

Operating Instructions

Dipfit CLA111

Immersion and installation assembly for conductivity measurement

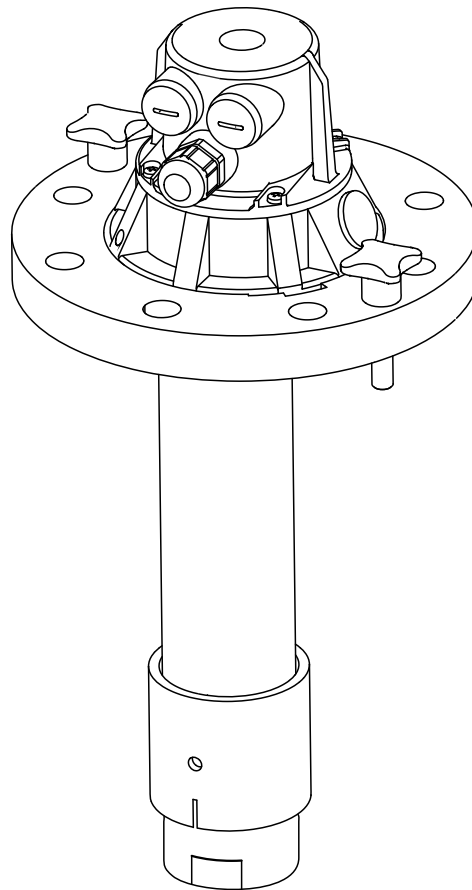





Table of contents








1	Document information	3
1.1	Safety information	3
1.2	Symbols	3
2	Basic safety instructions	4
2.1	Requirements for personnel	4
2.2	Designated use	4
2.3	Occupational safety	4
2.4	Operational safety	5
2.5	Product safety	5
3	Incoming acceptance and product identification	6
3.1	Incoming acceptance	6
3.2	Product identification	6
3.3	Scope of delivery	7
4	Installation	8
4.1	Installation conditions	8
4.2	Installing the assembly	11
4.3	Installing the sensor	14
4.4	Post-installation check	14
5	Electrical connection	14
5.1	Connecting the sensor	15
5.2	Post-connection check	16
6	Maintenance	17
6.1	Servicing the assembly	17
6.2	Cleaning the sensor	17
7	Repairs	18
7.1	Spare parts	18
7.2	Return	18
7.3	Disposal	18
8	Accessories	19
8.1	Installation accessories	19
8.2	Sensors	19
8.3	Extension cable	20
8.4	Chemoclean	20
9	Technical data	21
	Index	22

1 Document information

1.1 Safety information

Structure of information	Meaning
 DANGER Causes (/consequences) Consequences of non-compliance (if applicable) ► 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) Consequences of non-compliance (if applicable) ► 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) Consequences of non-compliance (if applicable) ► 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 Consequences of non-compliance (if applicable) ► Action/note	This symbol alerts you to situations which may result in damage to property.


1.2 Symbols

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


2 Basic safety instructions

2.1 Requirements for 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.
- Measuring point faults may be repaired only by authorized and specially trained personnel.

 Repairs not described in the Operating Instructions provided may only be carried out directly by the manufacturer or by the service organization.

2.2 Designated use

The assembly is suitable for universal use in water and wastewater applications. Thanks to its design, it can be used in pressurized systems (→  21).

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 Occupational safety

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

- Installation guidelines
- Local standards and regulations

2.4 Operational safety

1. Before commissioning the entire measuring point, verify that all connections are correct. Ensure that electrical cables and hose connections are undamaged.
2. Do not operate damaged products, and safeguard them to ensure that they are not operated inadvertently. Label the damaged product as defective.
3. If faults cannot be rectified:
Take the products out of operation and safeguard them to ensure that they are not operated inadvertently.

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 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Verify that the packaging is undamaged.
 - ↳ Notify your supplier of any damage to the packaging.
Keep the damaged packaging until the matter has been settled.
2. Verify that the contents are undamaged.
 - ↳ Notify your supplier of any damage to the delivery contents.
Keep the damaged products until the matter has been settled.
3. Check the delivery for completeness.
 - ↳ Check it against the delivery papers and 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.
The permitted ambient conditions must be observed (see "Technical data").

If you have any questions, please contact your supplier or your local sales center.

3.2 Product identification

3.2.1 Nameplate

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

- Manufacturer identification
- Extended order code
- Serial number
- Ambient and process conditions
- Safety information and warnings

 Compare the data on the nameplate with your order.

3.2.2 Product identification

Product page

www.endress.com/cla111

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 the product page for your product on the Internet.
2. In the navigation area on the right-hand side, select "Check your device features" under "Device support".
 - ↳ An additional window opens.
3. Enter the order code from the nameplate into the search field.
 - ↳ You will receive information on each feature (selected option) of the order code.

