## How does Luminescent Dissolved Oxygen work?

The HACH LDO 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 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.
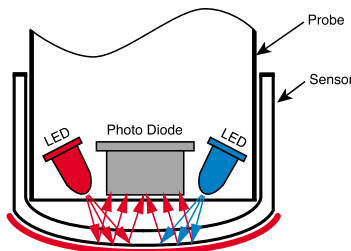


*LDO Flow Cell*

*New and improved Air Blast Head*

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-391 for details.

| Prod. No. | Description |
|---|---|
| **5790000** | HACH LDO® Dissolved Oxygen Probe |
| **5790001** | HACH LDO® Probe Class I, Div 2 |

ACCESSORIES
| | |
|---|---|
| **5867000** | Junction box for cable extensions |
| **5796000** | 25 ft. extension cable |
| **5796100** | 50 ft. extension cable |
| **5796200** | 100 ft. extension cable |
| **6190250** | LDO Air Blast head kit |
| **5795100** | Air Blast Cleaning System, 115 V |
| **5795200** | Air Blast Cleaning System, 230 V |
| **6170000** | High Output Air Blast Cleaning System, 115 V |
| **6170100** | High Output Air Blast Cleaning System, 230 V |
| **7300700** | LDO flow cell |

REPLACEMENT PARTS
| | |
|---|---|
| **5791100** | Replacement Sensor Cap |

MOUNTING KITS
| | |
|---|---|
| **5794400** | Pole Mount Kit |
| **5794300** | Ball Float Mount Kit |

**For more information, call to request Literature #2455, or visit www.hach.com**

### Primary Applications

• **Wastewater**        • **Industrial Water**        • **Drinking Water**

### Specifications*

**Measuring Range**
0 to 20.0 ppm,
0 to 20.0 mg/L,
0 to 200% saturation

**Sensitivity**
±0.5% of span

**Accuracy**
Measurement: ±0.2% of span
Temperature: ±0.2°C

**Repeatability**
±0.5% of span

**Response Time at 20ºC**
To 90% in less than 40 seconds
To 95% in less than 60 seconds

**Resolution**
Below 10 ppm:
±0.01 ppm or mg/L, ±0.1% saturation
Above 10 ppm:
±0.1 ppm or mg/L, ±0.1% saturation

**Interferences**
No interferences from the following: $H_2S$, pH, $K^{+1}$, $Na^{+1}$, $Mg^{+2}$, $Ca^{+2}$, $NH_4^{+1}$, $Al^{+3}$, $Pb^{+2}$, $Cd^{+2}$, $Zn^{+2}$, Cr (total), $Fe^{+2}$, $Fe^{+3}$, $Mn^{+2}$, $Cu^{+2}$, $Ni^{+2}$, $Co^{+2}$, $CN^{-1}$, $NO_3^{-1}$, $SO_4^{-2}$, $S^{-2}$, $PO_4^{+3}$, $Cl^{-1}$, anion active tensides, crude oils, or $Cl_2^{-1}$

**Operating Temperature**
0 to 50°C (32 to 122°F)

**Flow Rate**
None required

**Probe Immersion Depth and Pressure Limits**
107 m (350 ft.),
1050 kPa (150 psi), maximum

**Transmission Distance**
100 m (328 ft.) maximum
1000 m (3280 ft.) maximum when used with a termination box

**Sensor Cable (integral)**
10 m (33 ft.) terminated with quick-disconnect plug

**Wetted Materials**
Probe: Foamed Noryl® and 316 stainless steel
Sensor: Polybutyl methacrolate

**Dimensions**
60 x 292 mm (2.4 x 11.5 in.)

**Weight**
1.4 kg (3 lbs., 2 oz.)

**Warranties**
Probe: 3 Years; Sensor Cap: 1 Year

**Hazardous Location Ratings**
ETL listed (cETLus marked) to Canadian and US General Safety and Hazardous (Class I, Div. 2) Locations

*Noryl® is a registered trademark of General Electric Co.*

*\*Subject to change without notice.*

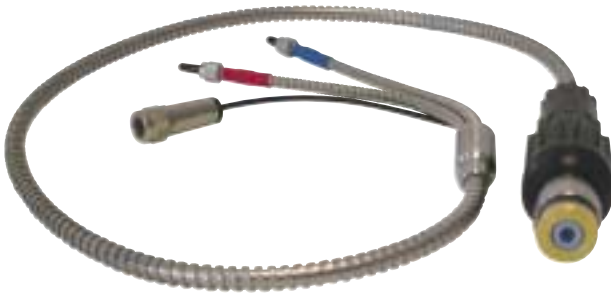*See page 151 for reagents, test kits, and accessories for measuring dissolved oxygen in the lab or field.*

# Dissolved Oxygen: G1100 Analyzer

## Trace oxygen monitoring in high purity water.

**NEW!**

- *First luminescent sensor for process ppb level oxygen monitoring*
- *No chemicals, membranes or electrolyte (<5 minutes annual service)*
- *Fully automatic in-situ calibration*
- *Perfectly suited for oxygenated treatment (OT) and all-volatile treatment (AVT), including plants working shifts: oxygen levels do not affect service intervals*

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.

*Ask About Our Service Programs*
*See page 15.*

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

| Prod. No. | Description |
| --- | --- |
| **41G1-W400** | **Hach Orbisphere luminescent oxygen analyzer-wall mount** <br> 1/4 inch sample inlet, 85-264 Vac, <br> 3 x 0/4-20mA analog output, RS485 |
| **41G1-P400** | **Hach Orbisphere luminescent oxygen analyzer-panel mount** <br> 1/4 inch sample inlet, 85-264 Vac, <br> 3 x 0/4-20mA analog output, RS485 |

ACCESSORIES

| | |
| --- | --- |
| **32963** | Wall Mount Kit |
| **32964** | Panel Mount Kit |
| **32972** | Pipe Mount Kit, for wall instrument |
| **32959** | Converter, RS232/RS-485, battery powered (batteries not included) |
| **32973** | PROFIBUS-DP Upgrade Kit, includes board and software key |
| **32534.03** | PROFIBUS-DP Cable, including SUB-D 9 female connector, 3 m |
| **32534.MM** | PROFIBUS-DP Cable, including SUB-D 9 female connector,(MM indicates length greater than 3 m) |

SPARE PARTS

| | |
| --- | --- |
| **32965** | Locking Key, for wall instruments |
| **32970** | Cap, to protect USB connector |
| **32966** | Power Supply Connector, 85 to 260 Vac |
| **32531.03** | Ethernet Cable, including connectors, 3 m |
| **32531.10** | Ethernet Cable, including connectors, 10 m |
| **32531.20** | Ethernet Cable, including connectors, 20 m |
| **32533.03** | USB Client Cable, including connectors, 3 m |
| **G1100-F6** | Complete Flow Chamber, for G1100 sensors, 6-mm fittings |

**For more information, call to request Literature #2574, or visit www.power.hach.com**

### Primary Applications

- **Pure Water/Power**
- **Industrial Water**

### 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

**Display Resolution**
1 ppb

**Ambient Temperature**
-5 to 50 °C (23 to 122 F)

**Sample Temperature**
5 to 45 °C (41 to 113 F)

**Sample Pressure/Flow Rate**
1 to 4 bar abs (14.5 to 58 psig)
50 to 500 ml/min

**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

**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

*\*Subject to change without notice.*

*See pages 27-52 for information on Hach laboratory and field LDO instruments.*

**800-227-4224**
*Outside the United States, call 970-669-3050*

## Replaceable membrane cartridge simplifies the task of installing new membranes.

- *Pre-installed, easy-to-replace membrane cartridge*
- *Rugged, foul-resistant, hydrophobic membrane withstands harsh environments*
- *Unique galvanic measurement technique*
- *Full-featured plug-and-play with sc100 or sc1000 Digital Controllers*
- *Self-cleaning air blast accessories available with or without an air compressor*
- *Versatile mounting hardware*
- *Complete encapsulation*

*Hach's galvanic membrane dissolved oxygen sensor has a replaceable membrane cartridge that simplifies the task of installing new membranes.*

| Prod. No. | Description |
|---|---|
| **5740D0B** | **5740 sc Galvanic DO Sensor** |
| | with 10 m (32.8 ft.) integral cable |

CONTROLLER

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-391 for details.

ACCESSORIES

| | |
|---|---|
| **5867000** | Termination Box, required for total cable lengths greater than 100 m (328 ft.) |
| **6122400** | Extension Cable, 1 m (3.3 ft.) |
| **5796000** | Extension Cable, 7.7 m (25 ft.) |
| **5796100** | Extension Cable, 15 m (50 ft.) |
| **5796200** | Extension Cable, 31 m (100 ft.) |
| **6136100** | Air Blast Cleaning System for 5740sc, 115 V |
| **6136200** | Air Blast Cleaning System for 5740sc, 230 V |

REPLACEMENT PARTS

| | |
|---|---|
| **6135200** | Replacement Cartridge |
| **276M1210** | Spare Calibration Bags |

MOUNTING KITS

| | |
|---|---|
| **6130800** | Pole Mount Kit |
| **6131000** | Ball Float Mount Kit |
| **6130900** | Economy Pole Mount Kit |
| **6136300** | Flow-through Union Mount Kit |

### Primary Applications

- **Wastewater**
- **Industrial Water**

### Specifications*

**Measuring Range**
0.0 to 40.00 ppm (0 to 40 mg/L) or 200% saturation

**Sensitivity**
±0.5% of span

**Accuracy**
Measurement: ±2% of span
Temperature: ±0.2°C

**Repeatability**
± 0.5% of span

**Response Time at 20ºC**
To 90% in 120 seconds

**Resolution**
Below 10 ppm:
±0.01 ppm or mg/L, ±0.1% saturation
Above 10 ppm:
±0.1 ppm or mg/L, ±0.1% saturation

**Operating Temperature**
-5 to 50ºC (23 to 122ºF)

**Flow Rate**
0.5 cm/s (0.016 ft./s), minimum

**Probe Immersion Depth and Pressure Limits**
107 m (350 ft.),
1000 kPa (145 psi), maximum

**Transmission Distance**
100 m (328 ft.) maximum
1000 m (3280 ft.) maximum when used with a termination box

**Sensor Cable (integral)**
10 m (33 ft.) terminated with quick-disconnect plug

**Wetted Materials**
Noryl® body, PVC mounting adapter, Viton® O-rings, polypropylene membrane, Noryl® and Ryton® cartridge assembly, and nylon cable grip/strain relief

**Electrode Materials**
Nickel-chrome cathode, lead anode

**Membrane Thickness**
40 µm

**Dimensions**
43.7 x 203.2 mm (1.72 x 8.00 in.)

**Weight**
0.26 kg (0.6 lbs.)

**Warranty**
1 year

*Noryl® is a registered trademark of General Electric Co.*
*Viton® is a registered trademark of E.I. Du Pont de Nemours + Co.*
*Ryton®is a registered trademark of Phillips 66 Co.*

*\*Subject to change without notice.*

**For more information, call to request Literature #2469, or visit www.hach.com**

*See page 151 for reagents, test kits, and accessories for measuring dissolved oxygen in the lab or field.*

Process Instruments

## DO$_2$ simplicity and performance.

### D4500 Instrument

- Simplified calibration
- Displays DO$_2$ in ppb or ppm
- Multiple outputs and relays

### Dissolved Oxygen Sensor

- Sensitivity range meets any need, from trace levels to super saturation
- Three-electrode polarographic design
- Guard ring electrode design improves speed of response and reduces interferences
- Rugged NEMA 4 /IP 68 P construction withstands harsh chemicals
- Installs in-line for process control, or in flow chamber for spot measurement

### System Technology

The sensor is constructed of two noble metal electrodes immersed in an electrolytic solution, separated from the sample by a gas-permeable membrane. A guard ring electrode surrounds the working electrode to shield against the influence of other gases and improve stability. Electrical potential is applied between the electrodes to reduce any oxygen that is driven through the membrane by a partial pressure gradient. The result is a proportional current, which is measured, scaled, displayed, and converted to analog and digital outputs.

