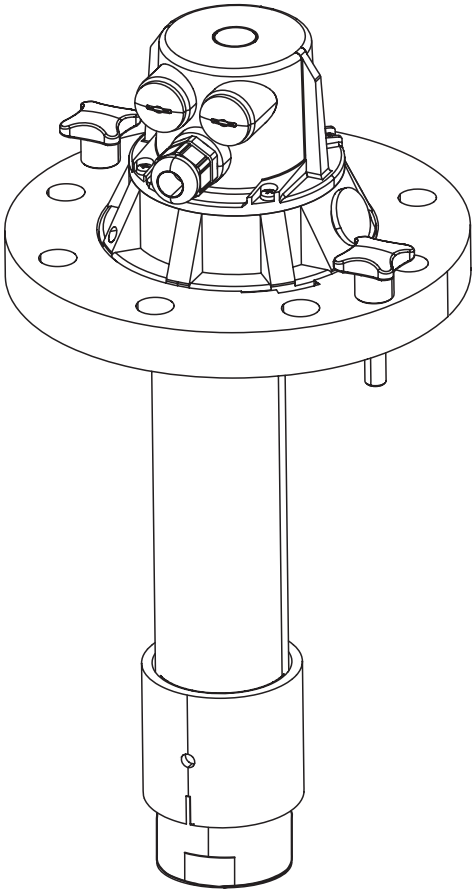
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions

Dipfit W CLA111

Immersion assembly for conductivity measurement



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Endress+Hauser

People for Process Automation

Brief overview

Here is how to use these Operating Instructions to commission your assembly quickly and safely:

	Safety instructions
Page 4 ff.	General safety instructions
Page 5	Explanation of the warning symbols You can find special instructions at the appropriate position in the chapter in question. The significance is indicated with the icons Warning ⚠, Caution ☝ and Note ✎.

▼

	Installation
Page 7 ff.	Here you can find installation conditions such as the dimensions of the assembly.
Page 9 ff.	These pages show you how to install the assembly.
Page 15 ff.	Here you can find how to install a sensor in the assembly.

▼

	Maintenance
Page 19 ff.	For normal operation of the assembly, it is absolutely essential to carry out maintenance tasks on a regular basis, such as sensor or assembly cleaning.
Page 20 ff.	On the given pages you can find the accessories for the assembly.
Page 22	Here you can find an overview of the spare parts which can be delivered.

▼

	Technical data
Page 7 ff.	Dimensions
Page 23	Environment and process, weight, materials etc.

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	Index
Page 25	You can find important terms and keywords on the individual sections here. Use the keyword index to find the information you need quickly and efficiently.

Table of contents

1 Safety instructions

1.1 Designated use

The immersion and process assembly Dipfit W CLA111 is suitable for universal use in water and wastewater applications.
Its mechanical design permits its use in pressurized systems (see "Technical data").

Any other use than the one described here compromises the safety of persons and the entire measuring system and is, therefore, not permitted.
The manufacturer is not liable for damage caused by improper or non-designated use.

1.2 Installation, commissioning and operation

Please note the following items:
- Installation, commissioning, operation and maintenance of the measuring system must only be carried out by trained technical personnel.
  The technical personnel must be authorized for the specified activities by the system operator.
- Electrical connection must only be carried out by a certified electrician.
- Technical personnel must have read and understood these Operating Instructions and must adhere to them.
- Before commissioning the entire measuring point, check all the connections for correctness. Ensure that electrical cables and hose connections are not damaged.
- Do not operate damaged products and secure them against unintentional commissioning. Mark the damaged product as being defective.
- Measuring point faults may only be rectified by authorized and specially trained personnel.
- If faults can not be rectified, the products must be taken out of service and secured against unintentional commissioning.
- Repairs not described in these Operating Instructions may only be carried out at the manufacturer's or by the service organization.

1.3 Operational safety

The assembly has been designed and tested according to the state of the art and left the factory in perfect functioning order.
Relevant regulations and European standards have been met.

As the user, you are responsible for complying with the following safety conditions:
- Installation instructions
- Local prevailing standards and regulations.

1.4 Return

If the assembly has to be repaired, please return it *cleaned* to the sales center responsible.
Please use the original packaging, if possible.

Please enclose the completed "Declaration of contamination" (copy the second last page of these Operating Instructions) with the packaging and the transportation documents.
No repair without completed "Declaration of contamination"!

1.5 Notes on safety icons and symbols

Warning!
This symbol alerts you to hazards. They can cause serious damage to the instrument or to persons if ignored.

Caution!
This symbol alerts you to possible faults which could arise from incorrect operation. They could cause damage to the instrument if ignored.

Note!
This symbol indicates important items of information.

2 Identification

2.1 Nameplate

You can identify the assembly version by the order code on the nameplate. Please compare this code with your order.

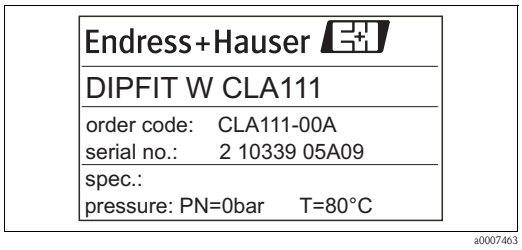


Fig. 1: Example of a nameplate

You can find possible assembly versions and the resulting order codes in the product structure.

2.2 Scope of delivery

The scope of delivery comprises:
- Dipfit W CLA111 assembly (ordered version)
- Measuring cable with plug for two-electrode sensor CLS21
- O-ring for sensors CLS21 and CLS21D
- Operating Instructions (English)

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

2.3 Product structure

	Immersion depth				
	0	Immersion depth: 1000 mm			
	1	Immersion depth: 2000 mm			
	2	Immersion depth: as specified: 500 - 3000 mm			
	3	Immersion depth: 500 mm			
	4	Immersion depth: 1500 mm			
	5	Immersion depth: 2500 mm			
	6	Immersion depth: 3000 mm			
		Assembly material			
		0	Thread G 1, O-rings: EPDM for CLS21 and CLS21D		
		1	Thread G ¾, O-rings: EPDM for CLS50		
			Process connection		
			A	Flange DN 100, PP / pressureless	
			B	Flange DN 100, PP / adjustable flange	
			C	Flange DN 100; max. 4 bar	
			D	Suspension bracket; 316Ti, immersion depth 1000 mm only	
			F	For pendulum frame mounting	
CLA 111-					complete order code

3 Installation

3.1 Incoming acceptance, transport, storage

- Make sure the packaging is undamaged!
  Inform the supplier about damage to the packaging. Keep the damaged packaging until the matter has been settled.
- Make sure the contents are undamaged!
  Inform the supplier about damage to the delivery contents. Keep the damaged products until the matter has been settled.
- Check that the scope of delivery is complete and agrees with your order and the shipping documents.
- The packaging material used to store or to transport the product must provide shock protection and humidity protection. The original packaging offers the best protection. Also, keep to the approved ambient conditions (see "Technical data").
- If you have any questions, please contact your supplier or your sales center responsible.

