

Operating Instructions

Dipfit CLA140

Immersion assembly for conductivity sensors with inductive measurement of conductivity

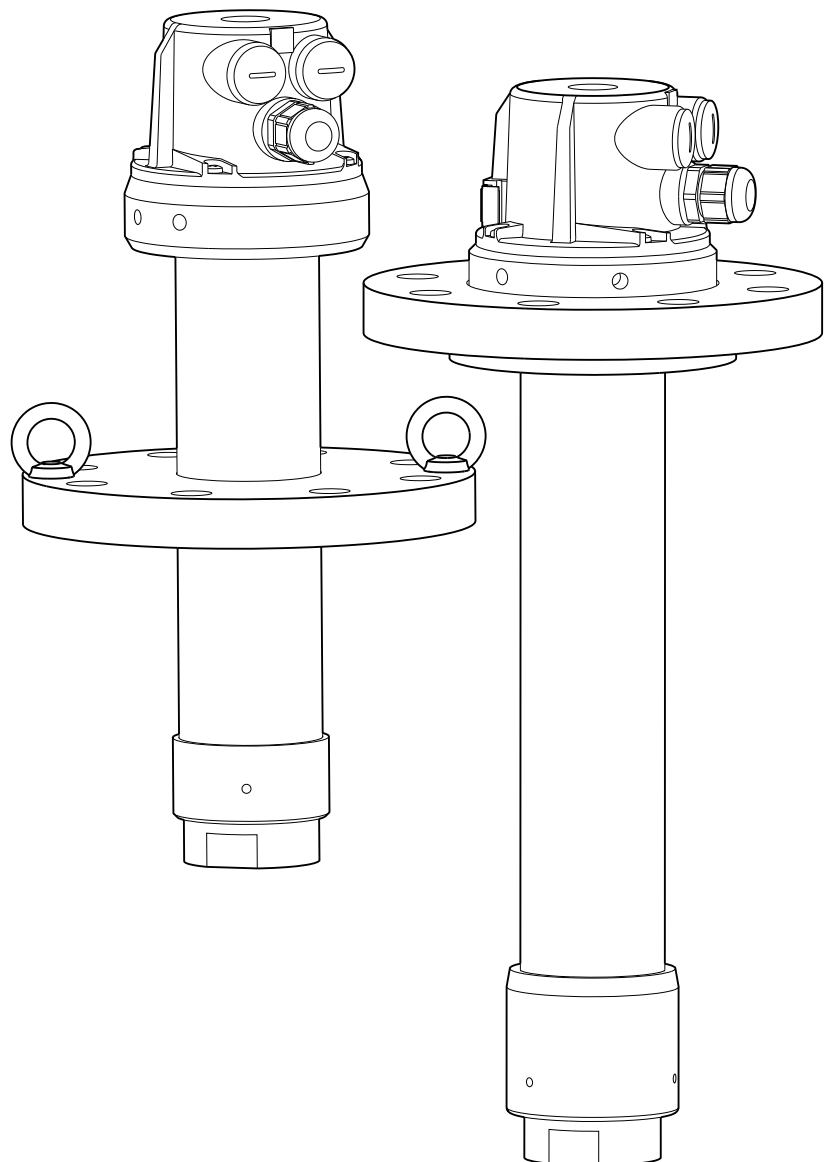





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1 About this document


1.1 Warnings

Structure of information	Meaning
 DANGER Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) <ul style="list-style-type: none"> ▶ Corrective action 	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation will result in a fatal or serious injury.
 WARNING Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) <ul style="list-style-type: none"> ▶ Corrective action 	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.
 CAUTION Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) <ul style="list-style-type: none"> ▶ Corrective action 	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE Cause/situation If necessary, Consequences of non-compliance (if applicable) <ul style="list-style-type: none"> ▶ Action/note 	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols used

Symbol	Meaning
	Additional information, tips
	Permitted or recommended
	Not permitted or not recommended
	Reference to device documentation
	Reference to page
	Reference to graphic
	Result of a step


1.3 Symbols on the device

Symbol	Meaning
	Reference to device documentation

2 Basic safety instructions

2.1 Requirements for the personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

 Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Designated use

The assembly is designed for the installation of conductivity sensors in vessels.

The main areas of application involve conductivity measurement in the following processes:

- Chemical industry, e.g. in
 - production of synthetic materials and dyes
 - production of pesticides and fertilizers
 - oil or wastewater separation
 - condensate treatment
- Power stations and incinerator plants, e.g. in
 - cooling water monitoring
 - flue gas cleaning
- Metal extraction and metal processing

Thanks to its design, it can be operated in pressurized systems (→  23).

Use of the device for any purpose other than that described, poses a threat to the safety of people and of the entire measuring system and is therefore not permitted.

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

2.3 Workplace safety

2.3.1 General notes

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations

2.3.2 Notes on installation in pressurized systems

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes!

- ▶ Do not exceed the permitted maximum process pressure.
- ▶ Prior to installing and removing the assembly, depressurize the system.
- ▶ Check glands and lines regularly for leaks and damage.

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:

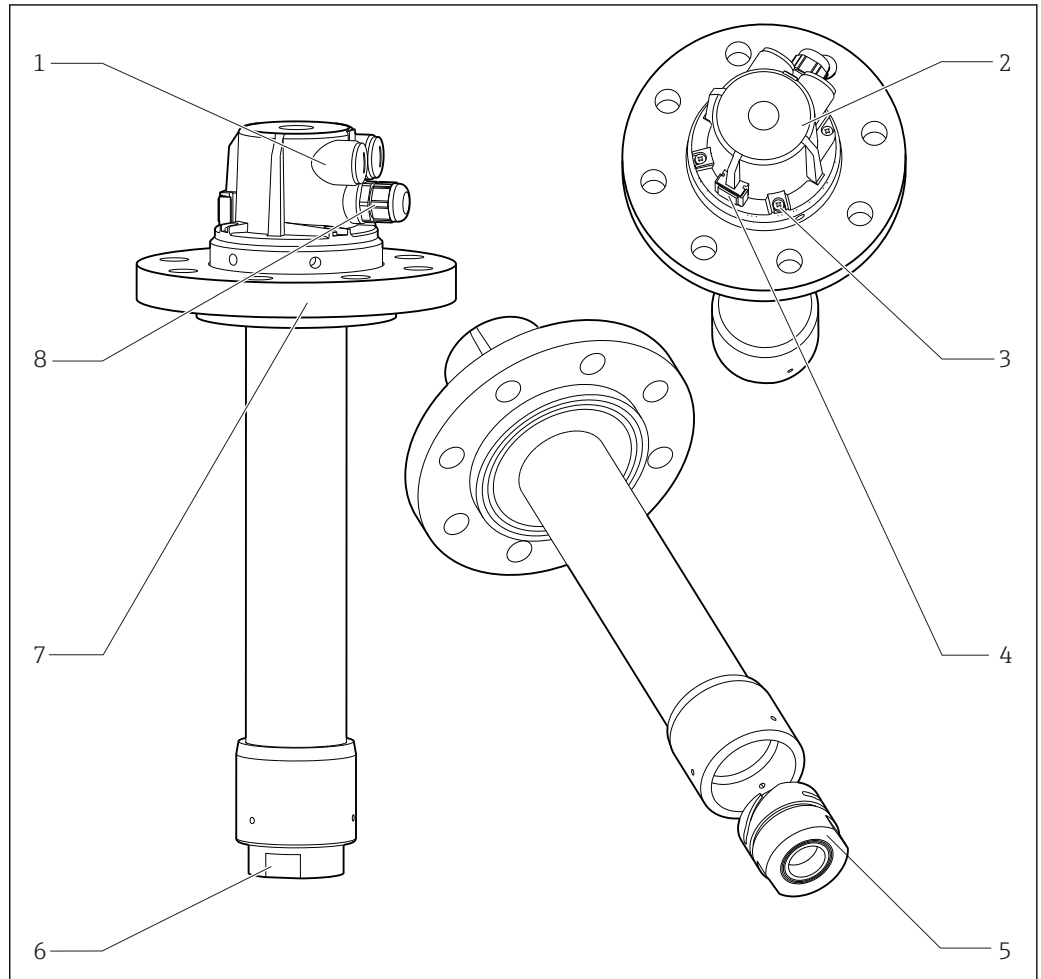
- ▶ If faults cannot be rectified:
products must be taken out of service and protected against unintentional operation.

2.5 Product safety

The product is designed 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. The relevant regulations and European standards have been observed.

3 Product description

3.1 PVDF version

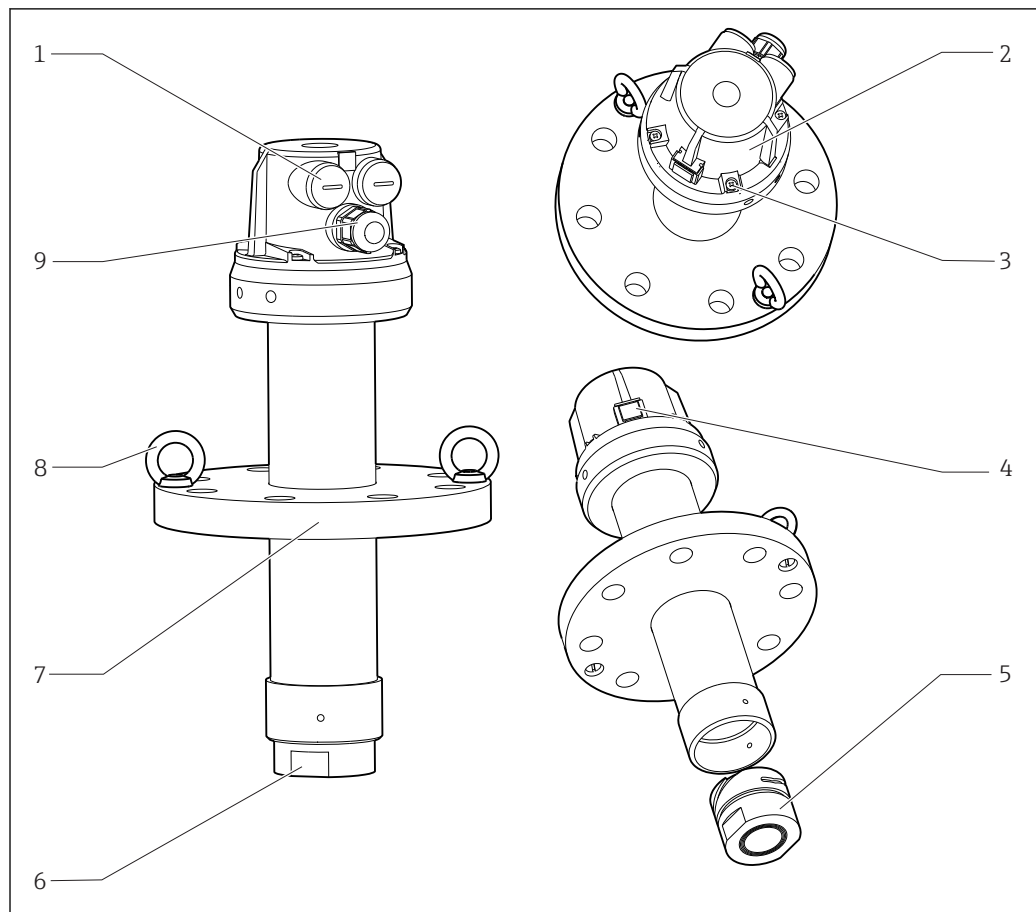


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1 PVDF version

- 1 Dummy plug Pg 16
- 2 Assembly head
- 3 M4 screws
- 4 GORE-TEX® filter
- 5 Sensor holder with bayonet lock
- 6 Wrench grip AF55
- 7 Lap joint flange, depending on version
- 8 Cable gland Pg 13.5

3.2 Stainless steel version



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2 Stainless steel version

- 1 Dummy plug Pg 16
- 2 Assembly head
- 3 M4 screws
- 4 GORE-TEX® filter
- 5 Sensor holder with bayonet lock
- 6 Wrench grip AF55
- 7 Fixed flange, depending on version
- 8 Installation aids (screw-in lifting eyes)
- 9 Cable gland Pg 13.5

4 Incoming acceptance and product identification

4.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify the supplier of any damage to the packaging.
Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
 - ↳ Notify the supplier of any damage to the delivery contents.
Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
 - ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
 - ↳ The original packaging offers the best protection.
Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

4.2 Scope of delivery

The scope of delivery comprises:

- Ordered version of assembly
- Operating Instructions

4.3 Product identification

4.3.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
 - Order code
 - Extended order code
 - Serial number
 - Ambient and process conditions
 - Safety information and warnings
- ▶ Compare the information on the nameplate with the order.

