



Orion Process Instruments

Providing high quality water analysis solutions

Orion Ionplus 2111LLEN Low-Level Sodium Monitor



Specifications

Range 0.001 ppb to 10 ppm
Resolution 1,2,3 or 4 significant digits
Accuracy $\pm 5\%$ or 0.01 ppb - whichever is greater

Response Time

95% within 2 minutes

Units Displayed

ppb, ppm, temperature, mV

Sample Conditions

Temperature 5 - 45°C
Total Acidity Less than 50 ppm CaCO₃
Inlet Pressure 8 - 100 psig

Display

Flow Rate 40 mL/min nominal
Custom backlit LCD Patent pending Menu Driven instructional display

Outputs

2 selectable galvanically isolated at either 0 - 20 mA or 4 - 20 mA, 3 - Relay outputs

Environmental Conditions

Ambient Operating Temp. 5 - 45°C
Relative Humidity 5 - 95% Non condensing
Waterproof Electrical Enclosure IP 66 & NEMA4X
Flow Rate 40 mL/min nominal set by pressure regulator 1/4" NPTF tube fitting

Physical Size

65 x 45 x 27 cm (26 x 17 x 11 in) (Fits on 1811EL panel mounting footprint)

Weight

Power Input

22.7 kg (50 lbs)
85 - 132 V; 100 mA
170 - 264 V; 200mA
50 - 60 hz

Orion 2109XP Fluoride Monitor



Specific Ion Measurements Range: 10 ppb to 200 ppm
Resolution: 1, 2, 3 digits
Accuracy (with DKA cal): $\pm 10\%$ or 10 ppb - whichever is greater
Reagent: Formic Acid

Response Time Reach 95% of final reading within 2 minutes of injecting a standard solution

Units Displayed ppb, ppm (auto ranging)

mV Measurement Range: ± 1999.9 mV
Resolution: 0.1 mV
Relative accuracy: $\pm (0.5\text{mV} + 0.1\%)$

Orion 2110XP Ammonia Monitor



Specific Ion Measurements Range: 0 to 10 ppm
Resolution: 2, 3 or 4 digits
Accuracy (with DKA cal): $\pm 5\%$ or 0.03 ppm - whichever is greater at 20°C and 35°C
Interferences: Level of interfering ions causing a 10% error at 0.5 ppm NH_4^+ :
K⁺ 0.5 ppm
Na⁺ 30 ppm
Ca²⁺ 600 ppm
Reagent: Acetic acid reagent

Response Time Initial response within 15 sec, reach 90% of reading within 1 min of injecting a standard solution

Units Displayed ppb, ppm (auto ranging), mV, temperature

Orion 2111XP Sodium Monitor



2111XA - Ammonia Application Package:
Reagent: Ammonia
Range: 0.30 ppb - 200ppm
Resolution: 1, 2, 3 digits
Accuracy (with DKA cal): $\pm 5\%$ or 0.3 ppb

2111XD - DIPA Application Package:
Reagent: Diisopropylamine
Range: 0.10 ppb - 10ppm
Resolution: 1, 2, 3 digits
Accuracy (with DKA cal): $\pm 5\%$ or 0.1 ppb

2111XC - Cation / High Acid Application Package:
Reagent: Ammonia
Range: 1.0 ppb - 200 ppm
Resolution: 1, 2, 3 digits
Accuracy (with DKA cal): $\pm 5\%$ or 2 ppb

Orion 2117XP Chloride Monitor



Specific Ion Measurements Range: 0.1 ppm to 100 ppm
Resolution: 2, 3 or 4 digits
Accuracy (with DKA cal): ± 0.1 ppm or 10% - whichever is greater
Reagent: Formic Acid

Response Time Reach 95% of final reading within 2 minutes of injecting a standard solution

Units Displayed ppb, ppm (auto ranging)

mV Measurement Range: ± 1999.9 mV
Resolution: 0.1 mV
Relative accuracy: $\pm (0.5\text{mV} + 0.1\%)$

Orion 2118XP Oxygen Scavenger Monitor



Specific Ion Measurements Range: Hydrazine: 0 ppb - 200 ppb
ELIMIN-OX®: 0 ppb - 1000 ppb
Resolution: 2, 3 or 4 digits
Accuracy (with DKA cal): Oxygen Scavenger: $\pm 5\%$ or 2 ppb
ELIMIN-OX®: $\pm 5\%$ or 30 ppb
Reagent: Iodide Reagent

