



## OPTIFLEX 1100 C Quick Start

Guided Radar (TDR) Level Meter

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### Warnings and symbols used



#### **DANGER!**

*This information refers to the immediate danger when working with electricity.*



#### **DANGER!**

*These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator's plant.*



#### **WARNING!**

*Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator's plant.*



#### **CAUTION!**

*Disregarding these instructions can result in damage to the device or to parts of the operator's plant.*



#### **INFORMATION!**

*These instructions contain important information for the handling of the device.*



#### **HANDLING**

- This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

#### ➔ **RESULT**

This symbol refers to all important consequences of the previous actions.

### Safety instructions for the operator



#### **CAUTION!**

*Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.*



#### **LEGAL NOTICE!**

*The responsibility as to the suitability and intended use of this device rests solely with the user. The supplier assumes no responsibility in the event of improper use by the customer. Improper installation and operation may lead to loss of warranty. In addition, the "Terms and Conditions of Sale" apply which form the basis of the purchase contract.*



#### **INFORMATION!**

- *Further information can be found in the handbook and on the data sheet. These documents can be downloaded from the website (Download Center).*
- *If you need to return the device to the manufacturer or supplier, please fill out the device return form and send it with the device. Unfortunately, the manufacturer cannot repair or inspect the device without the completed form. The form can be found in the handbook or downloaded from the website. Click on the "Service" tab on one of the web pages and read the instructions.*

## 2.1 Ø2 mm / 0.08" single cable probe (liquid applications)

### 2.1.1 Scope of delivery



#### INFORMATION!

Do a check of the packing list to make sure that you have all the elements given in the order.

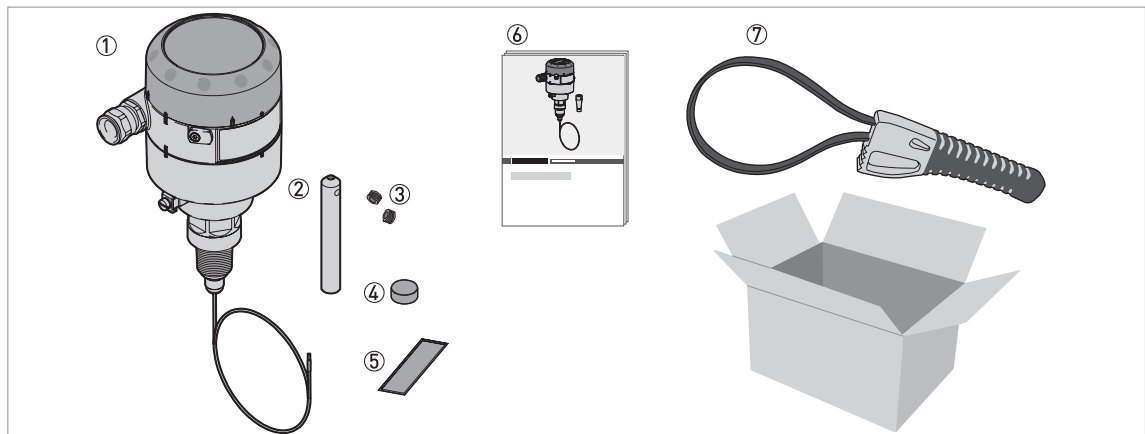


Figure 2-1: Scope of delivery: device with Ø2 mm single cable probe option

- ① Converter, process connection and probe
- ② Counterweight
- ③ 2 HC M6x5 screws for the counterweight
- ④ Probe assembly cover. For more data, refer to *How to turn or remove the signal converter* on page 14.
- ⑤ Sticker: if you adjust the probe length, write the new value on the sticker
- ⑥ Quick Start
- ⑦ Strap wrench

### 2.1.2 How to assemble a single cable probe

#### Adjust the probe length to the tank height

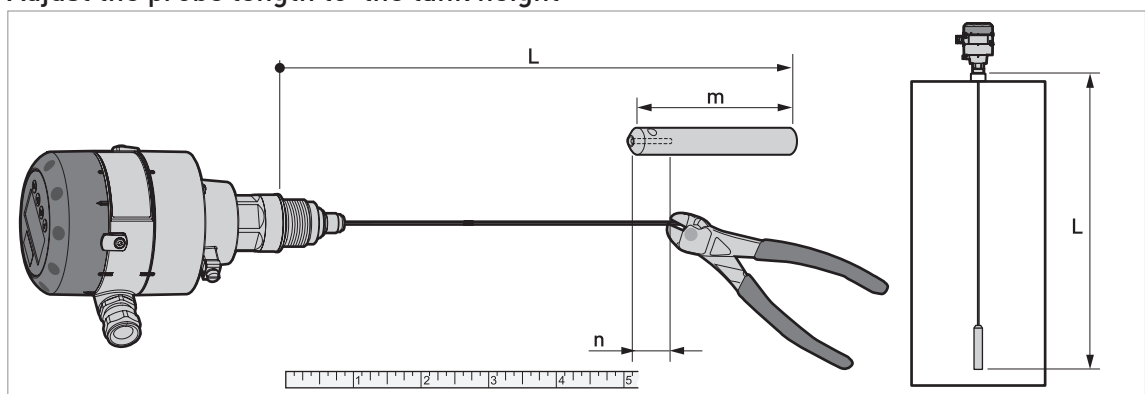


Figure 2-2: How to assemble the Ø2 mm / 0.08" single cable probe: part 1

L = Probe length (thread stop to the bottom of the counterweight)

m = Counterweight length = 100 mm / 4"

n = Cable insertion length = 15 mm / 0.6"

**INFORMATION!**

The single cable probe measures between the top of the counterweight and the thread stop on the process connection.