To completely minimize maintenance and associated costs, the sensor can be provided as a part of Hach/Orbisphere's performance program, which provides an overnight replacement whenever a freshly serviced sensor is needed.

### Primary Applications

- Pure Water/Power
- Industrial Water

### Specifications*

**Accuracy**
±1% of reading or ±1.5 ppb, whichever is greater

**Drift of Sensitivity**
±0.5% per month, non-accumulative

**Speed of Response**
90% in approximately 30 seconds

**Measuring Range**
0 to 80 ppm

**Compensated Temperature Range**
0 to 50°C

**Display**
Backlit dot matrix LCD

**Relays**
Four SPDT

**Outputs**
Two isolated 0/4 –20 mA (user adjustable), and RS-232

**Temperature Compensation**
Automatic, 0 to 50°C (32 to 122°F)

**Power**
105 to 250 Vac, 50 to 60 Hz.

**EMI/RFI Immunity**
CE compliant

**Enclosure**
1/2 DIN NEMA 4X with hardware for panel, surface, and pipe mounting

**Membrane Thickness**
25 microns

**Flow Requirement, optimum**
100 mL/min through model 32001 flow chamber

**Maximum Pressure**
290 psi (20 bar)

**Weight**
1.8 kg (3.94 lbs.)

*Subject to change without notice.*

| Prod. No. | Description |
| --- | --- |
| D4500-SYS-R | **D4500 Instrument and Sensor** with Recharge Kit |
| D4500-SYS-SP | **D4500 Instrument and Sensor** with 1-year Sensor Service |

**For more information, call to request Literature #N310 or visit www.hach.com**

## Intelligent, reliable, and simple DO measurement.

- *Calibration just three times a year*
- *No need for regeneration; the sensor is simply replaced —in less than 5 minutes*
- *Unique, self-cleaning transmitter design*
- *Cleaning is done by wiping the sensor with a cloth —three times a year when calibrated*
- *Fish farming application available—call for details*

| Prod. No. | Description |
|---|---|
| **SYSTEM PACKAGES** | |
| **085G4000** | OXY System Package 1 Includes USC 6000, OXY 4100 DO Transmitter (Ball Float Style), OXY 1100 Membrane Cartridge, Mounting Bracket |
| **085G4001** | OXY System Package 2 Includes USC 5000, OXY 4100 DO Transmitter (Ball Float Style), OXY 1100 Membrane Cartridge, Mounting Bracket |
| | OXY System Package 3          Call for details OXY 4100 DO Transmitter (Ball Float Style) Must specify measurement range, OXY 1100 Membrane Cartridge, Mounting Bracket |

**REPLACEMENT TRANSMITTER**
Must specify range if not used with USC, call for details.

| | |
|---|---|
| **085G4064** | OXY 4100 DO Transmitter, Ball-Float Style 0-20ppm, 24 Vdc, 33ft Cable, 4-20 mA Hart Transmitter, DOES NOT INCLUDE MEMBRANE CARTRIDGE |

**USC (UNIVERSAL SIGNAL CONVERTOR)**
For all these, other options exist, call for details. USC 7000, up to 15 transmitter inputs, (4) 4-20 mA outputs, (5) relays.
USC 6000, (1) transmitter input, (2) 4-20 mA outputs, (3) relays.
USC 5000, (1) transmitter input, (1) 4-20 mA output

| | |
|---|---|
| **085G4146** | USC 7000 Nema 6, 110-230 Vac |
| **085G4130** | USC 7000 w/ PROFIBUS PA Nema 6, 110-230 Vac |
| **085G4131** | USC 7000 w/ PROFIBUS DP Nema 6, 110-230 Vac |
| **085G4140** | USC 6000 Nema 6, 110-230 Vac |
| **085G4145** | USC 5000 Nema 6, 110-230 Vac |
| **LP-SUN02** | Sun Shield for USC 304 SS |

**OPTIONAL TELECOMMUNICATIONS MODULE**
Call for details.

**MEMBRANE CARTRIDGE**

| | |
|---|---|
| **085G0022** | OXY 1100 Membrane Cartridge 50 μm Standard Single |
| **085G0026** | 5 Pack |
| **085G0027** | 10 Pack |
| **085G0021** | OXY 1100 Membrane Cartridge 25 μm (0-2 ppm) Single |
| **085G0024** | 5 Pack |
| **085G0025** | 10 Pack |
| **085G0023** | OXY 1100 Membrane Cartridge 125 μm (2-50 ppm) Single |
| **085G0029** | 5 Pack |
| **085G0030** | 10 Pack |
| **192LX020** | OXY 1100 Moisture Barrier Paste 5.3 Ounce Tube |

**MOUNTING BRACKET**

| | |
|---|---|
| **085G4085** | Universal Mounting to flat surface or pipe, holds 1.5" PVC or steel pipe to attach to transmitter, 316 SS |

**SPARE PARTS**

| | |
|---|---|
| **081B5013** | Spare Parts Kit for Mounting Bracket (2 U-bolts, 4 washers, 4 nuts) |
| **085G9735** | OXY 4100 Collar (holds ion-permeable membrane) |

**For more information, call to request Literature #2494, or visit www.hach.com**

### Primary Applications

- **Wastewater**

### Specifications*

**OXY 4100 and 4150 TRANSMITTERS**

**Measuring Range**
Dissolved oxygen: 0 to 10-500%, 0 to 0.1-50 mg/L or ppm, temperature: 0 to 70°C

**Measuring Uncertainty**
Oxygen: ±0.5% of full scale, temperature: ±0.5°C

**Current Outputs**
4-20 mA, (scalable by HART®) galvanic isolated. Max. load 750 ohm@ 30 Vdc

**Response Time**
50 μm: time = 22 s
25 μm: time = 7 s
125 μm: time = 110 s

**Cable**
10 & 50 meters
(2 x 0.75 mm$^2$ shielded cable)

**Enclosure Rating**
OXY 4100 TRANSMITTER:
IP 68 to IEC 529 (1 m)
OXY 4150 TRANSMITTER:
IP 68 to IEC 529 (10 m)

**Ambient Temperature**
Storage: -40 to 70°C
Operation:
  Air -40 to 60°C
  Medium 0 to 40°C

**Power Supply**
12-30 Vdc

**Automatic Calibration**
Compensating for temperature (pressure, salinity, and humidity by entering values using HART®)

**Approvals**
CE, C-tick
Emission: EN 50081
Immunity: EN 50081-1
Immunity: EN 61000-6-2

**Enclosure Material**
PBT/PC

**Weight/Size**
OXY 4100 TRANSMITTER:
2 kg/diameter: 240 mm
OXY 4150 TRANSMITTER:
1 kg/diameter: 50 mm, length: 180 mm

**OXY 1100 SENSOR**

**Principle**
Replaceable Clark sensor measuring dissolved oxygen. Typical life: 40,000 ppm-hours for the 50μm membrane cartridge (temperature dependent)

**Ambient Temperature**
Storage: 0 to 70°C
Operation: 0 to 50°C

**Material**
Membrane: 50 μm (25 μm, 125 μm) FEP Teflon®
Cathode: Gold, Anode: Silver, Electrolyte: KCl Weight 15 g

*\*Subject to change without notice.*

Process Instruments

## Detect changes before your customers do.

Ensure the health of your distribution system—build a distribution monitoring network for maximum surveillance capability.

- *Detect cross connection in real time*
- *Detect contamination events—intentional or accidental*
- *Stay alert to quality degradation due to water age*
- *Identify degradation in water quality due to biofouling*
- *Locate and monitor dead ends and low flow areas of the system*
- *Detect corrosion by-products, improve corrosion control*

- *Alert operators and managers to undesirable changes in water quality*
- *Reduce labor costs associated with time and travel to perform grab sampling*
- *Troubleshoot distribution system issues remotely*
- *Identify trends and adjust operation parameters more efficiently*
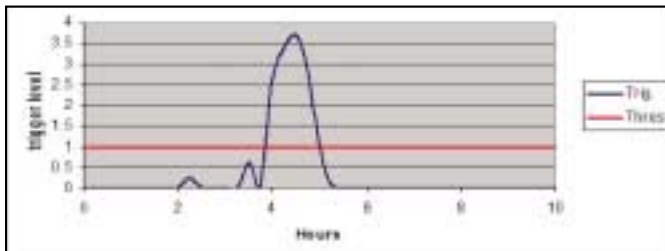


***Caustic Overfeed Event***

*This event occurred when a plant experienced an operational problem that resulted in the feed of excess caustic. This affected pH and conductivity of the water, causing the Event Monitor to alarm. Operators named the event, and the Event Monitor learned and stored it in the Plant Library, so that a recurrence of the event can be identified.*
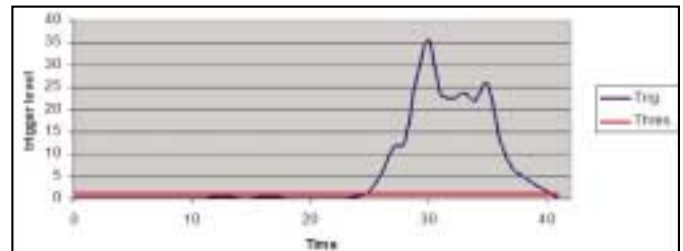