3.2 Installation conditions

3.2.1 Dimensions

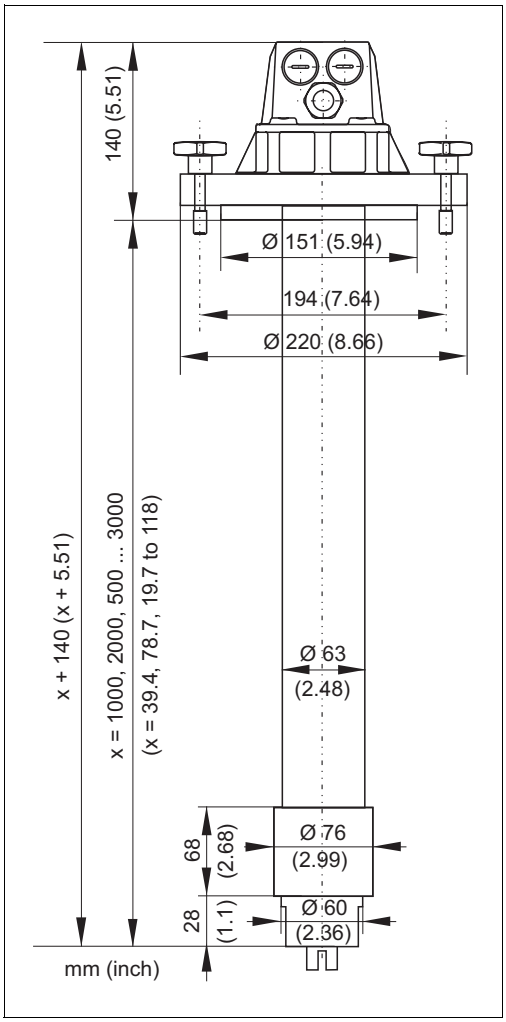


Fig. 2: Version A and C with flange DN 100

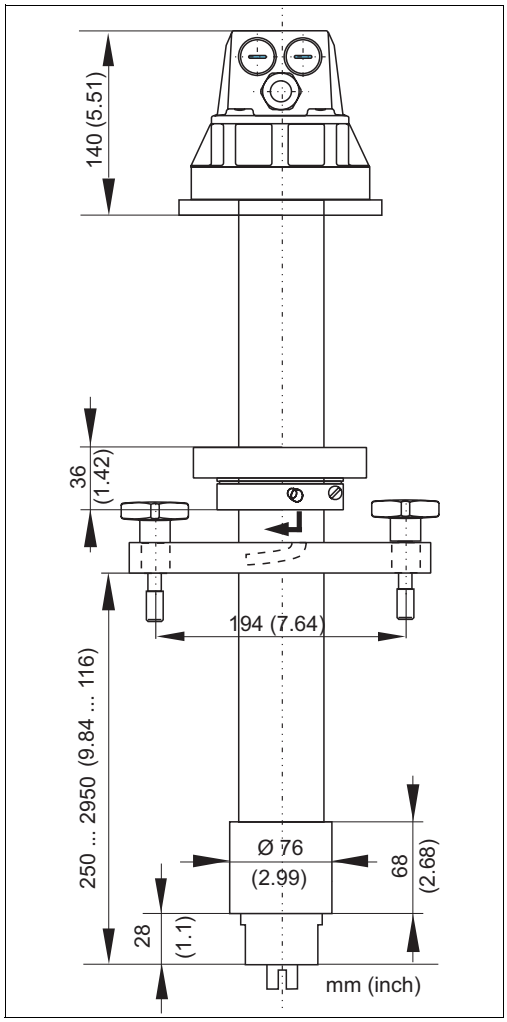


Fig. 3: Version B with adjustable flange DN 100

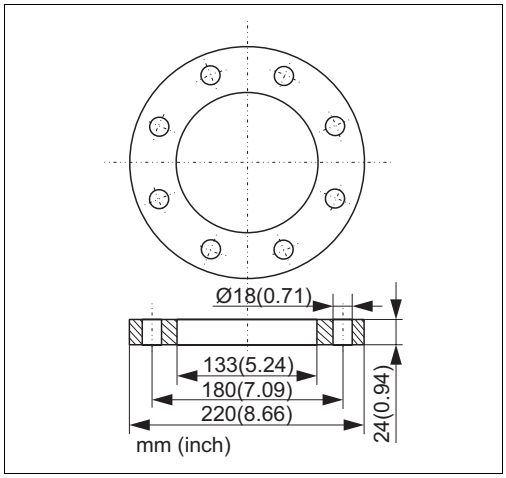


Fig. 4: Pressurized flange DN 100 for CLA111-C

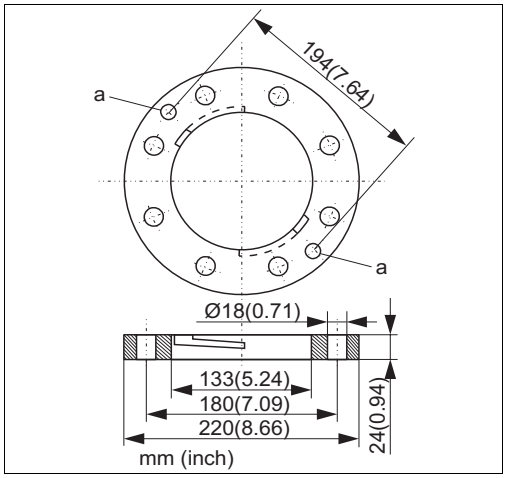


Fig. 5: Flange DN 100 for CLA111-A/B

a Through hole for star handle screws

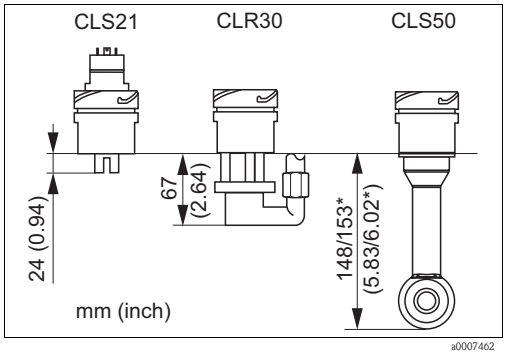


*Fig. 6: *Length below the sensor holder*

3.3 Installation instructions

3.3.1 Measuring system

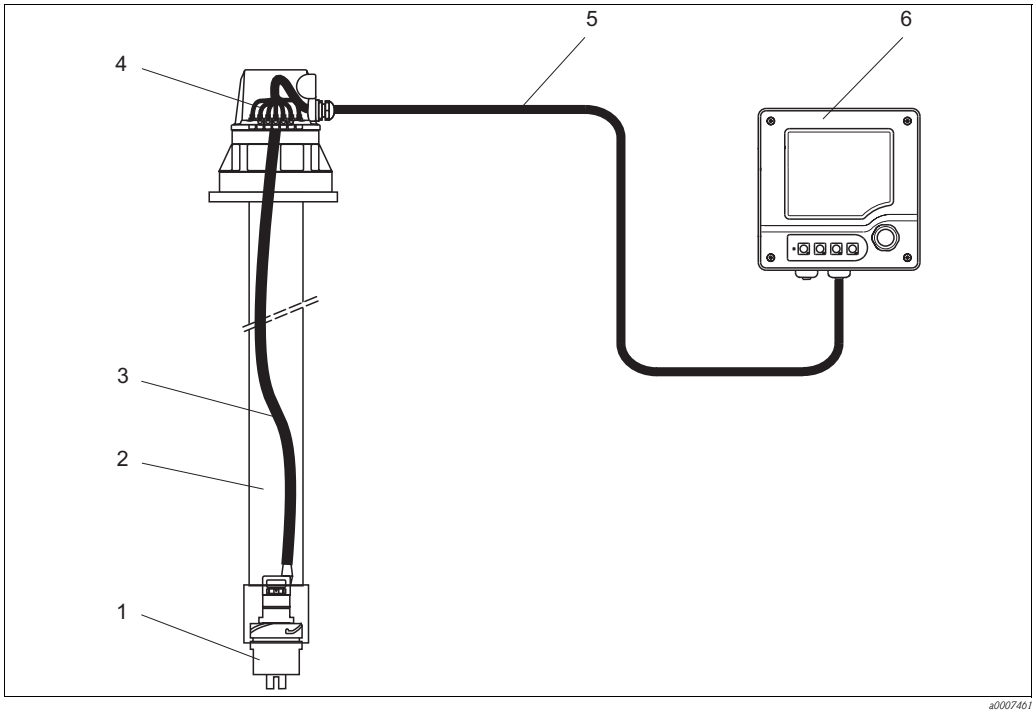


Fig. 7: Example of a complete measuring system

1	*Sensor holder*	*4*	*Cable gland Pg 13.5*