3.3 Scope of delivery

The delivery comprises:

- Assembly in the version ordered
- Measuring cable with connector for two-electrode sensor CLS2 1
- O-ring for sensors CLS21 and CLS21D
- Operating Instructions

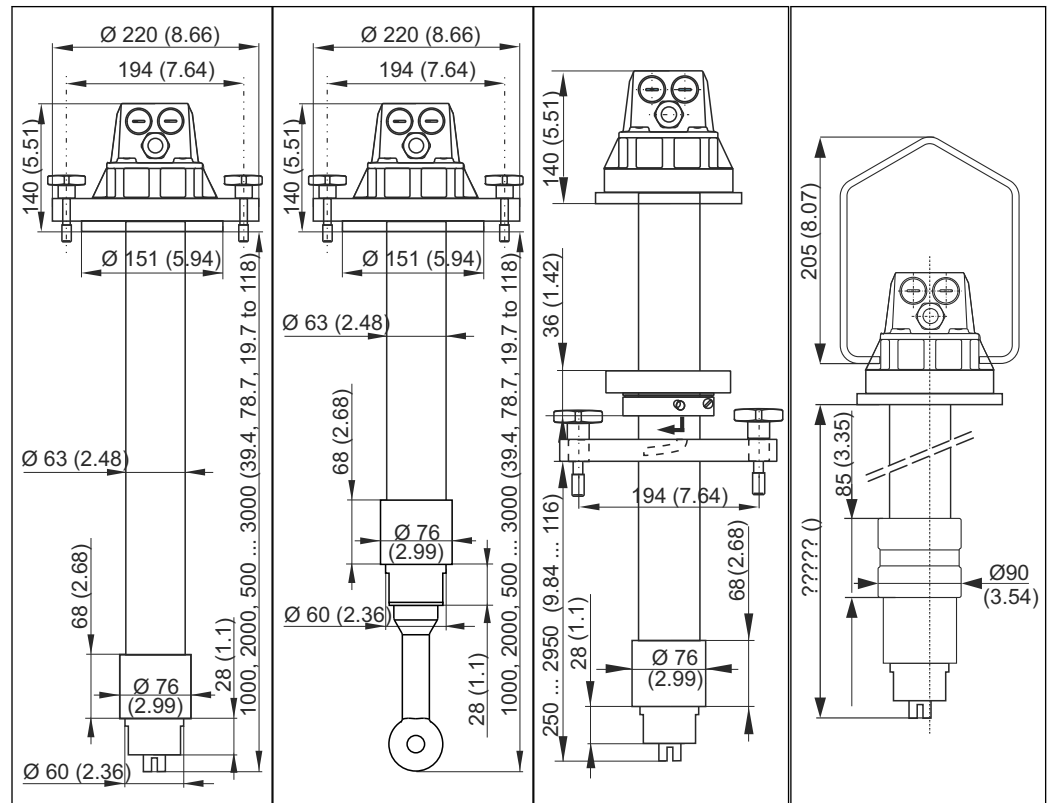


If you have any questions, please contact your supplier or your local sales center.

