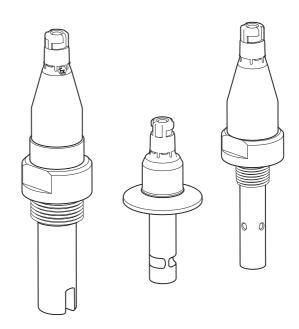
Operating Instructions Condumax CLS15D/16D/21D

Sensors with Memosens protocol For conductive measurement of conductivity in liquids







3

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1 Document information

1.1 Warnings

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.
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

Additional information, tips

✓ Permitted or recommended

Forbidden or not recommended

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.
- 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 conductivity sensors are designed for the conductive measurement of the conductivity of liquids.

They are used in the following fields:

Sensor	Applications	Hazardous areas
Condumax CLS15D	Measurements in pure and ultrapure water	Approved for Ex zone 0
Condumax CLS16D	Measurements in pure and ultrapure water with hygienic requirements	Approved for Ex zone 0
Condumax CLS21D	Measurements in media with medium or high conductivity	Approved for Ex zone 0

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

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

- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility

- The product has been tested for electromagnetic compatibility in accordance with the applicable European standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

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

2.5.1 State of the art

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.

2.5.2 Electrical equipment in hazardous areas

ATEX / NEPSI II 1G Ex ia IIC T3/T4/T6 Ga, IECEx Ex ia IIC T3/T4/T6 Ga

- The Memosens inductive sensor-cable connection system is suitable for use in potentially
 explosive atmospheres in accordance with EC type examination certificate BVS 04 ATEX E
 121. The corresponding EC declaration of conformity is part of this document.
- The certified conductivity sensors CLS15D/CLS16D/CLS21D may only be connected via the measuring cable CYK10-G to the certified intrinsically safe digital sensor output circuits of measuring device Liquiline M CM42-*E/F/G/I/J....... in accordance with EC type examination certificate TÜV 13 ATEX 7459 X.
- The electrical connection must be made according to the wiring diagram of the transmitter.
- Metallic process connection parts must be mounted at the mounting location electrostatically conductive (< 1 $M\Omega$).
- The CLS15D-type sensors with non-metal process connections and the CLS21D-type sensors may only be employed for measurement in liquids with a minimum conductivity of 10 nS/cm.
- The CLS15D-type sensors with non-metal process connections may not be operated under process conditions in which electrostatic charging of the sensor, and particularly of the electrically insulated outer electrode, is likely to occur.
- Measuring cable CYK10-G and its terminal head must be protected against electrostatic charging if it is run through zone 0.
- The maximum permitted cable length is 100 m.
- Ex versions of digital sensors with Memosens technology are indicated by an orange-red ring.
- Full compliance with regulations for electrical systems in hazardous locations (EN/IEC 60079-14) is mandatory when using the devices and sensors.

Temperature classes

Name	Туре					Medium temp. T _a for temperature class (Tn)	Cat.
Condumax	CLS15D	-	A	**	G	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +120 °C (T4) -20 °C ≤ Ta ≤ +70 °C (T6)	II 1G
Condumax	CLS15D	-	В	**	G	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +100 °C (T4) -20 °C ≤ Ta ≤ +50 °C (T6)	II 1G
Condumax	CLS16D	-	**	**	G	-5 °C ≤ Ta ≤ +135 °C (T3) -5 °C ≤ Ta ≤ +115 °C (T4) -5 °C ≤ Ta ≤ +65 °C (T6)	II 1G
Condumax	CLS21D	-	С	**	G	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +115 °C (T4) -20 °C ≤ Ta ≤ +65 °C (T6)	II 1G

If the specified medium temperatures are complied with, temperatures that are not permitted for the respective temperature class will not occur on the equipment.

