

OEM pH Competences

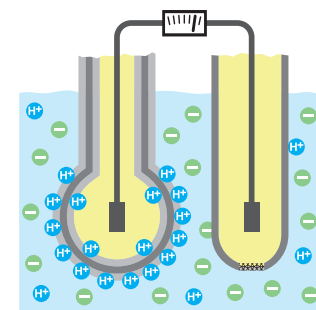
Solutions for pH OEM Applications in Liquid Analysis



pH Glass Electrodes

The method of pH measurement using glass electrodes is a potentiometric measurement method. Since glass is basically an electric insulator, amplifiers for the pH measurement must have an extremely high input impedance. The measuring effect is based on a pH-sensitive glass membrane—whose surface reacts to the acid or alkaline content of the solution with a specific voltage.

This voltage is then measured relative to a reference element. Nowadays, the most modern pH glasses display high selectivity (low cross-sensitivity to ions other than H^+) over a wide temperature range. A pH sensor can detect small changes in H^+ concentration over a wide range.



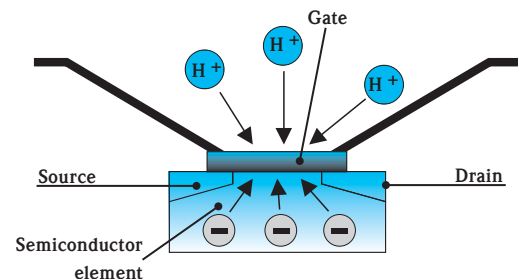
Potential charge during pH measurement with glass electrodes

Non-glass pH Electrodes

Apart from using a glass membrane, the pH value can also be measured using an ion-selective field-effect transistor (ISFET).

The basic principle of the ISFET working is the control of the current flowing between two semiconductor elements (drain and source) by electrostatic field, generated by the protonated oxide gate. Protonation of the gate is in a way identical to the process taking place in glass pH electrode, just the

methodology used to measure protonation degree is different. Instead of measuring potential difference on two sides of the glass, we measure the current flowing through the transistor. The lower the pH, the more protonated and charged the oxide gate becomes. This changes its electric field - changing in turn current flowing through the transistor. This current is a signal that can be measured to check the pH value.



The current between the source and drain of the semiconductor element depends on the charge at the gate and thus directly on the pH value.

ORP Sensors

The Oxidation Reduction Potential, ORP (or Redox), of a solution can be measured with an electrode similar to a pH sensor. The reference stays the same, so does the sensor body. The ORP sensor simply replaces the pH sensitive glass with a noble metal like platinum or gold. Platinum, the most common noble metal used, is not easily oxidized or reduced. It will, however, readily respond to Oxidation/Reduction Potentials.

The potential created is a function of the chemicals in solution and the metal or metals used in the ORP sensor.

The measurement of Oxidation-Reduction Potential has gained significant importance in reaction processes of oxidation or reduction. This is especially true in disinfection and processes related to disinfection.



pH/ORP with Memosens Technology

Memosens makes the sensor a digital sensor with integrated data storage. pH sensors with Memosens technology save the current calibration data and other information which can be used for look-ahead maintenance, such as hours of operation, maximum and minimum temperature. When the sensor is mounted, the calibration data are automatically transferred to the transmitter and used to calculate the current pH value.

Sensors equipped with Memosens transmit the measured value without normal electrical connections but rather through inductive signal connections. At the top of the sensor is an inductive plug-in head through which the signal is transmitted. This connection is impervious to corrosion, can be connected underwater and unaffected by leaks or having its values distorted by moisture.



Anything for You

Endress+Hauser Conducta serves a wide variety of industries, including chemical processing, water, wastewater, environmental, pool and spa, microelectronic, biotech, pharmaceutical, laboratory, and food & beverage industries.

Our OEM products and services range from customized sensors, assemblies and components through to an entire analytical product portfolio. Of course we also offer an assortment of standard products for your applications.

For us competent consultation, engineering, planning and implementation means to work in close relationship with you every step of the way to deliver solutions meeting the needs of the OEM marketplace.

