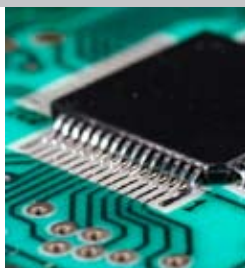


Managing corrosion in steam generating systems remains a consistent challenge, costing the power industry billions of dollars each year. Our products provide real-time ammonia results for effective corrosion control to ensure boiler reliability and maximize power production efficiency.

Thermo Scientific Orion 2110XP

Ammonia Monitor



Markets

- Power
- Pulp and Paper
- Semiconductor

Applications

- Boiler Feedwater
- Condensate

Superior Performance and Ease of Operation

The new Thermo Scientific Orion 2110XP ammonia monitor provides continuous, direct and precise measurements for the control and optimization of boiler ammonia levels. Reduce operational costs while producing the highest purity steam with ease of use for results that only the Orion 2110XP can provide.

The Orion 2110XP shows the most sensitive changes in ammonia concentration for condensate and feedwater optimization and control. Often plants will use conductivity or pH to control ammonia, however these methods are negatively influenced by other ionic species from the boiler treatment chemicals in the sample. Our monitor maintains sensitivity and accuracy at high and low levels to produce rapid results with the utmost confidence.

The Orion 2110XP provides stable and drift-free readings with minimal maintenance and eliminates the need for frequent calibrations, saving you time and money.

Advantages

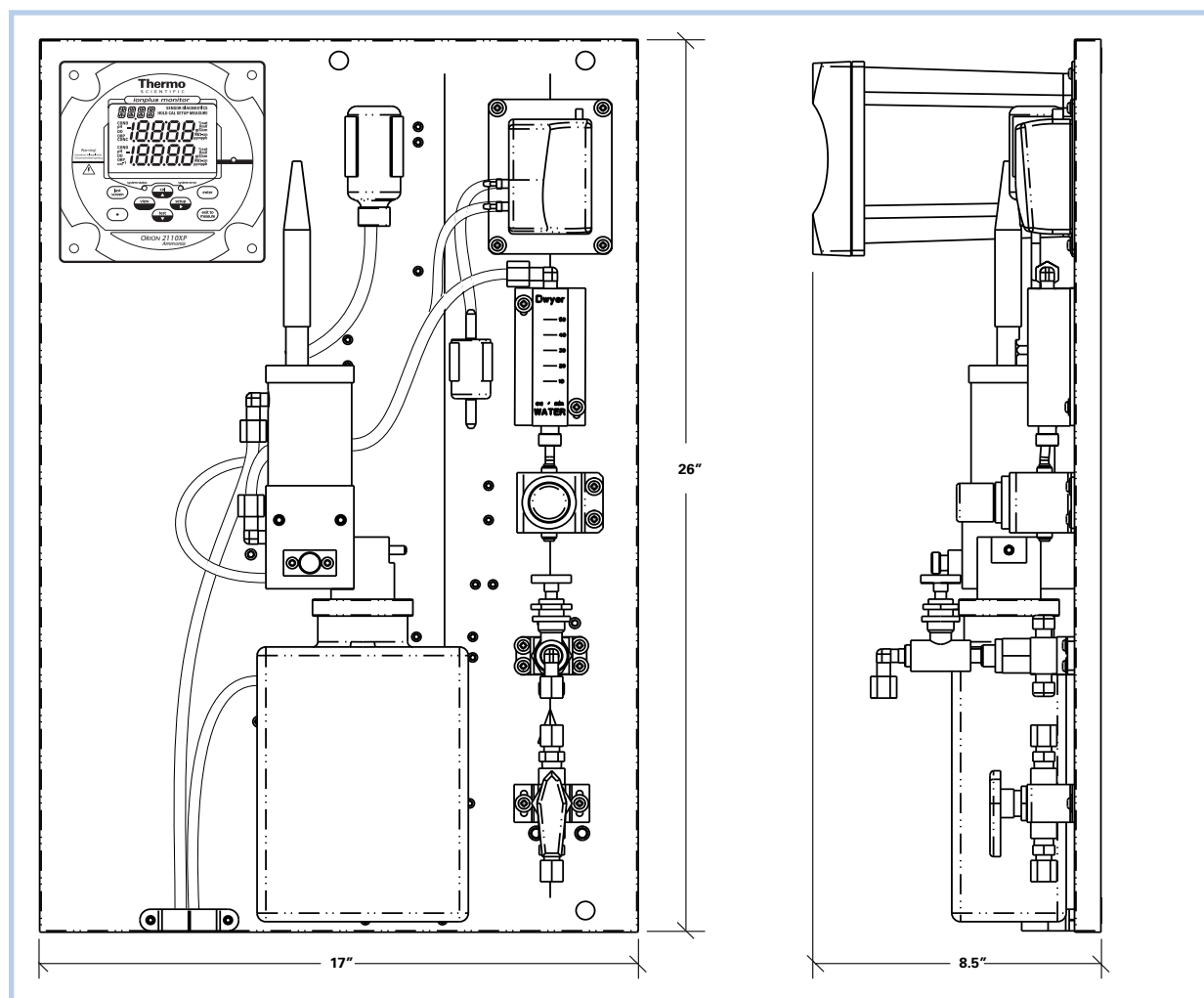
- Accurate detection allows precise ammonia control with confidence – maintain proper chemical feed levels without the guess work or excessive operating cost
- Repeatable and verifiable ammonia measurements using superior Thermo Scientific Orion ammonia electrode technology for the highest level of performance available
- Designed for ammonia specificity, the unique chemistry provides unsurpassed results across a wide range without the pitfalls of pH and conductivity “bottom out effects”
- Easy to operate and calibrate – the Orion 2110XP walks you through the step-by-step calibration process, ensuring a successful calibration the first time and every time

