimensions

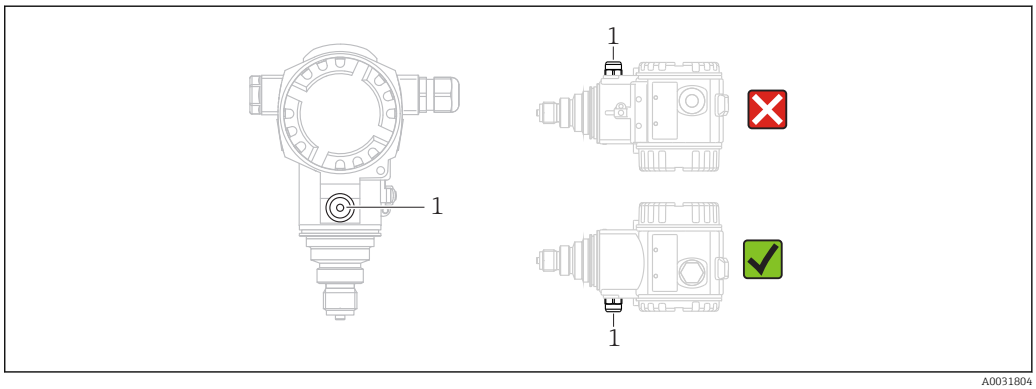
For dimensions, see the "Mechanical construction" section in the Technical Information.

5.2 Orientation

Due to the orientation, there may be a shift in the zero point, i.e. when the vessel is empty or partially full, the measured value does not display zero. This zero point shift can be corrected directly at the device using the E key → 35.

5.3 Installation conditions

- To ensure optimal readability of the onsite display, you can rotate the housing by up to 380° → 18.
- Endress+Hauser offers a mounting bracket for installation on pipes or walls → 17.
- If a heated device 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 device with the pressure compensation (1) pointing downwards.



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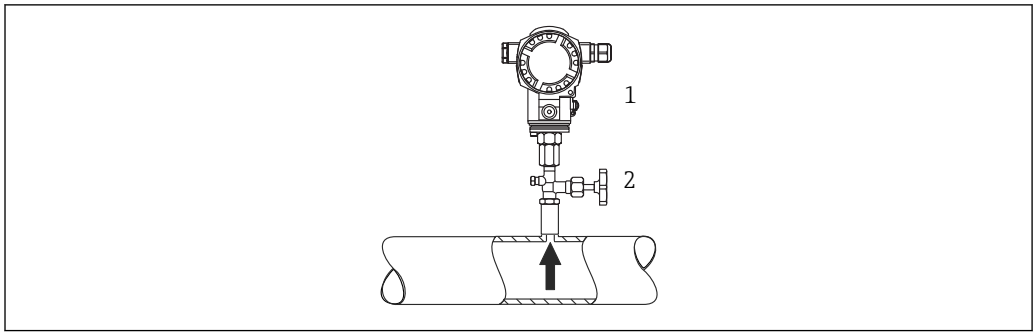
- Point the cable and connector downwards where possible to prevent moisture from entering (e.g. rain or condensation water).
- Devices without diaphragm seals are mounted as per the norms for a manometer (DIN EN 837-2). We recommend the use of shutoff devices and siphons. The orientation depends on the measuring application.
- Do not clean or touch process isolating diaphragms with hard or pointed objects.
- When measuring in media containing solids, such as dirty liquids, installing separators and drain valves is useful for capturing and removing sediment.
- Do not remove the protector on the process isolating diaphragm until just before installation.

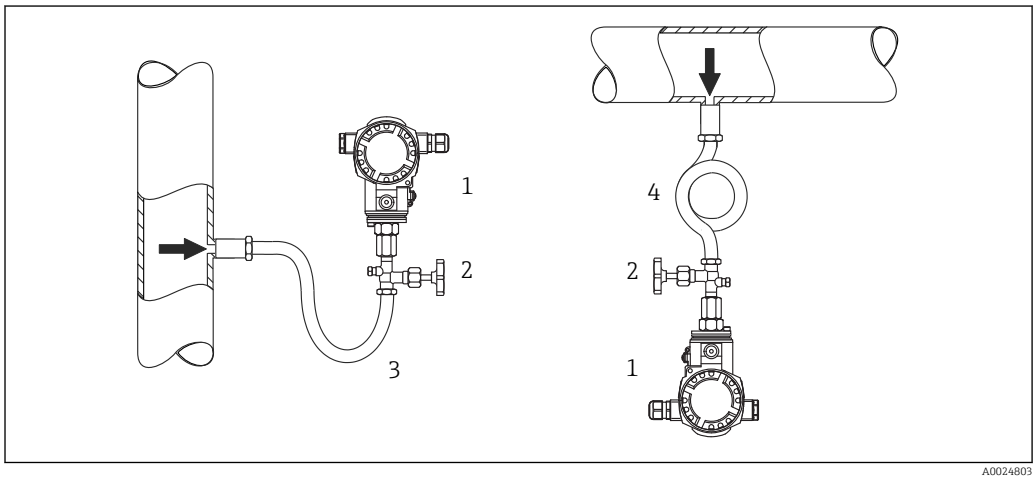
5.3.1 Pressure measurement in gases



1 Device
2 Shutoff device

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

5.3.2 Pressure measurement in vapors



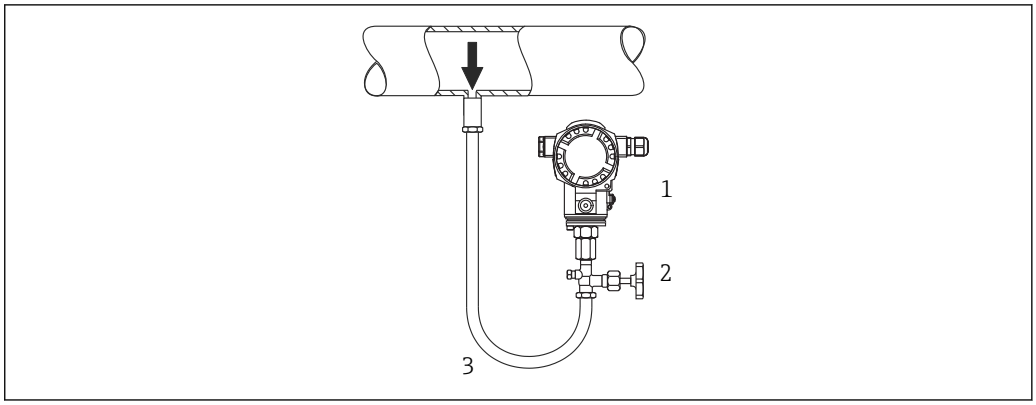
1 Device
2 Shutoff device
3 U-shaped siphon
4 O-shaped siphon

Use siphons for pressure measurement in vapors. The siphon reduces the temperature to almost ambient temperature. Preferably mount the device with the siphon below the tapping point.

Advantages:
- Defined water column only causes minimal/negligible measured errors
- Only minimal/negligible thermal effects on the device

Mounting above the tapping point is also permitted. Note the max. permitted ambient temperature of the transmitter.

5.3.3 Pressure measurement in liquids

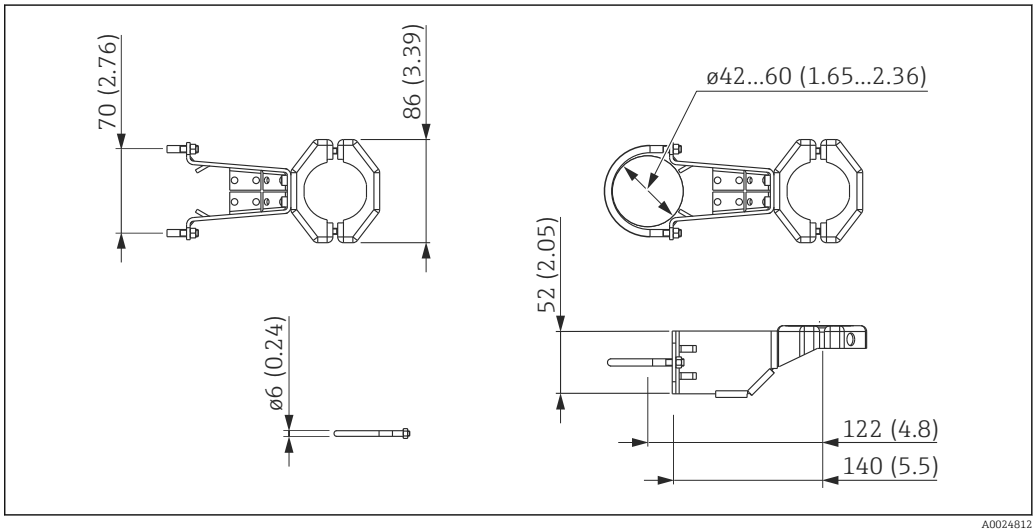


1 Device
2 Shutoff device

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

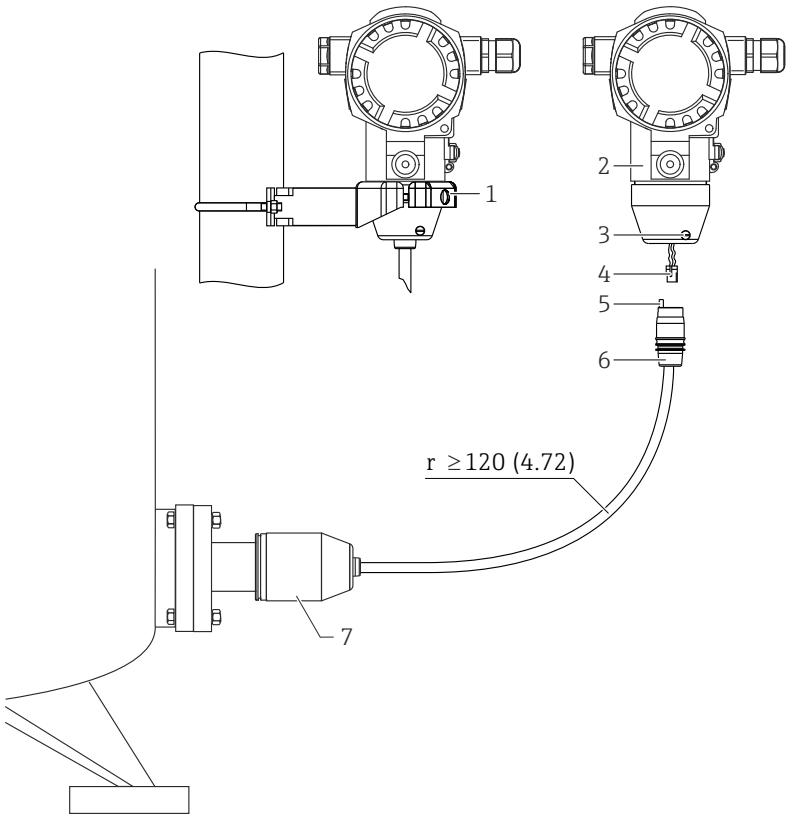
5.4 Wall and pipe mounting (optional)

Endress+Hauser offers a mounting bracket for installation on pipes or walls.