ATEX/NEPSI II 3G Ex ic IIC T3/T4/T6 Gc

- The Memosens inductive sensor-cable connection system is suitable for use in hazardous areas, Zone 2. The corresponding EC declaration of conformity is part of this document.
- The certified conductivity sensors CLS15D / CLS16D / CLS21D may only be connected via the measuring cable CYK10-V to the certified intrinsically safe digital sensor output circuits of measuring device Liquiline M CM42-*V.......
- The electrical connection must be made according to the wiring diagram of the transmitter.
- Metallic process connection parts must be mounted at the mounting location electrostatically conductive (< 1 $M\Omega$).
- The CLS15D-type sensors with non-metal process connections and the CLS21D-type sensors may only be employed for measurement in liquids with a minimum conductivity of 10 nS/cm.
- The CLS15D-type sensors with non-metal process connections may not be operated under process conditions in which electrostatic charging of the sensor, particularly of the electrically insulated outer electrode, is likely to occur.
- The maximum permitted cable length is 100 m.
- Full compliance with regulations for electrical systems in hazardous locations (EN/IEC 60079-14) is mandatory when using the devices and sensors.

Temperature classes

Name	Туре					Medium temp. T_a for temperature class (Tn)	
Condumax	CLS15D	-	A	**	V	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +120 °C (T4) -20 °C ≤ Ta ≤ +70 °C (T6)	II 3G
Condumax	CLS15D	-	В	**	V	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +100 °C (T4) -20 °C ≤ Ta ≤ +50 °C (T6)	II 3G

Name	Туре					Medium temp. T _a for temperature class (Tn)	
Condumax	CLS16D	-	**	**	V	-5 °C ≤ Ta ≤ +135 °C (T3) -5 °C ≤ Ta ≤ +115 °C (T4) -5 °C ≤ Ta ≤ +65 °C (T6)	II 3G
Condumax	CLS21D	-	С	**	V	-20 °C ≤ Ta ≤ +135 °C (T3) -20 °C ≤ Ta ≤ +115 °C (T4) -20 °C ≤ Ta ≤ +65 °C (T6)	II 3G

If the specified medium temperatures are complied with, temperatures that are not permitted for the respective temperature class will not occur on the equipment.

FM/CSA IS/NI Cl.1 Div.1&2 Gr. A-D

Observe the documentation and the control drawings of the transmitter.

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 Type code for versions with explosion protection

Name	Туре				Version
Condumax	CLS15D CLS16D CLS21D	-	* ** *	** ** **	G G G
		Process connections, materials not Ex-relevant			For use in hazardous areas, ATEX/NEPSI II 1G Ex ia IIC T3/T4/T6 Ga, IECEx Ex ia IIC T3/T4/T6 Ga

Name	Туре				Version
Condumax	CLS15D CLS16D CLS21D	-	* ** *	** ** **	0 0 0
		Process connections, materials not Ex-relevant			For use in hazardous areas, FM/CSA IS/NI CI I Div.1&2 Gr. A-D

Name	Туре				Version
Condumax	CLS15D CLS16D CLS21D	- - -	* ** *	** ** **	V V V
		Process connections, materials not Ex-relevant			For use in hazardous areas, ATEX/NEPSI II 3G Ex ic IIC T3/T4/T6 Gc

3.2.2 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
- Cell constant (nominal value)
- Protection class
- Ex labeling on hazardous area versions



Compare the data on the nameplate with your order.

3.2.3 Product identification

Product page

www.endress.com/cls15d

www.endress.com/cls16d

www.endress.com/cls21d

Interpreting the order code

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

- on the nameplate
- in the delivery papers

Obtaining information on the device

- 1. Go to the product page for your device 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.

3.3 Scope of delivery

The scope of delivery includes:

- Sensor in the version ordered
- Operating Instructions

3.4 Certificates and approvals

3.4.1 **C€** mark

Declaration of Conformity

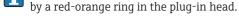
The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EC directives. The manufacturer confirms successful testing of the product by affixing to it the CE mark.

3.4.2 Ex approvals

ATEX / NEPSI II 1G Ex ia IIC T3/T4/T6 Ga, IECEx Ex ia IIC T3/T4/T6 Ga

FM/CSA IS/NI Cl. I Div.1&2 Gr. A-D in conjunction with Liquiline M CM42 transmitter ATEX/NEPSI II 3G Ex ic IIC T3/T4/T6 Gc for use in Zone 2 with Liquiline M CM42-KV*** transmitter

ATEX and FM/CSA versions of digital sensors with Memosens technology are indicated



3.4.3 EHEDG (CLS16D only)

Validated as follows:

- Cleanability in accordance with EHEDG, Document 2
- Sterilizability in accordance with EHEDG, Document 5
- Bacteria-tightness in accordance with EHEDG. Document 7

3.4.4 FDA (CLS16D only)

All materials in contact with the product are listed by the FDA.

