



Technical Information Memosens CPF82E

ORP sensor for mining operations, industrial water and wastewater treatment



Digital with Memosens 2.0 technology

Application

- Flotation
- Leaching
- Neutralization
- Outlet monitoring
- Inlet and outlet monitoring

Your benefits

- With proven KNO_3 electrolyte bridge for improved protection against electrode poisons such as S^{2-} or CN^- ions
- Threaded connection NPT $\frac{3}{4}$ " top and bottom for easy installation at user end
- Suitable for measurements in the temperature range 0 to 80 °C (32 to 176 °F)
- Integrated NTC 30K temperature sensor
- Protection guard against damage

Other advantages provided by Memosens technology

- Maximum process safety thanks to non-contact, inductive signal transmission
- Data security thanks to digital data transmission
- Very easy to use as sensor data are saved in the sensor
- Predictive maintenance can be performed by recording sensor load data in the sensor

Function and system design

Measuring principle

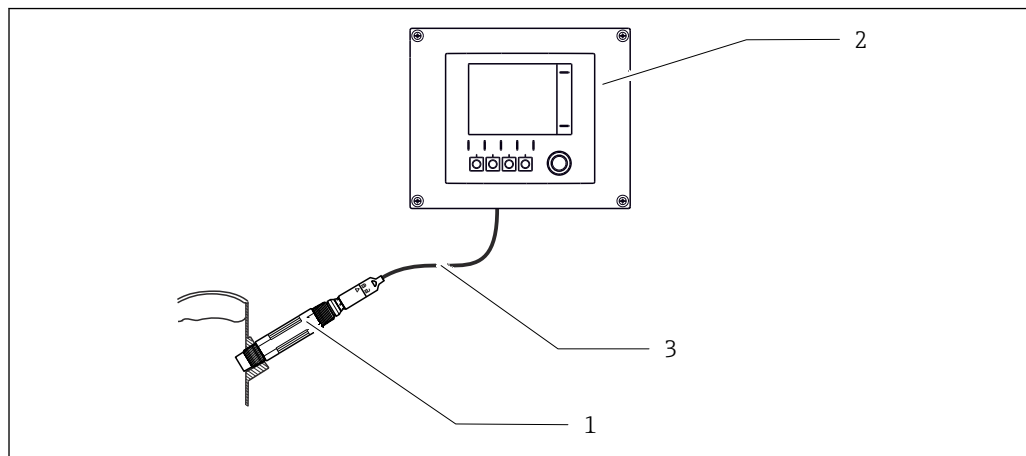
ORP measurement

The ORP potential is a unit of measurement for the state of equilibria between oxidizing and reducing components of a medium. The ORP is measured using a platinum or gold electrode. Similar to pH measurement, an integrated Ag/AgCl reference system is used as a reference electrode.

Measuring system

A complete measuring system comprises:

- Sensor CPF82E
- Transmitter, e.g. Liquiline CM44x/R or Liquiline M CM42
- Memosens data cable , e.g. CYK10



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1 Example of a measuring system

- 1 Sensor CPF82E
- 2 Transmitter Liquiline CM44x
- 3 Memosens data cable CYK10

Communication and data processing

Communication with the transmitter



Always connect digital sensors with Memosens technology to a transmitter with Memosens technology. Data transmission to a transmitter for analog sensors is not possible.

Digital sensors can store measuring system data in the sensor. These include the following:

- Manufacturing data
 - Serial number
 - Order code
 - Date of manufacture
- Calibration data
 - Calibration date
 - Offset of integrated temperature sensor
 - Offset of ORP measurement
 - Number of calibrations
 - Calibration history
 - Serial number of the transmitter used to perform the last calibration or adjustment
- Application data
 - Temperature application range
 - ORP application range
 - Date of first commissioning
 - Maximum temperature value
 - Hours of operation under extreme conditions

The data listed above can be displayed with Liquiline CM42, CM44x, and Memobase Plus CYZ71D.

Dependability

Reliability

Easy handling

Sensors with Memosens technology have an integrated electronics unit that stores calibration data and other information (e.g. total hours of operation or operating hours under extreme measuring conditions). Once the sensor has been connected, the sensor data are transferred automatically to the transmitter and used to calculate the current measured value. As the calibration data are stored in the sensor, the sensor can be calibrated and adjusted independently of the measuring point. The result:

- Easy calibration in the measuring lab under optimum external conditions increases the quality of the calibration.
- Pre-calibrated sensors can be replaced quickly and easily, resulting in a dramatic increase in the availability of the measuring point.
- Thanks to the availability of the sensor data, maintenance intervals can be accurately defined and predictive maintenance is possible.
- The sensor history can be documented on external data carriers and evaluation programs.
- The saved application data of the sensor can be used to determine the continued use of the sensor in a targeted manner.

