

# 9187sc Amperometric Chlorine Dioxide Sensor

Chlorine Dioxide

## Features and Benefits

### Selective Membrane Avoids Interference from Chlorine

The Hach 9187sc Amperometric Chlorine Dioxide Sensor uses a membrane that is selective for chlorine dioxide species. There are no interferences from bromine, chlorine, or hydrogen peroxide. The only potential interference is from ozone, which is rarely present in water treated with chlorine dioxide.

### Flexible Options

Options available for the 9187sc chlorine dioxide sensor 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 9187sc chlorine dioxide 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 9187sc chlorine dioxide sensor is used with Hach's Digital Controllers. Hach's 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 9187sc Amperometric Chlorine Dioxide Sensor with any of Hach's digital sensors for measuring dissolved oxygen, turbidity, ORP, conductivity, and many other parameters.



*Selective membrane used in the Hach 9187 sc Amperometric Chlorine Dioxide Sensor avoids interferences from chlorine for accurate, low level measurements. Electrode membranes are pre-mounted for easy replacement.*

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) as chlorine dioxide (ClO<sub>2</sub>)

### Minimum Detection Limit

10 ppb or 0.01 mg/L ClO<sub>2</sub>

### Accuracy

5% or ±10 ppb ClO<sub>2</sub>, whichever is greater

### Standard Deviation

1.5%

### 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

Ozone

### Zero Calibration

Electrically or with de-chlorinated 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 and limit the amount of waste.

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

The amperometric probe is made up of a gold working electrode where the main reaction occurs, a silver counter-electrode, electrolyte, and a porous membrane that isolates the electrochemical cell from the sample and through which chlorine dioxide diffuses. A fixed potential is set between the two electrodes causing reactions at the electrodes. The current generated is proportional to the concentration of chlorine dioxide.

ClO<sub>2</sub> is reduced at the gold working electrode (cathode).



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



The ClO<sub>2</sub> reduction at the cathode generates a current directly proportional to ClO<sub>2</sub> concentration.

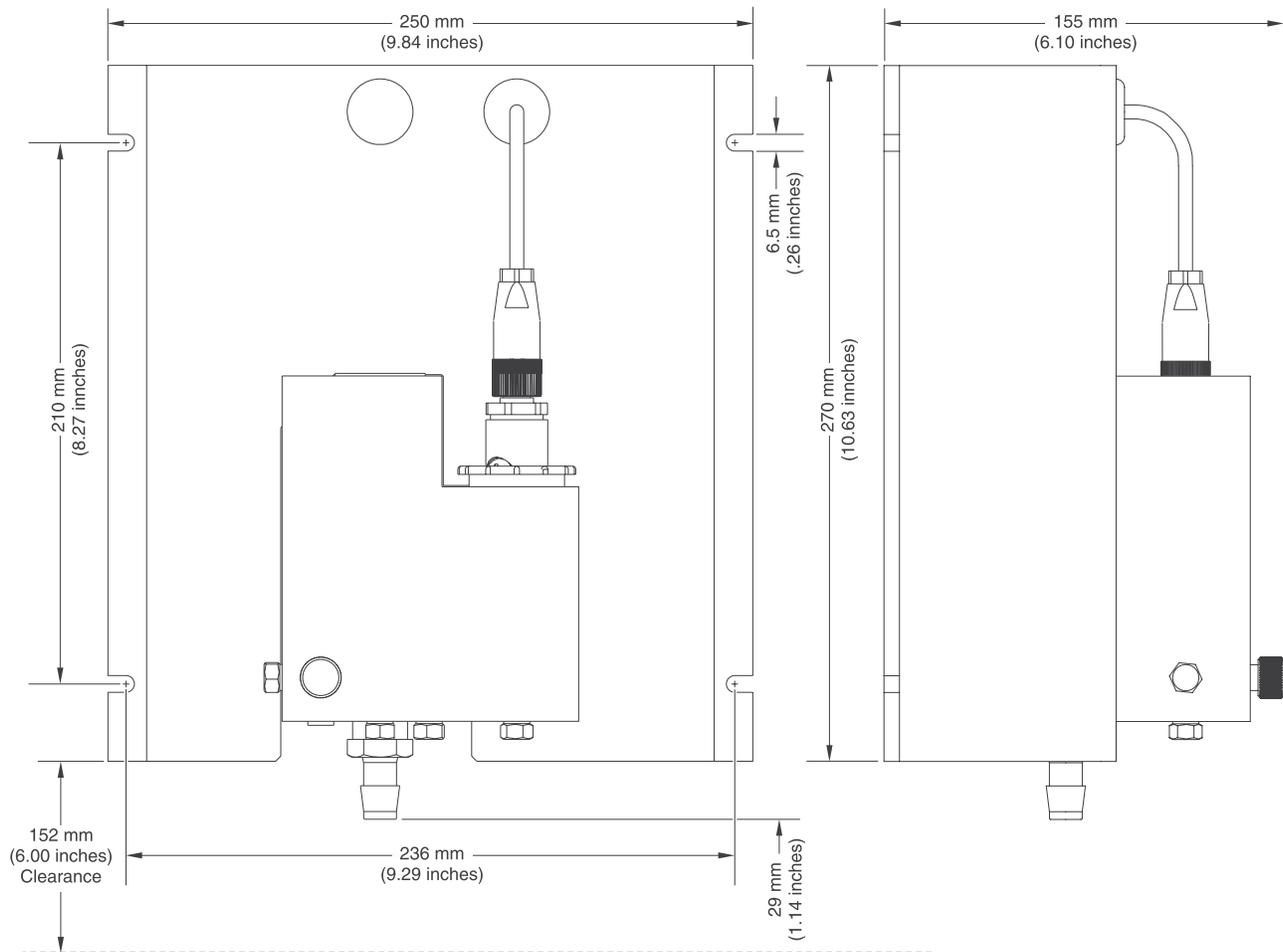
Although chlorine dioxide is stable over a wide pH range, the electrochemical reaction and diffusion through the membrane are temperature dependent. The measurement cell contains a temperature sensor for automatic temperature compensation to prevent measurement errors.

## Engineering Specifications

1. The sensor shall continuously measure the concentration of chlorine dioxide ( $\text{ClO}_2$ ) 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  $\text{ClO}_2$ .
4. The minimum detection limit shall be 10 ppb or 0.01 mg/L  $\text{ClO}_2$ .
5. The accuracy shall be less than 5% 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 9187sc Amperometric Chlorine Dioxide 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

LXV434.99.00001 9187sc Chlorine Dioxide 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

- 09184=A=1001 9187sc Electrode  
 09187=A=3500 9187sc Pre-mounted Membranes, qty. 4  
 09187=A=3600 9187sc Electrolyte

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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.**

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