Technical Information

Liquiline CM14

4-wire-controller based on digital Memosens technology for pH/ORP, conductivity and oxygen

Application

Liquiline CM14 is a 4-wire-controller 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 instrument in 48 x 96 mm panel mounted housing
- Easy to operate
- Memosens technology
  - Use of precalibrated sensors
  - Safety thanks to active detection of cable break
- Two contacts for limit contactor
- Second current output for temperature

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Function and system design

Memosens technology

Memosens makes your measuring point safer and more reliable:
- Non-contact, digital signal transmission enables optimum galvanic isolation
- No galvanic corrosion
- Completely watertight
- Laboratory sensor calibration possible, thus increasing measured value availability
- 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 with high temperatures
  - Number of steam sterilizations
  - Sensor condition

pH/ORP measurement
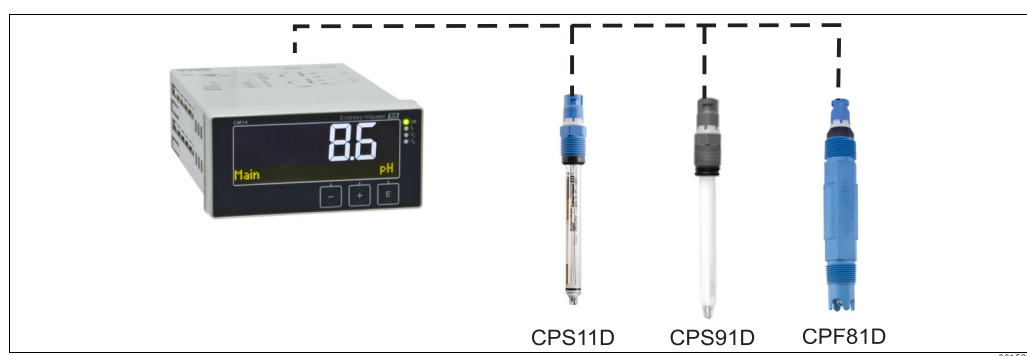
pH/ORP measurement with Liquiline CM14

Functions of the basic version

Mesaurement of pH and ORP value with glas elctrodes.
This is selected via the menu. The temperature is displayed alternatingly.

Process Check System (PCS)

The live check issues an alarm when the sensor signal does not change over a defined period of time. This may be caused by blocking, passivation, separation from the process, etc.

Conductivity measurement

Conductive or inductive
Two versions are available for the measurement with conductive (two electrode) sensors or inductive sensors. An inductive sensor is recommended for the measurement of high conductivities, for concentration measurement or adhering media.
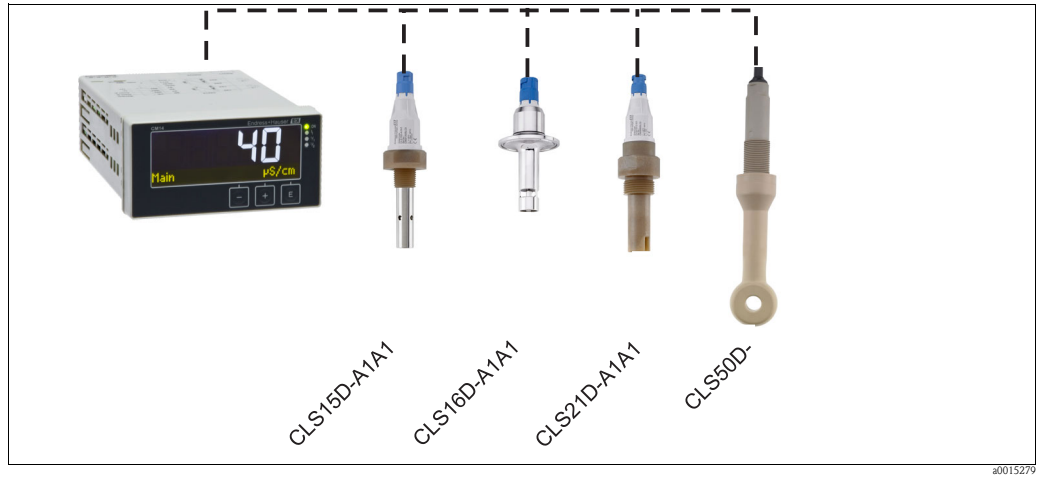
The measuring range of a measuring point is determined by the connected digital Memosens sensor.

