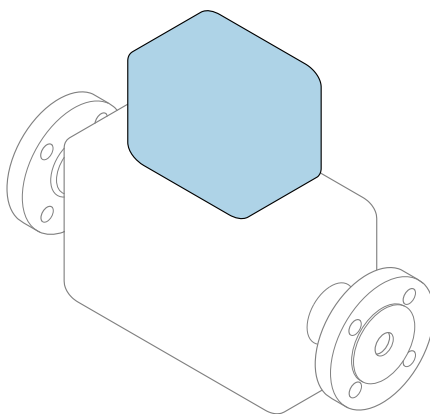# Brief Operating Instructions
Proline 300
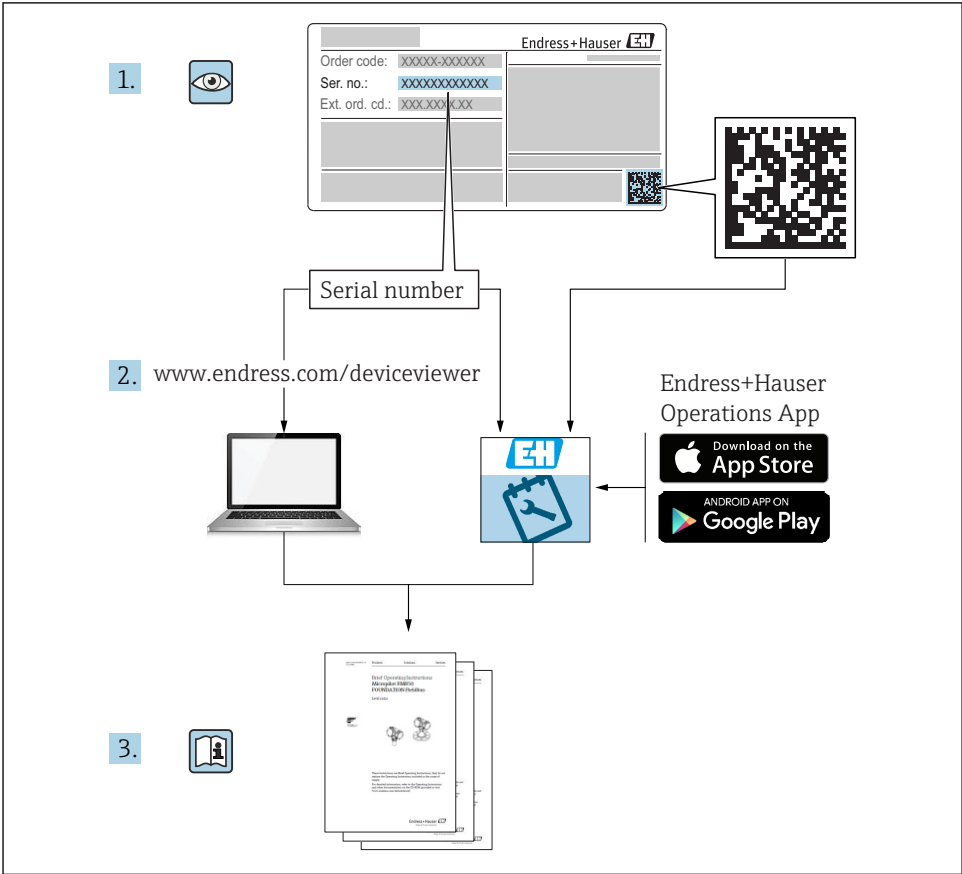# **EtherNet/IP**

Transmitter with Coriolis sensor

These instructions are Brief Operating Instructions; they are **not** a substitute for the Operating Instructions pertaining to the device.

Transmitter Brief Operating Instructions
Contain information about the transmitter.

Sensor Brief Operating Instructions → 🗎 3

Endress+Hauser **EH**

People for Process Automation

Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX.XXXX.XX

Endress+Hauser

1.

Serial number

2. www.endress.com/deviceviewer

Endress+Hauser
Operations App

Download on the
App Store

ANDROID APP ON
Google Play

3.

A0023555

Brief Operating Instructions for the device

The device consists of a transmitter and a sensor.

The process of commissioning these two components is described in two separate manuals:
• Sensor Brief Operating Instructions
• Transmitter Brief Operating Instructions

Please refer to both Brief Operating Instructions when commissioning the device as the contents of the manuals complement one another:

Sensor Brief Operating Instructions
The Sensor Brief Operating Instructions are aimed at specialists with responsibility for installing the measuring device.
• Incoming acceptance and product identification
• Storage and transport
• Installation

Transmitter Brief Operating Instructions
The Transmitter Brief Operating Instructions are aimed at specialists with responsibility for commissioning, configuring and parameterizing the measuring device (until the first measured value).
• Product description
• Installation
• Electrical connection
• Operation options
• System integration
• Commissioning
• Diagnostic information

Additional device documentation

These Brief Operating Instructions are the **Transmitter Brief Operating Instructions**.

The "Sensor Brief Operating Instructions" are available via:
• Internet: www.endress.com/deviceviewer
• Smart phone/tablet: *Endress+Hauser Operations App*

Detailed information about the device can be found in the Operating Instructions and the other documentation:
• Internet: www.endress.com/deviceviewer
• Smart phone/tablet: *Endress+Hauser Operations App*

Table of contents

1   Document information

1.1   Symbols used

1.1.1   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	**NOTICE!** This symbol contains information on procedures and other facts which do not result in personal injury.

1.1.2   Symbols for certain types of information

Symbol	Meaning	Symbol	Meaning
✅	**Permitted** Procedures, processes or actions that are permitted.	✅✅	**Preferred** Procedures, processes or actions that are preferred.
❌	**Forbidden** Procedures, processes or actions that are forbidden.	🛈	**Tip** Indicates additional information.
📖	Reference to documentation	▤	Reference to page
🖼	Reference to graphic	1, 2, 3...	Series of steps
↳	Result of a step	👁	Visual inspection

1.1.3   Electrical symbols

Symbol	Meaning	Symbol	Meaning
⎓	Direct current	∿	Alternating current
⏚	Direct current and alternating current	⏚	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

Symbol	Meaning
⏚	**Protective Earth (PE)** A terminal which must be connected to ground prior to establishing any other connections. The ground terminals are situated inside and outside the device: • Inner ground terminal: Connects the protectiv earth to the mains supply. • Outer ground terminal: Connects the device to the plant grounding system.

1.1.4 Communication symbols

Symbol	Meaning	Symbol	Meaning
📶	**Wireless Local Area Network (WLAN)** Communication via a wireless, local network.	⬛	**LED** Light emitting diode is off.
☀	**LED** Light emitting diode is on.	☀	**LED** Light emitting diode is flashing.

1.1.5 Tool symbols

Symbol	Meaning	Symbol	Meaning
✺	Torx screwdriver	◖	Flat blade screwdriver
✚	Cross-head screwdriver	⬡	Allen key
🔧	Open-ended wrench		

1.1.6 Symbols in graphics

Symbol	Meaning	Symbol	Meaning
1, 2, 3,...	Item numbers	1. , 2. , 3. ...	Series of steps
A, B, C, ...	Views	A-A, B-B, C-C, ...	Sections
⟨EX⟩	Hazardous area	⬚	Safe area (non-hazardous area)
≈➡	Flow direction		

2   Basic safety instructions

2.1   Requirements for the personnel

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

2.2   Designated use

Application and media
- The measuring device described in these Brief Operating Instructions is intended only for flow measurement of liquids and gases.
- The measuring device described in these Brief Operating Instructions is intended only for flow measurement of liquids.

Depending on the version ordered, the measuring device can also measure potentially explosive, flammable, poisonous and oxidizing media.

Measuring devices for use in hazardous areas, in hygienic applications or where there is an increased risk due to process pressure, are labeled accordingly on the nameplate.

To ensure that the measuring device remains in proper condition for the operation time:
▶ Keep within the specified pressure and temperature range.
▶ Only use the measuring device in full compliance with the data on the nameplate and the general conditions listed in the Operating Instructions and supplementary documentation.
▶ Based on the nameplate, check whether the ordered device is permitted for the intended use in the hazardous area (e.g. explosion protection, pressure vessel safety).
▶ Use the measuring device only for media to which the process-wetted materials are sufficiently resistant.
▶ If the ambient temperature of the measuring device is outside the atmospheric temperature, it is absolutely essential to comply with the relevant basic conditions as specified in the device documentation.
▶ Protect the measuring device permanently against corrosion from environmental influences.

Incorrect use
Non-designated use can compromise safety. The manufacturer is not liable for damage caused by improper or non-designated use.