- Measure the probe.
- ➡ Make sure that you include the length of the counterweight (m) minus the cable insertion length (n).
- Mark the probe length necessary for your application on the cable.
- Cut the cable.

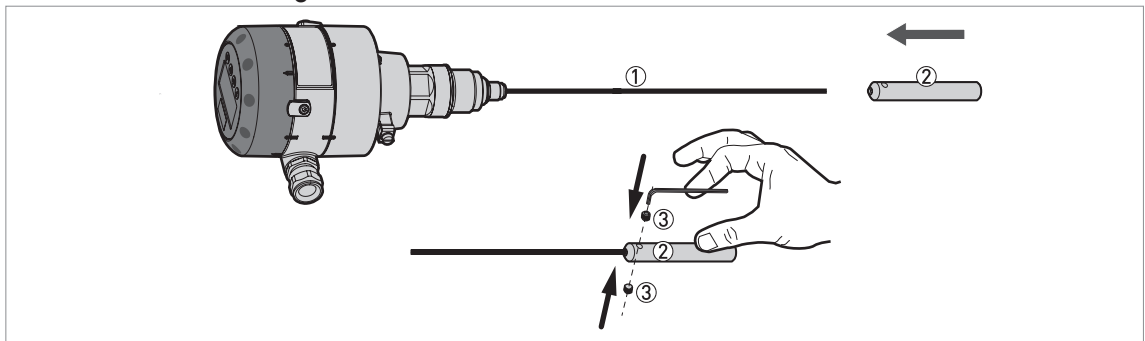
**Attach the counterweight**

Figure 2-3: How to assemble the single cable probe: part 2

- ① Single cable probe
- ② Counterweight
- ③ 2 HC M6x5 lock screws

**CAUTION!**

Make sure the cable is fully engaged in the probe counterweight.



- Attach the counterweight.
- Attach the lock screws to the counterweight. Tighten with a 3 mm Allen wrench.
- ➡ The device is prepared for installation on the tank.

If you decreased the probe length, you must enter the new value in the device configuration menu (NOTE: the device must have the LCD display option or the HMI service tool). For more data, refer to *Quick Setup* on page 16.

## 2.2 Coaxial probe (low-viscosity liquid applications)

### 2.2.1 Scope of delivery



#### **INFORMATION!**

Do a check of the packing list to make sure that you have all the elements given in the order.

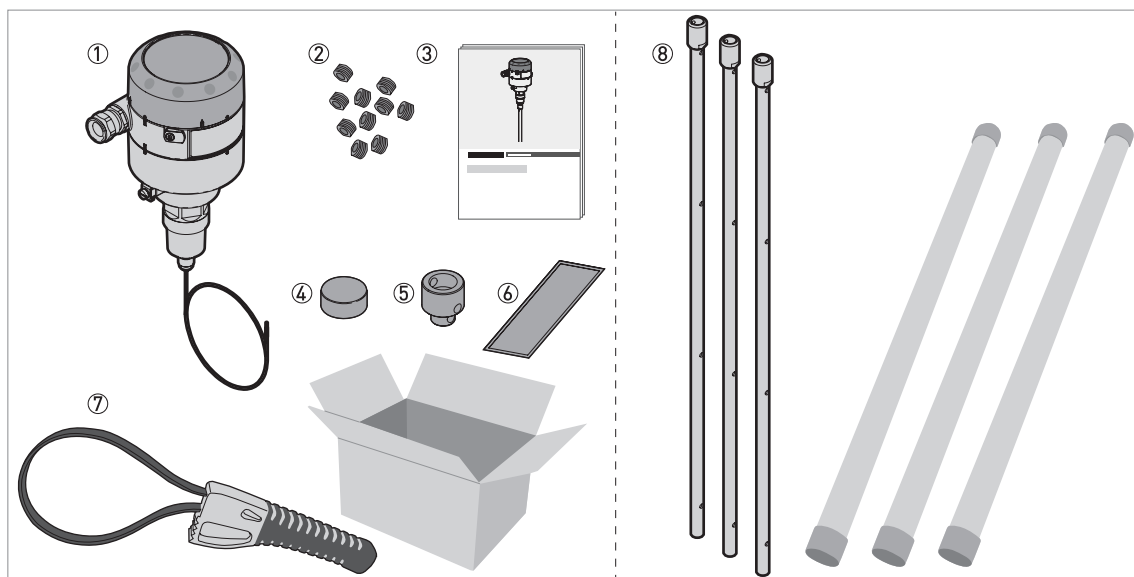


Figure 2-4: Scope of delivery: device with coaxial probe option

- ① Converter, process connection and signal cable
- ② HC M6×5 screws (1 screw per segment of tube, 3 screws for the last segment - supplied in a plastic sachet)
- ③ Quick Start
- ④ Probe assembly cover. For more data, refer to *How to turn or remove the signal converter* on page 14.
- ⑤ Probe end cap
- ⑥ Sticker: if you adjust the probe length, write the new value on the sticker
- ⑦ Strap wrench
- ⑧ Disassembled segments of tube

