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.

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 20°C**:
  - 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:
  - H₂S, pH, K⁺, Na⁺, Mg²⁺, Ca²⁺, NH₄⁺, Al³⁺, Pb²⁺, Cu²⁺, Cr (total), Fe²⁺, Fe³⁺, Mn²⁺, Cu¹⁺, Ni⁺, NO₃⁻, SO₄²⁻, S²⁻, PO₄³⁻, Cl⁻
  - Anion active tensides, crude oils, or Cl₂⁻
- **Operating Temperature**: 0 to 50°C (32 to 122°F)
- **Flow Rate**: None required
- **Probes 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
- **Temperature Range**: 0 to 50°C (32 to 122°F)
- **Flow Rate**: None required
- **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.*

Primary Applications

- Wastewater
- Industrial Water
- Drinking Water

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

See pages 24-47 for information on Hach laboratory and field LDO instruments.
Dissolved Oxygen: M1100 Sensor

The M1100 Luminescent Dissolved Oxygen Sensor allows you to monitor oxygen in beer.

- Minimal drift and annual calibration
- Highly accurate ppb oxygen measurement
- Robust optical technology without membrane or electrolyte
- Low-cost upgrade package

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1100-S00</td>
<td>ORBISPHERE M1100, Luminescent Dissolved Oxygen Sensor (28mm)</td>
</tr>
<tr>
<td>M1100-S10</td>
<td>ORBISPHERE M1100, Luminescent Dissolved Oxygen Sensor (12 mm)</td>
</tr>
</tbody>
</table>

**Dissolved Oxygen: G1200 Sensor**

Confidence in results and analyzer performance in a radioactive environment.

- Service requirement limited to “spot” change every 12 months—minimal maintenance and operator intervention significantly reducing time spent in radioactive environment
- Fully automatic, traceable calibration—results can always be trusted so time can be focused on solving process issue not proving result
- Dry sensor with no membrane, no electrolyte and no use of chemicals—Accuracy and reliability are not operator dependent; specialists not required to calibrate or maintain
- Tested and approved in nuclear applications for primary circuit (2Gy cumulated)

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1200-300</td>
<td>ORBISPHERE G1200, O₂ Luminescent Sensor, Nuclear Version</td>
</tr>
<tr>
<td>51G1-P400</td>
<td>ORBISPHERE G1200, O₂ Luminescent Sensor + 510 controller panel mount/cables, Nuclear Certified</td>
</tr>
</tbody>
</table>

See page 157 for reagents, test kits, and accessories for measuring dissolved oxygen in the lab or field.
Dissolved Oxygen: A1100 EC Sensor

Electrochemical (EC) sensor for corrosion control, in-line beverage, and deaerated water applications.

- Sensor refurbishment in 3 minutes with pre-filled recharge cartridge*
- No zero drift or measurement drift (true zero sensor)—lower calibration frequency reduces TCO
- 0.1ppb accuracy and fast response time (T90=7.2s)—most accurate/responsive sensor available maximizes process understanding/control
- Long-life (non-consumable) sensor with 1 yr warranty + 6 monthly membrane change—reduced cost of ownership as sensors are not disposable

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1100-S00</td>
<td>ORBISPHERE A1100, O₂ Electrochemical (EC) Sensor</td>
</tr>
</tbody>
</table>

**Accuracy**

±1% of reading, or ± lower range, whichever is greater (Assuming correct calibration)

**Detection Range**

1 ppb-80 ppm (Dissolved O₂ measurement range)

**Temperature Range (during measurement)**

-5 to 95°C (23 to 203°F) –with a grille

**Pressure (resistance)**

Up to 100 bar (1450 psia)

**Response Time (T90 from air)**

38 sec.

*Subject to change without notice.

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5740D0B</td>
<td>5740 sc Galvanic DO Sensor with 10 m (32.8 ft.) integral cable</td>
</tr>
</tbody>
</table>

**CONTROLLER**

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-393 for details.

**Dissolved Oxygen: 5740 sc Sensor**

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

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1100-S00</td>
<td>ORBISPHERE A1100, O₂ Electrochemical (EC) Sensor</td>
</tr>
</tbody>
</table>

**Accuracy**

±1% of reading, or ± lower range, whichever is greater (Assuming correct calibration)

**Detection Range**

1 ppb-80 ppm (Dissolved O₂ measurement range)

**Temperature Range (during measurement)**

-5 to 95°C (23 to 203°F) –with a grille

**Pressure (resistance)**

Up to 100 bar (1450 psia)

**Response Time (T90 from air)**

38 sec.

*Subject to change without notice.

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5740D0B</td>
<td>5740 sc Galvanic DO Sensor with 10 m (32.8 ft.) integral cable</td>
</tr>
</tbody>
</table>

**CONTROLLER**

This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-393 for details.

**Accuracy**

±1% of reading, or ± lower range, whichever is greater (Assuming correct calibration)

**Detection Range**

1 ppb-80 ppm (Dissolved O₂ measurement range)

**Temperature Range (during measurement)**

-5 to 95°C (23 to 203°F) –with a grille

**Pressure (resistance)**

Up to 100 bar (1450 psia)

**Response Time (T90 from air)**

38 sec.

*Subject to change without notice.

