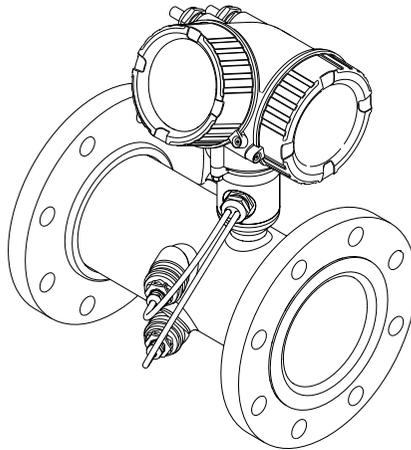


# Brief Operating Instructions

## Proline Prosonic Flow B 200

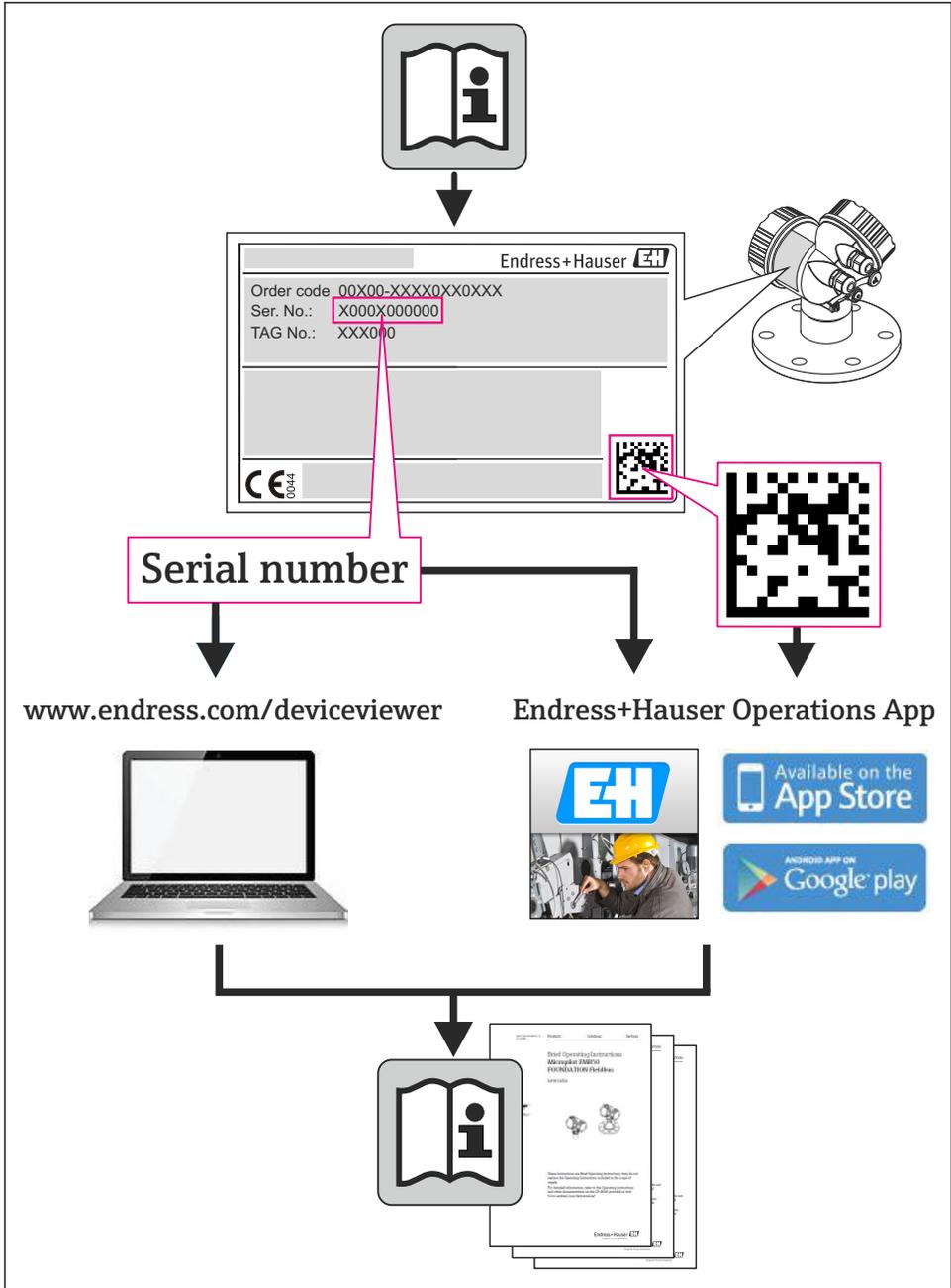
Ultrasonic time-of-flight flowmeter



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

Detailed information about the device can be found in the Operating Instructions and the other documentation:

- On the CD-ROM supplied (is not included in the delivery for all device versions).
- Available for all device versions via:
  - Internet: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)
  - Smart phone/tablet: *Endress+Hauser Operations App*



A0023555

# Table of contents

<b>1</b>	<b>Document information</b>	<b>4</b>
1.1	Symbols used	4
<b>2</b>	<b>Basic safety instructions</b>	<b>5</b>
2.1	Requirements for the personnel	5
2.2	Designated use	6
2.3	Workplace safety	7
2.4	Operational safety	7
2.5	Product safety	7
2.6	IT security	7
<b>3</b>	<b>Product description</b>	<b>7</b>
3.1	Product design	8
<b>4</b>	<b>Incoming acceptance and product identification</b>	<b>9</b>
4.1	Incoming acceptance	9
4.2	Product identification	10
<b>5</b>	<b>Storage and transport</b>	<b>10</b>
5.1	Storage conditions	10
5.2	Transporting the product	10
<b>6</b>	<b>Installation</b>	<b>12</b>
6.1	Installation conditions	12
6.2	Mounting the measuring device	16
6.3	Post-mounting check	17
<b>7</b>	<b>Electrical connection</b>	<b>19</b>
7.1	Connection conditions	19
7.2	Connecting the measuring device	22
7.3	Ensuring the degree of protection	23
7.4	Post-connection check	24
<b>8</b>	<b>Operation options</b>	<b>25</b>
8.1	Structure and function of the operating menu	25
8.2	Access to the operating menu via the local display	26
8.3	Access to the operating menu via the operating tool	30
<b>9</b>	<b>System integration</b>	<b>30</b>
<b>10</b>	<b>Commissioning</b>	<b>30</b>
10.1	Function check	30
10.2	Switching on the measuring device	30
10.3	Setting the operating language	30
10.4	Configuring the measuring device	31
10.5	Defining the tag name	32
10.6	Protecting settings from unauthorized access	32
<b>11</b>	<b>Diagnostic information</b>	<b>32</b>

# 1 Document information

## 1.1 Symbols used

### 1.1.1 Safety symbols

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

### 1.1.2 Electrical symbols

Symbol	Meaning	Symbol	Meaning
	Direct current		Alternating current
	Direct current and alternating current		<b>Ground connection</b> A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
	<b>Protective ground connection</b> A terminal which must be connected to ground prior to establishing any other connections.		<b>Equipotential connection</b> A connection that has to be connected to the plant grounding system: This may be a potential equalization line or a star grounding system depending on national or company codes of practice.

