

Sensor

ORP/Redox Deep-Sea Sensor





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Redox combination electrode for submersible probes

- Single housing for platinum and reference electrode
- Special double membrane for high signal stability
- Suitable for depths of up to 6,000 m

The problem:

Redox potential measurement systems, consisting of a noble metal electrode and a reference electrode, are useful for the numerical determination of the reduction or oxidation potential of water samples.

When measuring ORP in seawater, issues can arise when conventional reference electrodes with ceramic membranes are used, as high and variable junction potentials develop under high pressure. For this reason, redox potential measurement systems have historically only been available for depths of up to 1,500 m.

In addition, using two channels of the probe system for pH measurement—one for the glass electrode and one for the reference electrode—proved to be somewhat cumbersome.

The solution: Versatile combination electrode for underwater probe systems – also suitable for standalone operation

A new combination electrode for submersible probe systems: The redox combination sensor consists of a reference electrode and a noble metal electrode in a single housing.

To ensure accurate deep-sea measurements, a special double-membrane design is used for the reference electrode to improve signal stability under pressure changes.

The redox combination sensor for in-situ determination of redox potentials is available as a deep-sea version (up to 600 bar) without an integrated temperature sensor.

Applications

- **Oceanography & marine research**
Investigation of chemical processes, redox reactions, and oxygen dynamics in deep water layers.
- **Offshore and energy installations**
Monitoring of redox potential in underwater infrastructure, corrosion protection systems, and industrial offshore processes.
- **Environmental & water analysis**
Use in autonomous measurement stations, deep-sea platforms, ROVs, and AUVs.
- **Biogeochemical research**
Analysis of material cycles, sediment reactions, and zones of microbiological activity.

Technical data

Measuring range	± 2 V
Initial accuracy / resolution	2 mV / 0,1 mV
Pressure range	up to 6,000 dbar
Power supply	9,5–18 V DC (other options available on request)
Signal output	0–+5 V DC (other outputs available on request)
Dimensions	Diameter approx. 30.0 mm total length 250 mm
Connector	SubConn BH4M titanium version (other versions available on request)



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