Please note the following when mounting:
- Devices with capillary tubes: mount capillaries with a bending radius ≥ 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 lbf ft).

5.5 Assembling and mounting the "separate housing" version



1 *Mounting bracket provided, suitable for pipe and wall mounting (for pipe diameters from 1 ¼" to 2")*
2 *Housing fitted with housing adapter, included*
3 *Locking screw*
4 *Plug*
5 *Pressure compensation*
6 *Cable with socket*
7 *In the case of the "separate housing" version, the sensor is delivered with the process connection and cable ready mounted.*

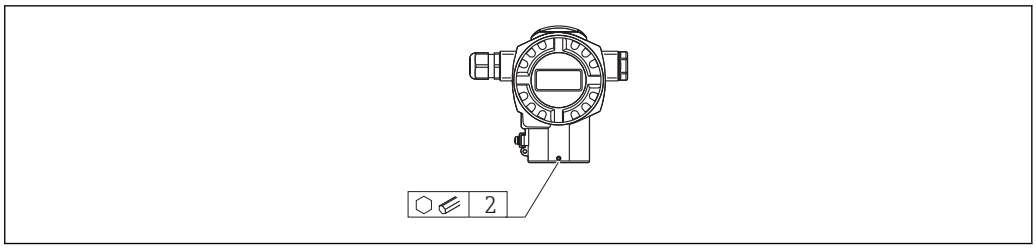
Engineering unit mm (in)

5.5.1 Assembly and mounting

1. Plug the connector (item 4) into the corresponding socket 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 lbf ft). Mount the cable with a bending radius (r) ≥ 120 mm (4.72 in).

5.6 Turning the housing

The housing can be rotated up to 380° by loosening the setscrew.



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1. Release the setscrew using a 2 mm (0.08 in) Allen key.
2. Rotate the housing (max. up to 380°).
3. Retighten the setscrew with 1 Nm (0.74 lbf ft).

5.7 Closing the housing covers

NOTICE

Devices with EPDM cover seal - transmitter not airtight!

Lubricants based on mineral oil, vegetable oil or animal fat cause the EPDM cover seal to swell with the result that the transmitter is no longer airtight.

- There is no need to lubricate the thread as the thread is already coated at the factory.

NOTICE

The housing cover can no longer be closed.

Damaged thread!

- When closing the housing covers make sure that the threads on the covers and the housing are free from dirt, such as sand. If you encounter resistance when closing the covers, then check the threads again for dirt or fouling.

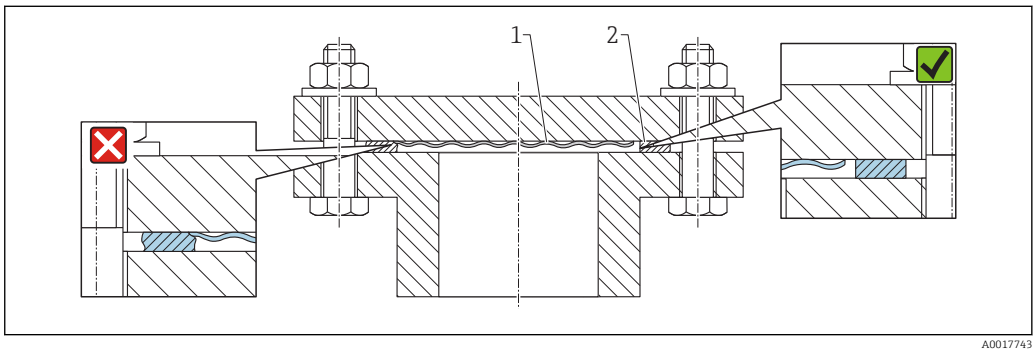
5.8 Seal for flange mounting

NOTICE

Distorted 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.



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1 Process isolating diaphragm
2 Seal

5.9 Post-installation check

❑	Is the device undamaged (visual inspection)?
❑	Does the device conform to the measuring point specifications? For example: ▪ Process temperature ▪ Process pressure ▪ Ambient temperature range ▪ Measuring range
❑	Are the measuring point identification and labeling correct (visual inspection)?
❑	Is the device adequately protected from precipitation and direct sunlight?
❑	Are the securing screw and securing clamp tightened securely?

6 Electrical connection

6.1 Connecting the measuring unit

6.1.1 Terminal assignment

⚠ WARNING

Supply voltage might be connected!

Risk of explosion!

- ▶ Switch off the supply voltage before connecting the device.

⚠ WARNING

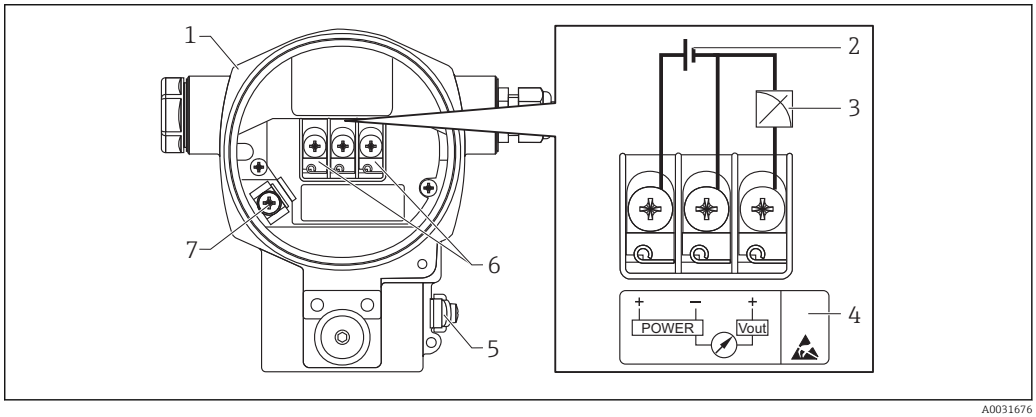
Electrical safety is compromised by an incorrect connection.

- ▶ Ensure that no uncontrolled processes are activated in the system.
- ▶ In accordance with IEC/EN61010 a separate circuit breaker must be provided for the device .
- ▶ When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations and the Safety Instructions or Installation or Control Drawings.
- ▶ All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas.
- ▶ Devices with integrated overvoltage protection must be grounded.
- ▶ Protective circuits against reverse polarity, HF influences and overvoltage peaks are integrated.

Connect the device in the following order:

1. Check whether the supply voltage matches the supply voltage indicated on the nameplate.
2. Remove the housing cover.
3. Guide cable through the gland.
4. Connect device in accordance with the following diagram.
5. Screw down housing cover.

Switch on supply voltage.



1 *Housing*
2 *Supply voltage*
3 *1-5V DC*
4 *Overvoltage protection (OVP) marking*
5 *External ground terminal*
6 *Terminals*
7 *Internal ground terminal*

6.1.2 Terminals

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

6.1.3 Supply voltage

⚠ WARNING

Supply voltage might be connected!
Risk of explosion!

- ▶ When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations as well as the Safety Instructions.
- ▶ All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas.

- Non-hazardous area: 9 to 35 V DC
- Ex-d: 9 to 35 V DC

6.1.4 Current consumption

9 V = 1.8 mA
35 V = 0.8 mA

6.2 Connection conditions

6.2.1 Maximum cable length

The following table shows the tolerance of the voltage output for a representative cable with a length of up to 100 m (328 ft), a resistance of 18 Ohm/km and specification 18 AWG (cable cross-section 0.8 mm²).

Tolerance of voltage output at cable end	Length
0.5 mV	25 m (82 ft)
1 mV	50 m (164 ft)
1.5 mV	75 m (246 ft)
2 mV	100 m (328 ft)

6.2.2 Cable specification

- Endress+Hauser recommends using a shielded cable.
- Cable outer diameter: 5 to 9 mm (0.2 to 0.35 in) depending on the cable entry used
  → 🖹 22

6.2.3 Cable entries

The cable entries have a 1/2 FNPT thread. The connection on the customer's side is protected by a plastic connector. A cable gland is not envisaged.

6.2.4 Overvoltage protection

- Overvoltage protection:
  - Nominal functioning DC voltage: 600 V
  - Nominal discharge current: 10 kA
- Surge current check î = 20 kA satisfied as per DIN EN 60079-14: 8/20 µs
- Arrester AC current check I = 10 A satisfied

NOTICE

Device could be destroyed!

▶ Devices with integrated overvoltage protection must be grounded.

6.3 Connection data

6.3.1 Load

The load must be at least 100 kΩ.

6.3.2 Shield

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.

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 systems as standard.

6.4 Post-connection check

❑	Is the device or cable undamaged (visual check)?
❑	Do the cables comply with the requirements ?
❑	Do the cables have adequate strain relief?
❑	Are all cable glands installed, securely tightened and leak-tight?
❑	Does the supply voltage match the specifications on the nameplate?
❑	Is the terminal assignment correct ?
❑	If required: Has protective ground connection been established?
❑	If supply voltage is present, is the device ready for operation and do values appear on the display module?
❑	Are all housing covers installed and securely tightened?
❑	Is the securing clamp tightened correctly?

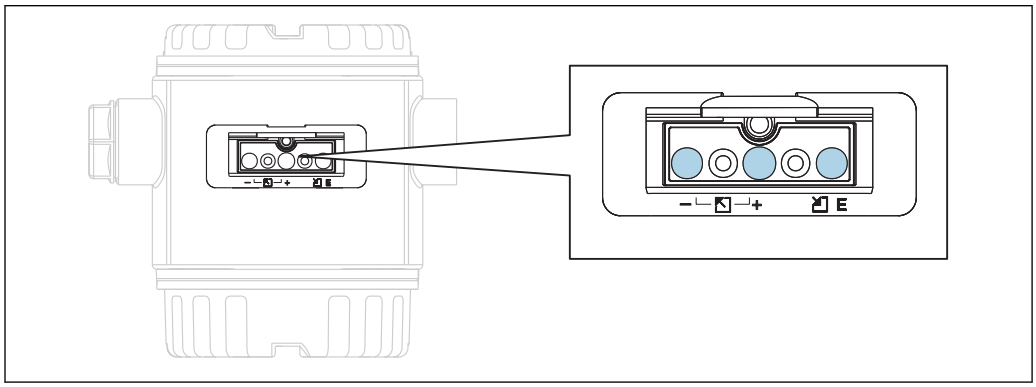
7 Operation options

7.1 Operation without an operating menu

7.1.1 Position of operating elements

Operating keys on the exterior of the device

With the T14 housing, the operating keys are located on the exterior of the device below the protection cap. In addition, there are also operating keys on the onsite display.