Sensor	Cell constant	Measuring range
CLS15D-A1A1	k = 0.01 1/cm	0.05 µS/cm to 20 µS/cm
CLS15D-B1A1	k = 0.1 1/cm	0.1 µS/cm to 200 µS/cm
CLS16D-3C1P1	k = 0.1 1/cm	0.04 µS/cm to 500 µS/cm
CLS21D-C1E1	k = 1.0 1/cm	10 µS/cm to 20 mS/cm
CLS50D-AA1B11	k = 1.98 1/cm	0.1 mS/cm to 2000 mS/cm

Measurement of conductivity or resistivity (conductive)
This is selected via the menu.

Temperature compensation

The following temperature compensation selections are available:
- Linear
- NaCl curve according to IEC 746
- Ultrapure water NaCl (neutral compensation)
- Ultrapure water HCl (acid compensation, also ammonia)

Ultrapure water monitoring acc. to USP (United States Pharmacopeia) and EP (European Pharmacopoeia)
Ultrapure water monitoring according to USP <645> and EP means that the uncompensated conductivity value and the temperature are measured and the results are compared by a table.

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

Oxygen measurement

Measurement of the oxygen content und setting of the sea level
The oxygen content is displayed in mg/l. The setting of the sea level is performed in m or ft.
This is selected via the menu. The temperature is displayed alternatingly.
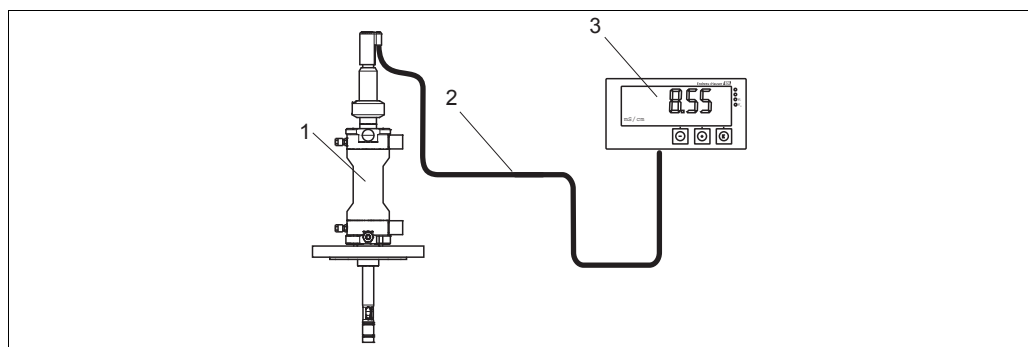

Oxygen measurement with Liquiline CM14

Sensor	Measuring range
COS51D	0.01 to 100 mg/l
COS22D-*1	0.01 to 60 mg/l

Measuring system

A complete measuring system comprises:
- The controller Liquiline CM14
- An assembly with sensor
- A measuring cable

Example of measuring system with Liquiline CM14

1   Assembly with sensor
2   Measuring cable
3   Controller Liquiline CM14

Input

Measuring variables	—> Documentation of the connected sensor
Measuring range	—> Documentation of the connected sensor
Input types	Digital sensor inputs
Cable specification	**Cable type** Memosens data cable CYK10 or sensor fixed cable, each with cable end sleeves **Cable length** Max. 100 m (330 ft)

Output

Output signal	2 x 0/4 to 20 mA active, potentially isolated from one another and from the sensor circuit
Load	Max. 500 Ω
Linearisation/transmission bevaviour	linear
Alarm output	The alarm output is designed as "open collector". Current max. 200 mA Voltage max. 30 V DC

Current output, active

Span	0 to 23 mA
Signal characteriziation	linear
Electrical specification	**Output voltage** Max. 24 V
Cable specification	**Cable type** Recommended: shielded cable **Cross section** max. 1.5 mm^2 (16 AWG)

Relay output

Relay type	2 changeover contacts
Switching current	max. 3 A @ 24 V DC max. 3 A @ 253 V AC min. 100 mW (5 V / 10 mA)
Cable specification	**Cross section** Max. 2.5 mm^2 (14 AWG)