### 1.1.3 Tool symbols

Symbol	Meaning	Symbol	Meaning
	Torx screwdriver		Flat blade screwdriver
	Phillips head screwdriver		Allen key
	Open-ended wrench		

### 1.1.4 Symbols for certain types of information

Symbol	Meaning	Symbol	Meaning
	<b>Permitted</b> Procedures, processes or actions that are permitted.		<b>Preferred</b> Procedures, processes or actions that are preferred.
	<b>Forbidden</b> Procedures, processes or actions that are forbidden.		<b>Tip</b> Indicates additional information.
	Reference to documentation		Reference to page
	Reference to graphic	1. 2. 3. ...	Series of steps
	Result of a sequence of actions		Visual inspection

### 1.1.5 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
	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 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

## 2.2 Designated use

### Application and media

The measuring device described in these Instructions is intended only for flow measurement of gases.

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 in applications 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:

- ▶ 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.
- ▶ Check the nameplate to verify if the device ordered can be put to its intended use in the approval-related area (e.g. explosion protection, pressure vessel safety).
- ▶ Use the measuring device only for media against which the process-wetted materials are adequately resistant.
- ▶ If the measuring device is not operated at atmospheric temperature, compliance with the relevant basic conditions specified in the associated device documentation is absolutely essential.
- ▶ 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 of the sensor due to corrosive or abrasive fluids or from environmental 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.

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

The external surface temperature of the housing can increase by max. 20 K due to the power consumption of the electronic components. Hot process fluids passing through the measuring device will further increase the surface temperature of the housing. The surface of the sensor, in particular, can reach temperatures which are close to the fluid temperature.

Possible burn hazard due to fluid temperatures!

- ▶ For elevated fluid temperature, ensure protection against contact to prevent burns.

## 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:

- ▶ It is recommended to wear gloves on account of the higher risk of electric shock.

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

## 2.6 IT security

We only provide a warranty 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 device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

# 3 Product description

The device consists of a transmitter and a sensor.

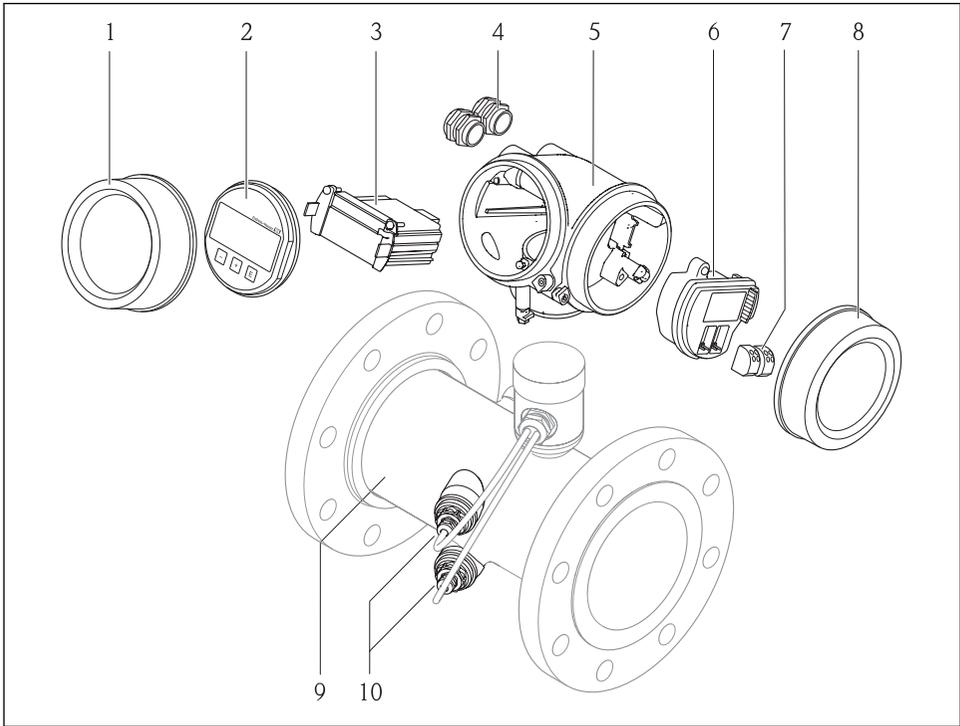
The device is available as a compact version:

The transmitter and sensor form a mechanical unit.



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

### 3.1 Product design



A0016199

#### 1 Important components of a measuring device

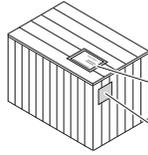
- 1 Electronics compartment cover
- 2 Display module
- 3 Main electronics module
- 4 Cable glands
- 5 Transmitter housing
- 6 I/O electronics module
- 7 Terminals (spring loaded terminals, pluggable)
- 8 Connection compartment cover
- 9 Sensor
- 10 Transducer

## 4 Incoming acceptance and product identification

### 4.1 Incoming acceptance

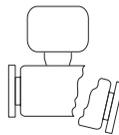
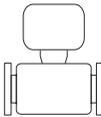
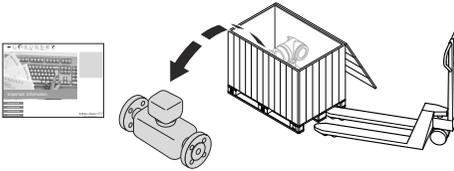


1  
+  
2

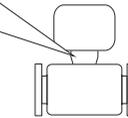
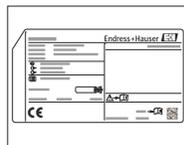


1  
+  
2

Are the order codes on the delivery note (1) and the product sticker (2) identical?



Are the goods undamaged?



Do the nameplate data match the ordering information on the delivery note?



Is the CD-ROM with the Technical Documentation (depends on device version) and documents present?

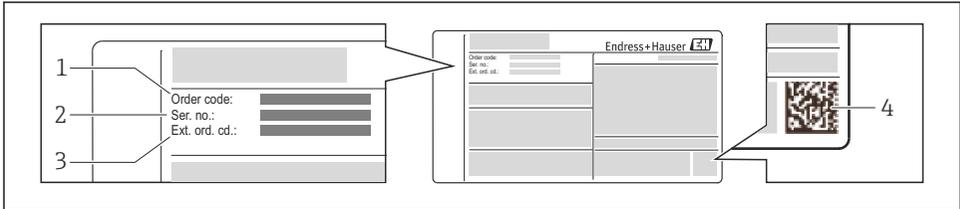


- If one of the conditions is not satisfied, contact your Endress+Hauser Sales Center.
- Depending on the device version, the CD-ROM might not be part of the delivery! The Technical Documentation is available via the Internet or via the *Endress+Hauser Operations App*.

## 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](http://www.endress.com/deviceviewer)): All information about the measuring device is displayed.
- Enter the serial number from the nameplates into the *Endress+Hauser Operations App* or scan the 2-D matrix code (QR code) on the nameplate with the *Endress+Hauser Operations App*: all the information for the measuring device is displayed.



A0021952

### 2 Example of a nameplate

- 1 Order code
- 2 Serial number (Ser. no.)
- 3 Extended order code (Ext. ord. cd.)
- 4 2-D matrix code (QR code)

 For detailed information on the breakdown of the specifications on the nameplate, see the Operating Instructions for the device .