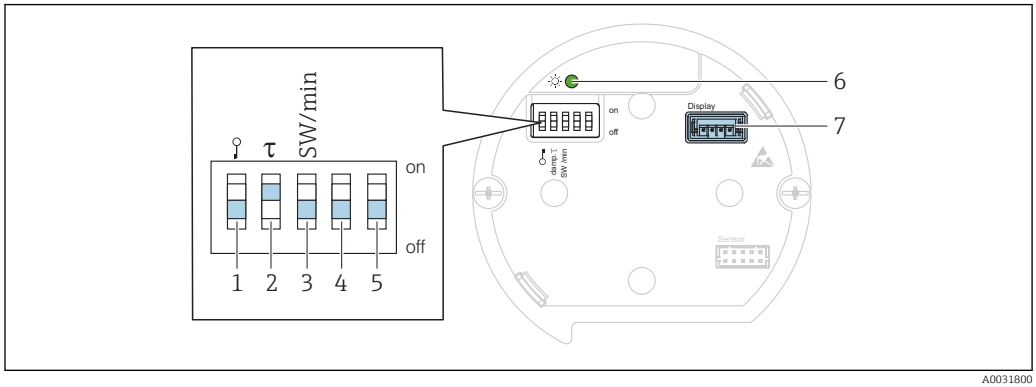


A0016499

The operating keys on the outside of the device make it unnecessary to open the housing. This guarantees:

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

Operating elements inside on the electronic insert



A0031800

1 DIP switch for locking/unlocking parameters relevant to the measured value
2 DIP switch for switching damping on/off
3 DIP switch for alarm voltage/alarm current SW / alarm min (0.9 V/~3.6 mA)
4…5 Not assigned
6 Green LED to indicate value being accepted
7 Slot for display

Function of the DIP switches

Switch	Symbol/ labeling	Switch position	
		"off"	"on"
1	 A0011978	The device is unlocked. Parameters relevant to the measured value can be modified.	The device is locked. Parameters relevant to the measured value cannot be modified.
2	damping τ	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 τ. [1]
3	SW/Alarm min	The alarm is defined via the setting in the operating menu. ("Setup" → "Extended setup" → "Voltage output" → "Output fail mode") [2]	The alarm voltage is 0.9 V (min), regardless of the setting in the operating menu.

1) The value for the delay time can be configured via the operating menu ("Setup" → "Damping"). Factory setting: τ = 2 s or as per order specifications.
2) can be set from 5.25 to 5.75 V

Function of the operating elements

	Operating key(s)	Meaning
 A0017535	Press for at least 3 seconds	Adopt lower range value. A reference pressure is present at the device. For a detailed description, see also the "Pressure measuring mode" section→ 🖹 37.
 A0017536	Press for at least 3 seconds	Adopt upper range value. A reference pressure is present at the device. For a detailed description, see also the "Pressure measuring mode" section→ 🖹 37.
 A0017537	Press for at least 3 seconds	Position adjustment
 A0017535 and  A0017536 and  A0017537	Press for at least 6 seconds	Reset all parameters. The reset via operating keys corresponds to the software reset code 7864.

7.2 Operation with an operating menu

7.2.1 Operating concept

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

User role	Meaning
Operator	Operators are responsible for the devices during normal "operation". This is usually limited to reading process values either directly at the device or in a control room. If the work with the devices goes beyond reading, it concerns simple, application-specific functions that are used in operation. Should an error occur, these users simply forward the information on the errors but do not intervene themselves.
Maintenance	Service engineers usually work with the devices in the phases following device commissioning. They are primarily involved in maintenance and troubleshooting activities for which simple settings have to be made at the device. Technicians work with the devices over the entire life cycle of the product. Thus, commissioning and advanced settings and configurations are some of the tasks they have to carry out.
Expert	Experts work with the devices over the entire life cycle of the device, but, at times, have high device requirements. Individual parameters/functions from the overall functionality of the devices are required for this purpose time and again. In addition to technical, process-oriented tasks, experts can also perform administrative tasks (e.g. user administration). "Experts" can access the entire parameter set.

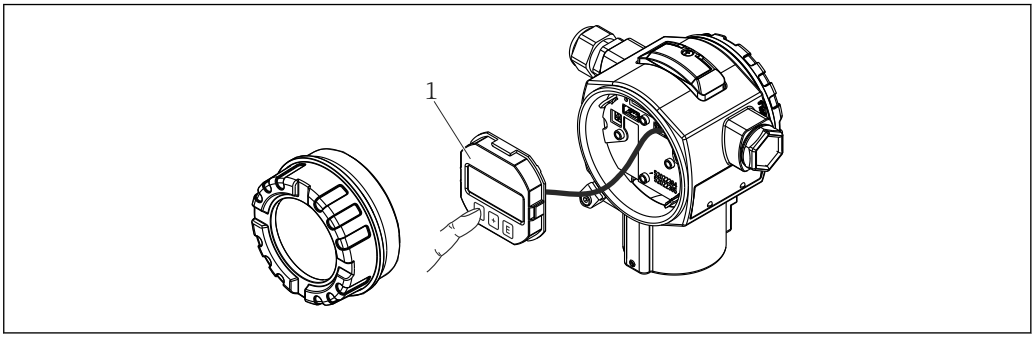
7.3 Structure of the operating menu

User role	Submenu	Meaning/use
Operator	Language	Only consists of the "Language" parameter (000) where the operating language for the device is specified. The language can always be changed even if the device is locked.
Operator	Display/ operat.	Contains parameters that are needed to configure the measured value display (selecting the values displayed, display format, etc.). With this submenu, users can change the measured value display without affecting the actual measurement.
Maintenance	Setup	Contains all the parameters that are needed to commission measuring operations. This submenu has the following structure: ▪ **Standard setup parameters** A wide range of parameters, which can be used to configure a typical application, is available at the start. After making settings for all these parameters, the measuring operation should be completely configured in the majority of cases. ▪ **"Extended setup" submenu** The "Extended setup" submenu contains additional parameters for more in-depth configuration of the measurement operation, for conversion of the measured value and for scaling the output signal. This menu is split into additional submenus depending on the measuring mode selected.

User role	Submenu	Meaning/use
Maintenance	Diagnostics	Contains all the parameters that are needed to detect and analyze operating errors. This submenu has the following structure: ▪ **Diagnostic list** contains up to 10 currently pending error messages. ▪ **Event logbook** contains the last 10 error messages (no longer pending). ▪ **Instrument info** contains information for identifying the device. ▪ **Measured values** contains all current measured values. ▪ **Simulation** is used to simulate pressure, voltage and alarm/warning. ▪ **Reset**
Expert	Expert	Contains all the parameters of the device (including those already in one of the submenus). The "Expert" submenu is structured by the function blocks of the device. It thus contains the following submenus: ▪ **System** contains all device parameters that do not affect either measurement or integration into a distributed control system. ▪ **Measurement** contains all parameters for configuring the measurement. ▪ **Output** contains all parameters for configuring the voltage output. ▪ **Diagnostics** contains all parameters required to detect and analyze operating errors.

7.4 Operation options

7.4.1 Local operation



A0017650

1 Display and operating module with push buttons.

7.5 Operation with onsite display

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

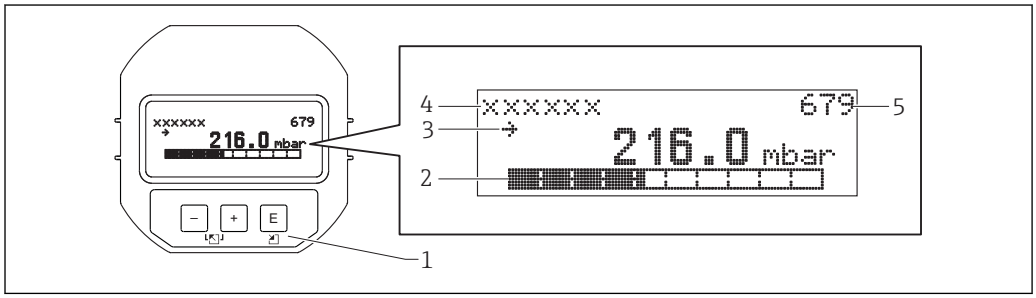
The display can be removed for easy operation.

The device display can be turned in 90° steps.

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

Functions:
- 8-digit measured value display incl. sign and decimal point, bar graph for 1 to 5 V.
- Simple and complete menu guidance due to breakdown of parameters into several levels and groups
- Each parameter is given a 3-digit ID number for easy navigation.
- Option for configuring the display according to individual requirements and preferences, such as language, alternating display, display of other measured values such as sensor temperature, contrast setting.
- Comprehensive diagnostic functions (fault and warning message, peakhold indicators, etc.).
- Quick and safe commissioning

7.5.1 Overview



A0016498

1 Operating keys
2 Bar graph
3 Symbol
4 Header
5 Parameter ID number

7.5.2 Setting the contrast on the display module

- ⊞ and Ⓔ (press simultaneously): increases the contrast.
- ⊟ and Ⓔ (press simultaneously): decreases the contrast.

7.5.3 Symbols on the onsite display

The following tables show the symbols that can be used on the onsite display. Four symbols may appear at the same time.

Error symbols

Symbol	Meaning
S A0012088	**Error message "Out of specification"** The device is being operated outside its technical specifications (e.g. during startup or cleaning).
C A0012100	**Error message "Service mode"** The device is in service mode (e.g. during a simulation).
M A0012101	**Error message "Maintenance required"** Maintenance is required. The measured value remains valid.
F A0012086	**Error message "Failure detected"** An operating error has occurred. The measured value is no longer valid.

Display symbols for locking status

Symbol	Meaning
 A0011978	**Lock symbol** The operation of the device is locked. To unlock device, see "Unlocking/locking configuration" section→ 🖹 33.

7.5.4 Navigation and selection from list

The operating keys are used to navigate through the operating menu and to select an option from a picklist.