Measurement parameters include:

pH/ORP
Specific-Ions
Conductivity
Dissolved Oxygen
Turbidity/Suspended Solids
Chlorine/ Chlorine Dioxide
Absorbance/Cell Growth
Ultraviolet
Color
Bubble Detection



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Our pH/ORP Product Overview

	GENERAL					INDUST	
MODEL	OPF01	OPF10	OPF21	OPS31	OPF51	OPF11	OPS21
							
FORMER MODELS	SOTA	M10	SPECTRA	OPS31	OPF51	M11	GTDJ
Body Material	PES	PPS (Ryton)	Polymer	Glass	Polymer	PPS (Ryton)	Glass
Mounting Thread	NA	1/2" MNPT	NA	PG 13.5	NA	3/4" MNPT	PG 13.5
Insertion Length	105 mm (4.15")	16.5 mm (0.65")	110 mm (4.33")	120 mm (4.73")	120 mm (4.72")	23.0 mm (0.9")	120 mm (4.72")
Membrane Type	Protected bulb	Protected bulb	Bulb	Bulb	Protected bulb	Protected bulb, flat & concave	Bulb
Reference Cell	Single	Single	Double	Single	Single	Double	Double
Junction Material	Teflon	Teflon	Teflon	Ceramic	Ceramic	Teflon	Teflon
Reference Electrolyte	AgCl gel & KCl	AgCl gel & KCl	KNO ₃ & KCl/ AgCl gel	KCl gel (AgCl free)	KCl gel (AgCl free)	KNO ₃ & KCl/ AgCl gel	KNO ₃ & KCl/ AgCl gel
Cable Connection	3' w/BNC	10' w/BNC	10' w/BNC	GSA or NSA head	3' w/BNC	15' w/BNC	ESA head
ORP Version available	Yes	Yes	Yes	OPS32	OPF52	Yes	Yes
ORP Element	Pt	Pt/Au	Pt	Pt	Pt	Pt	Pt
Use or Special Feature	Removable guard	Fits 1/2" pipe tee	High pressure & steam sterilizable	Small surface junction area	For portable instruments	Insertion/submersion	All purpose

APPLICATIONS							
Wastewater			■			■	■
Neutralization			■			■	■
Detoxification			■				■
Potable Water	■	■			■		
Process Water		■	■			■	■
Surface Water	■	■			■	■	
Waste Incineration			■				■
Flue Gas Scrubbing			■				■
Swimming Pool		■		■	■		
Aquaria	■	■		■	■		
Fish Farming	■	■			■		
Horticulture		■					
Lab General Use	■			■	■		
Cooling Tower		■	■			■	
Boiler Feed Water							
Process Control			■			■	■

Model OPM 223-253 pH/ORP Analyzer



- Available in panel mount (223) or NEMA 4X/IP65 rated field mount housing (253)
- Logically arranged menu structure
- Large, two-line display simultaneously indicates measured value and temperature
- Intuitive calibration procedure
- Continuous sensor diagnostics
- Choose up to 4 output contacts for use as:
 - Limit contacts
 - P(ID) control
 - Timed outputs for simple cleaning
 - Chemical cleaning processes
- CSA certified
- Solid state ISFET pH measurement option
- Optional 2nd current output for temperature
- Memosens option available to connect Intelligent Memosens sensors with integrated memory and rugged contactless cable connection

Housings

In many installations, electrodes require special housings. We offer a variety of different housings, including: immersion, flow through, in-line, and retractable.



Cables

We can provide cables and connectors for your sensor products. All lengths and connections are available. Our new TOP68 connector is rated IP68, and is fully submersible.

This allows your customer to replace their electrodes without replacing the cable, and without pulling a new cable through old cramped conduit, thereby reducing costs and extending the life of your process-setup.



Calibration & Maintenance Solutions

Your customers are already using buffer solution to calibrate their sensors and instruments. We make buffer solutions using the most advanced formulas, which are NIST traceable. Provide the customer the complete application solution they need.

