Technical Information
Memosens CPS62E

ORP sensor for hygienic and sterile applications

Digital with Memosens 2.0 technology

Application

Hygienic and sterile applications (sterilizable, autoclavable):
- Fermenters
- Biotechnology
- Pharmaceutical industry
- Foods

Your benefits

- Certified biocompatibility, no cytotoxicity
- Acrylamide-free bridging electrolyte
- Poison-resistant reference with improved ion trap ensures very long service life
- Bridging electrolyte free of silver ions
- Reference system for upside-down installation
- Solidified gel in the internal lead
- Integrated NTC 30K temperature sensor
- Suitable for CIP/SIP cleaning and autoclavable up to 140 °C (284 °F)
- Various optional approvals for use in non-hazardous areas

Other advantages of Memosens technology

- Maximum process safety with non-contact, inductive signal transmission
- Data security thanks to digital data transmission
- Very easy to use as sensor data saved in the sensor
- Recording of sensor load data in the sensor enables predictive maintenance

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People for Process Automation

Function and system design

| Measuring principle | **ORP measurement** |

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.
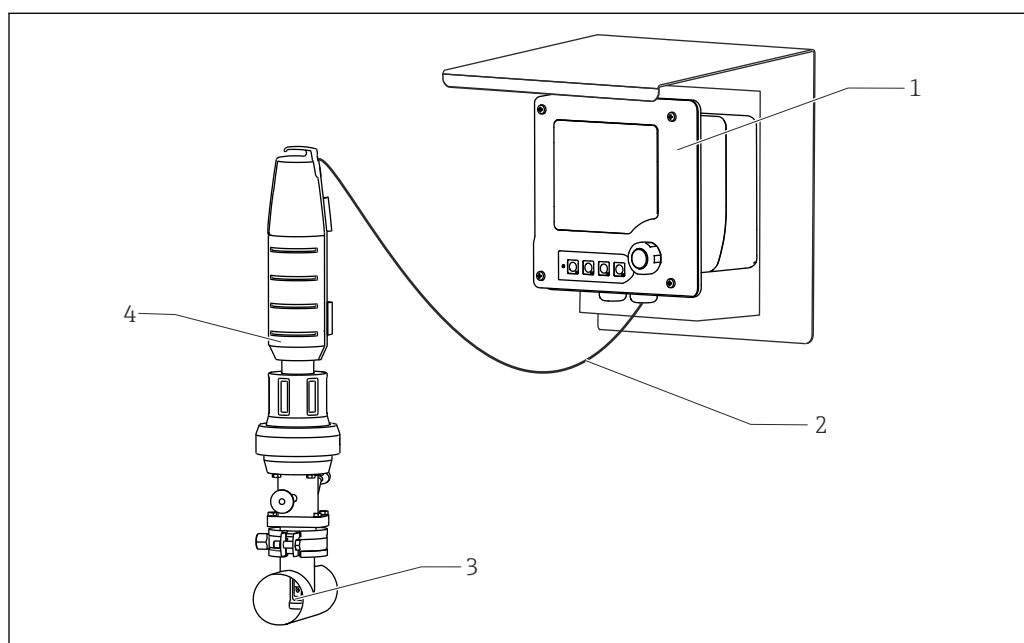
Measuring system

A complete measuring system consists of the following components at least:
- ORP sensor CPS62E
- Memosens data cable CYK10 or CYK20
- Transmitter, e.g. Liquiline CM44x, Liquiline CM42
- Assembly
  - Retractable assembly, e.g. Cleanfit CPA875
  - Permanent installation assembly, e.g. Unifit CPA842

Additional options are available depending on the application:
Automatic cleaning and calibration system, e.g.. Liquiline Control CDC90

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⊠ *1   Example of a measuring system for pH measurement*

1   Liquiline M CM42 two-wire transmitter for hazardous areas
2   Memosens data cable CYK10
3   ORP sensor CPS62E
4   Permanent installation assembly CPA875

Communication and data processing	**Communication with the transmitter**

ℹ️ 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:
- Manufacturer 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
- Operating data
  - Temperature application range
  - ORP application range
  - Date of initial commissioning
  - Maximum temperature value
  - Hours of operation under extreme conditions
  - Number of sterilizations
  - CIP counter

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

Dependability

Reliability

Easy handling
Sensors with Memosens technology have integrated electronics that store 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, e.g. Memobase Plus CYZ71D,.
- The saved application data of the sensor can be used to determine the continued use of the sensor in a targeted manner.

