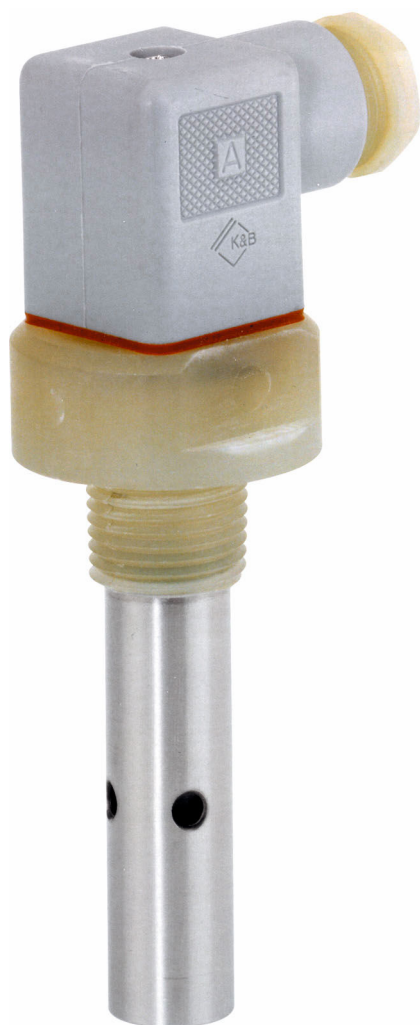




# Technical Information

## Condumax CLS19

Conductivity sensor



2-electrode sensors with cell constant  $k = 0.01 \text{ cm}^{-1}$  or  $k = 0.1 \text{ cm}^{-1}$

### Application

The sensor measures conductivity in pure and ultrapure applications for the monitoring and control of:

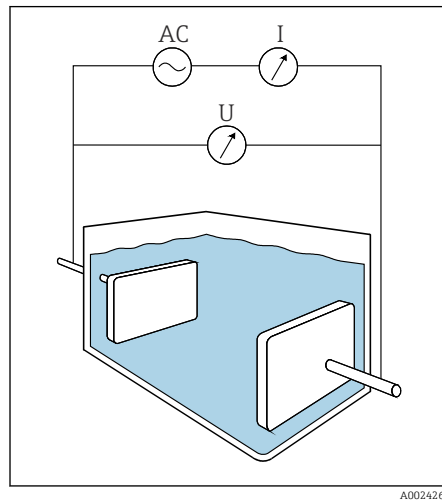
- Ion exchangers
- Reverse osmosis
- Cooling water
- Distillations
- Chip cleaning

### Your benefits

- Reliable and accurate measured values at low conductivities
- Best value for money
- Easy installation with thread
- Robust design for maximum durability
- Large measuring range thanks to variety of cell constants

## Function and system design

### Measuring principle



Conductivity of liquids is determined with a measuring arrangement where two electrodes are located in the medium. An alternating voltage that causes a current to flow through the medium is applied at these electrodes. The electrical resistance, or its reciprocal value - conductance  $G$  - is calculated based on Ohm's law. The specific conductance  $\kappa$  is determined from the conductance value using the cell constant  $k$ , which depends on the sensor geometry.

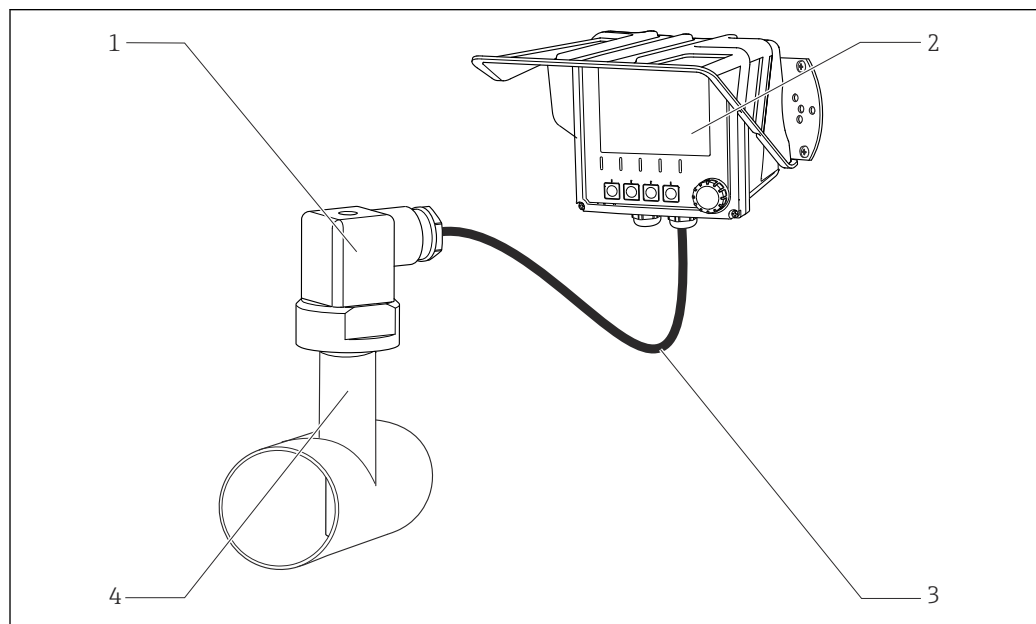
 1 Conductive measurement of conductivity