Response Time Reach 90% of reading within 1 minute of injecting a standard solution

Units Displayed ppb, ppm (auto ranging), mV, temperature

mV Measurement Range: ± 1999.9 mV
Resolution: 0.1 mV
Relative accuracy: $\pm (0.5\text{mV} + 0.1\%)$

Orion 2120XP Calcium Hardness Monitor



Specific Ion Measurements Range: 25 ppb to 500 ppm
Resolution: 1, 2, 3 digits
Accuracy (with DKA cal): $\pm 10\%$ or 10 ppb - CaCO_3 whichever is greater
Reagent: Formic Acid

Response Time Reach 95% of final reading within 2 minutes of injecting a standard solution

Units Displayed ppb, ppm (auto ranging)

mV Measurement Range: ± 1999.9 mV
Resolution: 0.1 mV
Relative accuracy: $\pm (0.5\text{mV} + 0.1\%)$



1816D0 Dissolved Oxygen Monitor

Measuring Range : 0.1 ppb-300 ppb dissolved oxygen
Calibration Range : 0-10 ppm oxygen in water saturated air
Accuracy : 0.1 ppb ± 2%, whichever is greater
Response Time : 1 min, from high to low levels
Signal Output : 4-20 mA or 0-20 mA 0-5V or 1-5V DC Bi-directional RS232, 2 relay
Sample Requirements : Temperature: 2 to 45°C (35 to 113°F)
 Flow: 50-200 mL/min
 pH: > 4 Pressure: < 4 bar (60 psi)
Calibration : Automatic in water saturated air
Protection Rating : NEMA 4X/IP65
Electrical Requirements: 115/230V AC 50/60 Hz 50 watts
Shipping : Dimensions: (LxWxD) 16x26x9 cm (6.3x10.24x3.54 in)
 Weight: 4.9 kg (10.8 lbs)



1817LL Low-Level Chloride Monitor

Measuring Range : 5ppb to 10ppm chloride
Signal Output : 4-20 mA or 0-20 mA 0-5V or
 0-10V DC Linear or log output
Precision : 10% of reading or ± 5 ppb, whichever is greater, within ± 5°C of calibration temperature.
Drift : 0.1 ppm per month or 10% of reading whichever is greater.
Sample Requirements : Temperature: 5 to 45 °C (40 to 113 °F)
 Pressure: (0.6 - 6.9 bar) (8-100 psi)
 Flow: 40 mL/min Total alkalinity: < 50 ppm CaCO₃ Sulfite must not be present.
Cooled Sample Temp : 5-12°C
Calibration : 1 - 3 - point calibration using dynamic calibrator
Electrical Requirements: 100/115/220 or 240V AC,
 ± 10%, 50/60 Hz, 100 watts.
Shipping : Dimensions: (LxWxD) 65x45x27 cm (26x17x11 in)
 Weight: 31.4 kg (69 lbs)

2030 Silica Monitor

Measuring Range : 0-500 ppb SiO₂
Method : Silica in water using the absorption band at 810 nm with reference wavelength at 450 nm single beam dual wavelength using fiber-optic probe in the transflection mode
Limit of Detection : 0.5 ppb
Response Time : 8-10 min, 0-100 ppb 15 min, 100-500 ppb
Signal Output : 0-10 mV 0-100 mV 0-1V 4-20 mA RS232 bi-directional Modem
Sample Requirements : Temperature: 5 to 70°C (41 to 158°F)
 Pressure: (0.2 - 3 bar) (2-50 psi) Flow: 50-900 mL/min
Sample Streams : 1 standard, 2-6 optional
Calibration : Automatic - fully programmable
Enclosure Rating : NEMA 4X, IP65
Electrical Requirements: 110/115/220/240V AC 50/60 Hz 100 watts
Shipping : Dimensions: (LxWxD) 76x76x48 cm (30x30x19 in)
 Weight: 44 kg (96 lbs)

