

# Hach Orbisphere G1100 Luminescent Dissolved Oxygen (LDO) Sensor

## Features and Benefits

### Operator Independent Accuracy and Reliability

The Hach Orbisphere G1100 Luminescent Dissolved Oxygen (LDO) Sensor offers a new way of monitoring dissolved oxygen in high purity water applications. It uses a dry sensor with no membrane. No electrolyte or chemicals are needed for operation. The sensor only needs an adjustment of the zero point. The on-line calibration is programmable to meet operating requirements.

### Minimal Operator Time Required

Designed to reduce maintenance requirements and complexity to a minimum, the G1100 LDO sensor is operator independent with a fully automatic calibration method. Service requirements are limited to 5 minutes every 18 months to replace the active spot of the sensor.

### Confidence in Results

Manual and automatic calibration modes are fully traceable. Real-time diagnostics includes notification of service due, need for calibration sample replacement, calibration operation or configuration failure, and sensor or system failure.

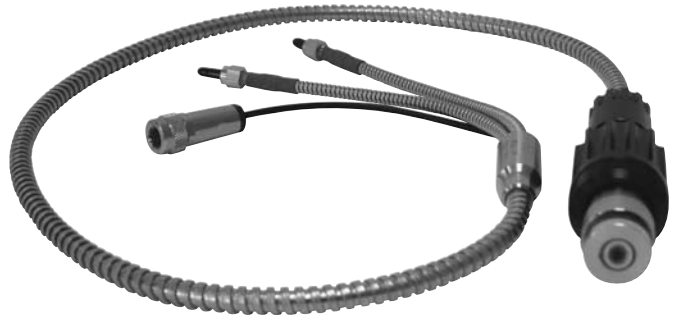
### Simple Calibration

Calibration of the G1100 LDO sensor is made by exposing the luminescent spot to pure nitrogen. The advantage of this method is the ability to use certified and traceable gas standards. In the range of 0 to 600  $\mu\text{g}/\text{kg O}_2$ , calibration is needed approximately quarterly. A standard calibration gas bottle will last about three years. Calibration can be launched manually or programmed to run automatically at defined intervals. After calibration, the instrument verifies the signal is within an acceptable range and stable.

### Diagnostics and Alarms

Use the G1100 LDO sensor with the Hach Orbisphere 410 Transmitter. Diagnostics features of the transmitter include:

- Notification that a sensor service is due for optimal preventative maintenance planning.
- Notification that the calibration sample needs replacement.
- Notification of potential auto-calibration or auto-verification failure.
- Notification of system or sensor failure.



*The Hach Orbisphere G1100 Luminescent Dissolved Oxygen (LDO) Sensor is the first luminescent sensor to provide trace oxygen monitoring in pure water processes where ppb level monitoring is needed. It features traceable fully automatic in-situ calibration and low cost of ownership—downtime is reduced to 5 minutes annual service. A dry sensor means there is no electrolyte, no chemicals, and no membrane.*

PW

IW

*This on-line process analyzer is designed for use in power generation plants running oxygenated treatment (OT), all volatile treatment (AVT) chemistry, or other industrial applications requiring effective oxygen monitoring, such as process water in the semiconductor industry.*

All diagnostic information together with user programmable measurement alarms can be assigned to one of three available relays or to one of three smart analog outputs.

### Communication and Data Management

Real time data is available through standard 4-20 mA analog outputs, RS485, Profibus DP, or Ethernet. Any stored information, including historical data, calibration reports, user log book, and system configuration can be retrieved with RS485, Ethernet, USB-client, and USB-host (USB memory stick).

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



Be Right™

## Specifications\*

### Measuring Range

0 to 20,000 ppb

### Repeatability

±1 ppb + 2% in the 0 to 600 ppb range

### Reproducibility

±2 ppb + 2.5% in the 0 to 600 ppb range

### Detection Limit

0 ppb ±2 ppb

### Response Time

30 seconds (t = 90%)

### Resolution (display)

1 ppb

### Calibration

Fully automatic user programmable single point zero calibration

### Calibration Sample

Standard 99.999% nitrogen (quality 50) gas bottles with 5/8-in. x 18 (C10) connection.