## 2.2.2 How to assemble the segmented coaxial probe

### Attach the tube segments

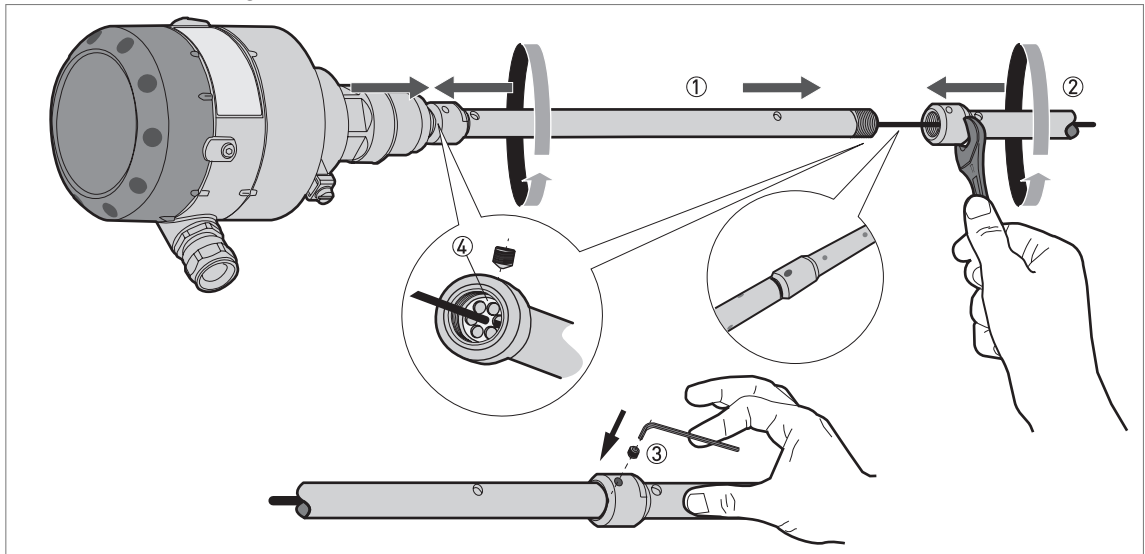


Figure 2-5: How to assemble the segmented coaxial probe: part 1

- ① Top segment of tube
- ② Bottom segment of tube
- ③ 1 HC M6×5 lock screw
- ④ Bonded plastic spacer



#### CAUTION!

- After you tighten the lock screw on each segment of tube, it will not be possible to disassemble the coaxial probe.
- If it is necessary to adjust the probe length, do not attach the lock screw to the last segment of tube!



- Put the signal cable into the first segment of tube. Make sure that the signal cable goes through the center hole in the spacer.
- Attach the first segment of tube to the thread at the top of the signal cable. Tighten with a 17 mm open-end wrench.
- Attach the lock screw to the top of the tube. Tighten with a 3 mm Allen wrench.
- Do these steps again for each segment of tube, but do not attach the lock screw to the last segment of tube.

Adjust the probe length to the tank height

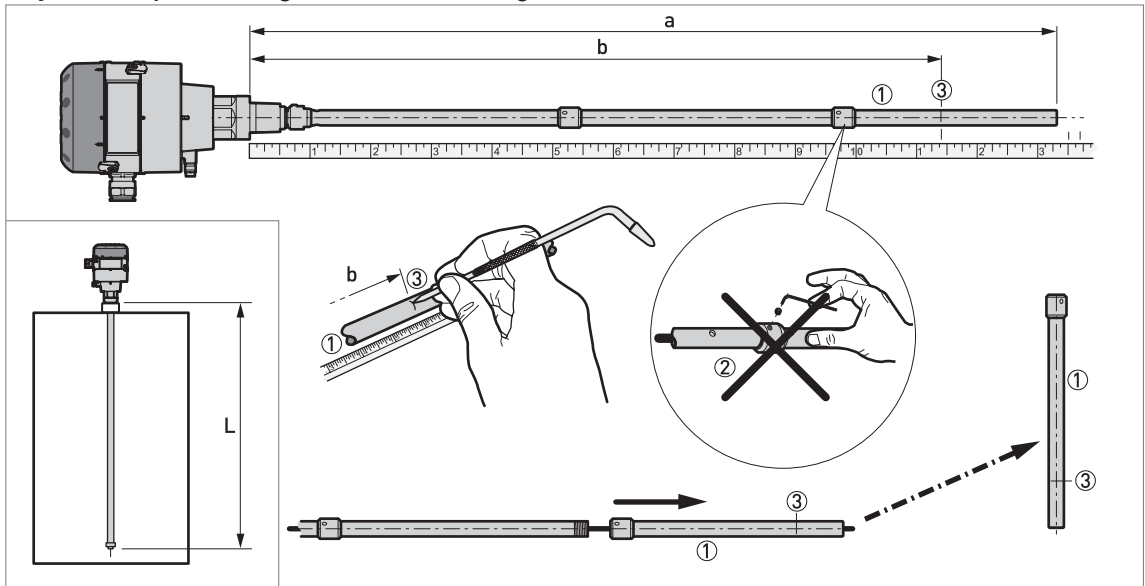


Figure 2-6: How to assemble the segmented coaxial probe: part 2

a = Delivered probe length (with all segments attached, but without the probe end cap)

b = Length of tube needed = total probe length, L - 15 mm / 0.6"

① Coaxial probe: Last segment of the tube

② Do not attach the lock screw to the last segment of tube! Make sure that the coaxial probe is the correct length for the tank.

③ Scriber mark - to cut the tube to the correct length



**CAUTION!**

*If it is necessary to decrease the length of the probe, do not attach the lock screw on the last segment of tube.*

*Make sure the probe is the correct length for the tank. Add the probe end cap length (15 mm / 0.6") to get the total length of the probe.*



- Measure the probe (with all the segments attached).
- Mark the probe length necessary for your application on the tube.
- Remove the last segment of tube.



