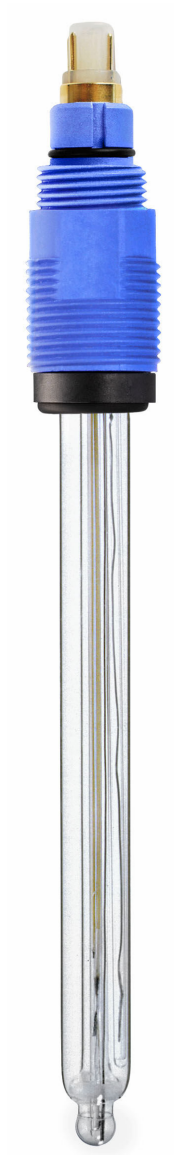


# Technical Information

## Orbitex W CPS21

pH sensors with open ring junction for wastewater technology



### Application

- Municipal wastewater
- Electroplating wastewater
- Wastewater from metal processing plants

### Your benefits

- Resistant to blocking media, quick response time and reliable measurement thanks to open ring junction
- Can be used under pressures up to 6 bar (87 psi) without counterpressure thanks to solid Polytex electrolyte
- Long service life due to optimized diffusion path of 180 mm (7.09 in) and thus a long poison diffusion path of the reference system
- TOP68/ESA plug-in head, water proof (IP 68)

## Function and system design

### Measuring principle

#### pH measurement

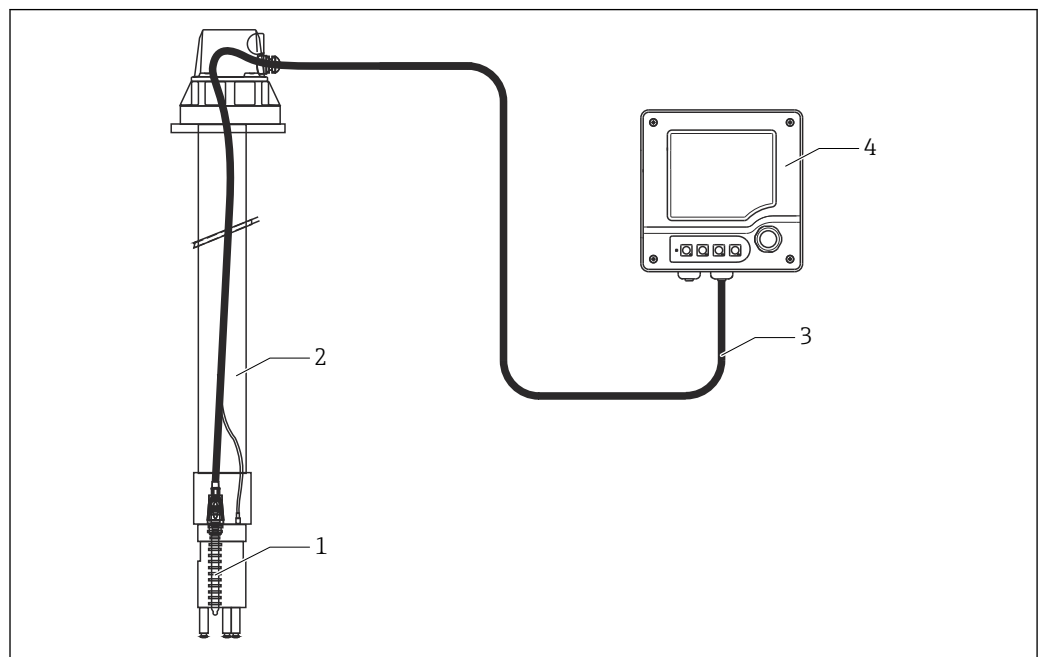
The pH value is used as a unit of measurement for the acidity or alkalinity of a medium. The membrane glass of the sensor supplies an electrochemical potential depending on the pH value of the medium. This potential is generated by the selective accumulation of  $H^+$  ions on the outer layer of the membrane. As a result, an electrochemical boundary layer with an electrical potential difference forms at this point. An integrated Ag/AgCl reference system serves as the required reference electrode.

The measured voltage is converted to the corresponding pH value using the Nernst equation.