Interference immunity

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.

Safety

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:
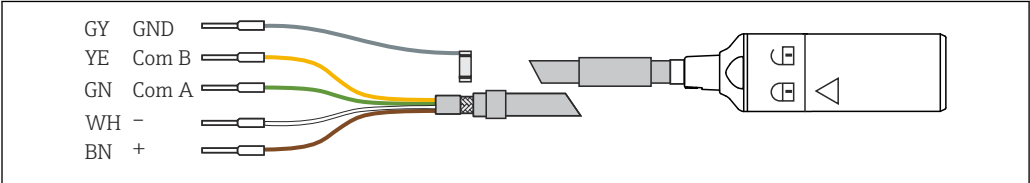- All problems caused by moisture are eliminated:
  - No corrosion at the connection
  - Measured values cannot be distorted by moisture
- The transmitter is galvanically decoupled from the medium. Issues concerning "symmetrical high-impedance" or "asymmetry" or the type of impedance converter are a 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 variable	ORP
	Temperature

Measuring range	−1 500 to 1 500 mV

> Pay attention to the operating conditions in the process.

Power supply

Electrical connection

GY GND
YE Com B
GN Com A
WH −
BN +

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🖼 *2   Measuring cable CYK10 or CYK20*

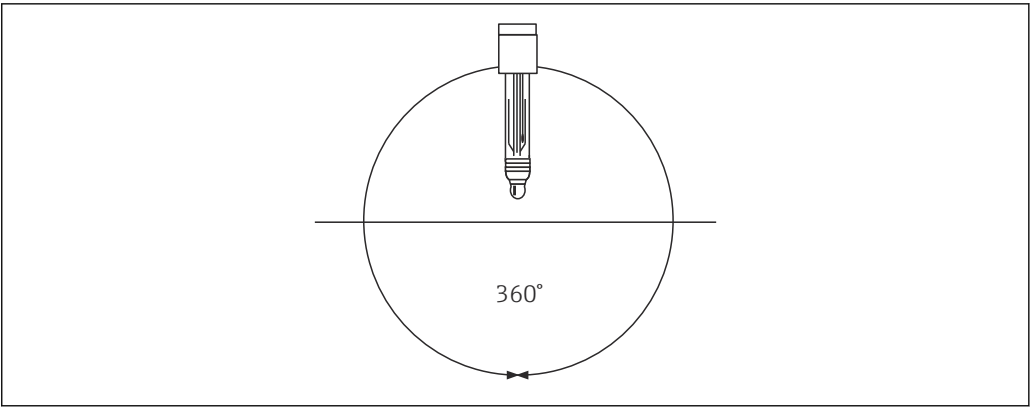▸ Connect the Memosens measuring cable, e.g. CYK10 or CYK20, to the sensor.

> For further information on cable CYK10, see BA00118C.

Performance characteristics

Reference system	Ag/AgCl reference lead, bridging electrolyte: gel KCl, 3M, AgCl-free, with ion trap

Installation

Orientation	The sensor is suitable for upside-down installation.

▸ Install the sensor at any angle.

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3 Any installation angle

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| Installation instructions | 📖 Follow the Operating Instructions for the assembly used for detailed information on installing the assembly. |

📖 For detailed information on removing the wetting cap, see BA01988C

1. 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.

2. Hand-tighten the sensor with a torque of 3 Nm (2.21 lbf ft) (Only applies when installing in Endress+Hauser assemblies).

Hygienic requirements

Devices in hygienic applications place specific demands on the installation. These must be taken into account in order to guarantee hygienic operation without contamination of the process medium.

