

Thermo Scientific Orion 2117LL Low-Level Chloride Analyzer

Continuous On-Line Measurement of Chloride
at Low Parts Per Billion Levels

Careful monitoring and control of the steam cycle and boiler chemistry is crucial for optimal performance in power generation applications.



Without accurate and real-time monitoring of chloride the risk of corrosion fatigue, stress corrosion cracking, and pitting can create significant costs in maintenance and downtime. Early detection of chloride ingress from feedwater helps your plant maintain the optimal balance of water purification with ease and gives you peace of mind.

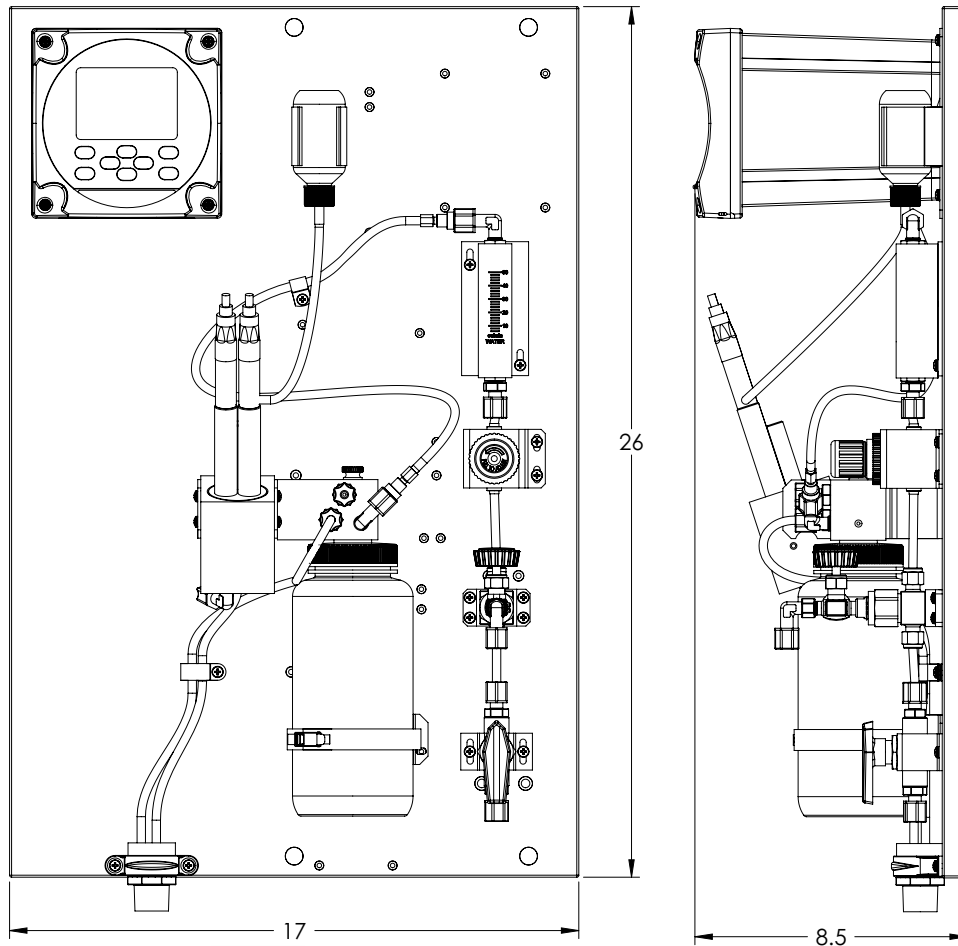
The new Thermo Scientific™ Orion™ 2117LL chloride analyzer detects chloride in real-time —providing accurate and reliable results that you can count on. Based upon our unique ROSS™ electrode technology for stability combined with a virtually maintenance free fluidic design, the Orion 2117LL analyzer provides high performance results with confidence.

