

Thermo Fisher Scientific provides chloride detection with rapid response – your best defense against the costly effects of corrosion. Let us show you how to trust your water chemistry results and maximize turbine efficiency with ease.

## Thermo Scientific Orion 2117XP Chloride Monitor



### Superior performance and ease of operation

The risks associated with adverse steam chemistry cost the power industry millions and lead to the accumulation of corrosive deposits that jeopardize the efficiency and safety of steam turbine components.

The NEW Thermo Scientific Orion 2117XP chloride monitor detects chloride in real time – providing accurate and reliable results that you can count on. Early detection of chloride ingress from feedwater helps your plant maintain the optimal balance of water purification with ease and peace of mind.

Based upon our premium electrode technology for stability combined with a virtually maintenance free fluidic design – the Orion 2117XP provides high performance results with confidence. The monitor continuously displays levels of chloride to prevent against corrosion effects known to cause mechanical damage to steam cycle components and subsequent efficiency losses.

#### Advantages:

- Holds calibration up to 60 days between reagent changes
- Fast and highly accurate calibration has you back online in minutes
- Long life solid state sensor technology offers stability and high performance
- Simple operation and minimal maintenance required – no moving parts
- Repeatable and verifiable measurements at a glance using the large, user friendly display



#### Markets

- Agricultural Water
- Semiconductor
- Power
- Pulp and Paper

#### Applications:

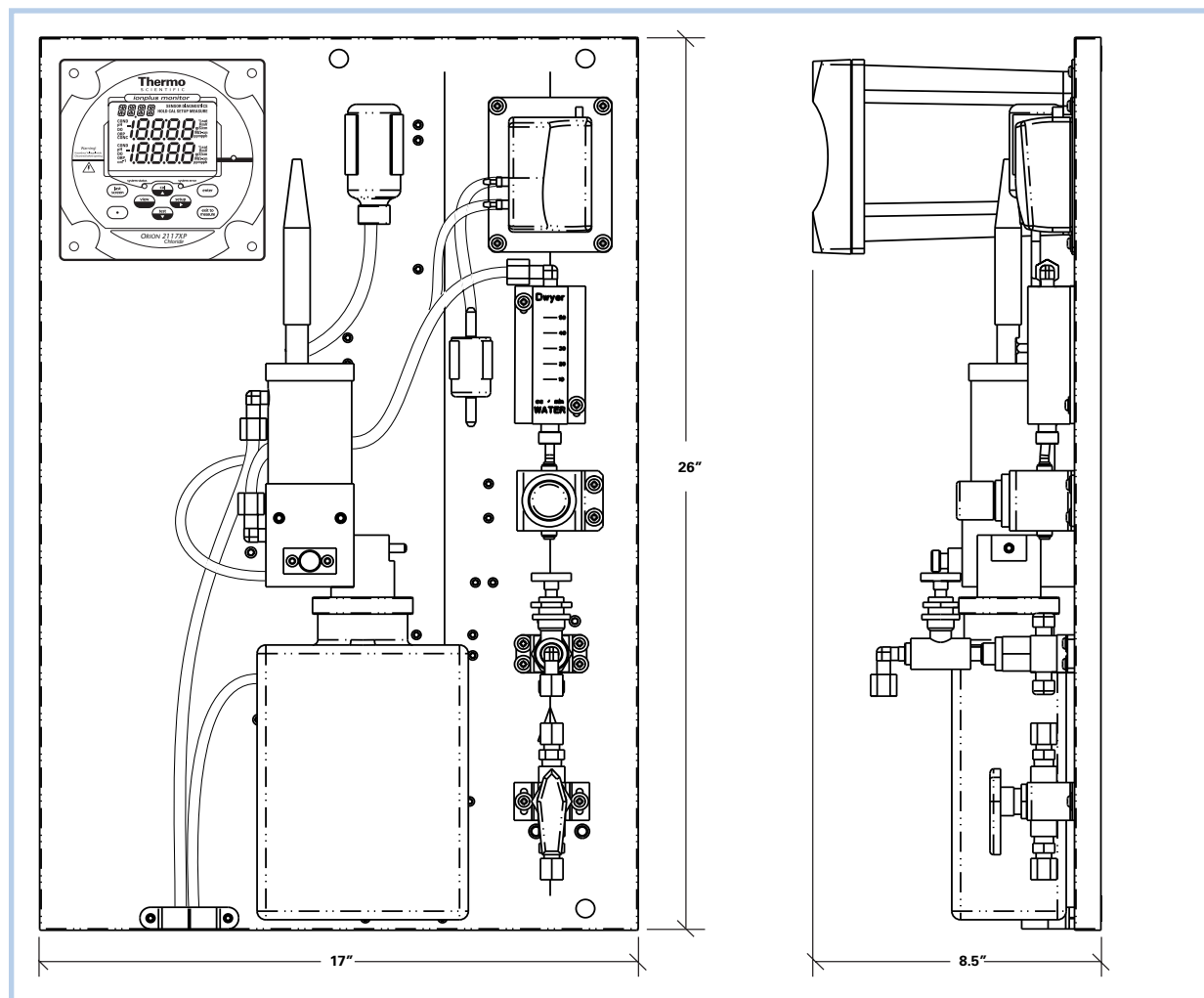
- RO Feedwater Monitoring
- Seawater Cooled Condenser Leak Detection
- Boiler Water Monitoring
- Agricultural Water Monitoring