***Roadwork Event***

*Road work near a distribution line dislodged biomass and other particulate matter. This event illustrates the ability of the Event Monitor to detect and alarm on unanticipated events. This fingerprint for the materials adhering to the walls of the pipes in this location is automatically stored in the Plant Library.*
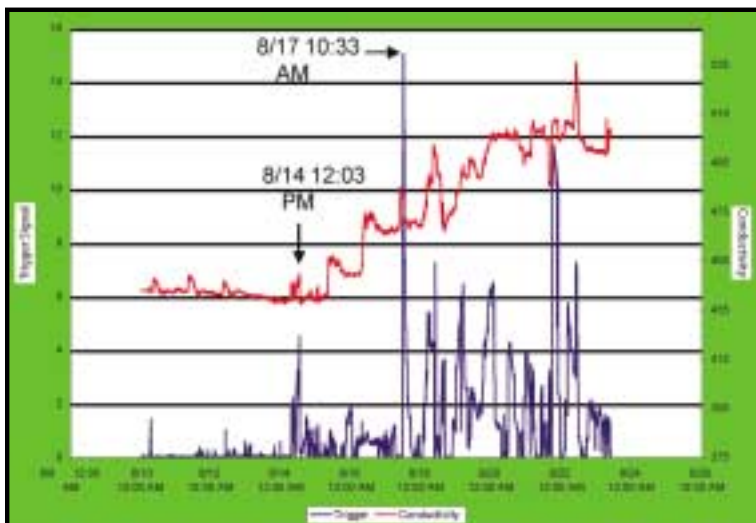


***Pipeburst Event***

*This graph depicts a 36-inch main break. GuardianBlue was 2 miles upstream and started to see significant deviations in water quality almost 3 full days before the catastrophic pipe break occurred.*

## Real-time analysis of data from Water Distribution Monitoring Panel and astroTOC UV On-line TOC Analyzer.

• *Alarm when water quality deviates from baseline*

• *Easily upgradable to the GuardianBlue® Early Warning System (See pages 492-501.)*

• *Profile and catalog events due to operational or catastrophic excursions*

• *Trigger signal shows current deviation from water quality baseline, real-time*

• *View trigger signal and all parameter measurements from the main screen*

• *Easily communicates with your SCADA system for centralized system surveillance*

• *Touch screen interface for fast and easy system navigation*

• *Patented technology*

The Event Monitor integrates multiple sensor outputs from the WDMPsc and the astroTOC UV TOC Analyzer. Every 60 seconds the system's patented algorithm analyzes deviations in five water quality parameters and uses the measurements to calculate a site's water quality baseline. The system alarms when the trigger signal exceeds a user-set threshold, indicating a water quality deviation from the system's normal operating baseline parameters.

| Prod. No. | Description |
|---|---|
| **6950000** | **Event Monitor Trigger System** |
| | Includes industrial computer with touchscreen interface mounted in a stainless steel enclosure, 115 Vac power, RS485 terminals for TOC analyzer and either WDMP or PipeSonde Probe, manual |

ACCESSORIES

| | |
|---|---|
| **120161** | Free-Standing Rack, wheeled |
| **69500EXW1** | One year extended warranty |
| **69500EXW2** | Two year extended warranty |
| **69500EXW3** | Three year extended warranty |

*For Water Distribution Monitoring Instrumentation, see Water Distribution Monitoring Panel pages 420-421, PipeSonde In-Pipe Probe page 503, Automatic Samplers page 502, and astroTOC UV On-line TOC Analyzer page 422.*

*The Event Monitor Trigger System can be easily upgraded to the GuardianBlue Early Warning System, see pages 492-501 for more info on the GuardianBlue system.*

**For more information, call to request Literature #2477, or visit www.hachhst.com**

### Specifications*

**Alarms**
Trigger Signal Alarm, High/Low Parameter Alarms, Frozen Parameter Alarm, Sensor Off-line Alarm; Plant Alarm; Missing Sensor; Invalid Data

**Power Requirements**
115 Vac, 100 W

**Operating Temperature**
5 to 40ºC

**Storage Temperature**
-20 to 65ºC

**Humidity**
95% at 40ºC max

**Environmental**
Industrial grade, splashproof, designed to IP62

**Communications**
RS-485 MODBUS®

**Dimensions**
18" high x 20" wide x 15.5" deep (46 x 51 x 39 cm)

**Weight**
65 lbs. (29 kg)

**Enclosure Material**
316 Stainless steel

**Mounting**
Wall mount or rack mount

**Display**
15" touch screen

**Certification**
Listed to UL 1010 by ETS

**Instrumentation**
Interfaces with Hach WDM Panel or Hach PipeSonde In-Pipe Probe; astroTOC UV On-line TOC Analyzer; Hach Sigma Portable, Refrigerated, or All-Weather Autosamplers

*\*Subject to change without notice.*

## Know the health of your water distribution system.



- *The right tool to establish your distribution system's water quality baseline*
- *Field proven instruments you can count on*
- *Multiparameter on-line panel includes pH, conductivity, chlorine (free or total) and turbidity, additional parameter optional*
- *Flexible system can be optimized with the Event Monitor Trigger System, On-line TOC Analyzer, Automatic Sampler, and ORP Probe*
- *Single sample inlet, outlet, and power hook-ups for ready-to-install convenience*

### The Right Tool to Establish Your Distribution System's Baseline

The initial step in knowing the health of your water distribution system is taking system vitals to establish a normal baseline at critical nodes, storage reservoirs, booster stations, pump stations, and other key monitoring points. The Water Distribution Monitoring Panel monitors the right combination of "indicator" parameters chosen by industry experts and recommended by the USEPA. In combination with the Hach Event Monitor™ Trigger System, you can now detect deviations from the baseline.

### Instruments You Can Count On, Each Ranked Top in Category

Reliability is critical for continuous, uninterrupted surveillance of your distribution system. Each instrument in the Water Distribution Monitoring Panel utilizes proven technology and provides readings with little or no time lag. All data is logged to the network controller and sent to the Event Monitor and SCADA or other remote locations



Ask About Our Service Programs
See page 15.

## What's on each WDMPsc and why.

Hach HST scientists chose commonly tested parameters and robust instrumentation.

### Chlorine- CL17 Chlorine Analyzer

Every 2.5 minutes the instrument obtains a sample, applies a DPD colorimetric method based on an approved USEPA method and gives either a free or total chlorine reading, depending on the reagent in use at the time. You want adequate chlorine residuals to provide a first defense against microorganism contamination, yet excess chlorine can form DBPs in the network.

### Turbidity- 1720E Turbidimeter

Continuously flowing sample enters the turbidimeter body and flows through a bubble trap designed to vent any entrained air bubbles from the sample stream. Turbidity is measured by directing a beam of light from the sensor assembly into the sample in the turbidimeter body and measuring the scatter light at 90 degrees with a photocell. The amount of light scattered is proportional to the amount of

turbidity in the sample. Corrosion products and biogrowth can elevate the turbidity level in the distribution system above that of the plant effluent. The "E" uses USEPA approved method 180.1.

### pH and Conductivity Probes from Hach/GLI

A patented differential pH measuring sensor provides information on the acid/base nature of the water. A two-electrode conductivity sensor measures the total ionic concentration in the water.

### Temperature

Temperature is measured to ensure the probes are measuring correctly and for other generic water quality information.

### Sample Pressure

The sample pressure is measured to ensure the sample going to the panel is within the specified range.

**HACH**
®
*Be Right™*

## Specifications*

### Hach Distribution Monitoring Panel

**sc1000 CONTROLLER**

**Dimensions**
22 x 51.5"

**SAMPLE REQUIREMENTS**

**Sample Inlet**
1/2" OD Tube Connection

**Sample Flow**
400-600 mL/min

**Sample Pressure**
20 - 125 psig

**Sample Operating Temperature**
5 to 40ºC

**Waste/Drain**
3/4" NPT Hose Barb Connection

**Waste/Drain Pressure**
ambient, free flowing

**Sampler Connection**
1/4" NPT on inlet manifold

**ELECTRICAL REQUIREMENTS**

**Line Voltage**
115 Vac / 60 Hz

**Power Consumption**
90 VA maximum for Cl17; 30 VA for others

**Digital Output**
RS 485 MODBUS

### Hach CL17 Chlorine Analyzer

**Range**
0 to 5 mg/L free or total residual chlorine

**Accuracy**
±5% or 0.035 mg/L as $Cl_2$, whichever is greater

**Precision**
±5% or 0.005 mg/L as $Cl_2$, whichever is greater

**Minimum Detection Limit**
0.035 mg/L

### Hach 1720E Turbidimeter

**Range**
0.01-100 Nephelometric Turbidity Units (NTU)

**Accuracy**
±2% of reading or ±0.015 NTU (whichever is greater) from 0 to 40 NTU; ±5% of reading from 40 to 100 NTU

**Displayed Resolution**
0.0001 NTU up to 9.9999 NTU; 0.001 NTU from 10.000 to 99.999 NTU

**Repeatability**
Better than ±1.0% of reading or ±0.002 NTU, whichever is greater

**Sample Flow Required**
200 to 750 mL/minute (3.1 to 11.9 gal/hour)

### Hach On-line pH Monitor

**Range**
0-14 pH

**Sensitivity**
Less than 0.005 pH

**Stability**
0.03 pH per 24 hours, non-cumulative

### Hach On-line Conductivity Monitor

**Range**
0-2000 µS/cm

**Accuracy**
±0.01 % of reading

**Stability**
0.05 % of span per 24 hours, non-cumulative

**Repeatability**
0.1% of span or better

**Temperature**
20 to 200ºC

### Pressure Sensor (Gems)

**Range**
0 - 150 psi

*Subject to change without notice.*

---

Hach's Water Distribution Monitoring Panels are shipped fully tested on a panel for wall mounting with a start-up kit and manual. The start-up kit includes reagents, and calibration standards for the CL17, 1720E, pH, and conductivity instruments. All panels include three flow meters, one Y-strainer, one pressure sensor, and one sample pressure regulator with gauge.

