



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Orbipore CPS92/CPS92D

ORP electrodes, analog or with digital Memosens technology

With open aperture for heavily soiled media



Application

- Chemical processes
- Pulp and paper industry
- Heavily soiled media:
 - Solids
 - Emulsions
 - Dispersions
 - Precipitation

Your benefits

Electrode

- Open aperture for application in heavily soiled media
- Low maintenance thanks to gel filling
- Long service life thanks to new stabilized gel
- Extremely insensitive to pressure and temperature variation
- Short response time

Further benefits offered by Memosens technology

- Maximum process safety through contactless inductive signal transmission
- Data safety through digital data transmission
- Easy handling thanks to storage of sensor-specific data in the sensor
- Predictive maintenance possible thanks to registration of 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. ORP potential is measured similarly to the pH value. A platinum electrode is used instead of pH-sensitive membrane glass. Analog to the pH measurement, an integrated Ag/AgCl reference system is used as a reference electrode.

General properties

■ Open aperture

Thanks to its open aperture, the electrode is particularly suitable for application in heavily soiled media.

■ Durability

The electrode is pressure-proof up to 13 bar (188.5 psi) and can be applied with temperatures of up to 110 °C (230 °F).

Important properties of CPS92D

Maximum process safety

The inductive and non-contacting measured value transmission of Memosens guarantees maximum process safety and offers the following benefits:

- All problems caused by moisture are eliminated.
 - The plug-in connection is free from corrosion.
 - Measured value distortion from moisture is not possible.
 - The plug-in system can even be connected under water.
- The transmitter is galvanically decoupled from the medium. The result: No more need to ask about "symmetrically high-impedance" or "unsymmetrical" (for pH/ORP measurement) or an impedance converter.
- EMC safety is guaranteed by screening measures for the digital measured value transmission.
- Application in explosion-hazardous areas is unproblematic; the integrated electronics are intrinsically safe.

Data safety through digital data transfer

The Memosens technology digitalizes the measured values in the sensor and transfers them to the transmitter contactlessly and free from interference potential. The result:

- An automatic error message is generated if the sensor fails or the connection between sensor and transmitter is interrupted.
- The availability of the measuring point is dramatically increased by immediate error detection.

Easy handling

Sensors with Memosens technology have integrated electronics that allow for saving calibration data and further information such as total hours of operation and operating hours at very high temperatures. When the sensor is mounted, the calibration data are automatically transferred to the transmitter and used to calculate the current ORP potential. Storing the calibration data in the sensor allows for calibration and adjustment away from the measuring point. The result:

- The sensors can be calibrated under optimum external conditions in the measuring lab. Wind and weather do neither affect the calibration quality nor the operator.
- The measuring point availability is dramatically increased by the quick and easy replacement of precalibrated sensors.
- The transmitter does not need to be installed close to the measuring point but can be placed in the control room.
- Maintenance intervals can be defined based on all stored sensor load and calibration data and predictive maintenance is possible.
- The sensor history can be documented on external data carriers and evaluation programs at any time. Thus, the current application of the sensors can be made to depend on their previous history.

Communication with the transmitter

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

Data storage of CPS92D

The digital sensors are able to store the following system data in the sensor.

- Manufacturing data
 - Serial number
 - Order code
 - Date of manufacture
- Calibration data
 - Calibration date
 - Calibrated offset (operating mode "mV")
 - % slope (operating mode "%")
 - Number of calibrations
 - Serial number of the transmitter used for the last calibration
- Application data
 - Temperature application range
 - ORP application range
 - Date of first commissioning
 - Operating hours

These system data can be displayed with Mycom S CPM153 or Liquiline M CM42 transmitters.