2095 Phosphate Monitor

Measuring Range : 0-60 ppm PO₄
Method : A. Molybdenum-Blue – Stannous Chloride / Range = 0 - 5 ppm as phosphate (PO₄)
 B. Molybdenum-Blue – Ascorbic Acid / Range = 0 - 10 ppm as phosphate (PO₄)
 C. Vanadomolybdate / Range = 0 - 60 ppm as phosphate (PO₄)
 The methods are Phosphate in water using the absorption band at 490 nm with a reference wavelength at 810 nm, and utilizing a single beam dual wavelength using a fiber-optic probe in the transflection mode.
Limit of Detection : A. 0.006 ppm B. 0.03 ppm C. 0.5 ppm
Response Time : A. < 10 min. B. < 15 min. C. < 5 min.
Signal Output : 0 - 10 mV, 0 - 100 mV, 0 - 1 V, 4 - 20 mA RS232 bi-directional modem
Sample Requirements : Temperature: 5 to 70°C (41 to 158°F)
 Pressure: (0.2 - 3 bar) (2-50 psi) Flow: 50-900 mL/min
Sample Streams : 1 standard, 2-6 optional
Calibration : Automatic - fully programmable
Enclosure Rating : NEMA 4X, IP65
Electrical Requirements: 110/115/220/240V AC 50/60 Hz 100 watts
Shipping : Dimensions: (LxWxD) 76x76x48 cm (30x30x19 in)
 Weight: 44 kg (96 lbs)

2030HL Silica Monitor (High Level)

Measuring Range : 500 ppb to 5 ppm (specify range of interest)
Method : Silica in water using the absorption band at 810 nm with reference wavelength at 450 nm single beam dual wavelength using fiber-optic probe in the transflection mode
Limit of Detection : 0.5 ppb
Response Time : 15 min, 500 ppb - 5 ppm
Signal Output : 0 - 10 mV, 0 - 100 mV, 0 - 1 V, 4 - 20 mA RS232 bi-directional modem
Sample Requirements : Temperature: 5 to 70°C (41 to 158°F)
 Pressure: (0.2 - 3 bar) (2-50 psi) Flow: 50-900 mL/min
Sample Streams : 1 standard, 2-6 optional
Calibration : Automatic - fully programmable
Enclosure Rating : NEMA 4X, IP65
Electrical Requirements: 110/115/220/240V AC 50/60 Hz 100 watts
Shipping : Dimensions: (LxWxD) 76x76x48 cm (30x30x19 in)
 Weight: 44 kg (96 lbs)





Markets

- Power Generation
- Pulp and Paper
- Bottled/Municipal Water
- Wastewater
- Process Water
- Industrial Water

Applications

- High Purity Applications to Wastewater Effluent
- Rugged Industrial Environments
- Process Optimization and Control Applications



Thermo Scientific Orion 2102PH pH/ORP Monitor Thermo Scientific Orion 2104CD Conductivity Monitor

Specific Measurements

pH Measurement (for 2102PH monitors only)

Range	0 to 14
Resolution	0.1, 0.01
Relative Accuracy	± 0.01
Hold Function	YES
Auto-Buffer Recognition	YES
Solution Compensation	YES
Conductivity Measurement (for 2104CD monitors only)	
Range	0.001 μ S/cm to 1000 mS/cm, cell constant dependent
Resolution	3 significant digits
Relative Accuracy	0.5% \pm 1 digit
Auto-Ranging	YES
Range locking	YES
Cell Constant	0.001 to 199.9 cm
Cell Types	Cell with temperature sensor
Reference Temperature	25 $^{\circ}$ C
Temperature Compensation	Linear (0.0 to 10.0 %/C), nLFn, nLFu

Solution Compensation	YES
2-Electrode Sensors	YES
4-Electrode Sensors	YES
TDS Range	0 to 19999 mg/L
Salinity Range	0.1 to 80.0 ppt NaCl equivalent

mV/ORP Measurement

Range	\pm 1999 mV
Resolution	1 mV
Relative Accuracy	\pm 1 mV
E _H ORP Mode	YES
Temperature Measurement	
Range	-10 to 110 $^{\circ}$ C
Resolution	0.1 $^{\circ}$ C
Relative Accuracy	\pm 0.5 $^{\circ}$ C
Temperature Display	YES
Temperature Compensation	Auto and manual
Continuous Temperature Readings	YES
ATC Probe Connection Detection	YES
Resistivity Measurement	
Range	2 Ohm to 100 Meg-Ohm
Resolution	2 ohms-cm
Relative Accuracy	0.5 % \pm 1 digit

Note: Specifications listed for single channel measurement specific monitors, dual channel configurations — digital communications options available, see ordering information