Operating key(s)	Meaning
 A0017879	▪ Navigate downwards in the picklist ▪ Edit the numerical values and characters within a function
 A0017880	▪ Navigate upwards in the picklist ▪ Edit the numerical values and characters within a function
 A0017881	▪ Confirm entry ▪ Jump to the next item ▪ Selection of a menu item and activation of edit mode
 A0017879 and  A0017881	Contrast setting of onsite display: darker
 A0017880 and  A0017881	Contrast setting of onsite display: brighter
 A0017879 and  A0017880	**ESC functions:** ▪ 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.

7.5.5 Navigation examples

Parameters with a picklist

	Language 000	Operation
1	✔ German Spanish	"English" is set as the menu language (default value). A ✔ in front of the menu text indicates the option that is currently active.
2	German ✔ Spanish	Select the menu language "Spanish" using ⊞ or ⊟.
3	✔ Spanish German	Confirm your selection with Ⓔ. A ✔ in front of the menu text indicates the option that is currently active ("Spanish" is the language selected). Use Ⓔ to exit edit mode for the parameter.

Accepting the pressure present

Example: setting position adjustment.

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

	Pos. zero adjust 007	Operation
1	✔ Cancel Confirm	The pressure for position 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 a position adjustment. The device confirms the adjustment and goes back to the "Pos. zero adjust" parameter.
4	✔ Cancel Confirm	Use Ⓔ to exit edit mode for the parameter.

User-definable parameters

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

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

	Set URV 014	Operation
1	1 0 0 . 0 0 0 mbar	The onsite display shows the parameter to be changed. The "mbar" unit is defined in another parameter and cannot be changed here.
2	**1** 0 0 . 0 0 0 mbar	Press ⊞ or ⊟ to get to edit mode. The first digit is highlighted in black.
3	**5** 0 0 . 0 0 0 mbar	Use the ⊞ key to change "1" to "5". Press the Ⓔ key to confirm "5". Cursor jumps to the next position. Use the Ⓔ key to confirm (second position).
4	5 0 **0** . 0 0 0 mbar	The third digit is highlighted in black and can now be edited.
5	5 0 ↵ . 0 0 0 mbar	Use the ⊟ key to change to the "↵" symbol. Use Ⓔ to save the new value and exit edit mode. See next graphic.
6	5 0 . 0 0 0 mbar	The new value for the full scale value is 50.0 mbar (0.75 psi). Use Ⓔ to exit edit mode for the parameter. Use ⊞ or ⊟ to return to edit mode.

7.6 Direct access to parameters

The parameters can only be accessed directly via the "Expert" user role.

Direct access (119)

Navigation Expert → Direct access

Read permission	Operator/Maintenance/Expert
Write permission	Expert
Description	Enter the direct access code to go directly to a parameter.
User entry	Enter the desired parameter code.
Factory setting	0
Note	For direct access, it is not necessary to enter leading zeros.

7.7 Locking/unlocking operation

Once you have entered all the parameters, you can lock your entries against unauthorized and undesired access.

You have the following options for locking/unlocking operation:
- Via the DIP switch on the electronic insert, locally at the device.
- Via the onsite display

The symbol on the onsite display indicates that operation is locked. Parameters which refer to how the display appears, e.g. "Language" and "Display contrast", can still be altered.

If operation is locked by means of the DIP switch, you can only unlock operation again by means of the DIP switch. If operation is locked by means of the local display, you can unlock operation by means of the local display.

The "Operator code" parameter is used to lock/unlock the device.

The parameters can only be accessed directly via the "Expert" user role.

Operator code (021)

Navigation	Setup → Extended setup → Operator code
Read permission	Operator/Maintenance/Expert
Write permission	Operator/Maintenance/Expert
Description	Use this function to enter a code to lock or unlock operation.
User entry	▪ To lock: Enter a number ≠ the access code (value range: 1 to 9999). ▪ To unlock: Enter the access code.
Factory setting	0
Note	The access code is "0" in the order configuration. Another access code can be defined in the "Code definition" parameter. If the user has forgotten the access code, the access code can be made visible by entering the number "5864". The access code is defined in the "Code definition" parameter.

Code definition (023)

Navigation Setup → Extended setup → Code definition

Read permission Operator/Maintenance/Expert

Write permission Operator/Maintenance/Expert

Description Use this function to enter an access code with which the device can be unlocked.

User entry A number from 0 to 9999

Factory setting 0

7.8 Resetting to factory settings (reset)

By entering a certain code, you can completely or partially reset the entries for the parameters to the factory settings [1]. Enter the code via the "Enter reset code" parameter (menu path: "Diagnosis" → "Enter reset code").

There are various reset codes for the device. The following table illustrates which parameters are reset by the particular reset codes. To perform a reset, operation must be unlocked (see "Locking/unlocking operation" section).→ 31

Any customer-specific configuration carried out at the factory is not affected by a reset (customer-specific configuration remains). If you want to change the customer-specific configuration carried out at the factory, please contact Endress+Hauser Service.

Reset code [1]	Description and effect
62	**PowerUp reset (warm start)** ▪ The device will restart. ▪ Data is read back anew from the EEPROM (process is reinitialized). ▪ Any simulation which may be running is ended.
333	**User reset** ▪ This code resets all the parameters apart from: - Device tag (022) - Operating hours (162) - Event logbook - Volt. trim 1 Volt (135) - Volt. trim 5 Volt (136) - Lo trim sensor (131) - Hi trim sensor (132) - Lo trim sensor (277) - Hi trim sensor (278) ▪ Any simulation which may be running is ended. ▪ The device will restart.
7864	**Total reset** ▪ This code resets all the parameters apart from: - Operating hours (162) - Event logbook - Lo trim sensor (131) - Hi trim sensor (132) - Lo trim sensor (277) - Hi trim sensor (278) ▪ Any simulation which may be running is ended. ▪ The device will restart.

1) To be entered in "System" → "Management" → Reset (124)

1) . The factory setting for the individual parameters is specified in the parameter description

8 Commissioning

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

⚠ WARNING

Process pressure above permitted maximum!

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 P" (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

Process pressure below permitted minimum!

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 P" (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 Function check

Before commissioning your measuring point, ensure that the post-installation and post-connection check have been performed:

- "Post-installation check" checklist → 20
- "Post-connection check" checklist → 23

8.2 Unlocking/locking configuration

If the device is locked to prevent configuration, it must first be unlocked.

8.2.1 Locking/unlocking software

If the device is locked via the software (device access code), the key symbol appears in the measured value display. If an attempt is made to write to a parameter, a prompt for the device access code appears. To unlock, enter the user-defined device access code.

8.3 Commissioning without an operating menu

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

- Position adjustment (zero point correction)
- Setting lower range value and upper range value
- Device reset → 32

- Operation must be unlocked → 31
- The pressure applied must be within the nominal pressure limits of the sensor. See information on the nameplate.

Perform position adjustment (see information at the start of "Commissioning" section)	
1	Pressure is present at the device.
2	Press the "Zero" and "Span" keys simultaneously for at least 3 s.

Perform position adjustment (see information at the start of "Commissioning" section)		
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 range value		
1	Desired pressure for lower range value 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	Applied pressure for lower range value has been accepted.	Applied pressure for lower range value has not been accepted. Observe the input limits.

Setting upper range value		
1	Desired pressure for upper range value 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	Applied pressure for upper range value has been accepted.	Applied pressure for upper range value has not been accepted. Observe the input limits.

8.4 Commissioning with an operating menu

Commissioning comprises the following steps:
- Function check → 🖹 33
- Selection of the pressure unit → 🖹 34
- Position adjustment → 🖹 35
- Configuring measurement:
  Pressure measurement → 🖹 37

8.5 Selecting the language

Language (000)

Navigation 🖵 Main menu → Language

Write permission Operators/Service engineers/Expert

Description Select the menu language for the local display.

Options
- English
- Another language (as selected when ordering the device)
- Possibly a third language (language of the manufacturing plant)

Factory setting English

8.6 For selecting the pressure engineering unit

Press. eng. unit (125)

Navigation Setup → Press. eng. unit

Write permission Operators/Service engineers/Expert

Description Select the pressure engineering unit. If a new pressure engineering unit is selected, all pressure-specific parameters are converted and displayed with the new unit.

Options
- mbar, bar
- mmH2O, mH2O, inH2O
- ftH2O
- Pa, kPa, MPa
- psi
- mmHg, inHg
- kgf/cm^2

Factory setting mbar or bar depending on the nominal measuring range of the sensor module, or as per order specifications.

8.7 Position adjustment

The pressure resulting from the orientation of the device can be corrected here.

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 sensor)

Navigation Setup → Pos. zero adjust

Write permission Operators/Service engineers/Expert

Description Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.

Options
- Confirm
- Cancel

Example
- 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 adjust) = 0.0 mbar
- The value of the voltage output is also corrected.

Factory setting Cancel

Calib. offset (008) (absolute pressure sensors)

Write permission Service engineers/Expert

Description Position adjustment – the pressure difference between the set point and the measured pressure must be known.

Example
- Measured value = 982.2 mbar (14.73 psi)
- You correct the measured value with the value entered (e.g. 2.2 mbar (0.033 psi)) via the "Calib. Offset" parameter. This means that you are assigning the value 980.0 (14.7 psi) to the pressure present.
- Measured value (after pos. zero adjust) = 980.0 mbar (14.7 psi)
- The value of the voltage output is also corrected.

Factory setting 0.0

8.8 Configuring the damping

The output signal follows measured value changes with the delay time. This can be configured via the operating menu.

Damping value (017)

Navigation Setup → Damping

Write permission Operators/Service engineers/Expert
(if the "Damping" DIP switch is set to "on")

Description Enter damping time (time constant τ) ("Damping" DIP switch set to "on")
Display damping time (time constant τ) ("Damping" DIP switch set to "off").
The damping affects the speed at which the measured value reacts to changes in pressure.

Input range 0.0 to 999.0 s

Factory setting 2.0 sec. or according to order specifications

8.9 Configuring pressure measurement

8.9.1 Calibration without reference pressure (dry calibration)

Example:

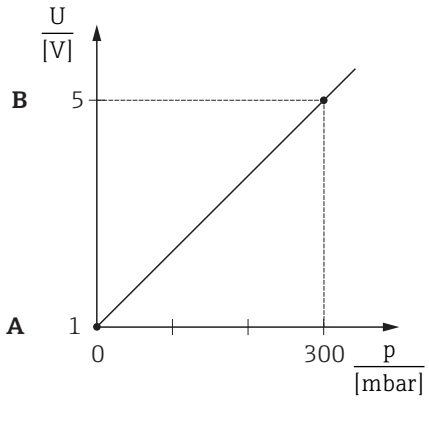
In this example, a device with a 400 mbar (6 psi)sensor is configured for the 0 to +300 mbar (0 to 4.5 psi) measuring range, i.e. 0 mbar and 300 mbar (4.5 psi) are assigned, respectively, to the 1V value and the 5V value.