### Verification

Fully automatic user programmable single point zero verification

### Ambient Temperature

5 to 50°C (41 to 122°F)

### Ambient Relative Humidity

0 to 95%, non-condensing

### Sample Temperature

5 to 45°C (41 to 113°F) [sensor resistant to temperature from -5 to 100°C (23 to 212°F)]

### Sample Pressure

1 to 4 bar abs (14.5 to 58 psig)

### Sample Flow Rate

50 to 500 mL/min

### Sample Connection

6 mm (1/4-in.) tubing

### Power Supply

Universal 85 to 264 Vac (50/60 Hz, 25 VA)  
or 10 to 36 Vdc (25 W)

### Certifications

*Electromagnetic compatibility standards:*  
EN61326:1997 /A1:1998 /A2:2001 /A3:2003  
*Safety standard:* EN61010-1: 2001 Directive 73/23/EEC

### Display

Monochrome STN 320 x 240 pixels with LED backlight

### User Interface

*Touch-screen panel:* displays concentration, trend graph, diagnostics, alarm status, historical data  
*Password protection:* five levels of authorized access to configuration and data management

### Analog outputs

3 Smart 0/4 – 20 mA (500 Ohms), programmable as linear or tri-linear, configurable to send diagnostics or alarm information

### Relay Outputs

3 *measurement alarm relays* (2A/30 Vac or 0.5A/50 Vdc) configurable to send diagnostics information  
1 *system alarm relay* (2A/30 Vac or 0.5A/50 Vdc)

### Digital Communication

RS485  
Profibus DP (optional)

### Data Retrieval

Ethernet  
USB-client to download data from a computer  
USB-host to download data with a USB memory stick

### Data Storage

Rolling buffer or store once mode for up to 1000 measurements and 1000 operator actions  
Holds calibration records for the last 10 calibrations

### Accessories

2 years spare parts kit  
Active spot  
Spare sensor  
Tool kit  
Pressure reducer for calibration gas bottle

### Materials

*Wall/pipe mount:* stainless steel, IP65  
*Panel mount:* aluminum, IP65

### Dimensions

*Wall/pipe mount transmitter:*  
220 x 229 x 151 mm (8.6 x 8.9 x 5.6 in.)  
*Panel mount transmitter:*  
250 x 156 x 256 mm (9.8 x 6.1 x 10.0 in.)  
*Sensor module:* 120 x 200 mm (4.7 x 7.8 in.)

### Weight

*Wall/pipe mount transmitter:* 3.8 kg (8.4 lbs.)  
*Panel mount transmitter:* 2.9 kg (6.4 lbs.)  
*G1100 sensor:* 0.5 kg (1.1 lbs.)  
*G1100-F flow chamber:* 0.8 kg (1.8 lbs.)  
*1 L calibration gas bottle (incl. valve):* 0.7 kg (1.5 lbs.)

\*Specifications subject to change without notice.

## Principle of Operation

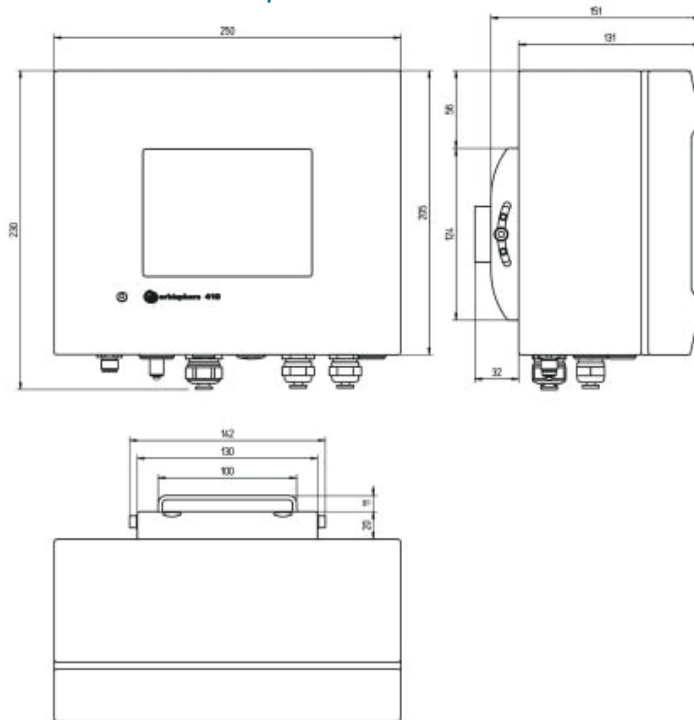
The Hach Orbisphere G1100 Luminescent Dissolved Oxygen (LDO) Sensor works on the principle of luminescence. An active fluorescent spot is excited with blue light and red luminescent light is detected. The presence of oxygen changes the decay time of the red luminescent light. With the appropriate calibration curve, the decay time is transformed into an oxygen partial pressure value.

