



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Condumax W CLS30

Conductivity sensors

Two-electrode sensors with cell constant $k = 10 \text{ cm}^{-1}$



Application

Measurements in media of high or medium conductivities:

- Process water
- Wastewater treatment
- Concentrate monitoring

The cell constant k of the sensor is 10 cm^{-1} . The measuring range reaches from 0.1 mS/cm to 200 mS/cm .

Sensors with temperature sensors are used together with conductivity transmitters equipped with automatic temperature compensation:

- Mycom S CLM153
- Liquisys M CLM223/253
- Liquiline M CM42

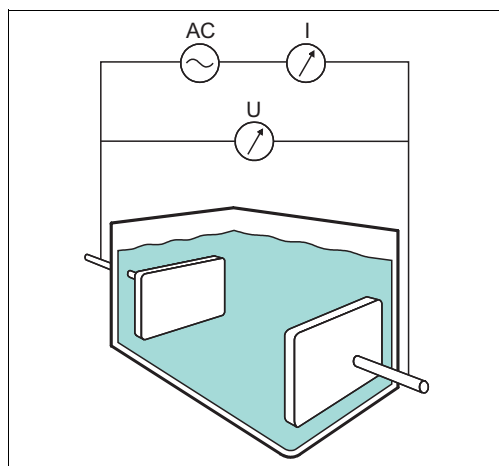
Your benefits

- Various designs guarantee optimum adaptation to the process conditions and methods of installation
- Installation in pipes or flow chambers
- High chemical, thermal and mechanical stability
- Compact design
- Quality certificate with statement of the individual cell constant

Function and system design

Measuring principle

Conductive measurement of conductivity



The conductivity of liquids is measured with the following measurement setup: Two electrodes are immersed in the medium. An AC voltage is applied to these electrodes which generates a current in the medium.

The electric resistance or its reciprocal value, the conductance G , is calculated according to Ohm's law. The specific conductivity κ is determined using the cell constant k that is dependent on the sensor geometry.

Conductive measurement of conductivity

»0003416

AC Power supply

I Current meter

U Voltage meter

Important properties

■ Electrodes

The sensor electrodes are made of special graphite.

The graphite guarantees high chemical stability and low polarization effects.

■ Accuracy

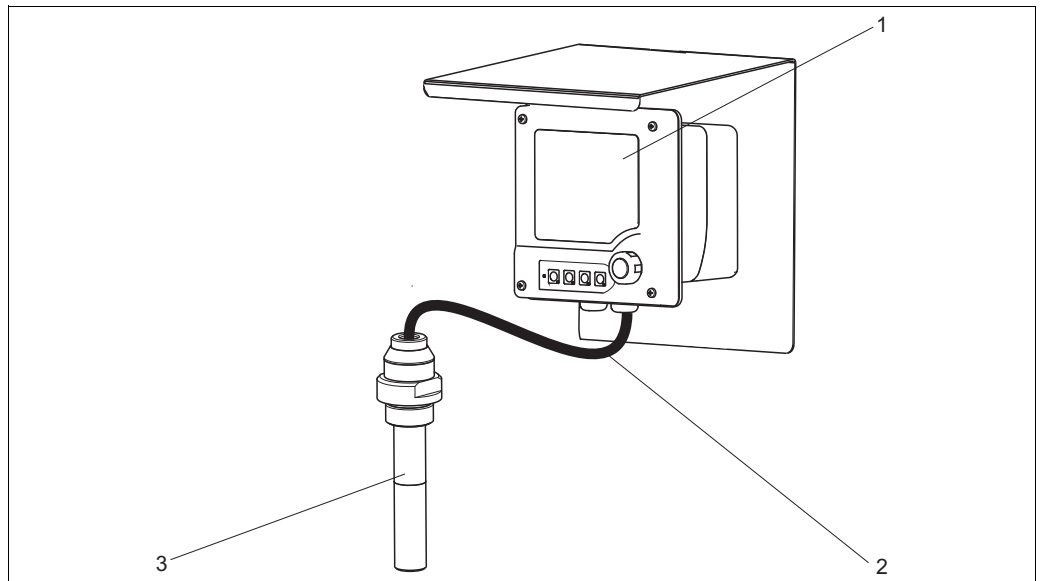
The electrodes are built into a lateral measuring duct and shielded by a Teflon® sleeve. This prevents electrical leakage and guarantees constant, accurate measurements.