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

See page 157 for reagents, test kits, and accessories for measuring dissolved oxygen in the lab or field.
**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 mm² 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: -40 to 70°C

**Power Supply**
12-30 Vdc

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

**Approvals**
CE, C-tick

**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.

**SYSTEM PACKAGES**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>085G4000</td>
<td>OXY System Package 1</td>
<td>$3,396.00</td>
</tr>
<tr>
<td></td>
<td>Includes USC 6000, OXY 4100 DO Transmitter (Ball Float Style), OXY 1100 Membrane Cartridge, Mounting Bracket</td>
<td></td>
</tr>
<tr>
<td>085G4001</td>
<td>OXY System Package 2</td>
<td>$2,876.00</td>
</tr>
<tr>
<td></td>
<td>Includes USC 5000, OXY 4100 DO Transmitter (Ball Float Style), OXY 1100 Membrane Cartridge, Mounting Bracket</td>
<td></td>
</tr>
<tr>
<td>085G4002</td>
<td>OXY System Package 3</td>
<td>Call for details</td>
</tr>
<tr>
<td></td>
<td>OXY 4100 DO Transmitter (Ball Float Style) Must specify measurement range, OXY 1100 Membrane Cartridge, Mounting Bracket</td>
<td></td>
</tr>
<tr>
<td>085G4064</td>
<td>OXY 4100 DO Transmitter, Ball-Float Style 0-20ppm, 24 Vdc, 33ft Cable, 4-20 mA Hart Transmitter, DOES NOT INCLUDE MEMBRANE CARTRIDGE</td>
<td>$1,752.00</td>
</tr>
<tr>
<td>085G4065</td>
<td>USC 7000, up to 15 transmitter inputs, (4) 4-20 mA outputs, (3) relays.</td>
<td></td>
</tr>
<tr>
<td>085G4066</td>
<td>USC 5000, (1) transmitter input, (1) 4-20 mA output</td>
<td></td>
</tr>
</tbody>
</table>

**REPLACEMENT TRANSMITTER**

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

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>085G4064</td>
<td>OXY 4100 DO Transmitter, Ball-Float Style 0-20ppm, 24 Vdc, 33ft Cable, 4-20 mA Hart Transmitter, DOES NOT INCLUDE MEMBRANE CARTRIDGE</td>
<td>$1,752.00</td>
</tr>
<tr>
<td>085G4065</td>
<td>USC 7000, up to 15 transmitter inputs, (4) 4-20 mA outputs, (3) relays.</td>
<td></td>
</tr>
<tr>
<td>085G4066</td>
<td>USC 5000, (1) transmitter input, (1) 4-20 mA output</td>
<td></td>
</tr>
</tbody>
</table>

**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, (3) relays.

**OPTIONAL TELECOMMUNICATIONS MODULE**

Call for details.

**MEMBRANE CARTRIDGE**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>085G0022</td>
<td>OXY 1100 Membrane Cartridge 50 µm Standard Single</td>
<td>$215.00</td>
</tr>
<tr>
<td>085G0026</td>
<td>5 Pack</td>
<td>$982.00</td>
</tr>
<tr>
<td>085G0027</td>
<td>10 Pack</td>
<td>$1,848.00</td>
</tr>
<tr>
<td>085G0024</td>
<td>OXY 1100 Membrane Cartridge 25 µm (0-2 ppm) Single</td>
<td>$215.00</td>
</tr>
<tr>
<td>085G0025</td>
<td>5 Pack</td>
<td>$982.00</td>
</tr>
<tr>
<td>085G0023</td>
<td>OXY 1100 Membrane Cartridge 125 µm (2-500 ppm) Single</td>
<td>$311.00</td>
</tr>
<tr>
<td>085G0029</td>
<td>5 Pack</td>
<td>$982.00</td>
</tr>
<tr>
<td>085G0030</td>
<td>10 Pack</td>
<td>$1,848.00</td>
</tr>
</tbody>
</table>

**MOUNTING BRACKET**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>085G4065</td>
<td>Universal Mounting to flat surface or pipe, holds 1.5” PVC or steel pipe to attach to transmitter, 316 SS</td>
<td></td>
</tr>
</tbody>
</table>

**SPARE PARTS**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>085G9735</td>
<td>OXY 4100 Collar (holds ion-permeable membrane)</td>
<td>$68.99</td>
</tr>
</tbody>
</table>

For more information, call to request Literature #2494, 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

See page 157 for reagents, test kits, and accessories for measuring dissolved oxygen in the lab or field.
Real-time analysis of data from Water Distribution Monitoring Panel and astroTOC UV On-line TOC Analyzer.

- Alarm when water quality deviates from baseline
- Simplified event detection for the Water Distribution Monitoring Panel (WDMpsc) and the Source Water Monitoring Panel (SWMP)
- Easily upgradeable to the GuardianBlue® Early Warning System (see pages 500-503)
- 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
- Touch screen interface for fast and easy system navigation
- Patented technology
- Hach CityGuard™ allows for remote access and control of your systems (see pages 496-497)

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.

**Specifications**

<table>
<thead>
<tr>
<th>Alarms</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger Signal Alarm, High/Low Parameter Alarms, Frozen Parameter Alarm, Sensor Off-line Alarm; Agent Alarm; Plant Alarm; Missing Sensor; Invalid Data</td>
<td>50 lbs. (23 kg)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Requirements</th>
<th>Enclosure Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-230 Vac</td>
<td>316 Stainless steel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 40°C</td>
<td>Wall mount or rack mount</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage Temperature</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20 to 65°C</td>
<td>15” touch screen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Humidity</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% at 40°C max</td>
<td>Listed to UL 1010 by ETS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Instrumentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial grade, meets Nema 4 and IP65 for indoor use</td>
<td>Interfaces with Hach WDM Panel or Source Water Monitoring Panel; astroTOC UV On-line TOC Analyzer; Hach Sigma Portable, Refrigerated, or All-Weather Autosamplers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-485 MODBUS®</td>
<td>21”(w) x 19.5”(h) x 7”(d)</td>
</tr>
<tr>
<td>(53cm x 50 cm x 18 cm)</td>
<td></td>
</tr>
</tbody>
</table>

For Water Distribution Monitoring Instrumentation, see Water Distribution Monitoring Panel pages 420-421, Automatic Samplers page 509, and astroTOC UV On-line TOC Analyzer page 461.