Benefits

- Ammonia detection range of 0 to 10 ppm for the most direct, accurate and precise results available
- Continuous online measurement ensures real-time information for optimum control of the ammonia feed without excessive operating costs
- Selective and sensitive for ammonia, our system surpasses the performance of other systems that have the limitations of pH and conductivity to track real-time boiler ammonia levels
- 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 superior Orion ammonia 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 2 months using our uniquely simple reagent addition design to condition the sample pH and suppress interfering ions for optimal measurement performance
- 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
- Easy installation has your plant up and running in minutes – the Orion 2110XP is retrofittable to the Thermo Scientific Orion 1810AO panel mounting footprint

Dimensions

Thermo Scientific Orion 2110XP installation dimensions shown without optional protective enclosure.





Thermo Scientific Orion 2110XP Ammonia Monitor

Specific Ion Measurements	Range: 0 to 10 ppm
	Resolution: 2, 3 or 4 digits
	Accuracy (with DKA cal): ± 5% or 0.03 ppm, whichever is greater, at 20 °C and 35 °C
	Interferences: Level of interfering ions causing a 10% error at 0.5 ppm NH ₄ ⁺ : K ⁺ 0.5 ppm Na ⁺ 30 ppm Ca ²⁺ 600 ppm
	Reagent: Acetic acid reagent
Response Time	Initial response within 15 seconds, reach 90% of reading within 1 minute 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: 2 points
	Offline calibration: YES
	Offline 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 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 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 ammonia, 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 1810AO 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
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
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 2110XP Ammonia Monitor

