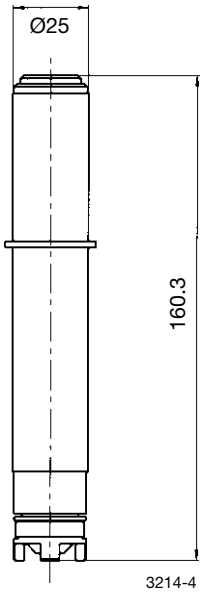
Brief Operating Instructions
Sensor for Ozone Type OZE 3-mA-2 ppm, Type OZE 2-4P

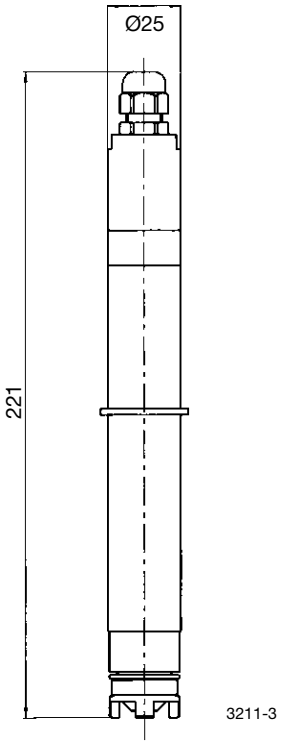


1 Function

Type OZE sensors serve the purpose of measuring ozone in swimming pool water, drinking water or process water of similar quality.

2 Technical Data

Measured variable:	Ozone		
Application:	Swimming pool water, drinking water and process water of similar quality (tenside-free)		
Measuring ranges:	0.02.....2 mg/l	OZE 3-mA-2 ppm	Part No. 79.29.57.8
	0.1.....3 mg/l	OZE 2.2-4P	Part No. 91.49.23.8
pH range:	stability range of ozone		
Temperature range:	5-40 °C (temperature-compensated) Max. temperature change rate <0.3 °C/min (no temperature surges)		
Max. pressure:	1 bar		
Flow rate:	30 l/h in in-line probe housing Type DGM or DLG III A/B Flow dependency is low, the typical signal increase at double the recommended flow rate is 15%		
Running-in time:	2-6 hours for initial operation 1-3 hours for resuming operation 1-3 hours after membrane/electrolyte change approx. 6 hours after cleaning the gold cathode		
Service life, membrane cap:	Typical 1 year (depending on water quality)		
Service life electrolyte:	Typical 6-8 weeks (depending on water quality)		
Material, membrane cap:	Clear PVC		
Material, stem:	PVC black or PMMA (Plexiglas) transparent		
Type of enclosure:	IP 65		
Supply voltage:	OZE 3-mA: 16 - 24 V DC		
Output signal:	4-20 mA ≈ 0...133 % of measuring range		
Cross sensitivity:	with respect to chlorine < 2 %; chlorine dioxide disturbs the measurement; Substances which relieve surface tension e.g. tenside, oil block the membrane (incorrect measurement)		
Storage temperature:	5-50 °C		



3 Electrical Connection

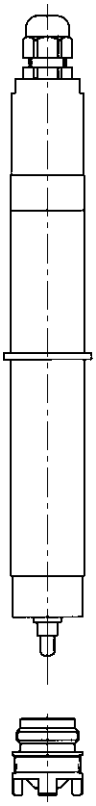
OZE 3 - mA - 2 ppm:
Turn the upper part of the sensor in counterclockwise direction by one quarter turn and remove. Release PG7 screwed union and pass through the 2-core cable (4 mm ø, 2 x 0.25 mm²). (Important: Ensure approx. 5 cm of stripped measuring line is kept in the sensor.) The 2-core cable is then connected to the terminal (1 positive pole, 2 negative pole). Press upper part fully into the housing and lock by turning in clockwise direction as far as it will go. Firmly tighten the nut of the PG screwed union. The OZE 3 sensor can now be installed.

