



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



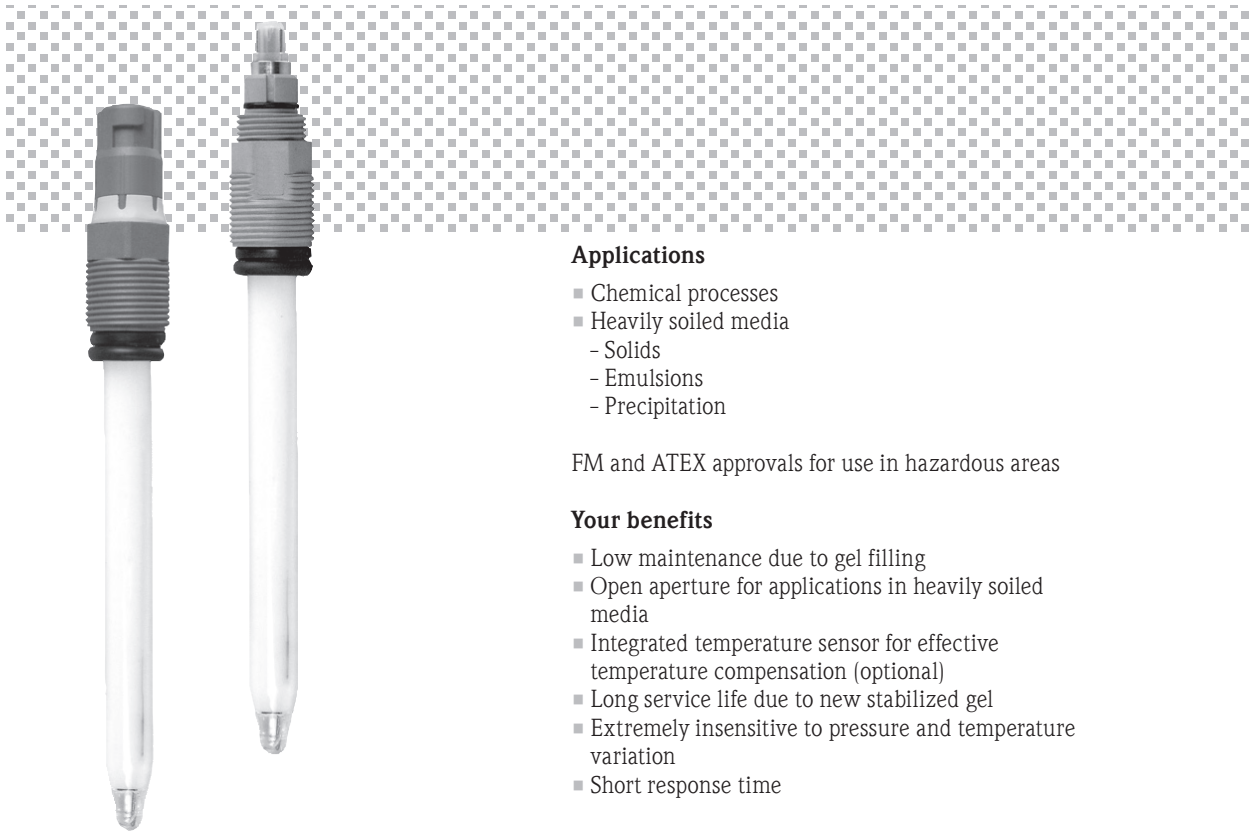
Solutions

Technical Information

Orbipore CPS91 and CPS91D

pH electrodes, analog and digital with Memosens technology

With open aperture for heavily soiled media, optional integrated temperature sensor



Applications

- Chemical processes
- Heavily soiled media
 - Solids
 - Emulsions
 - Precipitation

FM and ATEX approvals for use in hazardous areas

Your benefits

- Low maintenance due to gel filling
- Open aperture for applications in heavily soiled media
- Integrated temperature sensor for effective temperature compensation (optional)
- Long service life due to new stabilized gel
- Extremely insensitive to pressure and temperature variation
- Short response time

Benefits offered by Memosens technology

- Maximum process safety through contactless inductive signal transmission
- Data safety through digital data transmission
- Easy handling due to storage of sensor-specific data
- Predictive maintenance possible due to registration of sensor load data