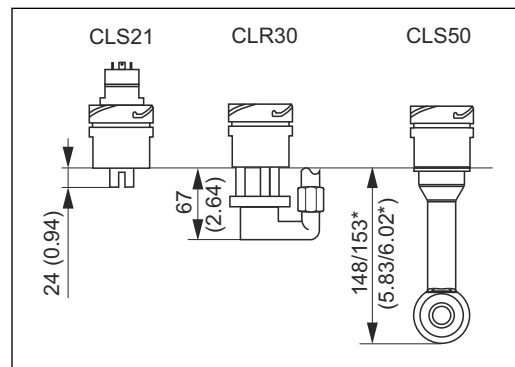
4 Installation

4.1 Installation conditions

4.1.1 Dimensions



1 CLA111-A/C with CLS21D/21 2 CLA111-A/C with CLS50D/50 3 CLA111-B* 4 CLA111-D*

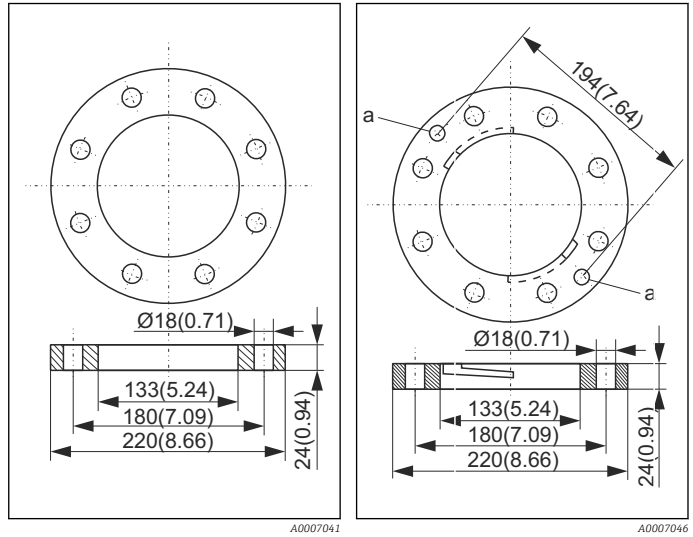


5 Length below the sensor holder

* PEEK version

All dimensions in mm (inch)
* Illustrations with CLS21D/21

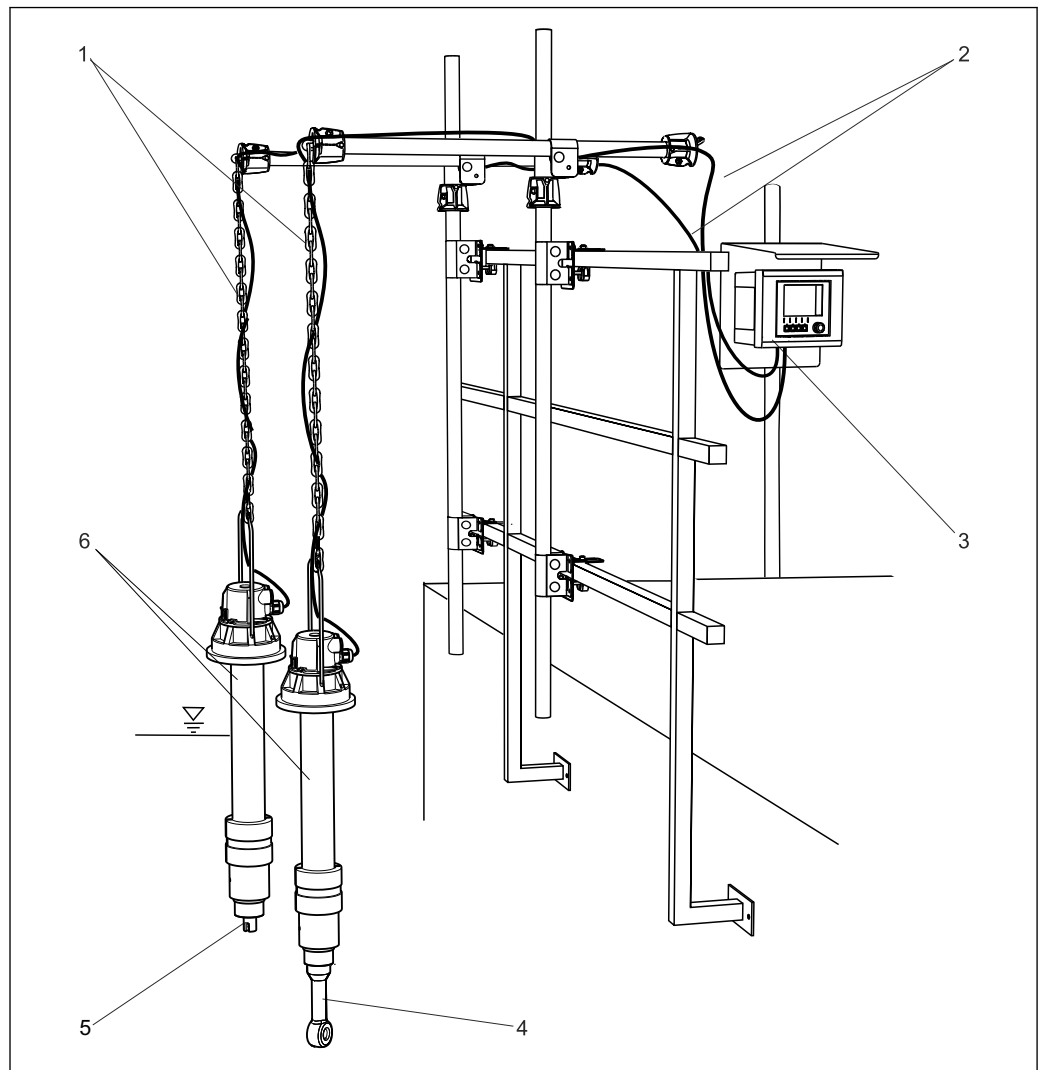
i Immersion length is the same when CLS50D/50 is installed. The length of the assembly pipe changes accordingly → 2.



6 Pressurized flange DN 100 for CLA111-C
All dimensions in mm (inch)

7 Flange DN 100 for CLA111-A/B
a = bore holes for cross formed screws

4.1.2 Measuring system



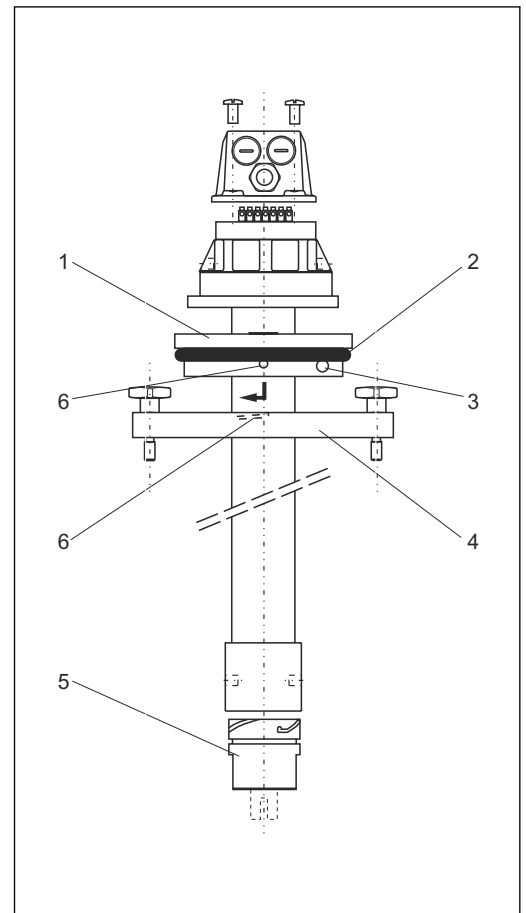
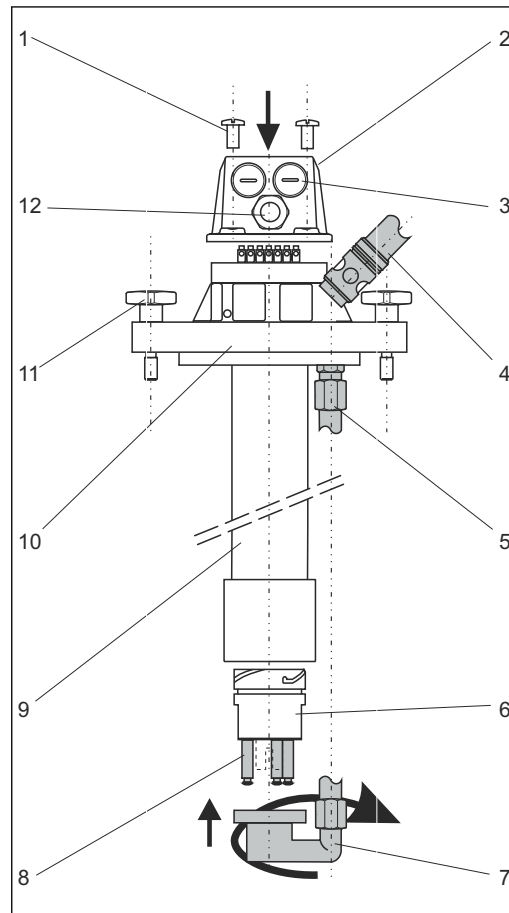
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8 Example of a measuring system