📖 Special Documentation for hygienic applications, SD02751C

For 3-A-compliant and easy-clean installation, please observe the following:
- Use a certified process assembly
- Use a process assembly with a protective guard around the sensor
- The installation must be self-draining
- Dead areas should be avoided

ℹ️ It is recommended to change the sensor after 40 CIP cycles.

Environment

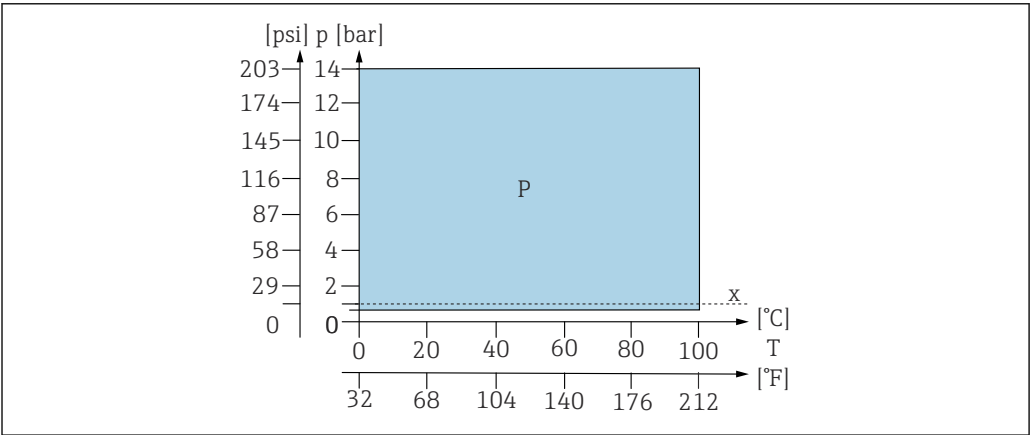| Ambient temperature range | **NOTICE**
Risk of damage from frost!
▶ Do not use the sensor at temperatures below . |
Storage temperature	0 to 50 ℃ (32 to 122 ℉)
Degree of protection	IP 68 (10 m (33 ft) water column, 25 ℃ (77 ℉), 45 days, 1 M KCl)
Electromagnetic compatibility (EMC)	Interference emission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

Process

Process temperature range	0 to 100 ℃ (32 to 212 ℉)
	0 to 140 ℃ (32 to 284 ℉) (140 ℃ (284 ℉) for sterilization only)

Process pressure range	0.8 to 14 bar (11.6 to 203 psi) (absolute)

Conductivity	10 µS/cm (at atmospheric pressure, without flow) (minimized flow; pressure and temperature must remain constant)