4.3.2 Product identification

Product page

www.endress.com/cla140

Interpreting the order code

The order code and serial number of your product can be found in the following locations:

- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.
2. Call up the site search (magnifying glass).
3. Enter a valid serial number.
4. Search.
 - ↳ The product structure is displayed in a popup window.
5. Click on the product image in the popup window.
 - ↳ A new window (**Device Viewer**) opens. All of the information relating to your device is displayed in this window as well as the product documentation.

4.3.3 Certificates and approvals**Pressure Equipment Directive 2014/68/EU**

The assembly has been manufactured according to good engineering practice as per Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU and is therefore not required to bear the CE label.

Inspection certificate

A test certificate 3.1 in accordance with EN 10204 is supplied depending on the version (→ Product Configurator on the product page).

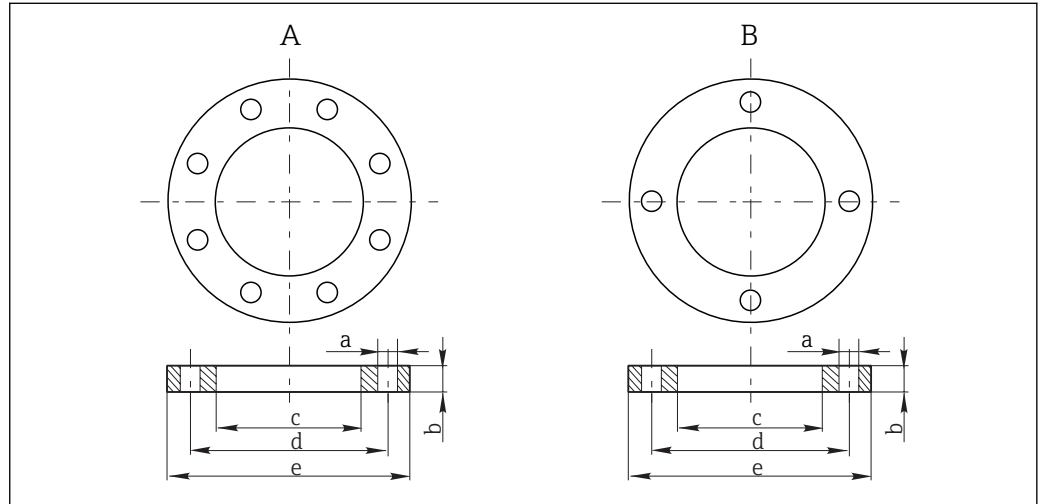
4.3.4 Manufacturer's address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
D-70839 Gerlingen

5 Installation

5.1 Installation conditions

5.1.1 Dimensions



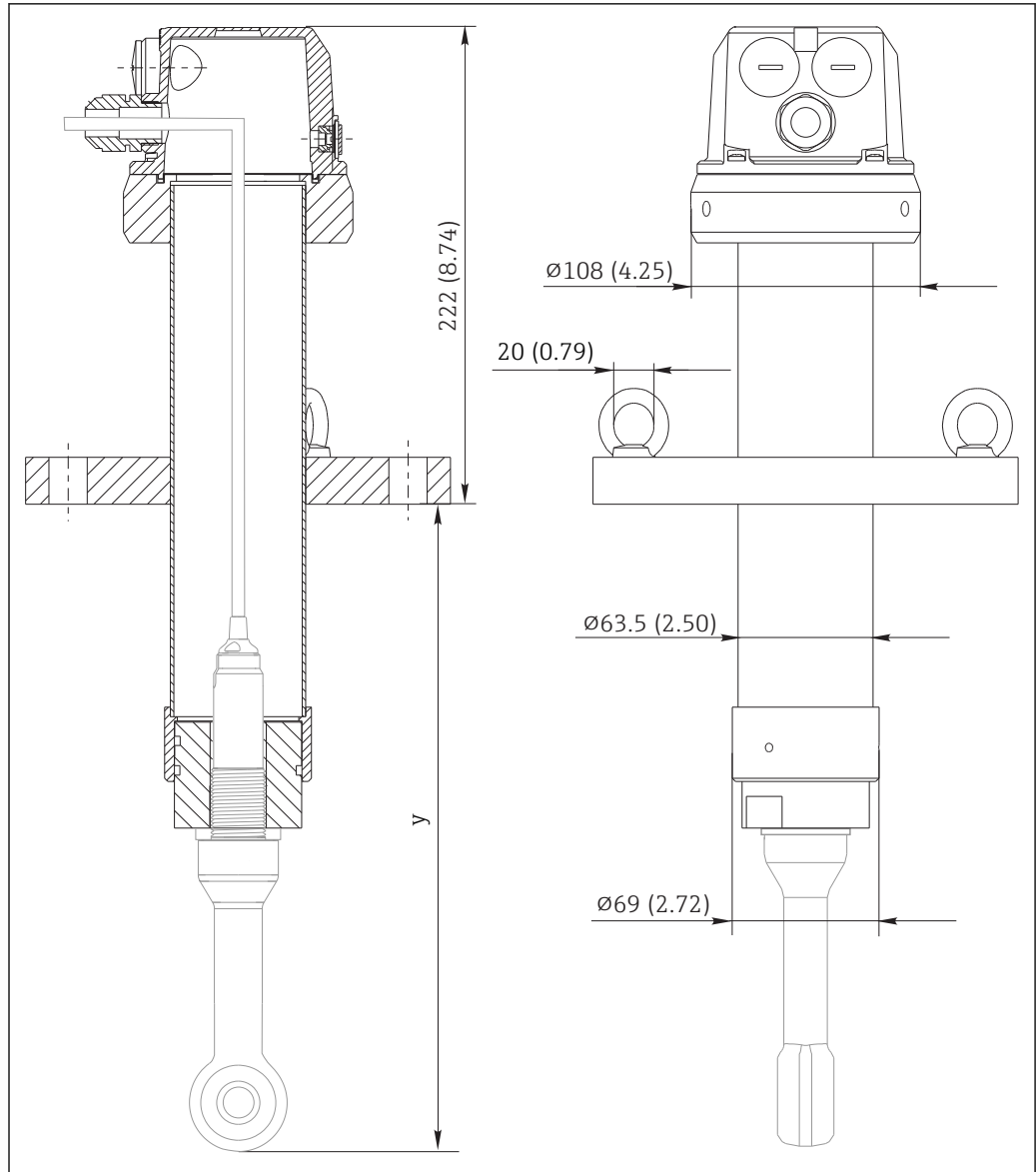
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3 Flange dimensions, → Table