| Prod. No. | Description |
|---|---|
| **6846000** | **WDMP sc** Includes: sc1000 with Modbus Probe Module; sc1000 Display module; pH calibration buffers; Conductivity Reference Solution 1000 µs/cm, 100 mL, quantity 3; StablCAL 20 NTU, 1L for turbidity; Free Chlorine reagent set; Total Chlorine reagent set; Sulfuric Acid, 19.2 N, 100mL MDB (for CL17 cleaning); CL17 start-up kit and 10 feet each of inlet and drain tubing, hose clamp, beaker, and manuals. |
| **6846100** | **WDMP sc** Same as Prod. No. 6846000 above, within a NEMA 4X enclosure. |
| **6846200** | **WDMP sc Start-up Kit** Included with Prod. No. 6846000. Can be ordered separately if you require additional kits. Includes: CL17 reagents, calibrations, standards, and accessories for first month of operation. |
| **6846300** | **WDMP sc Maintenance Kit** Includes: all the necessary items to perform routine maintenance for the first six months. NOTE: You must order your chlorine reagent separately and specify Total Chlorine Reagent Set Prod. No. 2557000 or Free Chlorine Reagent Set Prod. No. 2556900. Chlorine reagents sets last one month. |

| Prod. No. | Description |
|---|---|
| MONTHLY REAGENTS REQUIRED FOR WDMPsc | |
| **2556900** | Free Chlorine Reagent Set |
| **2557000** | Total Chlorine Reagent Set |
| ACCESSORIES | |
| **6846400** | ORP Accessory Kit Includes: ORP sensor; 200mV buffer, 500 mL |
| **6846600** | Pressure Regulator Brings sample pressure down to 125 psi where the panel can safely use it, upward limit of 300 psi. |
| **6846700** | sc 1000 Controller Attachment Plate Allows sc1000 controller to be attached to the WDMP sc wheeled rack. |
| **6844600** | WDMP sc Mounting Rack, Wheeled |
| **6840000** | Probe Plug (extra) |
| SERVICE WARRANTIES | |
| **FSPWDMPbasic** | Field Service Partnership for Water Distribution Monitoring Panel |
| **FSPWDMPfull** | Field Service Partnership for full water quality system including the Event Monitor |
| **59800EXW1** | One-Year Extended Warranty |
| **59800EXW2** | Two-Year Extended Warranty |
| **59800EXW3** | Three-Year Extended Warranty |

**For more information, call to request Literature #2566, or visit www.hachhst.com**

*Find it here… Buy it today on www.hach.com*
U.S. customers only.

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**Process Instruments**

## Increases system sensitivity to organic chemicals in the distribution system.

- *Greatly enhances the detection and classification capabilities of GuardianBlue Early Warning System*

- *When combined with the Water Panel, the TOC Analyzer exponentially increases the system's sensitivity to organic chemicals, creating one of the industry's most unique and innovative early warning systems. Total organic carbon is a crucial part of the fingerprint structure.*

- *Combines chemical and ultraviolet oxidation techniques in a low-temperature reactor to deliver direct TOC measurements*

- *Uses a multi-staged UV oxidation reactor and a chemically impervious non-dispersive infrared (NDIR) $CO_2$ detector system, assuring full compliance with Standard Methods 5310 C and EPA method 415.1*

### One of Hach HST's most sophisticated water quality sensors

In the first analysis step, the sample is mixed with acid, converting the total inorganic carbon (TIC) into $CO_2$. The TIC sparger removes all the $CO_2$ from the sample solution. Subsequently, the TIC-free sample is mixed with sodium persulfate and routed through the UV reactor, oxidizing the TOC into $CO_2$.

The gas/liquid mixture is transported by the carrier gas into the gas-liquid separator (GLS), where the sample gas is separated and diverted into the NDIR detector for the direct, interference-free $CO_2$ measurement. The resulting $CO_2$ concentration measurement is directly proportional to the original TOC concentration found in the sample. The front panel displays the TOC concentration in mg/L.

---

### Specifications*

**Range**
0-25 mg/L

**Accuracy**
±2% of full scale at 25ºC

**Repeatability**
±2% of reading at 25ºC

**Minimum Detection Limit**
≤0.015 mg/L for 0-5 mg/L

**Response Time**
T90 ≤8 min.

**Serial Communication**
Multi-function RS-232 or RS-485 serial port (MODBUS®, CSV)

**Mounting**
Wall mount or optional rack mount

*\*Subject to change without notice.*

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TOC Analyzers with communication hardware to interface with Event Monitor Trigger System, WDM Panel, and PipeSonde In-pipe Probe. Includes one-month's supply of reagents, 2 UV lamps, view window, drain, and reagent level indicators.

| Prod. No. | Description |
|---|---|
| **H-6195-1030DS** | **WDM astroTOC UV** CRS enclosure, 0-25 mg/L (Recommended for use with the Event Monitor.) |
| ACCESSORIES | |
| **4300-0006** | Purge Gas Generator with compressor, 110V |
| **120161** | Free Standing Rack, wheeled |
| **FSP1950+** | Field Service Partnership for 1 year |

**For more information, call to request Literature #2573, or visit www.hachhst.com**

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*Be Right™*

**800-604-3493**
*Outside the United States, call 970-669-3050*

## Direct in-pipe installation in distribution system with redundant safety features.

- *Seven water quality parameters in one in-pipe probe*
- *Enhance monitoring with the Event Monitor™ Trigger System to identify excursions from baseline water quality*
- *Flexible system—sample port allows simple connection of an on-line TOC analyzer and automatic sampler*
- *Patented technology*

The PipeSonde in-pipe probe is designed to provide a monitoring solution in places where larger instrumentation is not practical—such as major interconnections, trunk mains, air vaults, river intakes, remote storage tanks and reservoirs. The PipeSonde in-pipe probe may be installed directly into an 8-inch or larger, pressurized pipe through an industry standard two-inch corporation stop. Redundant safety mechanisms and patented design ensure protection of personnel during installation and removal. Sensors are water- and debris-tight and warranted to 300 psig for reliable operation with minimal maintenance.

Connect the PipeSonde probe to the Event Monitor Trigger System and monitor deviations from your baseline water quality, helping you identify excursions from normal water quality. The PipeSonde probe allows you to expand water distribution system monitoring to every key point in your network. Installation in high velocity pipes is not recommended.

### Performance

|  | Range | Accuracy | Resolution |
|---|---|---|---|
| **pH** | 0 to 14 units | ±0.2 units | 0.01 units |
| **ORP** | -999 to 999 mV | ±20 mV | 1 mV |
| **Specific Conductance** | 0 to 100 mS/cm | ±0.001 mS/cm or ±1% of reading | 4 digits |
| **Dissolved Oxygen (LDO)** | 0 to 20 mg/L | ±0.1 mg/L | 0.01 mg/L |
| **Turbidity** | 0 to 100 NTU | ±5% of range | 0.1 NTU |
| **Line Pressure** | 0 to 300 psig | ±0.5 psi | 0.1 psi |
| **Temperature** | -5 to 50°C (23 to 122°F) | ±0.10°C | 0.01°C |

**Prod. No.**
**PS5BASE**
**PipeSonde In-Pipe Probe**
Sensors include: pH, Conductivity, Dissolved Oxygen (LDO), Turbidity, ORP, Line Pressure, and Temperature. Includes data/power cable, AC adapter, Hydras 3 software, maintenance kits, and manual

ACCESSORIES
**007196**
Hach Surveyor® 4a
Hand-held accessory used to quickly calibrate the PipeSonde probe, record and graphically display parameters and automatically store or upload more than 375,000 measurements

**007185**
PipeSonde data & power cable 10' in length with standard RS-232 connector and AC power adapter

**014610**
Flow Cell for PipeSonde

**007666**
Turbidity calibration cup for use with StablCal or Formazin

**5870000**
Chlorine Pocket Colorimeter II for Free and Total Chlorine
(range 0.02 - 2.00 / 0.1 - 8.00 mg/L)

**Prod. No.**
**FSPPS5**
Field Service Partnership for 1 year

CORPORATION STOPS KITS AND SEALS
*(2-inch corporation stop with a Teflon® seal is required for installation)*
**007175**
Corporation stop kit, NPT, Ford, and Teflon® seal
**007176**
Corporation stop kit, CC, Ford, and Teflon® seal
*Corporation stop Teflon® seals available separately.*

SAMPLER OPTIONS
**007182**
900 Max automatic sampler, portable 24 x 1 L bottles with interface hardware and regulator
**007183**
900 Max automatic sampler, refrigerated 24 x 1 L bottles with interface hardware and regulator
**007184**
900 Max automatic sampler, All-weather refrigerated 24 x 1 L bottles with interface hardware and regulator

TOC OPTION
Contact your regional sales representative for more information.

### Specifications*

**Material**
316 stainless steel body and insertion device, Teflon® corporation stop seal, Nitrile® o-rings

**Data Communications**
MODBUS®, RS-232, SDI-12, RS-485 or RS-422 with adapter

**Power Requirements**
120 Vac or external 12 Vdc power supplied via data cable, 12 Vdc battery (solar panel option available)

**Operating Temperature**
-5 to 50°C (23 to 122°F)

**Sampler or TOC Hook-ups**
Stainless steel sample port, 1/4" NPT

**Pressure Rating**
300 psig

**Dimensions**
540.6 mm (21.3") height above corporation stop
181 mm (7.2") diameter without handles
604 mm (23.8") diameter with handles
42.8 mm (1.7") diameter of inserted probe
140 mm (5.5") insertion depth of probe

**Weight**
30 lbs., without corporation stop

*Subject to change without notice.*

## Accurate flow measurement at an economical price.

- *For pipe sizes from 1/2 to 4 inches*
- *Non-magnetic sensing technique*
- *Variable frequency square wave signal*
- *Wide rangeability*
- *Superior low-velocity performance*
- *FDA-approved wetted materials*
- *For use with F53, F33 or PRO-F3 controllers/ transmitters*

### Principal of Operation

Hach's Impeller Flow sensors unique non-magnetic sensing technique is impervious to fouling from metal particles. The non-magnetic sensing technique reduces drag for superior low-flow and low-volume measurement accuracy.

The forward-swept, six-bladed impeller has significantly better low-flow, low-velocity characteristics than conventional four-bladed impellers to provide higher measuring accuracy.