Function and system design

Measuring principle	<p>pH measurement</p> <p>The pH value is used as a unit of measurement for the acidity or alkalinity of a liquid medium. The membrane glass of the electrode supplies an electrochemical potential which is dependent upon the pH value of the medium. This potential is generated by the selective penetration of H⁺ ions through the outer layer of the membrane. An electrochemical boundary layer with an electric potential forms at this point. An integrated Ag/AgCl reference system serves as reference electrode.</p> <p>The transmitter converts the measured voltage into the corresponding pH value using the Nernst equation.</p>
General properties	<ul style="list-style-type: none"> ■ Open aperture Due to its open aperture, the CPS91 electrode can be applied in heavily soiled media. ■ Temperature compensation Depending on the ordered version, a Pt 100 or Pt 1000 temperature sensor is integrated in the electrode to measure the medium temperature. ■ Durability The electrode is pressure-proof up to 188.5 psi (13 bar) and can be applied with temperatures of up to 230°F (110°C).
Important properties of CPS91D	<p>Maximum process safety</p> <p>The inductive and non-contacting measured value transfer of Memosens guarantees maximum process safety and offers the following benefits:</p> <ul style="list-style-type: none"> ■ All problems caused by moisture are eliminated. <ul style="list-style-type: none"> – 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" or an impedance converter. ■ The cable does not act like an antenna; thus, EMC safety is guaranteed. <p>Data safety through digital data transfer</p> <p>The Memosens technology digitalizes the measured value in the sensor and transfers it to the transmitter via a contactless connection. The result:</p> <ul style="list-style-type: none"> ■ 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 ■ The digital signals are suitable for application in hazardous areas; the integrated electronics are intrinsically safe. <p>Easy handling</p> <p>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 low or very high pH values. When the sensor is mounted, the calibration data are automatically transferred to the transmitter and used to calculate the current pH value: Storing the calibration data in the sensor allows for calibration and adjustment away from the measuring point. The result:</p> <ul style="list-style-type: none"> ■ pH sensors can be calibrated under optimum external conditions in the measuring lab. Wind and weather do not affect the calibration quality or 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 data and calibration 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. <p>Communication with the transmitter</p> <p>Always connect the CPS91D to a transmitter with Memosens technology. Data transmission to a standard transmitter is not possible.</p>

Data storage of CPS91D

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

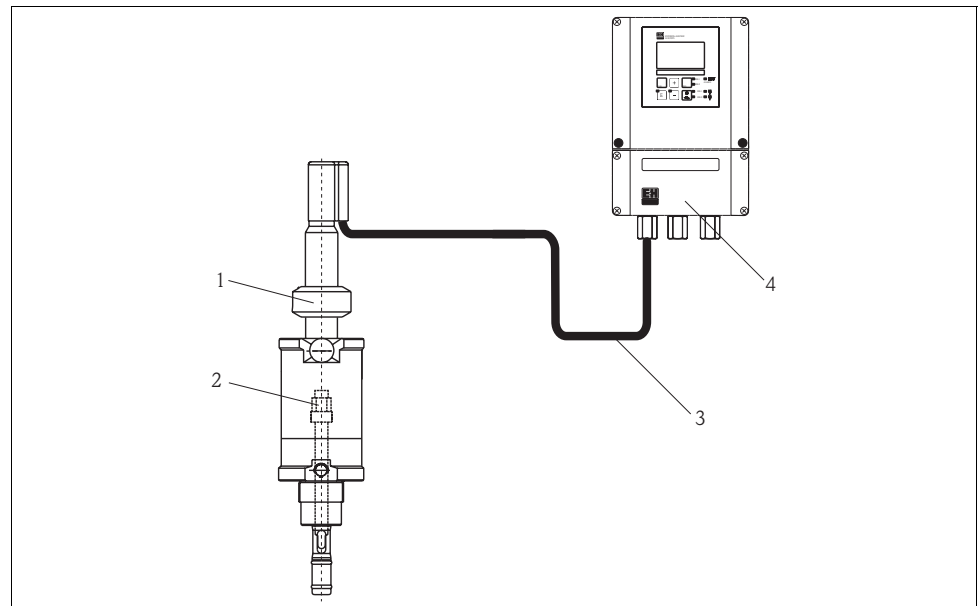
- Manufacturing data
 - Serial number
 - Order code
 - Date of manufacture
- Calibration data
 - Calibration date
 - Calibrated slope at 77°F (25°C)
 - Calibrated zero point at 77°F (25°C)
 - Temperature offset
 - Number of calibrations
 - Operator's signature for calibration or adjustment
- Application data
 - Temperature application range
 - pH application range
 - Date of first commissioning
 - Maximum temperature value
 - Operating hours at temperatures above 176°F (80°C) and 212°F (100°C)
 - Operating hours at very low and very high pH values (Nernst voltage below -300 mV, above +300 mV)
 - Number of sterilizations
 - Glass membrane impedance