The Event Monitor Trigger System can be easily upgraded to the GuardianBlue Early Warning System, see pages 500-503 for more info on the GuardianBlue system.

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

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’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.

### Hach CL17 Chlorine Analyzer
- **Range**: 0 to 5 mg/L free or total residual chlorine
- **Accuracy**: ±5% or 0.035 mg/L as Cl₂, whichever is greater
- **Precision**: ±5% or 0.005 mg/L as Cl₂, 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

---

**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 - 100 psig
- **Sample Operating Temperature**: 5 to 40ºC
- **Waste/Drain 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

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6846000</td>
<td>WDMP sc</td>
</tr>
<tr>
<td>6846100</td>
<td>WDMP sc</td>
</tr>
<tr>
<td>6846200</td>
<td>WDMP sc</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

- **6846400**: ORP Accessory Kit
- **6846600**: Pressure Regulator
- **6846700**: Controller Attachment Plate
- **6846800**: Probe Plug (extra)

**SERVICE WARRANTIES**

- **FSPWDMPscbasic**: Field Service Partnership for Water Distribution Monitoring Panel
- **FSPWDMPscfull**: Field Service Partnership for full water quality system including the Event Monitor

**MONTHLY REAGENTS REQUIRED FOR WDMPsc**

- **2556900**: Free Chlorine Reagent Set
- **2557000**: Total Chlorine Reagent Set

For more information, call to request Literature #2566, or visit www.hachhst.com
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) CO₂ detector system, assuring full compliance with Standard Methods 5310 C and EPA method 415.1

One of Hach’s most sophisticated water quality sensors

In the first analysis step, the sample is mixed with acid, converting the total inorganic carbon (TIC) into CO₂. The TIC sparger removes all the CO₂ from the sample solution. Subsequently, the TIC-free sample is mixed with sodium persulfate and routed through the UV reactor, oxidizing the TOC into CO₂.

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 CO₂ measurement. The resulting CO₂ concentration measurement is directly proportional to the original TOC concentration found in the sample. The front panel displays the TOC concentration in mg/L.

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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-6195-1030DS</td>
<td>WDM astroTOC UV CRS enclosure, 0-25 mg/L (Recommended for use with the Event Monitor.)</td>
</tr>
<tr>
<td>8814000K</td>
<td>TOC IR Bench Calibration Gas, Nitrogen Zero</td>
</tr>
<tr>
<td>8814100K</td>
<td>TOC IR Bench Calibration Gas, Carbon Dioxide, 1000 PPM</td>
</tr>
<tr>
<td>8814300</td>
<td>Adjustable Regulator and Flowmeter Combo for 103L gases</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4300-0008</td>
<td>Purge Gas Generator with compressor, 110V</td>
</tr>
<tr>
<td>4300-0009</td>
<td>Purge Gas Generator with compressor, 230V</td>
</tr>
<tr>
<td>120161</td>
<td>Free Standing Rack, wheeled</td>
</tr>
</tbody>
</table>

**SERVICE WARRANTIES**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSP1950+</td>
<td>Field Service Partnership for 1 year</td>
</tr>
</tbody>
</table>

*Specifications*

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>0-25 mg/L</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±2% of full scale at 25°C</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>±2% of reading at 25°C</td>
</tr>
<tr>
<td><strong>Minimum Detection Limit</strong></td>
<td>≤0.015 mg/L for 0-5 mg/L</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>T90 ≤8 min.</td>
</tr>
<tr>
<td><strong>Serial Communication</strong></td>
<td>Multi-function RS-232 or RS-485 serial port (MODBUS®, CSV)</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>Wall mount or optional rack mount</td>
</tr>
</tbody>
</table>

*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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1A11A1T</td>
<td>Polypropylene Sensor</td>
<td>$399.00</td>
</tr>
<tr>
<td>F1A11B2T</td>
<td>PVDF Sensor</td>
<td>$499.00</td>
</tr>
</tbody>
</table>

**Specifications**

**MODEL F1A11A1T POLYPROPYLENE SENSOR**

<table>
<thead>
<tr>
<th>Maximum Temperature</th>
<th>In PVC Tee</th>
<th>140°F at 40 psi (60°C at 2.75 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Cast Bronze Tee</td>
<td>176°F at 400 psi (80°C at 27.5 bar)</td>
<td></td>
</tr>
<tr>
<td>In PVDF Tee</td>
<td>140°F at 40 psi (60°C at 2.75 bar)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Pressure</th>
<th>In PVC Tee</th>
<th>100 psi at 77°F (6.9 bar at 25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Cast Bronze Tee</td>
<td>400 psi at 176°F (27.5 bar at 80°C)</td>
<td></td>
</tr>
<tr>
<td>In PVDF Tee</td>
<td>100 psi at 77°F (6.9 bar at 25°C)</td>
<td></td>
</tr>
</tbody>
</table>

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.) |

**MODEL F1A11B2T PVDF SENSOR**

<table>
<thead>
<tr>
<th>Maximum Temperature</th>
<th>In PVC Tee</th>
<th>140°F at 40 psi (60°C at 2.75 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Cast Bronze Tee</td>
<td>176°F at 400 psi (80°C at 27.5 bar)</td>
<td></td>
</tr>
<tr>
<td>In PVDF Tee</td>
<td>140°F at 40 psi (60°C at 2.75 bar)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Pressure</th>
<th>In PVC Tee</th>
<th>100 psi at 77°F (6.9 bar at 25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Cast Bronze Tee</td>
<td>400 psi at 176°F (27.5 bar at 80°C)</td>
<td></td>
</tr>
<tr>
<td>In PVDF Tee</td>
<td>100 psi at 77°F (6.9 bar at 25°C)</td>
<td></td>
</tr>
</tbody>
</table>

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**

Polypropylene body, Polypropylene impeller, TTZ (transformation toughened zirconia), ceramic shaft and Viton O-rings

**Wetted Materials**

- Polypropylene body
- Polypropylene impeller
- TTZ (transformation toughened zirconia)
- Ceramic shaft
- 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.
Fluoride: CA610™ Analyzer

Accurate, cost-effective fluoride analysis.