AC Alternating voltage source  
I Current intensity measurement  
U Voltage measurement

### Measuring system

A complete measuring system consists of the following components at least:

- The contacting conductivity sensor CLS19
- A transmitter, e.g. Liquiline M CM42
- A measuring cable, e.g. CYK71 for analog sensors



 2 Example of a measuring system

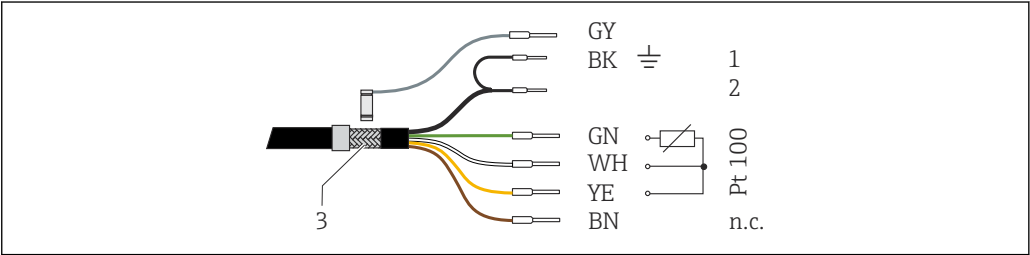
1 Sensor CLS19  
2 Transmitter CM42  
3 Sensor cable  
4 Pipe nozzle, process connection

## Input

|                    |                                                                   |                                                                                  |
|--------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Measured variables | <div>■ Conductivity</div> <div>■ Temperature</div>                |                                                                                  |
| Measuring ranges   | <b>Conductivity</b><br>CLS19 -A<br>CLS19 -B<br><b>Temperature</b> | (in relation to water at 25 °C (77 °F))<br>0.04 to 20 µS/cm<br>0.10 to 200 µS/cm |

## Power supply

|                       |                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical connection | The sensor is connected via the fixed cable or via the measuring cable CYK71 with a shield. The wiring diagram is provided in the Operating Instructions of the transmitter used. |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



A0044785

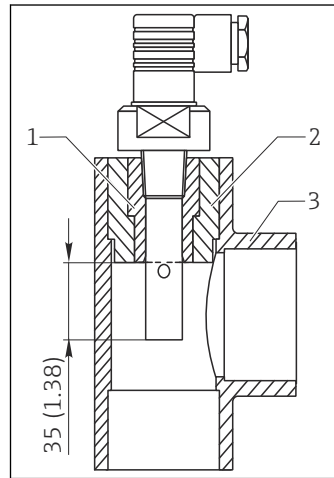
- 3 Measuring cable CYK71
- 1 Coax BK, shield (outer electrode)
- 2 Coax, inner, conductivity (inner electrode)
- Pt100 Temperature
- 3 Outer shield, pay attention to the wiring diagram of the transmitter
- n.c. Do not connect

A VMB junction box and another CYK71 cable are required for the cable extension.

## Mounting

### Installation instructions

1.



 4 Installation in T-piece or cross fitting

Mount the sensor directly via the NPT 1/2" process connection thread or alternatively install via a T-piece or cross fitting.

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

3. If using the sensor in the ultrapure water range:

Work under air-evacuated conditions.

↳ This prevents CO<sub>2</sub> in the air from dissolving in the water and increasing the conductivity by up to 3 µS/cm as a result of (weak) dissociation.

