

More of our sodium monitors 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 Monitor



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

Superior Performance and Ease of Operation

The new Thermo Scientific Orion 2111XP sodium monitor 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 monitoring.

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

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

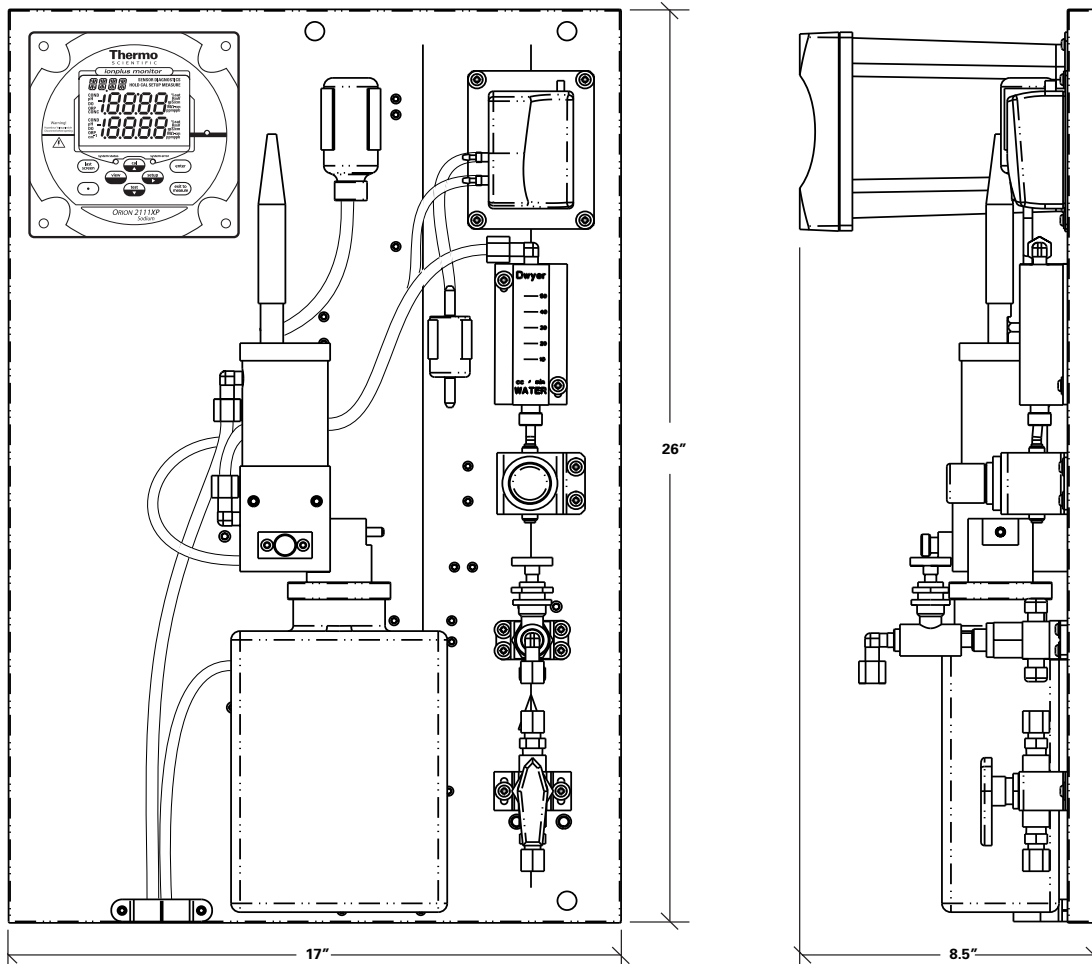
Maximize up time – the Orion 2111XP provides stable and drift free measurements, eliminating the need for frequent calibration.

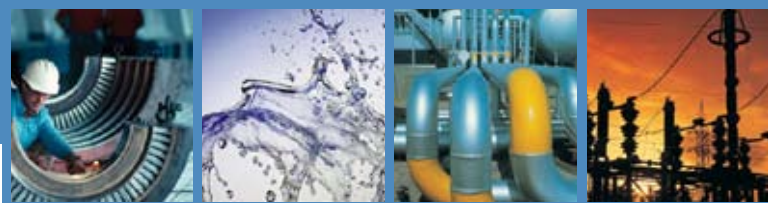
Benefits

- Detection limit of 0.1 ppb – the Orion 2111XP offers flexible application packages ideally suited for continuous sodium monitoring 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 retrofitable 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 Monitor

Specific Ion Measurements	<p>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</p> <p>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</p> <p>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</p>	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
Response Time	With freshly etched electrode, during calibration: Reach 95% of final reading within 2 minutes of injecting a standard solution	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.
Units Displayed	ppb, ppm (auto ranging)	Power Input: 85-132 or 170-264 V AC
mV Measurement	Range: ± 1999.9 mV Resolution: 0.1 mV Relative accuracy: ± (0.5 mV + 0.1%)	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
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	Meter Features Startup reset: YES Hardware calibration function: YES Non-volatile memory: YES Battery backup: YES Expansion bus: Serial communication & power Waterproof enclosure: IP66 & NEMA 4X
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	Regulatory and Safety CE, CSA, FCC Class A limits
Sample Conditions	Temperature: 5 to 45 °C Total acidity: Less than 250 ppm CaCO ₃ 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	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
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts	Case Material Valox 364
Inputs	ATC: 2 x NTC 30K Specific ion input & reference: Potentiometric	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 Monitor

- **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 monitor 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.