Prerequisite:

This is a theoretical calibration, i.e. the pressure values for the lower and upper range are known.

Due to the orientation of the device, there may be pressure shifts in the measured value, i.e. the measured value is not zero in a pressureless condition. For information on how to perform a position adjustment, see → 35.

	Description
1	Select a pressure unit via the "Press eng. unit" parameter, here "mbar" for example. Menu path: Setup → Press. eng. unit
2	Select the "Set LRV" parameter. Menu path: Setup → Extended Setup → Voltage output→ Set LRV
	Enter the value for the "Set LRV" parameter (here 0 mbar) and confirm. This pressure value is assigned to the lower voltage value (1V).
3	Select the "Set URV" parameter. Menu path: Setup → Extended Setup → Voltage output → Set URV
	Enter the value for the "Set URV" parameter, here 300 mbar (4.5 psi), and confirm. This pressure value is assigned to the upper voltage value (5V).
4	Result: The measuring range is configured for 0 to +300 mbar (0 to 4.5 psi).



A See table, step 2.
B See table, step 3.

8.9.2 Calibration with reference pressure (wet calibration)

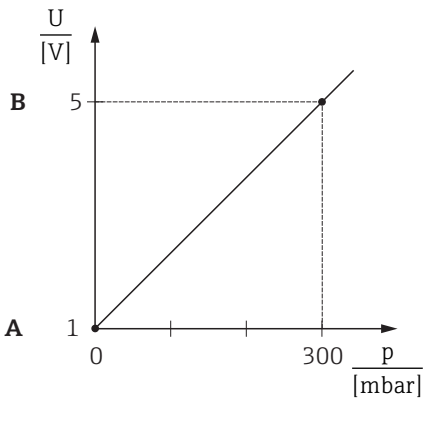
Example:

In this example, a device with a 400 mbar (6 psi)sensor is configured for the 0 to +300 mbar (0 to 4.5 psi) measuring range, i.e. 0 mbar and 300 mbar (4.5 psi) are assigned, respectively, to the 1V value and the 5V value.

Prerequisite:

The pressure values 0 mbar and 300 mbar (4.5 psi) can be specified. For example, the device is already installed.

Due to the orientation of the device, there may be pressure shifts in the measured value, i.e. the measured value is not zero in a pressureless condition. For information on how to perform a position adjustment, see → 35.

	Description	
1	Select a pressure unit via the "Press eng. unit" parameter, here "mbar" for example. Menu path: Setup → Press. eng. unit	 *A* *See table, step 2.* *B* *See table, step 3.*
2	The pressure for the LRV (1V value) is present at the device, here 0 mbar for example	
	Select the "Get LRV" parameter. Menu path: Setup → Extended Setup → Voltage output → Get LRV	
	Confirm the present value by selecting "Apply". The pressure value present is assigned to the lower voltage value (1V).	
3	The pressure for the URV (5V value) is present at the device, here 300 mbar (4.5 psi)for example.	
	Select the "Get URV" parameter. Menu path: Setup → Extended Setup → Voltage output → Get URV	
	Confirm the present value by selecting "Apply". The pressure value present is assigned to the upper current value (5V).	
4	Result: The measuring range is configured for 0 to +300 mbar (0 to 4.5 psi).	

9 Diagnostics and troubleshooting

9.1 Troubleshooting

General errors

Problem	Possible cause	Solution
Device is not responding.	Supply voltage does not match the value indicated on the nameplate.	Apply correct voltage.
	The polarity of the supply voltage is wrong.	Correct the polarity.
	Connecting cables are not in contact with the terminals.	Check the connection of the cables and correct if necessary.
No display	Onsite display is set too bright or too dark.	▪ Set the onsite display brighter by simultaneously pressing ⊞ and Ⓔ. ▪ Set the onsite display darker by simultaneously pressing ⊟ and Ⓔ.
	Connector for onsite display is not properly connected.	Connect the plug correctly.
	Onsite display is defective.	Replace onsite display.
Output voltage < 0.9 V	Signal line is not wired correctly. Electronics unit is defective.	Check wiring. Replace electronics.
Device measures incorrectly.	Configuration error.	Check and correct parameter configuration (see below).

9.2 Diagnostic events

9.2.1 Diagnostic message

Faults detected by the self-monitoring system of the measuring device are displayed as a diagnostic message in alternation with the measured value display.

Status signals

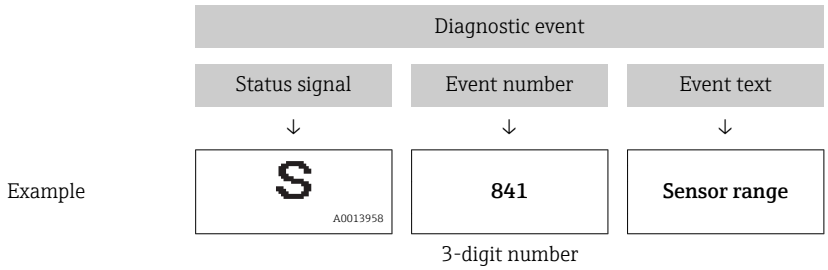
The table → 📄 40 lists the messages that may occur. The ALARM STATUS parameter shows the message with the highest priority. The device has four different status information codes according to NE107:

F A0013956	**"Failure"** A device error has occurred. The measured value is no longer valid.
M A0013957	**"Maintenance required"** Maintenance is required. The measured value remains valid.
C A0013959	**"Function check"** The device is in service mode (e.g. during a simulation).
S A0013958	**"Out of specification"** The device is operated: ▪ Outside its technical specifications (e.g. during warmup or cleaning processes) ▪ Outside of the configuration carried out by the user (e.g. level outside configured span)

Diagnostic event and event text

The fault can be identified by means of the diagnostic event.

The event text helps you by providing information on the fault.



If two or more diagnostic events are pending simultaneously, only the diagnostic message with the highest priority is shown.

Other diagnostic messages that are pending can be viewed in the **Diagnostic list** submenu → 66.

Past diagnostic messages that are no longer pending are shown in the **Event logbook** submenu→ 66.

9.2.2 List of diagnostic events

General messages

Diagnostic event		Cause	Corrective measure
Code	Description		
0	No error	-	-

"C" messages

Diagnostic event		Cause	Corrective measure
Code	Description		
C482	Simul. output	Simulation of the voltage output is switched on, i.e. the device is not measuring at present.	End the simulation
C484	Error simul.	Fault state simulation is switched on, i.e. the device is not measuring at present.	End the simulation
C485	Measure simul.	Simulation is switched on, i.e. the device is not measuring at present.	End the simulation
C824	Process pressure	▪ Overpressure or low pressure present. ▪ Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly.	▪ Check the pressure value ▪ Restart device ▪ Perform a reset

"F" messages

Diagnostic event		Cause	Corrective measure
Code	Description		
F002	Sens. unknown	Sensor does not suit the device (electronic sensor nameplate).	Contact Endress+Hauser Service
F062	Sensor conn.	▪ Cable connection between sensor and main electronics disconnected. ▪ Faulty sensor. ▪ Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly.	▪ Check sensor cable ▪ Replace electronics ▪ Contact Endress+Hauser Service ▪ Replace sensor (snap-on version)

Diagnostic event		Cause	Corrective measure
Code	Description		
F081	Initialization	▪ Cable connection between sensor and main electronics disconnected. ▪ Faulty sensor. ▪ Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly.	▪ Perform a reset ▪ Check sensor cable ▪ Contact Endress+Hauser Service
F083	Memory content	▪ Faulty sensor. ▪ Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly.	▪ Restart device ▪ Contact Endress+Hauser Service
F140	Working range P	▪ Overpressure or low pressure present. ▪ Electromagnetic effects are greater than specifications in the technical data. This message normally only appears briefly. ▪ Faulty sensor.	▪ Check the process pressure ▪ Check sensor range
F261	Electronics module	▪ Main electronics defective. ▪ Fault in the main electronics.	▪ Restart device ▪ Replace electronics
F282	Memory	▪ Fault in the main electronics. ▪ Main electronics defective.	▪ Restart device ▪ Replace electronics
F283	Memory content	▪ Main electronics defective. ▪ Electromagnetic effects are greater than the specifications in the technical data. ▪ The supply voltage is disconnected when writing. ▪ An error occurred when writing.	▪ Perform a reset ▪ Replace electronics
F841	Sensor range	▪ Overpressure or low pressure present. ▪ Faulty sensor.	▪ Check the pressure value ▪ Contact Endress+Hauser Service

"M" messages

Diagnostic event		Cause	Corrective measure
Code	Description		
M002	Sens. unknown	Sensor does not suit the device (electronic sensor nameplate). Device continues measuring.	Contact Endress+Hauser Service
M283	Memory content	▪ Cause as indicated for F283. ▪ Correct measurement can continue as long as you do not need the peakhold indicator function.	▪ Perform a reset ▪ Replace electronics
M431	Adjustment	The adjustment performed would cause the sensor nominal range to be exceeded or undershot.	▪ Check the measuring range ▪ Check position adjustment ▪ Check the setting
M434	Scaling	▪ Values for adjustment (e.g. lower range value and upper range value) are too close together. ▪ Lower-range value and/or upper-range value exceed or fall below the range limits of the sensor. ▪ The sensor was replaced and the customer-specific configuration does not suit the sensor module.	▪ Check the measuring range ▪ Check the setting ▪ Contact Endress+Hauser Service
M438	Data set	▪ The supply voltage is disconnected when writing. ▪ An error occurred when writing.	▪ Check the setting ▪ Restart device ▪ Replace electronics

"S" messages

Diagnostic event		Cause	Corrective measure
Code	Description		
S110	Operational range T	▪ High temperature or low temperature present. ▪ Electromagnetic effects are greater than specifications in the technical data. ▪ Faulty sensor.	▪ Check process temperature ▪ Check the temperature range
S140	Working range P	▪ Overpressure or low pressure present. ▪ Electromagnetic effects are greater than specifications in the technical data. ▪ Faulty sensor.	▪ Check the process pressure ▪ Check sensor range
S822	Process temp.	▪ The temperature measured in the sensor is higher than the upper nominal temperature of the sensor. ▪ The temperature measured in the sensor is lower than the lower nominal temperature of the sensor.	▪ Check temperature ▪ Check the setting
S841	Sensor range	▪ Overpressure or low pressure present. ▪ Faulty sensor.	▪ Check the pressure value ▪ Contact Endress+Hauser Service
S971	Adjustment	▪ The output voltage is outside the permitted range of 0.9 V to 5.1 V. ▪ The present pressure value is outside the configured measuring range (but within the sensor range, if applicable).	▪ Check the pressure value ▪ Check the measuring range ▪ Check the setting