### Economical and Practical

An F53 or F33 controller can independently monitor four sensors, making this system both economical and convenient to use.

| Prod. No. | Description |
|-----------|-------------|
| **F1A11A1T** | Polypropylene Sensor |
| **F1A11B2T** | PVDF Sensor |

**For more information, call to request Literature #G501 or visit www.hach.com**

| Mounting Tees | 1/2 inch | 3/4 inch | 1 inch | 1 inch (high flow) | 1 1/4 inch | 1 1/2 inch | 2 inch | 3 inch | 4 inch |
|---------------|----------|----------|--------|--------------------|-----------|-----------|--------|--------|--------|
| PVC tees | MHF15J2 | MHF15K2 | MHF15B2 | MHF15L2 | — | MHF15D2 | MHF15E2 | MHF15G2 | MHF15H2 |
| Cast bronze tees | — | — | MHF13B1 | — | MHF13C1 | MHF13D1 | — | — | — |
| PVDF tees | — | — | — | — | — | MHF16D2 | MHF16E2 | MHF16G2 | MHF16H2 |

*Mounting Tee Size*

### Specifications*

**PMODEL F1A11A1T POLYPROPYLENE SENSOR**

**Maximum Temperature**
| | |
|---|---|
| In PVC Tee | 140°F at 40 psi (60°C at 2.75 bar) |
| In Cast Bronze Tee | 176°F at 400 psi (80°C at 27.5 bar) |
| In PVDF Tee | 140°F at 40 psi (60°C at 2.75 bar) |

**Maximum Pressure**
| | |
|---|---|
| In PVC Tee | 100 psi at 77°F (6.9 bar at 25°C) |
| In Cast Bronze Tee | 400 psi at 176°F (27.5 bar at 80°C) |
| In PVDF Tee | 100 psi at 77°F (6.9 bar at 25°C) |
| Repeatability (in any tee) | ±0.5% of full scale |
| Linearity (in any tee | ±1% of full scale |

**Accuracy\*\***
| | |
|---|---|
| In PVC Tee | ±1% of full scale from 1 to 30 ft./sec. (0.3 to 9.0 m/sec.) |
| In Cast Bronze Tee | ±1% of full scale from 1 to 20 ft./sec. (0.3 to 6.0 m/sec.) |
| In PVDF Tee | ±1% of full scale from 1 to 30 ft./sec. (0.3 to 9.0 m/sec.) |

**Sensor Cable**
2 conductor (plus shield), 20 ft. (6 m)

**Wetted Materials**
Polypropylene body, Polypropylene impeller, TTZ (transformation toughened zirconia), ceramic shaft and EPR O-rings

**MODEL F1A11B2T PVDF SENSOR**

**Maximum Temperature**
| | |
|---|---|
| In PVC Tee | 140°F at 40 psi (60°C at 2.75 bar) |
| In Cast Bronze Tee | 176°F at 400 psi (80°C at 27.5 bar) |
| In PVDF Tee | 176°F at 40 psi (60°C at 2.75 bar) |

**Maximum Pressure**
| | |
|---|---|
| In PVC Tee | 100 psi at 77°F (6.9 bar at 25°C) |
| In Cast Bronze Tee | 400 psi at 176°F (27.5 bar at 80°C) |
| In PVDF Tee | 230 psi at 77°F (6.9 bar at 25°C) |
| Repeatability (in any tee) | ±0.5% of full scale |
| Linearity (in any tee | ±1% of full scale |

**Accuracy\*\***
| | |
|---|---|
| In PVC Tee | ±1% of full scale from 1 to 30 ft./sec. (0.3 to 9.0 m/sec.) |
| In Cast Bronze Tee | ±1% of full scale from 1 to 20 ft./sec. (0.3 to 6.0 m/sec.) |
| In PVDF Tee | ±1% of full scale from 1 to 30 ft./sec. (0.3 to 9.0 m/sec.) |

**Sensor Cable**
2 conductor (plus shield), 20 ft. (6 m)

**Wetted Materials**
PVDF body, PVDF impeller, TTZ (transformation toughened zirconia), ceramic shaft and Viton O-rings

*\*Subject to change without notice.*

*\*\*Accuracy is attained with at least 10 diameters of straight pipe upstream of sensor and at least 5 diameters of straight pipe downstream from sensor, and with full pipe flow.*

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**800-227-4224**
*Outside the United States, call 970-669-3050*

## Accurate flow measurement at an economical price.

- *For pipe sizes from 3 to 100 inches*
- *Non-magnetic sensing technique*
- *Variable frequency square wave output*
- *Wide rangeability*
- *Superior low-velocity performance*
- *Convenient pressurized line insertion*
- *Forward-swept, six-bladed impeller design*
- *For use with F53, F33 or PRO-F3 controllers/ transmitters*

### *Principal of Operation*

Offering the same six-bladed impeller design as the flow Tee-Mount sensors, but with pipe threads—or in a "Hot Tap" design. Pipe Thread flow sensors have a conventional adapter that threads easily into a standard 2-inch NPT pipe thread. For mounting into a pressurized or depressurized pipe, use a "Hot Tap" sensor model.

| Sensor | Material | Max. pressure | Mounting Tee Size | | |
| --- | --- | --- | --- | --- | --- |
| | | | 2 inch | 2 1/2 inch | 3-100 inches |
| F1A12C1T | Cast iron tee | 175 psi | MHF14E1 | MHF14F1 | Requires customer-supplied weldolet or pipe saddle for installation |
| F1A12D1T | Brass tee | 200 psi | MHF12E1 | MHF12F1 | Requires customer-supplied weldolet or pipe saddle for installation |
| | Cast iron tee | 175 psi | MHF14E1 | MHF14F1 | Requires customer-supplied weldolet or pipe saddle for installation |
| F1A13C1T | 316 SS | 200 psi | -- | -- | MHF21A0 (316 SS "hot tap" mounting assy. with 316 SS ball valve) |
| F1A13D1T | Brass | 200 psi | -- | -- | MHF22A0 (Brass "hot tap" mounting assy. with brass ball valve) |

| Prod. No. | Description |
| --- | --- |
| **F1A12C1T** | Pipe threaded 316 Stainless Steel Sensor |
| **F1A12D1T** | Pipe threaded Brass sensor |
| **F1A13C1T** | "Hot tap" 316 Stainless Steel sensor |
| **F1A13D1T** | "Hot tap" Brass sensor |

ACCESSORIES

| | |
| --- | --- |
| **F1-1001-101** | Repair kit for F1A11A1T flow sensor |
| **F1-1001-102** | Repair kit for F1A11B2T flow sensor |
| **F1-1001-103** | Repair kit for F1A12C1T, F1A12D1T, F1A13C1T, and F1A13D1T flow sensors |

*Each repair kit includes a new impeller, shaft and o-rings.*

### *Specifications**

**Maximum Temperature**
176°F at 40 psi (80°C at 2.75 bar)

**Maximum Pressure**
400 psi at 176°F (27.5 bar at 80°C)

**In PVDF Tee**
100 psi at 77°F (6.9 bar at 25°C)

**Repeatability (in any tee)**
±0.5% of full scale

**Linearity (in any tee)**
±1% of full scale

**Accuracy****
±1% of full scale from 1 to 30 ft./sec. (0.3 to 9.0 m/sec.)

**Sensor Cable**
2 conductor (plus shield), 20 ft. (6 m)

**Wetted Materials (Pipe Thread Sensors)**
316 stainless steel or brass sleeve over PVDF body, PVDF impeller, TTZ (transformation toughened zirconia), ceramic shaft, EPR O-rings, and 316 stainless steel or brass 2 inch NPT hex mounting adapter

**Wetted Materials ("Hot Tap" Sensors)**
316 stainless steel or brass sleeve over PVDF body, PVDF impeller, TTZ (transformation toughened zirconia), ceramic shaft, EPR O-rings, and 316 stainless steel or brass 2 inch NPT adapter

*\*Subject to change without notice.*

*\*\*Accuracy is attained with at least 10 diameters of straight pipe upstream of sensor and at least 5 diameters of straight pipe downstream from sensor, and with full pipe flow.*

**For more information,
visit www.hach.com**

# Fluoride: CA610™ Analyzer

## Accurate, cost-effective fluoride analysis.



*A patented electrode—with a molded replaceable lanthanum fluoride crystal tip— delivers an exceptionally long working life.*

- *Ion-selective electrode with patented,[†] replaceable tip*
- *Automatic calibration*
- *Temperature-controlled flow cell*
- *Rugged, lightweight enclosure*
- *Ultra-low reagent consumption*
- *Virtually immune to interferences*

[†]*U.S. Patent #5,393,402*

### Full-Time Assurance. Long-Term Affordability.

Using proven ion-selective electrode technology, Hach's CA610 Fluoride Analyzer provides continuous assurance that the fluoride concentration in your drinking water is correct. The CA610 also offers unmatched cost-efficiency and versatility. Reagent consumption is ultra-low. With a compact, self-contained design, the analyzer is ideal for monitoring in your plant or in remote locations.

### Dependable Technology. Practical Design.

The CA610 delivers accurate fluoride readings regardless of changes in a sample's ionic strength, pH, or temperature. It is virtually immune to interference. Hach's unique electrode—with a patented, replaceable tip—makes maintenance simple, infrequent, and inexpensive. There's no need to replace the entire electrode— only the fluoride crystal tip.

Hach CA610 Fluoride Analyzers are shipped with a one-month supply of reagents, installation kit, annual maintenance kit, and manual. The power cord is ordered separately.

| Prod. No. | Description |
|---|---|
| **5740001** | **CA610 Fluoride Analyzer** |
| **5740002** | **CA610 Fluoride Analyzer** with AquaTrend® Network Capability |

**ACCESSORIES**

| | |
|---|---|
| **5448800** | Power Cord with Strain Relief, 115 Vac, 10 A, 1.83 m (6') |
| **5448900** | Power Cord with Strain Relief, 230 Vac, 10 A, 1.83 m (6') |

**REPLACEMENT ITEMS**

| | |
|---|---|
| **2816900** | Reagent Set, CA610 Fluoride Analyzer Includes Reagent 1 TISAB, Standard 1, and Standard 2 |
| **5742100** | Maintenance Kit** |
| **5744400** | Pump Tubing Set |
| **5742700** | Instrument Tubing Set |
| **5744800** | Electrode Kit*** |

*\*\*Kit includes instrument and pump tubing sets (1-year supply), replacement filter screen, and spare fittings.*

*\*\*\*Kit includes ISE and pH electrodes, electrode tips, syringe, and inner fill solution.*

### Primary Applications

- **Drinking Water**
- **Industrial Water**

### Specifications*

**Range**
0.1 - 10 mg/L Fluoride

**Accuracy**
±10% or ±0.10 mg/L, whichever is greater

**Detection Limit**
0.10 ppm

**Cycle Time**
4.2 minutes

**Recorder Outputs**
One 4-20 mA, with output span programmable over any portion of the 0.1 to 10 mg/L range. 130 V isolation from earth ground

**Alarms**
Two alarms, selectable for sample concentration, system warning or system shutdown. Each alarm equipped with an SPDT relay with contacts rated for 5 A resistive load at 230 Vac.

**Optional External Outputs**
AquaTrend® Network interface

*\*Subject to change without notice.*

**For more information, call to request Literature #4540 or visit www.hach.com**

*See pages 152-153 for reagents, test kits, and accessories for measuring fluoride in the lab or field.*

**HACH**®
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**800-227-4224**
*Outside the United States, call 970-669-3050*

## Accurate, continuous hardness measurement.

- *Measures low-range hardness using EPA-approved calmagite chemistry*
- *Accurately and continuously measures up to two sample streams (requires sample sequencing kit)*
- *Operates unattended for one month*
- *Self-calibrating, self diagnostics*
- *Makes your water softening system more efficient and less costly*

### Industrial and Ultrapure Water Applications

The APA 6000 Hardness Analyzer can be used to monitor both influent and effluent in industrial applications and water treatment processes including demineralizer effluent, boiler feed-water, boiler water, and process water. It is also appropriate for monitoring hardness in ultrapure processes used by pharmaceutical, electronic chip, and cosmetics manufacturers.

