

Thermo Scientific Orion 2111XP Sodium Analyzer

Reliable sodium analysis in critical sample streams

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.



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



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 analysis.

The Orion 2111XP is offered in three application packages that are uniquely designed to accommodate the changing requirements for successful sodium analysis. Our flexible reagent kits are available in prepackaged bottles for safe and convenient replacement – saving you 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.

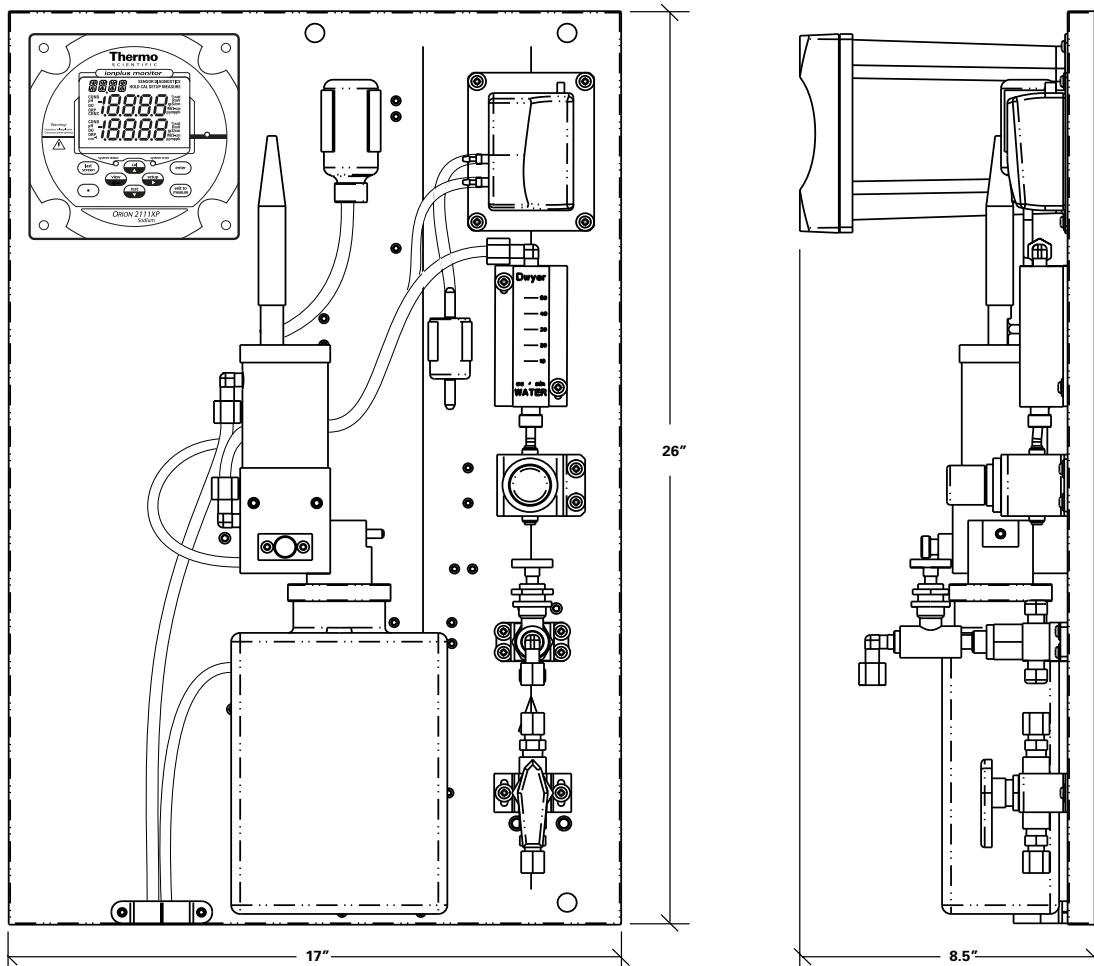
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Product Benefits

- Detection limit of 0.1 ppb – the Orion 2111XP offers flexible application packages ideally suited for continuous sodium analysis 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—Orion 2111XP is retrofittable to the Thermo Scientific™ Orion™ 1811EL/1811AO panel mounting footprint

Dimensions

Orion 2111XP installation dimensions shown without optional protective enclosure.