A Stainless steel version

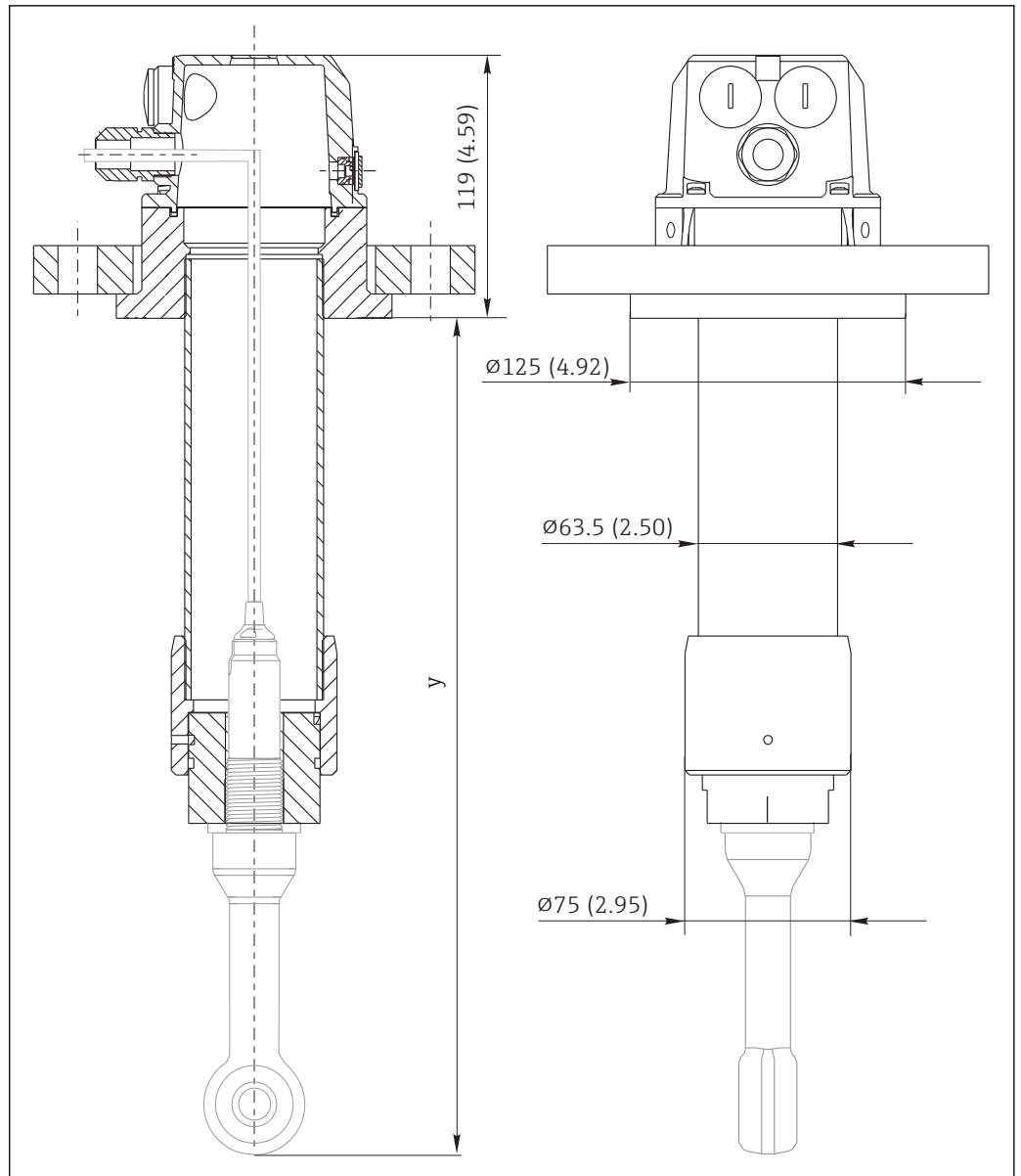
B PVDF version

	Stainless steel assembly version			PVDF assembly version		
	DN80 PN16	ANSI 3" 150 lbs	JIS 10K 80A	DN80 PN16	ANSI 3" 150 lbs	JIS 10K 80A
a [mm (in)]	18 (0.71)	19 (0.75)	19 (0.75)	18 (0.71)	19 (0.75)	19 (0.75)
b [mm (in)]	20 (0.79)	23.8 (0.94)	18 (0.71)	22 (0.87)	22 (0.87)	18 (0.71)
c [mm (in)]	63.5 (2.50)	63.5 (2.50)	63.5 (2.50)	110 (4.33)	110 (4.33)	110 (4.33)
d [mm (in)]	160 (6.30)	152.4 (6.00)	150 (5.91)	160 (6.30)	152 (5.98)	150 (5.91)
e [mm (in)]	200 (7.87)	190.5 (7.50)	185 (7.28)	200 (7.87)	200 (7.87)	185 (7.28)
Screws	M16	M16	M16	M16	M16	M16
Bore holes	8	4	4	8	4	4



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4 Stainless steel version, dimensions in mm (in)
 y Immersion depth, → Configurator on product page



5 PVDF version, dimensions in mm (in)

y Immersion depth, → Configurator on product page

i Sensor not included in the assembly delivery!