2	*Immersion assembly Dipfit W CLA111*	*5*	*Extension cable*
3	*Measuring cable*	*6*	*Transmitter Liquiline M CM42*

3.3.2 Installation of the assembly

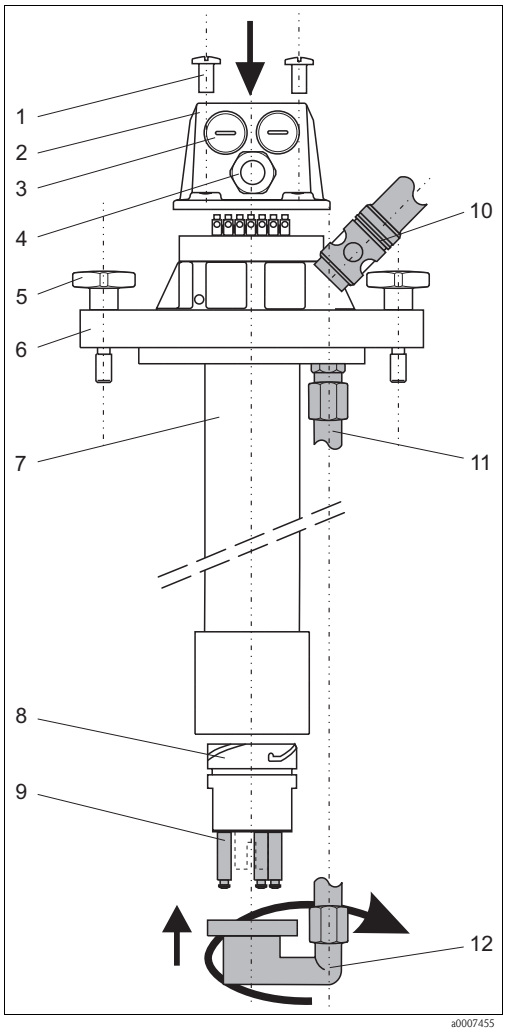


Fig. 8: Version A and C with flange DN 100

1 Phillips screw (4 pieces)
2 Assembly head
3 Dummy plug
4 Cable gland Pg 13.5
5 Star handle screws (not for pressurized version)
6 Flange DN 100 , A: standard , C: pressurized flange
7 Assembly pipe
8 Sensor holder
9 Sensor holder with fixing bolts for Chemoclean spray head CLR30
10 Quick fitting coupling for Chemoclean
11 Connecting pipe with pipe couplings for Chemoclean
12 Spray head for Chemoclean

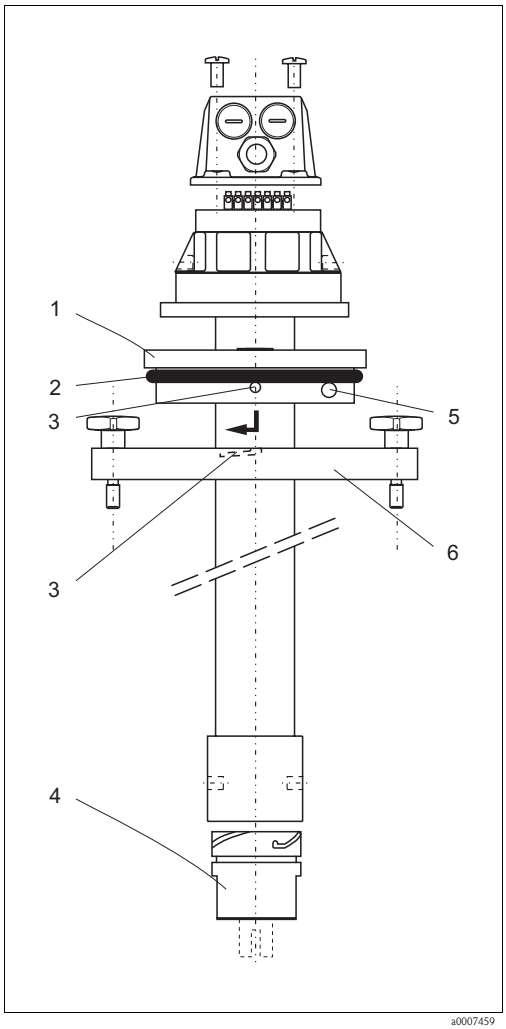
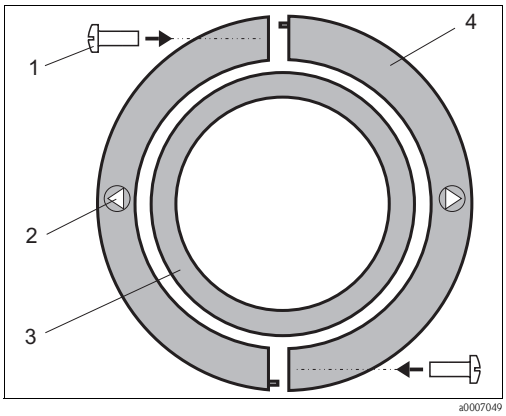