## Adjust the probe length to the tank height

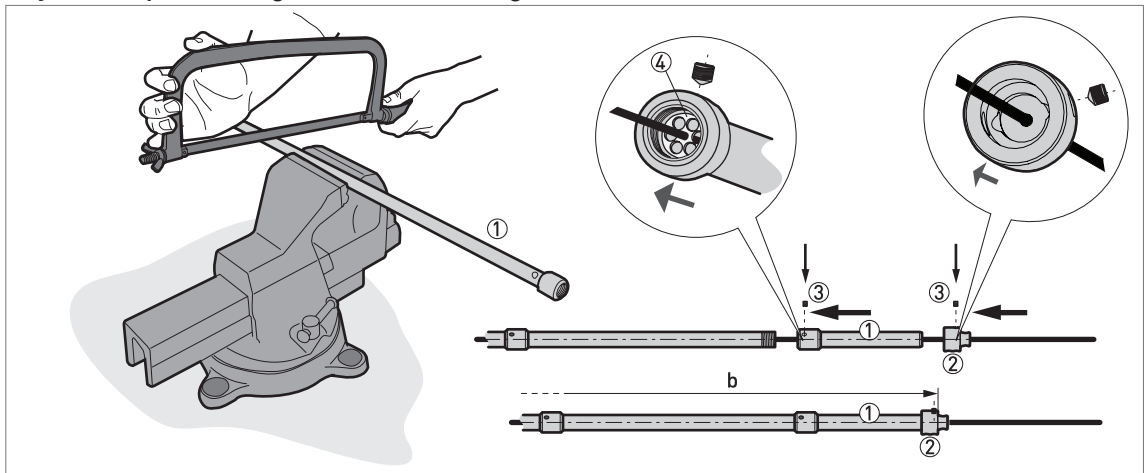


Figure 2-7: How to assemble the segmented coaxial probe

- ① Coaxial probe: Last segment of the tube
- ② Probe end cap
- ③ 1 HC M6×5 lock screw
- ④ Bonded plastic spacer

**CAUTION!**

*Before you cut the tube, disassemble the last segment of tube from the coaxial probe and remove the signal cable.*

*After you tighten the lock screw, it will not be possible to disassemble the coaxial probe.*



- Cut the last segment of tube.
- Attach the last segment of tube.
- Attach the probe end cap ② to the end of the tube. Tighten lock screw ③ with a 3 mm Allen wrench.

Make sure that the tension in the signal cable is correct

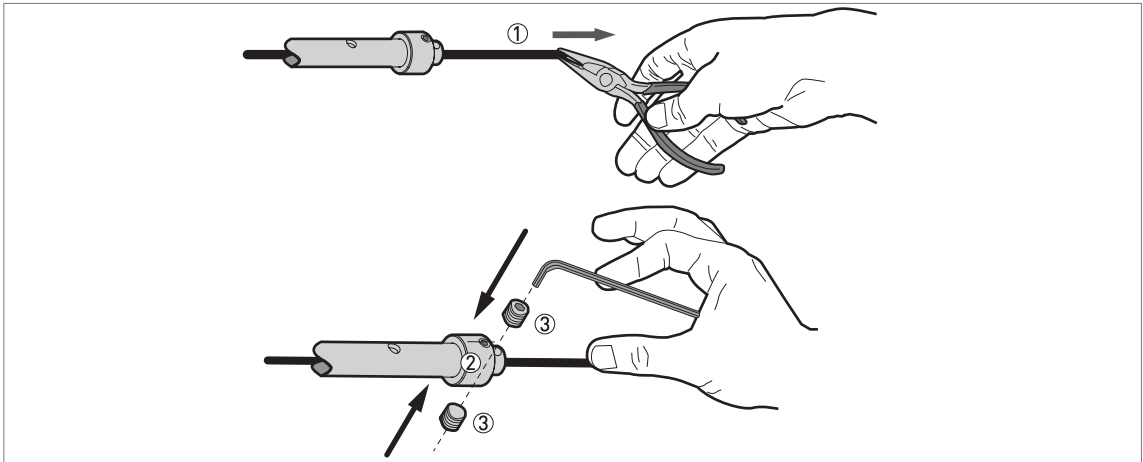


Figure 2-8: How to assemble the segmented coaxial probe: part 4

- ① Coaxial probe: Signal cable
- ② Coaxial probe: Probe end cap
- ③ 2 HC M6x5 screws



- Pull the signal cable from the bottom of the last segment of tube. Apply 10 kgf / 22 lbf.
- Attach the screws for the signal cable to the probe end cap. Tighten with a 3 mm Allen wrench.

Cut the signal cable to the correct length

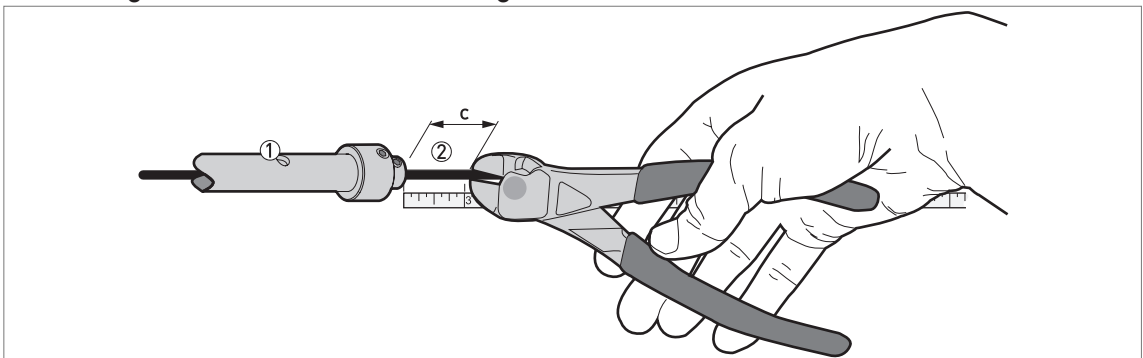


Figure 2-9: How to assemble the segmented coaxial probe: part 5

$c = 20 \text{ mm} / 0.8''$

- ① Coaxial probe: bottom of the last segment of tube
- ② Coaxial probe: signal cable



- Cut the signal cable 20 mm / 0.8" below the last segment of tube.
- ➡ The device is prepared for installation on the tank.

