More of our sodium analyzers have been sold than all others combined…

Designed for accuracy and reliability with years of proven performance – it’s easy to see why!

Thermo Scientific
Orion 2111XP
Sodium Analyzer

Superior Performance and Ease of Operation
The new Thermo Scientific Orion 2111XP sodium analyzer offers unmatched reliability in analyzing critical sample streams throughout the power/steam generation and industrial water industries. The Orion 2111XP is ideally suited to meet the demanding needs of high purity water measurements and high acid-cation exchange applications, all in one system and all from one of the most trusted names in sodium analyzering.

The Orion 2111XP is offered in three application packages that are uniquely designed to accommodate the changing requirements for successful sodium analyzering.

Our flexible reagent kits are available in prepackaged bottles for safe and convenient replacement – save your valuable time and money!

Advantages
- **Ammonia Package** – for general purpose sodium measurements, provides up to 45 days of continuous operation
- **Diisopropylamine (DIPA) Package** – best suited for low detection range, provides up to 60 days of continuous operation
- **Cation/High Acid Package** – for cation exchange breakthrough and high acid samples, provides up to 45 days of continuous operation

Maximize up time – the Orion 2111XP provides stable and drift free measurements, eliminating the need for frequent calibration.

Markets
- Power
- Semiconductor
- Chemical-Petrochemical
- Pulp and Paper

Applications
- Feedwater / Make-Up Water
- Boiler Feedwater
- Drum Boilers
- Demineralized Water
- Steam Condensate
- Cation Exchange Breakthrough
- High Acid Samples
**Benefits**

- Detection limit of 0.1 ppb – the Orion 2111XP offers flexible application packages ideally suited for continuous sodium analyzing in a wide variety of samples
- Protect against the costly effects of corrosion with sensitive, selective, reliable and verifiable measurements that provide early warning detection of sodium
- Extremely easy to use while maximizing uptime – simple step-by-step scrolling instruction for setup, calibration, operation and diagnostics menus
- Measurements at a glance from any distance for even the lowest light conditions using the large operator friendly backlit display
- Fastest and most stable measurements, limiting unnecessary calibration cycles due to drift with new superior Orion sodium electrode technology
- Minimize operator time and maintenance without use of complicated moving parts or pumps that often require frequent attention and expensive spare part expenditures
- Extend reagent consumption up to 3 months (application specific) while reducing costly waste disposal fees – innovative and simple reagent addition design conditions sample pH for optimal sodium electrode performance while suppressing interfering ions
- Advanced user interface with detailed calibration, measurement and diagnostic logs for early diagnostic and action level notification, configurable for your facility’s desired level of performance – all password protected if preferred
- Simple and fast calibration cycles using double known addition – quickly have your system back on line with security and confidence
- Expandable modules for grab sample and low level verification to meet the strictest guidelines for QA/QC validation programs
- Easy installation has your plant up and running in minutes – the Orion 2111XP is retrofittable to the Thermo Scientific Orion 1811EL/1811AO panel mounting footprint

**Dimensions**

Thermo Scientific Orion 2111XP installation dimensions shown without optional protective enclosure.
## Thermo Scientific Orion 2111XP Sodium Analyzer

### Specific Ion Measurements

#### 2111XA – Ammonia Application Package:
- **Reagent:** Ammonia
- **Range:** 0.30 ppb to 200 ppm
- **Resolution:** 1, 2 or 3 digits
- **Accuracy (with DKA cal):** ± 5% or 0.3 ppb

#### 2111XD – DIPA Application Package:
- **Reagent:** Diisopropylamine
- **Range:** 0.10 ppb to 10 ppm
- **Resolution:** 1, 2 or 3 digits
- **Accuracy (with DKA cal):** ± 5% or 0.1 ppb

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

### Response Time
- With freshly etched electrode, during calibration:
  - 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:** ± (0.5 mV + 0.1%)