Advantages:

- Holds calibration up to 60 days between reagent changes
- Only real-time monitor on the market capable of reading down to 5 ppb
- Long-life solid state sensor technology offers stability and high performance
- Simple operation and minimal maintenance required—no moving parts
- Repeatable and verifiable measurements

Engineering Specifications

1. The chloride monitor shall measure chloride concentrations using ion selective, solid state sensing electrodes.
2. Measurement shall be continuous.
3. The range of measurement shall be between 5 ppb and 10 ppm.
4. The detection limit shall be ± 5 ppb or 10% of reading, whichever is greater within $\pm 5^\circ\text{C}$ of calibration temperature.
5. Drift shall be 0.1ppm per month or 10% on reading, whichever is greater.
6. Monitor shall provide two isolated 4/20mA outputs and three programmable alarm relays. Relays shall be rated for 5A @ 240VAC.
7. Display shall be a digital graphics LCD with backlight.
8. Sample delivery requirement shall be nominal 40 mL/min.
9. Monitor shall be wall mounted with level floor space for cooler.
10. Power requirement shall be 85-132 or 170-264 AC, 50/60 Hz, dependent on power option chosen.
11. Analyzer shall be a Thermo Scientific Orion 2117LL Low Level Chloride Analyzer.



Product Specifications

Specific Ion Measurements Range	5 ppb to 10 ppm	Error Alarm	YES
Resolution	2, 3 or 4 digits	Calibration/Offline Alarm	YES
Accuracy	10% of reading or ± 5 ppb, whichever is greater, within $\pm 5^\circ$ C of calibration temperature, whichever is greater	Programmable Min & Max Values	YES
Reagent	Formic acid	Physical Size Electronics	144 x 144 x 187 mm
Response Time	90% of final reading within 2 minutes, function of flow	Entire System	65 x 45 x 27 cm (26" x 17" x 11") Fits on 1817HL/LL panel mounting footprint
Units Displayed	ppb, ppm (auto ranging)	Power Input	85-132 or 170-264 VAC
mV Measurement Range	± 1999.9 mV	Software Features Self-test & Diagnostics	YES
Resolution	0.1 mV	Real Time Clock	YES
Relative Accuracy	$\pm (0.5 \text{ mV} + 0.1\%)$	Meter Serial Number	YES
Temp. Measurement Range	- 10 to 120 $^\circ\text{C}$	Password Protection	YES
Resolution	0.1 $^\circ\text{C}$	Programmable Alarms	High, low, error, calibration/ offline
Relative Accuracy	$\pm 0.5 \text{ }^\circ\text{C}$	Reset Function	YES
Continuous Temperature Readings	YES	Meter Features Startup Reset	YES
ATC Probe Connection Detection	YES	Hardware Calibration Function	YES
DYN Calibration	YES	Non-volatile Memory	YES
DYN Calibration Points	3 points	Battery Backup	YES
Offline Calibration	YES	Expansion Bus	Serial communication & power
Offline Calibration Points	1 point	Waterproof Enclosure	IP66 & NEMA 4X
Pre-programmed Standard Values	YES	Regulatory and Safety	CE, CSA, FCC Class A limits
Custom Programmed Standard Values	YES	Environmental Operating	Ambient operating temperature: 5 to 45 $^\circ\text{C}$, Relative humidity: 5 to 95% non-condensing, Storage temperature: - 20 to 60 $^\circ\text{C}$
Sample Conditions Temperature	5 to 45 $^\circ\text{C}$, Cooled Sample Temperature 5 to 12 $^\circ\text{C}$	Storage Humidity	5 % to 95 %, non-condensing
Flow Rate	40 mL/min nominal set by pressure regulator	Case Material	Valox 364
Sample Inlet	1/4" NPTF tube fitting	Shock and Vibration	
Sample Drain	3/4" NPT male	Vibration, Shipping/Handling	0 - 60 Hz @ 1 G Load
Grab Sampler Supported	NO	Shock, Drop Test in Packaging	36" on all sides and corners
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts		
Inputs ATC	1 x NTC 30K		
Specific Ion Input & Reference	Potentiometric		
Outputs Analog Output	Galvanically isolated		
Number of Analog Outputs	2, one dedicated to chloride, 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		

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.