Integrity

Data security thanks to digital data transmission

Memosens technology digitizes the measured values in the sensor and transmits the data to the transmitter via a non-contact connection that is free from potential interference. The result:

- If the sensor fails or there is an interruption in the connection between the sensor and transmitter, this is reliably detected and reported.
- The availability of the measuring point is reliably detected and reported.

Security

Maximum process safety

With inductive transmission of the measured value using a non-contact connection, Memosens guarantees maximum process safety and offers the following benefits:

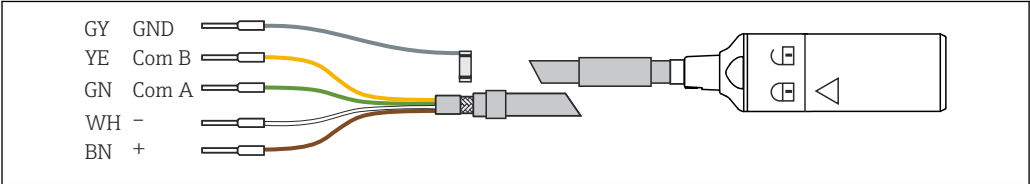
- All problems caused by moisture are eliminated:
 - No corrosion at the connection
 - Measured values cannot be distorted by moisture
- The transmitter is galvanically decoupled from the medium. Issues concerning "symmetrical high-impedance" or "asymmetry" or the type of impedance converter are a thing of the past.
- Electromagnetic compatibility (EMC) is guaranteed by screening measures for the digital transmission of measured values.
- Intrinsically safe electronics mean operation in hazardous areas is not a problem. Complete flexibility thanks to individual Ex approvals for all components, such as sensors, cables and transmitters.

Input

Measured variables	ORP Temperature
Measuring range	-1500 mV to +1500 mV  Pay attention to the operating conditions in the process.

Power supply

Electrical connection



 2 *Measuring cable CYK10 or CYK20*

- Connect the Memosens measuring cable, e.g. CYK10 or CYK20 to the sensor.

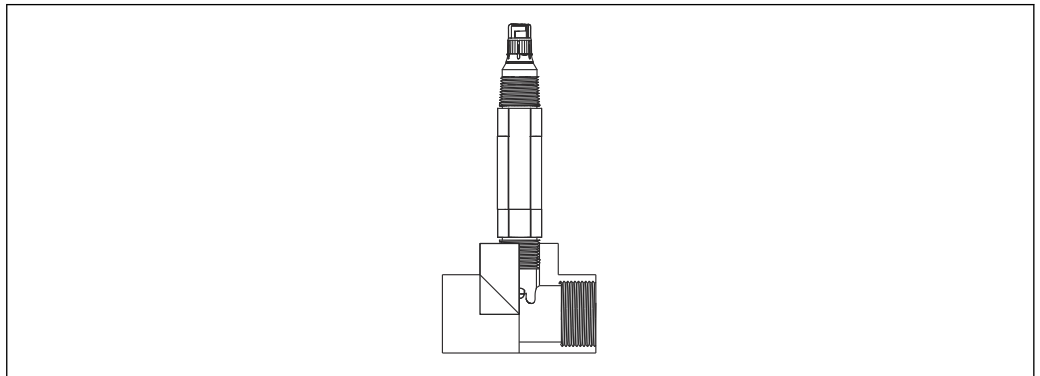
 For further information on cable CYK10, see BA00118C