Measuring system

A complete measuring system comprises:

- CPS92 or CPS92D ORP electrode
- Transmitter, e.g. Liquiline M CM42
- Special measuring cable, e.g. CPK9 or Memosens data cable CYK10 for CPS92D
- Immersion, flow or retractable assembly, e.g. Cleanfit P CPA472

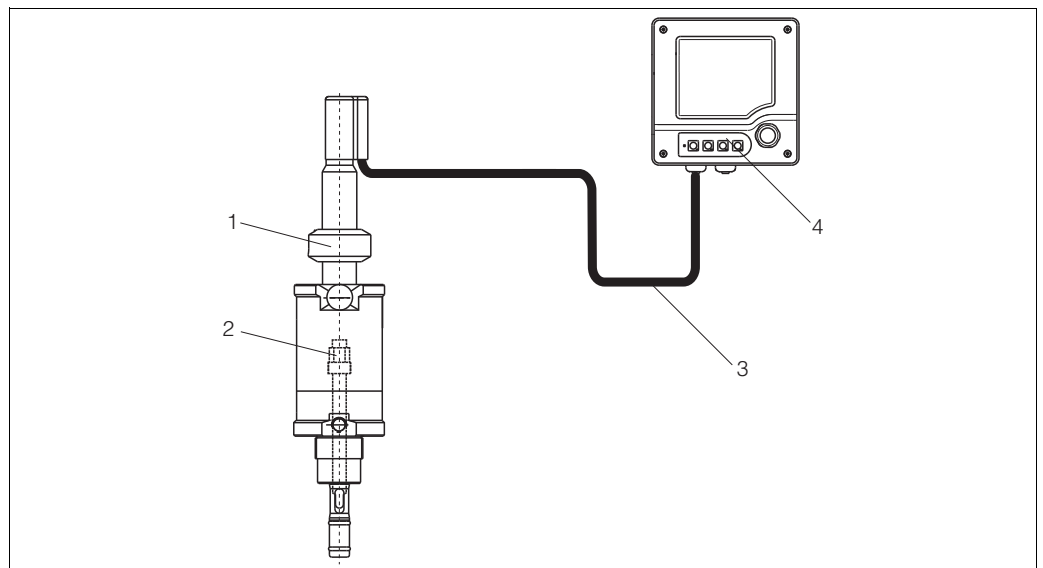


Fig. 1: Measuring system for ORP measurement

- 1 Cleanfit P CPA472 retractable assembly
- 2 CPS92D ORP electrode
- 3 CYK10 Memosens data cable
- 4 Liquiline M CM42 transmitter

Input**Measured variables**

ORP potential

Measuring range

-1500 to 1500 mV

Caution!

Please note the process operating conditions.

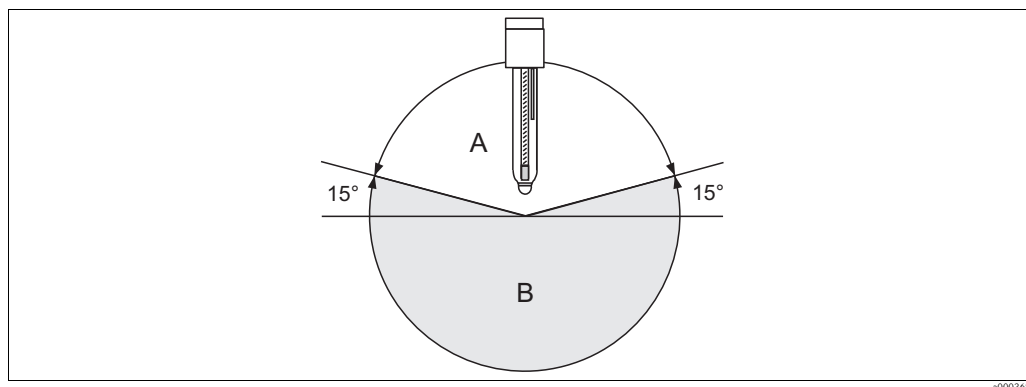
Installation

Installation instructions

Do not install the electrode upside down. The inclination angle must be at least 15° from the horizontal. A smaller inclination angle is not permitted as such an inclination results in air cushion forming. This might impair the contact of reference and metal lead.

Caution!

- Make sure that the assembly's threaded connection for the electrode is clean and well running before installing the electrode.
- Hand tighten the electrode (3 Nm)! (Given value only applies to installation in Endress+Hauser assemblies.)
- Make sure to follow the installation instructions in the operating instructions of the used assembly.



