TI00494C/07/EN/02.21-00
71552554
2021-12-31

Technical Information
Liquiline CM14

Based on digital Memosens technology



Four-wire transmitter for pH/ORP, conductivity and oxygen

Application

The Liquiline CM14 is a four-wire transmitter in compact design for installation in panels or cabinets.

Application

- Wastewater treatment
- Water treatment and drinking water monitoring
- Ion exchanger
- Surface water monitoring

Your benefits

- Compact device in 48 x 96 mm panel-mounted housing
- Easy to use
- Memosens technology
  - Use of precalibrated sensors
  - Safety thanks to active indication of cable break
- Two contacts for limit contactor
- Second current output for temperature

Endress+Hauser
People for Process Automation

Table of contents

Function and system design 3
Measuring system 3

Dependability 4
Reliability 4

Input 5
Measured variables 5
Measuring ranges 5
Types of input 5
Cable specification 5

Output 5
Output signal 5
Load 5
Linearization/transmission behavior 5
Alarm output 5

Current outputs, active 5
Span 5
Signal characteristic 5
Electrical specification 5
Cable specification 6

Relay outputs 7
Relay types 7
Switching capacity 7
Cable specification 7

Power supply 7
Electrical connection 7
Supply voltage 8
Power consumption 8

Performance characteristics 9
Response time 9
Reference temperature 9
Measured error for sensor inputs 9
Current output resolution 9
Repeatability 9

Installation 9
Mounting location 9
Orientation 9

Environment 9
Ambient temperature 9
Storage temperature 9
Humidity 9
Operating height 9
Degree of protection 9
Electromagnetic compatibility 10

Mechanical construction 10
Dimensions 10
Weight 10
Materials 10
Terminals 10

Human interface 11
Operating elements 11

Certificates and approvals 11

Ordering information 11
Product page 11
Product Configurator 11
Scope of delivery 12

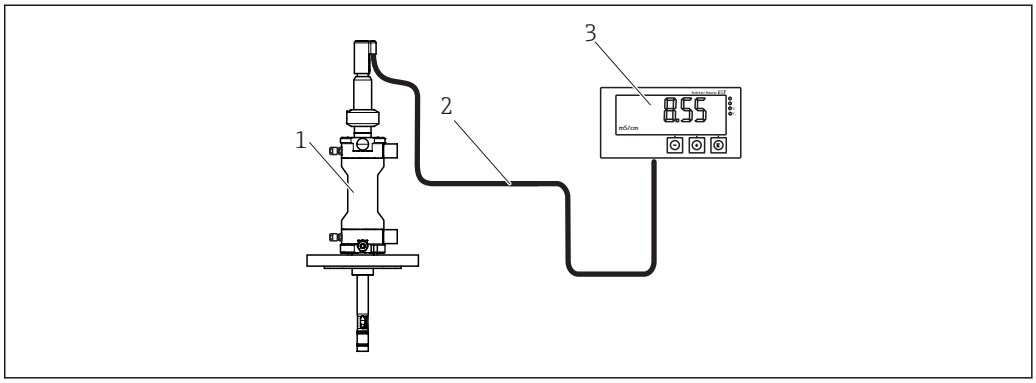
Accessories 12
Device-specific accessories 12

Function and system design

Measuring system

A complete measuring system comprises:

- a Liquiline CM14 transmitter
- an assembly with sensor
- a measuring cable



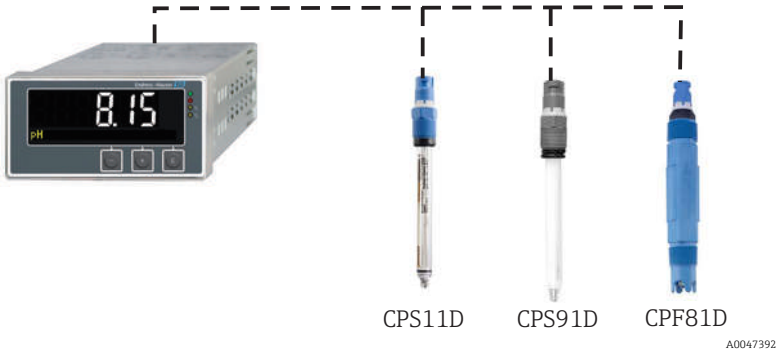
A0047385

1 Measuring system with Liquiline CM14

1 Assembly with sensor
2 Measuring cable
3 Liquiline CM14 transmitter

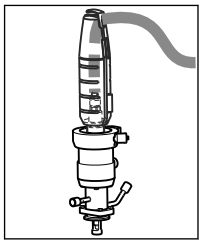
The overview shows examples of measuring systems. Other sensors and assemblies can be ordered for conditions specific to your application (www.endress.com/products).

pH value or ORP

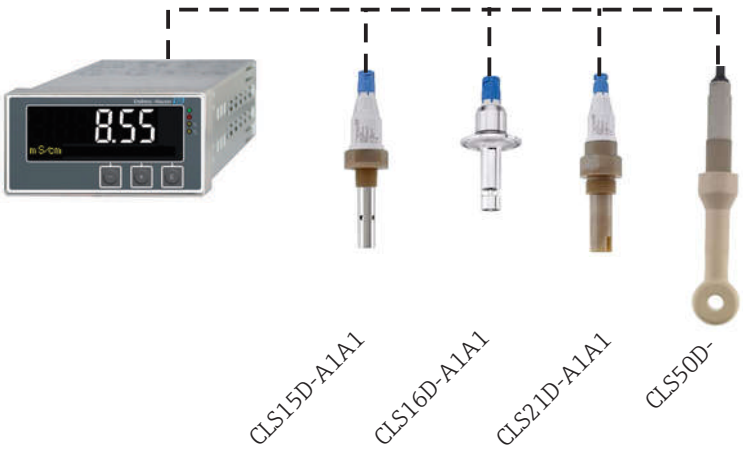


A0047392

2 pH/ORP measurement with Liquiline CM14

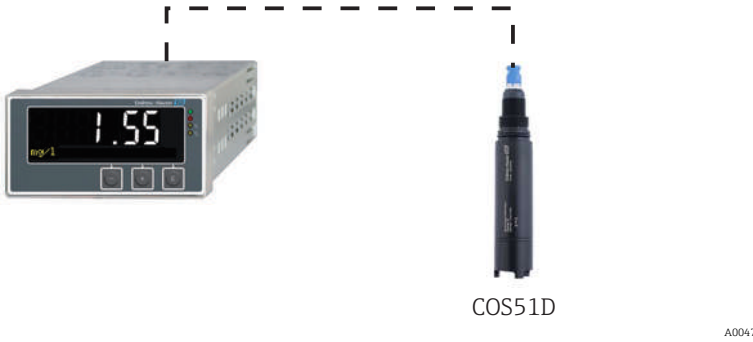


Conductivity



3 *Conductivity measurement with Liquiline CM14*

Oxygen



4 *Oxygen measurement with Liquiline CM14*

Dependability

Reliability

Process Check System (PCS)

This function is used to check the measuring signal for deviations (live check). If the measuring signal does not change over a certain period (several measured values), an alarm is triggered. The cause of such behavior may be contamination, clogging or similar.

Temperature compensation

The temperature compensation options are: linear, NaCl curve according to IEC 746, ultrapure water NaCl (neutral compensation) or ultrapure water HCl (acid compensation, also for ammonia).

Ultrapure water monitoring according to USP (United States Pharmacopoeia) and EP (European Pharmacopoeia)

Ultrapure water monitoring according to USP <645> or EP means that the uncompensated conductivity and the temperature are measured and the results are compared against a table.