Performance characteristics

Reference system	Double chamber reference system ■ 1st chamber: bridging electrolyte: gel - 3 MKNO₃ ■ 2nd chamber: Ag/AgCl reference lead, bridging electrolyte: gel KCl, 3M
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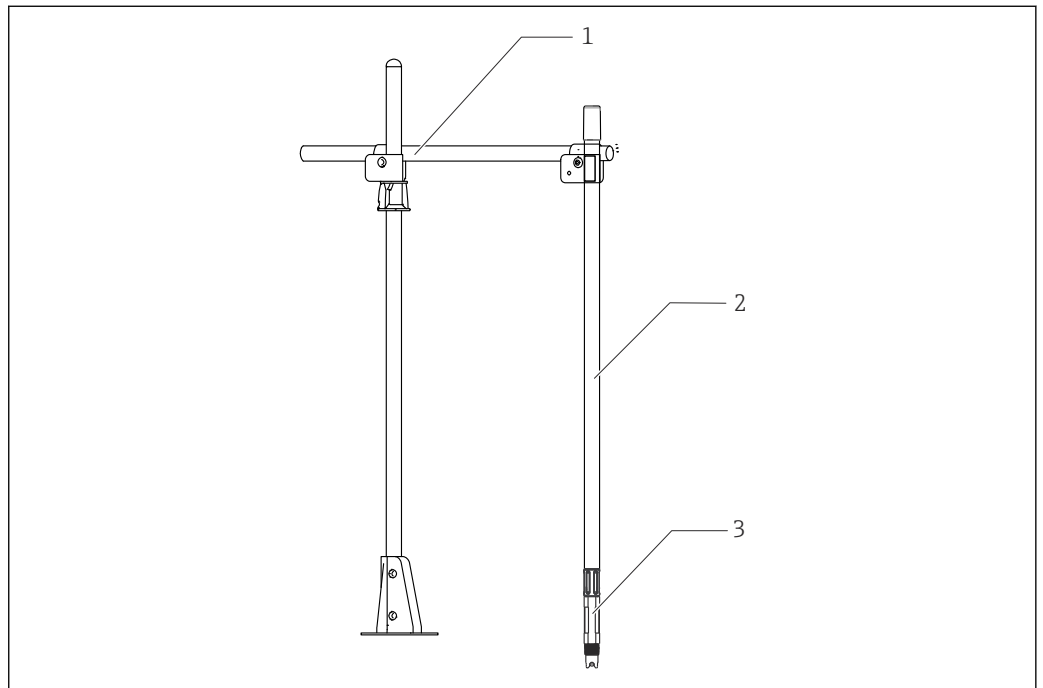
Installation

Installation instructions



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 3 Flow installation



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 4 Installation with immersion assembly with Flexdip CYA112

- 1 CYH112 holder
- 2 CYA112 assembly
- 3 Sensor

- Before screwing in the sensor, make sure the assembly thread, the O-rings and the sealing surface are clean and undamaged and that the thread runs smoothly.
- Pay attention to the installation instructions provided in the Operating Instructions of the assembly used.
- ▶ Screw in the sensor and tighten by hand with a torque of 3 Nm (2.21 lbf ft) (specifications only apply if installing in Endress+Hauser assemblies).



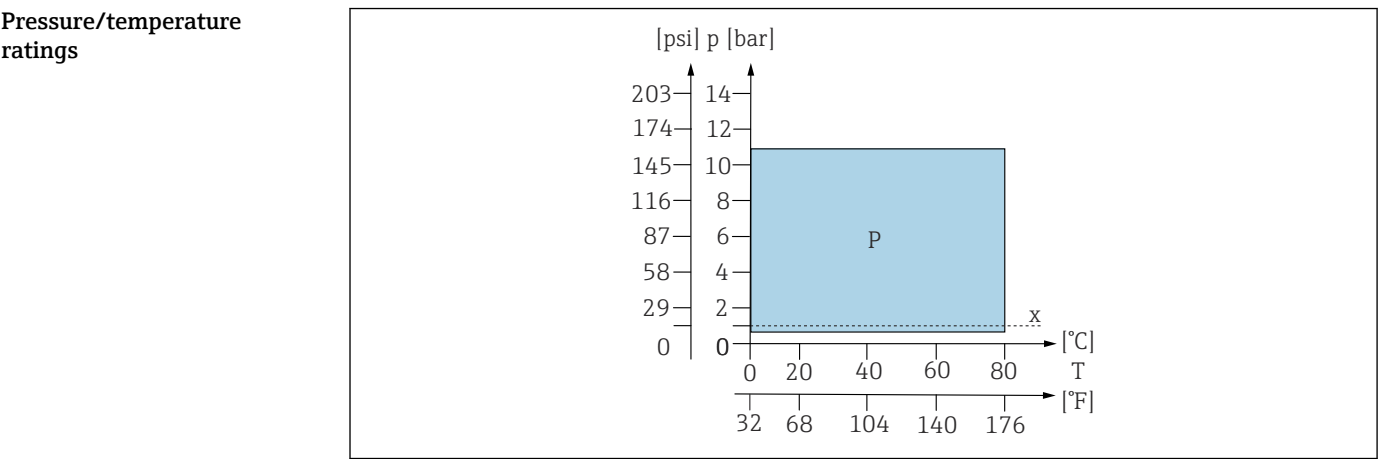
For detailed information on removing the moistening cap, see BA01988C

Environment

Ambient temperature range	NOTICE Risk of damage from frost! ▶ Do not use the sensor at temperatures below .
Storage temperature	0 to 50 °C (32 to 122 °F)
Degree of protection	IP 68 (10 m (33 ft) water column, 25 °C (77 °F), 45 days, 1 M KCl)
Electromagnetic compatibility (EMC)	Interference emission and interference immunity as per: ■ EN 61326-1:2013 ■ EN 61326-2-3:2013 ■ NAMUR NE21:2017