Electrode installation; inclination angle min. 15° from the horizontal

A Permitted inclination angle

B Non-permitted inclination angle

Environment

Ambient temperature

Caution!

Danger of frost damage

Do not use the electrode at temperatures below -15 °C (5 °F).

Storage temperature

0 to 50 °C (32 to 122 °F)

Ingress protection

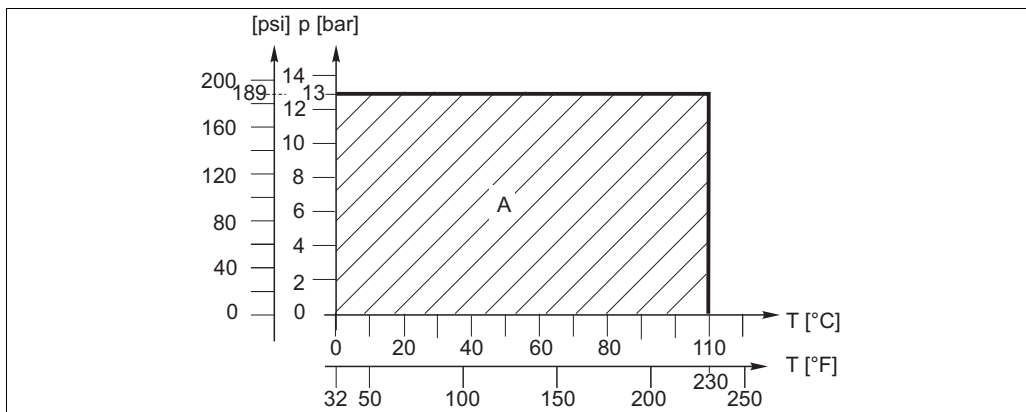
- | | |
|--------|--|
| IP 67: | GSA plug-in head (with closed plug-in connection) |
| IP 68: | TOP 68 plug-in head (1 m (3.28 ft) water column, 50 °C (122 °F), 168 h) |
| IP 68: | Memosens plug-in head (10 m (32.8 ft) water column, 25 °C (77 °F), 45 days, 1 M KCl) |

Process

Process temperature 0 to 110 °C (32 to 230 °F)

Process pressure 0 to 13 bar (0 to 188.5 psi)

Pressure-temperature load curve



Pressure-temperature load curve
 A CPS92/92D application range

Application

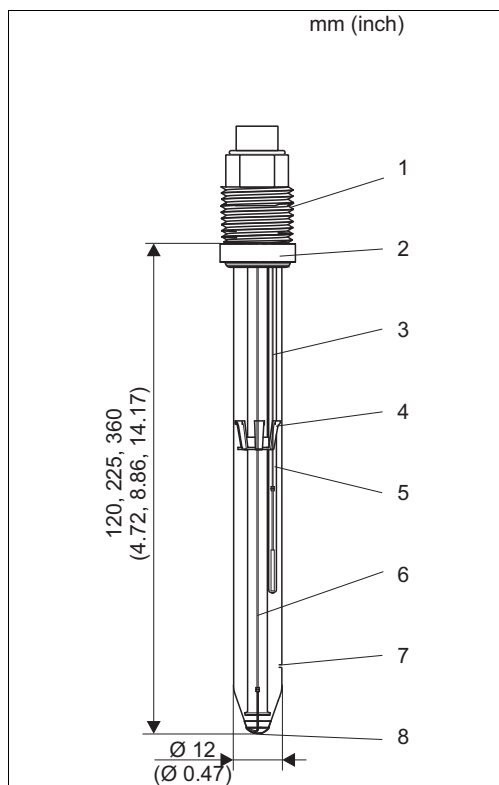
- Solids
- Emulsions
- Dispersions
- Precipitation

Caution!

Danger of damage to the electrode
 Do not operate the electrode in applications outside the given specifications!