- 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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5740001</td>
<td>CA610 Fluoride Analyzer</td>
<td>$5,448.00</td>
</tr>
<tr>
<td>5740002</td>
<td>CA610 Fluoride Analyzer with AquaTrend® Network Capability</td>
<td>$5,711.00</td>
</tr>
</tbody>
</table>

ACCESSORIES

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5448800</td>
<td>Power Cord with Strain Relief, 115 Vac, 10 A, 1.83 m (6')</td>
<td>$34.15</td>
</tr>
<tr>
<td>5448900</td>
<td>Power Cord with Strain Relief, 230 Vac, 10 A, 1.83 m (6')</td>
<td>$36.35</td>
</tr>
</tbody>
</table>

REPLACEMENT ITEMS

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2816900</td>
<td>Reagent Set, CA610 Fluoride Analyzer Includes Reagent 1 TISAB, Standard 1, and Standard 2</td>
<td>$63.09</td>
</tr>
<tr>
<td>5742100</td>
<td>Maintenance Kit**</td>
<td>$120.00</td>
</tr>
<tr>
<td>5744400</td>
<td>Pump Tubing Set</td>
<td>$31.50</td>
</tr>
<tr>
<td>5742700</td>
<td>Instrument Tubing Set</td>
<td>$57.10</td>
</tr>
<tr>
<td>5744800</td>
<td>Electrode Kit***</td>
<td>$735.00</td>
</tr>
</tbody>
</table>

**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.

See pages 158-159 for reagents, test kits, and accessories for measuring fluoride in the lab or field.
Hardness: APA 6000™ Analyzer

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.

### Specifications*

<table>
<thead>
<tr>
<th>LOW-RANGE ANALYZER</th>
<th>Range</th>
<th>0.05 to 10 mg/L for hardness as calcium carbonate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±5 % of reading or ± 0.05 mg/L whichever is greater</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±3% of reading or ± 0.03 mg/L whichever is greater</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Less than 5 minutes for 90% response</td>
<td></td>
</tr>
<tr>
<td>Cycle Time</td>
<td>4 minutes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HIGH-RANGE ANALYZER</th>
<th>Range</th>
<th>10 to 1,000 mg/L as CaCO₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±5 % of reading or ± 2 mg/L CaCO₃ whichever is greater</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±5% of reading or ±2 mg/L as CaCO₃ whichever is greater</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>Less than 17 minutes for 90% response</td>
<td></td>
</tr>
<tr>
<td>Cycle Time</td>
<td>8.2 minutes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPLY TO BOTH ANALYZERS</th>
<th>Sample Temperature Range</th>
<th>5 to 50°C (41 to 122°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample Flow</td>
<td>100 to 2000 mL/min. max.</td>
</tr>
<tr>
<td></td>
<td>Inlet Pressure</td>
<td>0.5 to 30.0 psig (0.03 to 2.04 bar)</td>
</tr>
<tr>
<td></td>
<td>Drain Fitting</td>
<td>3/4&quot; NPT barbed hose fitting</td>
</tr>
</tbody>
</table>

| 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). |
|                        | 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.

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

See pages 161-163 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 CaCO₃) 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.
Alarm Delay
2 consecutive cycles above set point activate alarm.
1 cycle below set point cancels alarm.
*Subject to change without notice.

See pages 161-163 for reagents, test kits, and accessories for measuring hardness in the lab or field.
Reliable and economical molybdate analysis.

- 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.

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

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6180004</td>
<td>Hach MO42 Molybdate Analyzer</td>
</tr>
</tbody>
</table>

ACCESSORIES

- 5448900  Power Cord; 125V, 10A, 1.83 m (6 ft.)
- 5448901  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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2890549</td>
<td>MO42 Reagent, 500 mL</td>
</tr>
</tbody>
</table>

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

See page 171 for reagents, test kits, and accessories for measuring molybdate in the lab or field.
Primary Applications

- Drinking Water

Speciation

Free and Total Ammonia (NH₃) and Monochloramine (NH₂Cl) as N. Also menu selectable to display as Cl₂.

Range

0.02 to 2 mg/L as N (0.1 to 10 mg/L as Cl₂)

Accuracy

± 5% of reading or ± 0.02 mg/L as N (0.1 mg/L as Cl₂), whichever is greater

Repeatability

± 3% of reading or ± 0.01 mg/L as N (0.05 mg/L as Cl₂), whichever is greater

Cycle Time

5.0 minutes per analysis for 1 sample stream (Optionally capable of sampling 2 streams—requires sample sequencing kit)

Alarms

Two SPDT alarm relays included; total of up to 14 programmable alarm relays (with optional Signal Output Modules)

Outputs

Two 4-20 mA outputs included; total of up to 14 programmable 4-20 mA outputs (with optional Signal Output Modules)

Network Connectivity

AquaTrend network using the LonWorks protocol

Compliance/Certification

UL, CSA and IEC safety standards, FCC & European RFI standards and European EMI standards

Dimensions

Approximately 522 x 627 x 527 mm (21" tall, 25" wide, 21" deep)

Enclosure

NEMA 4X (indoor)/IEC629 (IP66) with provision for air purge Reagent enclosure is drip-proof

Weight

25.5 kg (56 lbs.)

Power

95-240 Vac, 50/60 Hz

*Subject to change without notice.

Total chloramination control.