⚠ WARNING

Danger of breakage due to corrosive or abrasive fluids and ambient conditions!
▶ Verify the compatibility of the process fluid with the sensor material.
▶ Ensure the resistance of all fluid-wetted materials in the process.
▶ Keep within the specified pressure and temperature range.

> **NOTICE**

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 as minute changes in the temperature, concentration or level of contamination in the process can alter the corrosion resistance properties.

Residual risks

> ⚠️ **WARNING**

The electronics and the medium may cause the surfaces to heat up. This presents a burn hazard!
▸ For elevated fluid temperatures, ensure protection against contact to prevent burns.

Only applies for Proline Promass A, E, F, O, X and Cubemass C

> ⚠️ **WARNING**

Danger of housing breaking due to measuring tube breakage!
If a measuring tube ruptures, the pressure inside the sensor housing will rise according to the operating process pressure.
▸ Use a rupture disk.

> ⚠️ **WARNING**

Danger from medium escaping!
For device versions with a rupture disk: medium escaping under pressure can cause injury or material damage.
▸ Take precautions to prevent injury and material damage if the rupture disk is actuated.

2.3   Workplace safety

For work on and with the device:
▸ Wear the required personal protective equipment according to federal/national regulations.

For welding work on the piping:
▸ Do not ground the welding unit via the measuring device.

If working on and with the device with wet hands:
▸ Due to the increased risk of electric shock, gloves must be worn.

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.

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 EU directives listed in the device-specific EU Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

2.6   IT security

Our warranty is valid only if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the device and associated data transfer, must be implemented by the operators themselves in line with their security standards.

2.7   Device-specific IT security

The device offers a range of specific functions to support protective measures on the operator's side. These functions can be configured by the user and guarantee greater in-operation safety if used correctly.

📖 For detailed information on device-specific IT security, see the Operating Instructions for the device.

2.7.1   Access via service interface (CDI-RJ45)

The device can be connected to a network via the service interface (CDI-RJ45). Device-specific functions guarantee the secure operation of the device in a network.

The use of relevant industrial standards and guidelines that have been defined by national and international safety committees, such as IEC/ISA62443 or the IEEE, is recommended. This includes organizational security measures such as the assignment of access authorization as well as technical measures such as network segmentation.

ℹ️ The device can be integrated in a ring topology. The device is integrated via the terminal connection for signal transmission (output 1) and the connection to the service interface (CDI-RJ45) .

3   Product description

The device consists of a Proline 300 transmitter and a Proline Promass or Cubemass Coriolis sensor.

The device is available as a compact version:
The transmitter and sensor form a mechanical unit.
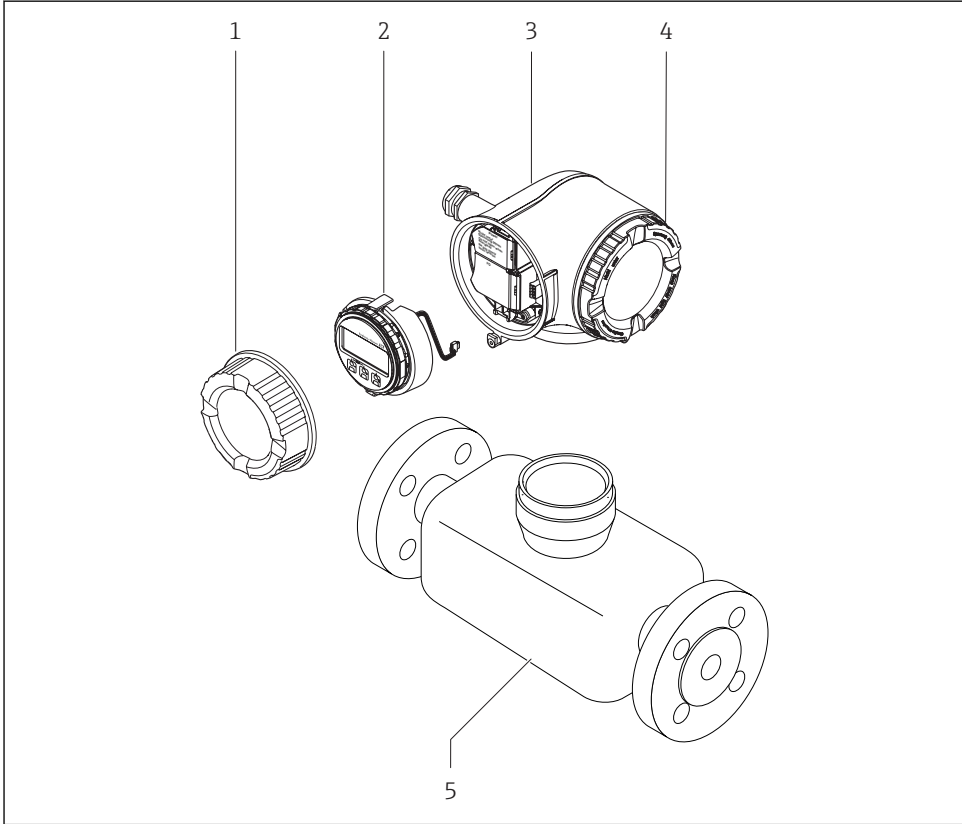
A0029586

1   Connection compartment cover
2   Display module
3   Transmitter housing
4   Electronics compartment cover
5   Sensor

ℹ️ Use of the device with the remote display and operating module DKX001 → 🗎 24.

📖 For detailed information on the product description, see the Operating Instructions for the device

4   Installation

For detailed information about mounting the sensor, see the Sensor Brief Operating Instructions → 🖻 3

4.1   Turning the transmitter housing

To provide easier access to the connection compartment or display module, the transmitter housing can be turned.
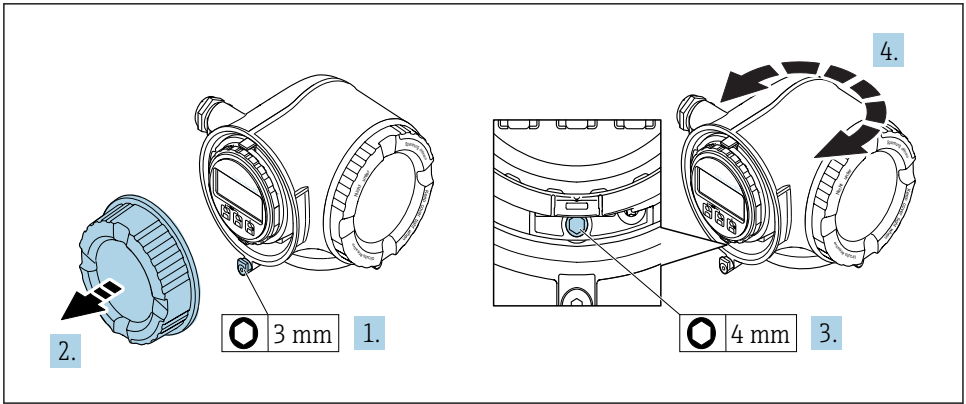
A0029993

1. Depending on the device version: Loosen the securing clamp of the connection compartment cover.
2. Unscrew the connection compartment cover.
3. Release the fixing screw.
4. Turn the housing to the desired position.
5. Firmly tighten the securing screw.
6. Screw on the connection compartment cover
7. Depending on the device version: Attach the securing clamp of the connection compartment cover.

4.2   Turning the display module

The display module can be turned to optimize display readability and operability.
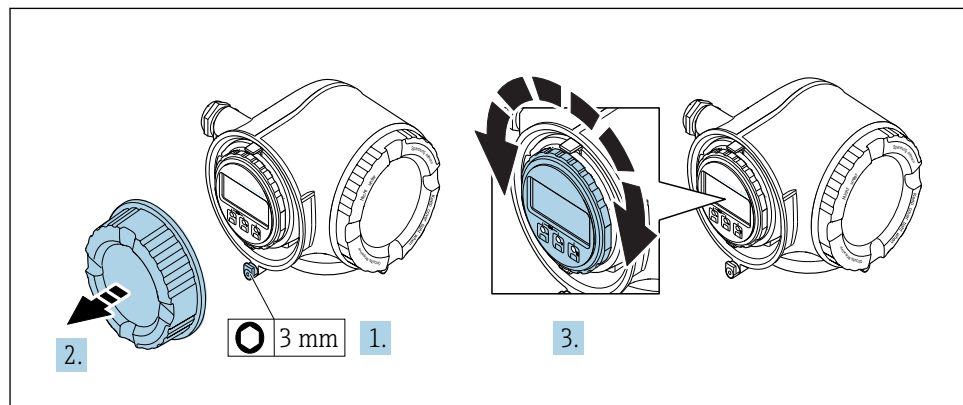
A0030035

