



AMT Analysenmesstechnik GmbH

Joachim-Jungius-Strasse 9

D-18059 Rostock, Germany

Telefon: +49 (0) 381 40 59 380

Fax: +49 (0) 381 40 59 383

e-Mail: amt-gmbh@t-online.de

Internet: <http://www.amt-gmbh.com>

O₃-Measuring Instrument with Amperometric Micro-sensor

Very fast and accurate determination of dissolved ozone in aqueous solutions without streaming the sensor's membrane



The microprocessor-operated measuring instrument has been developed for the fast and accurate in-situ determination of dissolved ozone without any sampling. The instrument is useful for the laboratory and for simple and fast measurements in the field (e.g. swimming pools, drinking water, chemical industry). The instrument is equipped with an amperometric, membrane covered O₃-micro-sensor, which has not to be streamed and with a temperature-sensor. The display shows the concentration of the measured dissolved hydrogen in mg/l and the temperature of the sample.

The battery-operated measuring instrument can be equipped with a power supply unit and with a RS 232 interface. By means of exchanging the O₃-sensor tip to a galvanic oxygen micro-sensor tip, the measuring instrument could be changed simply into a high performance oxygen measuring instrument.

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 O₃ and oxygen, there are also micro-sensors available for the determination of dissolved hydrogen and H₂S/Sulphide. All these sensors can be interfaced very simply to the measuring instrument. Instead the temperature sensor could be used also an combined pH/temperature sensor if this is required.

The measuring system is equipped with a functional leather case for the whole system with shoulder strap and with belly carrier bag function for easy handling and with a quiver for the sensors. The operation of the measuring device is possible without removing the instrument from the bag. This ensures a simple and protected handling also during field measurements under difficult conditions.

Advantages of the Ozone Measuring Instrument with amperometric Micro-sensor

Compared with the other commercially available so called macro-sensors and compared with the other available high-tech and very expensive instruments (especially optical instruments), the new measuring instrument with amperometric micro-sensor has the following advantages:

1. No streaming of the sensor's membrane necessary, very low analyte consumption
2. No exchange of membrane or electrolyte for maintenance
3. Very fast response time of the sensor (some seconds for $t_{90\%}$)
4. Analysis without any sampling or adding of chemicals
5. Very low detection limit: down to 0,02 mg/l
6. High accuracy
7. High economic efficiency (no chemical consumption)
8. Measurements also possible in turbid, coloured, muddy and salt containing samples
9. Continuous on-line measurements (not only average measurements of a big volume)
10. High local resolution of the measurements (μm -steps)
11. Immediate display of the ozone concentration (mg/l)



Fig.: Amperometric Ozone Micro-sensor, complete with titanium housing, integrated electronic device and exchangeable sensor head

Technical Data of the amperometric Micro-sensor:

- ☞ Measuring principle: amperometric, membrane covered micro-sensor with redox catalyst
- ☞ Polarisation voltage is realised by the integrated electronic device after switching on
- ☞ Polarisation time: approx. 5 minutes
- ☞ 3 sensor electrodes
- ☞ Streaming or stirring not necessary, very low analyte consumption
- ☞ Concentration ranges: variable on customers request
standard: 0,02...10 mg/l and others on request
- ☞ Accuracy of the sensor: better than 2% of the measuring value
- ☞ Measurements and storage is possible within a temperature range of 0°C to 30°C
- ☞ Response time: $t_{90\%}$: 4,5 seconds
- ☞ Average life time: approx. 5...10 months
- ☞ No signal interferences if the sample contains up to 40 g/l salt
- ☞ Cross sensitivities: H_2S (may lead to errors or sensor damage),
 H_2O_2 (concentrations of more than 2 Vol.%)
- ☞ No cross sensitivities in case of chlorine and oxygen
- ☞ Not suitable for measurements in strong alkaline solutions ($c > 0,02 \text{ mol/l OH}^-$) and in strong acid solutions ($c > 0,5 \text{ mol/l H}^+$)