

# 9185sc Amperometric Ozone Sensor

Ozone

## 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.



*The Hach 9185sc Amperometric Ozone Sensor is free from interference from oxidants such as bromine, chloramines, chlorine, chlorine dioxide, and hydrogen peroxide as well as pH and low-conductivity water. This sensor was designed to meet the specific needs of ozone measurements in drinking water plants, pure water loops, and the bottled water industry*

DW

WW

PW

IW

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

## Specifications\*

### Measurement Range

0 to 2 ppm (mg/L) ozone (O<sub>3</sub>)

### Minimum Detection Limit

5 ppb or 0.005 mg/L O<sub>3</sub>

### Accuracy

3% or ±10 ppb O<sub>3</sub>, 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.

\*Specifications subject to change without notice.

## 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<sup>-</sup>). As the concentration of OH<sup>-</sup> increases (pH increases), reaction with ozone increases. OH<sup>-</sup> is a by-product of ozone breakdown in water and the reaction between OH<sup>-</sup> and O<sub>3</sub> can be sustained until ozone is completely removed.

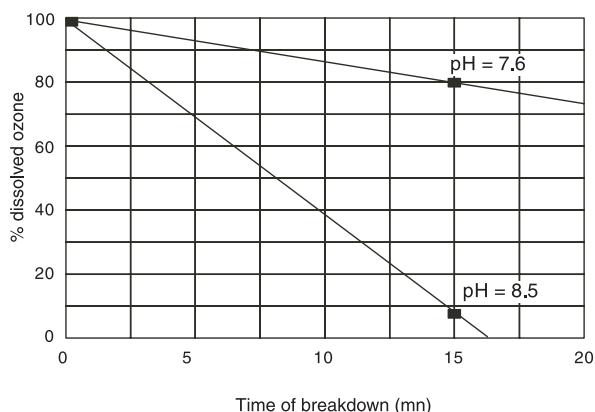
O<sub>3</sub> is reduced at the gold working electrode (cathode).



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



The O<sub>3</sub> reduction at the cathode generates a current directly proportional to O<sub>3</sub> concentration.