1. Depending on the device version: Loosen the securing clamp of the connection compartment cover.

2. Unscrew the connection compartment cover.

3. Turn the display module to the desired position: max. 8 × 45° in each direction.

4. Screw on the connection compartment cover.

5. Depending on the device version: Attach the securing clamp of the connection compartment cover.

4.3   Cover locking

NOTICE

Order code for "Housing", option L "Cast, stainless": The covers of the transmitter housing are provided with a borehole to lock the cover.
The cover can be locked using screws and a chain or cable provided by the customer.
▶ It is recommended to use stainless steel cables or chains.
▶ If a protective coating is applied, it is recommended to use a heat shrink tube to protect the housing paint.
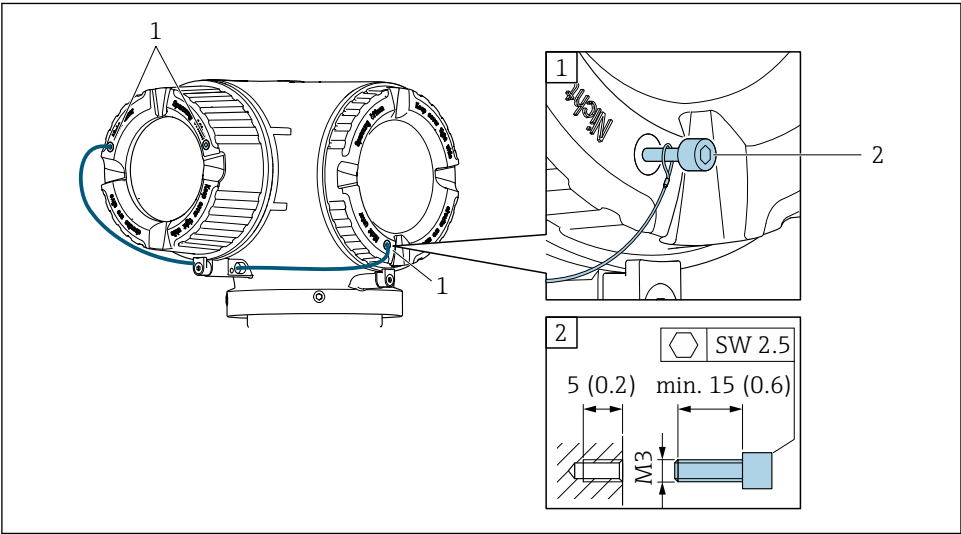
A0029800

*1   Cover borehole for the securing screw*
2   Securing screw to lock the cover

4.4   Transmitter post-installation check

The post-installation check must always be performed after the following tasks:
• Turning the transmitter housing
• Turning the display module

Is the device undamaged (visual inspection)?	❑
Turning the transmitter housing: • Is the securing screw firmly tightened? • Is the connection compartment cover screwed on tightly? • Is the securing clamp firmly tightened?	❑
Turning the display module: • Is the connection compartment cover screwed on tightly? • Is the securing clamp firmly tightened?	❑

5   Electrical connection

NOTICE

The measuring device does not have an internal circuit breaker.

▶ For this reason, assign the measuring device a switch or power-circuit breaker so that the power supply line can be easily disconnected from the mains.

▶ Although the measuring device is equipped with a fuse, additional overcurrent protection (maximum 10 A) should be integrated into the system installation.

5.1   Connection conditions

5.1.1   Required tools

- For cable entries: Use corresponding tools
- For securing clamp: Allen key 3 mm
- Wire stripper
- When using stranded cables: Crimper for wire end ferrule
- For removing cables from terminal: Flat blade screwdriver ≤ 3 mm (0.12 in)

5.1.2   Requirements for connecting cables

The connecting cables provided by the customer must fulfill the following requirements.

Electrical safety

In accordance with applicable federal/national regulations.

Protective ground cable

Cable ≥2.08 mm^2 (14 AWG)

The grounding impedance must be less than 1 Ω.

Permitted temperature range

- The installation guidelines that apply in the country of installation must be observed.
- The cables must be suitable for the minimum and maximum temperatures to be expected.

Power supply cable

Standard installation cable is sufficient.

Cable diameter

- Cable glands supplied:
  M20 × 1.5 with cable Ø 6 to 12 mm (0.24 to 0.47 in)
- Spring-loaded terminals: Suitable for strands and strands with ferrules.
  Conductor cross-section 0.2 to 2.5 mm^2 (24 to 12 AWG).

Signal cable

EtherNet/IP

The standard ANSI/TIA/EIA-568-B.2 Annex specifies CAT 5 as the minimum category for a cable used for EtherNet/IP. CAT 5e and CAT 6 are recommended.

For more information on planning and installing EtherNet/IP networks, please refer to the "Media Planning and Installation Manual. EtherNet/IP" of ODVA Organization

Current output 0/4 to 20 mA

Standard installation cable is sufficient.

Pulse/frequency/switch output

Standard installation cable is sufficient.

Relay output

Standard installation cable is sufficient.

Current input 0/4 to 20 mA

Standard installation cable is sufficient.

Status input

Standard installation cable is sufficient.

Requirements for the connecting cable

Optionally available connecting cable

A cable is supplied depending on the order option
- Order code for measuring device: order code **030** for "Display; operation", option **O** or
- Order code for measuring device: order code **030** for "Display; operation", option **M** and
- Order code for DKX001: order code **040** for "Cable", option **A, B, D, E**

Standard cable	$2 \times 2 \times 0.34$ mm^2 (22 AWG) PVC cable with common shield (2 pairs, pair-stranded)
Flame resistance	According to DIN EN 60332-1-2
Oil-resistance	According to DIN EN 60811-2-1
Shielding	Tin-plated copper-braid, optical cover ≥ 85 %
Capacitance: core/shield	≤200 pF/m
L/R	≤24 µH/Ω
Available cable length	5 m (15 ft)/10 m (35 ft)/20 m (65 ft)/30 m (100 ft)
Operating temperature	When mounted in a fixed position: −50 to +105 ℃ (−58 to +221 ℉); when cable can move freely: −25 to +105 ℃ (−13 to +221 ℉)

Standard cable - customer-specific cable

No cable is supplied, and it must be provided by the customer (up to max. 300 m (1 000 ft))
for the following order option:
Order code for DKX001: Order code **040** for "Cable", option **1** "None, provided by customer, max
300 m"

A standard cable can be used as the connecting cable.

Standard cable	4 cores (2 pairs); pair-stranded with common shield
Shielding	Tin-plated copper-braid, optical cover ≥ 85 %
Capacitance: core/shield	Maximum 1 000 nF for Zone 1, Class I, Division 1
L/R	Maximum 24 µH/Ω for Zone 1, Class I, Division 1
Cable length	Maximum 300 m (1 000 ft), see the following table

Cross-section	Max. cable length for use in Non-hazardous area, Ex Zone 2, Class I, Division 2 Ex Zone 1, Class I, Division 1
0.34 mm² (22 AWG)	80 m (270 ft)
0.50 mm² (20 AWG)	120 m (400 ft)
0.75 mm² (18 AWG)	180 m (600 ft)
1.00 mm² (17 AWG)	240 m (800 ft)
1.50 mm² (15 AWG)	300 m (1 000 ft)

5.1.3   Terminal assignment

Transmitter: supply voltage, input/outputs

Supply voltage		Input/output 1	Input/output 2		Input/output 3	
1 (+)	2 (−)	EtherNet/IP (RJ45 connector)	24 (+)	25 (−)	22 (+)	23 (−)
			Device-specific terminal assignment: adhesive label in terminal cover.			

Terminal assignment of the remote display and operating module → 🖹 24.

5.1.4   Preparing the measuring device

NOTICE

Insufficient sealing of the housing!
Operational reliability of the measuring device could be compromised.
▶ Use suitable cable glands corresponding to the degree of protection.

1. Remove dummy plug if present.

2. If the measuring device is supplied without cable glands:
    Provide suitable cable gland for corresponding connecting cable.

3. If the measuring device is supplied with cable glands:
    Observe requirements for connecting cables → 🖹 14.

5.2   Connecting the measuring device

NOTICE

Limitation of electrical safety due to incorrect connection!
▶ Have electrical connection work carried out by appropriately trained specialists only.
▶ Observe applicable federal/national installation codes and regulations.
▶ Comply with local workplace safety regulations.
▶ Always connect the protective ground cable ⊕ before connecting additional cables.
▶ For use in potentially explosive atmospheres, observe the information in the device-specific Ex documentation.