Power supply

Electrical connection
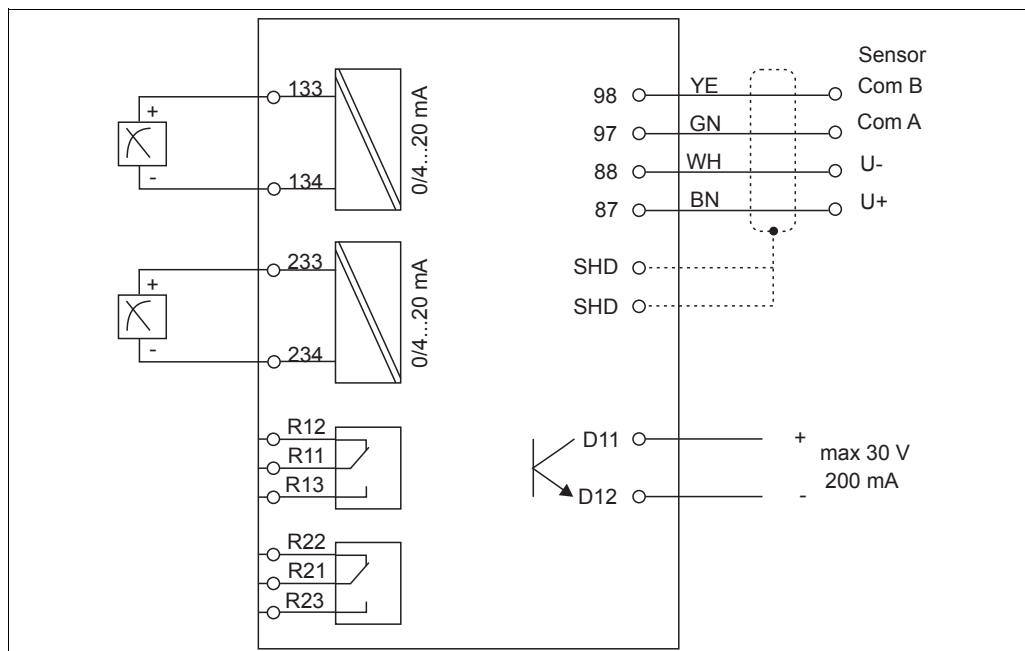
Electrical connection of controller

Terminal	Description
87	Connection Memosens cable, brown, sensor power U+
88	Connection Memosens cable, white, sensor power U–
97	Connection Memosens cable, green, Com A
98	Connection Memosens cable, yellow, Com B
SHD	Connection Memosens cable, shield
D11	Connection alarm output, +
D12	Connection alarm output, –
L/+	
N/–	Connection controller power
⏚PE	
133	Connection analog output 1, +
134	Connection analog output 1, –
233	Connection analog output 2, +
234	Connection analog output 2, –
R11, R12, R13	Connection relay 1
R21, R22, R23	Connection relay 2

Power supply

Wide range power supply 24 V to 230 V AC/DC (–20 % / +10 %) 50/60 Hz

Note!
The controller has no power switch
- A clearly marked mains disconnecting device must be installed in the vicinity of the instrument.
- Protect the controller by an appropriate fuse.

Power consumption

Max. 13.8 VA / 6.6 W

Performance characteristics

Response time	**Current output** t_{90} = max. 500 ms for an increase from 4 to 20 mA
Reference temperature	25 °C (77 °F)
Measuring error, input	—> Documentation of the connected sensor
Resolution current output	> 13 bit
Repeatability	—> Documentation of the connected sensor

Installation conditions

|	
Installation instructions	**Mounting location** Panel, cutout 92 x 45 mm (3.62 x 1.77 ") Max. panel thickness 26 mm (1") **Mounting orientation** The mounting orientation is determined by the display readability Max. angle of view +/- 45° of the display center axis in each direction.

mm (inch)

45 (1.77)

92 (3.62)