3.4.5 Manufacturer inspection certificate

Stating the individual cell constant

3.4.6 Biological reactivity test (USP class VI, CLS16D only)

Biological reactivity test certificate according to USP (United States Pharmacopeia) class VI part <87> and part <88> with batch traceability of materials in contact with the medium

3.4.7 Inspection certificate in accordance with EN 10204 3.1

A test certificate 3.1 in accordance with EN10204 is supplied depending on the version (\rightarrow Product Configurator on the product page).

3.4.8 ASME (CLS16D only)

Manufactured in accordance with ASME criteria (American Society of Mechanical Engineers)

3.4.9 Certification body

DEKRA EXAM GmbH

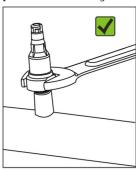
Bochum

4 Installation

4.1 Installing the sensor

4.1.1 CLS15D

The sensors are installed directly via the process connection thread NPT $\frac{1}{2}$ " or $\frac{3}{4}$ " or Clamp 1 $\frac{1}{2}$ ". As an option, the sensor can also be installed using a commercially available T-piece or cross fitting or using a flow assembly.



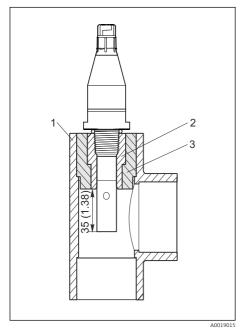


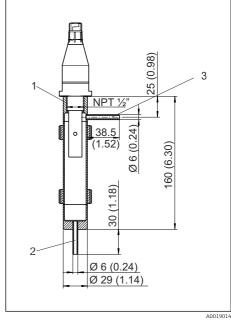
NOTICE

Incorrect mounting or disassembly

The Memosens head could become loose and fall off, resulting in total sensor failure

- ► Only mount the sensor via the process connection.
- ► To do so, use a suitable tool, such as an open-ended wrench.





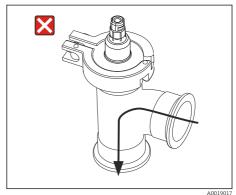
- **№** 1 With NPT 1/2" thread in T-piece or cross fitting
- *T-piece or cross fitting (DN 32, 40 or 50)*
- Glue-in VC threaded coupling (NPT 1/2" for DN 20)
- 3 Glue-in adapter coupling (for DN 32, 40, 50)
- **₽** 2 With NPT 1/2" thread in flow assembly 71042405, dimensions in mm (inch)
- 1 Sensor holder NPT 1/2"
- 2 Inlet
- 3 Outlet

Ensure that the electrodes are fully immersed in the medium during measurement. The immersion depth must be at least 35 mm (1.38"). If the sensor is being used in the ultrapure water range, you must work under air-evacuated conditions. Otherwise the CO₂ in the air can dissolve in the water and its (weak) dissociation can increase the conductivity by up to 3 μ S/cm.

4.1.2 CLS16D

The sensors are installed directly via the process connection. Take the flow direction into consideration when installing in pipes.





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₩ 3 Permitted flow direction

₩ 4 Inadmissible flow direction

Ensure that the electrodes are fully immersed in the medium during measurement. If the sensor is being used in the ultrapure water range, you must work under air-evacuated conditions. Otherwise the CO_2 in the air can dissolve in the water and its (weak) dissociation can increase the conductivity by up to 3 μ S/cm.

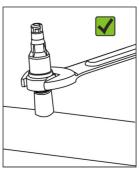
4.1.3 CLS21D



Clamp connection

Both sheet-metal brackets and solid brackets can be used to secure the sensor. Sheetmetal brackets have a lower dimensional stability, uneven bearing surfaces causing point loads, and sometimes sharp edges that can damage the clamp. We recommend you only use solid brackets due to their higher dimensional stability. Solid brackets can be used over the entire pressure/temperature range (see pressure-temperature ratings).