### Primary Applications

- **Drinking Water**
- **Pure Water/Power**
- **Industrial Water**

Ask About Our Service Programs
See page 15.

Each analyzer includes an installation kit, one month's supply of reagents, a maintenance kit, a sample conditioning kit, an illustrated manual, and a quick reference card. Power cords must be ordered separately.

| Prod. No. | Description |
|---|---|
| **5100210** | **APA 6000™** **Low-Range Hardness Analyzer** 50 to 10,000 µg/L, with AquaTrend® |
| **6200010** | **APA 6000™** **High-Range Hardness Analyzer** 10 to 1,000 mg/L, with AquaTrend® |

ACCESSORIES

*Low-Range Hardness NOTE: both sets are required for operation.*

| | |
|---|---|
| **6001900** | Low-Range Hardness Reagent Set |
| **6002000** | Low-Range Hardness Standards Set |

*High-Range Hardness NOTE: both sets are required for operation.*

| | |
|---|---|
| **6002100** | High-Range Hardness Reagent Set |
| **6002200** | High-Range Hardness Standards Set |
| **5133900** | APA 6000 Micro Filter System, 115 V |
| **5133901** | APA 6000 Micro Filter System, 230 V |
| **4630600** | Power cord kit, 120 Vac |
| **4630800** | Power cord kit, 240 Vac |
| **6200900** | Sample Sequencing Kit |

**For more information, call to request Literature #1584 or visit www.hach.com**

### Specifications*

**LOW-RANGE ANALYZER**

**Range**
0.05 to 10 mg/L for hardness as calcium carbonate

**Accuracy**
±5 % of reading or ± 0.05 mg/L whichever is greater

**Repeatability**
±3% of reading or ± 0.03mg/L whichever is greater

**Response Time**
Less than 5 minutes for 90% response

**Cycle Time**
4 minutes

**HIGH-RANGE ANALYZER**

**Range**
10 to 1000 mg/l as $CaCO_3$

**Accuracy**
±5 % of reading or ± 2 mg/L $CaCO_3$ whichever is greater

**Repeatability**
±5% of reading or ±2 mg/L as $CaCO_3$, whichever is greater

**Response Time**
Less than 17 minutes for 90% response

**Cycle Time**
8.2 minutes

**APPLY TO BOTH ANALYZERS**

**Sample Temperature Range**
5 to 50ºC (41 to 122ºF)

**Sample Flow**
100 to 2000 mL/min. max.

**Inlet Pressure**
0.5 to 30.0 psig (0.03 to 2.04 bar)

**Drain Fitting**
3/4" NPT barbed hose fitting

**Outputs**
Two 4-20 mA outputs suitable for recorders or PID control. Output span programmable over any portion of the measuring range (130 Vac isolation from earth ground).

**Alarms**
Two SPDT relays with contacts rated for 5A resistive load at 230 Vac. Additional relays available with optional Signal Output Modules.

**Network Connectivity**
AquaTrend™ network, using the Lonworks® protocol

**Certification**
NRTL certified to UL and CSA standards and CE approved

**Power Requirements**
95-240 Vac, 50/60 Hz ± 2 Hz

**Enclosure**
NEMA-4X(indoor)/IEC 529 (IP66) with provision for air purge. Reagent enclosure is drip-proof.

**Dimensions**
21 x 25 x 21" (522 x 627 x 526 mm)

**Weight**
56 lbs (25.5 kg)

*\*Subject to change without notice.*

*See pages 155-157 for reagents, test kits, and accessories for measuring hardness in the lab or field.*

## Maximize your softener cycle time and minimize your regeneration cost.

- *Low Maintenance—operates unattended for two months*
- *Low reagent consumption*
- *Rugged, lightweight, and self-contained*
- *Operates unattended for two months*
- *Immediately signals hardness breakthrough to activate regeneration*
- *Makes your water softening system more efficient and less costly*
- *Reliable, simple, and accurate—with automated calibration*
- *Continuous monitoring in "real time"*

### Continuous Hardness Detection

The SP 510 detects hardness breakthrough when the capacity of the water softener is exhausted, immediately signaling the need for regeneration. Alarm points 0.3, 1, 2, 5, 10, 20, 50 and 100 ppm (expressed as mg/L of $CaCO_3$) are selected by choosing the corresponding Hach model. Easy-to-read LED indicators show a simple "HARD" or "SOFT" sample status. You can also use the SP 510's built-in alarm relay to actuate an external annunciator.

### Low Maintenance Requirements

The SP 510 samples water every two minutes, operating automatically for up to 60 days. Spend only about 15 minutes of your time every two months to replenish and standardize the reagents. Replace tubing in the pump system every six months.

### Convenient, Trouble-Free Operation

The SP 510 eliminates the guesswork, so your softener is regenerated only when needed. Regeneration based on calculation or set times can be replaced with continuous monitoring and automatic control.

### Primary Applications

- **Drinking Water**
- **Pure Water/Power**
- **Industrial Water**

### Specifications*

**Repeatability**
± 10% of set point value in 0.3-2 mg/L ranges
± 4% of set point value in 5-100 mg/L ranges

**Cycle Time**
2.0 minutes, average

**Output**
One SPDT relay

**Power**
115/230 Vac, 50/60 Hz, selectable

**Certification**
NRTL certified to UL and CSA standards, and CE approved

**Reagent Requirements**
1 each of indicator and buffer. Replenish every two months for continuous operation.

*Subject to change without notice.*

Includes a two-month supply of reagents, an installation kit, a maintenance kit, and an instruction manual. (Recorder output capabilities not available.) Note: Select the model with the alarm trip point 40 to 50 percent higher than your normal effluent hardness.

| Prod. No. | Alarm Trip Point |
|---|---|
| 5410003 | 0.3 mg/L |
| 5410001 | 1 mg/L |
| 5410002 | 2 mg/L |
| 5410005 | 5 mg/L |
| 5410010 | 10 mg/L |
| 5410020 | 20 mg/L |
| 5410050 | 50 mg/L |
| 5410099 | 100 mg/L |
| 5448800 | Power cord Kit with strain relief, 120 Vac |
| 5448900 | Power cord Kit with strain relief, 240 Vac |

**For more information, call to request Literature #1457 or visit www.hach.com**

*See pages 155-157 for reagents, test kits, and accessories for measuring hardness in the lab or field.*

HACH
Be Right™

**800-227-4224**
*Outside the United States, call 970-669-3050*

## A complete portfolio of level sensing products for your most demanding application needs.

Hach's wide selection of RF Level Sensors, Transmitters, and Controllers provide point level detection and continuous level monitoring in a wide variety of process applications.

### Level Analyzers

| | Model 13L | Model 16L | Model 690L |
|---|---|---|---|
| Order Free Literature | #G560 | #G559 | #G558 |
| Measurement Type | Single-point | Four-point | Continuous |
| Compatible Sensors | Integral sensor included | 4000L, 4100L, 4200L, 4300L & 4600L | 4000L, 4100L, 4200L, 4300L & 4600L |
| Power Requirements | 115, 230, 24 Vdc | 115, 230, 24 Vdc | 115, 230, 24 Vdc |
| 4-20 mA Output | | | • |
| Relays | One | Four | None |
| PID Output | | | |
| Certifications | CSA general purpose | CSA Class 1 & 2, Div 1 | CSA Class 1 & 2, FM - Div 1, SA - Div 2 |
| Enclosure | NEMA 4, 7, 9 | NEMA 4, 7, 9 | NEMA 4, 7, 9 |
| Display | | | |
| Integral Mounting | • | • | • |
| Remote Mounting | | | • |

### Level Sensors

| | 4000L-series | 4100L-series | 4200L-series | 4400L-series | 4500L-series | 4300L-series and 4600L-series |
|---|---|---|---|---|---|---|
| Order Free Literature | #G551 | #G552 | #G553 | #G555 | #G556 | #G554 |
| Application | General purpose | Heavy duty | Enhance performance | Driven Shield | Concentric Shield | Flexible Cable general purpose |
| Extruded insulation construction | • | • | • | | • | • |
| Chemically-resistant materials | • | • | • | • | • | |
| Safe, captive sensing element | • | • | • | • | • | |
| Sheath option | • | • | • | | | |
| Optional ground wire or ground rod | • | • | • | | | |
| Flange, cooling gland, and custom bend options | • | • | • | • | • | • |

NOTE: Sensors are built to order, and modifications cannot be performed in the field. Prior to placing an order, we encourage you to contact Hach at 800-227-4224 to recommend the best sensor suited for your application.

*Use Hach's sc1000 to control your level-process by bringing in 4-20 mA signal from the 690L transmitter.*

*Find it here... Buy it today on www.hach.com*
U.S. customers only.

HACH®
Be Right™

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**Process Instruments**

## Reliable and economical molybdate analysis.

**NEW!**

- *Uses fast, reliable, and economical catechol chemistry for up to 30 days of unattended operation*
- *No extensive maintenance and minimal use of reagents means low operating costs*
- *Manual or automatic feed pump control*
- *The instrument performs self-diagnostics on every cycle and will issue warnings or alarms when an issue is detected —making troubleshooting simple*
- *Cost-effective alternative to grab samples and lab testing*

### Ideal for Industrial Water Treatment Applications

The MO42 Molybdate Analyzer is ideal for industrial water treatment applications where it is necessary to continuously monitor and control the concentration of molybdate within specified levels— cooling towers and closed recirculating systems, such as hot water heating (boilers) and chilled water systems (coolers).

Molybdate compounds are used extensively in these areas as corrosion inhibitors or as tracer agents for the determination of concentrations of other treatment chemicals. It is important that the concentration of molybdate be maintained at the specified levels in order to balance the benefits of corrosion protection without the additional expenses of chemical overfeed.

The Hach MO42 Molybdate Analyzer is an effective alternative to laboratory methods for molybdate monitoring and allows for real time feed control.

### Primary Applications

- **Pure Water/Power**
- **Industrial Water**

### Specifications*

**Range**
0 to 5 mg/L as $Mo^{6+}$

**Accuracy**
±5% or ±0.05 mg/L as $Mo^{6+}$, whichever is greater

**Precision**
±3% or 0.03 mg/L as $Mo^{6+}$, whichever is greater

**Minimum Detection Limit**
0.03 mg/L

**Cycle Time**
2.5 minutes

**Operating Temperature**
5 to 40°C (41 to 104°F)

**Recorder Outputs**
One 4-20 mA with an output span programmable over any portion of the 0 to 5 mg/L range, 130 V isolation from earth ground, 500 ohm maximum

**Alarm Relay Outputs**
Two alarms selectable for sample concentration alarm, analyzer system warning, or analyzer system shut-down alarm.