The transmitter contains the following functions:
- Monitoring of "Water for Injection" (WFI) according to USP and EP
- Monitoring of "Purified Water" (PW) according to EP

Memosens

Memosens makes your measuring point safer and more reliable:
- Non-contact, digital signal transmission enables optimum galvanic isolation
- No contact corrosion
- Completely watertight
  - Can even be connected under water
  - No contact corrosion

- Sensor can be calibrated in a lab, thus increasing the availability of the measuring point in the process
- Intrinsically safe electronics mean operation in hazardous areas is not a problem.
- Predictive maintenance thanks to recording of sensor data, e.g.:
  - Total hours of operation
  - Hours of operation with very high or very low measured values
  - Hours of operation at high temperatures
  - Number of steam sterilizations
  - Sensor condition

Input

Measured variables	→ Documentation of the connected sensor
Measuring ranges	→ Documentation of the connected sensor
Types of input	Digital sensor inputs for sensors with Memosens protocol
Cable specification	**Cable type** Memosens data cable CYK10 or fixed sensor cable, each with cable end sleeves or M12 round-pin connector (optional) Only Memosens data cables CYK10 with an appropriate approval may be connected to the intrinsically safe digital sensor inputs of the sensor communication module 2DS Ex-i. **Cable length** Max. 100 m (330 ft)

Output

Output signal	2 x 0/4 to 20 mA, active, galvanically isolated from one another and from the sensor circuits
Load	Max. 500 Ω
Linearization/transmission behavior	Linear
Alarm output	The alarm output is implemented as an "open collector". During normal operation, the alarm output is closed. In the event of a fault (diagnostic message with status "F", device is disconnected from power supply), the "Open Collector" opens. Max. current 200 mA Max. voltage 30 V DC

Current outputs, active

Span	0 to 23 mA
Signal characteristic	Linear
Electrical specification	**Output voltage** Max. 24 V

Test voltage
500 V

Cable specification

Cable type
Recommended: shielded cable

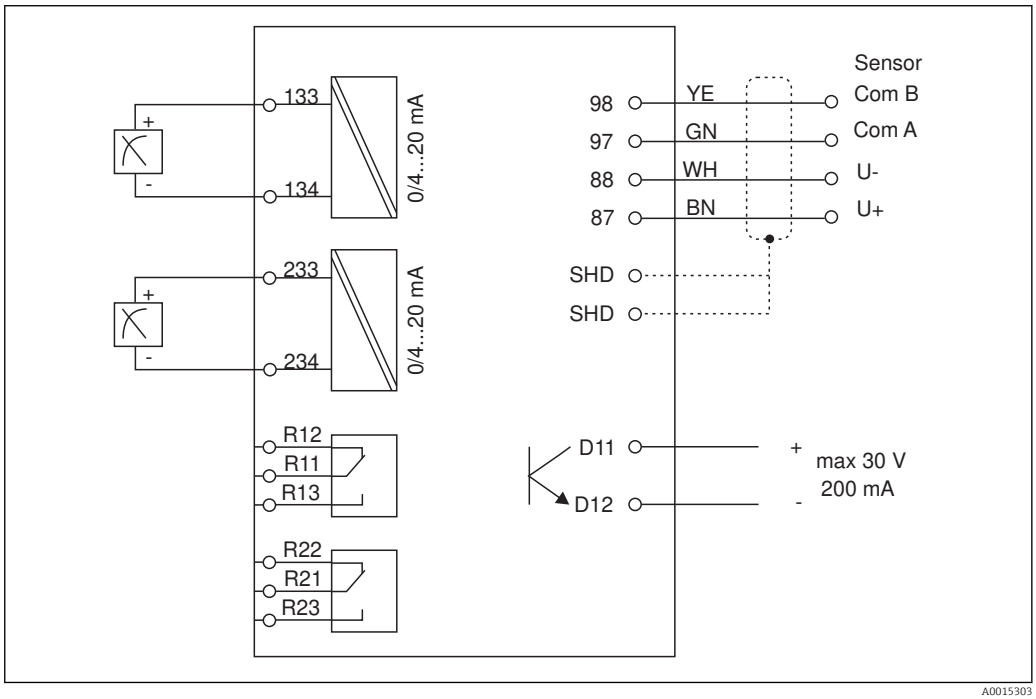
Cable specification
Max. 1.5 mm^2 (16 AWG)

Relay outputs

Relay types	2 changeover contacts
Switching capacity	max. 3 A @ 24 V DC max. 3 A @ 253 V AC min. 100 mW (5 V / 10 mA)
Cable specification	Max. 2.5 mm² (14 AWG)