### Benefits

- Detection limit of 0.1 ppm - the Orion 2117XP offers continuous chloride monitoring in a wide variety of samples
- Protect against early breakthrough with sensitive, selective, reliable and verifiable measurements that provide early detection of chloride in RO and boiler systems
- 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 that limit unnecessary calibration cycles due to drift with superior Orion chloride 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
- Advanced user interface with detailed calibration, measurement and diagnostic logs for early diagnostic and action level notification, configurable to your facility's desired level of performance, and all password protected if preferred
- Simple and fast calibration cycles using double known addition - quickly have your system back online with security and confidence
- Easy installation has your plant up and running in minutes - the Orion 2117XP is retrofittable to the Orion 1817HL panel mounting footprint
- Expandable platform with grab sampler, automation and automatic validation modules
- Reagent adjusts pH for proper sample conditioning to ensure accurate and reliable measurements consistently

### Dimensions

Thermo Scientific Orion 2117XP installation dimensions shown without optional protective enclosure.



**Thermo Scientific Orion 2117XP Chloride Monitor**

- **Global support**— with experience that comes from supporting our chloride 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](http://www.thermo.com/water).

Cat. No.	Chloride Monitor Packages
<b>2117XPEN</b>	<b>Chloride Monitor with Protective Enclosure Package</b> — Includes chloride monitor with protective enclosure, chloride sensing electrode (100025), reference electrode (100057), ATC (2100TP), standards solution kit (211740), CD user guide and options kit.
<b>2117XP</b>	<b>Chloride Monitor Instrument Only Package</b> — Includes chloride monitor with chloride sensing electrode (100025), reference electrode (100057), ATC (2100TP), standards solution kit (211740), CD user guide and options kit.
Cat. No.	Reagent Kits and Accessories
<b>211750XP</b>	<b>Chloride Consumables Kit</b> — for one year operation, includes (6) x 1 L bottles formic acid reagent and (6) x 2 ft long diffusion tubing with O-rings (182011), chloride standard solution kit (211740), chloride sensing electrode (100025), reference electrode (100057), (1) x 2 oz bottle reference electrode filling solution (900063), O-ring kit (2100OK), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)
<b>211750XP*</b>	<b>Reagent-less Chloride Consumables Kit</b> — for one year operation, includes (6) x 1 L empty bottles for use with formic acid reagent (182011), (6) x 2 ft long diffusion tubing with O-rings (181060), chloride standard solution kit (211740), chloride sensing electrode (100025), reference electrode (100057), (1) x 2 oz bottles reference electrode filling solution (900063), O-ring kit (2100OK), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)
<b>182011</b>	<b>Formic Acid Reagent</b> — 60 day supply- includes (1) x 1 L bottle formic acid reagent and (1) x 2 ft long diffusion tubing with O-rings (181060)
<b>182011F*</b>	<b>Reagent-less Formic Acid Reagent Bottle</b> — includes (1) x 1 L empty bottle for use with formic acid reagent (182011) and (1) x 2 ft long diffusion tubing with O-rings (181060)
<b>182011F6*</b>	<b>Reagent-less Formic Acid Reagent Bottle</b> — includes (6) x 1 L empty bottles for use with formic acid reagent (182011) and (6) x 2 ft long diffusion tubing with O-rings (181060)
<b>181060</b>	(1) x 2 ft long diffusion tubing and O-rings
<b>181160</b>	(3) x 5'8" long thin-walled diffusion tubing and O-rings for high alkalinity samples, 6 month supply
Cat. No.	Chloride Electrodes and Accessories
<b>2117XPEK</b>	<b>Chloride Electrode Kit</b> — includes chloride sensing electrode (100025), reference electrode (100057) and reference electrode filling solution (900063)
<b>100025</b>	<b>Chloride Sensing Electrode</b> — for use with 2117XP
<b>100057</b>	<b>Chloride Reference Electrode</b> — for use with 2117XP, includes reference electrode filling solution (900063)
<b>900063</b>	<b>Reference Electrode Filling Solution</b> — for use with 100057 reference electrode, (5) x 2 oz bottles

