

Ultra low level accuracy and reliability with years of proven performance ...

Protect your turbine with sodium measurements made simple.

Thermo Scientific Orion 2111LL Low Level Sodium Monitor



Superior performance and ease of operation

As the need for ultra pure water production advances, the power industry looks to the most trusted sodium monitor to keep pace. The NEW Orion 2111LL ultra low level sodium monitor exceeds the demands of high purity water measurements.

The fast response of the Orion 2111LL protects your turbine against destructive sodium levels with precise, real-time indication of sodium contaminants. Increase efficiency, prevent corrosive deposits and maximize uptime.

Trust your results - the Orion 2111LL provides stable and drift-free measurements using ROSS Ultra electrode technology. Choose the global leader in sodium ISE technology for maximum results every time.

Save your valuable time and money - our easy to order reagent kits are available in pre-packaged bottles for safe and convenient replacement.

Advantages:

- Ultra low level detection to 0.001 ppb for trace detection in high purity water and steam generation
- Superior stability using ROSS Ultra® electrode technology for high performance and accuracy without the need for frequent calibrations
- Rapid response to ultra low level changes, real time notification of sodium conditions, and protection from costly feedwater breakthrough and steam carryover
- Orion DIPA reagent reduces hazardous waste disposal costs with complete DIPA reagent consumption.
- Easy to operate and calibrate - the easy to read, step-by-step calibration process ensures a successful calibration the first time and every time.



Markets

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

Applications:

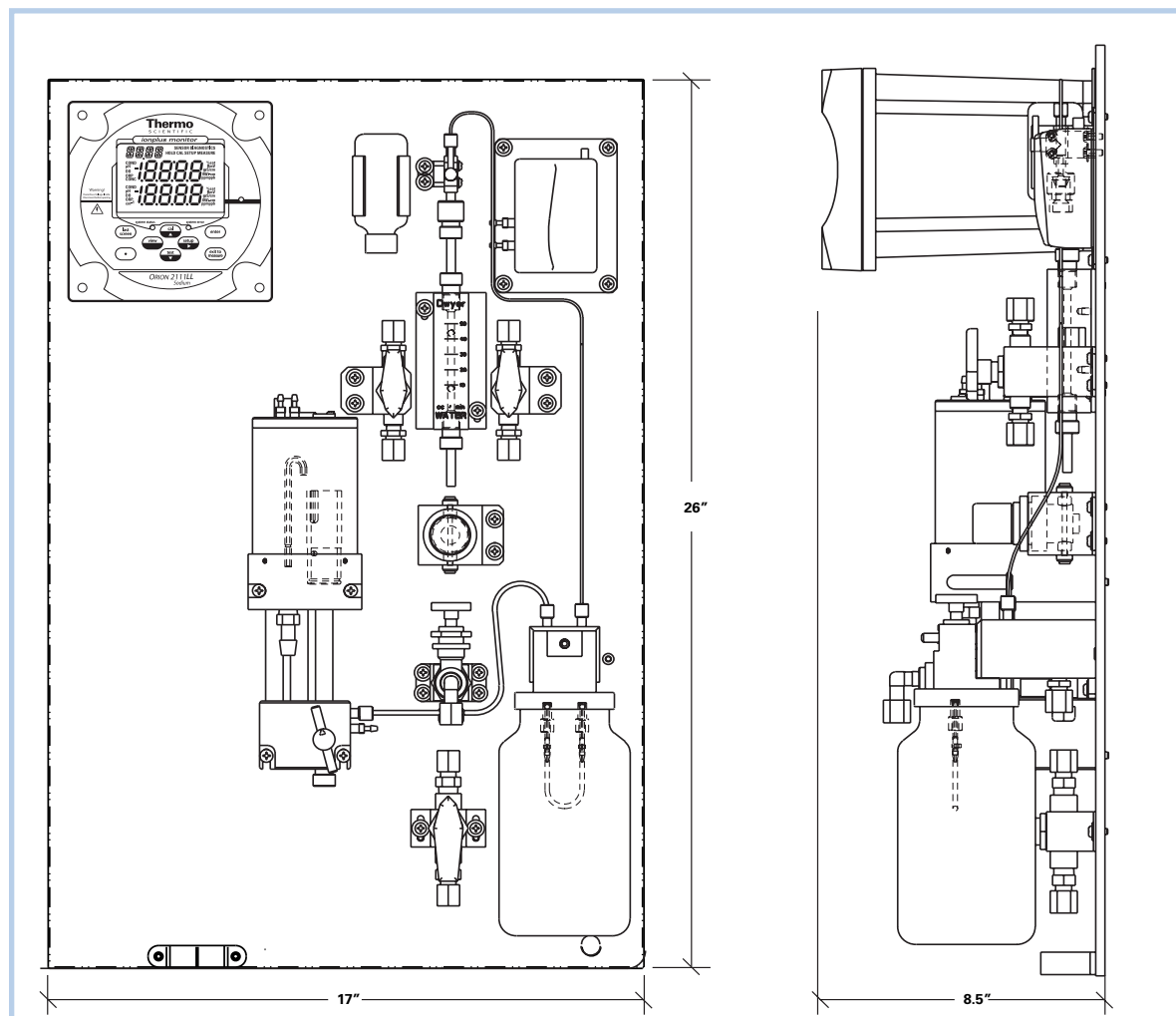
- Ultra Pure Water Analysis
- Demineralized Water/ RO
- Boiler Feedwater
- Drum Boilers
- Steam Condensate/ CDP