Low-Level Chloride Monitor Packages

2117LLEN	Low Level Chloride Analyzer with Protective Enclosure Package - includes chloride analyzer with protective enclosure, chloride electrode (100025), reference electrode (100057), ATC probe (2100TP), recirculating sample cooler, CD user guide and options kit.
2117LL	Chloride Analyzer Instrument Only Package - includes chloride analyzer with chloride electrode (100025), reference electrode (100057), ATC probe (2100TP), recirculating sample cooler, CD user guide and options kit.
2117LL230	Low Level Chloride Analyzer Only Package - includes chloride analyzer with protective enclosure, chloride electrode (100025), reference electrode (100057), ATC probe (2100TP), recirculating sample cooler for 230 VAC, CD user guide and options kit.
2117LLEN230	Low Level Chloride Analyzer with Protective Enclosure Package - includes chloride analyzer with protective enclosure, chloride electrode (100025), reference electrode (100057), ATC probe (2100TP), recirculating sample cooler for 230 VAC, CD user guide and options kit.

Reagent Kits and Accessories

182011	Formic Acid Reagent - 60 day supply, includes (1) x 1 L bottle formic acid reagent and (1) x 2 ft diffusion tubing with O-rings (181060)
182011F*	Reagent-less Formic Acid Reagent Bottle - includes (1) x 1 L empty bottle for use with formic acid reagent (182011) and (1) x 2 ft diffusion tubing with O-rings (181060)
182011F6*	Reagent-less Formic Acid Reagent Bottle - includes (6) x 1 L empty bottles for use with formic acid reagent (182011) and (6) x 2 ft diffusion tubing with O-rings (181060)
181060	(1) x 2 ft diffusion tubing and O-rings
181160	(3) x 5'8" thin-walled diffusion tubing and O-rings, for high alkalinity samples, 6 month supply

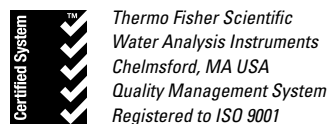
Focus on user benefits—We work closely with you to define your needs and ensure you are using the Analyzer in a way that improves your bottom line. To contact your local water quality specialists, call 1-800-225-1480; outside North America, call 001 978-232-6000. For more information visit www.thermoscientific.com/processwater.

Chloride Electrodes and Accessories

2117XPEK	Chloride Electrode Kit - includes chloride electrode (100025), reference electrode (100057) and (1) x 4 oz bottle reference electrode filling solution (100057F4)
100025	Chloride Sensing Electrode - for use with 2117LL
100057	Chloride Reference Electrode - for use with 2117LL, includes (1) x 4 oz bottle reference electrode filling solution
100057F4	Reference Electrode Filling Solution - (4) x 4 oz bottles, for use with 100057 reference electrode
941707	100 ppm chloride standard, 1 pint (475 mL) bottle
1817CAL	1817LL Calibration kit - includes dynamic calibrator (15DC15) and 100 ppm chloride standard (941707)

Field Replaceable Units

15DC15	Dynamic calibrator for performing three point calibration on 2117LL, includes syringe kits (150096 and 180096) and mounting bracket, 115 V
15DC20	Dynamic calibrator for performing three point calibration on 2117LL, includes syringe kits (150096 and 180096) and mounting bracket, 220 V
180096	Syringe kit with 20 cc syringe for use with dynamic calibrator during three point calibration on 2117LL
181170	Inlet filters, stainless steel, 60 micron filters with gaskets, pack of 2
181171	Filter gaskets, for use with 181170 inlet filters, pack of 2
2100EN	2100 series enclosure
2100BP	Steel back panel assembly
2100NV	Inlet valve assembly
2100BV	Bypass/needle valve assembly
2100RG	Regulator assembly
2100DA	Drain and clamp assembly
2100FM	Flow meter assembly
2100RT	Restrictor tube assembly
2100EC	(2) x 1 meter electrode cables for 100025 and 100057 electrodes
2117LLEP	2117LL electronics faceplate
2100OK	O-ring kit
2117RTE110	Recirculating refrigerated bath for the 2117LL 110V
2117RTE230	Recirculating refrigerated bath for the 2117LL 230V
2100FK110	Fuse kit assembly 115 V
2100FK230	Fuse kit assembly 230 V
2100PS	Power supply assembly



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