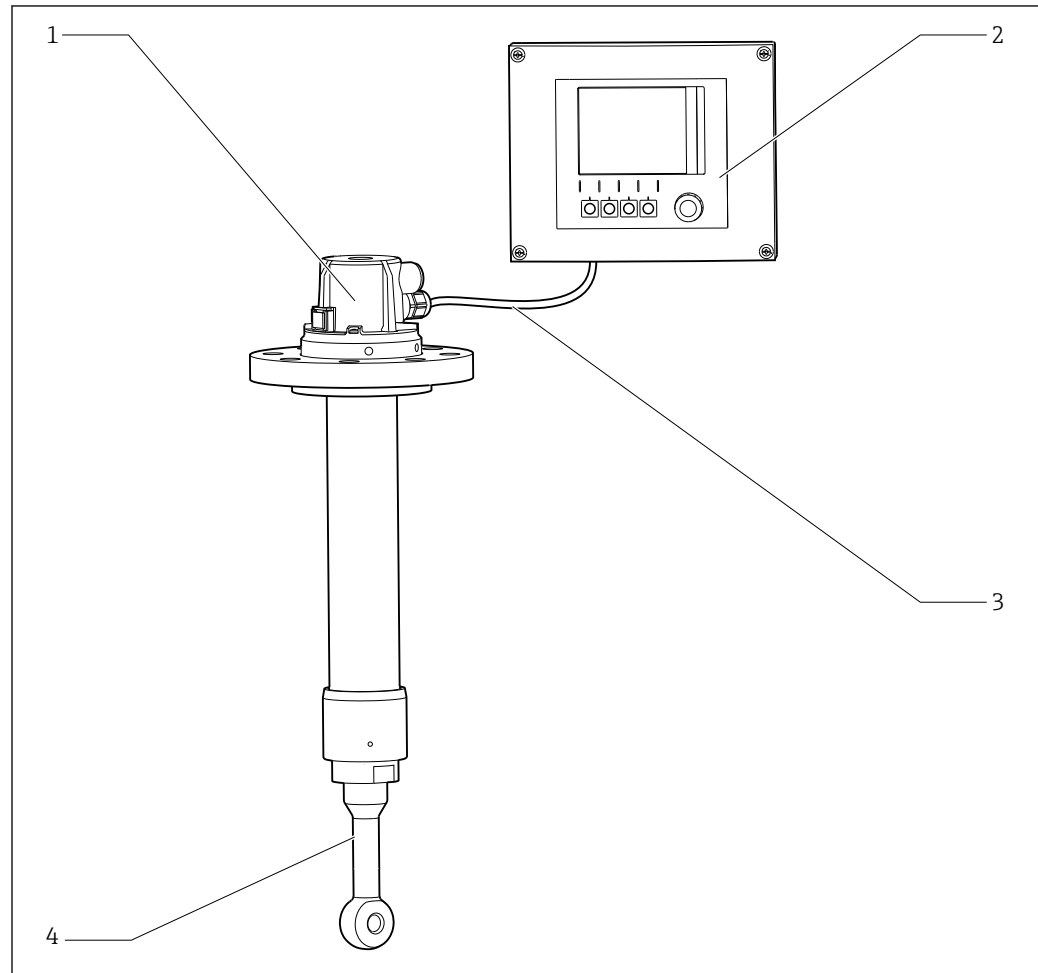
5.1.2 Measuring system

A complete measuring system comprises:

- Immersion assembly Dipfit CLA140
- Conductivity sensor with cable, e.g. Indumax CLS50D
- Transmitter, e.g. Liquiline CM442

Optional:

Extension cable, e.g. CYK11



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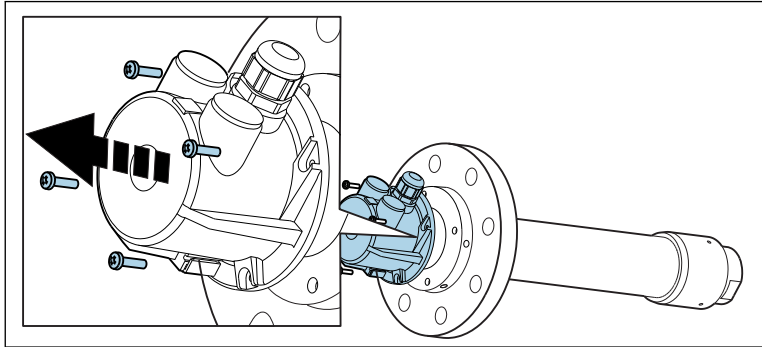
■ 6 Example of a measuring system (process and process connections are not illustrated)

- 1 Immersion assembly Dipfit CLA140, here as PVDF version
- 2 Transmitter CM442
- 3 Sensor cable
- 4 CLS50D inductive conductivity sensor

5.2 Mounting the sensor

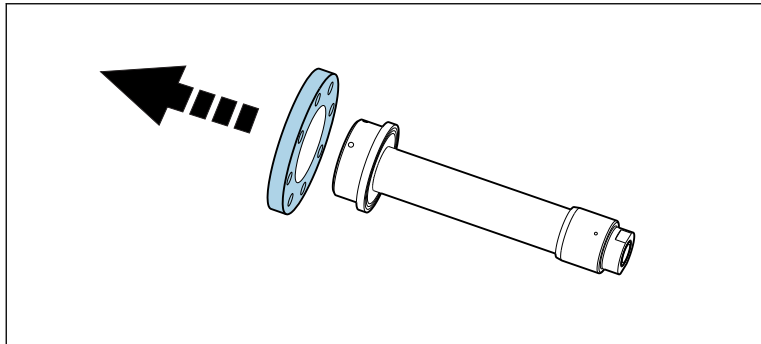
i The PVDF version is illustrated in the graphics below. The sensor mounting procedure is identical for the stainless steel version.

1.



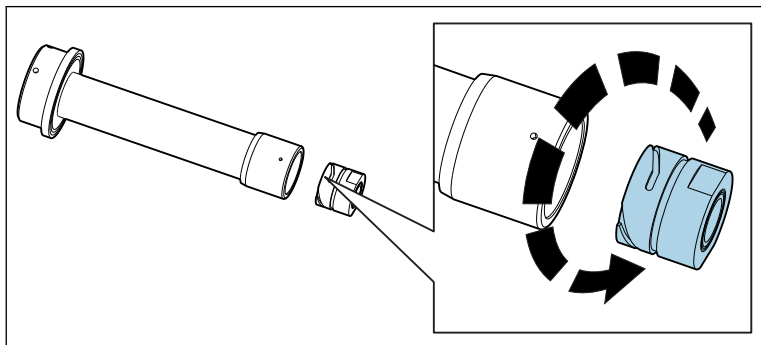
Release 4 screws (M4), remove the cover.

2.

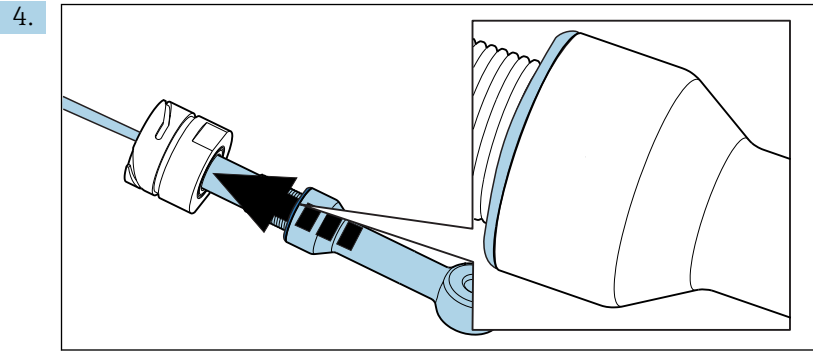


Only for the PVDF version:
Remove the lap joint flange.