## 5 Storage and transport

### 5.1 Storage conditions

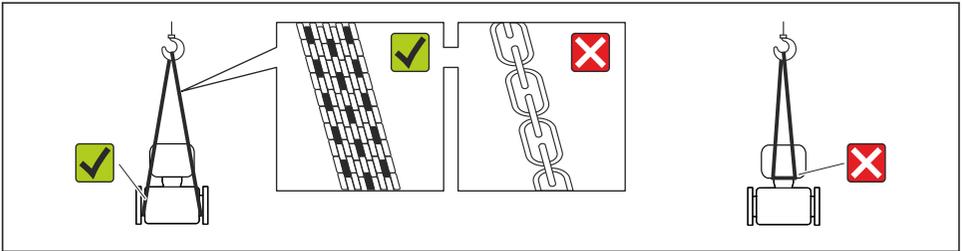
Observe the following notes for storage:

- Store in original packaging.
- Do not remove protective covers or protective caps installed on process connections.
- Protect from direct sunlight.
- Store in a dry and dust-free place.
- Do not store outdoors.

Storage temperature:  $-40$  to  $+80$  °C ( $-40$  to  $+176$  °F),

### 5.2 Transporting the product

Transport the measuring device to the measuring point in the original packaging.



A0015604

**i** Do not remove protective covers or caps installed on process connections. They prevent mechanical damage to the sealing surfaces and contamination in the measuring tube.

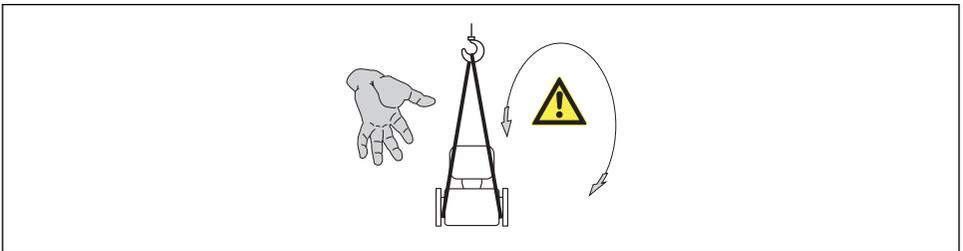
### 5.2.1 Measuring devices without lifting lugs

**⚠ WARNING**

**Center of gravity of the measuring device is higher than the suspension points of the webbing slings.**

Risk of injury if the measuring device slips.

- ▶ Secure the measuring device against slipping or turning.
- ▶ Observe the weight specified on the packaging (stick-on label).



A0015606

### 5.2.2 Measuring devices with lifting lugs

**⚠ CAUTION**

**Special transportation instructions for devices with lifting lugs**

- ▶ Only use the lifting lugs fitted on the device or flanges to transport the device.
- ▶ The device must always be secured at two lifting lugs at least.

### 5.2.3 Transporting with a fork lift

If transporting in wood crates, the floor structure enables the crates to be lifted lengthwise or at both sides using a forklift.

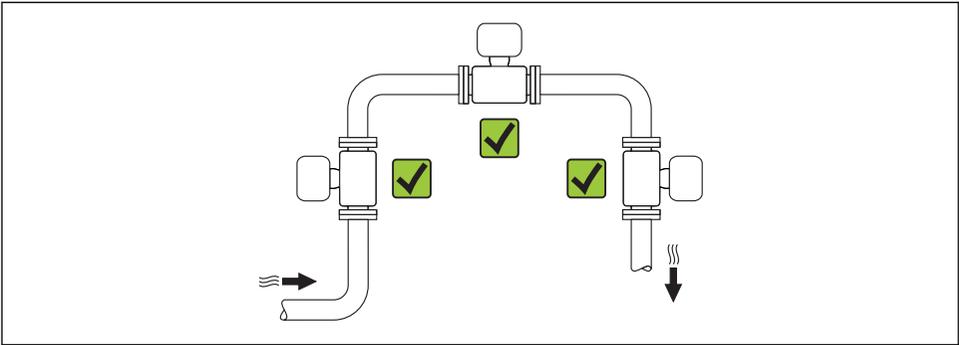
## 6 Installation

### 6.1 Installation conditions

No special measures such as supports are necessary. External forces are absorbed by the construction of the device.

#### 6.1.1 Mounting position

##### Mounting location

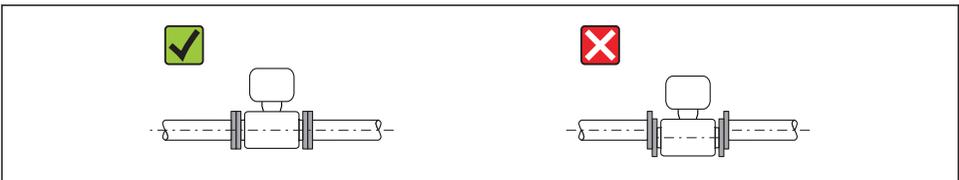


A0015543

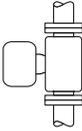
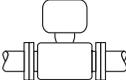
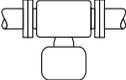
##### Orientation

The direction of the arrow on the sensor helps you to install the sensor according to the flow direction.

**i** Install the measuring device in a parallel plane free of external mechanical stress.

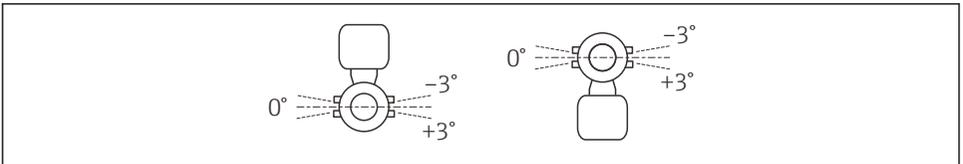


A0015895

Orientation			Compact version
A	Vertical orientation	 A0015545	✓✓
B	Horizontal orientation, transmitter head up *	 A0015589	✓✓
C	Horizontal orientation, transmitter head down *	 A0015590	✓
D	Horizontal orientation, transmitter head at side	 A0015592	✗



\* A maximum deviation of only  $\pm 3^\circ$  is permitted for the horizontal alignment of the converters.



A0016534

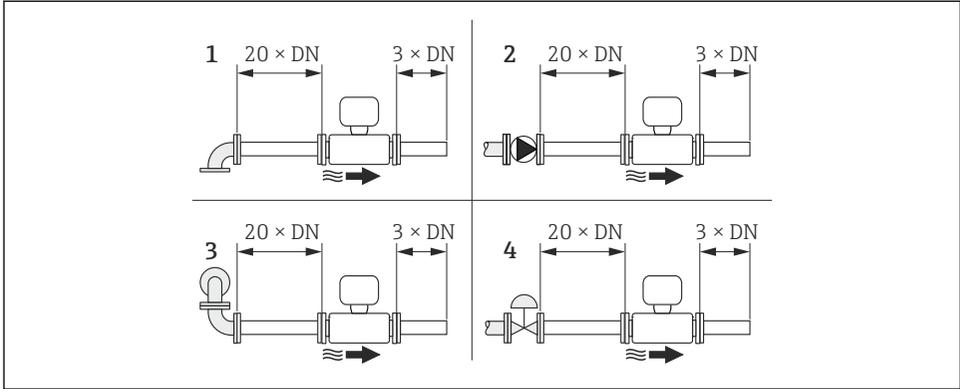
### Inlet and outlet runs

If possible, the sensor should be installed upstream from valves, T-pieces, elbows etc. To attain the specified level of accuracy of the measuring device, the below mentioned inlet and outlet runs must be maintained at minimum. If there are several flow disturbances present, the longest specified inlet run must be maintained.