a0010351
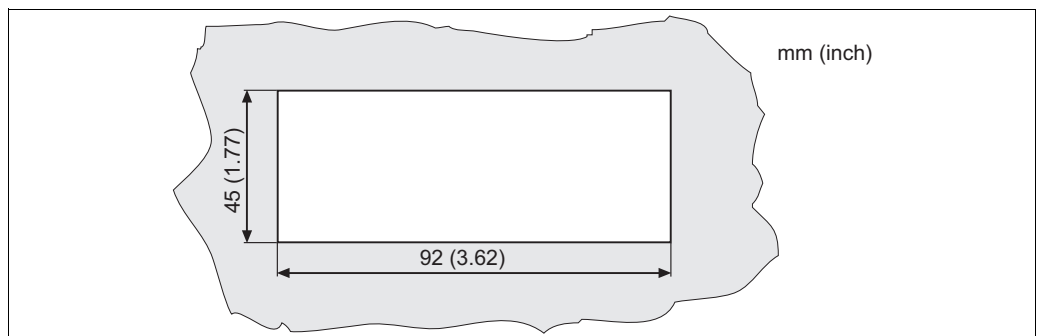
Panel cutout

Environment

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Ambient temperature range	−10 to +60 °C (14 to 140 °F)
Storage temperature range	−40 to +85 °C (−40 to 185 °F)
Altitude	<2000 m (6561 ft) above sea level
Electromagnetic compatibility	Interference emission and interference immunity as per EN 61326-1:2006, class A for industrial use
Ingress protection	**Front** IP65 / NEMA 4X **Body** Protection against contact IP20
Relative humidity	5 to 85 %, non-condensing

Mechanical construction

Dimensions

Dimensions
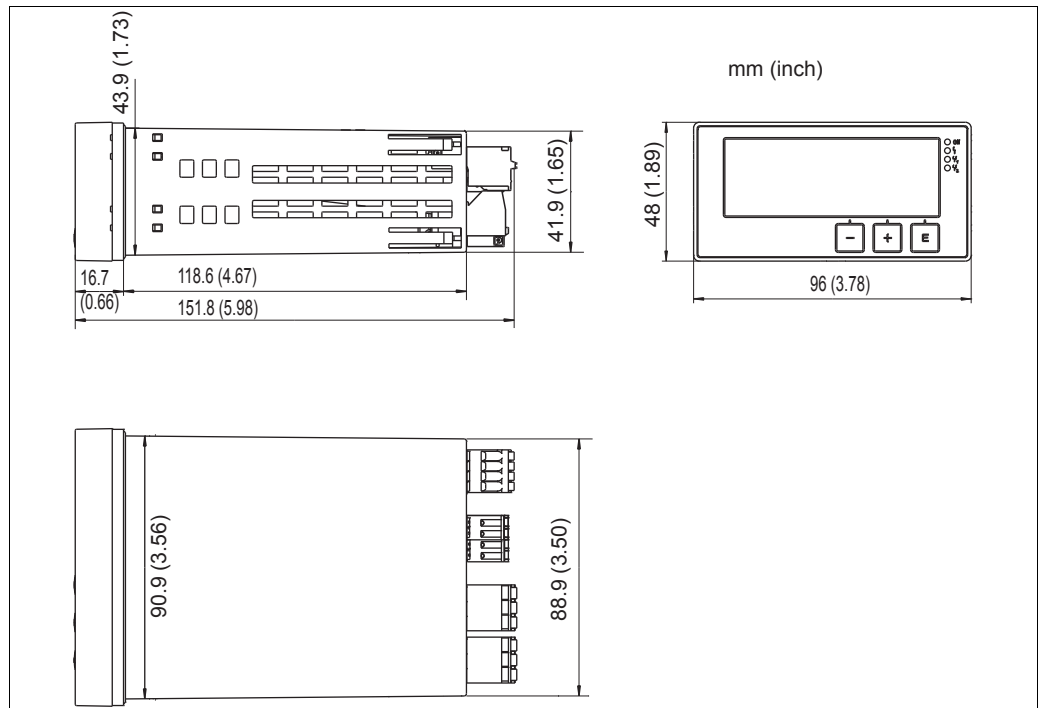
Weight	0.3 kg (0.66 lbs)

Materials	Housing, body:	Polycarbonate
	Front membrane:	Polyester, UV resistant

Terminals	max. 2.5 mm^2 (22-14 AWG; torque: 0.4 Nm (3.5 lb in))	Mains, relays

Operability

Operating elements
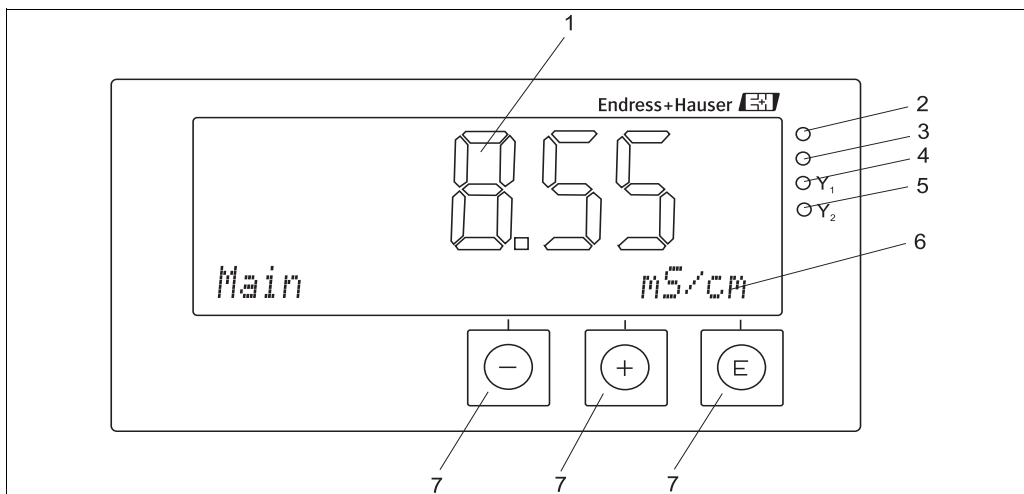
Display and operating elements