5.2.1 Connecting the transmitter
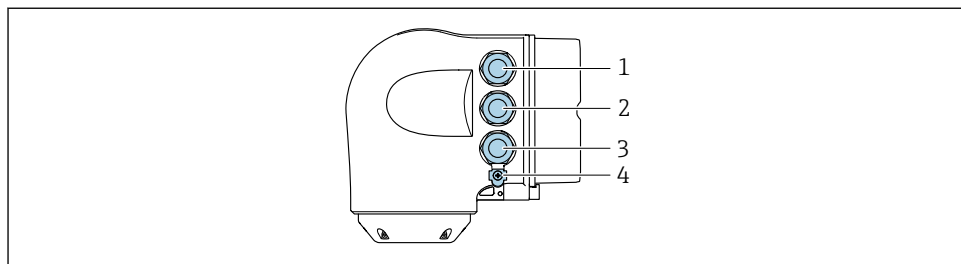
A0026781

1   Terminal connection for supply voltage
2   Terminal connection for signal transmission, input/output
3   Terminal connection for signal transmission, input/output or terminal connection for network connection via service interface (CDI-RJ45); optional: connection for external WLAN antenna or remote display and operating module DKX001
4   Protective earth (PE)

> In addition to connecting the device via EtherNet/IP and the available inputs/outputs, additional connection options are also available:
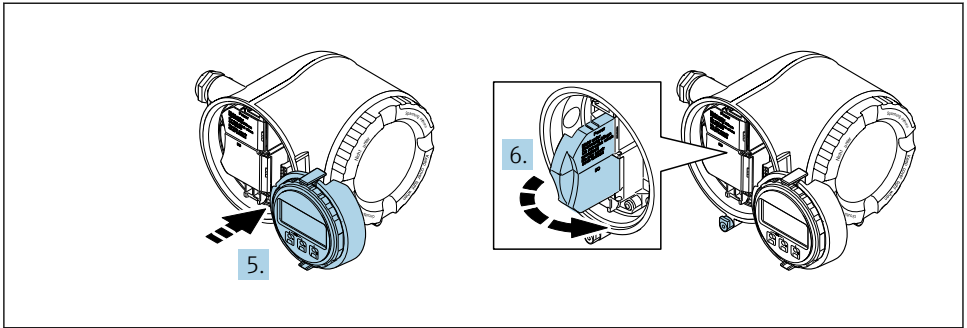> - Integrate into a network via the service interface (CDI-RJ45) → 🖺 22.
> - Integrate the device into a ring topology → 🖺 23.

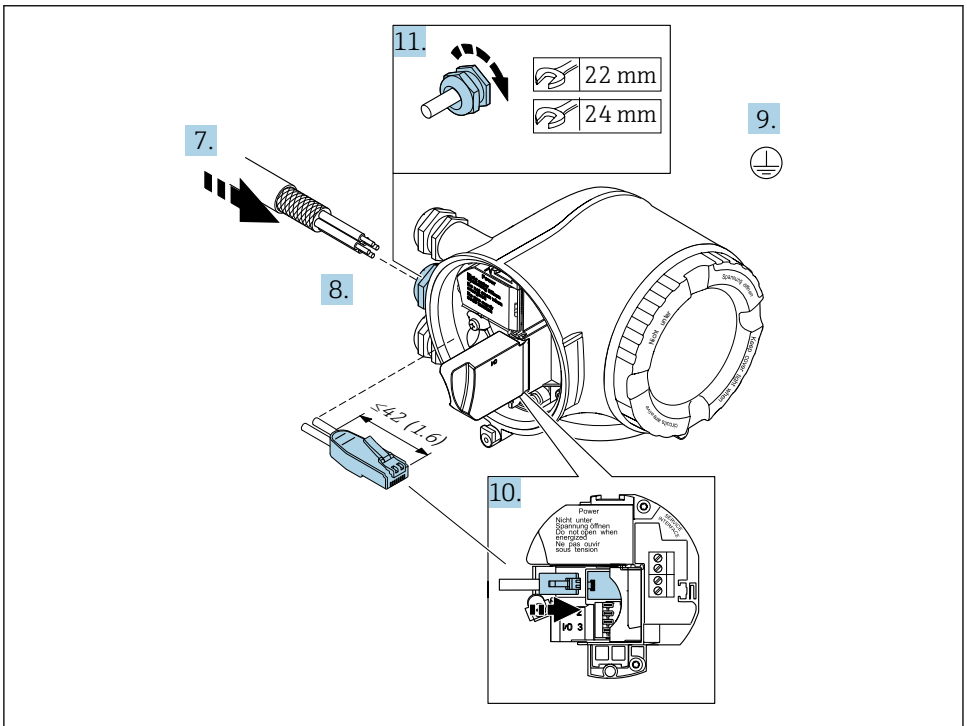**Connecting the EtherNet/IP connector**
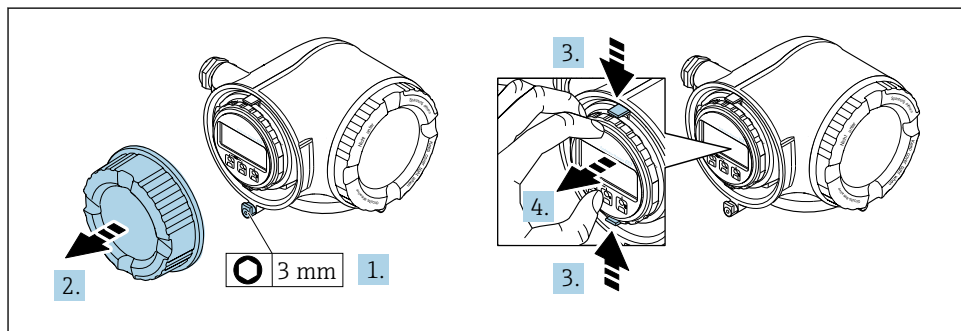
A0029813

1. Loosen the securing clamp of the connection compartment cover.

2. Unscrew the connection compartment cover.

3. Squeeze the tabs of the display module holder together.

4. Remove the display module holder.

A0029814

5. Attach the holder to the edge of the electronics compartment.
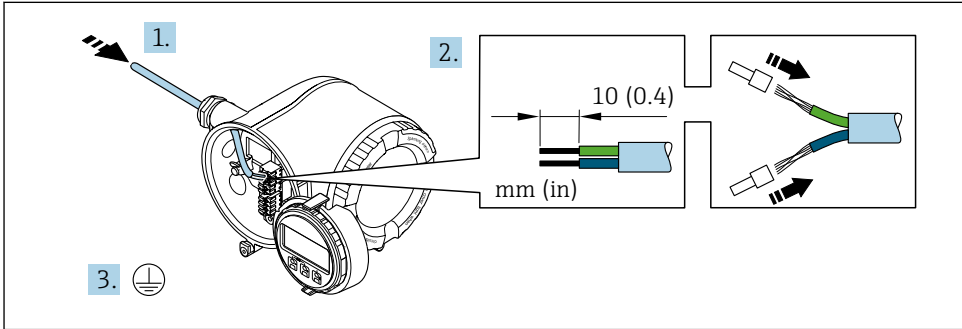
6. Open the terminal cover.

A0033722

7. Push the cable through the cable entry . To ensure tight sealing, do not remove the sealing ring from the cable entry.

8. Strip the cable and cable ends and connect to the RJ45 connector.

9. Connect the protective ground.

10. Plug in the RJ45 connector.

11. Firmly tighten the cable glands.
    ↳ This concludes the EtherNet/IP connection process.

Connecting the supply voltage and additional inputs/outputs

A0033983

1. Push the cable through the cable entry . To ensure tight sealing, do not remove the sealing ring from the cable entry.

2. Strip the cable and cable ends. In the case of stranded cables, also fit ferrules.

3. Connect the protective ground.
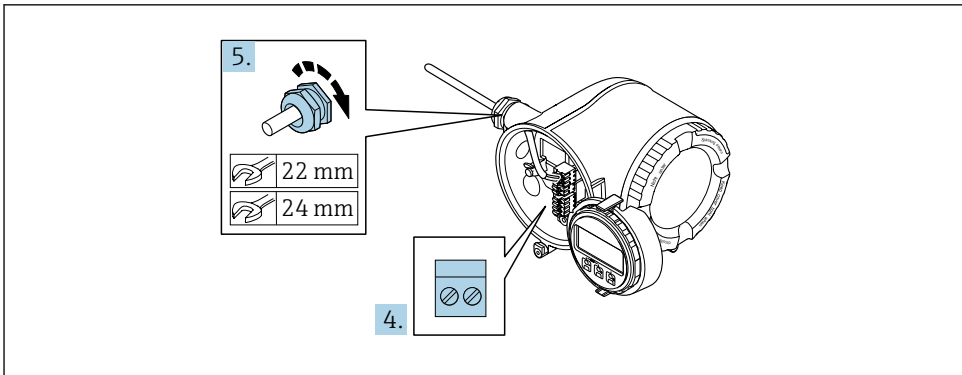
A0033984

4. Connect the cable in accordance with the terminal assignment .
   ↳ **Signal cable terminal assignment:** The device-specific terminal assignment is documented on an adhesive label in the terminal cover.
   Supply voltage terminal assignment: Adhesive label in the terminal cover or → 🗎 17.