For the dimensions and installation lengths of the device, see the "Technical Information" document, "Mechanical construction" section

Single-path version: DN 50 (2"), DN 80 (3")

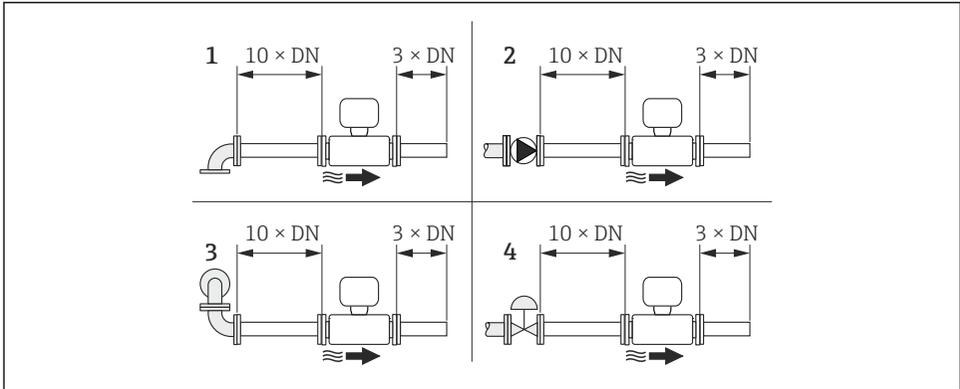


A0015453

3 Single-path version: minimum inlet and outlet runs with various flow obstructions

- 1 90° elbow or T-section
- 2 Pump
- 3 2 × 90° elbow, 3-dimensional
- 4 Control valve

Two-path version: DN 100 to 200 (4 to 8")



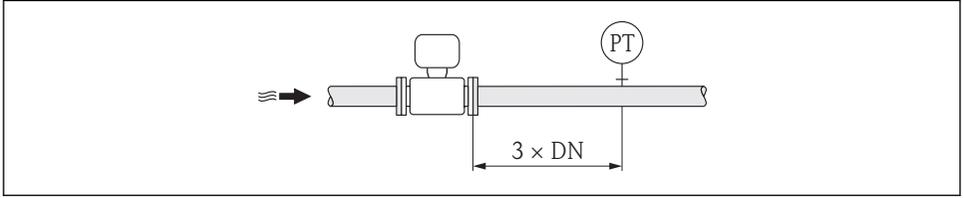
A0015553

4 Two-path version: minimum inlet and outlet runs with various flow obstructions

- 1 90° elbow or T-section
- 2 Pump
- 3 2 × 90° elbow, 3-dimensional
- 4 Control valve

### Outlet runs when installing external devices

If installing an external device, observe the specified distance.



A0015901

PT Pressure transmitter

## 6.1.2 Requirements from environment and process

### Ambient temperature range

Transmitter	-40 to +60 °C (-40 to +140 °F)
Local display	-20 to +60 °C (-4 to +140 °F), the readability of the display may be impaired at temperatures outside the temperature range.
Sensor	<ul style="list-style-type: none"> <li>■ Flange material carbon steel: -10 to +60 °C (+14 to +140 °F)</li> <li>■ Flange material stainless steel: -40 to +60 °C (-40 to +140 °F)</li> <li>■ Version without flange: -40 to +60 °C (-40 to +140 °F)</li> </ul>

#### ► If operating outdoors:

Avoid direct sunlight, particularly in warm climatic regions.

### System pressure

#### Sensor

Max. 10 bar (145 psi)

### Thermal insulation

For optimum temperature and methane fraction measurement (order characteristic for "Sensor version", option 2 "Volume flow + Biogas analysis"), make sure that heat is neither lost nor applied to the sensor. Thermal insulation can ensure that such heat transfer does not take place.

Thermal insulation is particularly recommended in situations where there is a large difference between the process temperature and the ambient temperature. This can result in heat convection errors during temperature measurement. A further factor which can lead to measurement errors due to heat convection is a low flow velocity.

## 6.2 Mounting the measuring device

### 6.2.1 Required tools

#### For transmitter

- For turning the transmitter housing: Open-ended wrench 8 mm
- For opening the securing clamps: Allen key 3 mm

#### For sensor

For flanges and other process connections: Corresponding mounting tools

### 6.2.2 Preparing the measuring device

1. Remove all remaining transport packaging.
2. Remove any protective covers or protective caps present from the sensor.
3. Remove stick-on label on the electronics compartment cover.

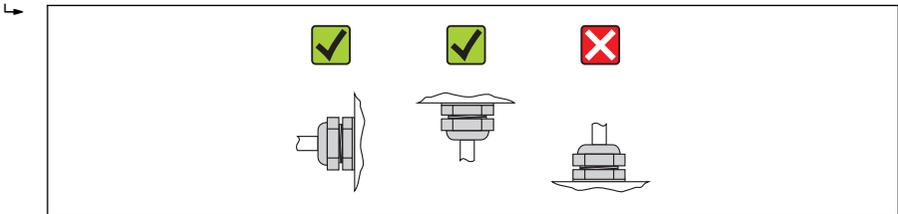
### 6.2.3 Mounting the measuring device

#### **⚠ WARNING**

#### **Danger due to improper process sealing!**

- ▶ Ensure that the inside diameters of the gaskets are greater than or equal to that of the process connections and piping.
- ▶ Ensure that the gaskets are clean and undamaged.
- ▶ Install the gaskets correctly.

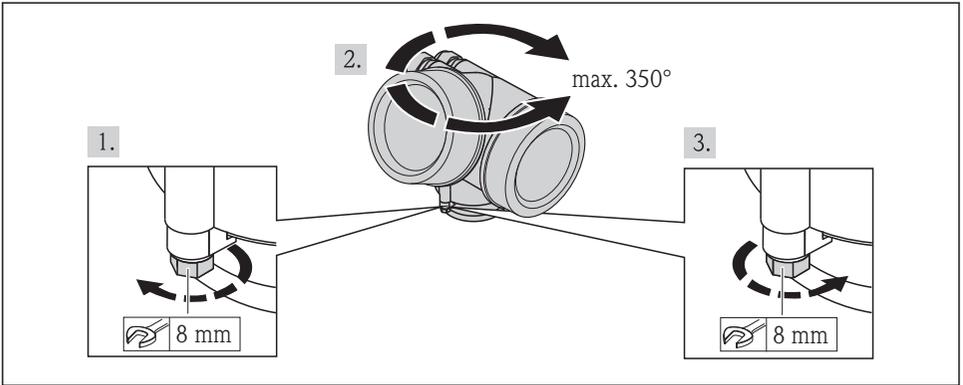
1. Ensure that the direction of the arrow on the sensor matches the flow direction of the medium.
2. Install the measuring device or turn the transmitter housing so that the cable entries do not point upwards.



A0013964

### 6.2.4 Turning the transmitter housing

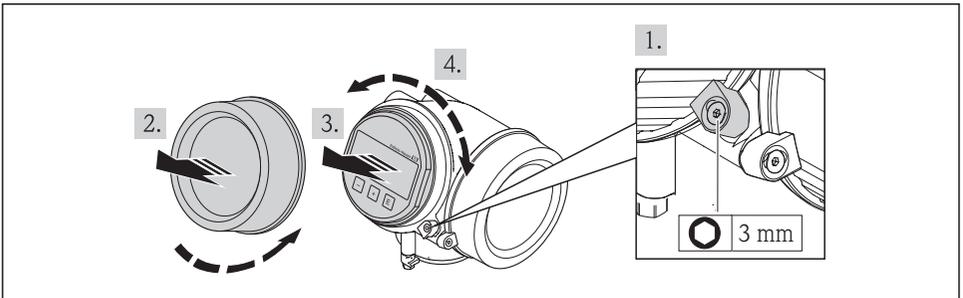
To provide easier access to the connection compartment or display module, the transmitter housing can be turned.