Process

Process temperature range	0 to 80 °C (32 to 176 °F)
Process pressure range	0.8 to 11 bar (11.6 to 159.5 psi) (absolute) CAUTION Pressurization of sensor due to prolonged use under increased process pressure Possibility of sudden rupture and injury from glass splinters! ▶ Avoid fast heating of these pressurized sensors if they are used under reduced process pressure or under atmospheric pressure. ▶ When handling these sensors, always wear protective goggles and appropriate protective gloves.
Conductivity	50 µS/cm (at atmospheric pressure, without flow) (minimized flow; pressure and temperature must remain constant)

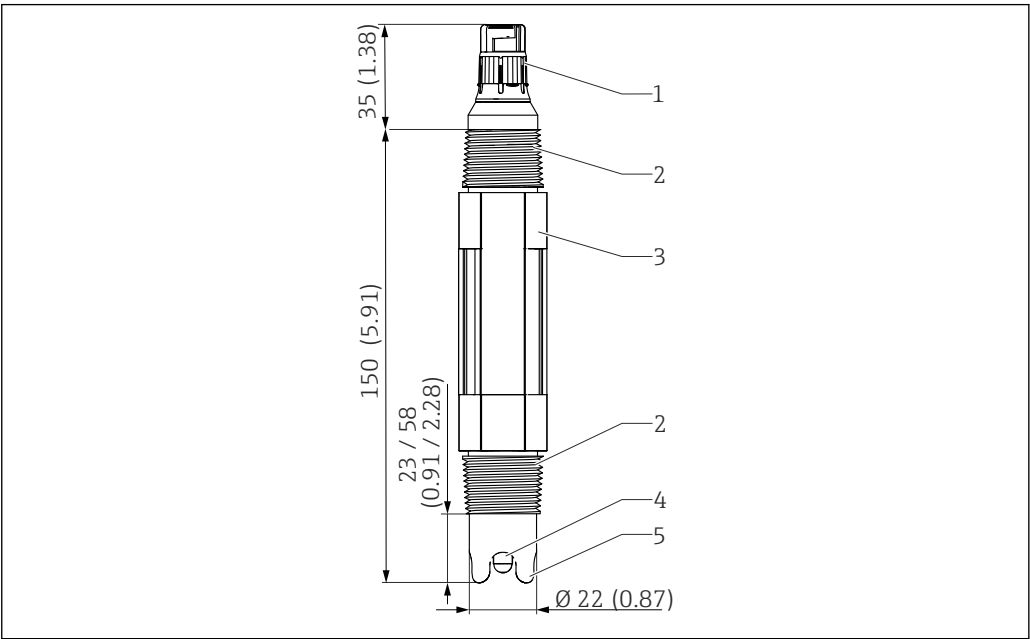


5 Pressure/temperature ratings

P Application P
x Atmospheric pressure

Mechanical construction

Dimensions



6 CPF82E. Engineering unit: mm (in)

- 1 Memosens plug-in head
- 2 NPT 3/4" thread
- 3 Width across flats 26
- 4 Platinum ring
- 5 Protection guard

Weight	0.12 to 0.15 kg (0.26 to 0.33 lb), depending on the version and excluding a cable	
Materials	Housing, sensor shaft	PPS
	ORP sensor (in contact with medium)	Platinum
	Double chamber reference system	KNO ₃ and KCl/AgCl
Plug-in head	Memosens plug-in head for digital, non-contact data transmission, pressure resistance 16 bar (232 psi) (relative)	
Process connections	NPT 3/4"	

Certificates and approvals

CE mark	The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EU directives. The manufacturer confirms successful testing of the product by affixing to it the CE mark.	
Additional certification	TÜV certificate for Memosens plug-in head	
	Pressure resistance 16 bar (232 psi) relative, minimum three times the safety pressure	
	EAC	
	The product has been certified according to guidelines TP TC 004/2011 and TP TC 020/2011 which apply in the European Economic Area (EEA). The EAC conformity mark is affixed to the product.	

Ordering information

Product page	www.endress.com/cpf82e
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 delivery comprises: ■ Sensor in the version ordered ■ 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.

Assembly	Flexdip CYA112 ■ Immersion assembly for water and wastewater ■ Modular assembly system for sensors in open basins, channels and tanks ■ Material: PVC or stainless steel ■ Product Configurator on the product page: www.endress.com/cya112  Technical Information TI00432C
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 Measuring cable CPK9 ■ Terminated measuring cable for connecting analog sensors with TOP68 plug-in head ■ Selection in accordance with product structure ■ Product Configurator on the product page: www.endress.com/cpk9  Technical Information TI00118C
Buffer solutions	ORP buffer solution CPY3 ■ 220 mV, pH 7 ■ 468 mV, pH 0.1 Product Configurator on the product page: www.endress.com/cpy3



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