5. Firmly tighten the cable glands.
   ↳ This concludes the cable connection process.

6. Close the terminal cover.

7. Fit the display module holder in the electronics compartment.

8. Screw on the connection compartment cover.

9. Secure the securing clamp of the connection compartment cover.

Removing a cable
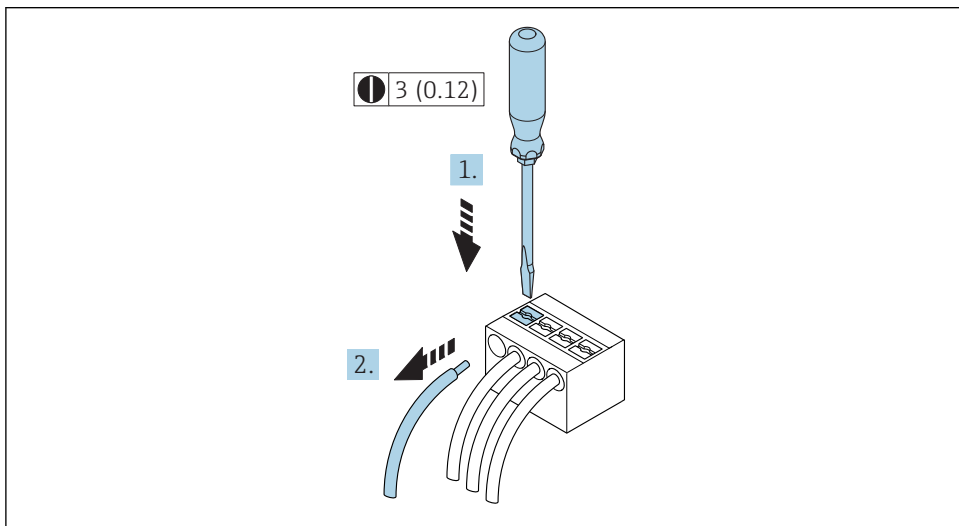
A0029598

☒ *1 Engineering unit mm (in)*

1. To remove a cable from the terminal, use a flat-blade screwdriver to push the slot between the two terminal holes

2. while simultaneously pulling the cable end out of the terminal.

## 5.2.2   Integrating the transmitter into a network

This section only presents the basic options for integrating the device into a network.

Integrating via the service interface

The device is integrated via the connection to the service interface (CDI-RJ45).

Note the following when connecting:
- Recommended cable: CAT 5e, CAT 6 or CAT 7, with shielded connector
- Maximum cable thickness: 6 mm
- Length of connector including bend protection: 42 mm
- Bending radius: 5 x cable thickness
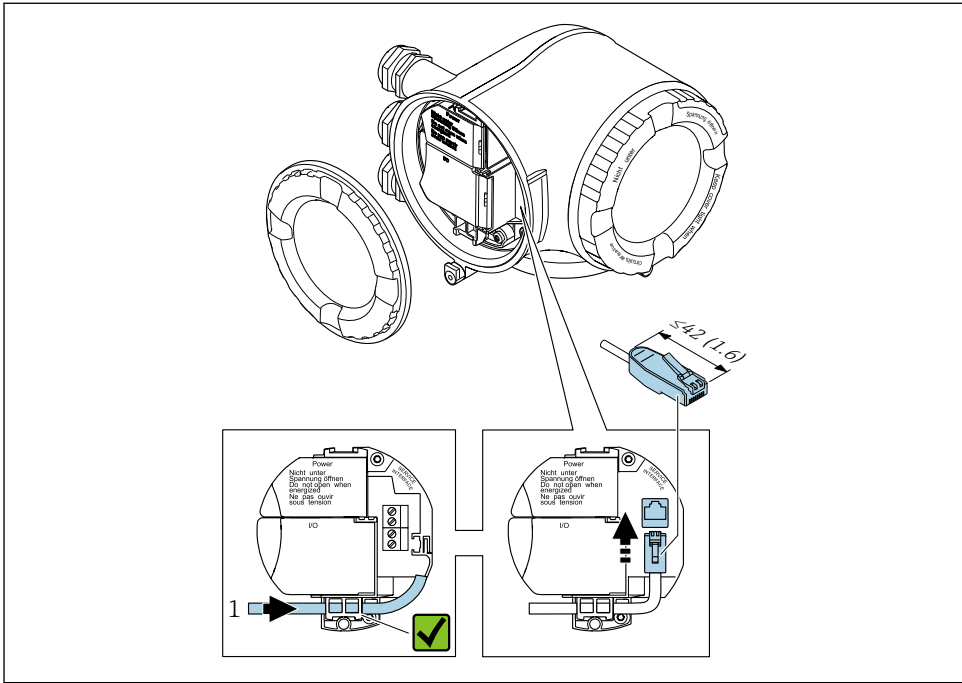
A0033703

1   Service interface (CDI-RJ45)

ℹ️ An adapter for RJ45 and the M12 connector is optionally available:
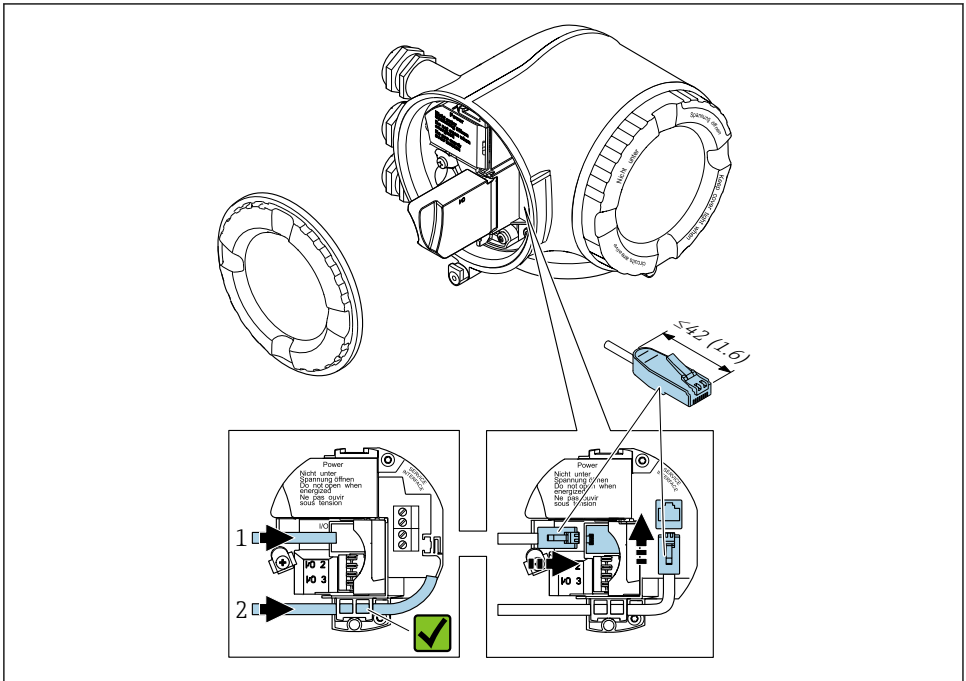Order code for "Accessories", option **NB**: "Adapter RJ45 M12 (service interface)"

The adapter connects the service interface (CDI-RJ45) to an M12 connector mounted in the cable entry. Therefore the connection to the service interface can be established via an M12 connector without opening the device.

Integrating into a ring topology

The device is integrated via the terminal connection for signal transmission (output 1) and the connection to the service interface (CDI-RJ45).

Note the following when connecting:
• Recommended cable: CAT5e, CAT6 or CAT7, with shielded connector
• Maximum cable thickness: 6 mm
• Length of connector including bend protection: 42 mm
• Bending radius: 2.5 x cable thickness

A0033717

1   EtherNet/IP connection
2   Service interface (CDI-RJ45)

An adapter for RJ45 and the M12 connector is optionally available:
Order code for "Accessories", option **NB**: "Adapter RJ45 M12 (service interface)"

The adapter connects the service interface (CDI-RJ45) to an M12 connector mounted in the cable entry. Therefore the connection to the service interface can be established via an M12 connector without opening the device.

5.2.3 Connecting the remote display and operating module DKX001

The remote display and operating module DKX001 is available as an optional extra .