Cat. No.	Chloride Electrodes and Accessories (cont'd)
<b>2100TP</b>	<b>2100 Series Automatic Temperature Probe</b> — with ground (30 kΩ), for use with 2117XP
<b>2001XT</b>	<b>2100 Series Automatic Temperature Probe</b> — with 10 meter extension cable and ground (30 kΩ), for use with 2117XP
<b>21003M</b>	<b>Extension Cables</b> — (2) x 3 meter cables, for 100025 and 100057 electrodes
<b>2117XPCAL</b>	<b>Calibration Kit</b> — includes carrying case, 0.5 mL pipette (204847-001), box of pipette tips (204846-001), wash bottle, (1) x 2 oz bottle chloride standard 1 (296 ppm), (1) x 2 oz bottle chloride standard 2 (2946 ppm) and (1) inlet filter
<b>211740</b>	<b>Chloride Standard Solution Kit</b> — includes (2) x 2 oz bottles of chloride standard 1 (296 ppm) and (2) x 2 oz bottles of chloride standard 2 (2946 ppm)
Cat. No.	Field Replaceable Units
<b>2100EN</b>	2100 series enclosure
<b>2100FP</b>	Fluidics panel assembly only
<b>2100BP</b>	Steel back panel assembly
<b>2100NV</b>	Inlet valve assembly
<b>2100BV</b>	Bypass/needle valve assembly
<b>2100RG</b>	Regulator assembly
<b>2100DA</b>	Drain and clamp assembly
<b>2100FM</b>	Flow meter assembly
<b>2100RT</b>	Restrictor tube assembly
<b>2100FC</b>	Flow cell assembly
<b>2100PA</b>	Air pump assembly
<b>2100AF</b>	Air filter assembly
<b>2100DV</b>	Diverter valve assembly
<b>2100VC</b>	Check valve
<b>2117RBA</b>	2117XP reagent bottle adapter
<b>2100OK</b>	O-ring kit
<b>2100EC</b>	(2) x 1 meter electrode cables
<b>2100FK115</b>	Fuse kit assembly 115 V
<b>2100FK230</b>	Fuse kit assembly 230 V
<b>2100PS</b>	Power supply assembly
<b>2117XPEP</b>	2117XP electronics faceplate
<b>2117XPSK</b>	<b>Service kit</b> — includes (1) electronics faceplate (2117XPEP), (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)