The sensors are installed directly via the process connection. As an option, the sensor can also be installed via a flow assembly.



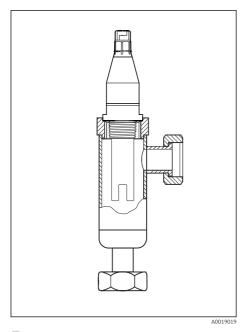


NOTICE

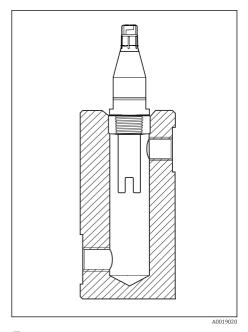
Incorrect mounting or disassembly

The Memosens head could become loose and fall off, resulting in total sensor failure

- ▶ Only mount the sensor via the process connection.
- ► To do so, use a suitable tool, such as an open-ended wrench.

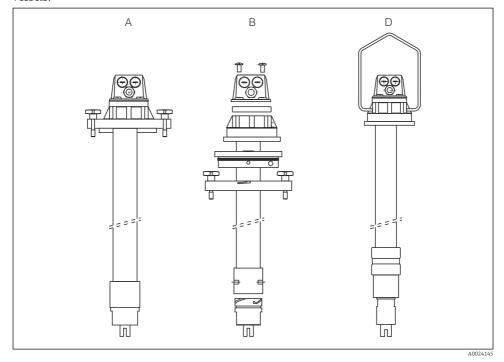


■ 5 Installation in flow assembly CLA751



■ 6 Installation in flow assembly CLA752

The Dipfit CLA111 immersion assembly is available to install sensors with a G1 thread in vessels.



 ${f I}$ 7 Installation in Dipfit CLA111 immersion assembly, fastening versions A, B and D

Ensure that the electrodes are fully immersed in the medium during measurement.

4.2 Post-installation check

- Are the sensor and cable undamaged?
- Is the sensor installed in the process connection and is not suspended from the cable?

5 Electrical connection

A WARNING

Device is live

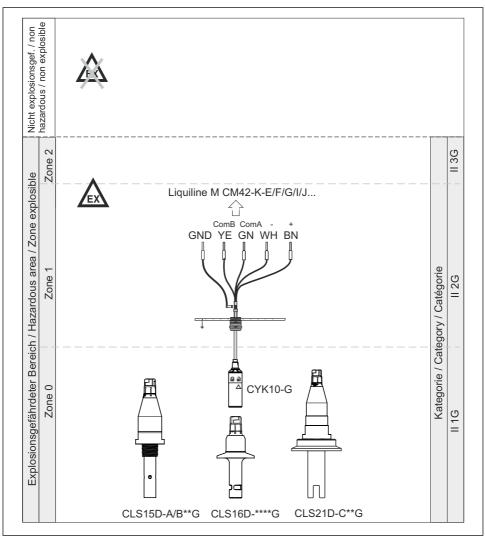
Incorrect connection may result in injury or death.

- ▶ 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 Connection conditions

5.1.1 Connection at a glance

Sensors for zone 0

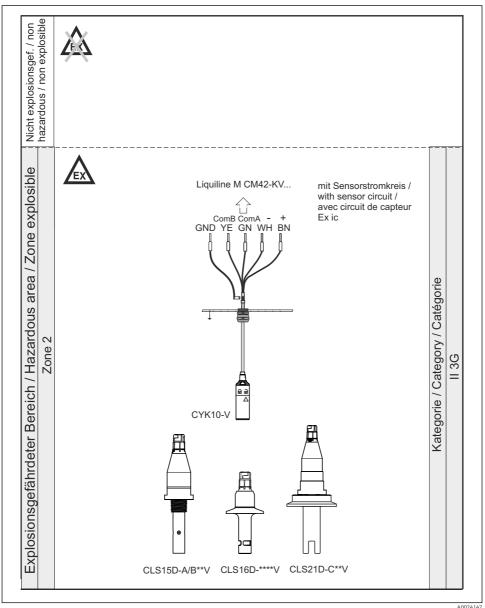


■ 8 Electrical connection CLSxxD-***(*)G and CYK10-G

Endress+Hauser 17

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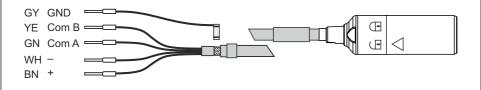
Sensors for zone 2