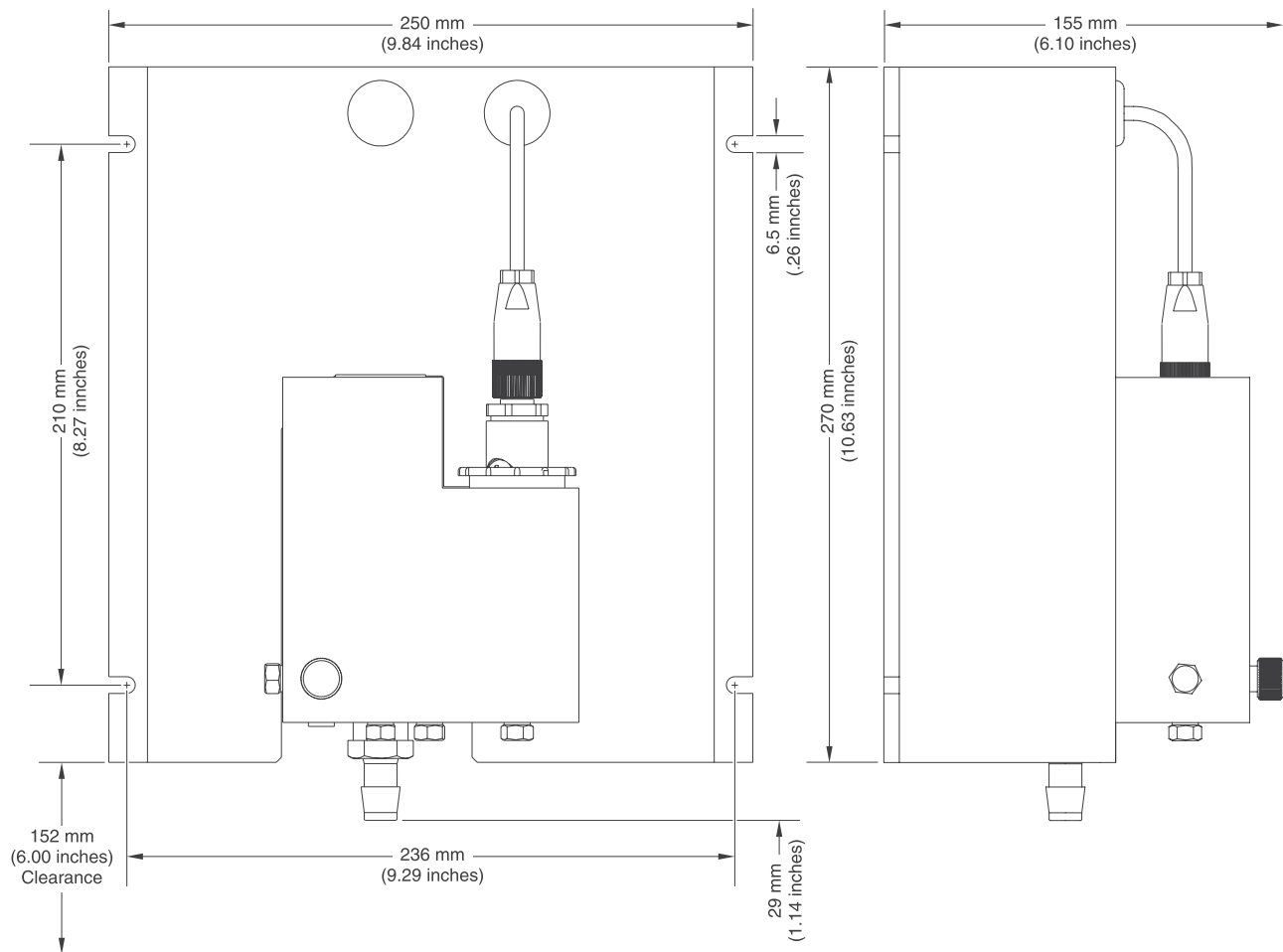


## Engineering Specifications

1. The sensor shall continuously measure ozone ( $O_3$ ) 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  $O_3$ .
4. The minimum detection limit shall be 5 ppb or 0.005 mg/L  $O_3$ .
5. The accuracy shall be less than 3% or  $\pm 10$  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.



## Ordering Information

LXV433.99.00001 9185sc Ozone Analyzer

### Optional Accessories

- LZY051 9180sc Acidification Unit  
 LZY052 9180sc Intermittent Flow Unit  
 57432-00 Instrument Stand  
 54488-00 125V Power Cord with Strain Relief  
 54489-00 230V Power Cord with Strain Relief

### Digital Extension Cables

Standard cable length is 0.4 m (1.25 ft.)

- 61224-00 1 m (3.2 ft.)  
 57960-00 7.6 m (25 ft.)  
 57961-00 15.2 m (50 ft.)  
 57962-00 30.5 m (100 ft.)

### Digital Termination Box

Required when the length of cable between the digital sensor and sc200 or sc1000 controller is between 100 and 1000 m (328 and 3280 ft.).

- 58670-00 Digital Termination Box

### Replacement Parts

- 09185=A=1000 9185sc Electrode  
 09185=A=3500 9185sc Pre-mounted Membranes, qty. 4  
 09185=A=3600 9185sc Electrolyte

Lit. No. 2407 Rev 1  
 D11 Printed in U.S.A.

©Hach Company, 2011. All rights reserved.

In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.

*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

**Keep it pure.**

**Make it simple.**

**Be right.**

*For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.*

*In the United States, contact:*

HACH COMPANY World Headquarters  
 P.O. Box 389  
 Loveland, Colorado 80539-0389  
 U.S.A.  
 Telephone: 800-227-4224  
 Fax: 970-669-2932  
 E-mail: orders@hach.com  
**www.hach.com**

*U.S. exporters and customers in Canada, Latin America, sub-Saharan Africa, Asia, and Australia/New Zealand, contact:*

HACH COMPANY World Headquarters  
 P.O. Box 389  
 Loveland, Colorado 80539-0389  
 U.S.A.  
 Telephone: 970-669-3050  
 Fax: 970-461-3939  
 E-mail: intl@hach.com  
**www.hach.com**

*In Europe, the Middle East, and Mediterranean Africa, contact:*

HACH LANGE GmbH  
 Willstätterstraße 11  
 D-40549 Düsseldorf  
 GERMANY  
 Tel: +49 (0) 211 5288-0  
 Fax: +49 (0) 211 5288-143  
 E-mail: info@hach-lange.de  
**www.hach-lange.com**



**Be Right™**