- The remote display and operating module DKX001 is only available for the following housing version: order code for "Housing": option A "Aluminum, coated"
- The remote display and operating module DKX001 is only available for the following housing versions, order code for "Housing":
  - Option A "Aluminum, coated"
  - Option L "Cast, stainless"
- The measuring device is always supplied with a dummy cover when the remote display and operating module DKX001 is ordered directly with the measuring device. Display or operation at the transmitter is not possible in this case.
- If ordered subsequently, the remote display and operating module DKX001 may not be connected at the same time as the existing measuring device display module. Only one display or operation unit may be connected to the transmitter at any one time.
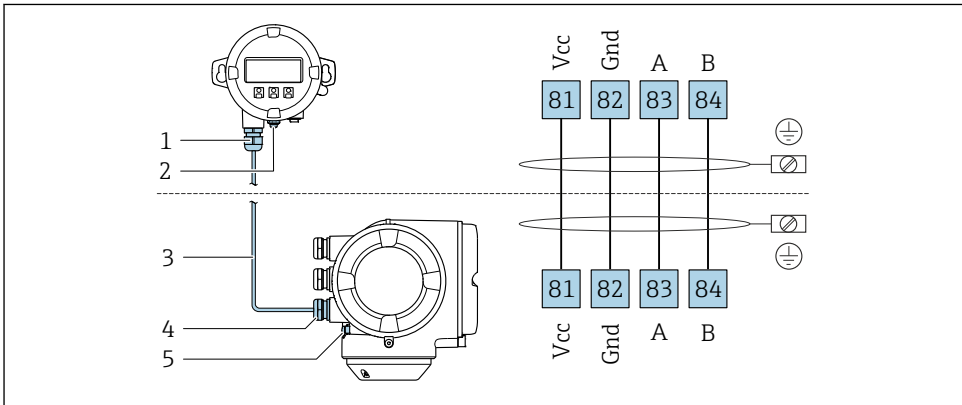
A0027518

1   Remote display and operating module DKX001
2   Protective earth (PE)
3   Connecting cable
4   Measuring device
5   Protective earth (PE)

5.3   Hardware settings

5.3.1   Setting the device address

The IP address of the measuring device can be configured for the network via DIP switches.

Addressing data

IP address and configuration options				
1st octet	2nd octet	3rd octet	4th octet
192.	**168.**	**1.**	**XXX**
↓			↓
Can only be configured via software addressing			Can be configured via software addressing and hardware addressing

|	
IP address range	1 to 254 (4th octet)
IP address broadcast	255
Addressing mode ex works	Software addressing; all DIP switches for hardware addressing are set to OFF.
IP address ex works	DHCP server active

ℹ️ Software addressing: The IP address is entered via the **IP address** parameter.

Setting the IP address

Risk of electric shock when opening the transmitter housing.
▶ Before opening the transmitter housing:
▶ Disconnect the device from the power supply.

ℹ️ The default IP address may **not** be activated → 🖹 26.
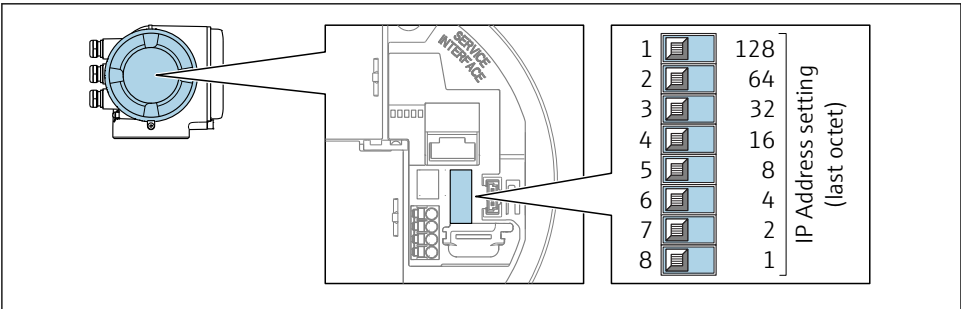
A0029635

▶ Set the desired IP address using the corresponding DIP switches on the I/O electronics module.

5.3.2   Activating the default IP address

The DHCP function is enabled in the device at the factory, i.e. the device expects an IP address to be assigned by the network. This function can be disabled and the device can be set to the default IP address 192.168.1.212 by DIP switch.

Activating the default IP address via the DIP switch

Risk of electric shock when opening the transmitter housing.
▸ Before opening the transmitter housing:
▸ Disconnect the device from the power supply.
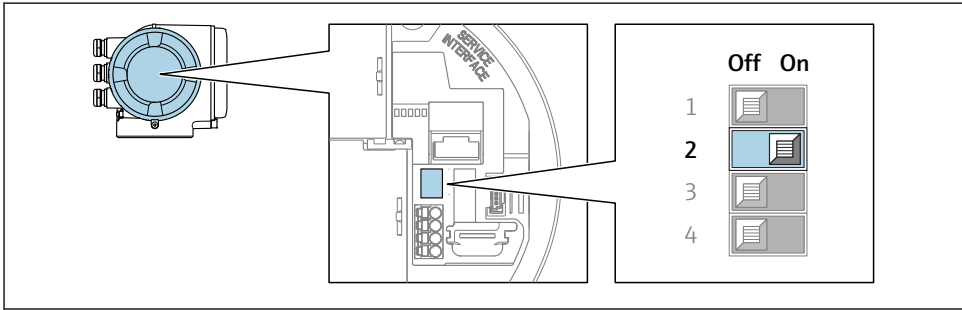
A0034499

▸ Set DIP switch No. 2 on the I/O electronics module from **OFF** → **ON**.

5.4   Ensuring potential equalization

5.4.1   Requirements

No special measures for potential equalization are required.

📖 For devices intended for use in hazardous locations, please observe the guidelines in the Ex documentation (XA).

5.5   Ensuring the degree of protection

The measuring device fulfills all the requirements for the IP66/67 degree of protection, Type 4X enclosure.

To guarantee IP66/67 degree of protection, Type 4X enclosure, carry out the following steps after the electrical connection:

1. Check that the housing seals are clean and fitted correctly.
2. Dry, clean or replace the seals if necessary.
3. Tighten all housing screws and screw covers.
4. Firmly tighten the cable glands.

5. To ensure that moisture does not enter the cable entry:

   Route the cable so that it loops down before the cable entry ("water trap").
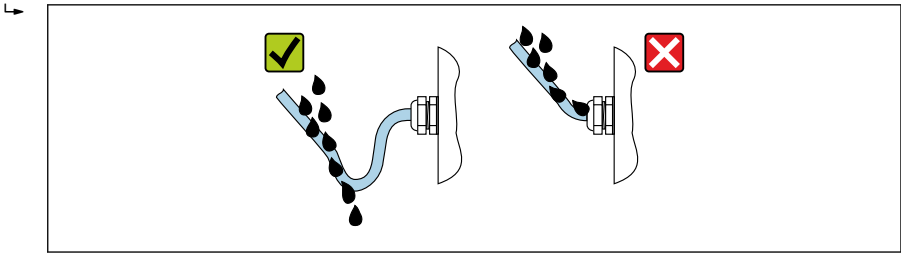

A0029278

6. Insert dummy plugs into unused cable entries.

5.6   Post-connection check

Are cables or the device undamaged (visual inspection)?	❑
Do the cables used meet the requirements?	❑
Do the cables have adequate strain relief?	❑
Are all the cable glands installed, firmly tightened and leak-tight? Cable run with "water trap" → 🔖 26?	❑
If supply voltage is present, do values appear on the display module?	❑