- | | | | |
|---|--|---|---|
| 1 | Assembly holder CYH112 (with chain) | 4 | Sensor CLS50D |
| 2 | Sensorkabel CYK10 (CLS21D) bzw. Festkabel (CLS50D) | 5 | Sensor CLS21D |
| 3 | Transmitter CM442 with weather protection cover | 6 | Assembly CLA111-D (with suspension bracket) |

4.2 Installing the assembly

4.2.1 Versions with a flange



📐 9 Version A and C with flange DN 100

- 1 Phillips screw (x 4)
- 2 Assembly head
- 3 Dummy plug
- 4 Quick connect coupling for Chemoclean cleaning
- 5 Connection pipe with pipe unions for Chemoclean cleaning
- 6 Sensor holder
- 7 Spray head for Chemoclean cleaning
- 8 Sensor holder with fixing bolts for Chemoclean spray head CLR30
- 9 Assembly pipe
- 10 Flange DN 100 , A: standard , C: pressurized flange
- 11 Cross formed screws (not for pressurized version)
- 12 Gland Pg 13.5

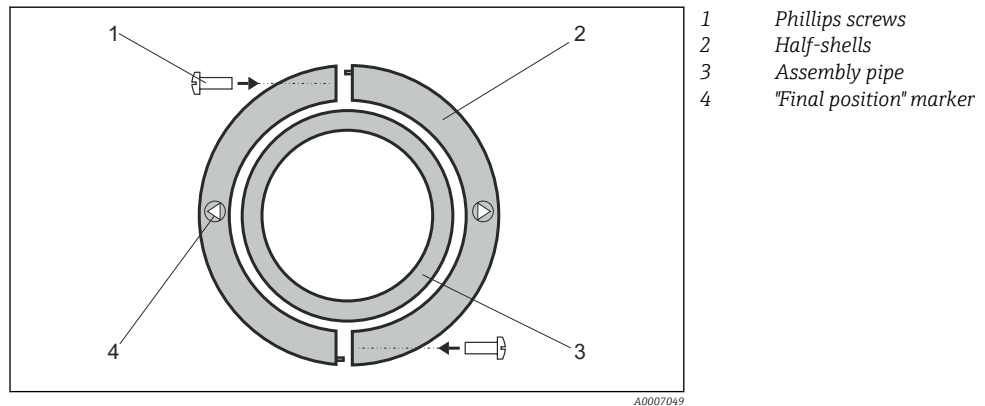
📐 10 Version B with adjustable flange DN 100

- 1 Adjustable flange adapter (2 half-shells)
- 2 O-ring for tolerance compensation
- 3 Tensioning screws (x 2)
- 4 Flange DN 100
- 5 Sensor holder
- 6 Bayonet lock

Installing the assembly with flange DN 100 (version A and C)

- ▶ Use the drawing as a guide (→ 📐 9).

Installing the assembly with adjustable flange DN 100 (version B)