A0013713

### 6.2.5 Turning the display module

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



A0013905

## 6.3 Post-mounting check

Is the device undamaged (visual inspection)?	<input type="checkbox"/>
Does the measuring device conform to the measuring point specifications? For example: <ul style="list-style-type: none"> <li>▪ Process temperature</li> <li>▪ Process pressure (refer to the section on "Pressure-temperature ratings" in the "Technical Information" document on the CD-ROM provided)</li> <li>▪ Ambient temperature range → 15</li> <li>▪ Measuring range</li> </ul>	<input type="checkbox"/>
Has the correct orientation for the sensor been selected → 12? <ul style="list-style-type: none"> <li>▪ According to sensor type</li> <li>▪ According to medium temperature</li> <li>▪ According to medium properties (outgassing, with entrained solids)</li> </ul>	<input type="checkbox"/>
Does the arrow on the sensor match the direction of flow of the medium through the piping → 12?	<input type="checkbox"/>

---

Are the measuring point identification and labeling correct (visual inspection)?	<input type="checkbox"/>
Is the device adequately protected from precipitation and direct sunlight?	<input type="checkbox"/>
Are the securing screw and securing clamp tightened securely?	<input type="checkbox"/>

## 7 Electrical connection



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.

### 7.1 Connection conditions

#### 7.1.1 Required tools

- For cable entries: Use corresponding tools
- For securing clamp: Allen key 3 mm
- Wire stripper
- When using stranded cables: crimping tool for ferrule
- For removing cables from terminal: flat blade screwdriver  $\leq 3$  mm (0.12 in)

#### 7.1.2 Connecting cable requirements

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

#### Electrical safety

In accordance with applicable federal/national regulations.

#### Permitted temperature range

- $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) to  $+80^{\circ}\text{C}$  ( $+176^{\circ}\text{F}$ )
- Minimum requirement: cable temperature range  $\geq$  ambient temperature  $+20$  K

#### Signal cable

##### *Current output*

- For 4-20 mA: standard installation cable is sufficient.
- For 4-20 mA HART: Shielded cable recommended. Observe grounding concept of the plant.

##### *Pulse/frequency/switch output*

Standard installation cable is sufficient.

##### *Current input*

Standard installation cable is sufficient.

#### Cable diameter

- Cable glands supplied:  
M20  $\times$  1.5 with cable  $\phi$  6 to 12 mm (0.24 to 0.47 in)
- Plug-in spring terminals for device version without integrated overvoltage protection: wire cross-sections 0.5 to 2.5 mm<sup>2</sup> (20 to 14 AWG)
- Screw terminals for device version with integrated overvoltage protection: wire cross-sections 0.2 to 2.5 mm<sup>2</sup> (24 to 14 AWG)

### 7.1.3 Terminal assignment

#### Transmitter

##### Connection versions

<p style="text-align: center;">3      2      1      4</p> <p style="text-align: center;">A0020738</p>	<p style="text-align: center;">3      2      1      4</p> <p style="text-align: center;">A0020739</p>
<p><i>Maximum number of terminals</i>                  Terminals 1 to 6:                  Without integrated overvoltage protection</p>	<p><i>Maximum number of terminals for order code for "Accessory mounted", option NA "Overvoltage protection"</i></p> <ul style="list-style-type: none"> <li>■ Terminals 1 to 4:                      With integrated overvoltage protection</li> <li>■ Terminals 5 to 6:                      Without integrated overvoltage protection</li> </ul>
<p>1    Output 1 (passive): supply voltage and signal transmission                  2    Output 2 (passive): supply voltage and signal transmission                  3    Input (passive): supply voltage and signal transmission                  4    Ground terminal for cable shield</p>	

Order code for "Output"	Terminal numbers					
	Output 1		Output 2		Input	
	1 (+)	2 (-)	3 (+)	4 (-)	5 (+)	6 (-)
Option A	4-20 mA HART (passive)		-		-	
Option B <sup>1)</sup>	4-20 mA HART (passive)		Pulse/frequency/switch output (passive)		-	
Option C <sup>1)</sup>	4-20 mA HART (passive)		4-20 mA analog (passive)		-	
Option D <sup>1) 2)</sup>	4-20 mA HART (passive)		Pulse/frequency/switch output (passive)		4-20 mA current input (passive)	

- 1) Output 1 must always be used; output 2 is optional.  
 2) The integrated overvoltage protection is not used with option D: Terminals 5 and 6 (current input) are not protected against overvoltage.

### 7.1.4 Requirements for the supply unit

#### Supply voltage

##### Transmitter

Order code for "Output"	Minimum terminal voltage	Maximum terminal voltage
Option A <sup>1) 2)</sup> : 4-20 mA HART	<ul style="list-style-type: none"> <li>■ For 4 mA: ≥ DC 16 V</li> <li>■ For 20 mA: ≥ DC 12 V</li> </ul>	DC 35 V
Option B : 4-20 mA HART, pulse/frequency/switch output	<ul style="list-style-type: none"> <li>■ For 4 mA: ≥ DC 16 V</li> <li>■ For 20 mA: ≥ DC 12 V</li> </ul>	DC 35 V
Option C : 4-20 mA HART + 4-20 mA analog	<ul style="list-style-type: none"> <li>■ For 4 mA: ≥ DC 16 V</li> <li>■ For 20 mA: ≥ DC 12 V</li> </ul>	DC 30 V
Option D: 4-20 mA HART, pulse/frequency/switch output, 4-20 mA current input <sup>3)</sup>	≥ DC 12 V	DC 35 V

- 1) External supply voltage of the power supply unit with load.
- 2) For device versions with SDO3 local display: The terminal voltage must be increased by DC 2 V if backlighting is used.
- 3) Voltage drop 2.2 to 3 V for 3.59 to 22 mA

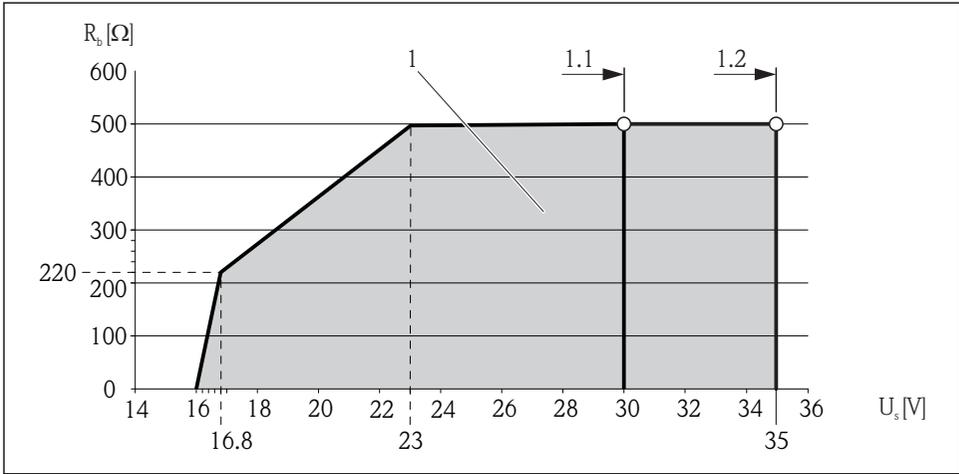
#### Load

Load for current output: 0 to 500 Ω, depending on the external supply voltage of the power supply unit

