

# Orion 2117LL Low Level Chloride Analyzer

Continuous online measurement of chloride at low parts per billion levels

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 manufacturing plants maintain the optimal balance of water purification with ease.

The Thermo Scientific™ Orion™ 2117LL Chloride Analyzer detects chloride in real-time, providing high performance, accurate and reliable results with confidence.

## Features

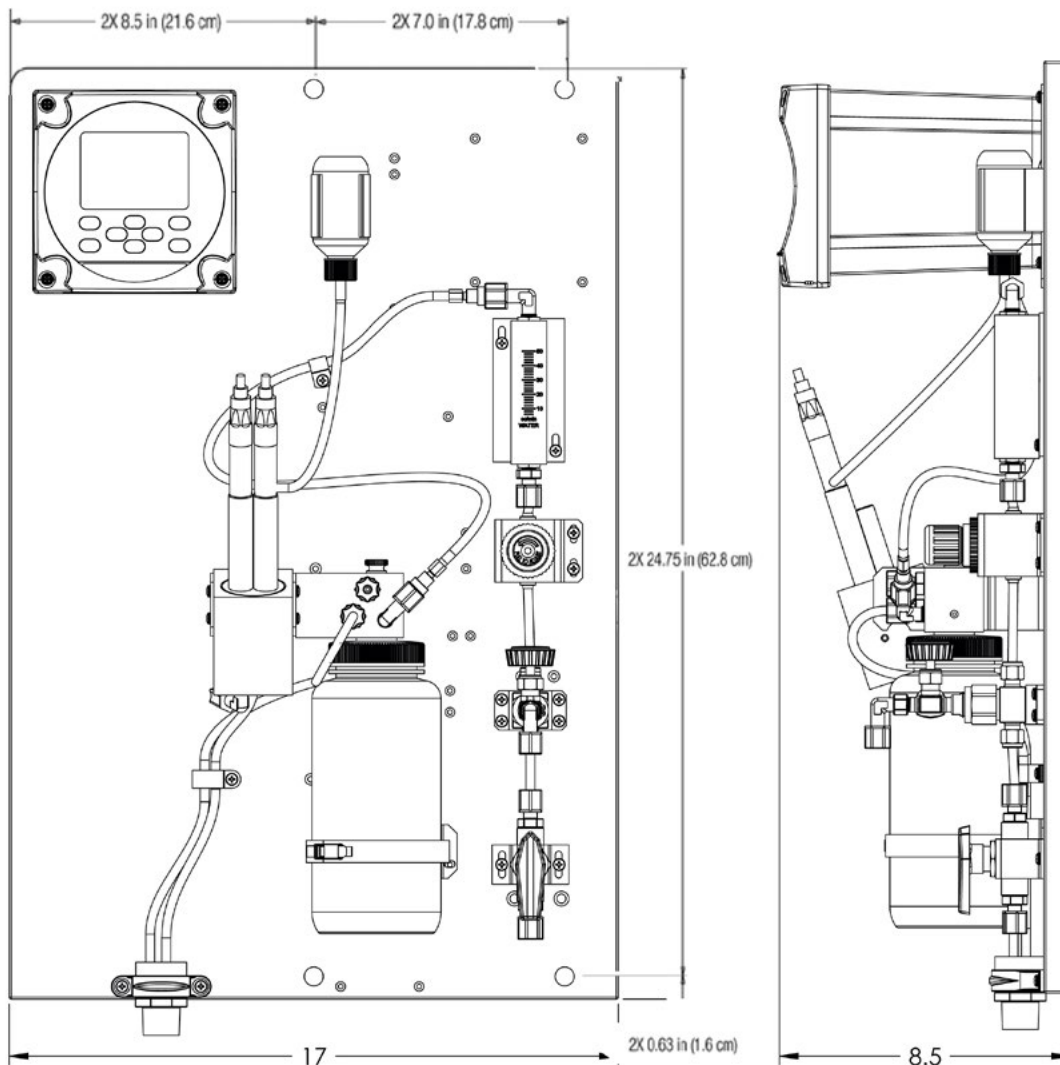
- Holds calibration up to 60 days between reagent changes
- Only real-time monitor on the market capable of reading down to 5 ppb
- Long-life solid state sensor technology offers stability and high performance
- Simple operation and minimal maintenance required with no moving parts
- Repeatable and verifiable



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## Engineering specifications

1. The chloride monitor measures chloride concentrations using ion selective, solid state sensing electrodes.
2. Measurement is continuous.
3. The range of measurement is between 5 ppb and 10 ppm.
4. The detection limit is  $\pm 5$  ppb or 10% of reading, whichever is greater within  $\pm 5^\circ\text{C}$  of calibration temperature.
5. Drift is 0.1ppm per month or 10% on reading, whichever is greater.
6. Monitor provides two isolated 4/20mA outputs and three programmable alarm relays. Relays are rated for 5A @ 240VAC.
7. Display is a digital graphics LCD with backlight.
8. Sample delivery requirement is nominal 40 mL/min.
9. Monitor is wall mounted with level floor space for cooler.
10. Power requirement: 100-120V 200mA / 200-240V 100mA; 50-60 Hz AC, dependent on power option chosen.
11. Modbus communication card option available.



Orion 2117LL installation dimensions shown without optional protective enclosure.

## Global support

With experience that comes from supporting our customers for over 50 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.

