

H₂O₂ Measuring Instrument with Amperometric Micro-sensor

Very fast determination of dissolved H₂O₂ without streaming the sensor membrane, display of H₂O₂ in %, temperature in °C



The microprocessor-operated measuring instrument has been developed for the fast and accurate *in-situ* determination of dissolved hydrogen peroxide without any sampling. The instrument is useful for the laboratory and for simple and fast measurements in the field. The instrument is equipped with an amperometric, membrane covered H₂O₂ micro-sensor and with a temperature sensor. The display shows the concentration of the measured dissolved hydrogen peroxide in mg/l (or %), the temperature of the sample and the pH.

The measuring instrument is equipped with a power supply unit and with a RS 232 interface. If requested, the instrument is also working battery-operated. The H₂O₂ measuring instrument could be changed very simply into a multi-sensor measuring instrument by pulling off the H₂O₂ sensor tip and push on a galvanic oxygen micro-sensor tip or a H₂S sensor tip.

Furthermore the instrument is useful to store the calibration coefficients of up to 10 different chemical micro-sensors and to calculate the concentration units by means of the measured raw data. This allows also the fast and simple exchange of sensors and measuring ranges, if required. Apart from the already mentioned micro-sensors for the determination of H₂O₂, O₂ and H₂S, there are also micro-sensors available for the determination of dissolved hydrogen and ozone. All these sensors can be interfaced very simply to the measuring instrument.

The measuring system is delivered with a case for the transport and storage.

Advantages of the H₂O₂ Measuring Instrument with Amperometric Micro-sensor

Compared with all the other commercially available electrochemical sensors or with volumetric methods (titrations) for the determination of dissolved hydrogen peroxide, the new measuring instrument with micro-sensor has the following advantages:

1. Determination without sampling and without adding any chemicals
2. Detection limit of 0,02%
3. High accuracy
4. High economic efficiency (no consumption of chemicals)
5. Fast putting into operation (polarisation time of the sensor approx. 5-10 minutes)
6. Measurements also in turbid, coloured, muddy and salt containing samples
7. No cross sensitivities against solids and liquids
8. Direct-reading *on-line* measurement (not only average values of a big volume)
9. No streaming of the sensor membrane necessary, very low analyte consumption
10. High local resolution of the measurement (μm -steps)



Fig.: Amperometric H₂O₂-Micro-sensor, complete with titanium housing, integrated electronics and exchangeable sensor tip

Technical Data of the Amperometric Micro-sensor:

- ☞ Measuring principle: amperometry, membrane covered sensor
- ☞ 3 sensor electrodes
- ☞ Polarisation is managed by the integrated electronics
- ☞ Ready for measurements after polarisation time of 5...15 minutes
- ☞ No streaming of the membrane, no stirring of the analyte, very low analyte consumption
- ☞ Concentration ranges: - type I: 0,02-10% H₂O₂
- ☞ Accuracy of the sensor: $\pm 1\%$ f.s.
- ☞ Measurements within a range of 0°C to 30°C
- ☞ Measurements within pH 0-12
- ☞ Response time: $t_{90\%}$: 1-2 seconds
- ☞ Average life time: approx. 5...9 months (depends on the samples matrix and on H₂O₂ stress)
- ☞ Pressure stability: 10 bar
- ☞ No cross sensitivities against: carbon dioxide, oxygen, methane, hydrogen, ammonia, carbon monoxide, organic solvents (less than 20% in aqueous solutions), acid acid, dimethyl sulphide, HCN, solids
- ☞ No influence of the measuring signal in case of salt concentrations less than 40 g/l