### Measuring system

A complete measuring system comprises:

- CPS21 pH sensor
- Transmitter, e.g. Liquiline CM42
- Measuring cable, e.g. CPK9
- Immersion or flow assembly, e.g. Dipfit CPA111



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 1 Measuring system for pH measurement

1 CPS21 pH sensor

2 Dipfit CPA111 immersion assembly

3 CPK9 measuring cable for sensors with TOP68 plug-in head

4 Liquiline CM42 transmitter

## Input


### Measured variables

pH value

Temperature

### Measuring range

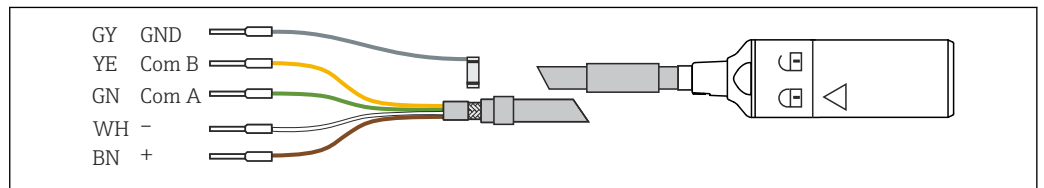
- pH: 2 to 12
- Temperature: -15 to 60 °C (5 to 140 °F)

 Pay attention to the operating conditions in the process.

## Energy supply

### Electrical connection

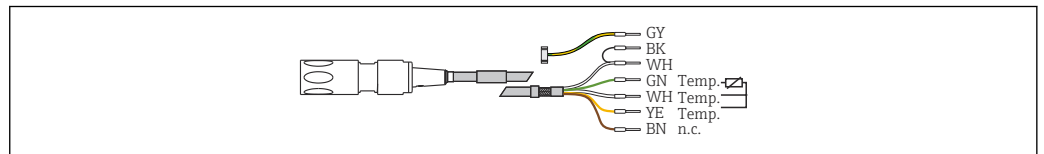
#### Memosens sensors



A0024019

2 Measuring cable CYK10 or CYK20

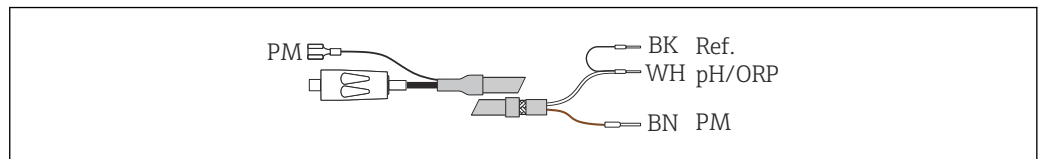
#### Sensors with TOP68 plug-in head



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3 Measuring cable CPK9

#### Sensors with GSA plug-in head



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4 Measuring cable CPK1

- ▶ Please follow the connection instructions contained in the Operating Instructions for the transmitter.

## Installation

### Installation instructions

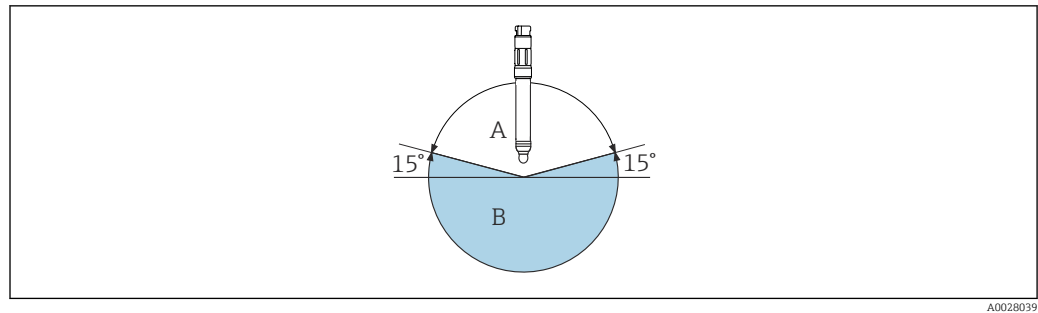
- Do not install the sensors upside-down.
- The angle of inclination from the horizontal must be at least 15°.

#### NOTICE

##### Angle of inclination of the sensor less than 15°

An air bubble forms in the glass bulb and there is then no guarantee that the pH membrane is completely covered with inner electrolyte!


- ▶ Select the installation angle of the sensor so that it does not drop below 15°.



 5 Installation angle at least 15° from the horizontal

A Permitted orientation

B Incorrect orientation

 Follow the Operating Instructions for the assembly used for detailed information on installing the assembly.

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).