**Shipping Weight**
11.3 kg (25 lbs.)
*Subject to change without notice.*

Hach MO42 Molybdate Analyzers include a one-month supply of reagents, maintenance kit, installation kit, and user manual. (Power cord sold separately.)

| Prod. No. | Description |
|---|---|
| **6180004** | **Hach MO42 Molybdate Analyzer** |

ACCESSORIES

| | |
|---|---|
| **5448800** | Power Cord; 125V, 10A, 1.83 m (6 ft.) |
| **5448900** | Power Cord; 230V, 10A, 1.83 m (6 ft.), continental European plug |
| **6181100** | Maintenance Kit; 1 year, includes tubing, caps, funnel, and fittings |
| **6181101** | Maintenance Kit with Preassembled Tubing; 1 year, includes tubing, caps, funnel, and fittings |
| **4643600** | Flow Meter; with 1/4-inch OD tubing |

REAGENTS

The Hach MO42 Molybdate Analyzer requires two (2) 500 mL bottles of reagent for a 30-day operating period.

| | |
|---|---|
| **2890549** | MO42 Reagent, 500 mL |

Service Plans available, call for latest pricing.

**For more information, call to request Literature #2589 or visit www.hach.com**

*See page 165 for reagents, test kits, and accessories for measuring molybdate in the lab or field.*

**HACH** ®
Be Right™

**800-227-4224**
*Outside the United States, call 970-669-3050*

## UV analysis—the reagent-free alternative.

- *UV absorption method—proven, continuous, and precise*
- *Eliminates reagents, sampling, and sample conditioning*
- *Self-cleaning sensor using built-in wiper*
- *Life-long factory calibration*
- *Full-featured plug-and-play with sc100 or sc1000 Digital Controllers*

### UV Analysis—Eliminates Reagents, Sampling, and Sample Conditioning

Using advanced ultraviolet (UV) absorption technology, Hach NITRATAX UV Nitrate Sensors offer unprecedented simplicity, accuracy, and economy in nitrate analysis.

### UV Absorption Method—Proven, Continuous, Precise

NITRATAX sensors rely on the principle that molecular bonds can absorb ultraviolet (UV) light—in this case, nitrate ($NO_3$) and nitrite ($NO_2$) absorb UV light. As the concentration of nitrate or nitrite increases, UV absorption also increases. A built-in photometer measures the absorbance, while a second beam of UV light provides a reference standard and corrects for interference caused by turbidity and organic matter.

### Primary Applications

- **Drinking Water**
- **Industrial Water**
- **Wastewater**
- **Environmental**

Ask About Our Service Programs
See page 15.

### Specifications*

| | NITRATAX plus sc | NITRATAX eco sc | NITRATAX clear sc |
|---|---|---|---|
| **Measuring Principal** | Reagent-free UV absorption with patented 2-beam technique (applies to all) | | |
| **Measuring Gap/Path Length** | 1, 2, and 5 mm | 1 mm | 5 mm |
| **Measuring Range $NO_{2+3}$-N** | 0.1 to 100.0 mg/L (1 mm) 0.1 to 50.0 mg/L (2 mm) 0.1 to 25.0 mg/L (5 mm) | 1.0 to 20.0 mg/L (1 mm) | 0.5 to 20.0 mg/L (5 mm) |
| **Detection Limits $NO_3$-N** | 0.1 to 100 mg/L | 1.0 to 20 mg/L | 0.5 to 20 mg/L |
| **Accuracy** | ± 3% of the mean ± 0.5 | ± 5% of the mean ± 1.0 | ± 5% of the mean ± 0.5 |
| **Resolution** | 0.1 mg/L | 0.5 mg/L | 0.1 mg/L |

*Subject to change without notice.*

### Prod. No.    Description

NITRATAX sc UV NITRATE ANALYZER SYSTEMS

**6139200    NITRATAX plus sc System**
includes sensor with 2 mm path length, mounting hardware, and sc100 controller

**6139500    NITRATAX plus sc System** includes
flow-through cell sensor with 2 mm path length, mounting hardware, and sc100 controller.

**6139400    NITRATAX eco sc System** includes
sensor with 1 mm path length, mounting hardware, and sc100 controller

**6139300    NITRATAX clear sc System** includes
sensor with 5 mm path length, mounting hardware, and sc100 controller

**6139600    NITRATAX clear sc System** includes
flow through cell sensor with 5 mm path length, mounting hardware, and sc100 controller

INDIVIDUAL NITRATAX sc UV NITRATE SENSORS
All sensors are equipped with 10 m (32.8 ft.) cable.

**LXV417.99.10002    NITRATAX plus sc Sensor**
1 mm path length

**LXV417.99.20002    NITRATAX plus sc Sensor**
2 mm path length

**LXV417.99.50002    NITRATAX plus sc Sensor**
5 mm path length

**LXV420.99.50002    NITRATAX clear sc Sensor**
5 mm path length

**LXV415.99.10002    NITRATAX eco sc Sensor**
1 mm path length

### CONTROLLER

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-391 for details.

### Prod. No.    Description

ACCESSORIES

**LZX414.00.10000    Mounting hardware for sensor**

**LZX869    Flow-through cell for NITRATAX** plus sc-sensors, 2 mm path length

**LZX867    Flow-through cell for NITRATAX** plus sc-sensors, 5 mm path length

**LZX866    Flow-through cell for NITRATAX** clear sc-sensors, 5 mm path length

**LZX961.54    Sun Shield, for sc100 controller**

**LCW825    Calibration standard 50 mg/L** (11.3 mg/L $NO_3$-N)

**LZX148    Spare wiper blades for 1 mm Nitratax, pk/5**

**LZX012    Spare wiper blades for 2 mm Nitratax, pk/5**

**LZX117    Spare wiper blades for 5 mm Nitratax, pk/5**

CABLE ACCESSORIES

**5867000    Junction box for extension cables**

**5796000    Extension cable, 7.6 m (25 ft.)**

**5796100    Extension cable, 15.2 m (50 ft.)**

**5796200    Extension cable, 30.5 m (100 ft.)**

**For more information, call to request Literature #2464 or visit www.hach.com**

*See pages 167-168 for reagents, test kits, and accessories for measuring nitrate in the lab or field.*

## Continuously protect plant treatment processes from high influent organic loads.



- *Continuous, automatic early warning systems*
- *Control activated sludge processes*
- *Self-cleaning wiper system*
- *Monitor efficiency of UV disinfection process*
- *Self diagnostics and easy maintenance*

*Ask About Our Service Programs*
*See page 15.*

### Primary Applications

- **Drinking Water**
- **Wastewater**
- **Industrial Water**

### Specifications*

**Measurement Technique**
UV absorption measurement
(2-beam technique), reagent-free

**Measurement Method**
SAC 254 in accordance with
DIN 38404 C3

**Measurement Path Length**
*UVAS sc Tank Sensors*
1, 2, 5 and 50 mm
*UVAS sc Bypass Sensors*
2, 5, and 50 mm

**Measurement Range**
*UVAS sc Tank Sensors*
Choice of:
0.01 to 60 m$^{-1}$ at 50 mm
0.1 to 600 m$^{-1}$ at 5 mm
0 to 1500 m$^{-1}$ at 2 mm
2 to 3000 m$^{-1}$ at 1 mm
*UVAS sc Bypass Sensors*
Choice of:
0.01 to 60 m$^{-1}$ at 50 mm
0.1 to 600 m$^{-1}$ at 5 mm
0 to 1500 m$^{-1}$ at 2 mm

**Compensation**
550 nm

**Measurement Interval (>= min)**
= 1 minute

**Sample Temperature**
2 to 40°C (35.6 to 104°F)

**Sample pH**
4.5 to 9 pH

**Probe Pressure Limit at Inlet**
*UVAS sc Tank Sensors*
0.5 bar (7.25 psi) maximum
*UVAS sc Bypass Sensors*
n/a

**Sample Flow Rate**
*UVAS sc Tank Sensors*
n/a
*UVAS sc Bypass Sensors*
0.5 L/hour minimum

**Sample Connection**
*UVAS sc Tank Sensors*
n/a
*UVAS sc Bypass Sensors*
4 mm ID/6 mm OD hose

**Cable Length**
10 to 120 m (32.8 to 393.7 ft.)

**Control Function**
PID, time control, 2-point controller
(with sc100 or sc1000)

**Inspection Interval**
6 months

**User Maintenance**
1 h / month, typical

**Dimensions**
70 x 333 mm
(2.75 x 13.11 in.) approximate

**Weight**
3.6 kg (7.9 lb.) approximate

*Subject to change without notice.*

### Principal of Operation

The Hach UVAS sc UV Absorbance / %Transmittance Sensor determines the Spectral Absorption Coefficient (SAC) at a wavelength of 254 nm. Measurements can be expressed in absorption units (m$^{-1}$), mE, AU, %T, %T/cm, mg/L, or ppm.

The following sensors include the Hach sc100 Multi-parameter Controller

| Prod. No. | Description |
|---|---|
| **6945000** | 1 mm UVAS sc sensor |
| **6945100** | 2 mm UVAS sc sensor |
| **6945200** | 5 mm UVAS sc sensor |
| **6945300** | 50 mm UVAS sc sensor |

UVAS sc SENSOR ONLY

| | |
|---|---|
| **LXV418.99.10002** | 1 mm UVAS sc sensor only |
| **LXV418.99.20002** | 2 mm UVAS sc sensor only |
| **LXV418.99.50002** | 5 mm UVAS sc sensor only |
| **LXV418.99.90002** | 50 mm UVAS sc sensor only |

CONTROLLER

This sensor requires a Hach sc100 or sc1000 Digital Controller.
See pages 388-391 for details.

BYPASS PANEL

| | |
|---|---|
| **LZX868** | Bypass Panel for 50 mm sensor |
| **LZX867** | Bypass Panel for 5 mm sensor |
| **LZX869** | Bypass Panel for 2 mm sensor |

MOUNTING HARDWARE

| | |
|---|---|
| **LZX414.00.10000** | Mounting Hardware with 90 degree adapter |

ACCESSORIES

| | |
|---|---|
| **LZX148** | Spare wiper blades for 1 mm UVAS sc, pk/5 |
| **LZX012** | Spare wiper blades for 2 mm UVAS sc, pk/5 |
| **LZX119** | Spare wiper blades for 50 mm UVAS sc, pk/5 |
| **LZX396** | Calibration Verification filter |

**For more information, call to request Literature #2485, or visit www.hach.com**

## Greater sensitivity in your feedwater.

- *3 electrode-controlled potential amperometry to ensure low signal drift*
- *High sensitivity*
- *Quick response time*
- *No moving parts or pumps*
- *Low reagent consumption*
- *Self-cleaning electrode*

### Low Drift

The Hach 9186 Oxygen Scavenger analyzer uses a three electrode amperometric cell which offers an excellent zero stability. The working electrode, counter electrode, and reference electrode allow this stability. The working electrode is self-cleaning by turning Teflon® beads. Calibrations are done via comparison method.