■ Durability

- The PP version of the sensor is pressure-proof up to 16 bar at 20 °C (232 psi at 68 °F) and can be applied with temperatures of up to 90 °C (194 °F).
- The PTFE version of the sensor is pressure-proof up to 6 bar at 20 °C (87 psi at 68 °F) and can be applied with temperatures of up to 125 °C (257 °F).

Measuring system

- A complete measuring system comprises:
- a CLS30 conductivity sensor with fixed cable
 - a transmitter, e.g. Liquiline M CM42

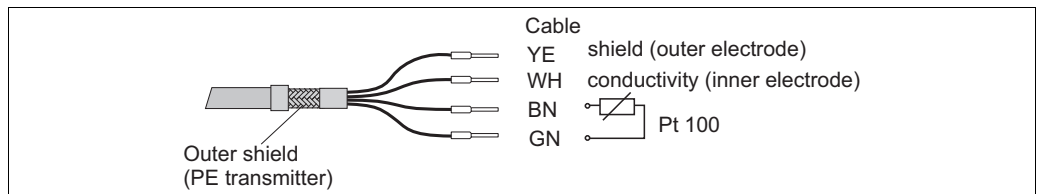


Example of a measuring system

- 1 Liquiline M CM42 transmitter
- 2 Fixed cable
- 3 Condumax W CLS30

Input

Measured variables	Conductivity Temperature	
Cell constant k	k = 10 cm ⁻¹ nominal	
Measuring ranges	Conductivity (referred to water at 25 °C (77 °F): Temperature: PTFE version: PP version:	0.1 mS/cm to 200 mS/cm -10 to 125 °C (14 to 257 °F) -10 to 90 °C (14 to 194 °F)
Temperature sensor	Pt 100	
Cable specification	The CLS30 sensor is connected to the transmitter via the fixed cable.	



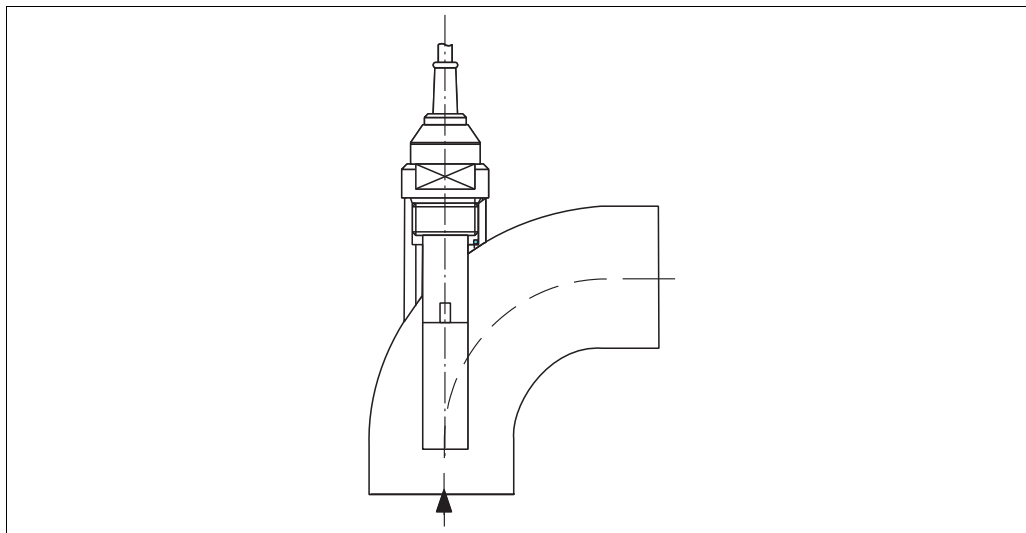
Fixed cable

To extend the connection, an RM junction box and a CYK71 extension cable is required. After the RM junction box, the Pt 100 temperature sensor must be connected by three wires.

Installation

Installation instructions

The sensors are mounted directly via the process connection or via a flow assembly (see "Accessories"). Install the sensor in such a way that the medium flow is directly from below. This guarantees constant filling and venting of the measuring duct and thus an accurate measurement (see figure below).



