

# Thermo Scientific Orion 2110XP Ammonia Analyzer

Real-time ammonia results for effective corrosion control

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.



#### Markets:

- Power
- Pulp and Paper
- Semiconductor

#### Applications:

- Boiler Feedwater
- Condensate



The new, Thermo Scientific™ Orion™ 2110XP ammonia analyzer 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 analyzer 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

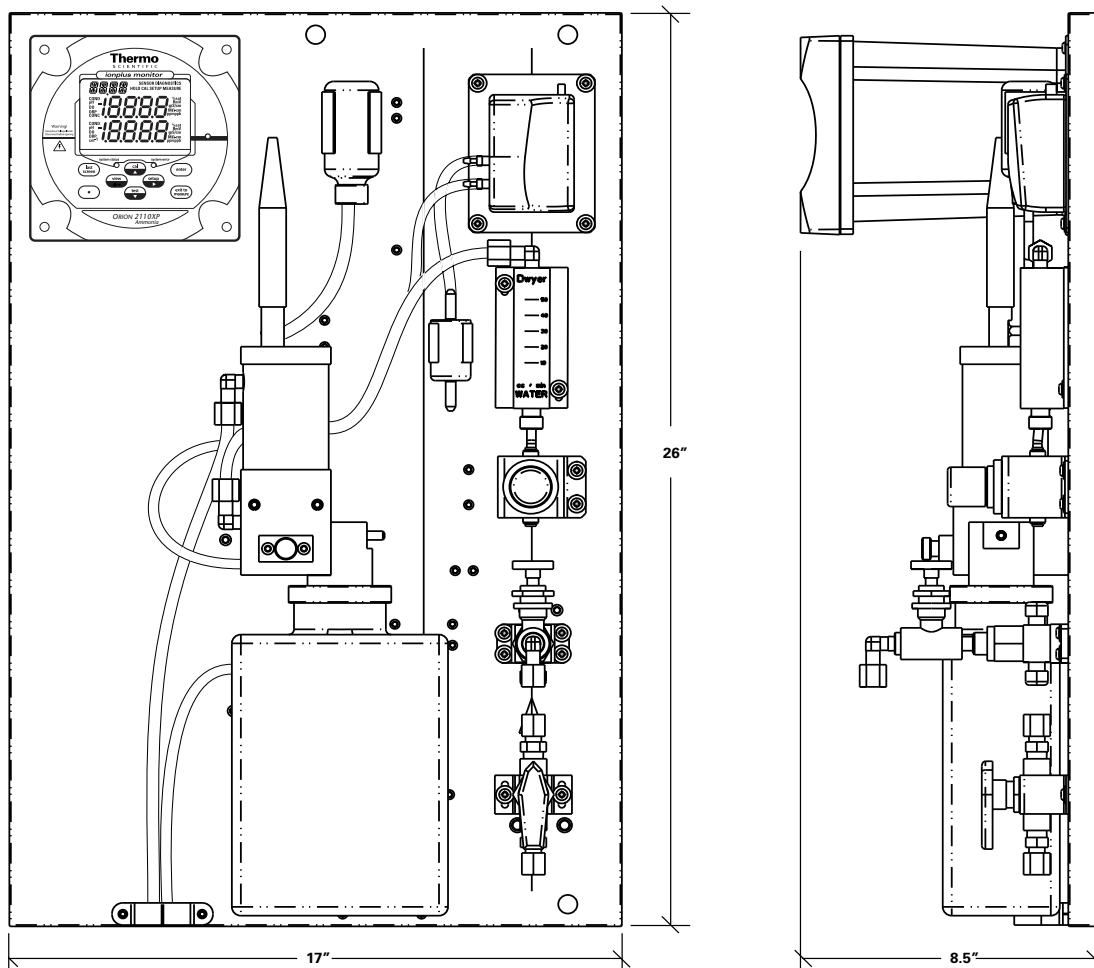
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## Product Benefits

- 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 Orion 1810AO panel mounting footprint

## Dimensions

Orion 2110XP installation dimensions shown without optional protective enclosure.