Fig. 9: Version B with adjustable flange DN 100

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



1 *Phillips screws*
2 *Marker "final position"*
3 *Assembly pipe*
4 *Half-shells*

Fig. 10: Adjustable flange adapter

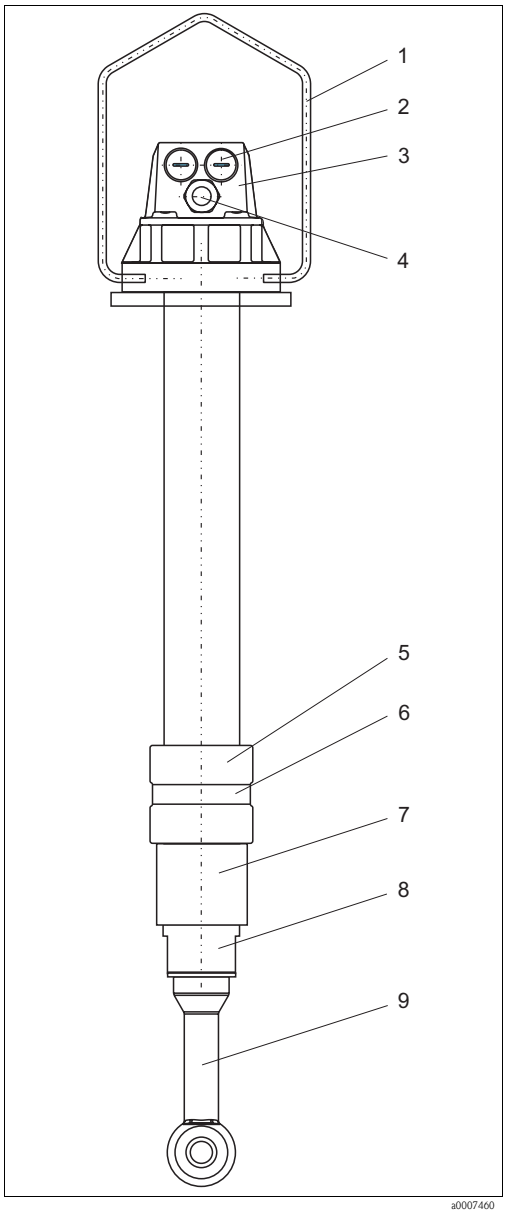
Installation of the assembly with adjustable flange DN 100:

1. Attach flange DN 100 to mounting frame.
2. Put the half-shells (4) of the adapter to the desired position of the pipe.
3. Use the Phillips screws (1) to screw the half-shells together.
4. Put the O-ring in the O-ring groove.
5. Insert the assembly in the installed flange DN 100.
6. Hold the assembly at the assembly head and screw it clockwise into the bayonet until marker “final position”(2).

Dismantling of the assembly

1. Leave the installed flange DN 100 on the mounting frame.
2. Hold the assembly at the assembly head and screw it counterclockwise out of the bayonet lock. Take it out of the medium.

3.3.3 Version with suspension bracket



1 Suspension bracket (AISI 316 Ti)
2 Dummy plug Pg 16
3 Assembly head
4 Cable gland Pg 13.5
5 Weight (half-shells)
6 Cable clamp to fix the half-shells
7 Sleeve
8 Sensor holder
9 Sensor

Mounting
The suspended version of the assembly can be mounted at basins using the assembly holder CYH101. The mounting chain allows a flexible immersion depth.

Note!
The weight (5) is required to stabilize the assembly. Push it all the way down to the sleeve (7) before you finally fix the cable clamp (6).

3.3.4 Version for pendulum frame mounting

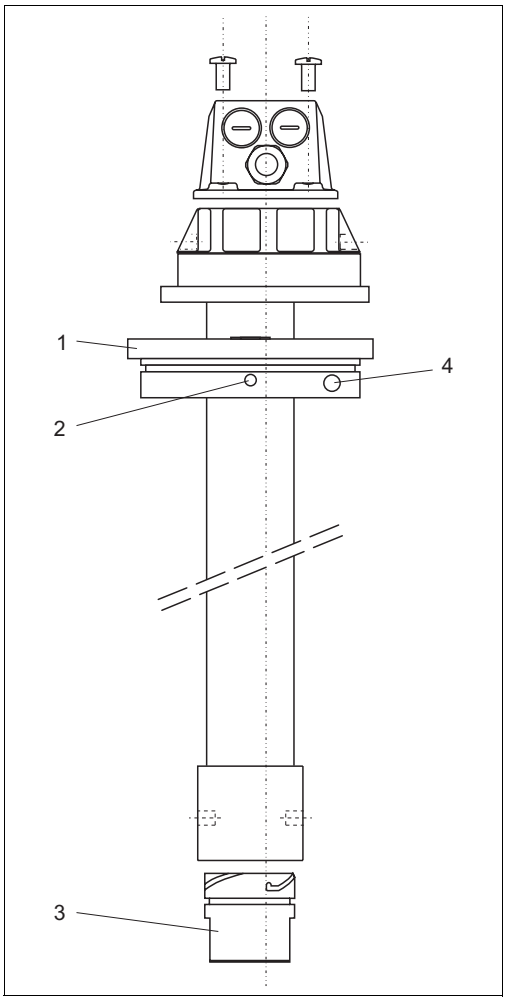


Fig. 11: Version F for pendulum frame mounting

1 Retaining ring (half-shells)
2 Threaded hole M8 for knurled thumb screw
3 Sensor holder
4 Tensioning screws (2 pieces) to fix the half-shells