Power supply

Electrical connection



5 Electrical connection of the transmitter

Connection	Description
87	Terminal for Memosens cable, brown, sensor power supply U+
88	Terminal for Memosens cable, white, sensor power supply U-
97	Terminal for Memosens cable, green, Com A
98	Terminal for Memosens cable, yellow, Com B
SHD	Terminal for Memosens cable, shield
D11	Terminal for alarm output, +
D12	Terminal for alarm output, -
L/+	Terminal for transmitter supply voltage
N/-	
⏚PE	
133	Terminal for analog output 1, +
134	Terminal for analog output 1, -
233	Terminal for analog output 2, +

Connection	Description
234	Terminal for analog output 2, -
R11, R12, R13	Terminal for relay 1
R21, R22, R23	Terminal for relay 2

Supply voltage

Universal power supply unit 24 to 230 V AC/DC (-20 % / +10 %) 50/60Hz

The device does not have a power switch
- The customer must provide a protected circuit breaker in the vicinity of the device.
- The circuit breaker must be a switch or power switch, and must be labeled as the circuit breaker for the device.

Power consumption

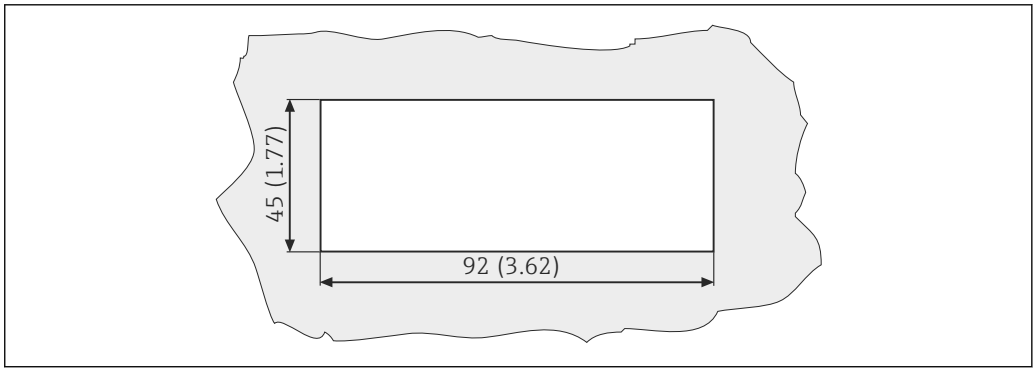
Max. 13.8 VA / 6.6 W

Performance characteristics

Response time	Current outputs t_{90} = max. 500 ms for an increase from 0 to 20 mA
Reference temperature	25 °C (77 °F)
Measured error for sensor inputs	→ Documentation of the connected sensor
Current output resolution	> 13 bit
Repeatability	→ Documentation of the connected sensor

Installation

Mounting location	Panel, cutout 92 x 45 mm (3.62 x 1.77 in) Max. panel thickness 26 mm (1 in)
Orientation	The orientation is determined by the legibility of the display. Max. viewing angle range of +/- 45° from the central display axis in every direction.