6   Operation options

6.1   Overview of operation options
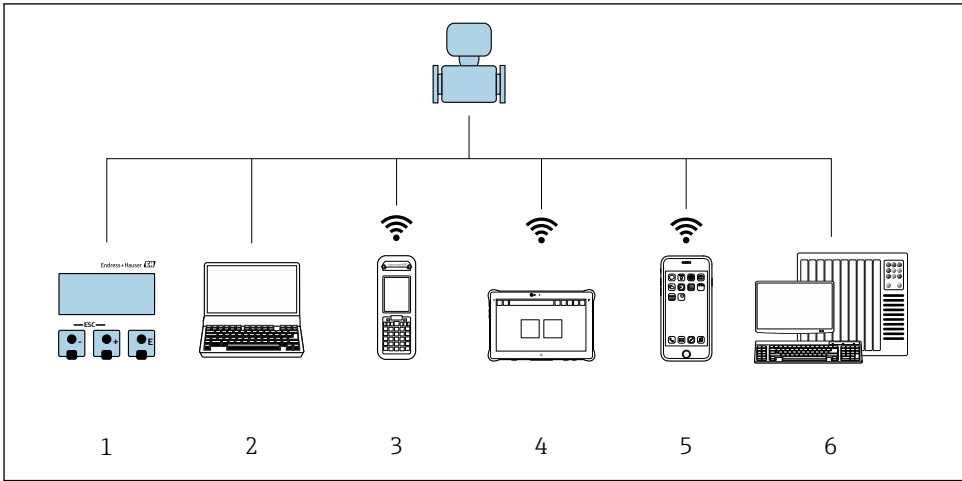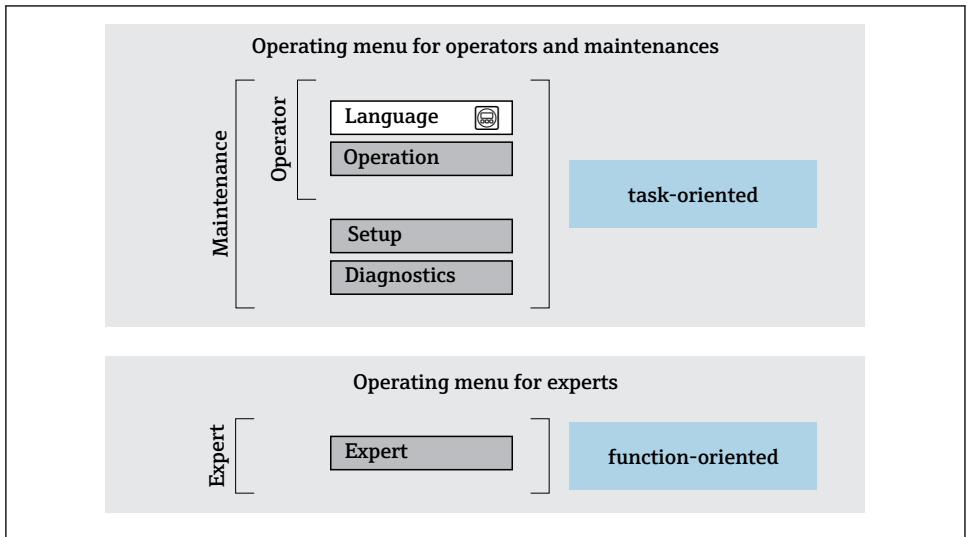

A0034513

1   Local operation via display module
2   Computer with Web browser (e.g. Internet Explorer) or with operating tool (e.g. FieldCare, DeviceCare, AMS Device Manager, SIMATIC PDM)
3   Field Xpert SFX350 or SFX370
4   Field Xpert SMT70
5   Mobile handheld terminal
6   Control system (e.g. PLC)

6.2   Structure and function of the operating menu

6.2.1   Structure of the operating menu

**⊞ 2**   *Schematic structure of the operating menu*

6.2.2   Operating philosophy

The individual parts of the operating menu are assigned to certain user roles (operator, maintenance etc.). Each user role contains typical tasks within the device lifecycle.

For detailed information on the operating philosophy, see the Operating Instructions for the device.

6.3 Access to the operating menu via the local display
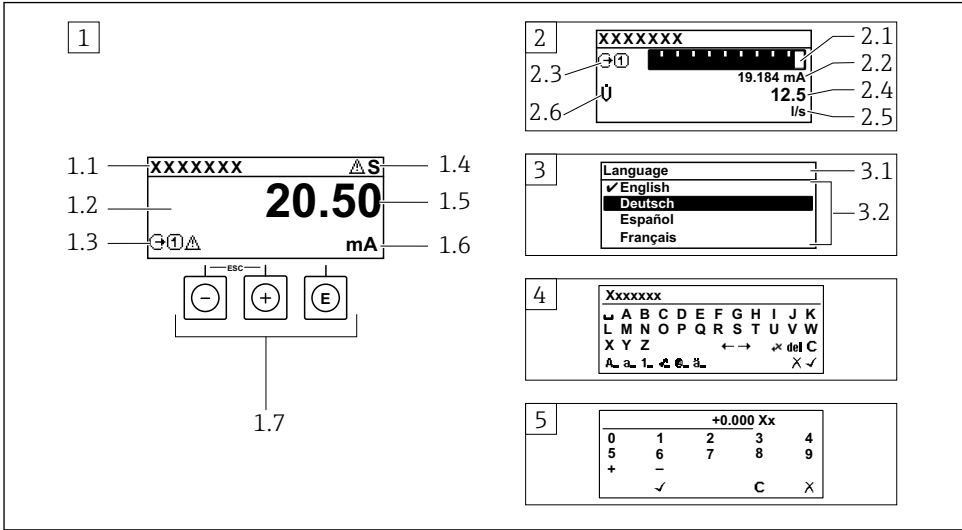
A0014013

1 Operational display with measured value shown as "1 value, max." (example)
1.1 Device tag
1.2 Display area for measured values (4-line)
1.3 Explanatory symbols for measured value: Measured value type, measuring channel number, symbol for diagnostic behavior
1.4 Status area
1.5 Measured value
1.6 Unit for the measured value
1.7 Operating elements
2 Operational display with measured value shown as "1 bar graph + 1 value" (example)
2.1 Bar graph display for measured value 1
2.2 Measured value 1 with unit
2.3 Explanatory symbols for measured value 1: measured value type, measuring channel number
2.4 Measured value 2
2.5 Unit for measured value 2
2.6 Explanatory symbols for measured value 2: measured value type, measuring channel number
3 Navigation view: picklist of a parameter
3.1 Navigation path and status area
3.2 Display area for navigation: ✔ designates the current parameter value
4 Editing view: text editor with input mask
5 Editing view: numeric editor with input mask

6.3.1   Operational display

| Explanatory symbols for the measured value	Status area

• Depends on the device version, e.g.:
  – Ů: Volume flow
  – ṁ: Mass flow
  – ρ: Density
  – G: Conductivity
  – ♨: Temperature
• Σ: Totalizer
• ⟼: Output
• ⟻: Input
• ①..⑯: Measurement channel number [1]
• Diagnostic behavior [2]
  – ⊗: Alarm
  – ⚠: Warning
	The following symbols appear in the status area of the operational display at the top right:
	• Status signals
	  – F: Failure
	  – C: Function check
	  – S: Out of specification
	  – M: Maintenance required
	• Diagnostic behavior
	  – ⊗: Alarm
	  – ⚠: Warning
	• 🔒: Locking (locked via hardware))
	• ↔: Communication via remote operation is active.

1)   If there is more than one channel for the same measured variable type (totalizer, output etc.).
2)   For a diagnostic event that concerns the displayed measured variable.

6.3.2   Navigation view

Status area	Display area

The following appears in the status area of the navigation view in the top right corner:
• In the submenu
  – The direct access code for the parameter you are navigating to (e.g. 0022-1)
  – If a diagnostic event is present, the diagnostic behavior and status signal
• In the wizard
  If a diagnostic event is present, the diagnostic behavior and status signal
	• Icons for menus
	  – ⊙: Operation
	  – 🔧: Setup
	  – ⚕: Diagnostics
	  – ⚓: Expert
	• ▸: Submenus
	• ⛟: Wizards
	• ✎: Parameters within a wizard
	• ⊠: Parameter locked

6.3.3   Editing view

Text editor		Correction symbols under ⟨⨯c↔⟩	
⟨✓⟩	Confirms selection.	⟨C⟩	Clears all entered characters.
⟨X⟩	Exits the input without applying the changes.	⟨→⟩	Moves the input position one position to the right.
⟨C⟩	Clears all entered characters.	⟨←⟩	Moves the input position one position to the left.
⟨⨯c↔⟩	Switches to the selection of the correction tools.	⟨⨯⟩	Deletes one character immediately to the left of the input position.

⟨Aa1@⟩	Toggle
	  • Between upper-case and lower-case letters
	  • For entering numbers
	  • For entering special characters		

Numeric editor			
☑	Confirms selection.	←	Moves the input position one position to the left.
☒	Exits the input without applying the changes.	.	Inserts decimal separator at the input position.
–	Inserts minus sign at the input position.	C	Clears all entered characters.

6.3.4 Operating elements

Keys and meaning
Ⓔ **Enter key**

For operational display
 • Pressing the key briefly opens the operating menu.
 • Pressing the key for 2 s opens the context menu.
 	
 In a menu, submenu
 • Pressing the key briefly
   – Opens the selected menu, submenu or parameter.
   – Starts the wizard.
   – If help text is open:
     Closes the help text of the parameter.
 • Pressing the key for 2 s for parameter:
   If present, opens the help text for the function of the parameter.
 	
 With a wizard: Opens the editing view of the parameter.
 	
 With a text and numeric editor:
 • Pressing the key briefly
   – Opens the selected group.
   – Carries out the selected action.
 • Pressing the key for 2 s:
   Confirms the edited parameter value.

