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Redox-combined electrode for submersible probes

Only one housing for platinum and reference electrode - Special double diaphragm for high signal stability - For depths of up to 6,000 m

The problem:
Redox potential measuring 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. But when measuring the ORP in sea water troubles may occur, if conventionally reference electrodes with ceramic diaphragms are used because high and variable junction potentials are developed at pressures. Therefore, until now redox potential measuring systems have been offered only for depths of up to 1,500 m. Besides, it was a little bit inconvenient to use 2 free channels for redox measurements - one for the noble metal electrode and another one for the reference electrode.

The solution - a new combined electrode for submersible probe systems
The redox-combined sensor consists of a reference electrode and a noble metal electrode in one housing to save one free channel of the probe system. For accurate measurements in the deep sea, a special double diaphragm for the reference electrode was used for a better signal stability when pressures changing. The interface reference electrode/sample is realized by means of a hole diaphragm. Inside the reference electrode follows a KCl containing gel with a special built-in second diaphragm containing the Ag/AgCl-reference system in a KCl solution. The redox-combined sensor for the *insitu* determination of redox potentials is available as deep sea version (up to 600 bar) without integrated temperature sensor.

Main features of the redox-combined electrode:

- measuring range: ± 2 Volt
- accuracy/resolution: 2 mV/0,1 mV
- pressure range: up to 6,000 dbar
- required power supply: 9.5 ... 18 V DC, others on request
- signal output: 0 ... + 5 V DC (others on request)
- dimensions: diameter: 30.0 (- 0.5) mm,
  total length: 250 mm over all