If you decreased the probe length, you must enter the new probe length in the device configuration menu (NOTE: the device must have the LCD display option or the HMI service tool). For more data, refer to *Quick Setup* on page 16.

## 2.3 Ø4 mm / 0.15" single cable probe (solid applications)

### 2.3.1 Scope of delivery



**INFORMATION!**

Do a check of the packing list to make sure that you have all the elements given in the order.

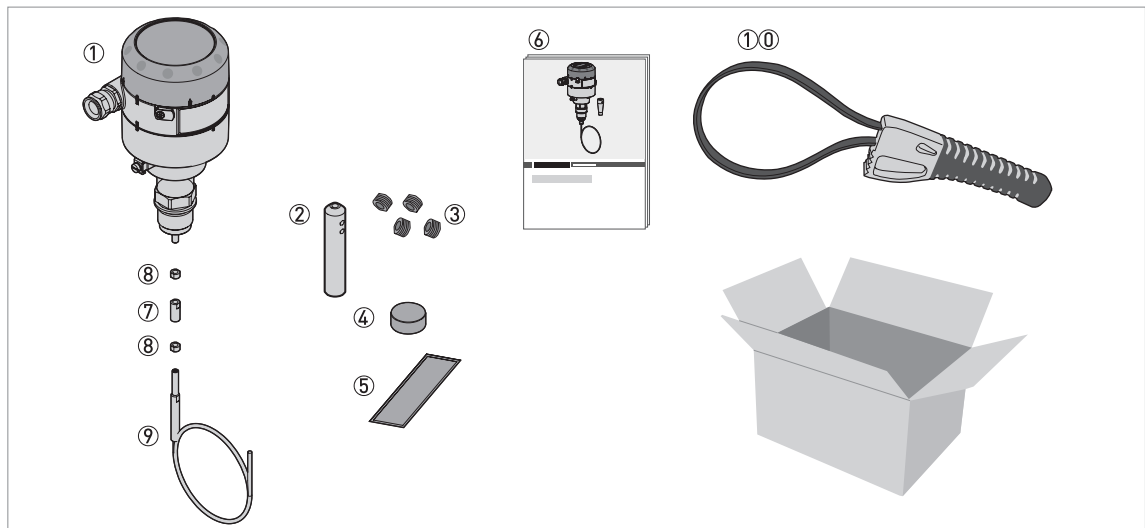


Figure 2-10: Scope of delivery: device with Ø4 mm single cable probe option

- ① Converter and process connection
- ② Counterweight
- ③ 4 HC M6×5 screws for the counterweight
- ④ Probe assembly cover. For more data, refer to *How to turn or remove the signal converter* on page 14.
- ⑤ Sticker: if you adjust the probe length, write the new value on the sticker
- ⑥ Quick Start
- ⑦ Union nut
- ⑧ 2 lock nuts
- ⑨ Probe
- ⑩ Strap wrench

## 2.3.2 How to assemble a single cable probe

## Attach the probe to the converter

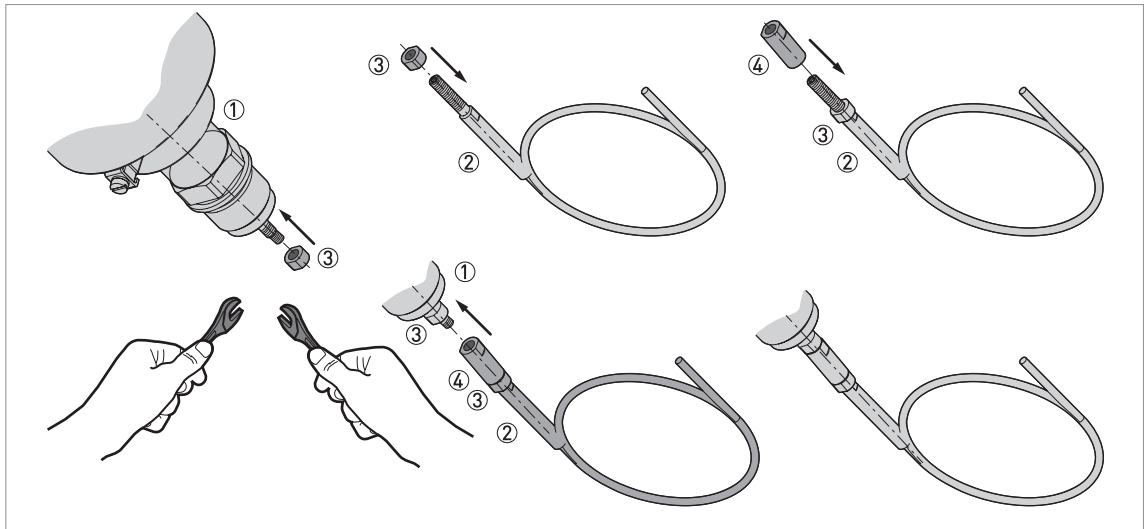


Figure 2-11: How to assemble the Ø4 mm / 0.15" single cable probe: part 1

- ① Converter and process connection
- ② Probe
- ③ Lock nut
- ④ Union nut



- Attach a lock nut ③ to the fitting below the process connection ①.
- Attach a lock nut ③ to the fitting at the top of the probe ②.
- Attach the union nut ④ to the fitting at the top of the probe. Use two 8 mm wrenches to tighten the lock nut and union nut.
- Use the union nut to attach the probe to the fitting below the process connection. Use two 8 mm wrenches to tighten the top lock nut and union nut.