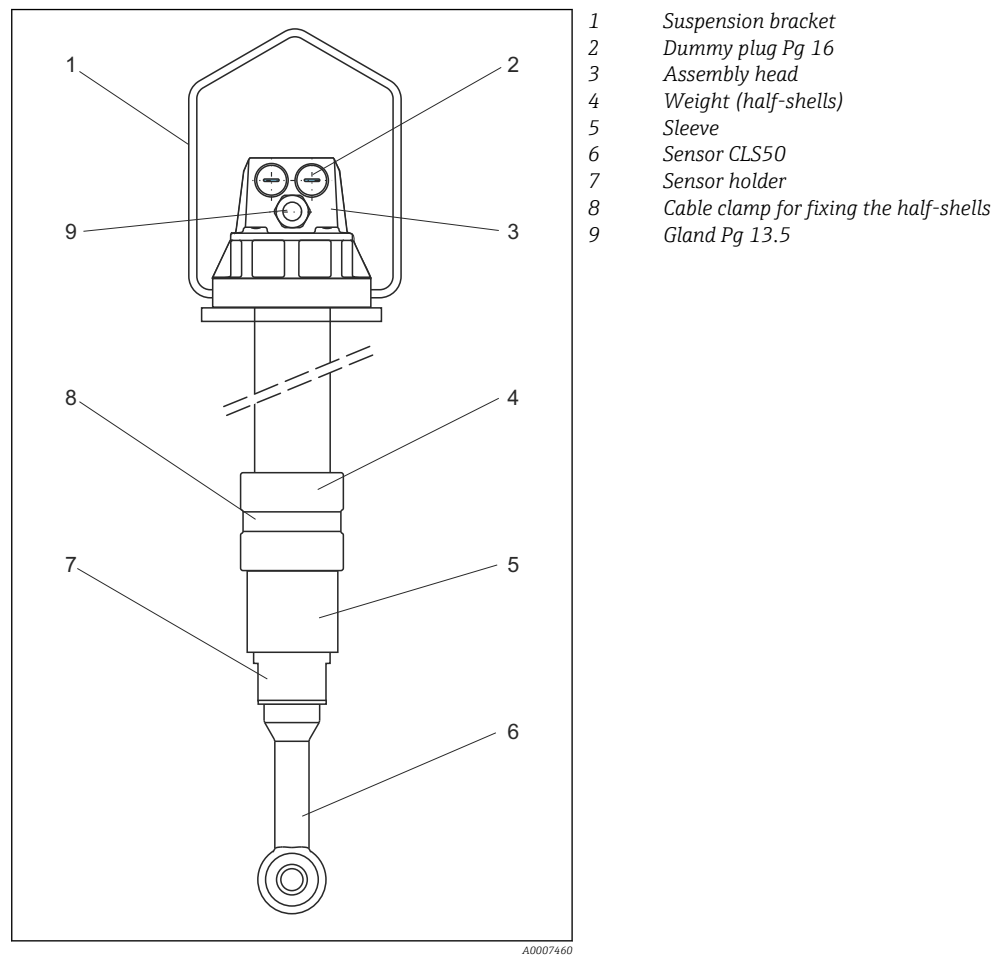
11 Adjustable flange adapter

1. Mount the flange DN 100 on the frame.
2. Fit the half-shells (→ 11, item 2) of the adapter in the desired position on the pipe.
3. Tighten the half-shells with the two Phillips screws (item 1).
4. Insert the O-ring into the O-ring groove (adjustable flange adapter on outside).
5. Insert the assembly into the ready-mounted flange DN 100.
6. Holding the assembly by the assembly head, screw the assembly clockwise into the bayonet lock as far as the "final position" marker (item 4).

Removing the assembly

1. Leave the mounted flange DN 100 on the frame.
2. Holding the assembly by the assembly head, screw the assembly counter-clockwise out of the bayonet lock and remove the assembly from the medium.

4.2.2 Version with suspension bracket



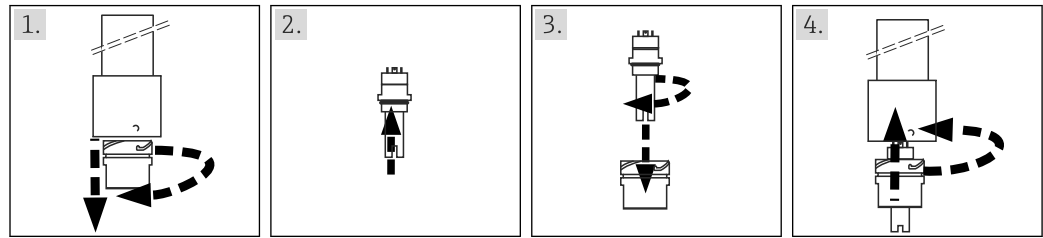
12 Version with suspension bracket

Installing the assembly in the measuring point

1. You can install the assembly on the basin.
 To do so, suspend the assembly from the chain retainer CYH112.
 ↳ The mounting chain enables a flexible immersion depth.
2. The weight (item 4) is required to stabilize the assembly.
 Push the weight down as far as the sleeve (item 5).
3. Then fix the cable clamp (item 8).

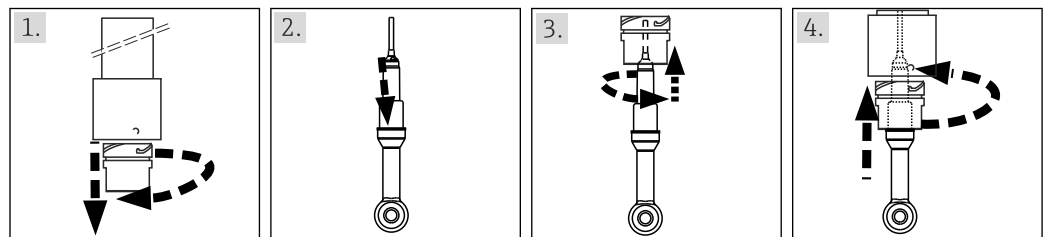
4.3 Installing the sensor

4.3.1 CLS21D and CLS21



1. Unscrew the sensor holder from the bayonet lock.
2. Push the O-ring over the threaded shaft of the sensor.
3. Screw the sensor into the sensor holder from above.
↳ Connect the sensor cable (→ 15).
4. Screw the sensor holder into the bayonet lock.