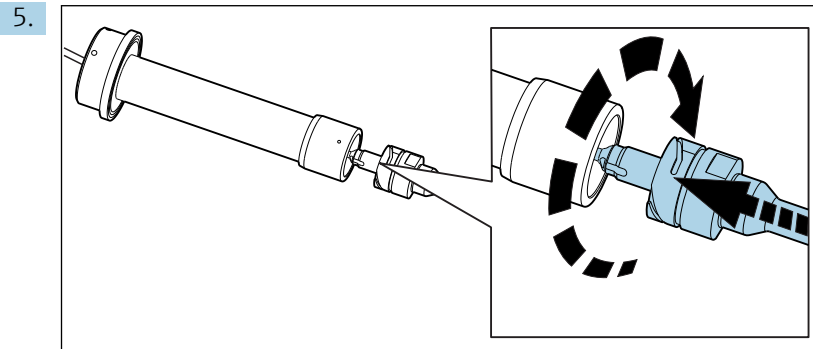
3.



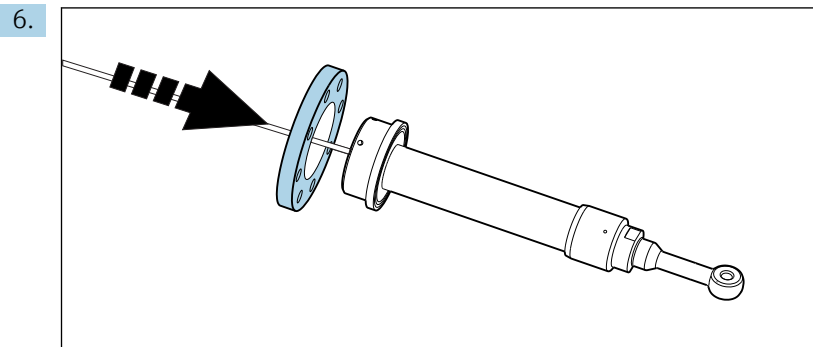
Unscrew the sensor holder (bayonet lock). Grease the G $\frac{3}{4}$ thread and sealing ring.



Slide the flat seal or O-ring (included in the sensor delivery) onto the sensor and screw the sensor into the holder hand-tight.

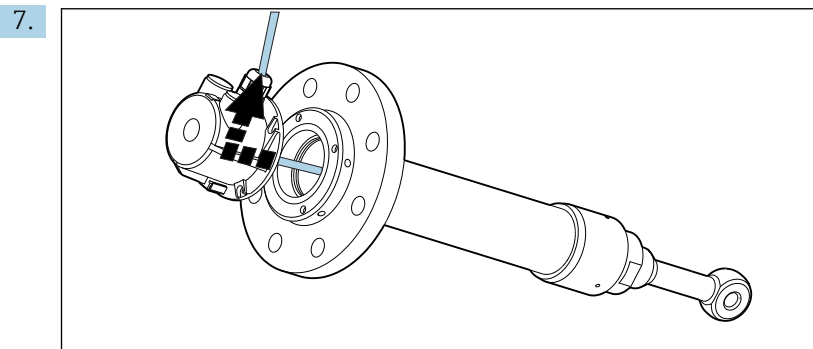


Screw in the sensor holder. Use a flat key wrench AF55 if necessary.

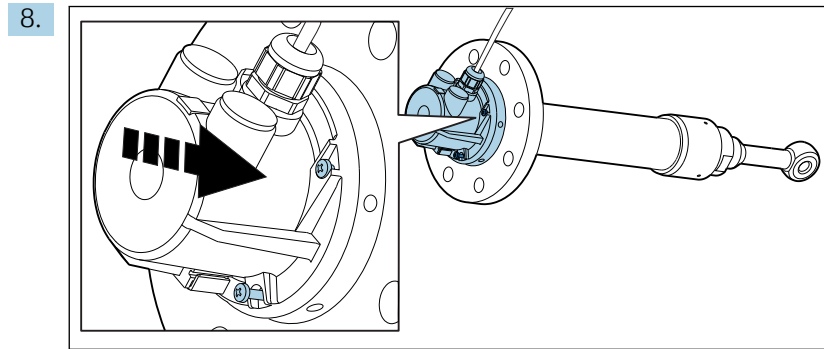


Only for the PVDF version:

Fit the flange.



Pull the sensor cable through the cable gland of the assembly head and then tighten the cable gland.



Screw on the cover.

You can now install the assembly in the process.

5.3 Mounting the assembly in the process

WARNING

Risk of injury from high pressure, high temperature or chemical hazards if process medium escapes!

- ▶ Do not exceed the permitted maximum process pressure.
- ▶ Prior to installing and removing the assembly, depressurize the system.
- ▶ Check that the sealing of the flange seal is tight (no leaks).

NOTICE

Measurement errors may occur if the installation factor is not taken into consideration!

- ▶ Pay attention to the distance of the installed sensor from the wall.
- ▶ Calibrate the installation factor if necessary.
- ▶ See the information in the Operating Instructions for the sensor.



The sensor must be installed before the assembly is mounted. → 15

1. Introduce the assembly with the sensor into the flange connection of the process vessel.
2. Screw down the flange (flange screws must be provided by the customer).
3. Connect the sensor cable to the transmitter. Refer to the Operating Instructions of the transmitter for this.

The measuring point is now ready to measure.

5.4 Post-installation check

- Assembly undamaged?
- Is a sensor installed in the assembly?
- Have all the seals been checked to ensure they are leak-tight?

6 Maintenance

⚠ CAUTION

Process medium and medium residues

Risk of injury from high pressure, high temperatures or chemical hazards!

- ▶ Wear protective gloves, protective goggles and protective clothing.
- ▶ Mount or dismantle the assembly only in vessels or pipes that are empty and unpressurized.

6.1 Cleaning the assembly

- ▶ For stable and reliable measurements, clean the assembly and the sensor regularly. The frequency and intensity of the cleaning process depend on the medium.

6.2 Cleaning agent

⚠ WARNING

Organic solvents containing halogens

Limited evidence of carcinogenicity! Dangerous for the environment with long-term effects!

- ▶ Do not use organic solvents that contain halogens.

