

BREAKTHROUGH LUMINESCENT TECHNOLOGY FOR **DISSOLVED OXYGEN**

HQ10 & HQ20 Portable Meters for laboratory and field monitoring

PORTABLE

# Hach LDO<sup>®</sup>

## PROBE AND METERS

# HACH LDO<sup>®</sup>

SAVE TIME AND MONEY  
WITH UNMATCHED  
PERFORMANCE,  
EASE-OF-USE,  
AND RUGGEDNESS  
IN A PORTABLE METER



- NO MEMBRANES TO CLEAN OR REPLACE
- LOW MAINTENANCE
- NO CALIBRATION REQUIRED
- NO POLARIZATION TIME
- NO ELECTROLYTE SOLUTION
- NO ELECTRODE POLISHING
- RAPID RESPONSE
- 99% ACCURACY
- ONE-YEAR SENSOR LIFE



Be Right<sup>™</sup>



RUGGED, WATERPROOF, PORTABLE METERS

# PORTABLE **Hach LDO**<sup>®</sup> PROBE AND METERS

- **Model HQ10** > Single parameter dissolved oxygen
- **Model HQ20** > Multi-parameter, measuring dissolved oxygen & either pH or Oxidation Reduction Potential (ORP)

## TRADITIONAL DO MEASUREMENT

For more than 50 years, galvanic, and polarographic technologies have been used to measure dissolved oxygen. These old technologies have been important for monitoring DO at municipal and industrial wastewater facilities.

Unfortunately, traditional electrochemical methods use membranes, anodes, cathodes, and electrolyte solutions, which experience high failure rates:

- Anodes are consumed over time, and periodic replacement can be inconvenient and costly
- Electrolytes are subject to contamination, and must also be replaced
- Gases like hydrogen sulfide can poison the anode and electrolyte, requiring replacement
- Sensor membranes often rupture or become coated with grease and dirt, requiring regular cleaning and replacement
- Electrolyte depletion and anode breakdown make regular sensor calibration necessary

Maintenance tasks to keep traditional portable DO meters working take unnecessary time and money.

Even if regular maintenance is performed, there's no guarantee that you'll get accurate results. Galvanic and polarographic DO measurements are subject to



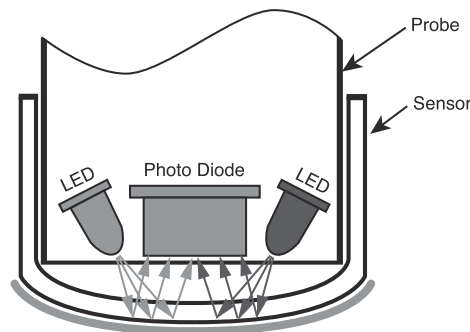
interference from anything that produces a voltage, including ferric chloride, ferrous sulfate, aluminum sulfate, and polymers. Changes in pH can also affect DO readings.

If you have already moved away from older DO measurement technology, and use an on-line LDO instrument from Hach, our new portable LDO instruments allow you to use the same technology for field measurements or to check DO levels at other process points. The portable Hach LDO<sup>®</sup> can also be used for process control.

## HOW DOES THE HACH LUMINESCENT DISSOLVED OXYGEN PROBE WORK?

The Hach LDO<sup>®</sup> sensor is coated with a luminescent material. Blue light from an LED is transmitted to the sensor surface. The blue light excites the luminescent material. As the luminescent material relaxes it emits red light. The time from when the blue light was sent and the red light is emitted is measured. The more oxygen that is present, the shorter the time it takes for the red light to be emitted. This time is measured and correlated to the oxygen concentration.

Between the flashes of blue light a red LED is flashed on the sensor and used as an internal reference, essentially validating each measurement.





## THE MANY ADVANTAGES OF THE PORTABLE HACH LDO® PROBE AND METERS

The Hach HQ10 and HQ20 portable meters with the Hach LDO® probe offer several key advantages over meters based on galvanic or polarographic sensor technology. These features will save you time, effort, money, and will increase your confidence in DO measurement:

- No membranes means improved data quality and less hassle
- No chemical interference from typical wastewater chemicals, withstands harsh wastewater applications
- Less maintenance than traditional DO probes means time savings and lower cost of ownership
- Factory calibrated DO sensor, no user-calibration required for the life of the sensor
- No polarization time—turn on the meter and you are ready to go
- Easy probe maintenance—no electrolyte to replace, no cathodes/anodes to polish
- Fast response, with minimal stirring required
- Durable sensor retains accuracy even when scratched or partially fouled, can easily be cleaned
- 3-year warranty on probe and meter—if it breaks, we'll replace it, free
- 1-year warranty on sensor caps



The HQ10 and HQ20 instruments are rugged and user-friendly, making field work and laboratory measurements easier and more convenient:

- Meets IP-67 requirements and survives 1-meter drop test onto concrete
- One-hand operation with simple menus and large, clear, backlit display
- Automated data logging records 500 measurements at user-defined durations—set the time-interval, leave the unit, and take care of something else while it logs the data for you
- Unlimited measurements can be recorded using the RS232 connection to a PC or printer
- User and sample IDs can be entered, and are attached to the analysis record
- Measurements are automatically corrected for barometric pressure, salinity, and temperature
- Results displayed as percent saturation or concentration in mg/L
- HQ20 features dual mode screen—view DO and pH/mV readings simultaneously

## APPLICATIONS

Where can the portable Hach LDO® probe and meters be used for dissolved oxygen measurements?