### Temperature Measurement
- **Range:** -10 to 120 °C
- **Resolution:** 0.1 °C
- **Relative accuracy:** ± 0.5 °C
- **Continuous temperature readings:** YES
- **ATC probe connection detection:** YES

### Specific Ion Calibrations
- **DKA calibration:** YES
- **DKA calibration points:** 3 points
- **Off-line calibration:** YES
- **Off-line calibration points:** 1 point
- **Pre-programmed standard values:** YES
- **Custom programmed standard values:** YES

### Sample Conditions
- **Temperature:** 5 to 45 °C
- **Total acidity:** Less than 250 ppm CaCO₃
- **Inlet pressure:** 8 to 100 psig
- **Flow rate:**
  - 40 mL/min nominal set by pressure regulator (DIPA and Ammonia applications)
  - 25 mL/min nominal set by pressure regulator (cation/high acid applications)
- **Sample inlet:** 1/4” NPTF tube fitting
- **Sample drain:** 3/4” NPT male
- **Grab sampler supported:** YES

### Display
- Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts

### Inputs
- **ATC:** 2 x NTC 30K
- **Specific ion input & reference:** Potentiometric

### Outputs
- **Analog output:** Galvanically isolated
- **Number of analog outputs:** 2, one dedicated to sodium, one to temperature, shared ground
- **Output selections:** 0 - 20 mA or 4 - 20 mA
- **Programmable range:** YES
- **Log & linear output options:** YES, user selectable
- **Alarm outputs:** 3
- **Number of relay outputs:** 3
- **Maximum relay load:** 250 VAC, 5 A, 30 VDC
- **Minimum value alarm:** YES
- **Maximum value alarm:** YES
- **Error alarm:** YES
- **Calibration/offline alarm:** YES
- **Programmable min & max values:** YES

#### Physical Size
- **Electronics:** 144 x 144 x 186 mm
- **Entire system:** 65 x 45 x 27 cm (26” x 17” x 11”)
- Fits on 1811EL / 1811AO panel mounting footprint.

#### Power
- **Input:** 85-132 or 170-264 V AC

#### Software Features
- **Self-test & diagnostics:** YES
- **Real time clock:** YES
- **Meter serial number:** YES
- **Password protection:** YES
- **Programmable alarms:** High, low, error, calibration/offline
- **Reset function:** YES

#### Meter Features
- **Startup reset:** YES
- **Hardware calibration function:** YES
- **Non-volatile memory:** YES
- **Battery backup:** YES
- **Expansion bus:** Serial communication & power

#### Electronics
- **Waterproof enclosure:** IP66 & NEMA 4X

#### Regulatory and Safety
- **CE, CSA, FCC Class A limits**

#### Environmental Operating Conditions
- **Ambient operating temperature:** 5 to 45 °C
- **Relative humidity:** 5 to 95% non-condensing
- **Storage temperature:** -20 to 60 °C
- **Storage humidity:** 5 % to 95 %, non-condensing

#### Case Material
- Valox 364

#### Shock and Vibration
- **Vibration, shipping/handling:** 0 - 60 Hz @ 1 G Load
- **Shock, drop test in packaging:** 36” on all sides and corners
Thermo Scientific Orion 2111XP Sodium Analyzer

- **Global support** – with experience that comes from supporting our sodium customers for over 35 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.

- **Focus on user benefits** – we work closely with you to define your needs, and ensure you are using the analyzer in a way that improves your bottom line.

For more information, contact your local water quality specialists, call 1-800-225-1480 or visit www.thermo.com/water.