₽9 Electrical connection CLSxxD-***(*)V and CYK10-V

5.2 Connecting the sensor

The sensor is electrically connected to the transmitter via the CYK10 measuring cable.



■ 10 Measuring cable CYK10

A0024019

NOTICE

Mechanical twist protection for CLS15D and CLS21D

If too much force is applied to the Memosens head, this can shear the connections and therefore destroy the sensor

- ► There is no need to exert excessive force when connecting the sensor to the cable coupling. Always connect the sensor gently.
- If the Memosens coupling clearly will not close, check the coupling for dirt or mechanical damage and make sure you are turning in the right direction. Pay attention to the lock symbol on the coupling.
- ▶ Use another Memosens cable if necessary.

5.3 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions and which are necessary for the required, designated use, may be carried out on the device delivered.

Exercise care when carrying out the work.

Otherwise, the individual types of protection (Ingress Protection (IP), electrical safety, EMC interference immunity) agreed for this product can no longer be guaranteed due, for example, to covers being left off or cable (ends) which are loose or insufficiently secured.

5.4 Post-connection check

Device condition and specifications	Notes
Are the outside of the sensor, assembly, junction box, 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

Device condition and specifications	Notes
Are all the cable entries installed, tightened and sealed?	In the case of lateral cable entries: Cable loops
Are all cable entries facing downwards or mounted laterally?	facing downwards to allow water to drip off.

6 Commissioning

Before first commissioning, check if:

- the sensor is correctly installed
- the electrical connection is correct.

If using an assembly with automatic cleaning, check that the cleaning medium (e.g. water or air) is connected correctly.

WARNING

Escaping process medium

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

- ► Before applying compressed air to an assembly with cleaning facility, make sure the connections are correctly fitted.
- ► Do not install the assembly in the process if you cannot make the correct connection reliably.

7 Maintenance

A CAUTION

Corrosive chemicals

Danger of chemical burns to the eyes and skin. Danger of damage to clothing and equipment

- ► It is absolutely essential to protect the eyes and hands properly when working with acids, bases and organic solvents!
- ▶ Wear protective goggles and safety gloves.
- ► Clean away splashes on clothes and other objects to prevent any damage.
- ▶ Pay particular attention to the information provided in the safety data sheets for the chemicals used.

Clean away fouling on the sensor as follows depending on the type of fouling:

1. Oily and greasy films:

Clean with a grease remover, e.g. alcohol, isopropyl alcohol as well as hot water and dishwashing detergent if necessary.

2. Lime and metal hydroxide buildup:

Dissolve buildup with diluted hydrochloric acid (3 %) and then rinse thoroughly with plenty of clear water.

- 3. Sulfidic buildup (from flue gas desulfurization or sewage treatment plants):
 Use a mixture of hydrochloric acid (3 %) and thiocarbamide (commercially available) and then rinse thoroughly with plenty of clear water.
- 4. Buildup containing proteins (e.g. food industry):

 Use a mixture of hydrochloric acid (0.5 %) and pepsin (commercially available) and then rinse thoroughly with plenty of clear water.

8 Repair

8.1 Sealing ring replacement and recalibration (CLS16D only)

Intact seals are a prerequisite for safe and reliable measurements. The seal should be replaced at regular intervals to guarantee maximum sensor operational safety and hygiene.