- Process control in facilities that do not have on-line DO instruments
- Aeration Tanks—measure DO levels in aeration basins, making sure the microorganisms remain viable
- Aerobic and anaerobic digesters
- Nitrification and de-nitrification tanks
- Collection Systems—control odor by using in conjunction with compressors and diffuser readings
- In the field for watershed and environmental monitoring
- For aquaculture applications
- For laboratory applications
- Point-of-process monitoring for industrial users



**No membranes + Low maintenance  
+ Greater accuracy and precision  
= Increased confidence in measurements & reduced cost of ownership**



**Be Right™**

# SPECIFICATIONS

## Portable Hach LDO™ Probe and HQ10 and HQ20 Specifications

<b>Probe Materials:</b>	Polycarbonate/ABS blend
<b>Sensor Materials:</b>	Polymethyl methacrylate (Acrylic)
<b>Temperature Sensor:</b>	30K Ohm Thermistor
<b>Temperature Compensation:</b>	Automatic (32 to 122°F, 0 to 50°C)
<b>Pressure Compensation:</b>	Automatic (400 to 1100 mBar)
<b>Salinity Correction:</b>	Automatic (0 to 70‰)
<b>Minimum Flow Rate:</b>	Negligible, <2 inches/minute (<5 cm/minute)
<b>Measuring Range:</b>	<i>Dissolved Oxygen Measurement:</i> 0.01 to 20.00 mg/L (ppm); 0 to 200% saturation <i>Temperature Measurement:</i> 32 to 122°F (0.0 to 50°C) <i>Pressure Measurement:</i> 400 to 1100 mBar
<b>Resolution:</b>	<i>Dissolved Oxygen:</i> 0.01 mg/L (ppm); 0.01% saturation <i>Temperature:</i> 0.1°F/°C <i>Pressure:</i> 1 mBar
<b>Accuracy:</b>	<i>Dissolved Oxygen Measurement:</i> ±0.1 mg/L @ <8 mg/L; ±0.2 mg/L @ >8 mg/L <i>Temperature:</i> ±0.3°C <i>Pressure:</i> ±2% of reading
<b>Sensitivity:</b>	±0.05% of Span
<b>Detection Limit:</b>	0.01 mg/L (ppm), estimated
<b>Response Time at 20° C:</b>	To 95% of measured value, <30 seconds
<b>Sensor Cable Lengths:</b>	1-meter (40"), 3-meter (10'), 5-meter (16'), 15-meter (50') are available
<b>Measuring Principle:</b>	Luminescence decay rate
<b>Interferences:</b>	No interferences noted at concentrations typically found in DW and WW. Species evaluated include: H <sub>2</sub> S, pH, Na <sup>+</sup> , Al <sup>+</sup> , Fe <sup>+</sup> , Fe <sup>+</sup> , SO <sub>4</sub> <sup>-2</sup> , Cl <sup>-1</sup> , Cl <sub>2</sub> , ClO <sub>2</sub> , Oil (oil did slow response)
<b>pH Mode (HQ20 only):</b>	<i>Range:</i> -2.00 to 19.99 <i>Resolution (selectable):</i> 0.001/0.01/0.1 <i>Slope (meter allowable):</i> 48 to 565 mV/pH <i>Instrument drift:</i> <40µV/°C <i>Input impedance:</i> >1012 ohms <i>Input Bias current:</i> -1 picoamp E input bias E 1 picoamp at 25°C (77 °F); ± 4 picoamp over full range
<b>Millivolt Mode (HQ20 only):</b>	<i>Range:</i> -2000 to 2000 mV <i>Resolution:</i> 0.1 mV <i>Accuracy (meter only):</i> ± 0.2 mV or ± 0.15% of the reading, whichever is greater
<b>Probe Warranty:</b>	3 Years