⊖ **Minus key**
• *In a menu, submenu:* Moves the selection bar upwards in a choose list.   • *With a wizard:* Confirms the parameter value and goes to the previous parameter.   • *With a text and numeric editor:* Moves the selection bar to the left (backwards) in an input screen.
⊕ **Plus key**
• *In a menu, submenu:* Moves the selection bar downwards in a choose list.   • *With a wizard:* Confirms the parameter value and goes to the next parameter.   • *With a text and numeric editor:* Moves the selection bar to the right (forwards) in an input screen.
⊕+⊖ **Escape key combination (press keys simultaneously)**

In a menu, submenu
 • Pressing the key briefly
   – Exits the current menu level and takes you to the next higher level.
   – If help text is open, closes the help text of the parameter.
 • Pressing the key for 2 s for the parameter: Returns you to the operational display ("home position").
 	
 With a wizard: Exits the wizard and takes you to the next higher level.
 With a text and numeric editor: Closes the text or numeric editor without applying changes.

⊖+Ⓔ **Minus/Enter key combination (press the keys simultaneously)**

Keys and meaning
Reduces the contrast (brighter setting).
⊡+⊡   **Plus/Enter key combination (press and hold down the keys simultaneously)**
Increases the contrast (darker setting).
⊡ + ⊡ + ⊡   **Minus/Plus/Enter key combination (press the keys simultaneously)**
*For operational display:*Enables or disables the keypad lock.

6.3.5 Further information

📖 For further information on the following topics, see the Operating Instructions for the device
- Calling up help text
- User roles and related access authorization
- Disabling write protection via access code
- Enabling and disabling the keypad lock

6.4 Access to the operating menu via the operating tool

📖 The operating menu can also be accessed via the FieldCare and DeviceCare operating tools. See the Operating Instructions for the device.

6.5 Access to the operating menu via the Web server

📖 The operating menu can also be accessed via the Web server. See the Operating Instructions for the device.

7 System integration

📖 A detailed description of how to integrate the device into an automation system (e.g. from Rockwell Automation) is available as a separate document: www.endress.com → Select country → Automation → Digital communication → Fieldbus device integration → EtherNet/IP
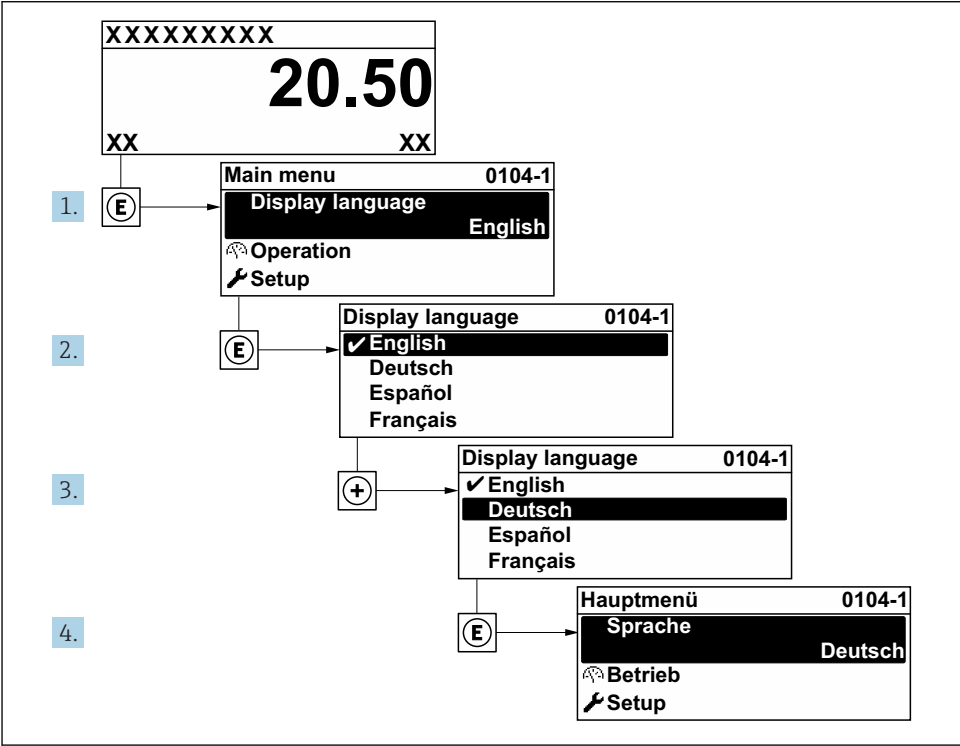
8 Commissioning

8.1 Function check

Before commissioning the measuring device:

▶ Make sure that the post-installation and post-connection checks have been performed.

- "Post-installation check" checklist → 📖 13
- "Post-connection check" checklist → 📖 27

8.2   Setting the operating language

Factory setting: English or ordered local language

A0029420

⊠ *3   Taking the example of the local display*

8.3   Configuring the measuring device

The **Setup** menu with its submenus and guided wizards is used for fast commissioning of the device. They contain all the parameters required for configuration, such as for measurement or communication.

| ℹ | Depending on the device version, not all submenus and parameters are available in every device. The selection can vary depending on the order code. |

Example: Available submenus, wizards	Meaning
System units	Configure the units for all measured values
Medium selection	Define the medium
User interface	Configure the display format on the local display
Low flow cut off	Set the low flow cut off

Example: Available submenus, wizards	Meaning
Partially filled pipe detection	Configure partial and empty pipe detection
Advanced setup	Additional parameters for configuration: • Calculated process variables • Sensor adjustment • Totalizer • User interface • WLAN settings • Data backup • Administration

8.4   Protecting settings from unauthorized access

The following write protection options exist in order to protect the configuration of the measuring device from unintentional modification:
• Protect access to parameters via access code
• Protect access to local operation via key locking
• Protect access to measuring device via write protection switch

For detailed information on protecting the settings against unauthorized access, see the Operating Instructions for the device.

9 Diagnostic information

Faults detected by the self-monitoring system of the measuring device are displayed as a diagnostic message in alternation with the operational display. The message about remedial measures can be called up from the diagnostic message, and contains important information on the fault.
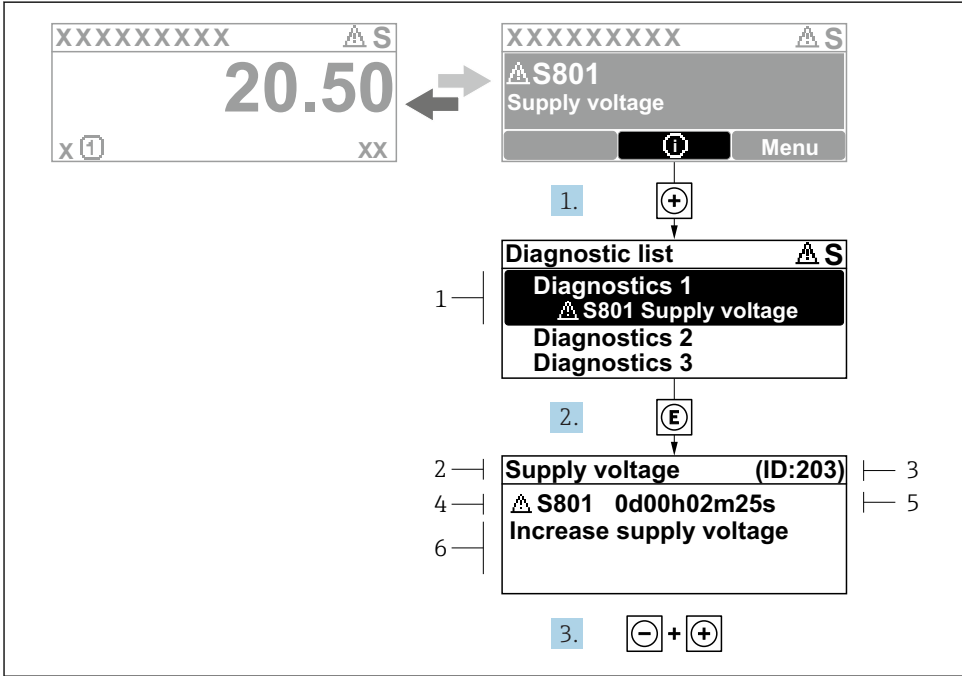
⊠ 4   Message about remedial measures

1   Diagnostic information
2   Short text
3   Service ID
4   Diagnostic behavior with diagnostic code
5   Operation time of occurrence
6   Remedial measures

1. The user is in the diagnostic message.
   Press ⊞ (ⓘ symbol).
   ↳ The **Diagnostic list** submenu opens.

2. Select the desired diagnostic event with ⊞ or ⊟ and press ⊑ .
   ↳ The message about the remedial measures opens.

3. Press ⊟ + ⊞ simultaneously.
   ↳ The message about the remedial measures closes.

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