### Adjust the probe length to the tank height

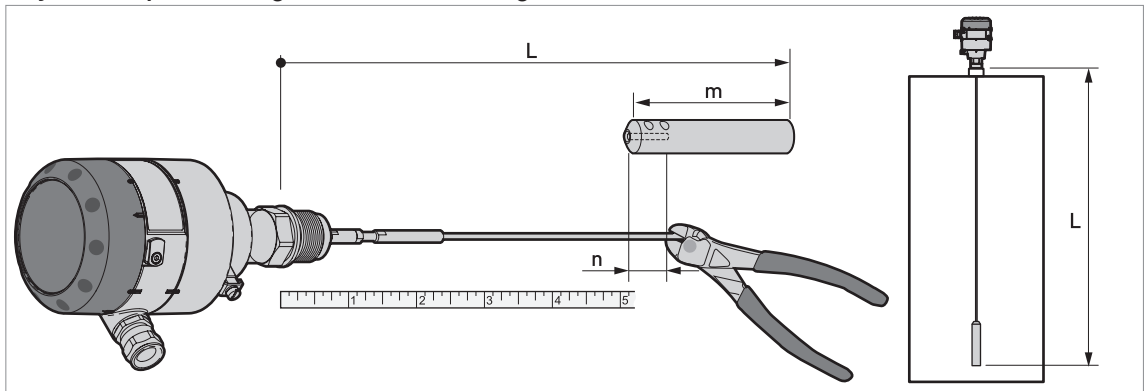


Figure 2-12: How to assemble the Ø4 mm / 0.15" single cable probe: part 2

L = Probe length (thread stop to the bottom of the counterweight)

m = Counterweight length = 100 mm / 4"

n = Cable insertion length = 36 mm / 1.4"



- Measure the probe.
- ➔ Make sure that you include the length of the counterweight (m) minus the cable insertion length (n).
- Mark the probe length necessary for your application on the cable.
- Cut the cable.

### Attach the counterweight

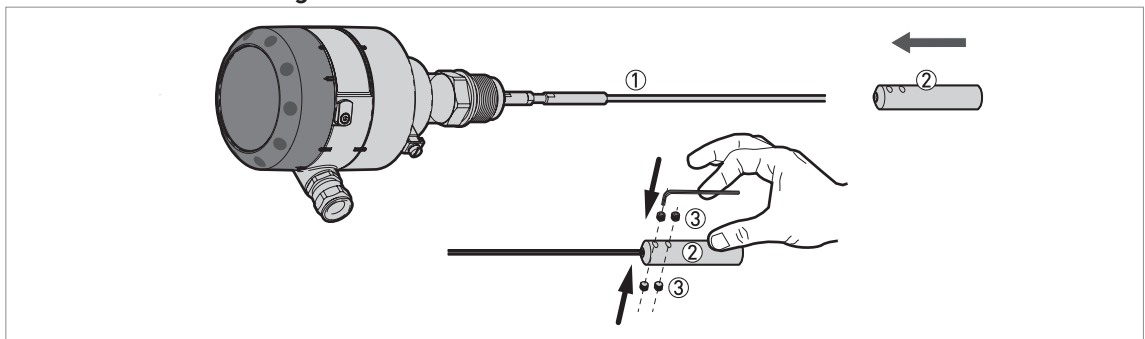


Figure 2-13: How to assemble the Ø4 mm / 0.15" single cable probe: part 3

① Single cable probe

② Counterweight

③ 4 HC M6x5 lock screws



#### CAUTION!

Make sure the cable is fully engaged in the probe counterweight.



- Attach the counterweight.
- Attach the lock screws to the counterweight. Tighten with a 3 mm Allen wrench.
- ➔ The device is prepared for installation on the tank.

If you decreased the probe length, you must enter the new probe length in the device configuration menu (NOTE: the device must have the LCD display option or the HMI service tool). For more data, refer to *Quick Setup* on page 16.

## 2.4 How to install a device with a threaded connection

### Equipment needed:

- Gasket (not supplied with G (ISO 228) threaded connections)
- 34 mm wrench (not supplied)