Mechanical construction

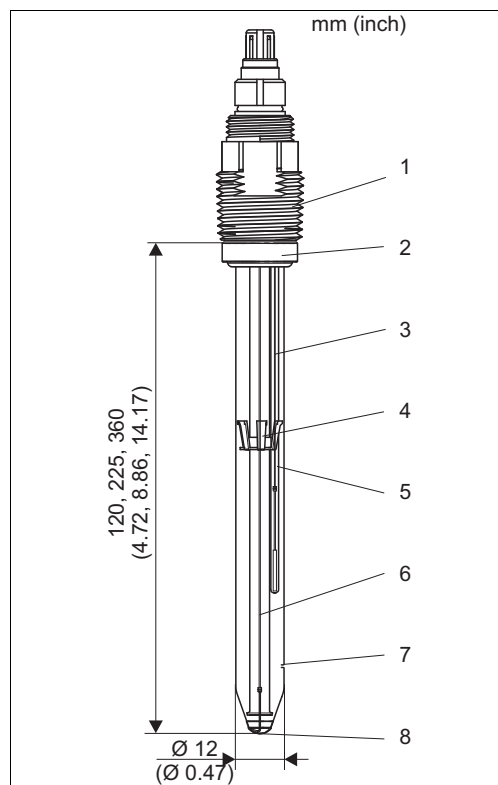
Design, dimensions CPS92



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CPS92 with GSA plug-in head

- 1 GSA plug-in head, Pg 13.5
- 2 Viton O-ring with thrust collar
- 3 Ag/AgCl reference lead
- 4 Spacer
- 5 "Advanced Gel" electrolyte
- 6 Inner metal lead
- 7 Open aperture
- 8 Platinum cap

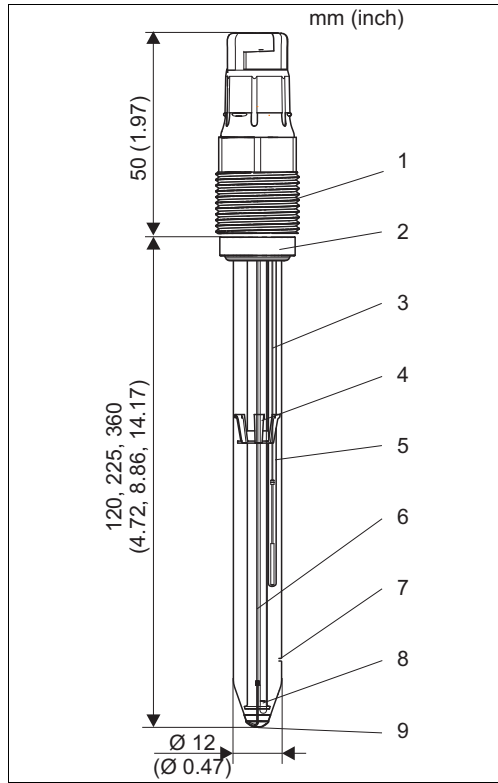


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CPS92 with TOP68 plug-in head (ESA)

- 1 TOP68 plug-in head, Pg 13.5
- 2 Viton O-ring with thrust collar
- 3 Ag/AgCl reference lead
- 4 Spacer
- 5 "Advanced Gel" electrolyte
- 6 Inner metal lead
- 7 Open aperture
- 8 Platinum cap

Design, dimensions CPS92D



CPS92D with Memosens plug-in head

- 1 Memosens plug-in head
- 2 Viton O-ring with thrust collar
- 3 Ag/AgCl reference lead
- 4 Spacer
- 5 "Advanced Gel" electrolyte
- 6 Inner metal lead
- 7 Open aperture
- 8 NTC 30K temperature sensor
- 9 Platinum cap

Weight	0.1 kg	
Materials	Electrode shaft ORP measuring element Diaphragm	process glass platinum cap open aperture
Process connection	Pg 13.5	
Plug-in heads	CPS92: ESA: Pg 13.5 plug-in head, TOP68, 16 bar, Ex GSA: Pg 13.5 plug-in head CPS92D: Memosens plug-in head for digital, contactless data transmission, 16 bar, Ex or non-Ex	
Reference system	Ag/AgCl lead with Advanced Gel 3 M KCl, AgCl free	

Certificates and approvals

Ex approval

CPS92 (ESA)¹⁾

- ATEX II 1G EEX ia IIC T4/T6
- FM Class I Div. 2, in combination with the Liquiline M CM42 and Mycom S CPM153 transmitters

CPS92D¹⁾

- ATEX II 1G EEX ia IIC T4/T6
- FM / CSA Class I Div. 2, in combination with the Liquiline M CM42 and Mycom S CPM153 transmitters

Note!