Important: The sensor output signal is not galvanically isolated!

OZE 2 - 4P:
The sensor is connected to the corresponding measurement and control device, e.g. OZWS by means of the DULCOTEST® test lead 4P (with 4-pin connector on either side and moisture-protected screw thread.

4 Mounting / Installation

Important: Neither the membrane nor electrode must be touched or damaged!
Close the shut-off valves upstream and downstream of the in-line probe housing before installing the sensor in the in-line probe housing. The system must be depressurized.
Appropriate safety measures must be taken when handling water or solution containing ozone.



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4.1 Filling the Membrane Cap with Electrolyte

The sensor is supplied with a protective membrane cap. Pull off this protective cap and unscrew the membrane cap from the stem. Carefully flush out the membrane cap and the electrode holder with the electrolyte provided. Do not touch or damage the membranes and electrodes. Fill the membrane cap free of bubbles. Allow electrolyte to run along the inner wall. Any air bubbles on the membrane or on the stem wall can be removed by carefully knocking the membrane cap on a firm base. The filled membrane cap is now placed on the electrode stem which is held vertically and turned until the thread catches. Then hold the sensor slightly tilted and turn the hole in the Plexiglas section of the electrode stem to the top. The electrode stem remains in this position while the membrane cap is firmly screwed down. Firmly tighten the membrane cap by hand. When screwing together, initially air and then surplus electrolyte escapes through the hole. No air bubbles must remain in the electrolyte chamber; repeat filling procedure if necessary.

4.2 Installation in DGM or DLG

Installation in DGM: Before installing in the DGM, the O-ring must be fitted over the sensor from below and pushed up to the lock washer. A washer must remain in the DGM. Then install the sensor in the DGM and firmly tighten with lock screw until the O-ring provides a tight seal. The correct installation depth of the sensor is defined by the lock washer.

Installation in DLG: Before installing in the DLG, the O-ring must be fitted over the sensor from below and pushed up to the lock washer. Then install the sensor in the DLG and firmly tighten with screw plug.

5 Calibration

The following prerequisites must be fulfilled to ensure successful calibration:

- Constant flow in the in-line probe housing (recommended: 30 l/h)
- Constant temperature
- Same temperature of sensor and measured medium (i.e. the sensor must be temperature-compensated for at least 15 minutes in the measured medium)
- Constant pH-value

Zero point calibration of the membrane-covered sensor is normally not necessary, however, it can be carried out in conjunction with a type D1C controller. The slope is calibrated with suitable ozone measuring equipment (DPD 4) and is set at the controller/measuring instrument in compliance with the operating instructions.

Calibration should be repeated at regular intervals. The calibration intervals depend on the sensor application and should be determined to suit individual cases.

Important: Slope calibration must be carried out every time a membrane and/or electrolyte is changed or after cleaning the gold cathode! The running-in times as specified under Point 2 must be observed.

6 Maintenance / Accessories

The sensor should be checked and calibrated regularly to ensure efficient operation. Visually inspect the membrane if the probe can no longer be calibrated at the controller/measuring instrument. Adhered dirt deposits can be removed with a light and soft water jet. To remove lime scale deposits, leave the membrane cap in a 1% hydrochloric acid solution for 1 day (then thoroughly rinse off hydrochloric acid!).

Important: Never treat the membrane with commercially available detergents or rub with a cloth. This will immediately destroy the membrane.

Electrolyte (100 ml)	Part No. 50.62.73.2
Membrane cap, complete (with grinding material)	Part No. 79.04.88.1
Signal cable (2-core, 4 mm ø, 2 x 0.25 mm^2)	Part No. 72.51.22.6
Signal cable (4-core, 5 m)	Part No. 81.54.56.6

7 Storage / Transport

For storage or transport, the electrodes and membranes should be rinsed with clean water and left to dry free of dust. The membrane cap should then be screwed on loosely. Fit the protective cap to protect the membrane cap.