## Environment

### Degree of protection

IP65

## Process

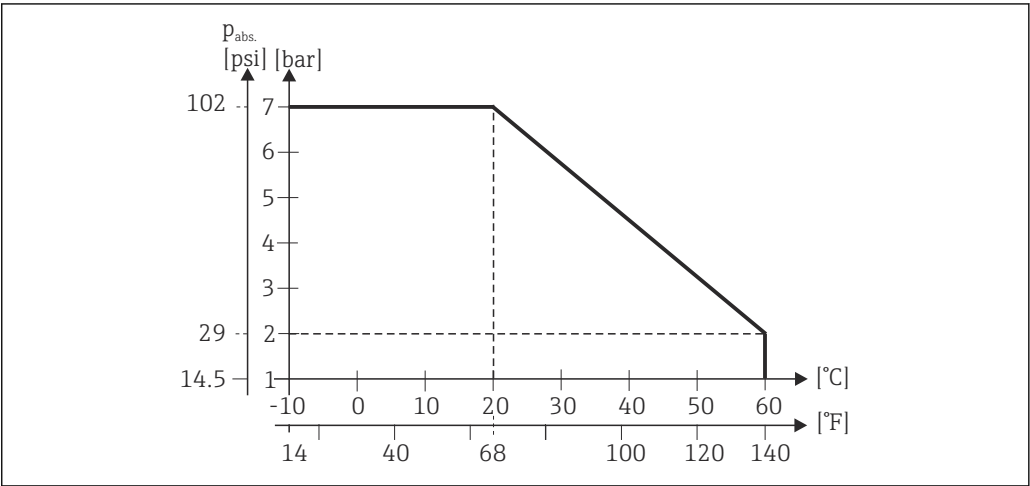
### Process temperature

-10 to +60 °C (+10 to +140 °F)

### Process pressure

max. 7 bar (102 psi), absolute, at 20 °C (68 °F)

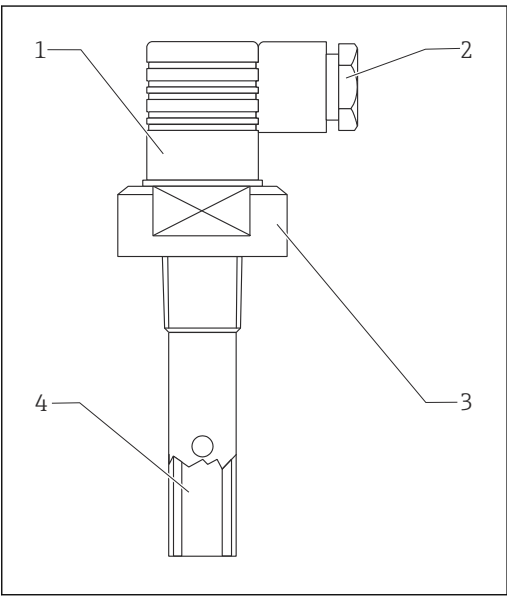
Temperature/pressure ratings



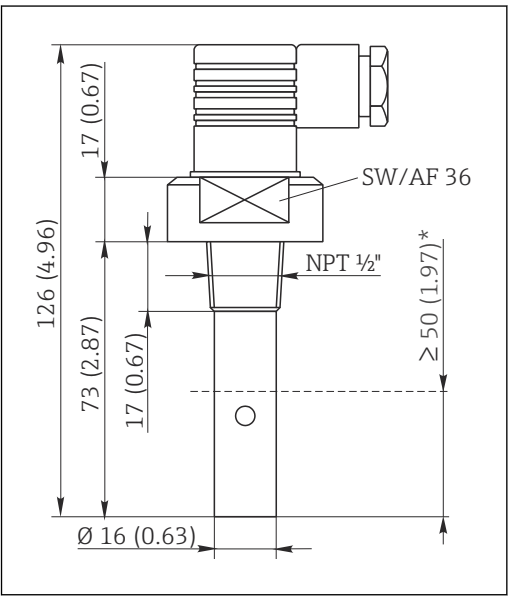
5 Mechanical pressure-temperature resistance