### Low Maintenance

No moving parts or pumps and insignificant signal drift make maintenance commonly less than 15 minutes per month.

### Self-Cleaning Electrodes

Teflon® beads, driven by sample flow, circulate on the surface of the platinum electrode to prevent deposits. This reduces maintenance costs and analyzer downtime.

The Hach 9186 Oxygen Scavenger Analyzer is shipped on a panel complete with controller, probe, cable, flow cell and all hardware necessary for installation.

| Prod. No. | Description |
|---|---|
| COMPLETE ANALYZER | |
| **19186=A=3011** | **Hach 9186 Oxygen Scavenger Analyzer** |
| **2834453** | Diisopropylamine, 99% 1L |
| ACCESSORIES | |
| **09186=C=0360** | Bottle cap adapter |
| **4630600** | Power cord 125V |
| **4630800** | Power cord 230V |
| REPLACEMENT PARTS | |
| **09186=A=8000** | Maintenance kit for 2 years** |

*\*\*Maintenance kit includes 6 filters, 1 reference electrode, 1 Venturi injection nozzle, 7 plastic beads, 2 meters of 4x 6mm PE tubing.*

### *Primary Applications*

- **Pure Water/Power**
- **Industrial Water**

### *Specifications\**

**Range**
5 - 500 µg/L Hydrazine
2 - 100 µg/L Carbohydrazide

**Repeatability**
$< \pm$ 2% of reading or $< \pm$ 1 µg/L $N_2H_4$ whichever is greater

**Response Time**
T90 approximately 60 seconds

**Service Intervals**
Every 4-5 weeks

**Analog Output**
Two 0/4-20 mA outputs, max. impedance 500 Ohms

**Operating Temperature Range**
5 to 45ºC (41 to 113ºF)

**Weight**
9.2 kg (20 lbs.)

*\*Subject to change without notice.*

*Process Instruments*

## Repeatable dissolved ozone measurements.



*Note: sc100 shown with optional mounting panel.*

- *Great for readings in low conductivity water with no interferences from oxidants or pH*
- *Reagentless analysis of ozone—ion-selective membrane separates electrolyte from sample water*
- *All-inclusive, pre-assembled panel reduces installation expenses*
- *Plug-and-play with digital controllers simplifies setup*
- *Integral temperature sensor provides more accurate readings*
- *Includes 2 years of typical maintenance parts*



*Optional acidification (for cleaning) and intermittent flow accessories link in series so they only take up one sensor port in the controller.*

| Prod. No. | Description |
|---|---|
| **6043300** | **9185 sc Ozone Sensor** Preassembled panel including Ozone probe with integral temperature and flow control, sc100 controller, and mounting panel for sc100 |
| **6043301** | Same as 6043300 but with MODBUS® RS485 output |
| **6043302** | Same as 6043300 but with MODBUS®RS232 output |

SENSOR ONLY

| | |
|---|---|
| **LXV433.99.00001** | 9185 sc Ozone Sensor |

CONTROLLER

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-391 for details.

ACCESSORIES

| | |
|---|---|
| **LZY051** | 9180 sc Acidification Unit Also used for cleaning |
| **LZY052** | 9180 sc Intermittent Flow |
| **LXY060** | Mounting panel for sc100 |

### Primary Applications

- **Drinking Water**
- **Wastewater**
- **Pure Water/Power**
- **Industrial Water**

### Specifications*

**Range**
0.005 ppm to 2 ppm  (0.005 mg/L to 2 mg/L)

**Accuracy**
±3% or ±10 ppb $O_3$ whichever is greater

**Cycle Time**
90% in T<90sec

*\*Subject to change without notice.*

**For more information, call to request Literature #2406, or visit www.hach.com**

*See page 172 for reagents, test kits, and accessories for measuring ozone in the lab or field.*

## Optimize your filter analysis.

- *Supports up to 32 size channels and 8 analog inputs (turbidity, pH, etc.)*
- *Operates stand-alone or as part of a networked system*
- *Volumetric—all particles pass through the sensing area*

For maximum flexibility in an on-line particle counter, the Model 2200 PCX is the most versatile counter available. The 2200 PCX offers serial connection to powerful software, simultaneous 4-20 mA SCADA serial connection, and serial connection to SCADA.

### Vista Software

For medium to large systems, up to to 32 sensors, Vista offers "intelligent monitoring." Intelligent monitoring minimizes total data stored, but maximizes useful information. Intelligent monitoring ensures that you capture critical information about filter-to-waste, impending filter breakthrough, or unexpected excursions. Vista is a high-performance package for Windows 2000/XP/Vista computers. Each provides clear tabular and graphical displays to assess plant performance with a glance.

### OPC Explorer Software

If you want a direct RS-485 connection between our particle counters and your SCADA system, use the 2200 PCX Explorer. It is an OLE for Process Control (OPC) driver for Microsoft® Windows® designed to easily connect particle counters to OPC clients (such as SCADA software or data loggers).

| Prod. No. | Description |
|---|---|
| **MODEL 2200 PCX PARTICLE COUNTER - 115V VERSION** | |
| **5705000** | **2200 PCX Particle Counter** with ANALOG with WATER WEIR |
| **5704000** | **2200 PCX Particle Counter** with WATER WEIR |
| **MODEL 2200 PCX PARTICLE COUNTER - 230V VERSION** | |
| **5705001** | **2200 PCX Particle Counter** with ANALOG with WATER WEIR |
| **5704001** | **2200 Particle Counter** with WATER WEIR |
| **MODEL PCT PARTICLE COUNTER TRANSMITTER** | |
| **5702000** | **PCT Particle Counter Transmitter** with 2 ANALOG OUT 115 Vac |
| **5702001** | **PCT Particle Transmitter** with 2 ANALOG OUT 230 Vac |
| **MODEL WGS 267 GRAB SAMPLING INSTRUMENT** | |
| **5703000** | WGS 267 Grab Sampling Instrument |
| **DATA ACQUISITION SOFTWARE - 2200 PCX** | |
| **5702500** | OPC Software - 2200 PCX |
| **DATA ACQUISITION SOFTWARE - WGS 267** | |
| **5700510** | PortAll Software |

**For more information, call to request Literature #4599, or visit www.hach.com**

### Primary Applications

- **Drinking Water**
- **Pure Water/Power**

### Specifications*

**Counting Range**
2-750 microns

**Flow Rate**
100 mL/minute

**Maximum Pressure**
65 psig, not more than 1 minute; 55 psig continuous

**Sample Time**
1 second to 24 hours

**Fluid Connections Inlet**
Barbed fitting with self-sealing quick disconnect for 1/4" O.D. tubing

**Fluid Connections Outlet**
Quick disconnect for 1/4" O.D. tubing

**Power**
100- 230 Vac; 50-60 Hz

**Dimensions**
13.8"H x 8.3"W x 7"D

*Subject to change without notice.*

## The smart choice for accurate, reliable, and dependable pH/ORP measurement.



*Hach Digital pHD sc sensors are available in convertible (PEEK® or Ryton®), insertion, and sanitary body styles. Three electrodes are used in these sensors to increase measurement accuracy and eliminate sensor ground loops.*



*Platinum ORP
(Gold ORP also available)*

*Wide range pH glass
(HF resistant glass also available)*



*By replacing the salt bridge and standard cell solution, Hach Differential Sensors can be regenerated for repeated use.*

### Primary Applications

- Drinking Water
- Industrial Water
- Wastewater
- Environmental
- Pure Water/Power
- Food and Beverage

### General Specifications*

**pH Range**
-2 to 14 pH

**Operating Temperature Range**
Analog Sensor:-5 to 105°C (23 to 221°F)
Digital Sensor: -5 to 70°C (23 to 158°F)

**Pressure Range**
0 to 6.9 bar (100 psi)

**ORP Range**
-1500 to +1500 mV

**Pressure Range**
0 to 6.9 bar (100 psi)

*\*Dependent on specific sensor and mounting.*

### Differential Electrode Measurement Technique

This field-proven technique uses three electrodes instead of the two used in conventional pH sensors. Process and reference electrodes measure the pH differentially with respect to a third ground electrode.

The result is unsurpassed measurement accuracy, reduced reference junction potential, and elimination of sensor ground loops. These sensors provide greater reliability, resulting in less downtime and maintenance.
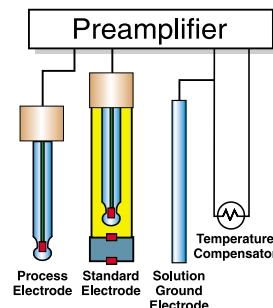


### Patented Technology

The former GLI, now a Hach Company brand, invented the Differential Electrode Technique for pH measurement in 1970. The pHD™ sensor series (U.S. Patent Number 6395158B1, dated May 28, 2002) takes this field-proven technology to a new level.

### Replaceable Salt Bridge/Protector

The unique, replaceable salt bridge holds an extraordinary volume of buffer to extend the working life of the sensor by protecting the reference electrode from harsh process conditions.

### Built-in Encapsulated Preamp

Encapsulated construction protects the sensor's built-in preamp from moisture and humidity, ensuring reliable sensor operation. The preamp in the pHD analog sensor produces a strong signal, enabling the sensor to be located up to 1000 m (3280 ft.) from the analyzer.

### Durable Body Materials

Both the digital and analog pH and ORP differential sensors feature a durable PEEK® body for chemical compatibility with most process solutions. For less aggressive solutions, Hach offers a Ryton® sensor in a convertible style for pH and ORP measurement. A sensor with a stainless steel body is available for immersion applications.

### Versatile Mounting Styles

Sensors are available in four mounting styles—convertible, insertion, immersion, and sanitary.

### Differential Sensor Warranty

Hach Company offers the best sensor warranty in the industry on its Differential Sensors. We will replace any Differential Sensor that fails due to defects in materials or workmanship within one year from the date of shipment—and up to 30 months on a prorated basis for any failure

*Available in analog or digital versions.*

**For more information, visit
www.hach.com/ProcesspHSensors**

*See pages 173-175 for reagents, test kits, and accessories for measuring pH in the lab or field.*