**9185sc Amperometric Ozone Sensor**

**Features and Benefits**

**Few Interferences from Oxidants or pH over a Wide Measurement Range**

Bromine, chloramines, chlorine, chlorine dioxide, hydrogen peroxide, and pH do not interfere with ozone measurements using the Hach 9185sc Amperometric Ozone Sensor which can measure from 0 to 2 mg/L ozone.

**Ideal for Low-Conductivity Samples**

The 9185sc ozone system has a low minimum detection limit of 0.005 mg/L ozone. Because the amperometric cell is separated from the sample by the membrane and is immersed into an electrolytic medium, the 9185sc ozone sensor is suitable for use in water with low conductivity.

**Reliable Amperometric Measurements**

The sensor used the 9185sc system is a two-electrode amperometric sensor (gold cathode and silver anode) with a membrane selective to ozone. Membranes are pre-mounted on retaining caps to simplify and reduce maintenance time.

**Flexible Options**

Options available for the 9185sc ozone system include:

- **Acidification Unit**—It can be used intermittently or continuously for cleaning and is fully programmable.
- **Intermittent Flow Unit**—This fully programmable unit saves resources while limiting excess flow to drain.

**Easy Setup and Maintenance**

The all-inclusive 9185sc ozone system comes pre-assembled on a panel. The membrane system of the sensor means there are no chemicals used for measurement. Maintenance is minimal and two years of typical maintenance items are included with the system.

**Compatible with Hach Multi-Sensor, Multi-Parameter Digital Controllers**

The Hach 9185sc Amperometric Ozone Sensor can be used with any of Hach's Digital Controllers. The sc digital controllers accept from two to eight sensors. Multiple sc controllers can be networked to accommodate many more sensors and parameters, reducing the cost per measuring point. Just plug in any Hach “plug and play” digital sensor and it's ready to use without software configuration. “Plug and play” connectivity means there's no complicated wiring or set up. Network the 9185sc ozone sensor with any of Hach’s digital sensors for measuring dissolved oxygen, turbidity, ORP, conductivity, and many other parameters.
**Specifications**

**Measurement Range**  
0 to 2 ppm (mg/L) ozone (O₃)

**Minimum Detection Limit**  
5 ppb or 0.005 mg/L O₃

**Accuracy**  
3% or ±10 ppb O₃, whichever is greater

**Standard Deviation**  
1.0%

**Response Time**  
90% in less than 90 seconds

**Measurement Interval**  
Continuous

**Minimum Flow Rate**  
14 L/hr (200 to 250 mL/min) auto-regulated by flow thru cell

**Pressure Range**  
0.1 to 2 bar in flow cell

**Storage Temperature**  
-20 to 60°C

**Operating Temperature**  
0 to 45°C

**Operating Humidity**  
0 to 90% non-condensing

**Sample Temperature**  
2 to 45°C

**Temperature Compensation**  
Automatic over sample temperature range

**Power Consumption**  
12 V, 1.5 watts

**Measurement Technology**  
Amperometric/Membrane (electrode, membrane, electrolyte)

**Interferences**  
No interference from bromine, chloramines, chlorine, chlorine dioxide, or hydrogen peroxide

**Zero Calibration**  
Electrically or with ozone-free water

**Calibration**  
Comparison of lab method with process sample

**Calibration Interval**  
2 months

**Maintenance Interval**  
Measurement Cell: 6 months for membrane and electrolyte, typical

**Mounting**  
Flat, vertical surface (panel, stand, etc.)

**Connections**  
Sample Line: 1/4-in. O.D.  
Drain Line: 1/2-in. I.D. (supplied)

**Materials**  
Electrode: gold cathode/silver anode  
Measuring cell: acrylic  
Probe body: PVC

**Environmental Ratings**  
IP-66/NEMA 4X

**Certifications**  
UL, CSA (certified by ETL), CE

**Dimensions**  
270 x 250 mm (10.63 x 9.84 in.)

**Shipping Weight**  
6.5 kg (14.3 lbs.)

**Accessories**

**Acidification Unit**  
Cleaning: can be set to inject acid through the measurement cell for cleaning purposes.  
Always on or programmable via controller relays.  
Equipped with power switch.  
NEMA 4X/IP66 compliant.  
Connects in series with analyzer.  
Complete system requires one input to the controller.

**Intermittent Flow Unit**  
Use to minimize the amount of water used by eliminating continuous measurement.  
Programmable via controller relays.  
NEMA 4X/IP66 compliant.  
Connects in series with analyzer.  
Complete system requires one input to the controller.

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**Principle of Operation**

Ozone is highly soluble in water—up to 13 times more soluble than oxygen. Ozone is also highly unstable in water with stability decreasing with increasing temperature. Ozone reacts with hydroxide ions (OH⁻). As the concentration of OH⁻ increases (pH increases), reaction with ozone increases. OH⁻ is a by-product of ozone breakdown in water and the reaction between OH⁻ and O₃ can be sustained until ozone is completely removed. O₃ is reduced at the gold working electrode (cathode).

\[ \text{O}_3 + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{O}_2 + 2\text{OH}^- \]

The silver reference electrode (anode) is oxidized into Ag⁺ ions that precipitate with bromide ions.

\[ 2\text{Br}^- + 2\text{Ag} \rightarrow 2\text{AgBr} + 2\text{e}^- \]

The O₃ reduction at the cathode generates a current directly proportional to O₃ concentration.
1. The sensor shall continuously measure ozone (O₃) concentration in water.

2. The measurement technology shall be amperometric/membrane which includes electrode, membrane, and electrolyte.

3. The measuring range shall be from 0 to 2 ppm O₃.

4. The minimum detection limit shall be 5 ppb or 0.005 mg/L O₃.

5. The accuracy shall be less than 3% or ±10 ppb of the measured value, whichever is greater.

6. The response time shall be approximately 90 seconds.

7. The flow rate of sample shall be 200 to 250 mL/minute.

8. The calibration method for the analyzer shall be comparison with lab method.

9. The transmitter enclosure shall be rated at NEMA4x/IP66.

10. The electrodes shall be constructed of a gold cathode and silver anode.

11. The analyzer shall be model 9185sc Amperometric Ozone Sensor manufactured by Hach Company.

**Dimensions**

The sensor should be installed in an accessible location. It can be mounted on a flat, vertical surface (such as a panel, stand, etc.). It should allow for access for any checking or maintenance. Sample flow should meet the specifications above.
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