Practical repair intervals can only be determined by the user as they depend greatly on the operating conditions, such as:

- Type and temperature of the product
- Type and temperature of the cleaning agent
- Number of cleanings
- Number of sterilizations
- Operating environment

Recommended intervals for seal replacement (reference values)

Application	Window
Media with temperatures from 50 to 100 °C (122 to 212 °F)	Approx. 18 months
Media with temperatures < 50 °C (122 °F)	Approx. 36 months
Sterilization cycles, max. 145 °C (293 °F), 30 min.	Approx. 400 cycles

To ensure your sensor is operational again after being exposed to very high loads, you can have it regenerated in the factory. In the factory, the sensor is fitted with new seals and recalibrated. Send the sensor to your Sales Center for this purpose.

Replacement of seals and recalibration in the factory Order No. 51505585

8.2 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.

Condumax CLS15D/16D/21D

8.3 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.

9 Technical data

9.1 Input

9.1.1 Measured variables

- Conductivity
- Temperature

9.1.2 Measuring ranges

Conductivity	(in relation to water at 25 °C (77 °F))
CLS15D-A	0.04 to 20 μS/cm
CLS15D-B	0.10 to $200~\mu\text{S/cm}$
CLS16D	0.04 to 500 μS/cm
CLS21D	$10 \mu \text{S/cm}$ to 20mS/cm

Temperature

CLS15D	-20 to 100 °C (-4 to 212 °F)
CLS16D	-5 to 100 °C (23 to 212 °F)
CLS21D	-20 to 100 °C (-4 to 212 °F)

9.1.3 Cell constant

CLS15D-A	$k = 0.01 \text{ cm}^{-1}$
CLS15D-B	$k = 0.1 \text{ cm}^{-1}$
CLS16D	$k = 0.1 \text{ cm}^{-1}$

CLS21D $k = 1.0 \text{ cm}^{-1}$, nominal

9.1.4 Temperature compensation

NTC 30K (CLS15D) (CLS16D) (CLS21D)

9.2 Performance characteristics

9.2.1 Uncertainty of measurement

CLS15D

Each individual sensor is factory-measured in a solution of approx. 5 μ S/cm for cell constant 0.01 cm $^{-1}$ or approx. 50 μ S/cm for cell constant 0.1 cm $^{-1}$ using a reference measuring system traceable to NIST or PTB. The exact cell constant is entered into the quality certificate supplied. The uncertainty of measurement in determining the cell constant is 1.0 %.

CLS16D

Each individual sensor is factory-measured in a solution of approx. $5 \,\mu\text{S/cm}$ using a reference measuring system traceable to NIST or PTB. The exact cell constant is entered into the quality certificate supplied. The uncertainty of measurement in determining the cell constant is $1.0 \,\%$.

CLS21D

Conductivity

Each individual sensor is factory-measured in a solution of approx. 5 mS/cmusing a reference measuring system traceable to NIST or PTB. The exact cell constant is entered into the quality certificate supplied. The uncertainty of measurement in determining the cell constant is $1.0\,\%$.

+ /20

9.2.2 Response time

Conductivity	195 ≥ 3 8
Temperature	
CLS15D-A	t ₉₀ ≤ 39 s
CLS15D-B	$t_{90} \le 17 \text{ s}$
CLS16D	t ₉₀ ≤ 13 s
CLS21D	t ₉₀ ≤ 296 s

9.2.3 Maximum measured error

CLS15D	2% of reading
CLS16D	2 % of reading up to 200 μS/cm
	3 % of reading from 200 to 500 μ S/cm
CLS21D	5% of reading

9.2.4 Repeatability

0.2% of reading

9.3 Environment

9.3.1 Ambient temperature range

-20 to +60 °C (0 to 140 °F)

9.3.2 Storage temperature

-25 to +80 °C (-10 to +180 °F)

9.3.3 Degree of protection

IP 68 / NEMA type 6P (1 m water column, 25 °C, 24 h)

9.4 Process

9.4.1 Process temperature

CLS15D

Normal operation $-20 \text{ to } 120 \,^{\circ}\text{C} \, (-4 \text{ to } 248 \,^{\circ}\text{F})$

Sterilization (max. 1 h) $^{1)}$ max. 140 $^{\circ}$ C (284 $^{\circ}$ F)

CLS16D

Normal operation -5 to 120 °C (23 to 248 °F)

Sterilization (max. 45 min.) max. $150 \,^{\circ}\text{C}$ (302 $^{\circ}\text{F}$) at 5 bar (73 psi)

CLS21D $-20 \text{ to } +135 \,^{\circ}\text{C} (-4 \text{ to } 275 \,^{\circ}\text{F}) \text{ at } 2.5 \text{ bar } (36 \text{ psi})$

1) Threaded versions: max. 30 minutes

The maximum temperature for communication with the transmitter is 130 °C (266°F) for the Memosens versions.