- Automatic operation—the system auto-calibrates, cleans, primes, and displays alarms on the front panel.
- Two-stream operation—optionally monitor up to two separate sample streams. The system completes one measurement per stream every 5 minutes.
- Flexible alarms and outputs—user-configured outputs include two 4-20mA analog outputs and two alarm relays. The analyzer can be expanded to 14 analog and/or relay outputs by adding additional Signal Output Modules.

Complete Confidence

The APA 6000 Ammonia/Monochloramine Analyzer was developed to meet the strict monitoring requirements of the Metropolitan Water District of Southern California—one of the largest water districts in the USA. It also meets your requirements for easy installation and continuous operation.

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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5500610</td>
<td>APA 6000 Ammonia and Monochloramine Analyzer with AquaTrend®</td>
</tr>
</tbody>
</table>

ACCESSORIES

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6001400</td>
<td>Ammonia/Monochloramine Reagent Set</td>
</tr>
<tr>
<td>6001500</td>
<td>Ammonia/Monochloramine Standards Set</td>
</tr>
</tbody>
</table>

NOTE: both sets are required for operation.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5133900</td>
<td>APA 6000 Micro Filter System, 115 V</td>
</tr>
<tr>
<td>5133901</td>
<td>APA 6000 Micro Filter System, 230 V</td>
</tr>
<tr>
<td>4630600</td>
<td>Power cord kit, 120 Vac</td>
</tr>
<tr>
<td>4630800</td>
<td>Power cord kit, 240 Vac</td>
</tr>
<tr>
<td>6200900</td>
<td>Sample Sequencing Kit</td>
</tr>
</tbody>
</table>

For more information, call to request Literature #1607, or visit www.hach.com

See page 134 for reagents, test kits, and accessories for measuring ammonia/monochloramine in the lab or field.
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 (NO₃⁻) and nitrite (NO₂⁻) 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.

Specifications*

<table>
<thead>
<tr>
<th>Measuring Principal</th>
<th>NITRATAX plus sc</th>
<th>NITRATAX eco sc</th>
<th>NITRATAX clear sc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring Gap/Path Length</td>
<td>1.2, and 5 mm</td>
<td>1 mm</td>
<td>5 mm</td>
</tr>
<tr>
<td>Measuring Range NO₂⁺³-N</td>
<td>0.1 to 100.0 mg/L (1 mm)</td>
<td>0.1 to 20.0 mg/L (1 mm)</td>
<td>0.5 to 20.0 mg/L (5 mm)</td>
</tr>
<tr>
<td>Detection Limits NO₃-N</td>
<td>0.1 to 100 mg/L</td>
<td>1.0 to 20 mg/L</td>
<td>0.5 to 20 mg/L</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 3% of the mean ± 0.5</td>
<td>± 5% of the mean ± 1.0</td>
<td>± 5% of the mean ± 0.5</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 mg/L</td>
<td>0.5 mg/L</td>
<td>0.1 mg/L</td>
</tr>
</tbody>
</table>

*Subject to change without notice.

Primary Applications

• Drinking Water
• Industrial Water
• Wastewater
• Environmental

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 388-393 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
LCW825 Calibration standard 50 mg/L (11.3 mg/L NO₃⁻-N)
LZX148 Spare wiper blades for 1 mm Nitratex, pk/5
LZX012 Spare wiper blades for 2 mm Nitratex, pk/5
LZX117 Spare wiper blades for 5 mm Nitratex, 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 page 173 for reagents, test kits, and accessories for measuring nitrate in the lab or field.
The easiest to maintain nitrate ISE sensor for continuous trending.

- **Improved Accuracy**—with the NEW CARTRICAL™ technology
- **Simplified Maintenance**—cartridge replacement in minutes
- **No Sample Preparation**—sensor immersion directly in aeration basin
- **Economical to Operate**—with continuous measurement and trending

**Principal of Operation:**
The Hach NO3D sc Nitrate Sensor uses an ion-selective electrode (ISE) to detect nitrate ions (NO₃⁻) directly in the aeration basin as nitrate nitrogen (NO₃-N). A differential electrode is used as the reference electrode for superior stability. The most probable interference is from chloride ions (Cl⁻) which is compensated through the use of an integrated chloride ISE to correct the nitrate value. Other interferences are further reduced using CARTRICAL technology, which calibrates each electrode individually and calibrates all three electrodes to each other. A temperature sensor is also included to improve accuracy.

**Specifications**

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LXV442.99.00002</td>
<td>NO3D sc Nitrate Sensor, includes 10 m (32.8 ft.) integral cable and a calibrated sensor cartridge</td>
</tr>
</tbody>
</table>

**CONTROLLER**
This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-393 for details.

**MOUNTING KITS**
- 6184900 Rail Mount Kit
- LZX914.99.12400 Chain Mount Kit

**ACCESSORIES**
- LZY331 Cleaning Unit
- 6860000 High Output Air Blast Cleaning Compressor, 115 Vac
- 6860100 High Output Air Blast Cleaning Compressor, 230 Vac

**REPLACEMENT PARTS**
- 6188401 Calibrated Sensor Cartridge
- 6188300 Test-Cartridge

*Subject to change without notice.

For more information, call to request Literature #2649, or visit www.hach.com

See page 173 for reagents, test kits, and accessories for measuring Nitrate in the lab or field.
Continuous oil–in–water monitoring for the right price.

- Probe design makes it the low price solution among competitive UV fluorescence instruments
- No tubes, pumps, or valves that can foul or require frequent maintenance
- Accurate online measurement reduces time-consuming laboratory testing
- Can detect polycyclic aromatic hydrocarbons (PAHs) from 1.2 ppb to up to 5000 ppb (µg/L) or mineral oils from 0.1 to 150 ppm (mg/L)
- UV fluorescence method makes it impervious to interferences by turbid water or natural organic matter (NOM)
- Available in stainless steel or titanium housing for measurement in the harshest of conditions
- Plug-and-play with Hach Digital Controllers

**Principle of Operation**

The FP 360 sc measures intensity of fluorescence light at a wavelength of 360 nm emitted by polycyclic aromatic hydrocarbons (PAH) after UV irradiation of the sample at 254 nm. Since PAHs are components of most mineral oils, the FP 360 sc can detect the presence of oil contamination in surface, process, or industrial waters. In addition, since the intensity of the emitted light is proportional to the PAHs concentration, the FP 360 sc can be calibrated to measure oil concentration in stable matrices.

**Specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Prod. No.</th>
<th>Measuring Range</th>
<th>Measurement Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel Without Cleaning Unit</td>
<td>LXV441.99.11102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
</tr>
<tr>
<td>Stainless Steel With Cleaning Unit</td>
<td>LXV441.99.11102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
</tr>
<tr>
<td>Stainless Steel Without Cleaning Unit</td>
<td>LXV441.99.11302</td>
<td>0–500 µg/L, 5 ft (1.5 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
</tr>
<tr>
<td>Stainless Steel With Cleaning Unit</td>
<td>LXV441.99.11302</td>
<td>0–500 µg/L, 5 ft (1.5 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
</tr>
<tr>
<td>Tungsten Without Cleaning Unit</td>
<td>LXV441.99.12102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
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<td>LXV441.99.12102</td>
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</tr>
<tr>
<td>Tungsten With Cleaning Unit</td>
<td>LXV441.99.12302</td>
<td>0–500 µg/L, 5 ft (1.5 m) cable</td>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
</tr>
</tbody>
</table>

**Primary Applications**

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

**Pro Model No.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Prod. No.</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel Without Cleaning Unit</td>
<td>LXV441.99.11102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
</tr>
<tr>
<td>Stainless Steel With Cleaning Unit</td>
<td>LXV441.99.11102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
</tr>
<tr>
<td>Stainless Steel Without Cleaning Unit</td>
<td>LXV441.99.11302</td>
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</tr>
<tr>
<td>Stainless Steel With Cleaning Unit</td>
<td>LXV441.99.11302</td>
<td>0–500 µg/L, 5 ft (1.5 m) cable</td>
</tr>
<tr>
<td>Tungsten Without Cleaning Unit</td>
<td>LXV441.99.12102</td>
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</tr>
<tr>
<td>Tungsten With Cleaning Unit</td>
<td>LXV441.99.12102</td>
<td>0–500 µg/L, 32.8 ft (10 m) cable</td>
</tr>
</tbody>
</table>

**Mounting Hardware**

- LZX914.99.11110 SS chain mounting set
- LZY669 Flow cell with mounting panel

**Accessories**

- LZX914.99.11110 SS chain mounting set
- LZY669 Flow cell with mounting panel

**Literature #2668 or visit www.hach.com**

For more information, call to request

**Specifications**

<table>
<thead>
<tr>
<th>Measurement Method</th>
<th>Reproducibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>UV fluorescence method for polycyclic aromatic hydrocarbons (PAH)</td>
<td>2.5% of measured value at constant temperature</td>
</tr>
</tbody>
</table>

**Response Time**

10 s (T90)

**Calibration**

Factory calibrated with UV fluorescence standard or process calibration with results of a grab sample analysis.

**Sample Temperature**

33.8 to 104°F or 1 to 40°C

**Pressure Range**

Max. 30 bar or 435 psia (measurement probe)

**Housing**

Stainless steel 316Ti (1.4571) or titanium

**Dimensions**

2.68" x 12.05" or 68 x 306 mm (D x H; without connector and suspension pin)

**Weight**

Stainless Steel: 6.2 lbs or 2.8 kg
Titanium: 4 lbs or 1.8 kg

**Resolution**

0.1 ppb (µg/L) (PAH) in the lowest measuring range

Limit of Detection (LOD) is 1.2 ppb (PAH)

**Subject to change without notice.**

The FP 360 sc is the only online oil–in–water instrument that delivers the highest sensitivity and selectivity with the lowest total cost of ownership.

Find it here... Buy it today on www.hach.com

U.S. customers only.

[Image of the product and technical specifications]
Organics: UVAS sc Sensor

Continuously protect plant treatment processes from high influent organic loads.

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

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.

Specifications*

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVAS sc UV ABSORBANCE/TRANSMITTANCE SYSTEM</td>
<td></td>
</tr>
<tr>
<td>The following systems include the Hach sc100 controller.</td>
<td></td>
</tr>
<tr>
<td>6945000 1 mm UVAS sc sensor</td>
<td>$15,954.00</td>
</tr>
<tr>
<td>6945100 2 mm UVAS sc sensor</td>
<td>$15,988.00</td>
</tr>
<tr>
<td>6945200 5 mm UVAS sc sensor</td>
<td>$15,954.00</td>
</tr>
<tr>
<td>6945300 50 mm UVAS sc sensor</td>
<td>$15,954.00</td>
</tr>
<tr>
<td>UVAS sc SENSOR ONLY</td>
<td></td>
</tr>
<tr>
<td>LXV418.99.10002 1 mm UVAS sc sensor only</td>
<td>$14,684.00</td>
</tr>
<tr>
<td>LXV418.99.20002 2 mm UVAS sc sensor only</td>
<td>$14,684.00</td>
</tr>
<tr>
<td>LXV418.99.50002 5 mm UVAS sc sensor only</td>
<td>$14,684.00</td>
</tr>
<tr>
<td>LXV418.99.90002 50 mm UVAS sc sensor only</td>
<td>$14,684.00</td>
</tr>
<tr>
<td>CONTROLLER</td>
<td></td>
</tr>
<tr>
<td>This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-393 for details.</td>
<td></td>
</tr>
<tr>
<td>LZX868 Bypass Panel for 50 mm sensor</td>
<td>$1,814.00</td>
</tr>
<tr>
<td>LZX867 Bypass Panel for 5 mm sensor</td>
<td>$1,934.00</td>
</tr>
<tr>
<td>LZX869 Bypass Panel for 2 mm sensor</td>
<td>$1,934.00</td>
</tr>
<tr>
<td>MOUNTING HARDWARE</td>
<td></td>
</tr>
<tr>
<td>LZX414.00.10000 Mounting Hardware with 90 degree adapter</td>
<td>$378.00</td>
</tr>
<tr>
<td>ACCESSORIES</td>
<td></td>
</tr>
<tr>
<td>LZX148 Spare wiper blades for 1 mm UVAS sc, pk/5</td>
<td>$402.00</td>
</tr>
<tr>
<td>LZX012 Spare wiper blades for 2 mm UVAS sc sensor</td>
<td>$188.00</td>
</tr>
<tr>
<td>LZX119 Spare wiper blades for 50 mm UVAS sc sensor</td>
<td>$99.55</td>
</tr>
<tr>
<td>LZX396 Calibration Verification filter</td>
<td>$97.60</td>
</tr>
</tbody>
</table>