### Product Specifications

Specifications	Description
Specific ion measurements	Range: 5 ppb to 10 ppm
	Resolution: 2, 3 or 4 digits
	Accuracy: 10% of reading or $\pm 5$ ppb, whichever is greater, within $\pm 5^{\circ}\text{C}$ of calibration temperature, whichever is greater
Reagent	Formic acid
Response time	90% of final reading within 2 minutes, function of flow
Units displayed	ppb, ppm (auto ranging)
mV measurement	Range: $\pm 1999.9$ mV
	Resolution: 0.1 mV
	Relative accuracy: $\pm (0.5 \text{ mV} + 0.1\%)$
Temperature measurement	Range: $-10$ to $120^{\circ}\text{C}$
	Resolution: $0.1^{\circ}\text{C}$
	Relative accuracy: $\pm 0.5^{\circ}\text{C}$
	Continuous temperature readings: Yes ATC probe connection detection: Yes
Specific ion calibrations	DYN calibration: Yes
	DYN calibration points: 3 points
	Offline calibration: Yes
	Offline calibration points: 1 point
	Pre-programmed standard values: Yes Custom programmed standard values: Yes
Sample conditions	Temperature: 5 to $45^{\circ}\text{C}$ , Cooled Sample Temperature 5 to $12^{\circ}\text{C}$
	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: No
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts
Inputs	ATC: 2 x NTC 30K (second ATC with second parameter card)
	Specific ion input & reference: Potentiometric

Specifications	Description
Outputs	Analog output: Galvanically isolated
	Number of analog outputs: 2, programmable sensing and temperature in any order
	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
Physical size	Error alarm: Yes
	Calibration/offline alarm: Yes
	Programmable min & max values: Yes
Power	Electronics: 144 x 144 x 187 mm
	Entire system: 65 x 45 x 27 cm (26" x 17" x 11") Fits on Orion 1817HL/LL panel mounting footprint
Software features	100-120V 200mA / 200-240V 100mA; 50-60 Hz AC
	Self-test and diagnostics: Yes
	Real time clock: Yes
	Meter serial number: Yes
	Password protection: Yes
Meter features	Programmable alarms: High, low, error, calibration/offline
	Reset function: Yes
	Startup reset: Yes
	Hardware calibration function: Yes
Electronics	Non-volatile memory: Yes
	Battery backup: Yes
Regulatory and safety	Expansion bus: Serial communication & power Modbus card option available
	Waterproof enclosure: IP66 & NEMA 4X
Environmental operating conditions	CE, CSA, FCC Class A limits
	Ambient operating temperature: 5 to $45^{\circ}\text{C}$
	Relative humidity: 5 to 95% non-condensing
	Storage temperature: $-20$ to $60^{\circ}\text{C}$
Shock and vibration	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

## Ordering Information

Description	Cat. No.
<b>Chloride analyzer packages</b>	
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.	2117LLEN
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.	2117LL
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.	2117LL230
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.	2117LLEN230
<b>Reagent kits and accessories</b>	
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)	182011
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)	182011F6*
(1) x 2 ft diffusion tubing and O-rings	181060
(3) x 5'8" thin-walled diffusion tubing and O-rings, for high alkalinity samples, 6 month supply	181160
<b>Chloride electrodes and accessories</b>	
Chloride Electrode Kit – includes chloride electrode (100025), reference electrode (100057) and (1) x 4 oz bottle reference electrode filling solution (100057F4)	2117XPEK
Chloride Sensing Electrode – for use with 2117LL	100025
Chloride Reference Electrode – for use with 2117LL, includes (1) x 4 oz bottle reference electrode filling solution	100057
Reference Electrode Filling Solution – (4) x 4 oz bottles, for use with 100057 reference electrode	100057F4
100 ppm chloride standard, 1 pint (475 mL) bottle	941707
2117LL Calibration kit, standards and syringe components	2117CAL

Description	Cat. No.
<b>Field replaceable units</b> Refer to user guide for complete list	
Dynamic calibrator (115 V) with 20 mL and 60 mL syringes, luer adapter, coupling, tubing assembly and mounting bracket	21DC15
Dynamic calibrator (230 V) with 20 mL and 60 mL syringes, luer adapter, coupling, tubing assembly and mounting bracket	21DC20
Syringe kit with 20 cc syringe for use with dynamic calibrator during three point calibration on 2117LL	180096
Inlet filters, stainless steel, 60 micron filters with gaskets, pack of 2	181170
Filter gaskets, for use with 181170 inlet filters, pack of 2	181171
2100 series enclosure	2100EN
Steel back panel assembly	2100BP
Inlet valve assembly	2100NV
Bypass/needle valve assembly	2100BV
Regulator assembly	2100RG
Drain and clamp assembly	2100DA
Flow meter assembly	2100FM
Restrictor tube assembly	2100RT
Flow meter assembly	2100FM
Restrictor tube assembly	2100RT
(2) x 1 meter electrode cables for 100025 and 100057 electrodes	2100EC
2117LL electronics faceplate	2117LLEP
O-ring kit	2100OK
Recirculating refrigerated bath for the 2117LL 110V	2117RTE110
Recirculating refrigerated bath for the 2117LL 230V	2117RTE230
Fuse kit assembly 115 V	2100FK115
Fuse kit assembly 230 V	2100FK230
Power supply assembly	2100PS

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