1   LC display for measuring values and configuration data
2   Status LED power connected
3   Status LED alarm function
4   Status LED limit contactor relay 1
5   Status LED limit contactor relay 2
6   Dot matrix display for measuring units and menu positions
7   Operating keys

Certificates and approvals

CE mark

Declaration of conformity
The product meets the requirements of the harmonized European standards. It thus complies with the legal requirements of the EC directives.
The manufacturer confirms successful testing of the product by affixing the CE symbol.

Ordering information

Product structure

		Approval	
	AA	Non-hazardous area	
	CA	CSA C/US general purpose	

		Sensor input	
	K	Digital, Memosens conductivity conductive	
	L	Digital, Memosens conductivity inductive	
	M	Digital, Memosens pH, ORP (glass)	
	O	Digital, Memosens oxygen amperom.	

CM14–		order code	

	Service
HC	PWIS free, PWIS = paint- wetting impairment substances

	Additional approval
LU	UL listed

	Marking
Z1	Tagging (TAG), see additional spec.

Note!
To complete your order code, simply add the optional features to the end of order code. If you have any questions, please contact your local sales office.

Scope of delivery

The scope of delivery comprises:
- Controller CM14 in ordered version
- Installation kit
- Operating instructions

Accessories

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

Sensors

Glass electrodes pH measurement

Orbisint CPS11D
■ pH electrode for process applications with Memosens technology
■ Dirt-repellent PTFE diaphragm
■ Ordering acc. to product structure, see Technical Information (TI028C/07/en)

Orbipore CPS91D
■ pH sensor with Memosens technology
■ With open aperture for media with high dirt load
■ Ordering acc. to product structure, see Technical Information (TI375C/07/en)

Orbipac CPF81D
■ Compact pH sensor for installation or immersion operation in process water and wastewater
■ Ordering acc. to product structure, see Technical Information (TI191C/07/en)

ORP sensors

Orbisint CPS12D
■ ORP sensor with Memosens technology
■ Dirt-repellent PTFE diaphragm
■ Ordering acc. to product structure, see Technical Information (TI367C/07/en)

Orbipore CPS92D
■ ORP sensor with Memosens technology
■ With open aperture for media with high dirt load
■ Ordering acc. to product structure, see Technical Information (TI435C/07/en)

Orbipac CPF82D
■ Compact ORP sensor for installation or immersion operation in process water and wastewater
■ Ordering acc. to product structure, see Technical Information (TI191C/07/en)

Conductivity sensors, conductive

Condumax W CLS15D
■ For measurement in pure and ultrapure water and in Ex applications
■ Ordering according to product structure, see Technical Information TI109C/07/en

Condumax H CLS16D
■ Hygienic sensor for measurement in pure and ultrapure water and in Ex applications
■ With EHEDG and 3A certificates
■ Ordering according to product structure, see Technical Information TI227C/07/en

Condumax W CLS21D
■ Two-electrode sensor in fixed cable and plug-in head version
■ Ordering according to product structure, see Technical Information TI085C/07/en

Conductivity sensors, inductive

Indumax CLS50D
■ High-stability inductive conductivity sensor for standard, Ex and high-temperature applications
■ Memosens technology
■ Order as per product structure, see Technical Information TI182C/07/en

Oxygen sensors

Oxymax COS51D
■ Amperometric sensor for dissolved oxygen, with Memosens technology
■ Ordering acc. to product structure, see Technical Information (TI413C/07/en)

Oxymax H COS22D
■ Sterilizable sensor for dissolved oxygen, with Memosens technology
■ Ordering acc. to product structure, see Technical Information (TI446C/07/en)

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