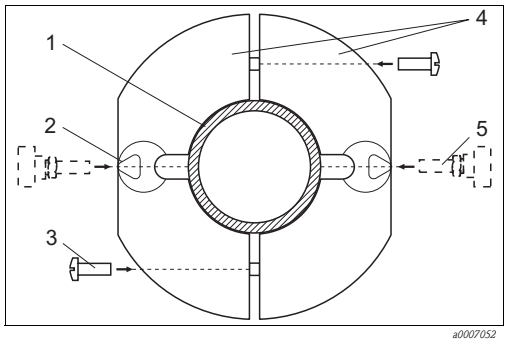


Fig. 12: Retaining ring

1 Assembly pipe
2 Marker "final position"
3 Phillips screws
4 Half-shells
5 Knurled thumb screws

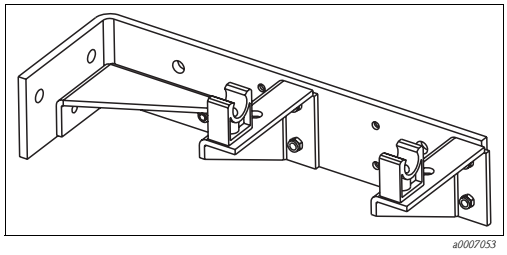


Fig. 13: Pendulum frame

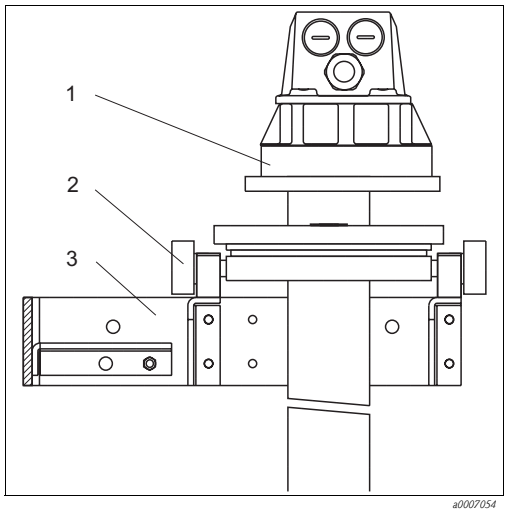


Fig. 14: CLA111 mounted with pendulum frame

1 Assembly
2 Knurled thumb screws
3 Pendulum frame

Mounting
The assembly version F is supplied with a retaining ring for pendulous suspension from the pendulum frame.
Mounting the assembly:

1. Put the half-shells (Fig. 12, pos. 4) of the adapter to the desired position of the assembly pipe.
2. Fix the half-shells with the Phillips screws (Fig. 12 pos. 3).
3. Screw the stop nuts onto the two knurled thumb screws (Fig. 12, pos. 5).
4. Screw the knurled thumb screws into the bore holes M8 (Fig. 11, pos. 2).
5. Fix the knurled thumb screws with the stop nuts.
6. Hang the assembly into the pillow blocks of the pendulum frame (Fig. 14).

3.4 Sensor installation

3.4.1 Installation of CLS21

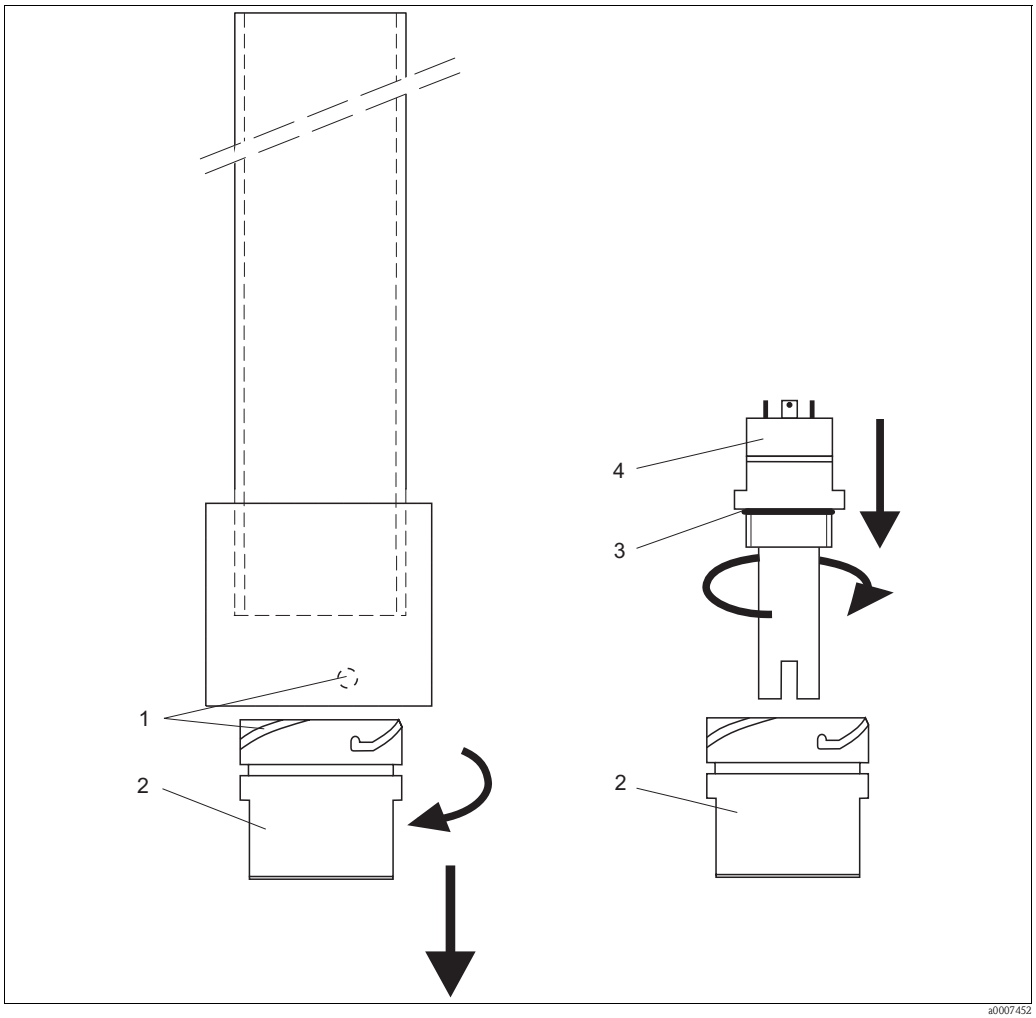


Fig. 15: Removal of the sensor holder and mounting of the sensor CLS21

1 Bayonet lock
2 Sensor holder
3 O-ring
4 Sensor CLS21

Mounting of the sensor:

1. Push the O-ring (pos. 3) over the threaded shaft.
2. Screw the sensor holder (pos. 2) out of the bayonet lock (pos. 1).
3. Screw the sensor (pos. 4) into the sensor holder from above.
4. Screw the sensor holder into the bayonet lock.