⚠ WARNING

Thiocarbamide

Harmful if swallowed! Limited evidence of carcinogenicity! Possible risk of harm to the unborn child! Dangerous for the environment with long-term effects!

- ▶ Wear protective goggles, protective gloves and appropriate protective clothing.
- ▶ Avoid all contact with the eyes, mouth and skin.
- ▶ Avoid discharge into the environment.

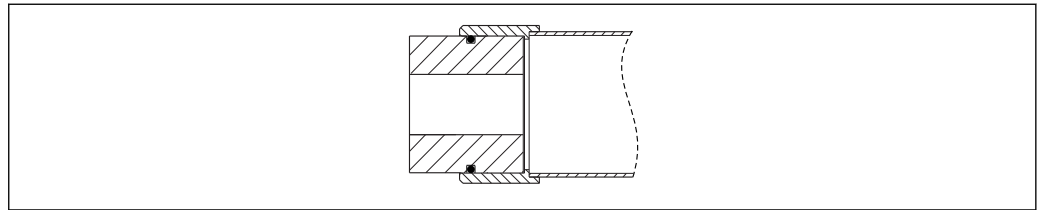
The most common types of soiling and the cleaning agents used in each case are shown in the following table.

Type of soiling	Cleaning agent
Greases and oils	Hot water or tempered (alkaline) agents containing surfactants or water-soluble organic solvents (e. g. ethanol)
Limescale deposits, metal hydroxide buildup, lyophobic biological buildup	Approx. 3% hydrochloric acid
Sulfide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein buildup	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibers, suspended substances	Pressurized water, possibly surface-active agents
Light biological buildup	Pressurized water


- ▶ Choose a cleaning agent to suit the degree and type of soiling.

6.3 Replacing the seal

6.3.1 Overview of seals



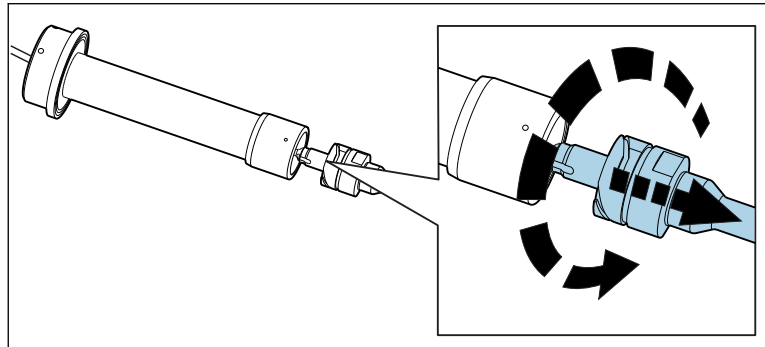
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 7 O-ring on sensor holder, ID 53.57 x 3.53

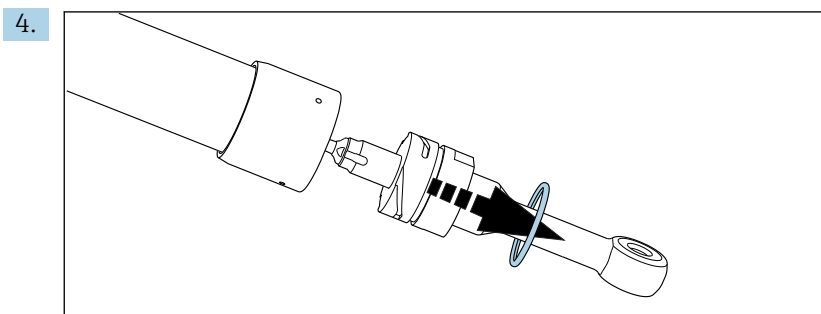
6.3.2 Replacing the seals

O-ring on the sensor holder

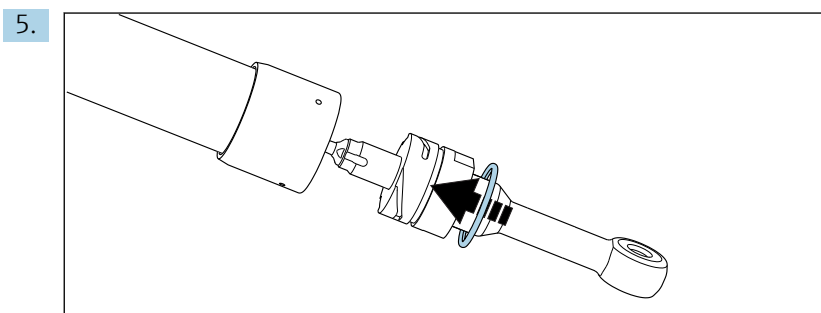
1. Remove the assembly from the medium.
2. Clean the assembly.
- 3.



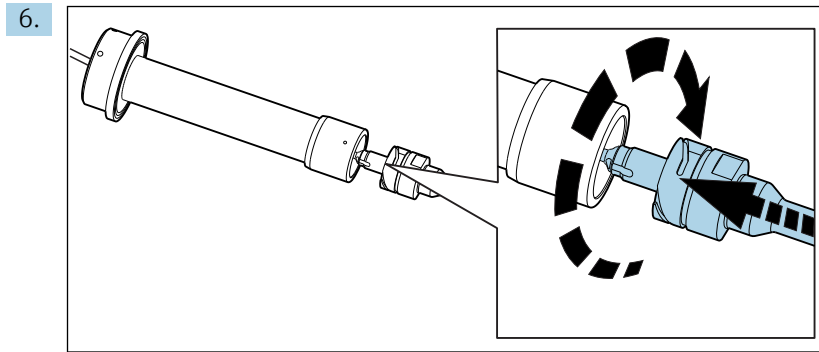
Unscrew the sensor holder (bayonet lock). Use a flat key wrench AF55 if necessary.



Remove the O-ring from the sensor holder.



Grease a new O-ring from the spare parts kit and fit it over the sensor holder and into the O-ring guide.



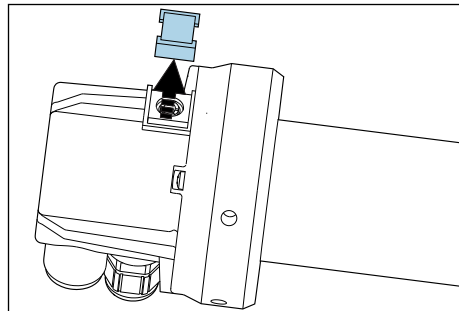
Screw in the sensor holder. Use a flat key wrench AF55 if necessary.