Sensor installation

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Environment

Ingress protection

IP 65

Process

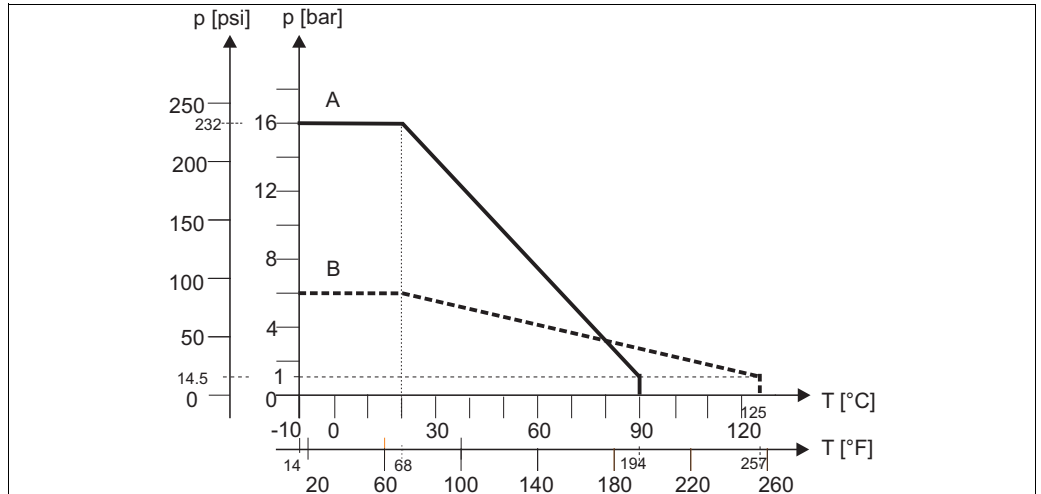
Process temperature

PTFE version: -10 to 125 °C (14 to 257 °F)
 PP version: -10 to 90 °C (14 to 194 °F)

Process pressure

PTFE version: 6 bar @ 20 °C (87 psi @ 68 °F)
 PP version: 16 bar @ 20 °C (232 psi @ 68 °F)

Pressure-temperature load curve

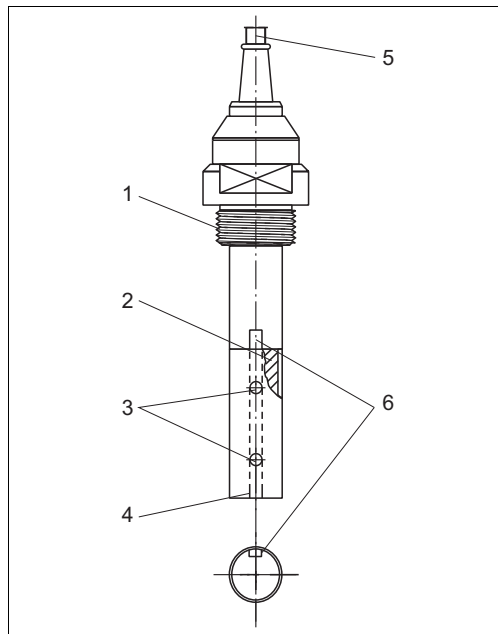


Mechanical pressure-temperature stability of the sensor

- A PP version
- B PTFE version

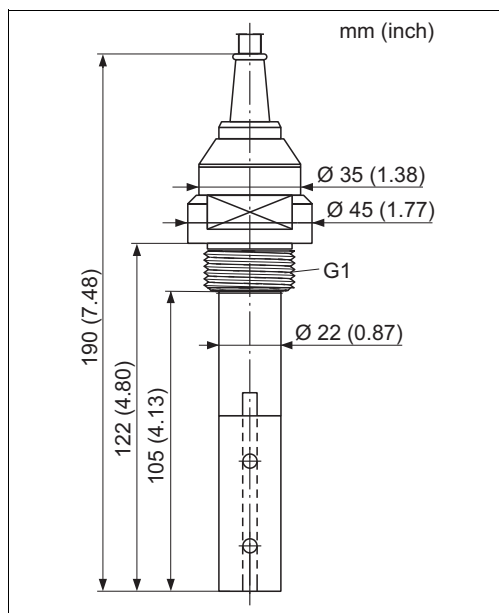
Mechanical construction

Design, dimensions

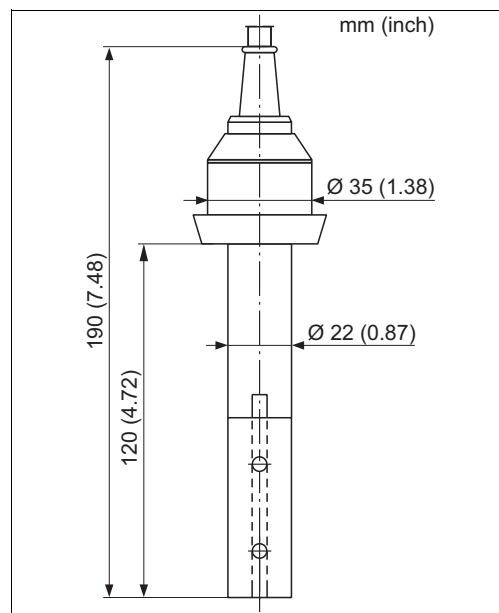


- 1 G1 thread
- 2 Shielding sleeve, PTFE
- 3 Electrodes, special graphite
- 4 Lateral measuring duct
- 5 Fixed cable
- 6 2 openings for medium flow