Cat. No.	Sodium Monitor Packages
2111XPEN	Sodium Monitor With Protective Enclosure Package – includes sodium monitor 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 (Application package 2111XA, 2111XD or 2111XC must be purchased separately)
2111XP	Sodium Monitor Instrument Only Package – includes sodium monitor, sodium electrode (210045), reference electrode (210056), ATC probe (2100TP), sodium standard solution kits (181140 and 181141), CD user guide and options kit (Application package 2111XA, 2111XD or 2111XC must be purchased separately)
Cat. No.	Application Packages
2111XA	Ammonia Application Package – Ammonia reagent bottle adapter (2100ARBA) and diffusion tubing (150060).
2111XD	DIPA Application Package – DIPA reagent bottle adapter (2100DRBA) and diffusion tubing (211194)
2111XC	Cation/High Acid Application Package – Ammonia reagent bottle adapter (2100ARBA) and diffusion tubing (181160)
Cat. No.	Reagent Packages
211160XP	Ammonia Application Consumables Package – for one year operation, includes (12) x 2 L bottles ammonia reagent (181130), diffusion tubing (150060), standard solution kit (181141), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference filling solution (181073), O-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters
211160XPF*	Reagent-less Ammonia Application Consumables Package – for one year operation, includes (12) x 2 L empty bottles for use with ammonia reagent (181130), diffusion tubing (150060), standard solution kit (181141), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference filling solution (181073), O-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)
150060	Ammonia Application Diffusion Tubing – (1) x 4 ft thick-walled diffusion tubing, for use with ammonia reagent
211192XP	Diisopropylamine Application Consumables Package – for one year operation, includes (6) x 0.8 L bottles DIPA reagent (211191), (6) 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), O-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters
211192XPF*	Reagent-less Diisopropylamine Application Consumables Package – for one year operation, includes (6) x 0.8 L empty bottles, (6) diffusion tube kits (211194), reagent bottle adapter, standard solution kit (181140), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference filling solution (181073), O-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters
211190	Diisopropylamine Reagent – for 60 days operation, includes (1) x 0.8 L bottle DIPA reagent and (1) diffusion tubing kit (211194)
211191	Diisopropylamine Reagent – for one year operation, includes (6) x 0.8 L bottles DIPA reagent and (6) diffusion tubing kits (211194)
211190FOR*	Reagent-less Diisopropylamine Reagent – (1) x 0.8 L empty bottle for use with DIPA reagent and (1) diffusion tubing kit (211194)
211191FOR*	Reagent-less Diisopropylamine Reagent – (6) x 0.8 L empty bottles for use with DIPA reagent and (6) diffusion tubing kits (211194)
211194	Diisopropylamine Application Diffusion Tubing Kit – (1) x 4 inch diffusion tubing assembly with O-rings
211198	Diisopropylamine Application Diffusion Tubing Kit – (1) x 8 inch diffusion tubing assembly with O-rings
* For International Use Only	

Cat. No.	Reagent Packages (cont'd)
211150XP	Cation/High Acid Application Consumables Package – for one year operation, includes (12) x 2 L bottles ammonia reagent (181130), diffusion tubing (181160), standard solution kit (181140), sodium electrode (210045), reference electrode (210056), reference electrode filling solution (181073), O-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly and inlet filters
211150XPF*	Reagent-less Cation/High Acid Application Consumables Package – for one year operation, includes (12) x 2 L empty bottles for use with ammonia reagent (181130), diffusion tubing (181160), standard solution kit (181140), sodium electrode (210045), reference electrode (210056), (5) x 2 oz. bottles reference electrode filling solution (181073), O-ring kit, check valve, pipet tips (0.1 mL), restriction tube assembly, and inlet filters
181160	Cation/High Acid Application Diffusion Tubing – (3) x 5' 8" thin-walled diffusion tubing for use with ammonia reagent
Cat. No.	Sodium Electrodes and Accessories
2111XPEK	Electrode Kit – includes sodium electrode (210045), reference electrode (210056) and (1) x 2 oz bottle reference electrode filling solution (181073)
210045	Sodium Sensing Electrode – for use with 2111XP
210056	Sodium Reference Electrode – for use with 2111XP, includes (1) x 2 oz bottle reference electrode filling solution (181073)
181073	Reference Electrode Filling Solution – (5) x 2 oz bottles, for use with reference electrode (210056)
2100EC	Electrode Cables – (2) x 1 meter cables for 210045 and 210056 electrodes
2100TP	2100 Series Automatic Temperature Probe – with ground (30 kΩ)
2111XPCAL	Calibration Kit – includes carrying case, 0.1 mL pipet (207524-001), pipet tips (207525-001), wash bottle, (1) x 2 oz bottle low level standard 1 (19.1 ppm Na ⁺), (1) x 2 oz bottle low level standard 2 (192 ppm Na ⁺), (1) x 2 oz bottle high level standard 1 (1910 ppm Na ⁺), (1) x 2 oz bottle high level standard 2 (19200 ppm Na ⁺) and sodium electrode etch solution (181113)
Cat. No.	Field Replaceable Units
2100EN	2100 series enclosure only
2100FP	Fluidics panel assembly only
2100BP	Steel back panel assembly
2100NV	Inlet valve assembly
2100BV	Bypass/needle valve assembly
2100RG	Regulator assembly
2100DA	Drain and clamp assembly
2100FM	Flow meter assembly
2100RT	Restrictor tube assembly
2100FC	Flow cell assembly
2100PA	Air pump assembly
2100AF	Air filter assembly
2100DV	Diverter valve assembly
2100VC	Check valve
2100DRBA	Reagent bottle adapter for use with DIPA reagent
2100ARBA	Reagent bottle adapter for use with ammonia reagent
2100OK	O-ring kit
2100FK115	Fuse kit assembly 115 V
2100FK230	Fuse kit assembly 230 V
2100PS	Power supply assembly
2111XPEP	2111XP electronics faceplate

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S-2111XP-E 0608 Rev.D

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