9.3 Response of output to errors

The behavior of the voltage output in case of fault is defined by the following parameters:

- Alarm behav. P (050)→ 🖹 60
- "Output fail mode (190)" → 🖹 61
- "High alarm volt. (052)" → 🖹 61

9.4 Firmware history

Date	Firmware version	Modifications	Documentation
			Operating Instructions
01.02.2017	01.00.zz	Original firmware.	BA01633P/00/EN/02.17

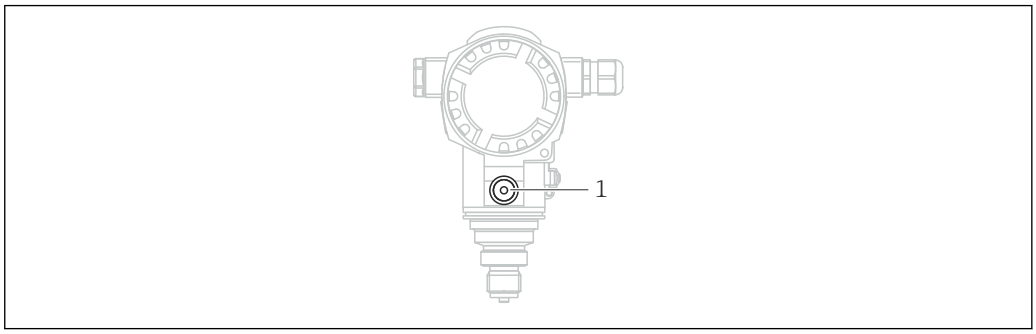
9.5 Disposal

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

10 Maintenance

No special maintenance work is required.

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



A0024791-EN

10.1 Information on cleaning

Endress+Hauser provides flushing rings as an accessory to enable cleaning of the process isolating diaphragm without removing the transmitter from the process.

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

10.2 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 process isolating diaphragm, e.g. due to sharp objects, must be avoided.
- Observe the degree of protection of the device. See the nameplate if necessary → 13.

11 Repair

11.1 General notes

11.1.1 Repair concept

The Endress+Hauser repair concept requires for devices to have a modular design and for repairs to be carried out by Endress+Hauser Service or by properly trained customers.

Spare parts are grouped into logical kits with the associated replacement instructions.

For more information on service and spare parts, please contact Endress+Hauser Service.

11.1.2 Repair of Ex-certified devices

⚠ WARNING

Incorrect repair can reduce electrical safety!
Risk of explosion!

- ▶ Only specialist personnel or Endress+Hauser-Service can carry out repairs to Ex certified devices.
- ▶ Relevant standards and national regulations as well as safety instructions (XA) and certificates must be observed.
- ▶ Only genuine Endress+Hauser spare parts may be used.
- ▶ When ordering spare parts, please check the device designation on the nameplate. Identical parts may only be used as replacements.
- ▶ Carry out repairs according to the instructions. Following a repair, the device must fulfill the requirements of the individual tests specified for that device.
- ▶ A certified device may be converted to another certified device version by Endress +Hauser Service only.
- ▶ All repairs and modifications must be documented.

11.2 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) and can be ordered. If available, users can also download the associated Installation Instructions.

Measuring device serial number:
- Located on the device and spare part nameplate.
- Can be read out via the "Serial number" parameter in the "Instrument info" submenu.

11.3 Return

The measuring device must be returned in the event of a factory calibration, or if the wrong device has been ordered or delivered.

As an ISO-certified company and due to legal requirements,

Endress+Hauser is required to follow certain procedures when handling returned products that have been in contact with a medium. 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

- Select country.
  - The web site of the responsible sales office opens with all of the relevant information relating to returns.

1. If the desired country is not listed:
   Click on the "Choose your location" link.
   - An overview of Endress+Hauser sales offices and representatives opens.
2. Contact your Endress+Hauser sales office or representative.

12 Overview of the operating menu

Depending on the parameter configuration, not all submenus and parameters are available. Information on this can be found in the parameter description under "Prerequisite".

				Direct access	Description
Language				000	→ 53
Display/operat.	Display mode			001	→ 54
	Add. display value			002	→ 54
	Format 1st value			004	→ 54
Setup	Operating mode			005	→ 55
	Press. eng. unit			125	→ 56
	Corrected press.			172	→ 58
	Pos. zero adjust			007	→ 55
	Set LRV			013	→ 57
	Set URV			014	→ 58
	Damping switch			164	→ 56
	Damping value			017	→ 56
	Pressure af.damp			111	→ 58
	Extended setup	Code definition		023	→ 50
		Device tag		022	→ 51
		Operator code		021	→ 51
		Voltage output	Alarm behav. P	050	→ 60
			Alarm vol. switch	165	→ 60
			Output fail mode	190	→ 61
			High alarm volt.	052	→ 61
			Set min. voltage	053	→ 61
			Output voltage	054	→ 60
			Get LRV	015	→ 61
			Set LRV	013	→ 62
			Get URV	016	→ 62
			Set URV	014	→ 62
Diagnosis	Diagnostic code			071	→ 64
	Last diag. code			072	→ 64
	Min. meas. press.			073	→ 65
	Maximum pressure			074	→ 65
	Diagnostic list	Diagnostics 1		075	→ 66
		Diagnostics 2		076	→ 66
		Diagnostics 3		077	→ 66
		Diagnostics 4		078	→ 66
		Diagnostics 5		079	→ 66
		Diagnostics 6		080	→ 66
		Diagnostics 7		081	→ 66
		Diagnostics 8		082	→ 66

				Direct access	Description
		Diagnostics 9		083	→ 66
		Diagnostics 10		084	→ 66
	Event logbook	Last diag. 1		085	→ 66
		Last diag. 2		086	→ 66
		Last diag. 3		087	→ 66
		Last diag. 4		088	→ 66
		Last diag. 5		089	→ 66
		Last diag. 6		090	→ 66
		Last diag. 7		091	→ 66
		Last diag. 8		092	→ 66
		Last diag. 9		093	→ 66
		Last diag. 10		094	→ 66
	Instrument info	Firmware version		095	→ 52
		Serial number		096	→ 51
		Ext. order code		097	→ 52
		Order identifier		098	→ 52
		Cust. tag number		254	→ 51
		Device tag		022	→ 51
		ENP version		099	→ 52
		Config. counter		100	→ 65
		LRL sensor		101	→ 59
		URL sensor		102	→ 59
		Manufacturer ID		103	→ 53
		Device type code		104	→ 53
		Device revision		108	→ 53
	Measured values	Pressure measured		020	→ 58
		Sensor pressure		109	→ 58
		Corrected press.		172	→ 58
		Pressure af.damp		111	→ 58
		Sensor temp.		110	→ 57
	Simulation	Simulation mode		112	→ 67
		Sim. pressure		113	→ 67
		Sim. voltage		117	→ 67
	Reset to zero	Enter reset code		124	→ 55
Expert	Direct access			119	→ 50
	System	Code definition		023	→ 50
		Lock switch		120	→ 50
		Operator code		021	→ 51
		Instrument info	Cust. tag number	254	→ 51
			Device tag	022	→ 51
			Serial number	096	→ 51
			Firmware version	095	→ 52
			Ext. order code	097	→ 52

			Direct access	Description
		Order identifier	098	→ 52
		ENP version	099	→ 52
		Electr. serial no.	121	→ 52
		Sensor serial no.	122	→ 53
		Manufacturer ID	103	→ 53
		Device type code	104	→ 53
		Device revision	108	→ 53
	Display	Language	000	→ 53
		Display mode	001	→ 54
		Add. display value	002	→ 54
		Format 1st value	004	→ 54
	Administration	Enter reset code	124	→ 55
Measurement	Operating mode		005	→ 55
	Basic setup	Pos. zero adjust	007	→ 55
		Damping switch	164	→ 56
		Damping value	017	→ 56
		Press. eng. unit	125	→ 56
		Temp. eng. unit	126	→ 57
		Sensor temp.	110	→ 57
	Pressure	Set LRV	013	→ 57
		Set URV	014	→ 58
		Pressure measured	020	→ 58
		Sensor pressure	109	→ 58
		Corrected press.	172	→ 58
		Pressure af.damp	111	→ 58
	Sensor limits	LRL sensor	101	→ 59
		URL sensor	102	→ 59
	Sensor trim	Lo trim measured	129	→ 59
		Hi trim measured	130	→ 59
		Lo trim sensor	131	→ 59
		Hi trim sensor	132	→ 60
Output	**Voltage output**	Output voltage	054	→ 60
		Alarm behav. P	050	→ 60
		Alarm vol. switch	165	→ 60
		Output fail mode	190	→ 61
		High alarm volt.	052	→ 61
		Set min. voltage	053	→ 61
		Get LRV	015	→ 61
		Set LRV	013	→ 62
		Get URV	016	→ 62
		Set URV	014	→ 62
		Startup voltage	134	→ 62
		Volt. trim 1 V	135	→ 63

			Direct access	Description
		Volt. trim 5 V	136	→ 63
		Offset trim 1 V	137	→ 63
		Offset trim 5 V	138	→ 64
Diagnosis	Diagnostic code		071	→ 64
	Last diag. code		072	→ 64
	Reset Logbook		159	→ 64
	Min. meas. press.		073	→ 65
	Maximum pressure		074	→ 65
	Reset peakhold		161	→ 65
	Operating hours		162	→ 65
	Config. counter		100	→ 65
	Diagnostic list	Diagnostics 1	075	→ 66
		Diagnostics 2	076	→ 66
		Diagnostics 3	077	→ 66
		Diagnostics 4	078	→ 66
		Diagnostics 5	079	→ 66
		Diagnostics 6	080	→ 66
		Diagnostics 7	081	→ 66
		Diagnostics 8	082	→ 66
		Diagnostics 9	083	→ 66
		Diagnostics 10	084	→ 66
	Event logbook	Last diag. 1	085	→ 66
		Last diag. 2	086	→ 66
		Last diag. 3	087	→ 66
		Last diag. 4	088	→ 66
		Last diag. 5	089	→ 66
		Last diag. 6	090	→ 66
		Last diag. 7	091	→ 66
		Last diag. 8	092	→ 66
		Last diag. 9	093	→ 66
		Last diag. 10	094	→ 66
	Simulation	Simulation mode	112	→ 67
		Sim. pressure	113	→ 67
		Sim. voltage	117	→ 67

13 Description of device parameters

This section describes the parameters in the order of how they are arranged in the "Expert" operating menu.