These system data can be displayed with the Mycom S transmitter

Measuring system

A complete measuring system comprises:


- CPS91 pH electrode or CPS91D digital sensor
- Transmitter, e.g. Liquisys M CPM223/253 (with Memosens technology for CPS91D)
- Special measuring cable, e.g. CPK9 or Memosens data cable CYK10 for CPS91D
- Immersion, flow or retractable assembly, e.g. Cleanfit P CPA472




Measuring system for pH measurement

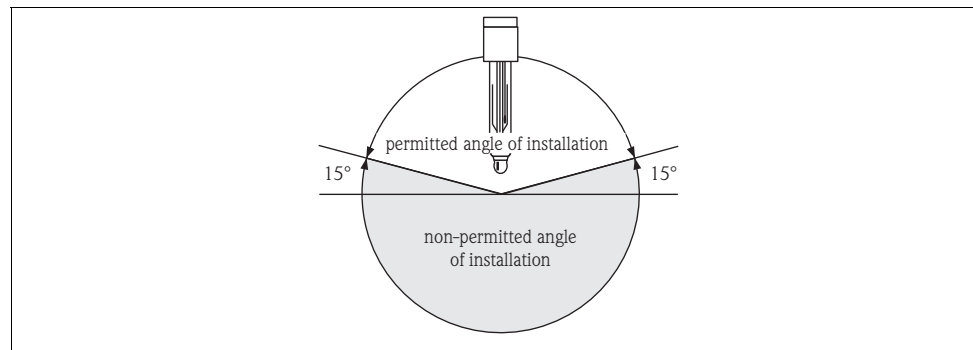
- 1 Cleanfit P CPA472 retractable assembly
- 2 CPS91 electrode
- 3 Special measuring cable CPK9 (for electrodes with TOP68 plug-in head) / CYK10 for digital sensors
- 4 Liquisys M CPM253 transmitter

Input

Measured variables	pH value Temperature
Measuring range	0 to 14 pH 32 to 230°F (0 to 110°C)
	 Caution! Please note the process operating conditions.


Installation

Installation instructions	<p>Do not install the electrode overhead. The angle of inclination must be at least 15° from the horizontal. A smaller installation angle is not allowed since such an angle results in air cushion forming in the glass sphere. This may impair full wetting of the pH membrane with the inner electrolyte.</p> <p> Caution!</p> <ul style="list-style-type: none"> ■ Make sure that the assembly's threaded connection for the electrode is clean and without burrs before installing the electrode. ■ Hand tighten the electrode 2.2 ft lb force (3 Nm)! (Given value only applies to installation Endress+Hauser assemblies.) ■ Make sure to follow the installation instructions in the operating instructions of the used assembly.
----------------------------------	--