Ex versions of digital sensors with Memosens technology are indicated by an orange-red ring in the plug-in head.

TÜV certificate TOP68 and Memosens plug-in head

Pressure resistance 16 bar (232 psi), min. triple overpressure safety

Electromagnetic compatibility of CPS92D

Interference emission and interference immunity complies with EN 61326: 1997 / A1: 1998

Ordering information

Product structure CPS92

Electrode type	
0	Basic version
Measuring surface	
PB	Platinum
Shaft length	
2	120 mm (4.72")
4	225 mm (8.86")
5	360 mm (14.17")
Plug-in head	
ESA	Plug-in head Pg 13.5, TOP68, 16 bar (232 psi), Ex
GSA	Plug-in head Pg 13.5, DIN coax, non Ex
CPS92-	complete order code

Product structure CPS92D

Electrode type	
7	Basic version
Measuring surface	
PB	Platinum
Schaft length	
2	120 mm (4.72")
4	225 mm (8.86")
5	360 mm (14.17")
Approval	
G	ATEX II 1G, FM IS NI, CSA IS NI
1	Non-hazardous area
CPS92D-	complete order code

1) approval pending

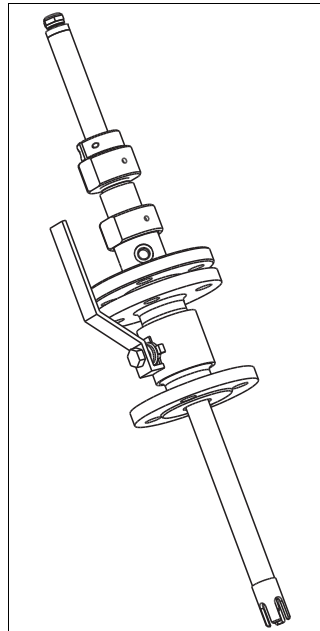
Accessories

Note!

In the following sections, you find the accessories available at the time of issue of this documentation. For information on accessories that are not listed here, please contact your local service.

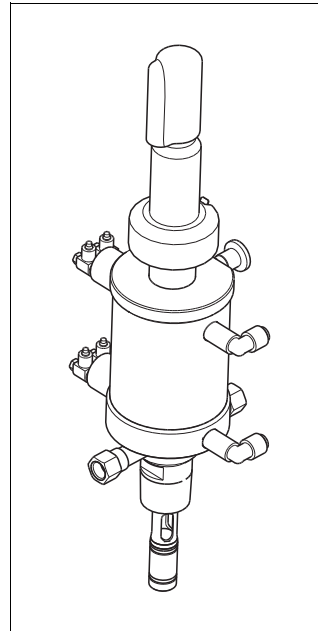
Assemblies

- Cleanfit W CPA450
Manually operated, retractable stainless steel assembly, for installation of 120 mm (4.72") pH/ORP electrodes in tanks and pipes;
Ordering acc. to product structure, see Technical Information (TI183C/07/en)
- Cleanfit P CPA471
Compact retractable stainless steel assembly, for the installation in tanks and pipes, manual or pneumatic operation;
Ordering acc. to product structure, see Technical Information (TI217C/07/en)
- Cleanfit P CPA472
Compact retractable plastic assembly, for the installation in tanks and pipes, manual or pneumatic operation;
Ordering acc. to product structure, see Technical Information (TI223C/07/en)
- Cleanfit P CPA472D
Robust retractable assembly for pH, ORP and other industry sensors, manual or pneumatic operation, heavy-duty version;
Ordering acc. to product structure, see Technical Information (TI403C/07/en)