6 Panel cutout. Engineering unit mm (in)

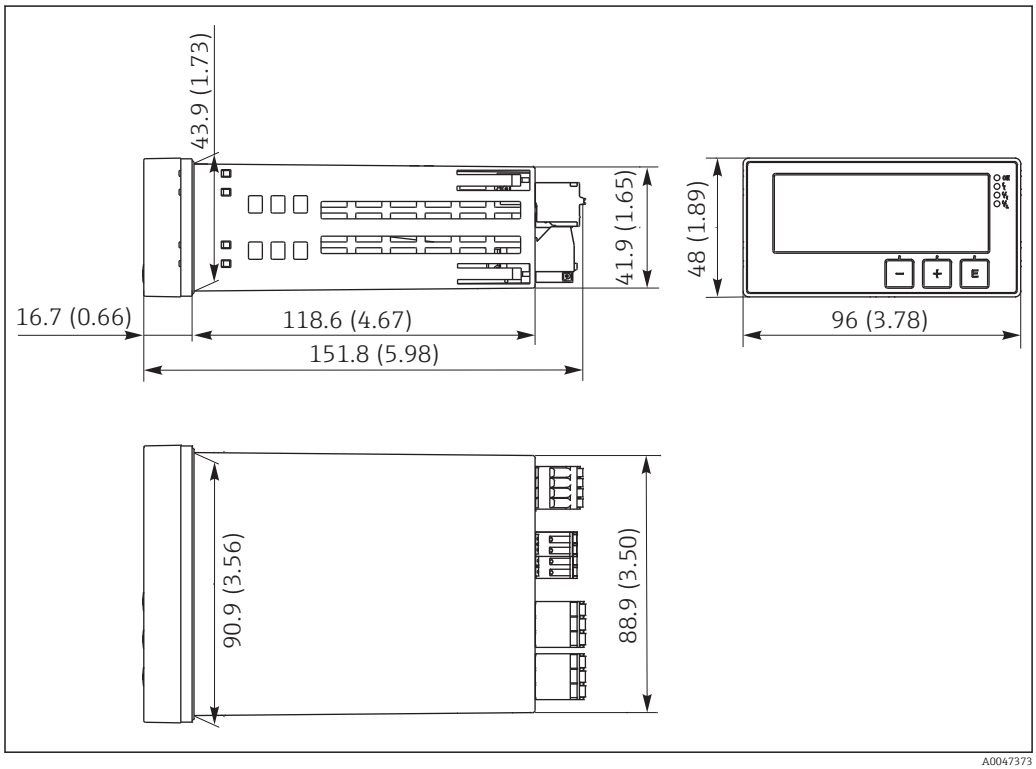
Environment

Ambient temperature	−10 to +60 °C (14 to 140 °F)
Storage temperature	-40 to +85 °C (-40 to 185 °F)
Humidity	5 to 85 %, non-condensing
Operating height	< 2 000 m (6 561 ft) above MSL
Degree of protection	**Front** Front IP65 / NEMA 4X **Casing** IP20 shock protection

Electromagnetic compatibility	Interference emission and interference immunity as per EN 61326-1:2013, Class A for Industry

Mechanical construction

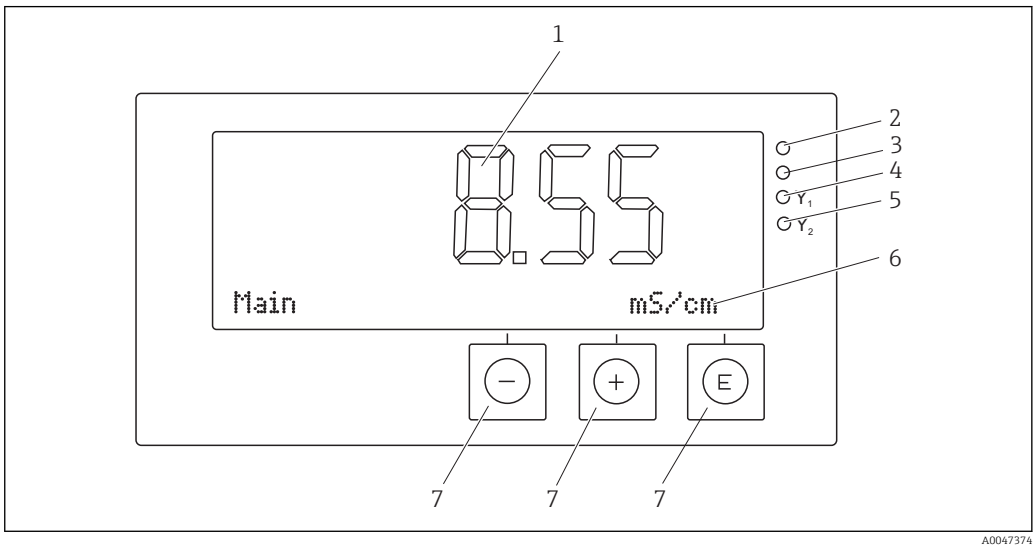
Dimensions



Weight	0.3 kg (0.66 lbs)	
Materials	Housing, casing:	Polycarbonate
	Front foil:	Polyester, UV-resistant
Terminals	Max. 2.5 mm² (22-14 AWG; torque 0.4 Nm (3.5 lb in)) mains, relay	