Pressure-temperature ratings

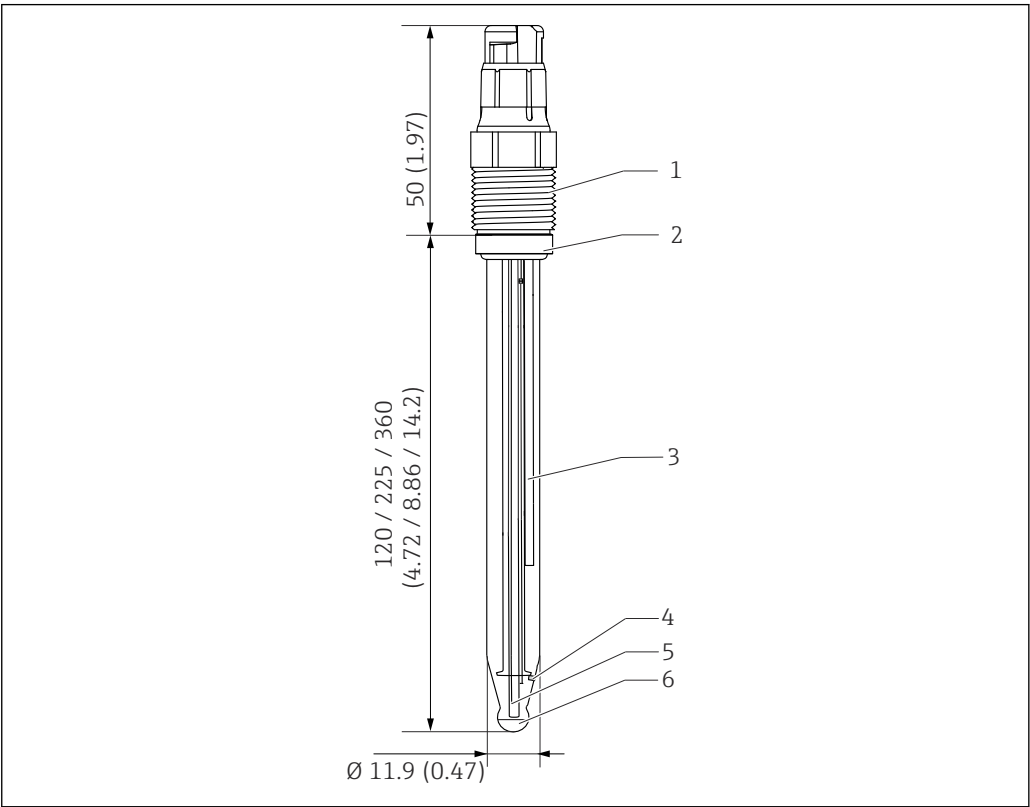

🖼 4   *Pressure-temperature ratings*

P   Application P
x   Atmospheric pressure

Mechanical construction

Design, dimensions

☒ *5   CPS62E. Unit: mm (in)*

1   Memosens plug-in head with process connection
2   O-ring with thrust collar
3   Ag/AgCl lead with ion trap
4   Ceramic junction
5   Temperature sensor
6   Platinum cap

Weight

Installation length	120 mm (4.72 in)	225 mm (8.86 in)	360 mm (14.17 in)
Weight	40 g (1.4 oz)	60 g (2.1 oz)	90 g (3.2 oz)

Materials

Sensor shaft	Glass to suit process
ORP measuring element	Platinum
Metal lead	Ag/AgCl
Aperture	Ceramic junction, zirconium dioxide
O-ring on thrust collar	FKM
Process coupling	PPS, fiberglass-reinforced
Nameplate	ceramic metal oxide

Temperature sensor   NTC 30K

Plug-in head   Memosens plug-in head for digital, non-contact data transmission, pressure resistance 16 bar (232 psi) (relative)

Process connections   Pg 13.5

Certificates and approvals

Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.

2. Open the product page.

3. Select **Downloads**.

Ex approval	**ATEX** II 1G Ex ia IIC T3/T4/T6 Ga **IECEx** Ex ia IIC T3/T4/T6 Ga **NEPSI** Ex ia IIC T3/T4/T6 Ga **CSA C/US** • IS CL I DIV 1, GP A, B, C, D Ex ia IIC T3/T4/T6 • CL 1 Zone 0, AEx ia IIC T3/T4/T6 Ga **Japan Ex** Ex ia IIC T3/T4/T6 Ga **INMETRO** Ex ia IIC T3/T4/T6 Ga **Korea Ex** Ex ia IIC T3/T4/T6 Ga **EAC Ex** EAC Ex 0Ex ia IIC T3/T4/T6 Ga X **UKCA Ex** II 1G Ex ia IIC T3/T4/T6 Ga

Hazardous area versions of the digital sensors with Memosens technology are indicated by a red/orange ring on the plug-in head.

Pay attention to the instructions for Memosens data cable CYK10 and transmitters CM82, CM42 and CM42B.

Additional certification	The following tests, certificates and declarations are available for the product depending on the order version selected: • ASME BPE CoC • Compliance with requirements derived from cGMP • FDA 21 CFR • EU Food Contact Materials REG (EC) 1935/2004 • CN Food Contact Materials GB 4806 • 3-A Certificate • EHEDG Certificate • Substances and allergens

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 Directive TP TC 020/2011 applicable in the Eurasian Economic Union (EAEU). The EAC conformity mark has been affixed to the product.