Direct access (119)

Navigation	Expert → Direct access
Read permission	Operator/Maintenance/Expert
Write permission	Expert
Description	Enter the direct access code to go directly to a parameter.
User entry	Enter the desired parameter code.
Factory setting	0
Note	For direct access, it is not necessary to enter leading zeros.

13.1 Expert → System

Code definition (023)

Write permission	Operators/Service engineers/Expert
Description	Use this function to enter an access code with which the device can be unlocked.
Options	A number from 0 to 9999
Factory setting	0

Lock switch (120)

Write permission	Operators/Service engineers/Expert
Description	Displays the status of DIP switch 1 on the electronic insert. You can lock or unlock parameters relevant to the measured value with DIP switch 1. If operation is locked by means of the "Operator Code" (021) parameter, you can only unlock operation again by means of this parameter.
User interface	▪ On (locking switched on) ▪ Off (locking switched off)
Factory setting	Off (locking switched off)

Operator code (021)

Write permission	Operators/Service engineers/Expert
Description	Use this function to enter a code to lock or unlock operation.
User entry	▪ To lock: Enter a number ≠ the access code (value range: 1 to 9999). ▪ To unlock: Enter the access code.
Note	The access code is "0" in the order configuration. Another access code can be defined in the "Code definition" (023) parameter. If the user has forgotten the access code, the access code can be visible by entering the number "5864".
Factory setting	0

13.2 Expert → System → Instrument info

Cust. tag number (254)

Write permission	Operators/Service engineers/Expert
Description	Enter the device tag, e.g. TAG number (max. 8 alphanumeric characters).
Factory setting	No entry or according to order specifications

Device tag (022)

Navigation	Setup → Extended setup → Device tag
Write permission	Operators/Service engineers/Expert
Description	Enter the device tag, e.g. TAG number (max. 32 alphanumeric characters).
Factory setting	No entry or according to order specifications

Serial number (096)

Write permission	Parameter is read only. Only Endress+Hauser Service has write permission.
Description	Displays the serial number of the device (11 alphanumeric characters).

Firmware version (095)

Write permission No write permissions. Parameter is read only.

Description Displays the firmware version.

Ext. order code (097)

Write permission Parameter is read only. Only Endress+Hauser Service has write permission.

Description Displays extended order number.

Factory setting According to order specifications

Order identifier (098)

Navigation Diagnosis → Instrument info → Order identifier

Write permission Parameter is read only. Only Endress+Hauser Service has write permission.

Description Displays the order identifier.

Factory setting According to order specifications

ENP version (099)

Write permission No write permissions. Parameter is read only.

Description Displays the ENP version
(ENP = electronic nameplate)

Electr.serial no (121)

Write permission No write permissions. Parameter is read only.

Description Displays the serial number of the main electronics (11 alphanumeric characters).

Sensor ser. no (122)

Write permission No write permissions. Parameter is read only.

Description Displays the serial number of the main electronics (11 alphanumeric characters).

Manufacturer ID (103)

Write permission No write permissions. Parameter is read only.

Description Display the manufacturer ID number in a decimal digit format.
Here: 17 (Endress+Hauser)

Device type code (104)

Write permission No write permissions. Parameter is read only.

Description Display of the numerical ID of the device

Device revision (108)

Write permission No write permissions. Parameter is read only.

Description Display of Device Revision (e.g. 1)

13.3 Expert → System → Display

Language (000)

Navigation Main menu → Language

Write permission Operators/Service engineers/Expert

Description Select the menu language for the local display.

Options
- English
- Another language (as selected when ordering the device)
- Possibly a third language (language of the manufacturing plant)

Factory setting English

Display mode (001)

Navigation Display/Operat. → Display mode (001)

Write permission Operators/Service engineers/Expert

Description Specify the contents for the first line of the local display in measuring mode.

Options
- Primary value
- External value
- All alternating

Factory setting Primary value

Add. display value (002)

Navigation Display/operat. → Add. display value (002)

Write permission Operators/Service engineers/Expert

Description Specify the contents for the second value in the alternating display mode in measuring mode.

Options
- No value
- Pressure
- Main measured value (%)
- Voltage output
- Temperature

Factory setting No value

Format 1st value (004)

Navigation Display/Operat. → Format 1st value (004)

Write permission Operators/Service engineers/Expert

Description Specify the number of places after the decimal point for the value displayed in the main line.

Options
- Auto
- x
- x.x
- x.xx
- x.xxx
- x.xxxx
- x.xxxxx

Factory setting Auto

13.4 Expert → System → Management

Enter reset code (124)

Write permission Operators/Service engineers/Expert

Description Reset parameters completely or partially to the factory values or order configuration by entering a reset code, see "Resetting to factory settings (reset)" section.→ 32.

Factory setting 0

13.5 Expert → Measurement → Measuring mode

Measuring mode (005)

Write permission Operators/Service engineers/Expert

Description Read only

Factory setting Pressure

13.6 Expert → Measurement → Basic calibration

Pos. zero adjust (007)

Write permission Operators/Service engineers/Expert

Description Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.

Example
- 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 position adjustment) = 0.0 mbar
- The voltage value is also corrected.

Options
- Confirm
- Cancel

Factory setting
Cancel

Damping switch (164)

Write permission
Operators/Service engineers/Expert
(if the "Damping" DIP switch is set to "on")

Description
Displays the switch position of DIP switch 2 which is used to switch the damping of the output signal on and off.

Display
- Off
  The output signal is not damped.
- On
  The output signal is damped. The attenuation constant is specified in the "Damping value" (017) parameter.

Factory setting
On

Damping value (017)

Write permission
Operators/Service engineers/Expert
(if the "Damping" DIP switch is set to "on")

Description
Enter damping time (time constant τ).
The damping affects the speed at which the measured value reacts to changes in pressure.

Input range
0.0 to 999.0 s

Factory setting
2.0 sec. or according to order specifications

Press. eng. unit (125)

Write permission
Operators/Service engineers/Expert

Description
Select the pressure engineering unit. If a new pressure engineering unit is selected, all pressure-specific parameters are converted and displayed with the new unit.

Options
- mbar, bar
- mmH2O, mH2O, inH2O
- ftH2O
- Pa, kPa, MPa
- psi
- mmHg, inHg
- kgf/cm^2

Factory setting mbar or bar depending on the nominal measuring range of the sensor, or as per order specifications

Temp. eng. unit (126)

Write permission Service engineers/Expert

Description Select the unit for the temperature measured values.

Options
- ℃
- ℉
- K

Note The setting affects the unit for the "Sensor temp." parameter.

Factory setting ℃

Sensor temp. (110)

Write permission No write permissions. Parameter is read only.

Description Displays the temperature currently measured in the sensor module. This can deviate from the process temperature.

13.7 Expert → Measurement → Pressure

Set LRV (013)

Write permission Operators/Service engineers/Expert

Description Set the pressure value or content for the lower voltage value (1V).

Factory setting 0.0 mbar/bar or as per order specifications

Set URV (014)

Write permission Operators/Service engineers/Expert

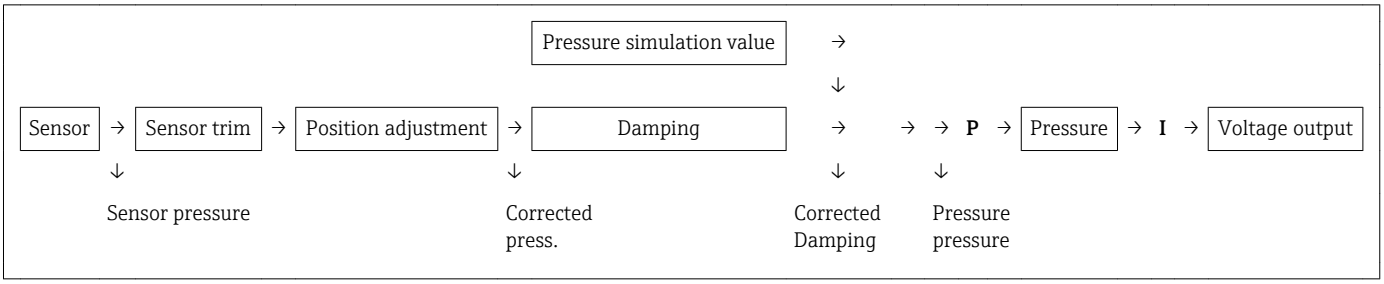
Description Set the pressure value, level or content for the upper voltage value (5V).

Factory setting Upper measuring limit or as per order specifications

Meas. pressure (020)

Write permission No write permissions. Parameter is read only.

Description Displays the measured pressure after sensor trim, position adjustment and damping.



Sensor pressure (109)

Write permission No write permissions. Parameter is read only.

Description Displays the measured pressure before sensor trim and position adjustment.

Corrected press. (172)

Write permission No write permissions. Parameter is read only.

Description Displays the measured pressure after sensor trim and position adjustment.

Press after damping (111)

Write permission No write permissions. Parameter is read only.

Description Displays the measured pressure after sensor trim, position adjustment and damping.

13.8 Expert → Measurement → Sensor limits

LRL sensor (101)

Write permission No write permissions. Parameter is read only.

Description Displays the lower-range limit of the sensor.

URL sensor (102)

Write permission No write permissions. Parameter is read only.

Description Displays the upper-range limit of the sensor.

13.9 Expert → Measurement → Sensor trim

Lo trim measured (129)

Write permission Parameter is read only. Only Endress+Hauser Service has write permission.

Description Displays the reference pressure present to be accepted for the lower calibration point.

Hi trim measured (130)

Write permission Parameter is read only. Only Endress+Hauser Service has write permission.

Description Displays the reference pressure present to be accepted for the upper calibration point.

Lo trim sensor (131)

Write permission No write permissions. Parameter is read only.

Description Sensor recalibration by entering a target pressure while simultaneously and automatically accepting a reference pressure present for the lower calibration point.

Hi trim sensor (132)

Write permission No write permissions. Parameter is read only.

Description Sensor recalibration by entering a target pressure while simultaneously and automatically accepting a reference pressure present for the upper calibration point.

13.10 Expert → Output → Voltage output

Output voltage (054)

Write permission Operator/Maintenance/Expert

Description Display the current voltage value.

Alarm behav. P (050)

Write permission Operator/Maintenance/Expert

Description Set voltage output if sensor limits are overshot or undershot.