## Environment

Operating temperature range

**NOTICE**

**Risk of damage from frost!**

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

Storage temperature

0 to 50 °C (32 to 122 °F)

Degree of protection

IP 67: GSA plug-in head (with closed connector system)

IP 68: TOP68 plug-in head, up to 135 °C (275 °F) (1 m (3.3 ft) water column, 50 °C (122 °F), 168 h)

Electromagnetic compatibility (EMC)

Interference emission and interference immunity as per EN 61326: 2012

## Process

Process temperature range

-15 to 60 °C (5 to 140 °F)

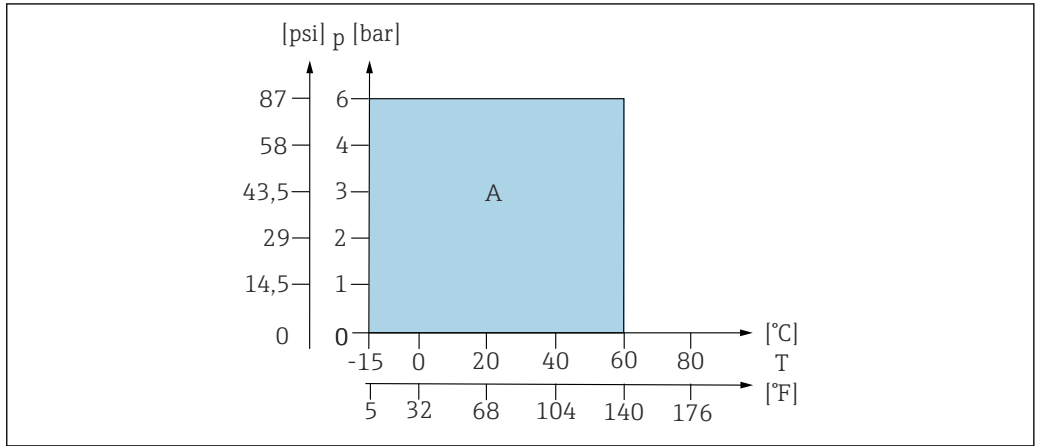
Process pressure range

0 to 6 bar (0 to 87 psi)

Conductivity

Min. 500 µS/cm

**Pressure/temperature ratings**



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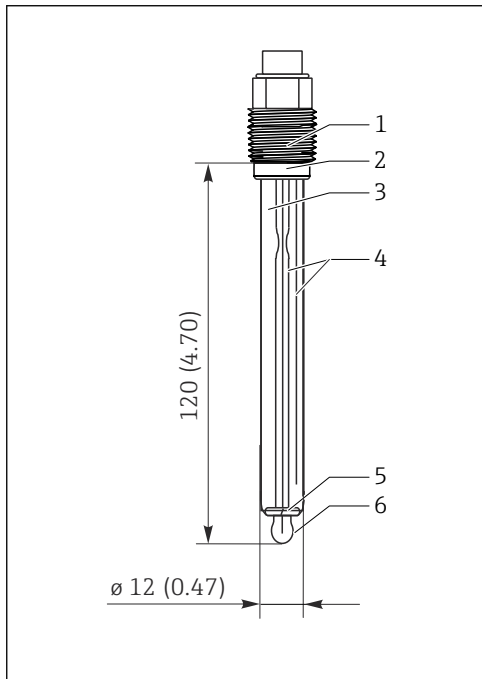
6 Pressure/temperature rating

A Application A

B Atmospheric pressure

**Mechanical construction**

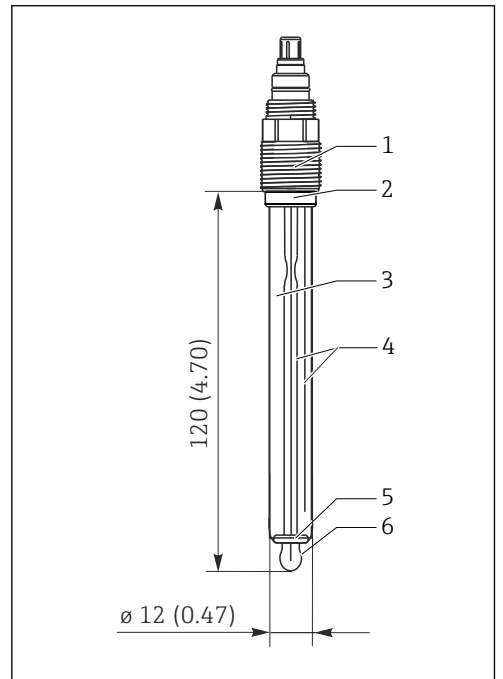
**Design, dimensions**



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7 CPS21 with GSA plug-in head

- 1 GSA plug-in head, Pg 13.5
- 2 Viton O-ring with thrust collar
- 3 Solid "Polytex" electrolyte
- 4 Ag/AgCl reference system
- 5 Open ring junction
- 6 pH glass membrane