CRN

Since the sensor can be operated at a nominal pressure > 1 bar (15 psi), it has been registered in all Canadian provinces with a CRN (Canadian Registration Number) in accordance with CSA B51 ("Boiler, pressure vessel, and pressure piping code", category F).

Ordering information

Scope of delivery

The scope of delivery comprises:
- Ordered version of the sensor
- Operating Instructions
- Safety instructions for the hazardous area (for sensors with Ex approval)
- Supplementary sheet for optionally ordered certificates

Product page

www.endress.com/cps62e

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. **Accept**: 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. **CAD**: Open this tab.
   - ↳ The drawing window is displayed. You have a choice between different views. You can download these in selectable formats.

Accessories

The following are the most important accessories available at the time this documentation was issued.

Listed accessories are technically compatible with the product in the instructions.

1. Application-specific restrictions of the product combination are possible.
   Ensure conformity of the measuring point to the application. This is the responsibility of the operator of the measuring point.
2. Pay attention to the information in the instructions for all products, particularly the technical data.
3. For accessories not listed here, please contact your Service or Sales Center.

Device-specific accessories

Assemblies

Unifit CPA842
- Installation assembly for food, biotechnology and pharmaceutics
- With EHEDG and 3A certificate
- Product Configurator on the product page: www.endress.com/cpa842

📖 Technical Information TI01367C

Cleanfit CPA875
- Retractable process assembly for sterile and hygienic applications
- For in-line measurement with standard sensors with 12 mm diameter, e.g. for pH, ORP, oxygen
- Product Configurator on the product page: www.endress.com/cpa875

📖 Technical Information TI01168C

Dipfit CPA140
- pH/ORP immersion assembly with flange connection for very demanding processes
- Product Configurator on the product page: www.endress.com/cpa140

📖 Technical Information TI00178C

Cleanfit CPA871
- Flexible process retractable assembly for water, wastewater and the chemical industry
- For applications with standard sensors with 12 mm diameter
- Product Configurator on the product page: www.endress.com/cpa871

📖 Technical Information TI01191C

Unifit CPA442
- Installation assembly for food, biotechnology and pharmaceutics
- With EHEDG and 3A certificate
- Product Configurator on the product page: www.endress.com/cpa442

📖 Technical Information TI00306C

Cleanfit CPA450
- Manual retractable assembly for installing sensors with a diameter of 12 mm and a length of 120 mm in tanks and pipes
- Product Configurator on the product page: www.endress.com/cpa450

📖 Technical Information TI00183C

Cleanfit CPA473
- Stainless steel process retractable assembly with ball valve shutoff for particularly reliable separation of the medium from the environment
- Product Configurator on the product page: www.endress.com/cpa473

📖 Technical Information TI00344C

Cleanfit CPA474
- Plastic process retractable assembly with ball valve shutoff for particularly reliable separation of the medium from the environment
- Product Configurator on the product page: www.endress.com/cpa474

📖 Technical Information TI00345C

Dipfit CPA111
- Immersion and installation assembly made of plastic for open and closed vessels
- Product Configurator on the product page: www.endress.com/cpa111

📖 Technical Information TI00112C

Flowfit CPA240
- pH/ORP flow assembly for processes with stringent requirements
- Product Configurator on the product page: www.endress.com/cpa240

📖 Technical Information TI00179C

Flowfit CPA25
- Flow assembly for pH/ORP measurement
- Product Configurator on the product page: www.endress.com/cpa25

📖 Technical Information TI01710C

Ecofit CPA640
- Set comprising adapter for 120 mm pH/ORP sensors and sensor cable with TOP68 coupling
- Product Configurator on the product page: www.endress.com/cpa640

📖 Technical Information TI00246C

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

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

Memosens laboratory cable CYK20
- For digital sensors with Memosens technology
- Product Configurator on the product page: www.endress.com/cyk20

Handheld instrument

Liquiline Mobile CML18
- Multiparameter mobile device for laboratory and field
- Reliable transmitter with display and app connection
- Product Configurator on the product page: www.endress.com/CML18

Operating Instructions BA02002C

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www.addresses.endress.com