4.3.2 CLS50D and CLS50



1. Unscrew the sensor holder from the bayonet lock.
2. Push the O-ring over the threaded shaft of the sensor.
3. Guide the sensor cable through the sensor holder and the assembly pipe and screw the sensor into the sensor holder from below.
4. Screw the sensor holder into the bayonet lock.

4.4 Post-installation check

1. After mounting, check all the connections to ensure they are secure and leak-tight.
2. Check the hoses for damage.

5 Electrical connection

⚠ WARNING

Device is live


Incorrect connection may result in injury or death.

- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- ▶ **Prior** to commencing connection work, ensure that no voltage is present on any cable.

5.1 Connecting the sensor

Connecting the CLS21D, CLS50D or CLS50

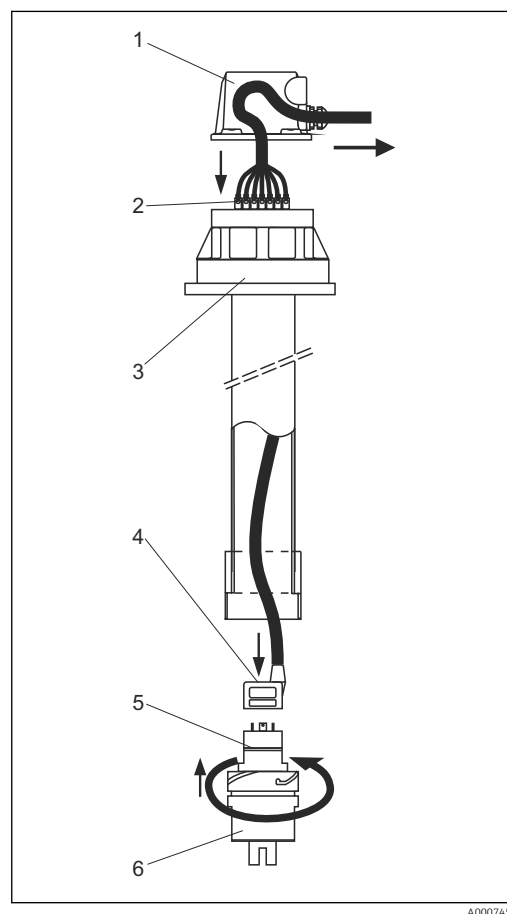
The sensor can be connected to a variety of transmitters.


 Pay attention to the connection instructions, e.g. for the terminal assignment, in the Operating Instructions of the transmitter used.

1. Guide the sensor cable from the sensor through the sensor holder and assembly pipe to the assembly head and through the Pg 13.5 cable gland to the outside.
2. Connect the sensor cable directly to the transmitter.




Connecting the CLS21

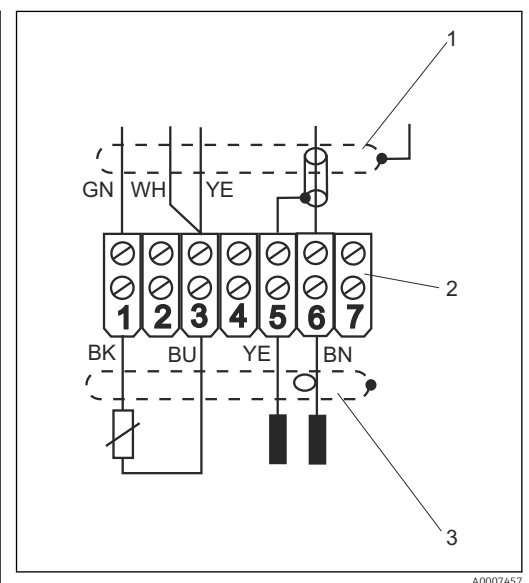
A special measuring cable is included with the assembly delivery to connect the CLS21 sensor. Connect this cable to the terminals in the assembly head.




 13 Measuring cable connection for CLS21


- 1 Assembly head cover
- 2 Terminals
- 3 Assembly head
- 4 Measuring cable connector
- 5 Sensor CLS21
- 6 Sensor holder

1. Unscrew the cover (→  13, item 1) of the assembly head (item 3).
2. Push the measuring cable supplied through the assembly pipe from below.
3. Connect the cable to the terminals in the assembly head (→  14, item 2 and 3).
4. Attach the connector (→  13, item 4) of the cable to the sensor plug-in head (item 5).
5. Screw the sensor holder (item 6) into the bayonet lock of the assembly pipe.



 14 Terminals

- 1 Measuring cable CYK71 (to transmitter)
- 2 Terminals
- 3 Measuring cable (to sensor)

6. Mount a Pg 13.5 cable gland in the assembly head cover.
7. Guide the measuring cable CYK71 (not included in the delivery for the assembly) through the Pg gland.
8. Connect the cable to the terminals (→  14, item 1 and 2).
9. Screw the assembly head cover onto the assembly head.

5.2 Post-connection check

Device condition and specifications	Notes
Are the outside of the sensor, assembly, cable undamaged?	Visual inspection
Electrical connection	Notes
Are the installed cables strain-relieved and not twisted?	
Is a sufficient length of the cable cores stripped, and is it positioned in the terminal correctly?	Check the fit (by pulling gently)
Are all the screws terminals properly tightened?	Tighten
Are all cable entries mounted, tightened and leak-tight?	For lateral cable entries, make sure the cables loop downwards to allow water to drip off
Are all cable entries installed downwards or mounted laterally?	