Electrode installation, installation angle min. 15° from the horizontal

Environment

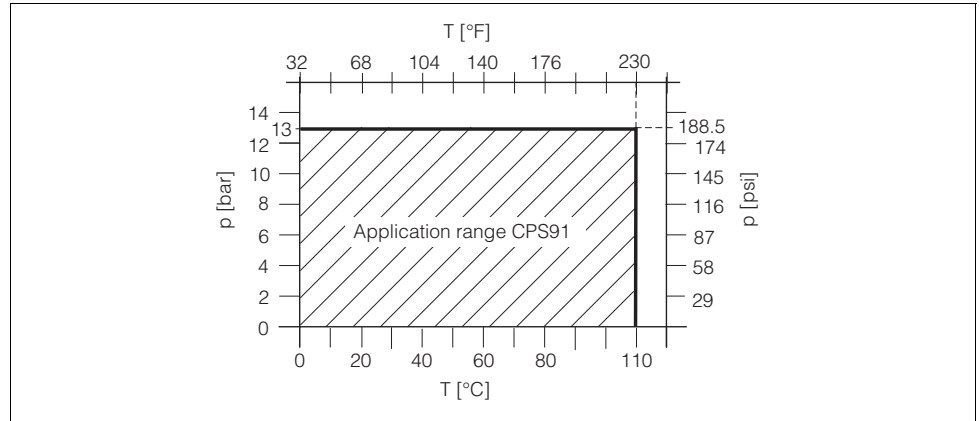
Ambient temperature	<p> Caution! Danger of frost damage Do not operate the sensor at temperatures below 5°F (–15°C).</p>
Storage temperature	2 to 122°F (0 to 50°C)
Ingress protection	<p>NEMA 6 (IP 67) with GSA plug-in head (with closed plug-in connection) NEMA 6P (IP 68) with TOP68 plug-in head (3.1 ft / 1 m water column, 122°F / 50°C, 168 h) NEMA 6P (IP 68) with Memosens plug-in head (33 ft / 10 m water column, 77°F / 25°C, 45 days, 1 M KCl)</p>

Process

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

Process pressure 0 to 190 psi (0 to 13 bar)

Pressure-temperature load curve



Pressure-temperature load curve of CPS 91

Conductivity min. 500 μ S/cm

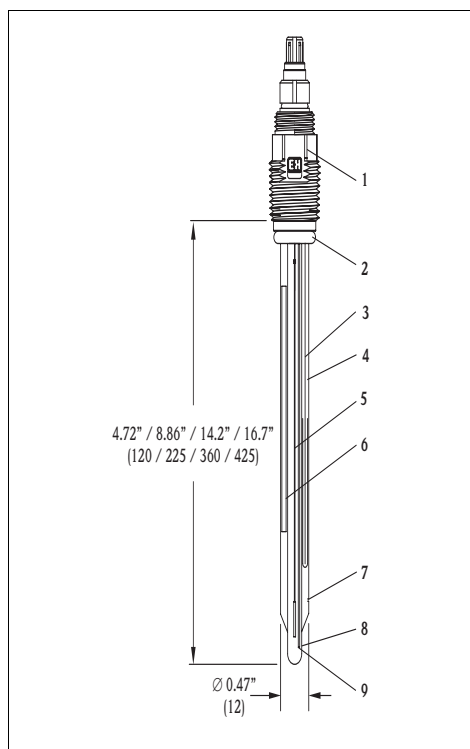
pH range 0 to 14 pH



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

Mechanical construction

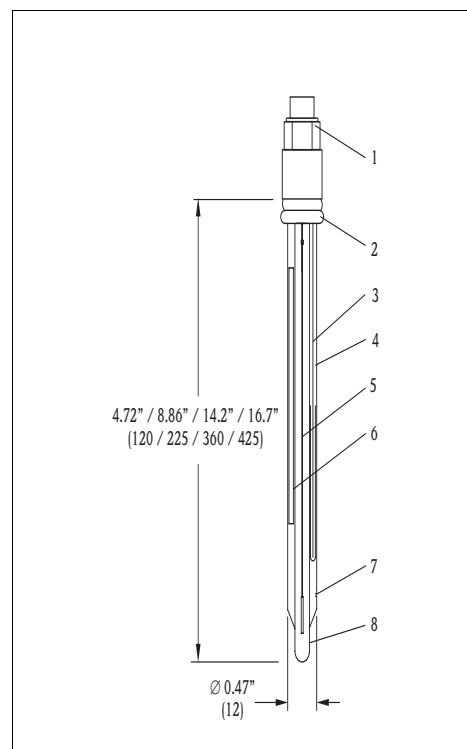
Design, dimensions CPS91



C07-CPS91 xxx-06-05-00-en-001.eps

CPS91 with ESA plug-in head, temperature sensor

- 1 TOP68 plug-in head, Pg 13.5
- 2 EPDM O-ring with thrust collar
- 3 Ag/AgCl metal lead
- 4 Bridge electrolyte
- 5 Ag/AgCl metal lead
- 6 Compensator
- 7 Open aperture
- 8 pH membrane
- 9 Temperature sensor