*Subject to change without notice.

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.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19186=A=3011</td>
<td>Hach 9186 Oxygen Scavenger Analyzer</td>
</tr>
<tr>
<td>2834453</td>
<td>Diisopropylamine, 99% 1L</td>
</tr>
<tr>
<td>ACCESSORIES</td>
<td></td>
</tr>
<tr>
<td>09186=C=0360</td>
<td>Bottle cap adapter</td>
</tr>
<tr>
<td>4630600</td>
<td>Power cord 125V</td>
</tr>
<tr>
<td>4630800</td>
<td>Power cord 230V</td>
</tr>
<tr>
<td>REPLACEMENT PARTS</td>
<td></td>
</tr>
<tr>
<td>09186=A=8000</td>
<td>Maintenance kit for 2 years**</td>
</tr>
</tbody>
</table>

**Maintenance kit includes 6 filters, 1 reference electrode, 1 Venturi injection nozzle, 7 plastic beads, 2 meters of 4x6mm PE tubing.

Primary Applications
- Pure Water/Power
- Industrial Water

Specifications*

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

- **Repeatability**
  - < ± 2% of reading or < ± 1 µg/L N₂H₄ 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 45°C (41 to 113°F)

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

*Subject to change without notice.
Repeatable dissolved ozone measurements.

- 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

**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 O₃ whichever is greater

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

*Subject to change without notice.

**Prod. No.** | **Description**
--- | ---
**COMPLETE ANALYZERS**
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

**CONTROLLERS ONLY**
This sensor requires a Hach sc100 or sc1000 Digital Controller. See pages 388-393 for details.

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

For more information, call to request Literature #2407, or visit www.hach.com

See page 178 for reagents, test kits, and accessories for measuring ozone in the lab or field.
The NEW C1100 Ozone Sensor for bottled water, UPW pharmaceutical, and drinking water applications.

- Installs in-line to eliminate continual product loss
- Sensor refurbishment in under 5 minutes with pre-filled recharge cartridge
- Quick and easy air calibration
- Stainless steel body extends sensor life

Principle of Operation
The sensor is constructed of two metal electrodes, the noble working electrode, immersed in an electrolytic solution, and separated by a gas permeable membrane from the sample if interest. An auxiliary guard ring electrode surrounds the working electrode to shield against the influence of other gases and improve stability.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1100-T00</td>
<td>Electrochemical ozone sensor, Titanium version, Maximum pressure 100 bar, with Smart capability</td>
<td>$4,725.00</td>
</tr>
<tr>
<td>C1100-S00</td>
<td>Electrochemical ozone sensor, Stainless Steel version, Maximum pressure 40 bar, with Smart capability</td>
<td>$3,360.00</td>
</tr>
<tr>
<td>2956A-C</td>
<td>Recharge kit of 4 pre-filled cartridges with premounted 2956A membranes for C1100 ozone sensors. Includes o-rings, cotton filters, cleaning tools and dacrons</td>
<td>$295.00</td>
</tr>
</tbody>
</table>

Specifications*
- Measuring Range: 0 ppb–50 ppm O₃
- Accuracy: ±0.4 ppb or ±5% whichever is the greater
- Repeatability: ±0.4 ppb or ±5% whichever is the greater
- Pressure Rating:
  - Stainless Steel/Titanium: 40 bars / 100 bars
  - 580 psi / 1450 psi
- Limit of Detection: 0.6 ppb
- Response Time: 30 s
- Working Operating Range: -5 to 45°C
- Maximum Operating Range: -5 to 100°C
- Membrane: 2956A-C
- Typical Flow Rate: 350 mL/min

*Subject to change without notice.

For more information, call to request Literature #2680 or visit www.hach.com

See page 178 for reagents, test kits, and accessories for measuring ozone in the lab or field.
Particle Counting: 2200 PCX

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 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. Additionally, Vista Data Management software 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).

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.

Product Information

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5705000</td>
<td>MODEL 2200 PCX PARTICLE COUNTER - 115V VERSION</td>
</tr>
<tr>
<td>5704000</td>
<td>2200 PCX Particle Counter with ANALOG with WATER WEIR</td>
</tr>
<tr>
<td>5705001</td>
<td>2200 PCX Particle Counter with ANALOG with WATER WEIR</td>
</tr>
<tr>
<td>5704001</td>
<td>2200 Particle Counter with WATER WEIR</td>
</tr>
<tr>
<td>2084445-01</td>
<td>MODEL WGS 267 GRAB SAMPLING INSTRUMENT</td>
</tr>
<tr>
<td>5702500</td>
<td>DATA ACQUISITION SOFTWARE - 2200 PCX</td>
</tr>
<tr>
<td>5701525</td>
<td>Vista Software V1.3.1</td>
</tr>
<tr>
<td>5700510</td>
<td>DATA ACQUISITION SOFTWARE - WGS 267</td>
</tr>
</tbody>
</table>

For more information, call to request Literature #4599, or visit www.hach.com
The smart choice for accurate, reliable, and dependable pH/ORP measurement.

