



Orion ionplus® 2111LL
low-level sodium monitor

The next generation in sodium protection.

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION

*Simplified, highly reliable chemistry
raises the performance standards in the
industry and challenges the competition.*


Protect your turbine with sodium made simple



Shown above:
Orion 2111LLEN
(Cat. No. 2111LLEN)
Grab Sampler
(Cat. No. 18GRAB)
Dynamic Calibrator
(115V Cat. No. 15DC15)
(230V Cat. No. 15DC20)

Thermo Electron introduces the most advanced low level sodium monitor that not only protects your turbine against destructive sodium levels but also will prove to be the simplest, easy-to-use sodium monitor you have ever used. Drift resistant results with the patented **Orion ROSS Ultra®** technology combined with the patent pending flow cell design provides rapid response to ultra low-level changes – ensuring that you and your turbine are protected.

Thermo strives to provide only the most **innovative technology** and instrument solutions to meet the demands of our valued customers. Building upon over 35 years of sodium monitoring expertise, the **Orion 2111LL ionplus® monitor** combines the most advanced electrode sensing technology with simplified, highly reliable chemistry – raising the performance standards in the industry while challenging the competition.



*The Orion 2111LL ionplus®
low-level sodium monitor*

Simple step-by-step instructions.

Imagine a Sodium Monitor that walks you through the calibration process, step-by-step ensuring a successful calibration — first time — every time!

The easy to read backlit LCD includes a scrolling instruction guide to make it simple for any technician to efficiently calibrate and continuously operate without formal training sessions. **You can install, calibrate and be operating in less time than you think.** It's that simple and the rinse down to parts per trillion is that quick.

Password protected set-up, calibration and datalog menus ensure that **all measurements are safe and secure.**

The Orion 2111LL ionplus puts the control in your hands.

- Simple **step-by-step scrolling instructions** for set-up, calibration and operation
- Visible **backlit display** for measurements at a glance
- Patent pending **menu driven prompts** make training **easy** for every user
- Secure, **password protected** data logging

If reductions in resources and costly downtime keep you awake at night – then we have the simple solution.... Orion 2111LL ionplus®.

Reduce hazardous waste.



The Orion DIPA reagent provides **improved signal stability** and an **increase in low-level sensitivity** without the additional hazard disposal costs. Coupled with the newly designed fluidics of the Orion 2111LL system you can program in a custom calibration cycle to fit your plant's schedule.

Each calibration is complete without extended rinse down procedures that are required for use in competitive systems. The DIPA and pump-less liquid handling system makes for **reliable calibration cycles**—every time.

Let us demonstrate how the Orion 2111LL ionplus was designed to keep us ahead of the competition now and with future expandable options.

- **Reduce hazardous waste disposal costs** with complete DIPA reagent consumption
- Virtually **maintenance free** pump-less liquid handling system
- Highly reliable fluidics with **easy access** to critical components
- Customer **selectable calibration cycles** increase workforce efficiencies

*Unsurpassed stability and drift
resistance with the patented
ROSS Ultra® electrode technology*

Ultra low level detection.



Today's power market demands the best protection possible for turbine productivity. The Orion 2111LL ionplus allows our customers to analyze, detect and measure sodium corrosives to the lowest detection levels in the market.

Building upon our industry leading patented **ROSS Ultra® electrode** technology and the patent-pending flowcell design you can ensure that your turbine is protected to **10 parts per trillion** level.

With the Orion 2111LL ionplus and the ROSS Ultra electrode, protecting your investment has never been easier.

- **Ultra low level detection** to 10 parts per trillion with high accuracy and precision
- Unsurpassed **stability** and **drift resistance** with the patented ROSS Ultra electrode
- **Patent pending flow cell design** with sample isolation provides rapid, reliable responses



Thermo now offers multiple levels of Service Programs to meet your needs beyond the One-Year Product Warranty period.

2111LL Service Options

Extended Warranty

A **cost effective** way to blend your in-house expertise with Thermo service and support experts, to get the support you need at a specified annual contracted price. This warranty plan must be purchased within ninety days of the initial product purchase date.

- Extends the features of the standard One-Year Product Warranty for a second or third year.
- Provides access to the manufacturer's **technical experts** at Thermo Support Call Center, 800-225-1480, Monday – Friday, 8:00 AM – 5:00 PM EST.
- After telephone consultation, Thermo will send you required parts for installation by your on-site technician.