Options
- Warning
  The device continues to measure. An error message is displayed.
- Alarm
  The output signal adopts a value that can be specified by the "Output fail mode" function.
- NAMUR
  - Lower sensor limit undershot:
    Voltage output = 0.95 V
  - Upper sensor limit exceeded:
    Voltage output adopts a value of to 5.1 V, depending on the setting of the "High alarm volt." parameter (052).

Factory setting Warning

Alarm vol. switch (165)

Write permission Operator/Maintenance/Expert

Description Displays the switching state of DIP switch 3 "SW/Alarm min."

Display
- SW
  The alarm voltage has the value defined in "Output fail mode" (190).
- Alarm min
  The alarm voltage is 0.9 V, regardless of the software setting.

Output fail mode (190)

Write permission Operator/Maintenance/Expert

Description Select Output fail mode. In the event of an alarm, both the voltage and the bar graph adopt the voltage value specified using this parameter.

Options
- Max. alarm: can be set from 5.25 V to 5.75 V
- Hold measured value: last measured value is held.
- Min. Alarm: 0.9 V

Factory setting Max. alarm

High alarm volt. (052)

Write permission Operator/Maintenance/Expert

Description Enter voltage value for maximum alarm voltage. See also "Output fail mode".

Input range 5.25 V to 5.75 V

Factory setting 5.7 V

Set min. voltage (053)

Write permission Operator/Maintenance/Expert

Description Enter lower voltage limit.
Some switching units do not accept voltages lower than 1V.

Options 0.9 V

Factory setting 0.9 V

Get LRV (015)

Write permission Operator/Maintenance/Expert

Description Set the lower-range value – reference pressure is present at the device. The pressure for the lower voltage value (1V) is present at the device. Use the "Confirm" option to assign the lower voltage value to the applied pressure value.

Options
- Cancel
- Confirm

Factory setting Cancel

Set LRV (013)

Write permission Operator/Maintenance/Expert

Description Set the pressure value for the lower voltage value (1V).

Factory setting 0.0 mbar/bar or as per order specifications

Get URV (016)

Write permission Operator/Maintenance/Expert

Description Set the upper-range value – reference pressure is present at the device. The pressure for the upper voltage value (5.25 V to 5.75 V) is present at the device. Use the "Confirm" option to assign the upper voltage value to the applied pressure value.

Options
- Cancel
- Confirm

Factory setting Cancel

Set URV (014)

Navigation Setup → Set URV
Setup → Extended setup → Voltage output → Set URV

Write permission Operator/Maintenance/Expert

Description Set the pressure value for the upper voltage value (5.25 V to 5.75 V).

Factory setting Upper measuring limit or as per order specifications

Startup voltage (134)

Write permission Maintenance/Expert

Description Enter the startup voltage.

Options
- 3 V
- Max alarm (5.5 V, cannot be adjusted)

Factory setting 3 V

Volt. trim 1 V (135)

Write permission Maintenance/Expert

Description Enter the voltage value for the lower point (1 mA) of the voltage regression lines. Using this parameter and "Volt. trim 5 V", you can adapt the voltage output to the transmission conditions.

Options Carry out the voltage trim for the lower point as follows:
- Select the "Voltage" option in the "Simulation mode" parameter.
- In the "Sim. voltage" parameter, configure the "1 V" value.
- Enter the voltage value measured with the switching unit in the "Volt. trim 1 V" parameter.

Input range Measured voltage ±50 mV

Factory setting 1 V

Volt. trim 5 V (136)

Write permission Maintenance/Expert

Description Enter the voltage value for the upper point (5 V) of the voltage regression lines. Using this parameter and "Volt. trim 1 V", you can adapt the voltage output to the transmission conditions.

Options Carry out the voltage trim for the upper point as follows:
- Select the "Voltage" option in the "Simulation mode" parameter.
- In the "Sim. voltage" parameter, configure the "5 V" value.
- Enter the voltage value measured with the switching unit in the "Volt. trim 5 V" parameter.

Input range Measured current ±250 mV

Factory setting 5 V

Offset trim 1 V (137)

Write permission Maintenance/Expert

Description Display/enter the difference between 1 V and the value entered for the "Volt. trim 1 V" parameter.

Factory setting 0

Offset trim 5 V (138)

Write permission Maintenance/Expert

Description Display/enter the difference between 5 V and the value entered for the "Volt. trim 5 V" parameter.

Factory setting 0

13.11 Expert → Diagnostics

Diagnostic code (071)

Write permission No write permissions. Parameter is read only.

Description Displays the diagnostic message with the highest priority currently present.

Last diag. code (072)

Write permission No write permissions. Parameter is read only.

Description Displays the last diagnostic message that occurred and was rectified.

Note Use the "Reset logbook" parameter to clear the messages listed in the parameter "Last diag. code".

Reset logbook (159)

Write permission Service engineers/Expert

Description Use this parameter to reset all messages of the parameter "Last diag. code" and the event logbook "Last diag. 1" to "Last diag. 10".

Options
- Cancel
- Confirm

Factory setting Cancel

Min. meas. press. (073)

Write permission No write permissions. Parameter is read only.

Description Displays the lowest pressure value measured (peakhold indicator). You can reset this indicator by means of the "Reset peakhold" parameter.

Max. meas. press. (074)

Write permission No write permissions. Parameter is read only.

Description Displays the highest pressure value measured (peakhold indicator). You can reset this indicator by means of the "Reset peakhold" parameter.

Reset peakhold (161)

Write permission Service engineers/Expert

Description You can reset the "Min. meas. press." and "Max. meas. press." indicators with this parameter.

Options
- Cancel
- Confirm

Factory setting Cancel

Operating hours (162)

Write permission No write permissions. Parameter is read only.

Description Displays the hours of operation. This parameter cannot be reset.

Config. counter (100)

Write permission Operators/Service engineers/Expert

Description Displays the configuration counter.
This counter is increased by one every time a parameter or group is changed. The counter counts up to 65535 and then starts again at zero.

13.12 Expert → Diagnostics → Diagnostic list

Diagnostic 1 (075)
Diagnostic 2 (076)
Diagnostic 3 (077)
Diagnostic 4 (078)
Diagnostic 5 (079)
Diagnostic 6 (080)
Diagnostic 7 (081)
Diagnostic 8 (082)
Diagnostic 9 (083)
Diagnostic 10 (084)

Navigation Diagnostics → Diagnostic list

Write permission No write permissions. Parameter is read only.

Description This parameter contains up to ten diagnosis messages that are currently pending, arranged in order of priority.

13.13 Expert → Diagnostics → Event logbook

Last diag. 1 (085)
Last diag. 2 (086)
Last diag. 3 (087)
Last diag. 4 (088)
Last diag. 5 (089)
Last diag. 6 (090)
Last diag. 7 (091)
Last diag. 8 (092)
Last diag. 9 (093)
Last diag. 10 (094)

Navigation Diagnostics → Event logbook

Write permission No write permissions. Parameter is read only.

Description This parameter contains the last 10 diagnosis messages to occur and be rectified. They can be reset using the "Reset logbook" parameter.
Errors which have occurred multiple times are displayed once only.

13.14 Expert → Diagnostics → Simulation

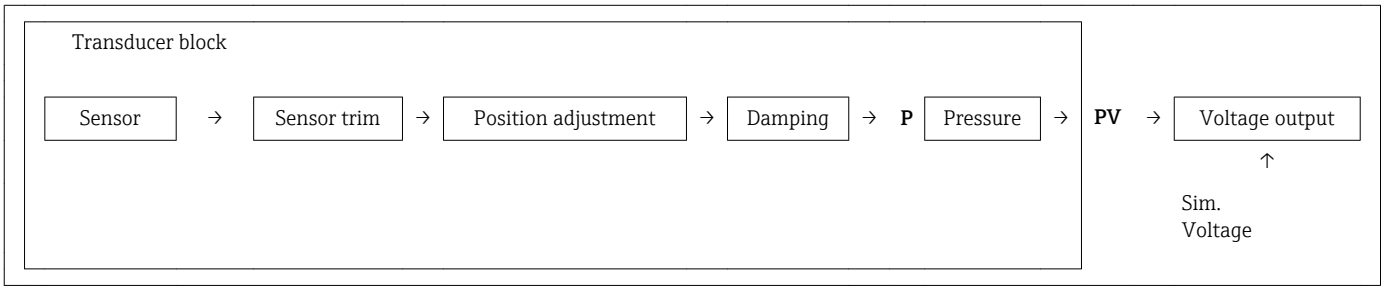
Simulation mode (112)

Write permission Operators/Service engineers/Expert

Description Switch on simulation and select the simulation mode.

Options
- None
- Pressure → see this table, "Sim. press." parameter
- Voltage output, → see this table, "Sim. voltage" parameter
- Alarm/warning, → see this table, "Sim. error no." parameter

Factory setting None



Sim. voltage (117)

Write permission Operators/Service engineers/Expert

Description Enter the simulation value. See also "Simulation mode".

Prerequisite "Simulation mode" = voltage value

Value at switch-on Current voltage value

Sim. pressure (113)

Write permission Operators/Service engineers/Expert

Description Enter the simulation value. See also "Simulation mode".

Prerequisite "Simulation mode" = Pressure

Value at switch-on Current pressure measured value

14 Technical data

14.1 Pressure specifications

⚠ WARNING

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

- For pressure specifications, see the "Measuring range" section and the "Mechanical construction" section.
- The measuring device must be operated only within the specified limits!
- MWP (maximum working pressure): The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of +20 °C (+68 °F) and may be applied to the device for an unlimited time. Observe temperature dependency of the MWP.
- The pressure values permitted at higher temperatures can be found in the standards EN 1092-1: 2001 Tab. 18 (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.), ASME B 16.5a – 1998 Tab. 2-2.2 F316, ASME B 16.5a – 1998 Tab. 2.3.8 N10276, JIS B 2220.
- The test pressure corresponds to the over pressure limit of the individual sensors (OPL = 1.5 x MWP (formula does not apply to the PMP71 with a 40 bar (600 psi) or 100 bar (1500 psi) measuring cell)) and may be applied only for a limited period of time to prevent any lasting damage.
- The Pressure Equipment Directive (2014/68/EU) uses the abbreviation "PS". The abbreviation "PS" corresponds to the MWP (maximum working pressure) of the measuring device.
- In the case of sensor range and process connection combinations where the over pressure limit (OPL) of the process connection is smaller than the nominal value of the sensor, the device is set at the factory, at the very maximum, to the OPL value of the process connection. If you want to use the entire sensor range, select a process connection with a higher OPL value (1.5 x PN; MWP = PN)

14.2 Additional technical data

See Technical Information TI00383P.

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