**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 pHDM 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 pHDM 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.

See next page for ordering information.

For more information, visit www.hach.com/ProcesspHSensors
pH/ORP: Differential Sensors

CONTROLLER REQUIRED
For information about Hach digital and analog controllers, see pages 388-398.

pH sc DIGITAL DIFFERENTIAL pH/ORP SENSORS
All digital sensors include built-in digital electronics and integral 10 m (33 ft.) cable terminated with connector for a digital controller. Body styles:
- Convertible – 1-inch NPT threads at both ends, designed for tee-mounting or other flow through mountings, and pipe mounting for immersion
- Insertion – no threads on the electrode end, designed for use with insertion valve assembly or flow-through cell
- Sanitary – 2-inch flange for a tri-clover style fitting
- Immersion – used with chain mounting or pipe mounting

pH Sensors

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Material</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPD1P1</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>DPD1P3</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>DPD2P1</td>
<td>PEEK</td>
<td>Insertion</td>
</tr>
<tr>
<td>DPD3P1</td>
<td>PEEK</td>
<td>Sanitary</td>
</tr>
<tr>
<td>DPD1R1</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>DPD1R3</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>DPS1</td>
<td>Stainless Steel</td>
<td>Immersion</td>
</tr>
</tbody>
</table>

ORP Sensors

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Material</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRD1P5</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>DRD1P6</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>DRD2P5</td>
<td>PEEK</td>
<td>Insertion</td>
</tr>
<tr>
<td>DRD1R5</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>DRD1R6</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>DRS5</td>
<td>Stainless Steel</td>
<td>Immersion</td>
</tr>
</tbody>
</table>

PHD sc ANALOG SENSORS

pH Sensors

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Material</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD1P1</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>PD1P3</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>PD2P1</td>
<td>PEEK</td>
<td>Insertion</td>
</tr>
<tr>
<td>PD3P1</td>
<td>PEEK</td>
<td>Sanitary</td>
</tr>
<tr>
<td>PD1R1</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>PD1R3</td>
<td>Ryton</td>
<td>Convertible</td>
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</table>

ORP Sensors

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Material</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD1P5</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>RD1P6</td>
<td>PEEK</td>
<td>Convertible</td>
</tr>
<tr>
<td>RD2P5</td>
<td>PEEK</td>
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</tr>
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<td>RD1R5</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
<tr>
<td>RD1R6</td>
<td>Ryton</td>
<td>Convertible</td>
</tr>
</tbody>
</table>

Digital Gateway

6120500 Use the Digital Gateway to connect pH analog sensors to a Hach digital controller.

pHD sc DIGITAL AND PHD ANALOG SENSOR ACCESSORIES

Cables
Extension cables are used only with digital sensors or digital gateways when connecting to a digital controller.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6122400</td>
<td>Digital Extension Cable, 1 m (3.2 ft.)</td>
</tr>
<tr>
<td>5796000</td>
<td>Digital Extension Cable, 7.7 m (25 ft.)</td>
</tr>
<tr>
<td>5796100</td>
<td>Digital Extension Cable, 15 m (50 ft.)</td>
</tr>
<tr>
<td>5796200</td>
<td>Digital Extension Cable, 31 m (100 ft.)</td>
</tr>
</tbody>
</table>

Interconnect cables are used only with analog sensors, junction box, and controller.

5867000 Digital Termination Box

Analog Junction Box
Required when the length of cable between the analog sensor and analog controller is greater than standard length of sensor cable.

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60A2053</td>
<td>Junction Box, Surface-mount, aluminum (includes mounting hardware)</td>
</tr>
<tr>
<td>60A9944</td>
<td>Junction Box, Pipe-mount, PVC (for 1/2-inch diameter pipe, includes mounting hardware)</td>
</tr>
<tr>
<td>60G2052</td>
<td>Junction Box, Pipe-mount, PVC (for 1-inch diameter pipe, includes mounting hardware)</td>
</tr>
<tr>
<td>76A4010-001</td>
<td>Junction Box, NEMA 4X (no mounting hardware included)</td>
</tr>
</tbody>
</table>

pHD sc Digital and pHD Analog Sensor Reagents and Standards

25M1A1025-115 Standard Cell Solution, to replenish standard cell chamber in pH sensors while replacing salt bridge, 500 mL

25M8A1002-101 Gel Powder, for >95°C applications, 2 g

pH Buffers

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>2283549</td>
<td>pH 7</td>
<td>500 mL (1 pint)</td>
</tr>
<tr>
<td>2283449</td>
<td>pH 4</td>
<td>500 mL (1 pint)</td>
</tr>
<tr>
<td>2283649</td>
<td>pH 10</td>
<td>500 mL (1 pint)</td>
</tr>
</tbody>
</table>

ORP Reference Solutions (in resealable plastic bottles)

<table>
<thead>
<tr>
<th>Prod. No.</th>
<th>Description</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>25M2A1001-115</td>
<td>200 mV</td>
<td>500 mL (1 pint)</td>
</tr>
<tr>
<td>25M2A1002-115</td>
<td>600 mV</td>
<td>500 mL (1 pint)</td>
</tr>
</tbody>
</table>

pH/ORP systems with Class I Division II safety classification are available—please contact your Hach representative.

For additional information and available mounting hardware options, call Hach or download product data sheet (Lit. #2467) from www.hach.com/ProcesspHSensors.

See pages 179-181 for reagents, test kits, and accessories for measuring pH in the lab or field.