7. Put the assembly back into the medium.

6.4 Replacing the GORE-TEX® filter

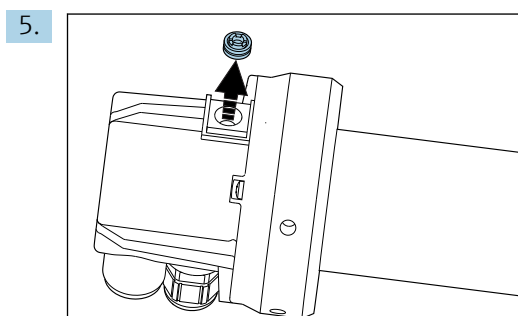
The filter must only be replaced if it is visibly contaminated and no longer fulfills its purpose.

1. Remove the assembly from the medium.
2. Clean the assembly.
- 3.



Remove the cover of the filter (e.g. using a flat-blade screwdriver).

4. Check the filter.
 - ↳ Replace the filter if it is visibly contaminated. Otherwise, fit the cover back on (click it into place).



Remove the used filter.

6. Insert a new filter and fit the cover back on (click it into place).
7. Put the assembly back into the medium.

7 Repair

CAUTION

Danger resulting from improper repair!

- ▶ Any damage to the assembly that compromises pressure safety must be repaired only by authorized and qualified personnel.
- ▶ Following each repair and maintenance task, check the assembly for leaks using appropriate procedures. Following this, the assembly must again comply with the specifications in the technical data.
- ▶ Replace all other damaged components immediately.

7.1 Spare parts

For more detailed information on spare parts kits, please refer to the [Spare Part Finding Tool](#) on the Internet.

7.2 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

To ensure the swift, safe and professional return of the device:

- ▶ Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

7.3 Disposal

- ▶ Please observe local regulations!

8 Accessories

The following are the most important accessories available at the time this documentation was issued.

- ▶ For accessories not listed here, please contact your Service or Sales Center.

Indumax CLS50D / CLS50

- High-durability inductive conductivity sensor
- For standard and hazardous area applications
- With Memosens technology
- Product Configurator on the product page: www.endress.com/cls50d or www.endress.com/cls50



Technical Information TI00182C

9 Technical data

9.1 Environment

Ambient temperature range -10 to +70 °C (+10 to +160 °F)

Storage temperature -10 to +70 °C (+10 to +160 °F)

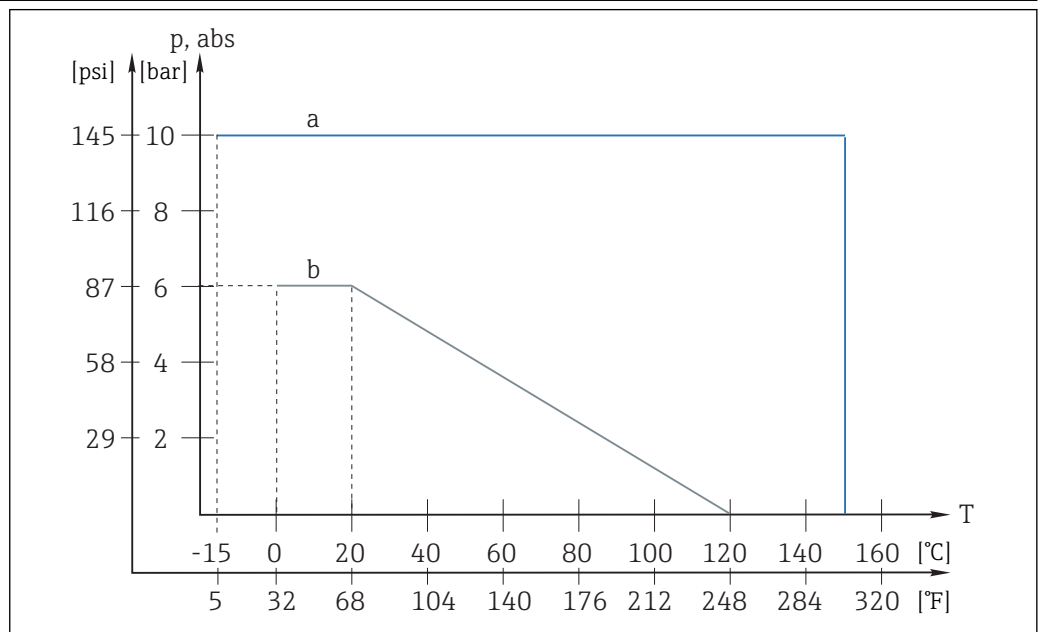
Degree of protection IP65

9.2 Process

Process temperature
 PVDF version 0 to 120 °C (32 to 250 °F)
 Stainless steel version -15 to 150 °C (5 to 300 °F), for all seals except EPDM
 -15 to 140 °C (5 to 280 °F), for EPDM seal

Process pressure
 PVDF version Max. 6 bar (87 psi), absolute
 Stainless steel version Max. 10 bar (145 psi), absolute

Pressure-temperature ratings



8 Pressure-temperature ratings

a Stainless steel version

a PVDF version

9.3 Mechanical construction

Dimensions → 11

Weight	Depends on version (material, immersion depth):	
	PVDF	2.5 to 3.0 kg (5.5 to 6.6 lbs)
	Stainless steel	8.0 to 12.0 kg (17.6 to 26.5 lbs)

Materials *In contact with medium, depending on version*

Immersion tube	PVDF / stainless steel 1.4404 (AISI 316L)
O-rings	EPDM / VITON / Chemraz / Fluoraz
Sensor holder	PVDF / stainless steel 1.4404 (AISI 316L)

Not in contact with medium, depending on version

Assembly head	PP-GF 20
Lap joint flange	UP-GF / stainless steel 1.4404 (AISI 316L)
Installation aids ¹⁾	Stainless steel 1.4301 (AISI 304)

1) Only for stainless steel version

Process connections	Depending on version:	
	■	None
	■	Flange DN 80 / PN 16
	■	Flange ANSI 3" / 150 lbs
	■	Flange JIS 10K 80A

Cable glands	1 x Pg 13.5 and 2 x dummy plug Pg 16
--------------	--------------------------------------

Sensor mounting slots	1 x G ³ / ₄
-----------------------	-----------------------------------

Immersion depth	Depending on version:	
	■	500 mm (19.7 in)
	■	1000 mm (39.4 in)
	■	1500 mm (59.1 in)
	■	2000 mm (78.7 in)
	■	2500 mm (98.4 in)

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