3.4.2 Installation of CLS50

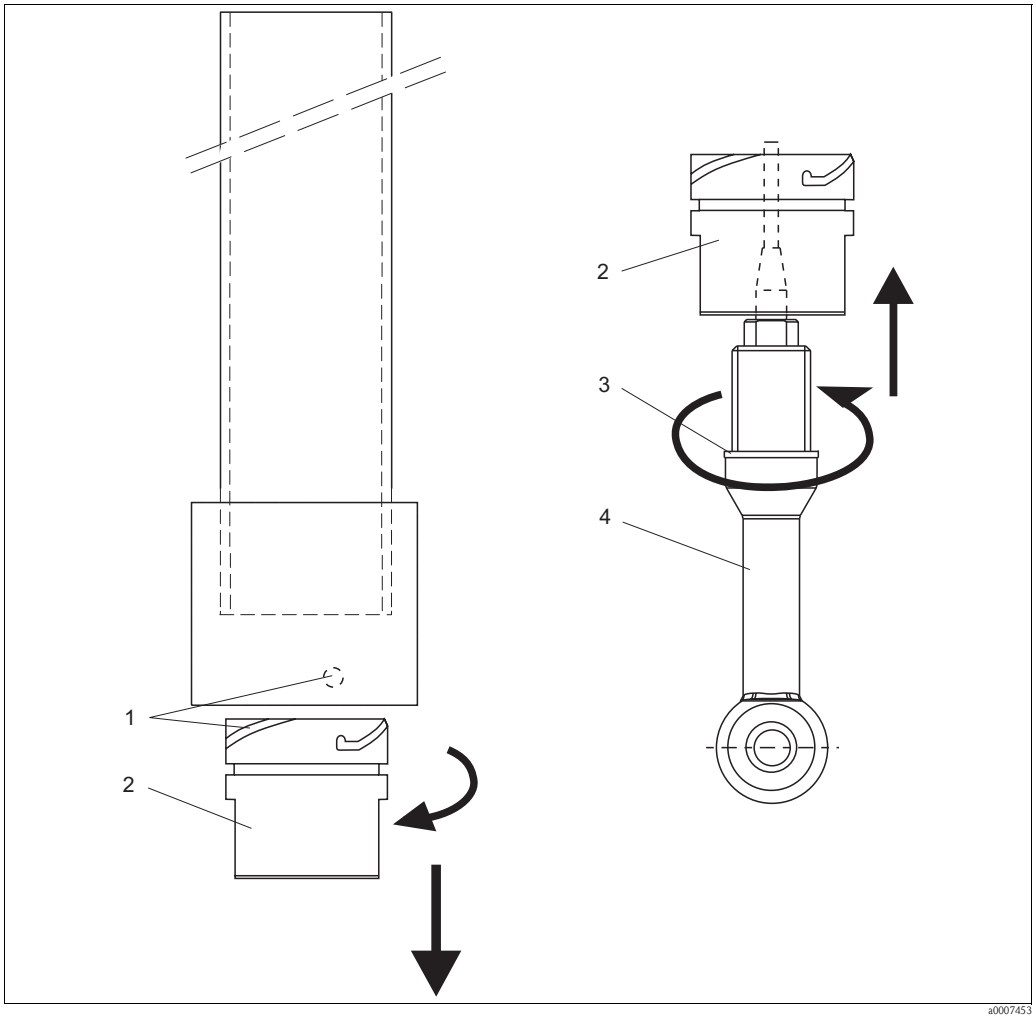


Fig. 16: Removal of the sensor holder and mounting of the sensor CLS50

1 Bayonet lock
2 Sensor holder
3 Gasket
4 Sensor CLS50

Mounting of the sensor:

1. Push the gasket (pos. 3) over the threaded shaft.
2. Screw the sensor holder (pos. 2) out of the bayonet lock (pos. 1).
3. Lead the sensor cable from the bottom through the sensor holder and through the assembly pipe.
4. Screw the sensor (pos. 4) from the bottom into the sensor holder.
5. Screw the sensor holder into the bayonet lock.

3.5 Post-installation check

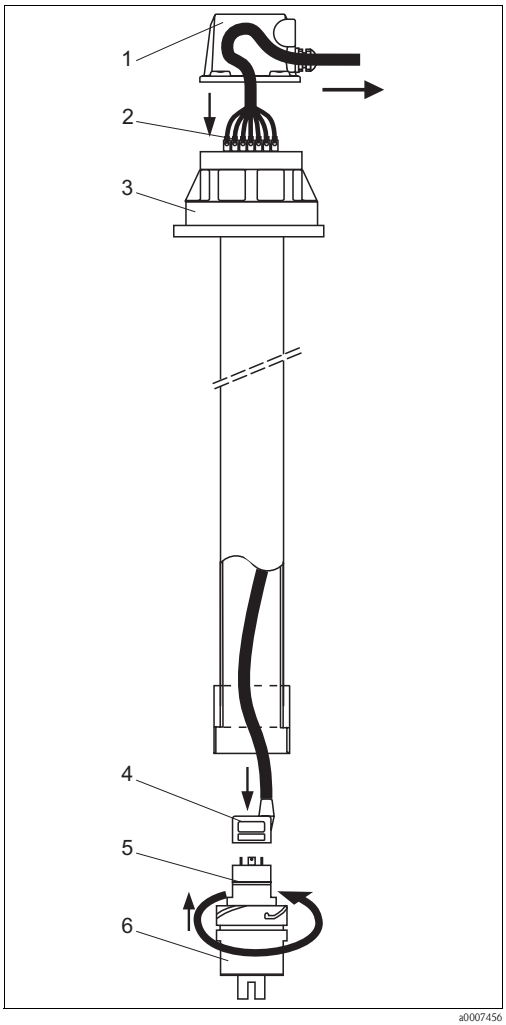
- After installation, check that all connections are firmly in position and leak-tight.
- When mounting the assembly via pendulum frame, check if the assembly is moving freely.

4 Wiring

4.1 Connection of the sensors

Connect the sensors CLS21D and CLS50 directly at the transmitter.
Connect the sensor CLS21 with the special measuring cable (included in the scope of delivery) at the terminals in the assembly head.

Connection of the sensor CLS21:



1 Assembly head cover
2 Terminals
3 Assembly head
4 Plug of the measuring cable
5 Sensor CLS21
6 Sensor holder

Fig. 17: Connection of the measuring cable for CLS21

1. Unscrew the cover (pos. 1) from the assembly head (pos. 3).
2. Push the measuring cable from the bottom through the assembly pipe.
3. Connect the measuring cable according to → Fig. 18 to the terminals (pos. 2) inside the assembly head.
4. Push the plug (pos. 4) of the measuring cable onto the sensor head (pos. 5).
5. Screw the sensor holder (pos. 6) into the bayonet lock of the assembly pipe.
6. Mount a cable gland Pg 13.5 at the cover of the assembly head.
7. Lead the measuring cable CYK71 through the cable gland.
8. Connect the measuring cable CYK71 according to → Fig. 18 to the terminals (pos. 2).
9. Screw the cover onto the assembly head.