Benefits

- Ultra low level sodium detection to 10 parts per trillion with high accuracy and precision
- 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 visible backlit display
- Fastest, most stable measurements limit unnecessary calibration cycles due to drift - utilize NEW superior Orion ROSS Ultra sodium electrode technology
- Minimize operator time and maintenance without the use of complicated moving parts or pumps that often require frequent attention and expensive spare part expenditures
- Extend reagent consumption up to 3 months 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 desired level of performance - all password protected if preferred
- Simple and fast calibration cycles using double known addition - quickly have your system back online 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 2111LL is retrofittable to the Orion 1811EL panel mounting footprint

Dimensions

Thermo Scientific Orion 2111LL installation dimensions shown without optional protective enclosure.





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Specific Ion Measurements	Range: 0.001 ppb - 10 ppm
	Resolution: 2, 3 or 4 digits
	Accuracy (with DKA cal): ± 5% or 0.01 ppb
	Reagent: Diisopropylamine
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, temperature
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 50 ppm CaCO ₃
	Inlet pressure: 8 to 100 psig
	Flow rate: 40 mL/min nominal set by pressure regulator
	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, 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	
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 panel mounting footprint.	
	Power	Input: 85 - 132 or 170 - 264 VAC
	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
		Startup reset: YES
Meter Features	Hardware calibration function: YES	
	Non-volatile memory: YES	
	Battery backup: YES	
	Expansion bus: Serial communication & power	
	Waterproof enclosure: IP66 & NEMA 4X	
Regulatory and Safety	CE, CSA, UL, 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 2111LL Low Level 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.	Low Level Sodium Monitor Packages
2111LLEN	Low Level Sodium Monitor With Protective Enclosure Package – Includes low level sodium monitor with protective enclosure, ROSS sodium electrode (210048), ROSS Ultra reference electrode (210058), ATC probe (2100TP), standard solutions kit (181140), CD user guide and options kit
2111LL	Low Level Sodium Monitor Instrument Only Package – Includes low level sodium monitor, ROSS sodium electrode (210048), ROSS Ultra reference electrode (210058), ATC probe (2100TP), standard solutions kit (181140), CD user guide and options kit
Cat. No.	Reagent Packages and Accessories
211192	Low Level Sodium Consumables Kit – for one year operation, includes (6) Diisopropylamine (DIPA) reagent (6 x 0.8 L bottle) with (6) diffusion tubing kit (211194), reagent bottle adapter (2111RBA), (1) standard solutions kit (19.1 ppm and 192 ppm Na ⁺ standards and etch solution), (1) sodium electrode, (1) reference electrode, (5) x 2 oz bottles reference filling solution, (1) O-ring kit, (1) check valve, (1) set of 100 pipette tips, (1) restriction tube assembly, (2) 60 micron inlet filters and (1) filter gasket
211190	Diisopropylamine Reagent – for 60 days operation, includes (1) x 0.8 L DIPA reagent and (1) diffusion tube assembly (211194)
211191	Diisopropylamine Reagent – for one year operation, includes (6) x 0.8 L DIPA reagent and (6) diffusion tube assemblies (211194)
211194	Diffusion Tubing Kit – (1) complete twist and lock diffusion tubing assembly (4 inch tube) with O-rings, for standard applications
211198	Diffusion Tubing Kit – (1) complete twist and lock diffusion tubing assembly (8 inch tube) with O-rings, for low pH applications (pH less than 10)
181148	Calibration Kit with Carrying Case – includes 0.1 mL pipette, box of pipette tips, wash bottle, (1) x 2 oz bottle standard 1 (19.1 ppm Na ⁺ standard), (1) x 2 oz bottle standard 2 (192 ppm Na ⁺ standard) and (1) x 2 oz bottle of etch solution (181113)
181140	Sodium Standard Solutions Kit – includes (2) x 2 oz bottles of standard 1 (19.1 ppm Na ⁺ standard), (2) x 2 oz bottles of standard 2 (192 ppm Na ⁺ standard) and (1) x 2 oz bottle of etch solution (181113)
181141	High Level Sodium Standard Solutions Kit – includes (2) x 2 oz bottles of standard 1 (1910 ppm Na ⁺ standard), (2) x 2 oz bottles of standard 2 (19200 ppm Na ⁺ standard) and (1) x 2 oz bottle of etch solution (181113)
181113	Sodium Electrode Etch Solution – (1) x 2 oz. bottle
210048	ROSS® Sodium Electrode – with screw cap
210058	ROSS Ultra® Reference Electrode – with screw cap
150072	Reference Electrode Filling Solution – (5) x 2 oz bottles for use with 210058 reference electrode
2111EK	Electrode Kit – includes (1) sodium electrode (210048) and (1) reference electrode (210058)
21003M	Extension Cables – (2) x 3 meter for 210048 and 210058 electrodes