Product Specifications

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	Outputs	Analog output: Galvanically isolated
	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		Number of analog outputs: 2, one dedicated to sodium, one to temperature; shared ground
	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		Output selections: 0 - 20 mA or 4 - 20 mA
Response Time	With freshly etched electrode, during calibration: Reach 95% of final reading within 2 minutes of injecting a standard solution		Programmable range: YES
Units Displayed	ppb, ppm (auto ranging)		Log & linear output options: YES, user selectable
mV Measurement	Range: ± 1999.9 mV	Physical Size	Alarm outputs: 3
	Resolution: 0.1 mV		Number of relay outputs: 3
	Relative accuracy: ± (0.5 mV + 0.1%)		Maximum relay load: 250 V AC, 5 A, 30 V DC
Temperature Measurement	Range: - 10 to 120 °C		Minimum value alarm: YES
	Resolution: 0.1 °C		Maximum value alarm: YES
	Relative accuracy: ± 0.5 °C		Error alarm: YES
	Continuous temperature readings: YES		Calibration/offline alarm: YES
Specific Ion Calibrations	ATC probe connection detection: YES		Programmable min & max values: YES
	DKA calibration: YES	Power	Electronics: 144 x 144 x 186 mm
	DKA calibration points: 3 points		Entire system: 65 x 45 x 27 cm (26" x 17" x 11") Fits on 1811EL / 1811AO panel mounting footprint
	Off-line calibration: YES	Software Features	Input: 85-132 or 170-264 V AC
	Off-line calibration points: 1 point		Self-test & diagnostics: YES
	Pre-programmed standard values: YES		Real time clock: YES
Custom programmed standard values: YES		Meter serial number: YES	
Sample Conditions	Temperature: 5 to 45 °C	Meter Features	Password protection: YES
	Total acidity: Less than 250 ppm CaCO ₃		Programmable alarms: High, low, error, calibration/ offline
	Inlet pressure: 8 to 100 psig		Reset function: YES
	Flow rate:		Startup reset: YES
	• 40 mL/min nominal set by pressure regulator (DIPA and Ammonia applications) • 25 mL/min nominal set by pressure regulator (cation/high acid applications)		Hardware calibration function: YES
Sample inlet: 1/4" NPTF tube fitting		Non-volatile memory: YES	
Sample drain: 3/4" NPT male		Battery backup: YES	
Grab sampler supported: YES		Expansion bus: Serial communication & power	
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts	Electronics	Waterproof enclosure: IP66 & NEMA 4X
		Regulatory and Safety	CE, CSA, FCC Class A limits
Inputs	ATC: 2 x NTC 30K	Environmental Operating Conditions	Ambient operating temperature: 5 to 45 °C
	Specific ion input & reference: Potentiometric		Relative humidity: 5 to 95% non-condensing
			Storage temperature: - 20 to 60 °C
		Case Material	Storage humidity: 5 % to 95 %, non-condensing
		Shock and Vibration	Valox 364
			Vibration, shipping/handling: 0 - 60 Hz @ 1 G Load
			Shock, drop test in packaging: 36" on all sides and corners

Orion 2111XP Sodium Analyzer

Global support — with experience that comes from supporting our 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.thermoscientific.com/processwater.

Product Ordering Information

Cat. No.	Sodium Analyzer Packages	Cat. No.	Reagent Packages (cont'd)
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), sodium standard solution kits (181140 and 181141), CD user guide and options kit (Ships with application package 2111XD)	211191	Diisopropylamine Reagent — for one year operation, includes (6) x 0.8 L bottles DIPA reagent and (6) diffusion tubing kits (211194)
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)	211194	Diisopropylamine Application Diffusion Tubing Kit — (1) x 4 inch diffusion tubing assembly with O-rings for use with DIPA reagent
2111XP	Sodium Analyzer Instrument Only Package — includes sodium analyzer and internal grab sampler, 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)	211193	(1) x 8 inch pack
2111XPG	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 2111XA, 2111XD or 2111XC must be purchased separately)	211198	Diisopropylamine Application Diffusion Tubing Kit — (1) x 8 inch diffusion tubing assembly with O-rings for use with DIPA reagent
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	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
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	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
181130	Ammonia Reagent — for 30 days operation, includes (1) x 2 L bottle (application-specific diffusion tubing not included)	181160	Cation/High Acid Application Diffusion Tubing — (3) x 5' 8" thin-walled diffusion tubing for use with ammonia reagent
181130FOR	Includes (1) x 2 L bottle empty for use with Ammonia Reagent (application-specific diffusion tubing not included)	Cat. No.	Sodium Electrodes and Accessories
150060	Ammonia Application Diffusion Tubing — (1) x 4 ft thick-walled diffusion tubing, for use with ammonia reagent	2111XPEK	Electrode Kit — includes sodium electrode (210045), reference electrode (210056) and (1) x 2 oz bottle reference electrode filling solution (181073)
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	210045	Sodium Sensing Electrode — for use with 2111XP
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	210056	Sodium Reference Electrode — for use with 2111XP, includes (1) x 2 oz bottle reference electrode filling solution (181073)
211190	Diisopropylamine Reagent — for 60 days operation, includes (1) x 0.8 L bottle DIPA reagent and (1) diffusion tubing kit (211194)	181073	Reference Electrode Filling Solution — (5) x 2 oz bottles, for use with reference electrode (210056)
211191FOR*	Reagent-less Diisopropylamine Reagent — For one year operation, includes (6) x 8 inch diffusion tubing assemblies with O-rings for use with DIPA reagent	2100EC	Electrode Cables — (2) x 1 meter cables for 210045 and 210056 electrodes
211190FOR*	Reagent-less Diisopropylamine Reagent — For 60 days of operation, includes (1) x 8 inch diffusion tubing assemblies with O-rings for use with DIPA reagent	2100TP	2100 Series Automatic Temperature Probe — with ground (30 kΩ)
		2111XP	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 - For a complete listing refer to the user guide
		2100EN	2100 series enclosure only
		2100FP	Fluidics panel assembly only
		2100BV	Bypass/needle valve assembly
		2100RG	Regulator assembly
		2100FM	Flow meter assembly
		2100RT	Restrictor tube assembly
		2100FC	Flow cell assembly
		2100PA	Air pump assembly
		2100AF	Air filter 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
		2100PS	Power supply assembly
		2111XPEP	2111XP electronics faceplate

* For International Use Only



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