A0047489

8 CPS21 with TOP68 plug-in head

- 1 TOP68 plug-in head, Pg 13.5
- 2 Viton O-ring with thrust collar
- 3 Solid "Polytex" electrolyte
- 4 Ag/AgCl reference system
- 5 Open ring junction
- 6 pH glass membrane

**Weight** 0.1 kg (0.2 lb)

**Materials**  
 Electrode shaft: Glass to suit process  
 pH membrane glass: Type A

Metal lead:	Ag/AgCl
Diaphragm:	Open ring junction

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**Temperature sensor**

<b>Plug-in head</b>	ESA:	Threaded plug-in head Pg 13.5, TOP68, 16 bar (232 psi) overpressure protection (threefold)
	GSA:	Threaded plug-in head Pg 13.5

<b>Process connections</b>	Pg 13.5
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<b>Reference system</b>	Ag/AgCl with Polytex gel 3M KCl, AgCl-free
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## Certificates and approvals

Current certificates and approvals that are available for the product can be selected via the Product Configurator at [www.endress.com](http://www.endress.com):

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

## Ordering information

<b>Product page</b>	<a href="http://www.endress.com/cps21">www.endress.com/cps21</a>
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<b>Product Configurator</b>	<ol style="list-style-type: none"> <li>1. <b>Configure</b>: Click this button on the product page.</li> <li>2. Select <b>Extended selection</b>. <ul style="list-style-type: none"> <li>↳ The Configurator opens in a separate window.</li> </ul> </li> <li>3. Configure the device according to your requirements by selecting the desired option for each feature. <ul style="list-style-type: none"> <li>↳ In this way, you receive a valid and complete order code for the device.</li> </ul> </li> <li>4. <b>Apply</b>: Add the configured product to the shopping cart.</li> </ol> <p> For many products, you also have the option of downloading CAD or 2D drawings of the selected product version.</p> <ol style="list-style-type: none"> <li>5. <b>Show details</b>: Open this tab for the product in the shopping cart. <ul style="list-style-type: none"> <li>↳ The link to the CAD drawing is displayed. If selected, the 3D display format is displayed along with the option to download various formats.</li> </ul> </li> </ol>
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<b>Scope of delivery</b>	<p>The scope of delivery comprises:</p> <ul style="list-style-type: none"> <li>▪ Ordered version of the sensor</li> <li>▪ Operating Instructions</li> <li>▪ Safety instructions for the hazardous area (for sensors with Ex approval)</li> <li>▪ Supplementary sheet for optionally ordered certificates</li> </ul>
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## 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.

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**Assemblies****Dipfit CPA111**

- Immersion and installation assembly made of plastic for open and closed vessels
- Product Configurator on the product page: [www.endress.com/cpa111](http://www.endress.com/cpa111)



Technical Information TI00112C

**Dipfit CPA140**

- pH/ORP immersion assembly with flange connection for very demanding processes
- Product Configurator on the product page: [www.endress.com/cpa140](http://www.endress.com/cpa140)



Technical Information TI00178C

**Flowfit CPA240**

- pH/ORP flow assembly for processes with stringent requirements
- Product Configurator on the product page: [www.endress.com/cpa240](http://www.endress.com/cpa240)



Technical Information TI00179C

**Flowfit CYA27**

- Modular flow assembly for multiparameter measurements
- Product Configurator on the product page: [www.endress.com/cya27](http://www.endress.com/cya27)



Technical Information TI01559C

**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](http://www.endress.com/cpa640)



Technical Information TI00246C

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**Buffer solutions****High-quality buffer solutions from Endress+Hauser - CPY20**

The secondary buffer solutions have been referenced to primary reference material of the PTB (German Federal Physico-technical Institute) or to standard reference material of NIST (National Institute of Standards and Technology) according to DIN 19266 by a laboratory accredited by the DAkkS (German accreditation body) according to DIN 17025.

Product Configurator on the product page: [www.endress.com/cpy20](http://www.endress.com/cpy20)

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**Measuring cable****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](http://www.endress.com/cpk9)



Technical Information TI00118C

**Measuring cable CPK12**

- Terminated measuring cable for connecting analog ISFET sensors with TOP68 plug-in head
- Selection in accordance with product structure
- Ordering information: Endress+Hauser sales office or [www.endress.com](http://www.endress.com)

**CPK1**

- For pH/ORP sensors with GSA plug-in head
- Product Configurator on the product page: [www.endress.com/cpk1](http://www.endress.com/cpk1)
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For ordering information, contact your sales office or see [www.endress.com](http://www.endress.com).



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[www.addresses.endress.com](http://www.addresses.endress.com)

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