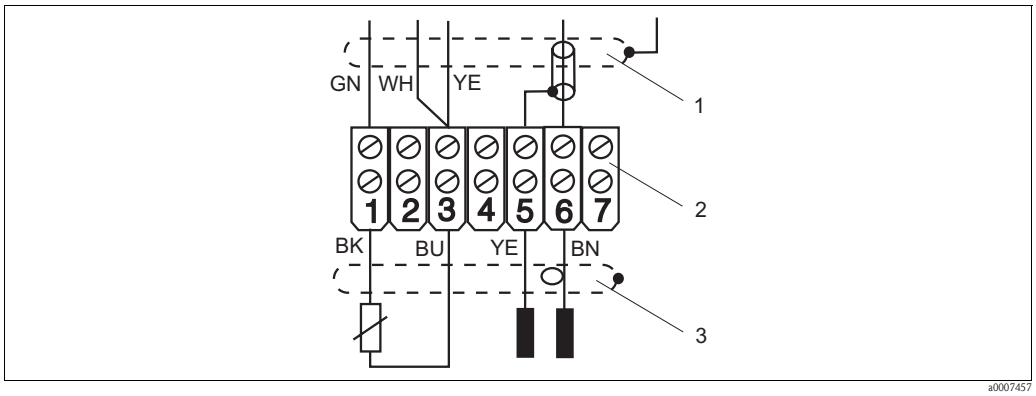


Fig. 18: Terminals for CLS21

1 Measuring cable CYK71 (to the transmitter)
2 Terminals
3 Special measuring cable (to the sensor)

4.2 Post-connection check

Device condition and specifications	**Note**
Is the sensor, junction box or cable damaged externally?	Visual inspection
Electrical connection	**Notes**
Are the mounted cables strain-relieved and not twisted?	
No loops and cross-overs in the cable?	
Are the power supply and signal cables correctly connected?	Use the wiring diagram of the transmitter
Are all screw terminals firmly tightened?	
Are all cable entries installed, firmly tightened and correctly sealed?	

5 Maintenance

Warning!
Risk of injury!
Before starting maintenance work on the assembly, make sure that the process line and the tank are depressurized, empty and rinsed.

5.1 Maintaining the assembly

To ensure a reliable measurement perform the following maintenance work:

- Replace damaged assembly parts.
- Keep O-rings and sealing surfaces clean.
- Replace damaged O-rings (apply a thin layer of grease to new or dry O-rings (e.g. Syntheso Glep)).
- Remove deposits from time to time.

5.2 Cleaning the sensor

You have to clean the sensor:
- before every calibration
- regularly during operation
- before being returned for repair

You can remove and clean the sensor manually or perform a cyclical cleaning operation with the automatic cleaning system Chemoclean. A complete cleaning system consists of:

- Spray head CLR30
- Cleaning injector CYR10
- Cleaning control, e.g. program sequencer CYR20 or internally via transmitter Mycom CLM153 or Liquisys M CLM223/253 with "Plus Package".

5.3 Cleaning agents

The selection of the cleaning agent is dependent on the degree and type of contamination. The most common contaminations and the suitable cleaning agents are listed in the following table.

Type of contamination	Cleaning agent
Greases and oils	Hot water or tempered substances containing tensides (alkaline) or water-soluble organic solvents (e.g. ethanol)
Calciferous deposits, metal hydroxide deposits, lyophobic biological deposits	Approx. 3% hydrochloric acid
Sulphide deposits	Mixture of 3% hydrochloric acid and thiocarbamide (commercially available)
Protein deposits	Mixture of 3% hydrochloric acid and pepsin (commercially available)
Fibers, suspended substances	Water under pressure, poss. with surface-active agents
Light biological deposits	Water under pressure

Caution!
Do not use organic solvents containing halogen or acetone. These solvents could destroy plastic components of the assembly or the sensor and it is also partly suspected that they cause cancer (e.g. chloroform).

6 Accessories

6.1 Installation material

Immersion assembly holder CYH101
- For pH, ORP, oxygen, conductivity assemblies and for oxygen and turbidity sensors;
- Ordering acc. to product structure (Technical Information TI092C/07/en)

Mounting frame for CPA111, CPA510, CPA530 and CLA111
- Material: stainless steel 1.4301 (AISI 304)
- Order number: 50066561

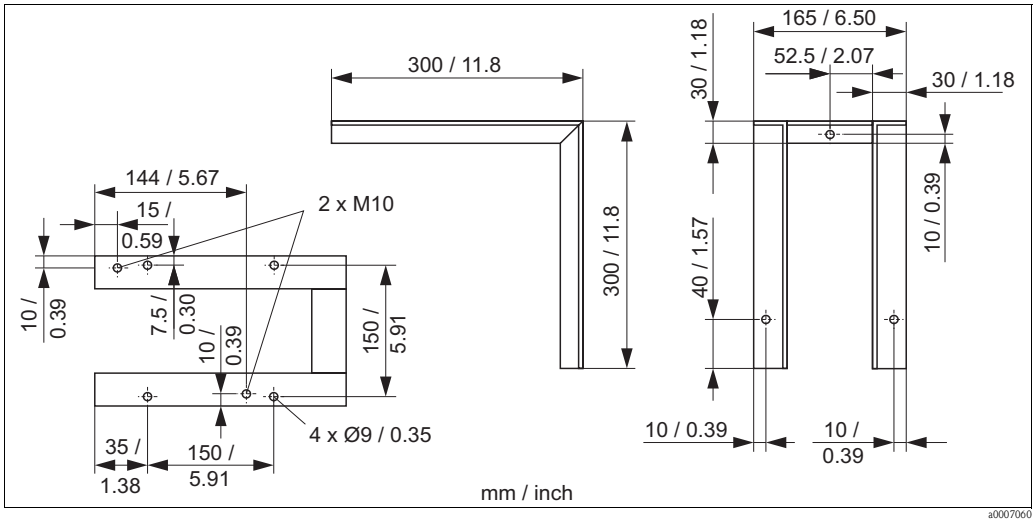


Fig. 19: Dimensions of mounting frame

Pendulum frame
- For pendulous suspension of CPA111, CLA111, CPA510 and CYA611 assemblies
- Order number: 50080196

Add-on kit pendulum frame
- To mount CPA111 and CLA111 at pendulum frame
- Order number: 50087873

Adjustable flange adapter DN 100
- For CPA111 and CLA111 with variable immersion depth
- Order number: 50070514

Flange DN 100 unpressurized
- For CPA111 and CLA111 suitable for the adjustable flange adapter
- Order number: 50066632

6.2 Sensors

Conductive conductivity sensors Condumax W CLS21/CLS21D
- Two-electrode sensor in fixed cable and plug-in head version
- Optionally with Memosens technology (CLS21D)
- With temperature sensor Pt 100 (CLS21) or NTC (CLS21D)
- Cell constant k = 1 cm^{-1}
- Order according to product structure, see Technical Information TI085C/07/en

Inductive conductivity sensor Indumax P CLS50
- Highly resistant conductivity sensor for standard, Ex and high-temperature applications,
- Order according to product structure, see Technical Information TI182C/07/en

6.3 Extension cables

Special measuring cable / extension cable CYK71
- For two-electrode conductivity sensors with integrated temperature sensor
- One low-noise coaxial line, four auxiliary cores at 0.75 mm^2 each with a common screen
- Outer diameter 7 mm (0.25")

Sold by the meter, (minimum) length 5 m (16.4 ft)	order no. 50085333
Length 5 m (16.4 ft)	order no. 50088280
Length 10 m (32.8 ft)	order no. 50088281
Length 50 m (164 ft)	order no. 50088284
Length 100 m (328 ft)	order no. 50088285

CYK10 Memosens data cable
- For digital sensors with Memosens technology
- Ordering according to product structure, see Technical Information (TI376C/07/en)