##### Calculation of the maximum load

Depending on the supply voltage of the power supply unit ( $U_S$ ), the maximum load ( $R_B$ ) including line resistance must be observed to ensure adequate terminal voltage at the device. In doing so, observe the minimum terminal voltage

- For  $U_S = 16.0$  to  $16.8$  V:  $R_B \leq (U_S - 16.0 \text{ V}): 0.0036 \text{ A}$
- For  $U_S = 16.8$  to  $23.0$  V:  $R_B \leq (U_S - 12.0 \text{ V}): 0.022 \text{ A}$
- For  $U_S = 23.0$  to  $30.0$  V:  $R_B \leq 500 \Omega$



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### 1 Operating range

1.1 For order code for "Output", option A "4-20 mA HART"/option B "4-20 mA HART, pulse/frequency/switch output" with Ex i and option C "4-20 mA HART + 4-20 mA analog"

1.2 For order code for "Output", option A "4-20 mA HART"/option B "4-20 mA HART, pulse/frequency/switch output" with non-Ex and Ex d

## Sample calculation

Supply voltage of the power supply unit:  $U_S = 17.5 \text{ V}$

Maximum load:  $R_B \leq (17.5 \text{ V} - 12.0 \text{ V}) : 0.022 \text{ A} = 250 \Omega$

### 7.1.5 Preparing the measuring device

1. Remove dummy plug if present.

2. **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.

If measuring device is delivered without cable glands:

Provide suitable cable gland for corresponding connecting cable .

3. If measuring device is delivered with cable glands:

Observe cable specification .

## 7.2 Connecting the measuring device

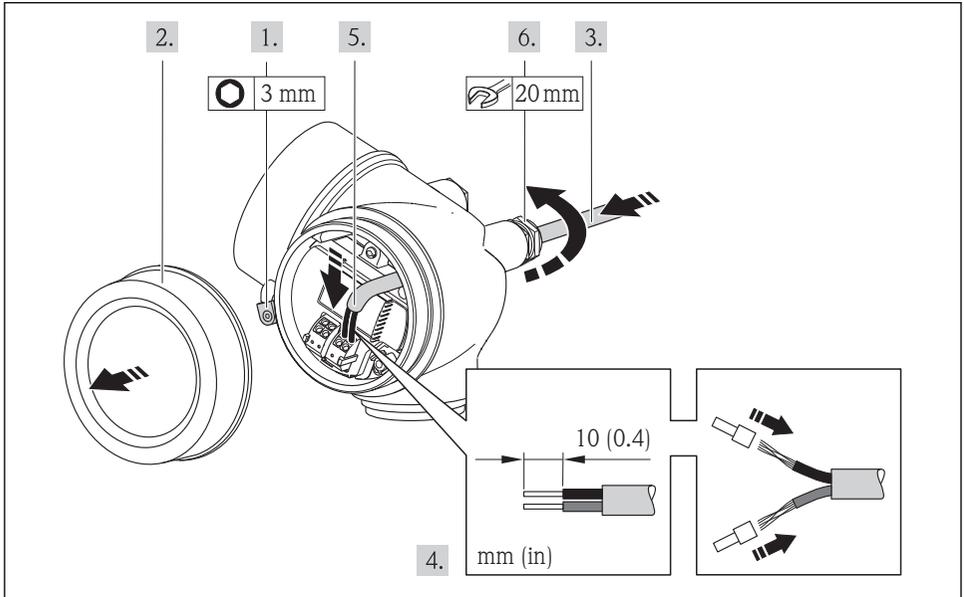
**NOTICE**

### Limitation of electrical safety due to incorrect connection!

► For use in potentially explosive atmospheres, observe the information in the device-specific Ex documentation.

## 7.2.1 Connecting the transmitter

### Connection via terminals



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- ▶ Connect the cable in accordance with the terminal assignment . For HART communication: when connecting the cable shielding to the ground terminal, observe the grounding concept of the facility.

## 7.2.2 Ensuring potential equalization

### 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).

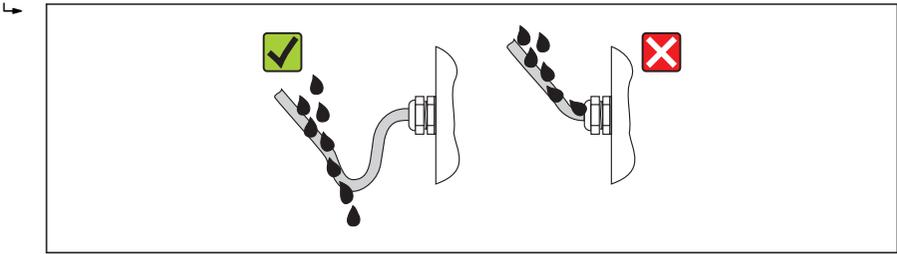
## 7.3 Ensuring the degree of protection

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. Dry, clean or replace the seals if necessary.
2. Tighten all housing screws and screw covers.

3. Firmly tighten the cable glands.
4. To ensure that moisture does not enter the cable entry, route the cable so that it loops down before the cable entry ("water trap").



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5. Insert dummy plugs into unused cable entries.

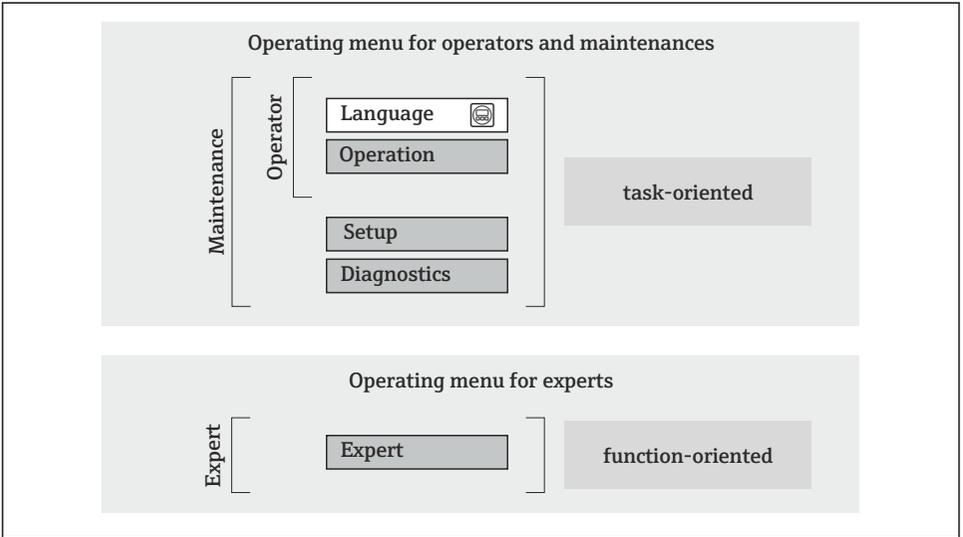
## 7.4 Post-connection check

Are cables or the device undamaged (visual inspection)?	<input type="checkbox"/>
Do the cables comply with the requirements ?	<input type="checkbox"/>
Do the cables have adequate strain relief?	<input type="checkbox"/>
Are all the cable glands installed, firmly tightened and leak-tight? Cable run with "water trap" → 23 ?	<input type="checkbox"/>
Depending on the device version: are all the device plugs firmly tightened ?	<input type="checkbox"/>
Does the supply voltage match the specifications on the transmitter nameplate ?	<input type="checkbox"/>
Is the terminal assignment correct ?	<input type="checkbox"/>
If supply voltage is present, do values appear on the display module?	<input type="checkbox"/>
Are all housing covers installed and firmly tightened?	<input type="checkbox"/>
Is the securing clamp tightened correctly?	<input type="checkbox"/>