<b>Sensor Warranty:</b>	1-year service life, plus 1-year storage life
<b>Instrument Warranty:</b>	3 Years
<b>Net Weight:</b>	<i>Instrument:</i> 0.86 lbs. (391g)
<b>Environmental Conditions:</b>	<i>Operation:</i> 32 to 122°F (0.0 to 50°C); 0 to 95% non-condensing relative humidity <i>Storage:</i> -4 to +140°F (-20 to +60°C); 0 to 95% non-condensing relative humidity
<b>Display:</b>	Graphic dot matrix LCD, 160x160 pixels with electroluminescent (EL) backlighting
<b>Power Requirements:</b>	<i>Docking Station:</i> 6-12 V dc; use Hach-supplied 115 or 230 V, 50/60 Hz external power with 330 mA output, 5.5-mm power plug with a 2.5 mm center post (positive). <i>Meter:</i> 4 AA alkaline batteries or power through the docking station
<b>Battery Life:</b>	20,000 to 40,000 measurements*
<b>Low Battery Indicator:</b>	Yes
<b>Meter Dimensions:</b>	21.2 x 8.7 x 4.2 cm (8.35 x 3.43 x 1.65 inches)
<b>Enclosure:</b>	Waterproof designed to meet IP67, chemical resistant, dust proof; meter will float; probe/meter connection requires drying out if wetted. Docking station is water-resistant to IP40.
<b>Installation Category:</b>	II (for 115 V and 230 V external power supplies)
<b>D.O. Calibration Methods:</b>	<i>Factory Cal:</i> Sensor calibration is downloaded from RS232 module to meter <i>Sample Cal:</i> Enter one sample value derived by laboratory analysis or comparison reading. <i>Air Cal:</i> For use when the sensor is calibrated in water saturated air.
<b>Meter Communication:</b>	<i>Inputs:</i> (1) 5-pin Hach LDO probe locking connector (HQ10 and HQ20) (1) 5-pin Hach pH/mV/temperature probe connector (HQ20 only) RS-232 via docking station <i>Output:</i> Internal datalogging and external printer/PC output through RS-232 docking station. User selectable intervals from 10-seconds to 30-minutes. User selectable durations from 15-minutes to 48-hours.
<b>Memory (non-volatile):</b>	All user settings and data are retained in non-volatile memory The meter stores 500 data records
<b>EMI/RFI Conformance:</b>	Exceeds U.S. and meets European standards for conducted and radiated emissions and immunity; certified CE compliant for applications as specified by EN 50081-1 for emissions and EN 50082-2 for immunity

\* Battery life is a function of use. Both models offer two modes of operation: continuous-read mode and push-to-read mode. Push-to-read mode, the meter's default setting, conserves power, as the red and blue LEDs (light emitting diodes) in the probe flash once for each measurement, and display the last measurement until the "read" button is pushed again. In continuous-read mode, the LEDs flash on and off quickly, and a new reading is displayed twice each second.



Be Right™

## HOW TO ORDER

51815-01 HQ10 portable meter with Hach LDO probe (1-meter probe cable)  
51815-03 HQ10 portable meter with Hach LDO probe (3-meter probe cable)  
51815-05 HQ10 portable meter with Hach LDO probe (5-meter probe cable)  
51815-15 HQ10 portable meter with Hach LDO probe (15-meter probe cable)

51825-01 HQ20 portable meter with Hach LDO probe (1-meter probe cable)  
51825-03 HQ20 portable meter with Hach LDO probe (3-meter probe cable)  
51825-05 HQ20 portable meter with Hach LDO probe (5-meter probe cable)  
51825-15 HQ20 portable meter with Hach LDO probe (15-meter probe cable)

51811-01 Replacement Hach LDO Probe (1-meter probe cable)  
51811-03 Replacement Hach LDO Probe (3-meter probe cable)  
51811-05 Replacement Hach LDO Probe (5-meter probe cable)  
51811-15 Replacement Hach LDO Probe (15-meter probe cable)

51812-00 Replacement Hach LDO Sensor Cap

51830-01 HQ10/HQ20 Docking Station, 115 V  
51830-02 HQ10/HQ20 Docking Station, 230 V

51917-00 Hard Case  
51904-00 Soft Case

51910-00 Pt. Series pH Electrode  
51935-00 Gel-filled pH Electrode  
51937-00 Pt. Series ORP Electrode  
51939-00 Gel-filled ORP Electrode



## WHY HACH?

### **Wastewater expertise and knowledge**

*Our experience in wastewater applications helps you tackle all the challenges in your plant. We have development teams focused specifically on the unique needs of wastewater treatment to deliver the best products for your money. Outstanding technical consultants will help you every step of the way. We're just a phone call away.*

### **Training opportunities**

*The Hach Technical Training Center (HTTC) is available to improve your knowledge. Choose from 14 different training classes, offered throughout the year, or design your own workshop based on your needs.*

### **Service and support**

*Hach offers the best warranty, service, and support programs in the business to keep you up and running.*

### **The new www.hach.com**

*Our new Web site was designed for you to quickly find solutions to your application needs, easily access technical documentation and information, and place your order online, anytime – fast and easy.*

Campbell Scientific (Canada) Corp.  
11564-149 Street, Edmonton, AB T5M 1W7  
tel 780.454.2505 fax 780.454.2655  
www.campbellsci.ca dataloggers@campbellsci.ca

*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](mailto:orders@hach.com)  
Website: [www.hach.com](http://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](mailto:intl@hach.com)  
Website: [www.hach.com](http://www.hach.com)

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

**HACH + LANGE** Europe  
Dr. Bruno Lange GmbH & Co. KG  
Willstätterstraße 11  
D-40549 Düsseldorf  
GERMANY  
Telephone: +49 (0) 211-5288-0  
Fax: +49 (0) 211-5288-143  
E-mail: [kundenservice@drlange.de](mailto:kundenservice@drlange.de)  
[www.drlange.com](http://www.drlange.com)



**Be Right™**