CLS30 design



CLS30 with G1 thread



CLS30 with dairy fitting

Weight approx. 0.450 kg (0.99 lbs)

Materials
 Electrodes graphite, titanium
 Sensor shaft PP, PTFE

Process connections
 G 1 thread
 Dairy fitting DN 25 according to DIN 11851

Ordering information

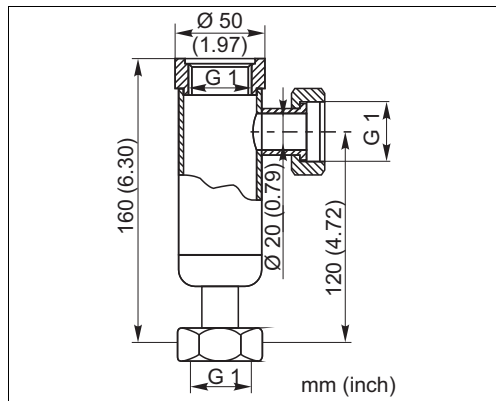
Product structure

Measuring range and cell constant	
D	Measuring range 0.1 to 200 mS/cm ($k = 10 \text{ cm}^{-1}$)
Process connection and material	
1C	G 1 thread, shaft: PP
1F	G 1 thread, shaft: PTFE
2G	Dairy fitting DIN 11851, DN 25, shaft: PP
2L	Dairy fitting DIN 11851, DN 25, shaft: PTFE
Cable connection	
4	3 m (9.84 ft) fixed cable
Temperature sensor	
A	Pt 100
CLS30-	complete order code

Accessories

Assemblies

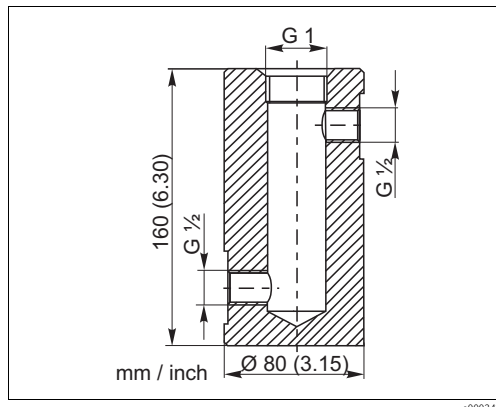
- CLA751 flow assembly



CLA751 flow assembly

For installation of conductivity sensors with G 1 thread.
 Inlet (bottom) and outlet (lateral) DN 20 with union nuts G 1.
 Stainless steel 1.4571 (AISI 316Ti)
 Max. temperature: 160 °C (320 °F)
 Max. pressure: 12 bar (174 psi)
 Order no.: 50004201

- CLA752 flow assembly



CLA752 flow assembly

For installation of conductivity sensors with G 1 thread
 Inlet (lateral) and outlet (lateral) DN 20 with G 1/2 internal thread
 Polypropylene (PP)
 Max. temperature: 90 °C (194 °F)
 Max. pressure: 6 bar (87 psi)
 Order no.: 50033772

Connection

Measuring cable

CYK71 measuring cable

- Non-terminated cable for the connection of sensors or the extension of sensor cables
- Sold by the meter, order numbers:
 - non-Ex version, black: 50085333
 - Ex version, blue: 51506616

Junction boxes

Junction box RM

- For cable extension (e.g. for Memosens sensors or CUS31/CUS41)
- 5 terminals
- Cable entries: 2 x Pg 13.5
- Material: PC
- Ingress protection: IP 65 (≅ NEMA 4X)
- Order no.: 51500832

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)

Calibration solutions

Precision solutions, traceable to SRM (standard reference material) by NIST, for qualified calibration of conductivity measurement systems according to ISO 9000, with temperature table

- CLY11-B
149.6 µS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
Order no. 50081903
- CLY11-C
1.406 mS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
Order no. 50081904
- CLY11-D
12.64 mS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
Order no. 50081905
- CLY11-E
107.0 mS/cm (reference temperature 25 °C / 77 °F), 500 ml / 16.9 fl.oz
Order no. 50081906

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