## 8 Operation options

### 8.1 Structure and function of the operating menu

#### 8.1.1 Structure of the operating menu



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5 Schematic structure of the operating menu

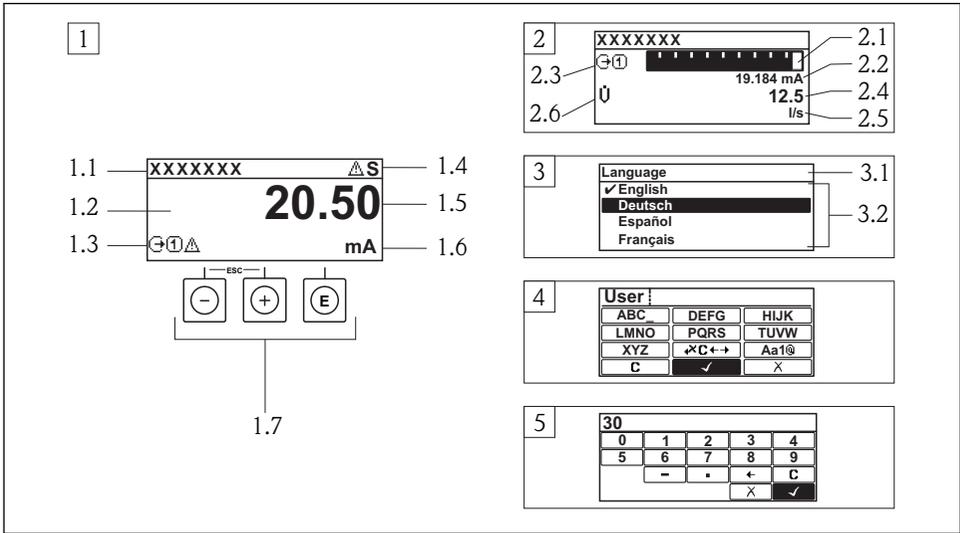
#### 8.1.2 Operating philosophy

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.

## 8.2 Access to the operating menu via the local display



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- 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

## 8.2.1 Operational display

### Status area

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 (the device is locked via the hardware)
- : Communication (communication via remote operation is active)

### Display area

- Measured variables (depending on the device version), e.g.:
  - : Volume flow
  - : Mass flow
  - : Density
  - **G**: Conductivity
  - : Temperature
- : Totalizer (the measurement channel number indicates which totalizer is displayed)
- : Output (the measurement channel number indicates which output is displayed)
- : Input
-  ... : Measurement channel number (if more than one channel is present for the same measured variable type)
- Diagnostic behavior (for a diagnostic event that concerns the displayed measured variable)
  - : Alarm
  - : Warning

## 8.2.2 Navigation view

### Status area

The following appears in the status area of the navigation view in the top right corner:

- Of 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

## Display area

- Icons for menus
  - : Operation
  - : Setup
  - : Diagnostics
  - : Expert
- : Submenus
- : Wizards
- : Parameters within a wizard
- : Parameter locked

### 8.2.3 Editing view

#### Input mask

##### *Operating symbols in the numeric editor*

Key	Meaning	Key	Meaning
	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.		Clears all entered characters.

##### *Operating symbols in the text editor*

Key	Meaning	Key	Meaning
	Confirms selection.		Switches to the selection of the correction tools.
	Exits the input without applying the changes.		Clears all entered characters.
	Toggle <ul style="list-style-type: none"> <li>▪ Between upper-case and lower-case letters</li> <li>▪ For entering numbers</li> <li>▪ For entering special characters</li> </ul>		

##### *Correction symbols under*

Key	Meaning	Key	Meaning
	Clears all entered characters.		Moves the input position one position to the left.
	Moves the input position one position to the right.		Deletes one character immediately to the left of the input position.

## 8.2.4 Operating elements

Keys and meaning
<p> <b>Minus key</b></p> <ul style="list-style-type: none"> <li>▪ <i>In a menu, submenu:</i> Moves the selection bar upwards in a choose list.</li> <li>▪ <i>With a wizard:</i> Confirms the parameter value and goes to the previous parameter.</li> <li>▪ <i>With a text and numeric editor:</i> Moves the selection bar to the left (backwards) in an input screen.</li> </ul>
<p> <b>Plus key</b></p> <ul style="list-style-type: none"> <li>▪ <i>In a menu, submenu:</i> Moves the selection bar downwards in a choose list.</li> <li>▪ <i>With a wizard:</i> Confirms the parameter value and goes to the next parameter.</li> <li>▪ <i>With a text and numeric editor:</i> Moves the selection bar to the right (forwards) in an input screen.</li> </ul>
<p> <b>Enter key</b></p> <p><i>For operational display</i></p> <ul style="list-style-type: none"> <li>▪ Pressing the key briefly opens the operating menu.</li> <li>▪ Pressing the key for 2 s opens the context menu.</li> </ul> <p><i>In a menu, submenu</i></p> <ul style="list-style-type: none"> <li>▪ Pressing the key briefly: <ul style="list-style-type: none"> <li>- Opens the selected menu, submenu or parameter.</li> <li>- Starts the wizard.</li> <li>- If help text is open, closes the help text of the parameter.</li> </ul> </li> <li>▪ Pressing the key for 2 s for parameter: If present, opens the help text for the function of the parameter.</li> </ul> <p><i>With a wizard:</i> Opens the editing view of the parameter.</p> <p><i>With a text and numeric editor:</i></p> <ul style="list-style-type: none"> <li>▪ Pressing the key briefly: <ul style="list-style-type: none"> <li>- Opens the selected group.</li> <li>- Carries out the selected action.</li> </ul> </li> <li>▪ Pressing the key for 2 s confirms the edited parameter value.</li> </ul>
<p>+ <b>Escape key combination (press keys simultaneously)</b></p> <p><i>In a menu, submenu</i></p> <ul style="list-style-type: none"> <li>▪ Pressing the key briefly: <ul style="list-style-type: none"> <li>- Exits the current menu level and takes you to the next higher level.</li> <li>- If help text is open, closes the help text of the parameter.</li> </ul> </li> <li>▪ Pressing the key for 2 s for the parameter: Returns you to the operational display ("home position").</li> </ul> <p><i>With a wizard:</i> Exits the wizard and takes you to the next higher level.</p> <p><i>With a text and numeric editor:</i> Closes the text or numeric editor without applying changes.</p>
<p>+ <b>Minus/Enter key combination (press the keys simultaneously)</b></p> <p>Reduces the contrast (brighter setting).</p>
<p>+ <b>Plus/Enter key combination (press and hold down the keys simultaneously)</b></p> <p>Increases the contrast (darker setting).</p>
<p> +  +  <b>Minus/Plus/Enter key combination (press the keys simultaneously)</b></p> <p><i>For operational display:</i> Enables or disables the keypad lock (only SD02 display module).</p>

### 8.2.5 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

## 8.3 Access to the operating menu via the operating tool

 For detailed information about access to the operating menu via operating tool, refer to the Operating Instructions for the device .