6 Maintenance

⚠ WARNING

Risk of injury if medium escapes

- ▶ Before every maintenance task make sure that the process pipe or container is empty and rinsed.

Take all the necessary precautions in time to ensure the operational safety and reliability of the entire measuring system.

NOTICE

Effects on process and process control

- ▶ When carrying out any work on the system, take into account possible repercussions for process control or the process itself.
- ▶ For your own safety, only use genuine accessories. With genuine parts, the function, accuracy and reliability are also ensured after maintenance work.

6.1 Servicing the assembly

The assembly must be serviced at regular intervals. The frequency and type of servicing depend on the medium.

1. Remove buildup on the assembly from time to time.
2. Keep O-rings and sealing surfaces clean.
3. Replace damaged O-rings.
 - ↳ Versehen Sie trockene O-Ringe mit einem dünnen Fettfilm (z.B. Syntheso Glep).
4. Replace damaged parts of the assembly.

Most common types of fouling and suitable cleaning agents

Fouling	Suitable cleaning agent
Greases and oils	Agents containing surfactants (alkaline agents) or water-soluble organic solvents (halogen-free, 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

⚠ WARNING

Solvents containing halogens and acetone

Gesundheitsgefährdung durch Einatmen, können Krebs verursachen (z.B. Chloroform) und Kunststoffteile der Armatur oder Sensors zerstören (Aceton).

- ▶ Never use acetone or any solvents containing halogens.

6.2 Cleaning the sensor

You must clean the sensor:

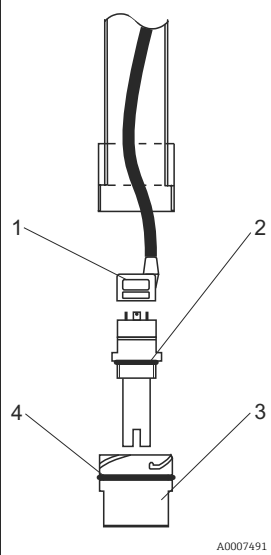
- Before every calibration
- Regularly during operation
- Before returning it for repairs

You can remove the sensor and clean it manually. Alternatively you can use the Chemoclean automatic spray cleaning system for cyclic sensor cleaning. The complete cleaning system includes:

- Spray head CLR30
- Cleaning injector CYR10
- Cleaning control, e.g. internally via transmitter Liquisys CLM223/253 with a Plus Package.

7 Repairs

7.1 Spare parts

	Item No.	Description and contents	Order No.
	1	Conductivity sensor cable; 3 m with straight connector for CLS21	50015632
	2	O-ring; ID = 28.17; W = 3.53; OD = 35.23; EPDM	50051753
	3	PP sensor holder G $\frac{3}{4}$ (without accessories) for CLS50D/CLS50 installation	51500640
	3	Kit for PP sensor holder G1 <ul style="list-style-type: none"> ▪ O-ring; ID = 53.57; W = 3.53; OD = 60.63; VITON ▪ O-ring; ID = 28.17; W = 3.53; OD = 35.23; EPDM ▪ Cable; 3 m with straight connector for CLS21 	50074080
	4	O-ring; ID = 53.57; W = 3.53; OD = 60.63; VITON	50009289

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 swift, safe and professional device returns, please read the return procedures and conditions at www.endress.com/support/return-material.

7.3 Disposal

The device contains electronic components and must therefore be disposed of in accordance with regulations on the disposal of electronic waste.

Observe the local regulations.

8 Accessories

i 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 office.

8.1 Installation accessories

Flexdip CYH112

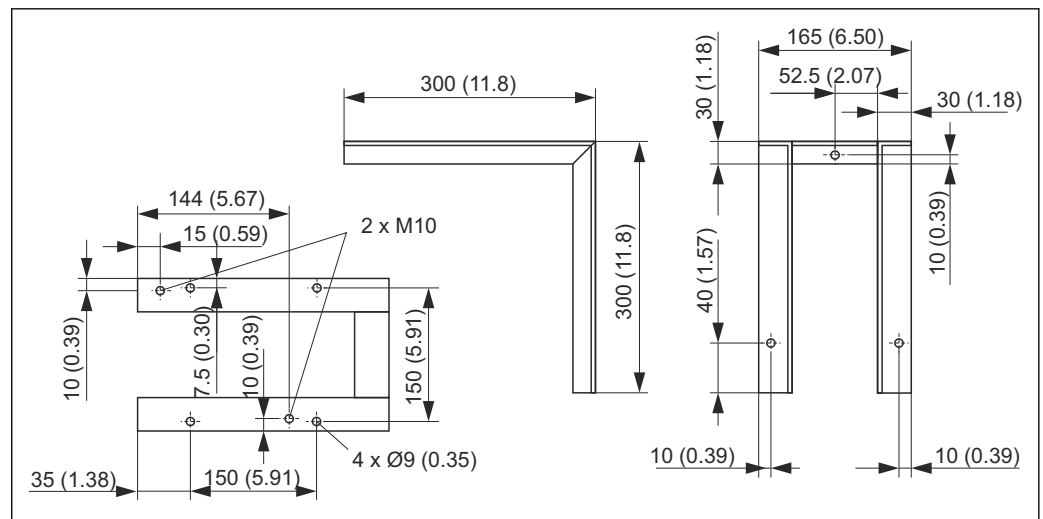
- Modular holder system for sensors and assemblies in open basins, channels and tanks
- For Flexdip CYA112 water and wastewater assemblies
- Can be affixed anywhere: on the ground, on the capstone, on the wall or directly onto railings.
- Stainless steel version
- Product Configurator on the product page: www.endress.com/cyh112