6.4 Transmitters

Liquiline M CM42 (for analog conductivity sensors and digital conductivity sensors with Memosens technology)
- Modular two-wire transmitter for Ex and non-Ex areas
- Hart®, PROFIBUS or FOUNDATION Fieldbus available
- Ordering acc. to product structure, see Technical Information (TI381C/07/en)

Liquisys M CLM223/253 (for analog conductivity sensors)
- Transmitter for conductivity, field or panel-mounted housing,
- Hart® or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI193C/07/en)

Mycom S CLM153 (for analog conductivity sensors)
- Transmitter for conductivity, one or two channel version, Ex or Non-Ex,
- Hart® or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI234C/07/en)

6.5 Cleaning systems

Chemoclean CLR30
- Automatic cleaning system for the sensors CLS21/CLS21D
- Ordering according to product structure

	Design, material		
	0	CLA111, PP	
		Immersion depth	
		0	1000 mm
		1	2000 mm
		2	special length 500 ... 3000 mm
CLR30-			**complete order code**

7 Spare part kits

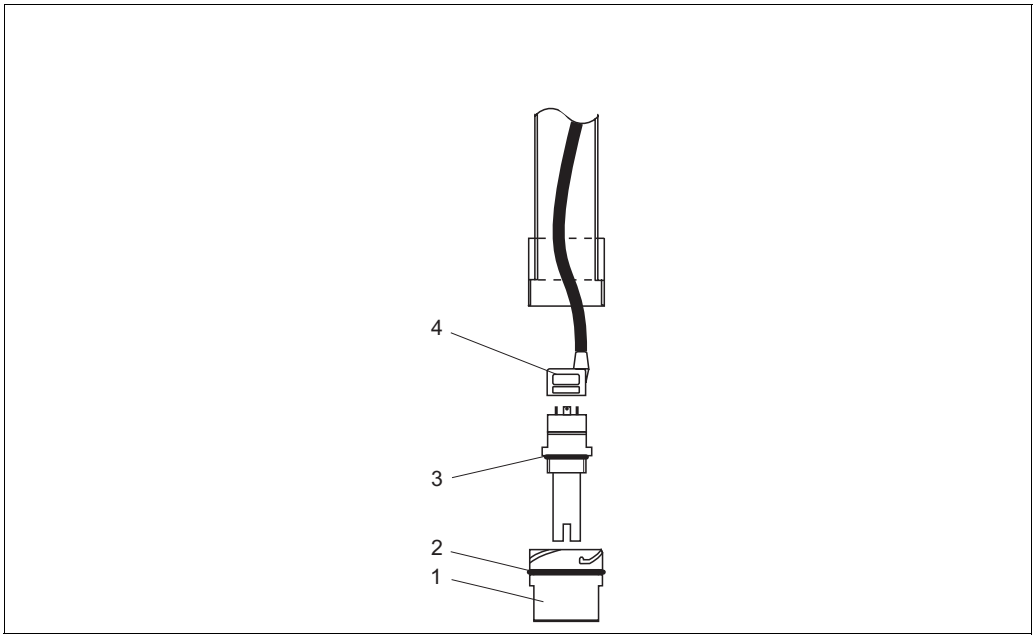


Fig. 20: Spare parts

Note!
Please, refer to the following table for the spare part kits order numbers according to the positions in Fig. 20.

Position	Description and kit content	Spare part kit order no.
1	Sensor holder G¾ , material: PP (without accessories)	51500640
1	Kit sensor holder G1, material: PP, 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 (9.84 ft) with special plug for CLS21	50074080
2	O-ring; ID = 53.57; W = 3.53; OD = 60.63; VITON	50009289
3	O-ring; ID = 28.17; W = 3.53; OD = 35.23; EPDM	50051753
4	Conductivity sensor cable; 3 m (9.84 ft) with special plug for CLS21	50061684

8 Technical data

8.1 Environment

Ambient temperature	-10 ... 80 °C (14 ... 176 °F)

8.2 Process

Process pressure and temperature	version A, B, D, F	unpressurized, 80 °C (176 °F)
	version C	4 bar at 20 °C (58 psi at 68 °F) unpressurized, 80 °C (176 °F)

8.3 Mechanical construction

Cable glands	1 x Pg 13.5; 2 x Pg 16	
Applicable sensors	CLS21, CLS21D and CLS50	
Immersion depth	standard: 1000 mm (39.4"), 2000 mm (78.8") optional length: 500 ... 3000 mm (19.7 ... 118")	
Required cross section	DN 100	
Weight	approx. 4 kg (8.82 lbs)	
Materials (in contact with medium)	sensor holder immersion pipe O-ring	PP-GF 20 PP EPDM
Additionally with versions D and F	half-shells cable clips	gray cast iron, PVC coated stainless steel 1.4401 (AISI 316)

8.4 Fastening

Version A	Flange DN 100, with additional captive star handle screws
Version B	Adjustable flange DN 100
Version C	Pressurized flange DN 100
Version D	Suspension bracket; material: stainless steel 1.4571 (AISI 316 Ti)
Version F	for pendulum frame

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Endress+Hauser

People for Process Automation

Declaration of Hazardous Material and De-Contamination

Erklärung zur Kontamination und Reinigung

RA No. ☐☐☐☐☐☐☐☐

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.
Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.

Type of instrument / sensor
Geräte-/Sensortyp _____

Serial number
Seriennummer _____

☐ **Used as SIL device in a Safety Instrumented System /** *Einsatz als SIL Gerät in Schutzeinrichtungen*

Process data/ *Prozessdaten*
Temperature / *Temperatur*_____ [°F] _____ [°C]
Conductivity / *Leitfähigkeit* _____ [µS/cm]
Pressure / *Druck* _____ [psi] _____ [Pa]
Viscosity / *Viskosität* _____ [cp] _____ [mm^2/s]

Medium and warnings
Warnhinweise zum Medium

	Medium /concentration *Medium /Konzentration*	Identification CAS No.	flammable *entzündlich*	toxic *giftig*	corrosive *ätzend*	harmful/ irritant *gesundheits-schädlich/ reizend*	other * *sonstiges**	harmless *unbedenklich*
Process medium *Medium im Prozess*								
Medium for process cleaning *Medium zur Prozessreinigung*								
Returned part cleaned with *Medium zur Endreinigung*								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive
* *explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv*

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.
Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / *Fehlerbeschreibung* _____

_____

_____

Company data / *Angaben zum Absender*

Company / *Firma* _____

_____

Address / *Adresse*

_____

_____

Phone number of contact person / *Telefon-Nr. Ansprechpartner:*

_____

Fax / E-Mail _____

Your order No. / *Ihre Auftragsnr.* _____

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge.We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."
"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefahrbringender Menge sind."

_____ (place, date / *Ort, Datum)*

_____ Name, dept./*Abt.* (please print / *bitte Druckschrift*)

_____ Signature / *Unterschrift*

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