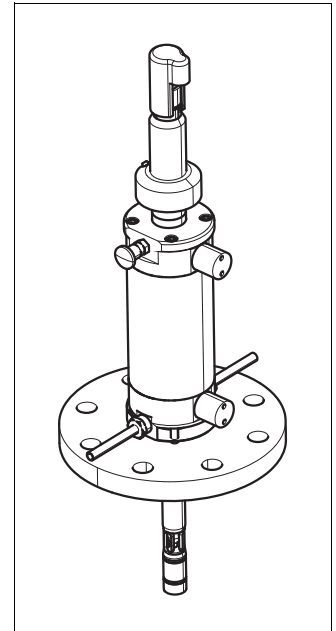
Cleanfit W CPA450

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Cleanfit P CPA471 or 472

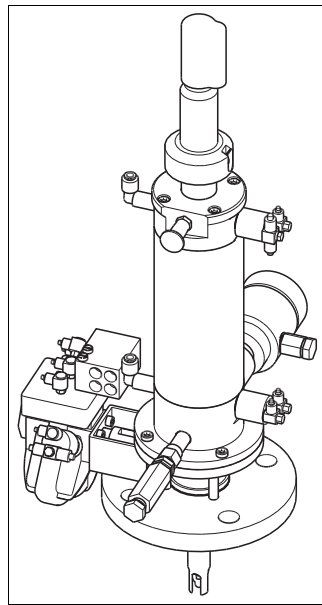
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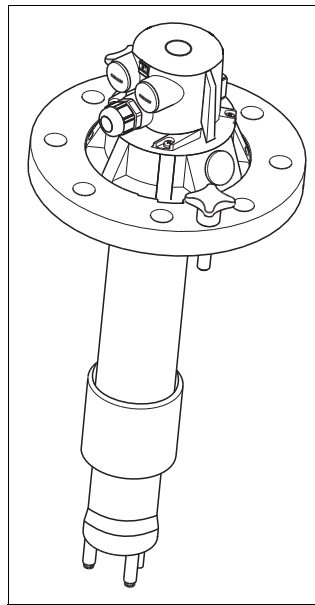
Cleanfit P CPA472D

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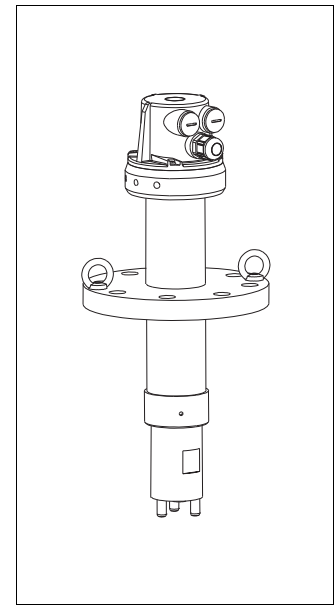
- Cleanfit P CPA473
Retractable stainless steel process assembly, with ball valve for a particularly safe and reliable separation of the medium from the environment;
Ordering acc. to product structure, see Technical Information (TI344C/07/en)
- Cleanfit P CPA474
Retractable plastic process assembly, with ball valve for a particularly safe and reliable separation of the medium from the environment;
Ordering acc. to product structure, see Technical Information (TI345C/07/en)
- Dipfit W CPA111
Plastic immersion and installation assembly, for open and closed tanks;
Ordering acc. to product structure, see Technical Information (TI112C/07/en)
- Dipfit P CPA140
Stainless steel immersion assembly for pH/ORP electrodes for demanding processes;
Ordering acc. to product structure, see Technical Information (TI178C/07/en)