*\* For International use only*



**Thermo Scientific Orion 2117XP Chloride Monitor**

<b>Specific Ion Measurements</b>	<b>Range:</b> 0.1 ppm to 100 ppm
	<b>Resolution:</b> 2, 3 or 4 digits
	<b>Accuracy (with DKA cal):</b> ± 0.1 ppm or 10%, whichever is greater
	<b>Reagent:</b> Formic Acid
<b>Response Time</b>	Reach 95% of final reading within 2 minutes of injecting a standard solution
<b>Units Displayed</b>	ppb, ppm (auto ranging)
<b>mV Measurement</b>	<b>Range:</b> ± 1999.9 mV
	<b>Resolution:</b> 0.1 mV
	<b>Relative accuracy:</b> ± (0.5 mV + 0.1%)
<b>Temperature Measurement</b>	<b>Range:</b> - 10 to 120 °C
	<b>Resolution:</b> 0.1 °C
	<b>Relative accuracy:</b> ± 0.5 °C
	<b>Continuous temperature readings:</b> YES
	<b>ATC probe connection detection:</b> YES
<b>Specific Ion Calibrations</b>	<b>DKA calibration:</b> YES
	<b>DKA calibration points:</b> 3 points
	<b>Offline calibration:</b> YES
	<b>Offline calibration points:</b> 1 point
	<b>Pre-programmed standard values:</b> YES
	<b>Custom programmed standard values:</b> YES
<b>Sample Conditions</b>	<b>Temperature:</b> 5 to 35 °C
	<b>Total alkalinity:</b> Less than 50 ppm CaCO <sub>3</sub> <i>*Sulfite must not be present in the sample*</i>
	<b>Inlet pressure:</b> 8 to 100 psig
	<b>Flow rate:</b> 40 mL/min nominal set by pressure regulator
	<b>Sample inlet:</b> 1/4" NPTF tube fitting
	<b>Sample drain:</b> 3/4" NPT male
	<b>Grab sampler supported:</b> YES
<b>Display</b>	Custom backlit LCD with temperature, concentration, mV, error codes, menu driven prompts
<b>Inputs</b>	<b>ATC:</b> 2 x NTC 30K
	<b>Specific ion input &amp; reference:</b> Potentiometric

<b>Outputs</b>	<b>Analog output:</b> Galvanically isolated
	<b>Number of analog outputs:</b> 2, one dedicated to chloride, one to temperature; shared ground
	<b>Output selections:</b> 0 - 20 mA or 4 - 20 mA
	<b>Programmable range:</b> YES
	<b>Log &amp; linear output options:</b> YES, user selectable
	<b>Alarm outputs:</b> 3
	<b>Number of relay outputs:</b> 3
	<b>Maximum relay load:</b> 250 VAC, 5 A, 30 VDC
	<b>Minimum value alarm:</b> YES
	<b>Maximum value alarm:</b> YES
	<b>Error alarm:</b> YES
	<b>Calibration/offline alarm:</b> YES
	<b>Programmable min &amp; max values:</b> YES
<b>Physical Size</b>	<b>Electronics:</b> 144 x 144 x 187 mm
	<b>Entire system:</b> 65 x 45 x 27 cm (26" x 17" x 11") Fits on 1817HL panel mounting footprint.
<b>Power</b>	<b>Input:</b> 85-132 or 170-264 VAC
<b>Software Features</b>	<b>Self-test &amp; diagnostics:</b> YES
	<b>Real time clock:</b> YES
	<b>Meter serial number:</b> YES
	<b>Password protection:</b> YES
	<b>Programmable alarms:</b> High, low, error, calibration/offline
	<b>Reset function:</b> YES
	<b>Startup reset:</b> YES
<b>Meter Features</b>	<b>Hardware calibration function:</b> YES
	<b>Non-volatile memory:</b> YES
	<b>Battery backup:</b> YES
	<b>Expansion bus:</b> Serial communication & power
	<b>Waterproof enclosure:</b> IP66 & NEMA 4X
	<b>Regulatory and Safety</b>
<b>Environmental Operating Conditions</b>	<b>Ambient operating temperature:</b> 5 to 45 °C
	<b>Relative humidity:</b> 5 to 95% non-condensing
	<b>Storage temperature:</b> - 20 to 60 °C
	<b>Storage humidity:</b> 5 % to 95 %, non-condensing
<b>Case Material</b>	Valox 364
<b>Shock and Vibration</b>	<b>Vibration, shipping/handling:</b> 0 - 60 Hz @ 1 G Load
	<b>Shock, drop test in packaging:</b> 36" on all sides and corners