## Engineering Specifications

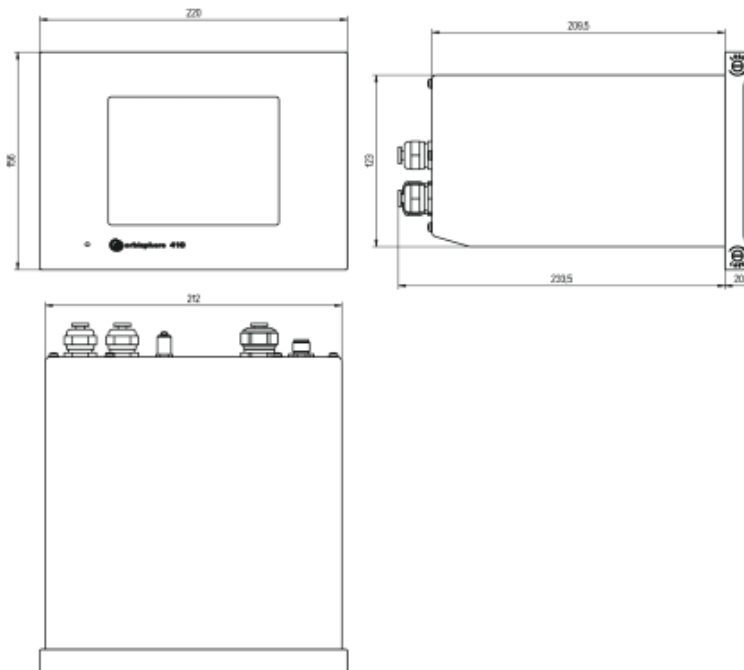
1. The sensor shall continuously measure the concentration of dissolved oxygen in water.
2. The measurement technology shall be via luminescence.
3. The measuring range shall be from 0 to 20,000 ppb  $O_2$ .
4. The minimum detection limit shall be 0 ppb  $\pm 2$  ppb  $O_2$ .
5. The repeatability shall  $\pm 1$  ppb  $+2\%$  in the 0 to 600 ppb range.
6. The reproducibility shall  $\pm 2$  ppb  $+2.5\%$  in the 0 to 600 ppb range.
7. The response time shall be approximately 30 seconds.
8. The flow rate of sample shall be 5 to 50 L/hour.
9. The transmitter enclosure shall be rated at IP66.
10. The analyzer shall be model Orbisphere G1100 Luminescent Dissolved Oxygen (LDO) Sensor.

## Dimensions

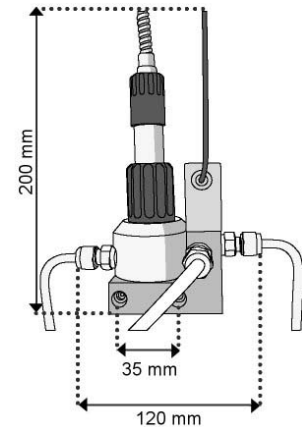
Wall/Pipe Mount Transmitter



Panel Mount Transmitter



Sensor



## Ordering Information

**41G1-W400** Hach Orbisphere Luminescent Oxygen Analyzer, wall/pipe mount

**41G1-P400** Hach Orbisphere Luminescent Oxygen Analyzer, panel mount

All analyzers are equipped with 1/4-in. sample inlet, 85 to 264 Vac, 3 x 0/4-20 mA analog output, and RS485.

### Accessories

<b>32963</b>	Wall Mount Kit
<b>32964</b>	Panel Mount Kit
<b>32972</b>	Pipe Mount Kit, for wall instrument
<b>33015</b>	Pressure Reducer, for calibration gas bottles with 0.1-L/min flow, 5/8-in. x 18 connection, 70 bar maximum
<b>33021</b>	Spare Parts Kit, 2 years, for G1100 sensors and flow-chambers
<b>33022</b>	Tool Kit, for G1100 sensors
<b>32959</b>	Converter, RS232/RS-485, battery powered (batteries not included)
<b>32973</b>	PROFIBUS-DP Upgrade Kit, includes board and software key
<b>32534.03</b>	PROFIBUS-DP Cable, including SUB-D 9 female connector, 3 m
<b>32534.MM</b>	PROFIBUS-DP Cable, including SUB-D 9 female connector, (MM indicates length greater than 3 m)

### Spare Parts

<b>32965</b>	Locking Key, for wall instruments
<b>32970</b>	Cap, to protect USB connector
<b>32966</b>	Power Supply Connector, 85 to 260 Vac
<b>32975</b>	Power Supply Connector, 10 to 30 Vdc
<b>32531.03</b>	Ethernet Cable, including connectors, 3 m
<b>32531.10</b>	Ethernet Cable, including connectors, 10 m
<b>32531.20</b>	Ethernet Cable, including connectors, 20 m
<b>32533.03</b>	USB Client Cable, including connectors, 3 m
<b>G1100-300</b>	Luminescent Oxygen Sensor, for pure water applications, with 3 meter cable
<b>G1100-F6</b>	Complete Flow Chamber, for G1100 sensors, 6-mm fittings
<b>G1100-F4</b>	Complete Flow Chamber, for G1100 sensors, 1/4-in. fittings

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*Keep it pure.*

*Make it simple.*

*Be right.*

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