## 2.5 How to turn or remove the signal converter

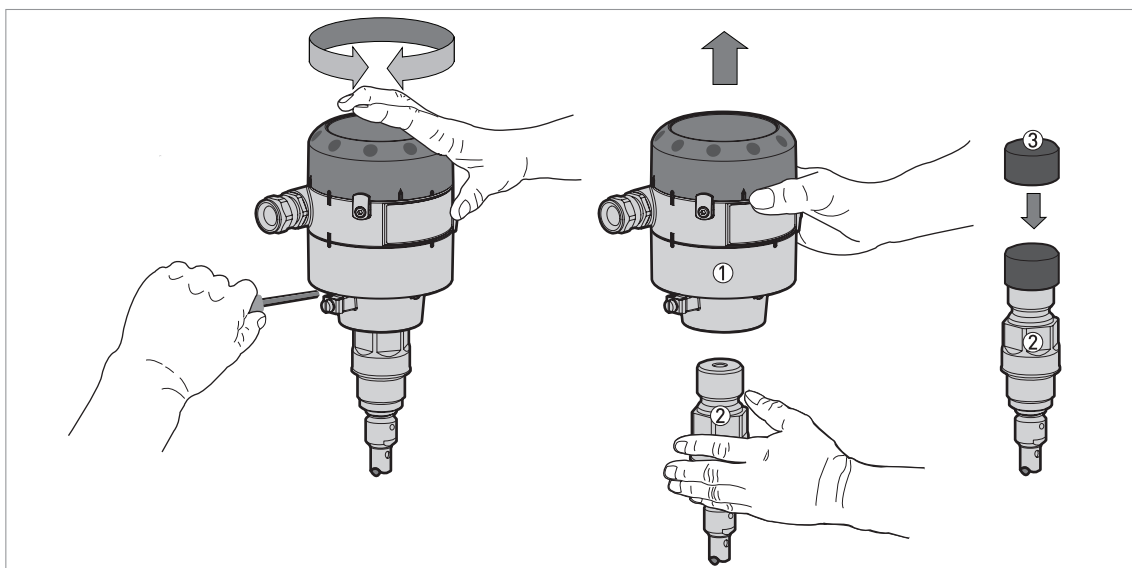


Figure 2-14: How to turn or remove the signal converter

- ① Signal converter
- ② Process connection and probe assembly
- ③ Cover for the coaxial hole on top of the process connection assembly



### CAUTION!

When the housing is attached to the process connection assembly, make sure that the lock screw is tight.



### How to remove the signal converter

- Loosen the lock screw with a 5 mm wrench.
- Remove the signal converter from the probe assembly.
- Put the cover ③ on the probe assembly.

### 3.1 Electrical installation: 2-wire, loop-powered

#### Open the terminal compartment cover

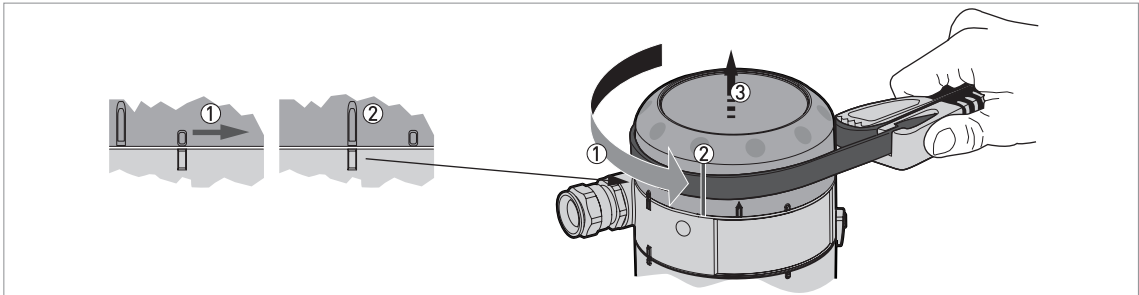


Figure 3-1: How to open the terminal compartment cover



- Turn the cover counterclockwise with a strap wrench.
- Remove the cover.

#### Connect the device to the electrical circuit

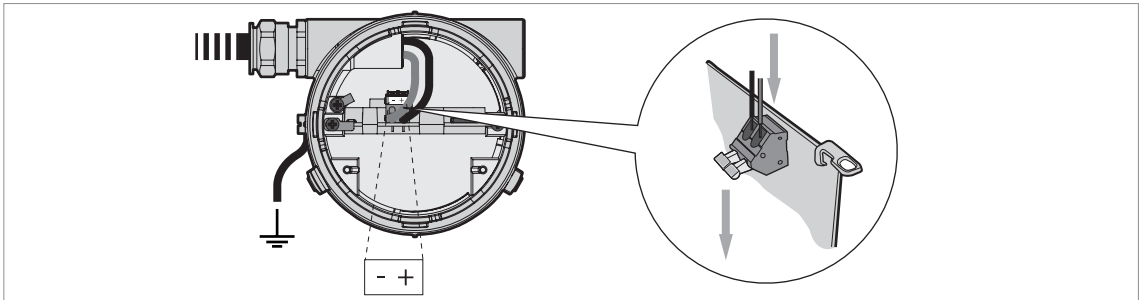


Figure 3-2: How to connect the device to the electrical circuit



#### **WARNING!**

*If you do not push the wires away from the cover thread when you attach display unit to the signal converter, there is a risk of damage to the wires.*



#### **INFORMATION!**

*Use a 14...30 VDC power supply to energize the device.*

#### Close the terminal compartment cover

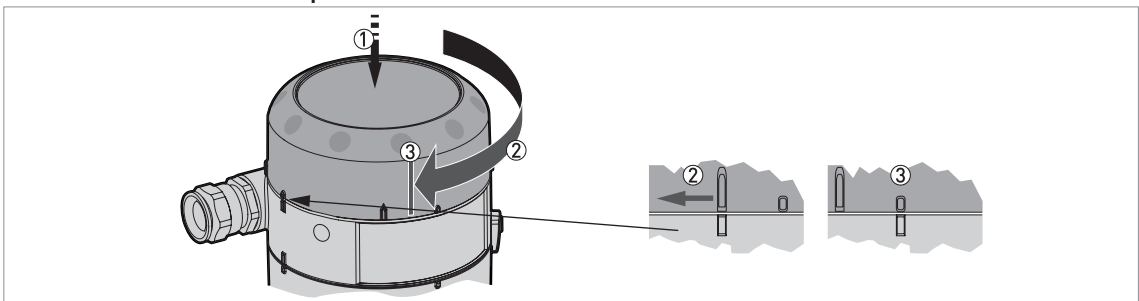


Figure 3-3: How to close the terminal compartment cover



- Attach the cover.
- Turn the cover clockwise.

### 4.1 General notes

For more data about device configuration, refer to the handbook.