i Technical Information TI00430C

Mounting frame

For CPA111, CPA510, CPA530 and CLA111

- Material: stainless steel 1.4301 (AISI 304)
- Order number: 50066561



i 16 Mounting frame in mm (inch)

Adjustable flange adapter DN 100

- For CPA111 and CLA111 for variable immersion depths
- Order number: 50070514

Flange DN 100, unpressurized

- For CPA111 and CLA111 suitable for adjustable flange adapter
- Order number: 50066632

8.2 Sensors

Condumax CLS21D/ CLS21

- Two-electrode sensor in plug-in head version and fixed cable version
- Product Configurator on the product page: www.endress.com/CLS21d or www.endress.com/CLS21

i Technical Information TI00085C


Indumax CLS50D/ CLS50

- High-durability inductive conductivity sensor
- For standard and hazardous area applications
- With Memosens technology (CLS50D)
- Product Configurator on the product page: www.endress.com/cls50d or www.endress.com/cls50

 Technical Information TI00182C

8.3 Extension cable**Memosens data cable CYK11**

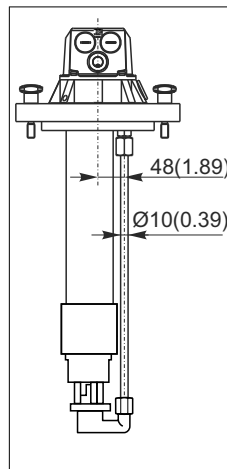
- Extension cable for digital sensors with Memosens protocol
- Product Configurator on the product page: www.endress.com/cyk11

 Technical Information TI00118C

Measuring cable CYK71

- Unterminated cable for connecting analog sensors and for extending sensor cables
- Sold by the meter, order numbers:
 - Non-Ex version, black: 50085333
 - Ex-version, blue: 50085673

8.4 Chemoclean*Chemoclean CLR30*

	Automatic spray cleaning system for cleaning the sensors CLS2.1/CLS2.1D Order according to product structure	
	<i>Materials in contact with the medium</i>	
	Spray head	PP-GF20
	O-rings	EPDM / VITON
	<i>Operating data</i>	
	Process pressure	Max. 4 bar (58 psi) absolute, at 20 °C (68 °F)
	Process temperature	Max. 80 °C (176 °F) at ambient pressure
	Cleaner pressure	4 to 6 bar (58 to 87 psi) absolute, at 20 °C (68 °F)

9 Technical data

9.1 Environment

Ambient temperature range -10 to +80 °C (+10 to +180 °F)

9.2 Process

Process temperature -10 to +80 °C (+10 to +180 °F)

Process pressure	CLA111-A/B/D	Unpressurized
	CLA111-C	Max. 5 bar (72 psi) abs. at 20 °C (68 °F), unpressurized up to 80 °C (176 °F)

9.3 Mechanical construction

Dimensions →  8

Weight Approx. 4.0 kg (8.8 lbs)

Materials	Sensor holder	PP-GF 20
	Immersion tube	PP
	O-ring	VITON
	<i>Only version CLA111-D:</i>	
	Half-shells	Cast iron, PVC-coated
	Cable clamp	Stainless steel 1.4401 (AISI 316)

Cable entries 1 x Pg 13.5 and 2 x Pg 16

Sensors suitable for use CLS21D, CLS21, CLS50D, CLS50

Immersion depth	Standard	1000 mm (39.4 inch), 2000 mm (78.8 inch)
	Other length	500 to 3000 mm (19.7 to 118 inch)

Process connections	CLA111-A	Flange DN 100, additionally with captive cross formed screws
	CLA111-B	Adjustable flange DN 100
	CLA111-C	Pressurized flange DN 100
	CLA111-D	Stainless steel suspension bracket (1.4571 (AISI 316 Ti))

Index

A

Ambient temperature range	21
Assembly	
Installation	11
Servicing	17

C

Check	
Connection	16
Installation	14
Chemoclean	20

D

Designated use	4
Disposal	18

E

Electrical connection	14
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I

Incoming acceptance	6
Installation	
Check	14
Installation conditions	8
Installing the assembly	11
Sensor	14
Installation conditions	
Dimensions	8
Measuring system	10

M

Maintenance	17
-----------------------	----

N

Nameplate	6
---------------------	---

P

Process pressure	21
Process temperature	21
Product identification	6

R

Repairs	18
Return	18

S

Safety information	3
Safety instructions	4
Scope of delivery	7
Sensor	
Accessories	19
Cleaning	17
Connecting	15
Installing	14
Spare parts	18
Suspension bracket	13
Symbols	3

T

Technical data	
Environment	21
Mechanical construction	21
Process	21

U

Use	4
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