## Product Specifications

Specific Ion Measurements	Range: 0 to 10 ppm	Physical Size	Electronics: 144 x 144 x 186 mm
	Resolution: 2, 3 or 4 digits		Entire system: 65 x 45 x 27 cm (26" x 17" x 11") Fits on 1810A0 panel mounting footprint.
	Accuracy (with DKA cal): $\pm 5\%$ or 0.03 ppm, whichever is greater, at 20 °C and 35 °C	Power	Input: 85-132 or 170-264 VAC
	Interferences: Level of interfering ions causing a 10% error at 0.5 ppm $\text{NH}_4^+$ : K <sup>+</sup> 0.5 ppm Na <sup>+</sup> 30 ppm Ca <sup>+2</sup> 600 ppm	Software Features	Self-test & diagnostics: YES
	Reagent: Acetic acid reagent		Real time clock: YES
Response Time	Initial response within 15 seconds, reach 90% of reading within 1 minute of injecting a standard solution		Meter serial number: YES
Units Displayed	ppb, ppm (auto ranging), mV, temperature		Password protection: YES
mV Measurement	Range: $\pm 1999.9$ mV		Programmable alarms: High, low, error, calibration/offline
	Resolution: 0.1 mV		Reset function: YES
	Relative accuracy: $\pm (0.5 \text{ mV} + 0.1\%)$	Meter Features	Startup reset: YES
Temperature Measurement	Range: - 10 to 120 °C		Hardware calibration function: YES
	Resolution: 0.1 °C		Non-volatile memory: YES
	Relative accuracy: $\pm 0.5$ °C		Battery backup: YES
	Continuous temperature readings: YES		Expansion bus: Serial communication & power
	ATC probe connection detection: YES	Electronics	Waterproof enclosure: IP66 & NEMA 4X
Sample Conditions	Temperature: 5 to 45 °C	Regulatory and Safety	CE, CSA, FCC Class A limits
	Total acidity: Less than 250 ppm $\text{CaCO}_3$	Environmental Operating Conditions	Ambient operating temperature: 5 to 45 °C
	Inlet pressure: 8 to 100 psig		Relative humidity: 5 to 95% non-condensing
	Flow rate: 40 mL/min nominal set by pressure regulator		Storage temperature: - 20 to 60 °C
	Sample inlet: 1/4" NPTF tube fitting		Storage humidity: 5 % to 95 %, non-condensing
	Sample drain: 3/4" NPT male	Case Material	Valox 364
	Grab sampler supported: YES	Shock and Vibration	Vibration, shipping/handling: 0 - 60 Hz @ 1 G Load
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts		Shock, drop test in packaging: 36" on all sides and corners
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		

## Orion 2110XP Ammonia 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](http://www.thermoscientific.com/processwater).

## Cat. No. Ammonia Analyzer Packages

2110XPEN **Ammonia Analyzer with Protective Enclosure Package**— includes ammonia analyzer with protective enclosure, ammonia electrode (100047), reference electrode (210056), ATC probe (2100TP), ammonia standard solution kit (181040), CD user guide and options kit

2110XPENG **Ammonia Analyzer with Protective Enclosure Package**— includes ammonia analyzer with protective enclosure and integral grab sampler, ammonia electrode (100047), reference electrode (210056), ATC probe (2100TP), ammonia standard solution kit (181040), CD user guide and options kit

2110XP **Ammonia Analyzer Instrument Only Package**— includes ammonia analyzer, 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 (21100K), (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 (21100K), (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 21100K 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

21100K 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)



Thermo Fisher Scientific  
Water Analysis Instruments  
Chelmsford, MA USA  
Quality Management System  
Registered to ISO 9001

[thermoscientific.com/processwater](http://thermoscientific.com/processwater)

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