Cleanfit P CPA473 or 474

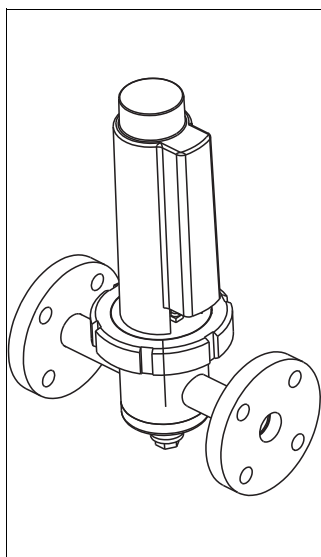


Dipfit W CPA111



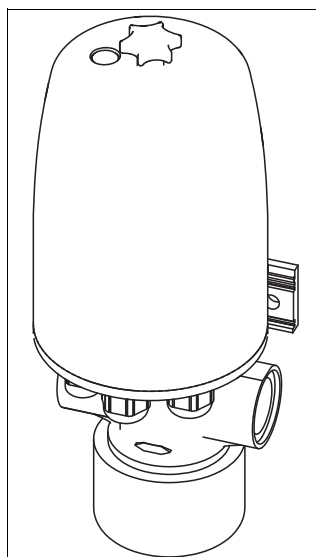
Dipfit P CPA140

- **Flowfit P CPA240**
Stainless steel flow assembly for pH/ORP, for demanding processes;
Ordering acc. to product structure, see Technical Information (TI179C/07/en)
- **Flowfit W CPA250**
Plastic flow assembly for pH and ORP measurement
Ordering acc. to product structure, see Technical Information (TI041C/07/en)
- **Ecofit CPA640**
Plastic process-connection adapter and cable set for 120 mm (4.72") pH/ORP electrodes with TOP68 plug-in head;
Ordering acc. to product structure, see Technical Information (TI264C/07/en)



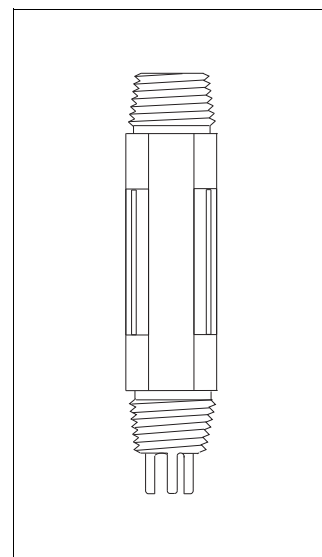
Flowfit P CPA240

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Flowfit W CPA250

a0003143



Ecofit CPA640

a0003145

Buffer solutions

Technical buffer solutions for ORP electrodes

- +220 mV, pH 7.0, 100 ml (3.4 fl.oz.); order no. CPY3-0
- +468 mV, pH 0.1, 100 ml (3.4 fl.oz.); order no. CPY3-1

Transmitters

Liquiline M CM42

- Modular two-wire transmitter, stainless steel or plastic, field or panel instrument,
- various Ex approvals (ATEX, FM, CSA, Nepsi, TIIS),
- HART, PROFIBUS or FOUNDATION Fieldbus available
- Ordering acc. to product structure, see Technical Information (TI381C/07/en)

Liquisys M CPM223/253

- Transmitter for pH and ORP, field or panel-mounted housing,
- HART or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI194C/07/en)

Mycom S CPM153

- Transmitter for pH and ORP, one or two channel version, Ex or non-Ex,
- HART or PROFIBUS available
- Ordering acc. to product structure, see Technical Information (TI233C/07/en)

Measuring cables

CPK9 special measuring cable

- For sensors with TOP68 plug-in head, for high-temperature and high-pressure applications, IP 68
- Ordering acc. to product structure, see Technical Information (TI118C/07/en)

CPK1 special measuring cable

- For pH/ORP electrodes with GSA plug-in head
- Ordering acc. to product structure, see Technical Information (TI118C/07/en)

CYK10 Memosens data cable

- For digital sensors with Memosens technology
- Ordering according to product structure, see below

CYK10 product structure

Certificates	
A	Standard, non Ex
G	ATEX II 1G EEx ia IIC T6/T4

Cable length	
03	Cable length: 3 m (9.8 ft)
05	Cable length: 5 m (16 ft)
10	Cable length: 10 m (33 ft)
15	Cable length: 15 m (49 ft)
20	Cable length: 20 m (66 ft)
25	Cable length: 25 m (82 ft)
88	... m length
89	... ft length

Ready-made	
1	Wire terminals

CYK10-				complete order code
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Note!

Ex versions of CYK10 are indicated by an orange-red coupling end.

Instruments International

Endress+Hauser
Instruments International AG
Kaegenstrasse 2
4153 Reinach
Switzerland

Tel.+41 61 715 81 00
Fax+41 61 715 25 00
www.endress.com
info@ii.endress.com

Endress+Hauser 

People for Process Automation