Mechanical construction

Design, dimensions



6 Design  
1 Terminal head  
2 Cable connection  
3 Threaded shaft  
4 Electrodes (coaxially arranged)



7 Dimensions in mm (in)  
\* Minimum immersion depth

|                                    |                                    |                                                                            |
|------------------------------------|------------------------------------|----------------------------------------------------------------------------|
| Weight                             | 0.1 kg (0.2 lbs)                   |                                                                            |
| Materials (in contact with medium) | Electrodes<br>Sensor shaft<br>Seal | Stainless steel 1.4571 (AISI 316Ti)<br>Polyethersulfone (PES-GF20)<br>EPDM |
| Process connections                | Thread NPT 1/2"                    |                                                                            |
| Cell constant                      | CLS19 -A<br>CLS19 -B               | k = 0.01 cm <sup>-1</sup><br>k = 0.1 cm <sup>-1</sup>                      |

Temperature sensor Pt100

## Ordering information

Product page [www.endress.com/cls19](http://www.endress.com/cls19)

### Product Configurator

1. **Configure:** Click this button on the product page.
  2. Select **Extended selection**.
    - ↳ The Configurator opens in a separate window.
  3. Configure the device according to your requirements by selecting the desired option for each feature.
    - ↳ In this way, you receive a valid and complete order code for the device.
  4. **Apply:** Add the configured product to the shopping cart.
-  For many products, you also have the option of downloading CAD or 2D drawings of the selected product version.
5. **Show details:** Open this tab for the product in the shopping cart.
    - ↳ The link to the CAD drawing is displayed. If selected, the 3D display format is displayed along with the option to download various formats.

### Scope of delivery

The scope of delivery includes:

- Sensor in the version ordered
- Mounted plug-in jack, Pg 9
- Operating Instructions

## Accessory

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.

### Device-specific accessories

#### Assemblies

##### Flowfit CYA21

- Universal assembly for analysis systems in industrial utilities
- Product Configurator on the product page: [www.endress.com/CYA21](http://www.endress.com/CYA21)



Technical Information TI01441C

#### Threaded and adapter couplings

For sensors with NPT 1/2" process connection /

##### PVC threaded coupling

- For gluing into commercially available PVC cross fittings or T-pieces with DN 20
- With G1/2 internal thread, self-sealing with NPT 1/2" sensor thread
- Order No. 50066536

##### PVDF threaded coupling

- With G1/2 internal thread and G1 external thread
- Explosion-proof up to 12 bar at 20 °C (174 psi at 68 °F), max. 120 °C at 1 bar (248 °F at 14.5 psi), including O-ring
- Self-sealing internal thread with NPT 1/2" sensor thread
- Order No. 50004381

#### **PVC adapter couplings AM**

- For adapting the PVC threaded coupling to larger nominal diameters
- Diameter, order numbers:
  - AM 32: for cross-fittings or T-pieces DN 32, Order No. 50004738
  - AM 40: for cross-fittings or T-pieces DN 40, Order No. 50004739
  - AM 50: for cross-fittings or T-pieces DN 50, Order No. 50004740

#### **Measuring cable**

##### **Measuring cable CYK71**

- Underminated 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

#### **Junction boxes**

##### **VBM**

- Junction box for cable extension
- 10 terminal strips
- Cable entries: 2 x Pg 13.5 or 2 x NPT ½"
- Material: aluminum
- Degree of protection: IP 65
- Order numbers
  - Cable entries Pg 13.5 : 50003987
  - Cable entries NPT ½": 51500177

---

#### **Service-specific accessories**

#### **Calibration solutions**

##### **Conductivity calibration solutions CLY11**

Precision solutions referenced to SRM (Standard Reference Material) by NIST for qualified calibration of conductivity measuring systems in accordance with ISO 9000

- CLY11-A, 74 µS/cm (reference temperature 25 °C (77 °F)), 500 ml (16.9 fl.oz)  
Order No. 50081902
- CLY11-B, 149.6 µS/cm (reference temperature 25 °C (77 °F)), 500 ml (16.9 fl.oz)  
Order No. 50081903



Technical Information TI00162C

#### **Calibration set**

##### **Conducual CLY421**

- Conductivity calibration set (case) for ultrapure water applications
- Complete, factory-calibrated measuring system with certificate, traceable to SRM by NIST and PTB, for comparison measurement in ultrapure water up to max. 20 µS/cm
- Product Configurator on the product page: [www.endress.com/cly421](http://www.endress.com/cly421)



Technical Information TI00496C/07/EN



info@lennotech.com Tel. +31-152-610-900  
www.lennotech.com Fax. +31-152-616-289

Endress+Hauser   
People for Process Automation