Service Kit to Expand Standard Warranty

Purchase this service kit within ninety days of the initial product purchase date to eliminate the costly effects of down time.

- Provides a contracted, cost-effective means to enhance level of support offered during the product warranty period.

- Provides priority access to the manufacturer's technical experts at Thermo Support Call Center.
- Provides a Service Kit to expedite on-site repairs in conjunction with telephone consultation with Thermo experts.

The Service Kit includes:

- Power supply
- Front panel display
- Air pump
- Sensing & reference electrode cables
- Pressure regulator
- Fuse kit

Advanced Replacement

When down-time is a cost - factor to be strictly controlled, the **Advanced Replacement Service Plan** is often times the **best choice**.

- Enhances level of support offered during the standard One-Year Product Warranty.
- Provides access to the manufacturer's technical experts at Thermo Support Call Center and repair facilities.
- If, after reasonable remote diagnostics and trouble-shooting attempts, Thermo determines the instrument to be non-functioning, Thermo will make all reasonable effort to get required parts or equipment out to your facility by the following day for installation by your on-site technician.
- Offers predictable expenditure through fixed annual contract price.

Not sure which plan is best for you?

Ask your Thermo Sales Representative to put you in touch with a Thermo Service Plan Manager. We have additional service options that are sure to address your concerns.

Installation and Start-Up

To help you achieve optimum performance, rely on Thermo to provide you with an efficient and quality installation and the start-up support you need to be up and running quickly.

Thermo Service Representatives are highly trained, experienced, and certified for your product and will be there to make sure that your instrumentation delivers to specifications.

Remedial Service

This is a one-day service engineer on-site visit to your facility for remedial service events at standard response time. Consider this plan an excellent uplift to one of the aforementioned programs.

Preventive Maintenance Programs

All precision-made scientific equipment requires preventive maintenance and calibration checks to perform at their maximum effectiveness. Consider a fixed-fee preventive maintenance contract to have a Thermo expert perform the following tasks:

- Sampling check
- Full validation test
- Visual check for worn, loose, or damaged parts
- Replacement of consumables (additional charge for consumables)
- Diagnostic check to verify all operating parameters are within the factory specifications
- Check instrument electrodes, flows and pressures
- Clean and replace any wearable items such as tubing, O-rings, reagents.

Orion ionplus® 2111LLEN low-level sodium monitor

Specifications

Range	0.001 ppb to 10 ppm
Resolution	1,2,3 or 4 significant digits
Accuracy	+/- 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 CaCO ₃
Inlet pressure	8-100 psig
Flow Rate	40 mL/min nominal
Display	Custom backlit LCD Patent pending Menu Driven instructional display
Outputs	2 selectable galvanically isolated at either 0-20mA or 4-20mA, 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	22.7 kg (50 lbs)
Power Input	85 - 132 V; 100 mA 170 - 264 V; 200 mA 50 - 60 hz

Ordering Information

2111LLEN	LL Sodium Monitor with Enclosure
2111LL	LL Sodium Monitor
2111EN	Enclosure
2111FP	Fluidics Panel Only
211100	Electronics Only
210048	Sodium ROSS Ultra Electrode, SC
210058	Reference ROSS Ultra Electrode, SC
2111EK	Sensing and Reference Electrode Kit
2100TP	Temperature Probe with Solution GND
21003M	Electrode Extension Cables, 3 Meters, (1 ea)
150072	Reference Electrode Filling Solution (5 ea - 2 oz Btls)
181113	Sodium Etch Solution
181140	Sodium Standard Solution Kit
181141	(High Level) Sodium Standard Solution Kit
181148	Calibration Kit
211190	Diisopropylamine (DIPA) Reagent (1 ea - 0.8L Btl w/Diffusion Kit)
211191	Diisopropylamine (DIPA) Reagent (6 ea - 0.8L Btl w/Diffusion Kit)
211192	Sodium Consumables Kit for one year
211194	Diffusion Kit (2 ea w/O-Rings)
2111MK	Maintenance Kit
2111-SVCKIT	Service Kit

Thermo
ELECTRON CORPORATION

www.thermo.com

Environmental Instruments
Water Analysis Instruments

166 Cummings Center
Beverly, MA 01915 USA

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Toll Free: 1-800-225-1480
Tel: 1-978-232-6000
Dom. Fax: 1-978-232-6015
Int'l Fax: 978-232-6031
www.thermo.com/water



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