- Global support** – with experience that comes from supporting our calcium hardness 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.	Ammonia Monitor Packages
2110XPEN	Ammonia Monitor with Protective Enclosure Package —includes ammonia monitor with protective enclosure, ammonia electrode (100047), reference electrode (210056), ATC probe (2100TP), ammonia standard solution kit (181040), CD user guide and options kit
2110XP	Ammonia Monitor Instrument Only Package — includes ammonia monitor, ammonia electrode (100047), reference electrode (210056), ATC probe (2100TP), ammonia standard solution kit (181040), CD user guide and options kit
Cat. No.	Reagent Kits and Accessories
211050XP	Ammonia Consumables Kit — for one year operation, includes (2) x 2 L bottles acetic acid reagent (181130), (2) x 4 ft diffusion tubing assemblies with O-rings (150060), reagent bottle adapter (2110RBA), (1) ammonia standard solution kit (181040), (1) ammonia electrode (100047), (1) reference electrode (210056), (5) x 2 oz bottles reference filling solution (181073), (1) O-ring kit (2110OK), (1) restriction tube assembly, (2100RT), (2) x 60 micron inlet filters, (1) filter gasket (181127) and (1) set of 100 pipette tips (204846-001)
211050XPF*	Reagent-less Ammonia Consumables Kit — for one year operation, includes (2) x 1 L empty bottles for use with ammonia reagent (181130), (2) x 4 ft diffusion tubing assemblies with O-rings (150060), reagent bottle adapter (2110RBA), (1) ammonia standard solution kit (181040), (1) ammonia electrode (100047), (1) reference electrode (210056), (5) x 2 oz bottles reference filling solution (181073), (1) O-ring kit (2110OK), (1) restriction tube assembly, (2100RT), (2) x 60 micron inlet filters, (1) filter gasket (181127) and (1) set of 100 pipette tips (204846-001)
181030	Acetic Acid Reagent — for 6 months operation, includes (1) x 1 L bottle acetic acid reagent (does not include tubing, purchase 150060 separately)
150060	Diffusion Tubing Kit — (1) x 4 ft diffusion tubing assembly with O-rings
150063	Diffusion Tubing Only — (1) x 100 ft thick-walled diffusion tubing (does not include O-ring, purchase 2110OK separately)
2110XPCAL	Calibration Kit with Carrying Case — 0.5 mL pipette (204847-001), set of 100 pipette tips (204846-001), (1) ammonia standard solution kit (181040), (1) inlet filter, wash bottle and (1) x 4 ft length diffusion tubing (150060)
181040	Ammonia Standard Solution Kit — includes (1) x 2 oz bottle of standard 1 (191 ppm) and (1) x 2 oz bottle of standard 2 (1920 ppm)

* For International Use Only

Cat. No.	Ammonia Electrodes and Accessories
2110XPEK	Ammonia Electrode Kit — includes (1) ammonia electrode (100047), (1) reference electrode (210056) and 1 x 2 oz bottle reference filling solution (181073)
100047	Ammonia Sensing Electrode — for use with 2110XP
210056	Ammonia Reference Electrode — for use with 2110XP, includes 1 x 2 oz bottle reference electrode 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 100047 and 210056 electrodes
21003M	Extension Cables — (2) x 3 meter cables, for 100047 and 210056 electrodes
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 Units
2100EN	2100 series enclosure
2110FP	Fluidics panel assembly only
2110XPEP	2110XP electronics faceplate
2100NV	Inlet valve assembly
2100BV	Needle valve assembly
2100RG	Regulator assembly
2100FM	Flow meter assembly
2100RT	Restrictor tube assembly
2110RBA	Reagent bottle adapter assembly with diffusion tube assembly
2100PA	Air pump assembly
2100AF	Air filter
2100VC	Check valve
2100TG	Tygon tubing (4 ft)
2100PS	Power supply assembly
2100FK115	Fuse kit assembly 115 V
2100FK230	Fuse kit assembly 230 V
2110OK	O-ring kit, includes O-rings for reagent bottle and diffusion tube assembly
181170	(2) inlet sample filters and gaskets
2110XPSK	Service Kit — includes (1) electronic faceplate (2110XPEP), (1) air pump assembly (2100PA), (1) regulator assembly (2100RG), (2) electrode cable with gland assemblies for sensing and reference electrodes, (1) power supply assembly (2100PS), and (1) fuse kit assembly (2100FK115 and 2100FK230)

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S-2110XP-E 0608 Rev.B

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