### 4.2 Digital display screen (option)

Display screen

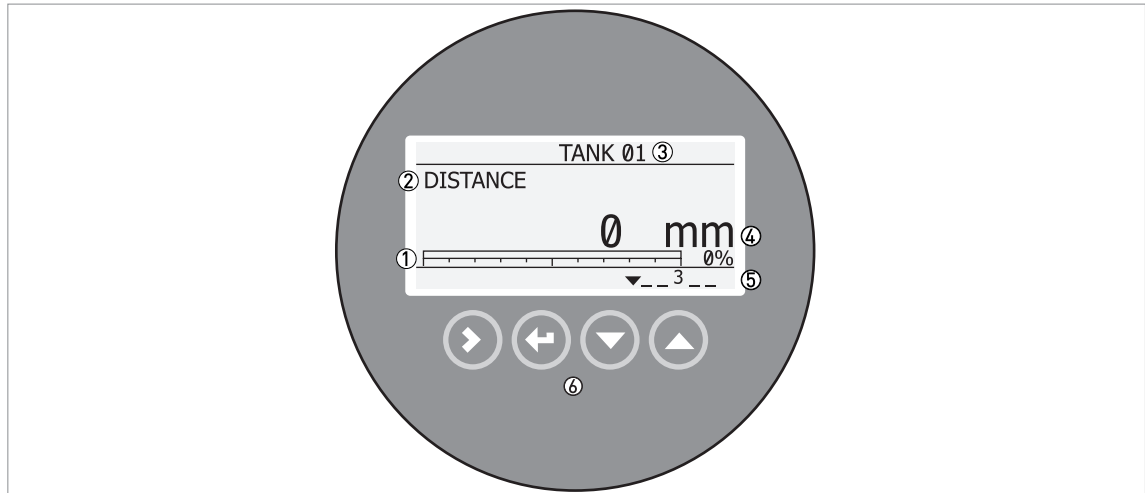


Figure 4-1: Default screen

- ① Current output percentage (bar graph and text - only shown if the output function is the same as the measurement name on the screen in normal mode)
- ② Measurement name (in this example, distance)
- ③ Device tag name
- ④ Measurement value and units
- ⑤ Device status (markers)
- ⑥ Keypad buttons

#### Keypad functions


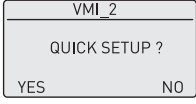
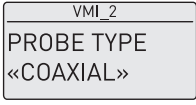
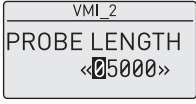
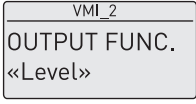
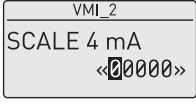
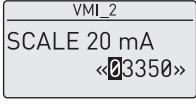
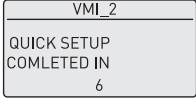
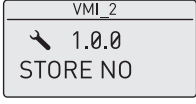
Button	Function
	Normal mode: Enter configuration mode Configuration mode: Move cursor to the right
	Normal mode: Change the measurement units (m, cm, in ft) Configuration mode: Exit
	Normal mode: Change the measurement name (distance, level, output (%), output (mA)) Configuration mode: Decrease value or change parameter
	Normal mode: Change the measurement name (distance, level, output (%), output (mA)) Configuration mode: Increase value or change parameter

### 4.3 Quick Setup

Use this procedure to change the probe length and give the top and bottom measuring limits. « xx » in the illustrations shows that you can change the value or the parameter. Push the keypad buttons in the correct sequence:



## Procedure

Screen	Steps	Description
	<ul style="list-style-type: none"> <li>[&gt;] 3 times.</li> </ul>	Default screen. Enter configuration mode.
	<ul style="list-style-type: none"> <li>[&gt;] YES - to start the quick set-up procedure, or [▲] NO - to go back to the menu.</li> </ul>	
	<ul style="list-style-type: none"> <li>[▲] or [▼] for the selection of the probe type (COAXIAL or SINGLE CABLE).</li> <li>[←] to confirm.</li> </ul>	
	<ul style="list-style-type: none"> <li>[&gt;] to change the probe length.</li> <li>[&gt;] to change the position of the cursor.</li> <li>[▼] to decrease the value or [▲] to increase the value.</li> <li>[←] to confirm.</li> </ul>	Change this value if you have decreased the length of the probe. The probe length for the cable probe options includes the length of the countweight.
	<ul style="list-style-type: none"> <li>[▲] or [▼] for the selection of the measurement name (Distance, Level, Conversion or Ullage Conv.).</li> <li>[←] to confirm.</li> </ul>	If "Level" or "Conversion" is set, the 0% limit for the 4...20 mA scale is at the bottom of the tank. If "Distance" or "Ullage Conv." is set, the 0% limit is at the top of the tank.
	<ul style="list-style-type: none"> <li>[&gt;] to change Scale 4 mA.</li> <li>[&gt;] to change the position of the cursor.</li> <li>[▼] to decrease the value or [▲] to increase the value.</li> <li>[←] to confirm.</li> </ul>	Use this step to give the 4 mA output setting (0% limit) in the tank. Distance is measured from the thread stop of the process connection.
	<ul style="list-style-type: none"> <li>[&gt;] to change Scale 20 mA.</li> <li>[&gt;] to change the position of the cursor.</li> <li>[▼] to decrease the value or [▲] to increase the value.</li> <li>[←] to confirm.</li> </ul>	Use this step to give the 20 mA output setting (100% limit) in the tank. Distance is measured from the thread stop of the process connection.
		After 8 seconds the Quick Setup is completed.
	<ul style="list-style-type: none"> <li>[←] to confirm.</li> <li>[▲] or [▼] for the selection of the save option (STORE NO or STORE YES).</li> <li>[←] to confirm.</li> </ul>	Set to STORE YES to save and use the data. Set to STORE NO to cancel the changes to the device settings.







### KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature meters
- Pressure meters
- Analysis products
- Measuring systems for the oil and gas industry
- Measuring systems for sea-going tankers

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**KROHNE**