Cat. No.	Reagent Packages and Accessories (cont'd)
2100TP	2100 Series Automatic Temperature Probe – with ground (30 kΩ)
2001XT	2100 Series Automatic Temperature Probe – with 10 meter extension cable and ground (30 KΩ)
Cat. No.	Field Replaceable Parts
2111EN	2100 series enclosure for use with 2111LL
2111FP	Fluidics panel assembly only
2111BP	Steel back panel assembly
2111LLEP	2111LL electronics faceplate
2111NV	Inlet valve assembly
2111BV	Needle valve assembly
2111RG	Regulator assembly
2111FM	Flow meter assembly
2111SV	Calibration shutoff valve assembly
2111RT	Restrictor tube assembly
2111RMA	Reagent manifold assembly
2111RBA	Reagent bottle adapter assembly
2111DBB	Reagent bottle bracket for DIPA reagent bottle
2111NT	Inlet tube assembly
2111PA	Air pump assembly
2111RVA	Right air valve
2111LVA	Left air valve
2111AF	Air filter
2111VC	Check valve
2111TG	Tygon tubing (4 ft)
2111PS	Power supply assembly
2111FK115	Fuse kit assembly 115 V
2111FK230	Fuse kit assembly 230 V
2111FC	Flow cell assembly
2111CA	Flow cell cap assembly
2111LLOK	O-ring kit
2111ST	Sensing tube for flow cell
181170	(2) Inlet sample filters
2111MK	Maintenance Kit – includes (2) electrode cables, (1) diffusion tubing kit, (1) sample filter, (1) O-ring kit, (1) check valve, (1) sensing tube, (1) shut off valve, (1) restrictor tubing assembly, (1) air filter, (1) inlet tubing assembly and (1) reagent bottle cap and adapter
2111LLSK	Service Kit – includes (1) electronics faceplate (2111LLEP), (1) air pump assembly (2111PA), (1) regulator assembly (2111RG), (2) electrode cable with gland assemblies for sensing and reference electrodes, (1) power supply assembly (2111PS) and (1) fuse kit assembly (2111FK115 and 2111FK230)