Human interface

Operating elements



7 *Display and operating elements*

1 *LC display for displaying the measured values and configuration data*
2 *Status LED, power supply connected*
3 *Status LED, alarm function*
4 *Status LED for limit switch relay 1*
5 *Status LED for limit switch relay 2*
6 *Dot matrix display for displaying the dimensions and menu items*
7 *Operating keys*

Certificates and approvals

Current certificates and approvals for the product are available via the Product Configurator at www.endress.com.

1. Select the product using the filters and search field.
2. Open the product page.

The **Configuration** button opens the Product Configurator.

Ordering information

Product page

www.endress.com/cm14

Product Configurator

On the product page there is a **Configure** button to the right of the product image.

1. Click this button.
   ↳ The Configurator opens in a separate window.
2. Select all the options to configure the device in line with your requirements.
   ↳ In this way, you receive a valid and complete order code for the device.
3. Export the order code as a PDF or Excel file. To do so, click the appropriate button on the right above the selection window.

For many products you also have the option of downloading CAD or 2D drawings of the selected product version. Click the **CAD** tab for this and select the desired file type using picklists.

Scope of delivery

The scope of delivery comprises:
- 1 Transmitter in the version ordered
- 1 Mounting kit
- 1 Operating Instructions

Accessories

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

Measuring cable

Memosens data cable CYK10
- For digital sensors with Memosens technology
- Product Configurator on the product page: www.endress.com/cyk10

Technical Information TI00118C

Sensors

Glass electrodes

Orbisint CPS11D
- pH sensor for process technology
- With dirt-repellent PTFE diaphragm
- Product Configurator on the product page: www.endress.com/cps11d

Technical Information TI00028C

Orbipore CPS91D
- pH electrode with open aperture for media with high dirt load
- Product Configurator on the product page: www.endress.com/cps91d

Technical Information TI00375C

Orbipac CPF81D
- Compact pH sensor for installation or immersion operation
- In industrial water and wastewater
- Product Configurator on the product page: www.endress.com/cpf81d

Technical Information TI00191C

ORP sensors

Orbisint CPS12D
- ORP sensor for process technology
- Product Configurator on the product page: www.endress.com/cps12d

Technical Information TI00367C

Orbipore CPS92D
- ORP electrode with open aperture for media with high dirt load
- Product Configurator on the product page: www.endress.com/cps92d

Technical Information TI00435C

Orbipac CPF82D
- Compact ORP sensor for installation or immersion operation in process water and wastewater
- Product Configurator on the product page: www.endress.com/cpf82d

Technical Information TI00191C

Conductive conductivity sensors

Condumax CLS15D
- Conductive conductivity sensor
- For pure water, ultrapure water and hazardous area applications
- Product Configurator on the product page: www.endress.com/CLS15d

Technical Information TI00109C

Condumax CLS16D
- Hygienic, conductive conductivity sensor
- For pure water, ultrapure water and Ex applications
- With EHEDG and 3A approval
- Product Configurator on the product page: www.endress.com/CLS16d

Technical Information TI00227C

Condumax CLS21D
- Two-electrode sensor in plug-in head version version
- Product Configurator on the product page: www.endress.com/CLS21d

Technical Information TI00085C

Conductive conductivity sensors

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

Technical Information TI00182C

Oxygen sensors

Oxymax COS51D
- Amperometric sensor for dissolved oxygen
- With Memosens technology
- Product Configurator on the product page: www.endress.com/cos51d

Technical Information TI00413C

Oxymax COS22D
- Sterilizable sensor for dissolved oxygen
- With Memosens technology
- Product Configurator on the product page: www.endress.com/cos22d

Technical Information TI00446C



www.addresses.endress.com

Endress+Hauser

People for Process Automation