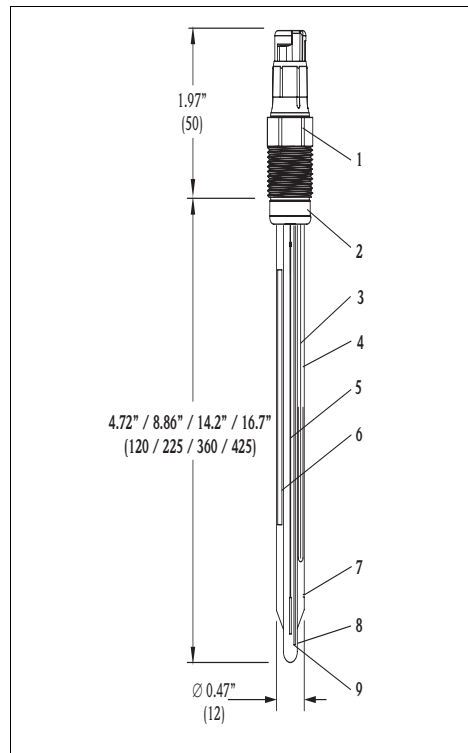


C07-CPS91 xxx-06-05-00-en-002.eps

CPS91 with GSA plug-in head

- 1 GSA plug-in head, Pg 13.5
- 2 EPDM O-ring with thrust collar
- 3 Ag/AgCl metal lead
- 4 Bridge electrolyte
- 5 Ag/AgCl metal lead
- 6 Compensator
- 7 Open aperture
- 8 pH membrane

Design, dimensions CPS91D



CPS91D with Memosens plug-in head, temperature sensor

- 1 Memosens plug-in head, Pg 13.5
- 2 Viton O-ring, Viton thrust collar
- 3 Ag/AgCl metal lead - reference chamber
- 4 Bridge electrolyte
- 5 Ag/AgCl metal lead
- 6 Compensator
- 7 Open aperture
- 8 pH membrane
- 9 Temperature sensor

Weight Approximately 0.2 lb. (0.1 kg)

Material

Electrode shaft	glass, suitable for processes
pH membrane glass	type B
Metal lead	Ag/AgCl
Diaphragm	open aperture

Process connection Pg 13.5

Temperature sensor

CPS91:	Pt 100, Pt 1000
CPS91D:	NTC

Plug-in heads

CPS91:	
ESA	plug-in head Pg 13.5, TOP 68 for electrodes with or without temperature sensor, 232 psi (16 bar) triple safety overpressure, Ex
GSA	plug-in head Pg 13.5 for electrodes without temperature sensor
CPS91D:	Memosens for digital, contactless data transmission

Reference system Ag/AgCl metal lead with reference electrolyte

Certificates and approvals

Ex approval CPS91 (ESA) and CPS91D

- ATEX II 1G EEX ia IIC T4/T6
- FM Class I Div. 2, in combination with the Mypro CPM431 and Mycom S CPM153 transmitters (CPS91 only)

TÜV certificate TOP68 plug-in head

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

EMC compatibility of CPS91D

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

Ordering information

Product structure CPS91

		Electrode type	
	1	without temperature sensor	
	2	with built-in Pt 100 (not available with GSA plug-in head)	
	3	with built-in Pt 1000 (not available with GSA plug-in head)	
		Application range	
	BO	pH = 0 to 14, T = 32 to 230°F (0 to 110°C)	
		Shaft length	
	2	120 mm (4.7")	
	4	225 mm (8.9")	
	5	360 mm (14.1")	
	6	425 mm (16.7")	
		Plug-in head	
	ESA	Plug-in head Pg 13.5, TOP68, 232 psi (16 bar), hazardous areas	
	GSA	Plug-in head Pg 13.5, DIN coax, nonhazardous areas	
CPS91-			complete order code

Product structure CPS91D

		Version	
	7	Maximum 230°F (110°C) with built-in temperature sensor	
		Application range	
	BO	pH = 0 to 14, T = 32 to 230°F (0 to 110°C)	
		Shaft length	
	2	120 mm (4.7")	
	4	225 mm (8.9")	
	5	360 mm (14.1")	
	6	425 mm (16.7")	
		Options	
	1	Standard	
CPS91D-			complete order code

广州晋合水处理设备有限公司



地 址：广东省广州市海珠区工业大道333号华新园区7幢218
电 话：020-88191905
传 真：020-61139917
邮 编：510300
邮 箱：jinhewater@jinhewater.com
网 址：<http://www.jinhewater.com>

Endress+Hauser 
People for Process Automation