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Cat. No. Sodium Analyzer Packages

2111XPEN Sodium Analyzer With Protective Enclosure Package – includes sodium analyzer with protective enclosure and internal grab sampler, sodium electrode (210045), reference electrode (210056), ATC probe (2100TP), electrode filling solution (181073), sodium standard solution kits (181140 and 181141), CD user guide and options kit (Ships with application package 2111XD)

2111XPENG Sodium Analyzer With Protective Enclosure Package – includes sodium analyzer with protective enclosure, sodium electrode (210045), reference electrode (210056), ATC probe (2100TP), sodium standard solution kits (181140 and 181141), CD user guide and options kit (Ships with application package 2111XD)

2111XP Sodium Analyzer Instrument Only Package – includes sodium analyzer and internal grab sampler, sodium electrode (210045), reference electrode (210056), ATC probe (2100TP), standard solution kit (181140 and 181141), CD user guide and options kit (Application package 2111XDA, 2111XCD or 2111XCC must be purchased separately)

2111XPXG Sodium Analyzer Instrument Only Package – includes sodium analyzer, sodium electrode (210045), reference electrode (210056), ATC probe (2100TP), sodium standard solution kits (181140 and 181141), CD user guide and options kit (Application package 2111XDA, 2111XCD or 2111XCC must be purchased separately)

Cat. No. Application Packages

2111XDA Ammonia Application Package – Ammonia reagent bottle adapter (2100ARBA) and diffusion tubing (159066).

2111XD DIPA Application Package – DIPA reagent bottle adapter (2100DRBA) and diffusion tubing (211194).  

2111 XC Cation/High Acid Application Package – Ammonia reagent bottle adapter (2100ARBA) and diffusion tubing (181160).

Cat. No. Reagent Packages

211106XP Ammonia Application Consumables Package – for one year operation, includes (12) x 2 L bottles (application-specific diffusion tubing not included) sodium electrode (210045), reference electrode (210056), standard solution kit (181140), diffusion tubing (159066), standard solution kit (181141), sodium standard solution kits (181140 and 181141), sodium electrode (210045), reference electrode filling solution (181073), D-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters.

211106XP* Reagent-less Ammonia Application Consumable Package – for one year operation, includes (12) x 2 L empty bottles for use with ammonia reagent (211130), diffusion tubing (159066), standard solution kit (181140), sodium standard solution kits (181140 and 181141), sodium electrode (210045), reference electrode filling solution (181073), D-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters.

181130 Ammonia Reagent – for 30 days operation, includes (1) x 2 L bottle (application-specific diffusion tubing not included)

181130FOR Includes (1) x 2 L bottle empty for use with Ammonia Reagent (application-specific diffusion tubing not included)

150060 Ammonia Application Diffusion Tubing – (1) x 4 ft thick-walled diffusion tubing, for use with ammonia reagent.

211192XP Disproplylamylamine Application Consumables Package – for one year operation, includes (8) x 0.8 L bottles DIPA reagent (211191), diffusion tubing kits (211194), reagent bottle adapter, standard solution kit (181140), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference filling solution (181073), D-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters.

211192XP* Reagent-less Disproplylamylamine Application Consumable Package – for one year operation, includes (8) x 0.8 L empty bottles for use with DIPA reagent (211191), diffusion tubing kits (211194), reagent bottle adapter, standard solution kit (181140), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference filling solution (181073), D-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters.

211190 Disproplylamylamine Reagent – for 60 days operation, includes (1) x 0.8 L bottle DIPA reagent and (1) x 4 ft diffusion tubing kit (211194)

211191FOR* Reagent-less Disproplylamylamine Reagent – For one year operation, includes (8) x 8 inch diffusion tubing assemblies with D-rings for use with DIPA reagent

211190FOR* Reagent-less Disproplylamylamine Reagent – For 60 days of operation, includes (1) x 8 inch diffusion tubing assemblies with D-rings for use with DIPA reagent

211196 (8) x 8 inch pack

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Thermo Scientific Orion 2111XP Sodium Analyzer

For 30 days operation, includes (1) x 2 L bottle (application-specific diffusion tubing not included)

For 60 days of operation, includes (1) x 8 inch diffusion tubing assemblies with D-rings for use with DIPA reagent