9.4.2 Process pressure

CLS15D 13 bar (188 psi) at 20 °C (68 °F)

1 bar (14 psi) at 120 °C (248 °F)

CLS16D 13 bar (188 psi) at 20 °C (68 °F)

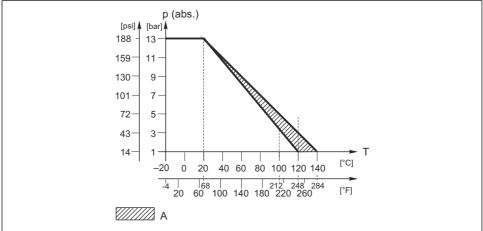
9 bar (130 psi) at 120 °C (248 °F)

0.1 bar (1.5 psi (negative pressure)) at 20 °C (68 °F)

CLS21D 17 bar (246 psi) at 20 °C (68 °F)

9.4.3 Temperature-pressure ratings

CLS15D

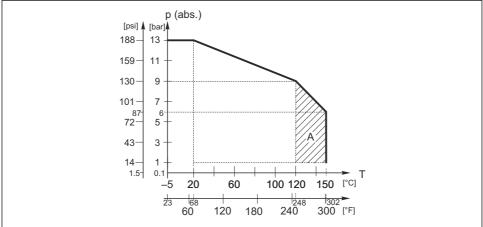


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■ 11 Mechanical pressure-temperature resistance

A Can be sterilized for a short time (1 hour)

CLS16D

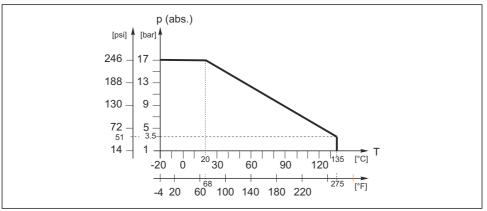


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 \blacksquare 12 Mechanical pressure-temperature resistance

A Can be sterilized for a short time (45 min.)

CLS21D



■ 13 Mechanical pressure-temperature resistance

9.5 Mechanical construction

9.5.1 Weight

CLS15D and CLS21D

Approx. 0.3 kg (0.66 lbs) depending on version

CLS16D

Approx. 0.13 to 0.75 kg (0.29 to 1.65 lbs) depending on version

9.5.2 Materials

CLS15D

Electrodes Polished, stainless steel 1.4435 (AISI 316L)

Sensor shaft Polyethersulfone (PES-GF20)

O-ring, in contact with medium **EPDM**

(only Clamp version)

CLS16D

Electrodes Electropolished, stainless steel 1.4435 (AISI 316L) Seal Gasket seal ISOLAST (FFKM), FDA-compliant

CLS21D

Electrodes Graphite

Sensor shaft Polyethersulfone (PES-GF20)

Titanium 3.7035 Thermal conductivity socket for

temperature probe

9.5.3 Process connection

CLS15D

Thread NPT $\frac{1}{2}$ " and $\frac{3}{4}$ " Clamp $\frac{1}{2}$ " as per ISO 2852

CLS16D

Clamp 1", 1½", 2" as per ISO 2852 (also suitable for TRI-CLAMP, DIN 32676) Tuchenhagen VARIVENT N DN 50 to 125 NEUMO BioControl D50

CLS21D

Thread G1 NPT 1" thread Clamp 2" as per ISO 2852 Sanitary connection DN 25 as per DIN 11851

9.5.4 Surface roughness (CLS15D, CLS16D only)

CLS15D

 $R_a \le 0.8 \ \mu m$

CLS16D

 $R_a \leq 0.8~\mu m,$ electropolished $R_a \leq 0.38~\mu m,$ electropolished, optional