# 9 System integration

 For detailed information on system integration, see the Operating Instructions for the device.

# 10 Commissioning

## 10.1 Function check

Before commissioning the measuring device:

- ▶ Make sure that the post-installation and post-connection checks have been performed.
  - "Post-installation check" checklist →  17
  - "Post-connection check" checklist →  24

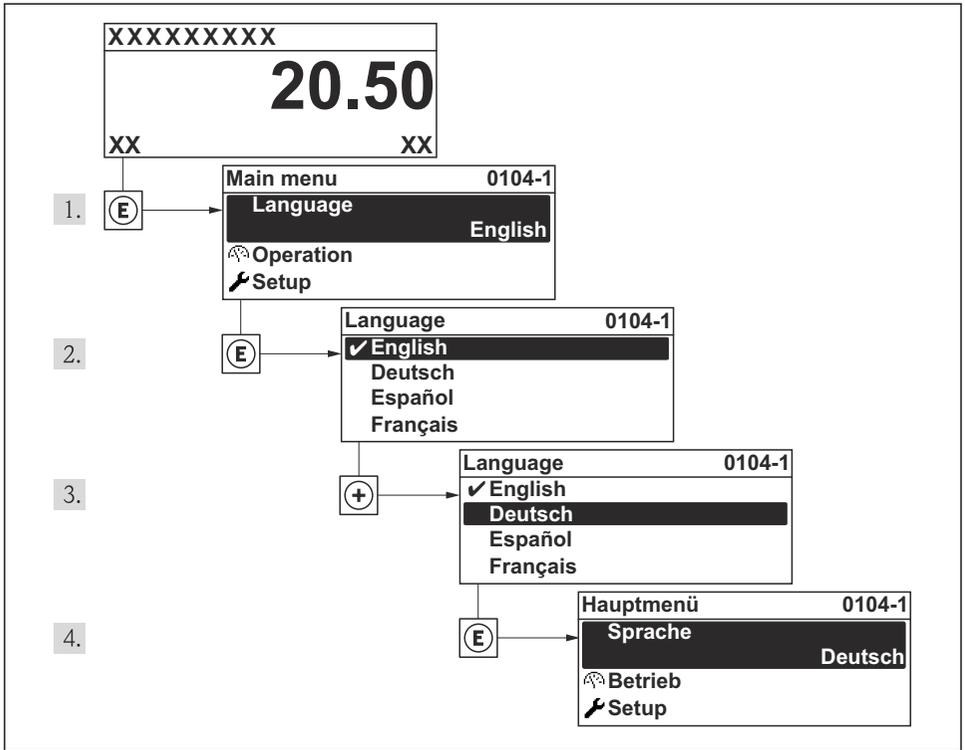
## 10.2 Switching on the measuring device

- ▶ After a successful function check, switch on the measuring device.
  - ↳ After a successful startup, the local display switches automatically from the startup display to the operational display.

 If nothing appears on the local display or a diagnostic message is displayed, refer to the Operating Instructions for the device →  2

## 10.3 Setting the operating language

Factory setting: English or ordered local language



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6 Taking the example of the local display

### 10.4 Configuring the measuring device

The **Setup** menu with its **System units** submenu and various guided wizards enable fast commissioning of the measuring device.

The desired units can be selected in the **System units** submenu. The wizards systematically guide the user through all the parameters required for configuration, such as parameters for measurement or outputs.

 The wizards available in the particular device can vary on account of the device version (e.g. communication method).

Wizard	Meaning
HART input	Configure the HART input
Current output 1 to 2	Set current output 1-2
Pulse-Frequency-Switch output	Configure the selected output type
Analog inputs	Configure the analog inputs

Wizard	Meaning
Display	Configure the measured value display
Output conditioning	Define the output conditioning
Low flow cut off	Set the low flow cut off

## 10.5 Defining the tag name

To enable fast identification of the measuring point within the system, you can enter a unique designation using the **Device tag** parameter and thus change the factory setting.

### Navigation

"Setup" menu → Device tag

### Parameter overview with brief description

Parameter	Description	User entry	Factory setting
Device tag	Enter tag for measuring point.	Max. 32 characters such as letters, numbers or special characters (e.g. @, %, /).	Prosonic Flow

## 10.6 Protecting settings from unauthorized access

The following options exist for protecting the configuration of the measuring device from unintentional modification after commissioning:

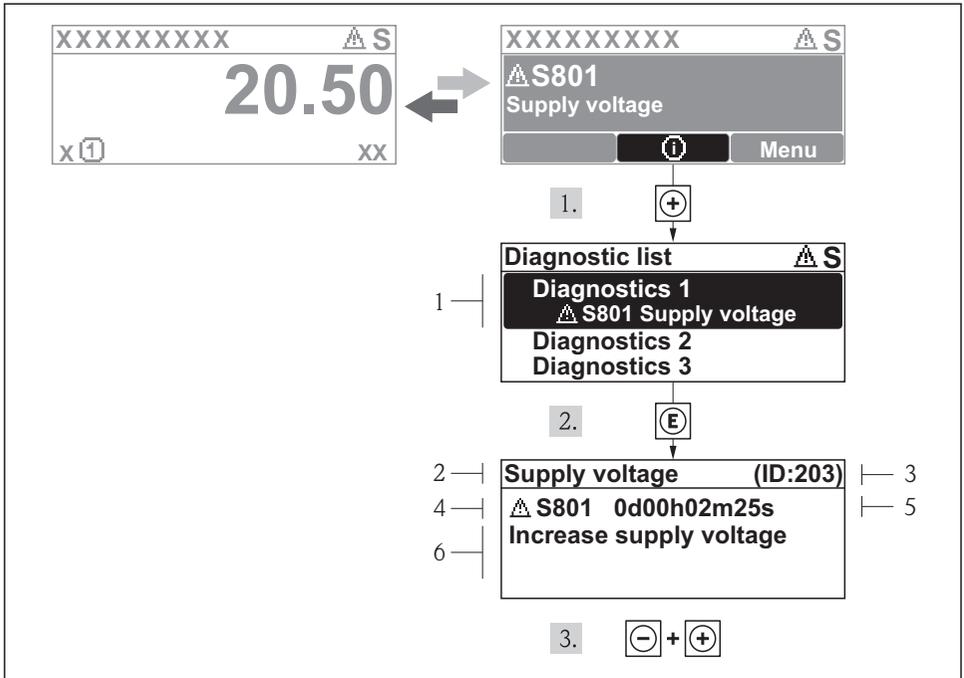
- Write protection via access code
- Write protection via write protection switch
- Write protection via keypad lock



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

## 11 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 on remedial measures can be called up from the diagnostic messages, and contains important information on the fault.



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### 7 Message for 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

The user is in the diagnostic message.

1. Press **+** (ⓘ symbol).
  - ↳ The **Diagnostic list** submenu opens.
2. Select the desired diagnostic event with **+** or **-** and press **E** .
  - ↳ The message for the remedial measures for the selected diagnostic event opens.
3. Press **-** + **+** simultaneously.
  - ↳ The message for the remedial measures closes.





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