10 EC Declaration of Conformity

10.1 ATEX /NEPSI II 1G Ex ia IIC T3/T4/T6 Ga, IECEx Ex ia IIC T3 / T4 / T6 Ga

roducts	Solutions	Service
EG-Konf	formitätserklärung	
EC Decla	aration of Conformity	
CE Décla	aration de Conformité	
We declare in sole	leiniger Verantwortung, dass das Produkt responsibility that the product us la seule responsabilité que le produit	
Memosens		
CLS15D-***G,	CLS16D-****G, CLS21D-***G	
Zusammen mit Mes	skabel / together with measuring cable / ensemble avec cab	le de mesure
CYK10-G**1,	CYK20-BA****	
EG-Baumusterprü		
EC type examinati Certificat d'exame		BVS 04 ATEX E 121 X
	ssued by exposé par:	DEKRA Exam GmbH Dinnendahlstrasse 9 44809 Bochum, Germany
Kennnummer Id	lentification number Numéro d'identification :	0158
is in conformity w	ren folgender Europäischer Richtlinien übereinstimmt: tiht her egulations of the following European Directive prescriptions des directives Européennes suivantes: Gerate zur Verwendung im explosionsgefahrdeten Be Equipment for use in potentially explosive atmosphe Appareils pour application en atmosphère explosive.	ereichen. res.
Applied harmoniz	Elektromagnetische Verträglichkeit. Electromagnetic Compatibility. Compatibilité delectromagnetique. nonisierte Normen oder normative Dokumente: ed standards or normative documents: ées su documents normatives appliquées:	
EN 60079-0:2012	2, EN 60079-11:2012, EN 60079-26:2007 + Corrigen 5, EN 61326-2-3:2006	dum 1
Identification nun	Managementsystem-Zertifikats: aber of management system certificate: cation de certificat système de management:	BVS 11 ATEX ZQS/E115
Notified body for	ir QS-Überwachung, Kennnummer QAN, Identification number pour l'assurance qualité, Numéro d'identification	DEKRA Exam GmbH, 0158 Dinnendahlstrasse 9 44809 Bochum, Germany
	Conducta Iess- und Regeltechnik mbH+Co. KG 0839 Gerlingen, Germany	Date: 10-23-2014
i. V. Jörg-Martin M	Müller (Director Technology)	i. V. Gunnar Fischer (TGC)
i.V. / -/	ild.	i.V. Cunnay tisher
Z-NEW No. 1 Con	tificate-no.: EG153A_07_a3	Endress + Hauser

10.2 ATEX/NEPSI II 3G Ex ic IIC T3/T4/T6 Gc

EG-Kon	formitätserklärung	
EC Decla	aration of Conformity	
CE Décla	aration de Conformité	
We declare in sole	leiniger Verantwortung, dass das Produkt e responsibility that the product ous la seule responsabilité que le produit	
Memosens	tu scare responsabilite que le produit	
CLS15D-***V	, CLS16D-***V, CLS21D-***V	
Zusammen mit Me:	sskabel / together with measuring cable / ensemble	avec cable de mesure
CYK10-V**1,	CYK20-BA****	
is in conformity w	ten folgender Europäischer Richtlinien überein: rith the regulations of the following European E prescriptions des directives Européennes suiva:	lirectives:
94/9/EC	Geräte zur Verwendung in explosionsgefährt Equipment for use in potentially explosive at Appareils pour application en atmosphère ex	mospheres – Category 3G
2004/108/EC	Elektromagnetische Verträglichkeit. Electromagnetic Compatibility. Compatibilité électromagnétique.	
Applied harmoni:	monisierte Normen oder normative Dokumente zed standards or normative documents: sées ou documents normatives appliquées:	
	2, EN 60079-11:2012 6, EN 61326-2-3:2006	
	Conducta Mess- und Regeltechnik mbH+Co. KG 70839 Gerlingen, Germany	Date: 10-23-2014
i. V. Jörg-Martin	Müller (Director Technology)	i. V. Gunnar Fischer (TGC)
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Zertifikats-Nr. Ce Seite Page 1	rtificate-no.: BG157A_07_a3	Endress+Hauser 🔣





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