

# Thermo Scientific Orion 2109XP Fluoride Analyzer

Measurement of fluoride easily, reliably and accurately

We are driven to improve your water quality and ensure safe drinking water for our communities today as well as those emerging globally – let us show you a new world of possibilities.



#### Markets:

- Bottled Water
- Municipal Water
- Food and Beverage
- Semiconductor

#### Applications:

- Fluorination Control
- Fluoride Level Analyzing

For many of us, water is simple to access at the turn of a faucet. We think little about the silent process that consistently delivers it without delay.

As the pioneer of fluoride electrode technology, the new, Thermo Scientific™ Orion™ 2109XP fluoride analyzer is based on the Standard Test Method for Fluoride Ion in Water (ASTM D 1179-04). The Orion 2109XP provides the highest quality fluoride measurements for drinking water required by the Safe Drinking Water Act (1974) to accurately control fluoride levels between 1.4 and 2.4 ppm.

The Orion 2109XP fluoride analyzer offers accuracy, reliability and ease-of-use to best meet the demands for fluoride analysis with complete assurance. The Orion 2109XP maximizes uptime and keeps your plant in perfect operation by offering unmatched versatility and performance

#### Advantages:

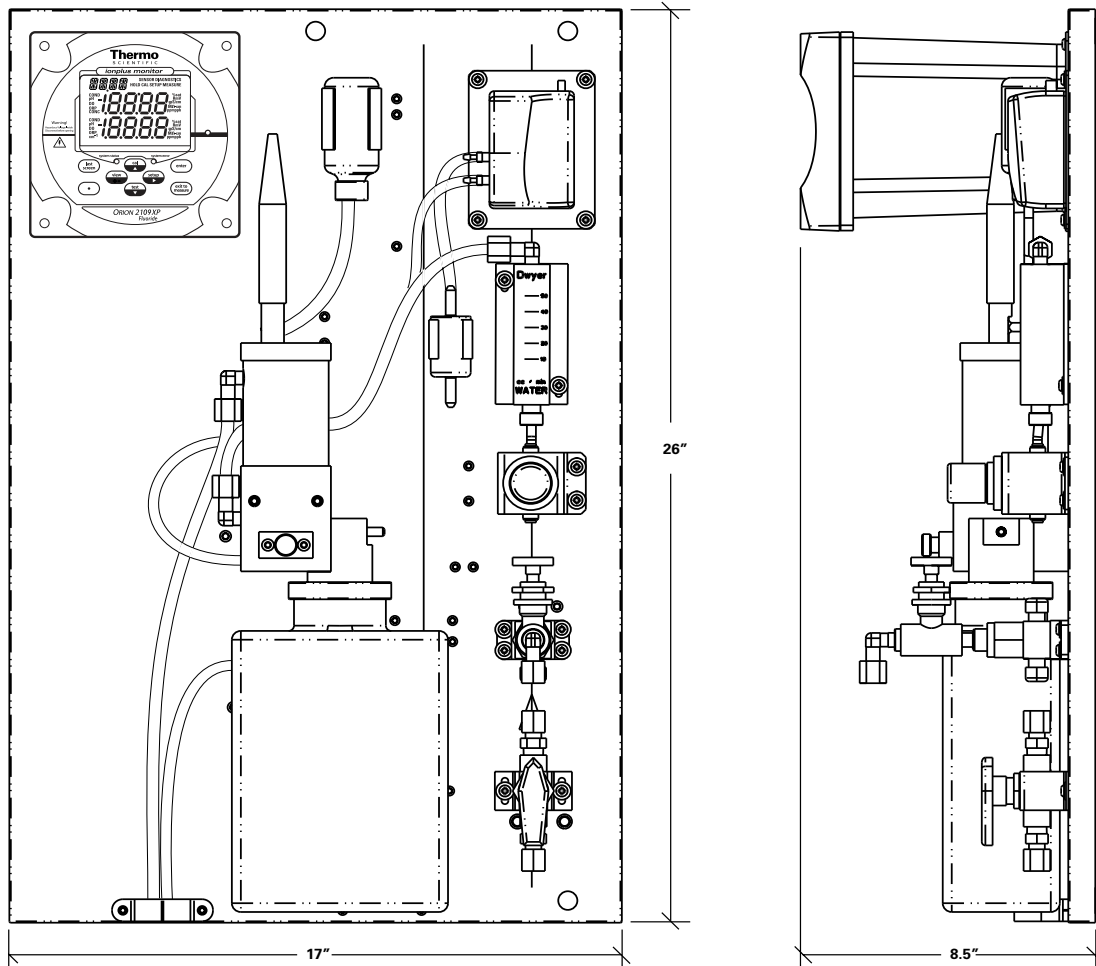
- Recognized EPA method for fluoride analysis using an ion selective electrode (ISE)
- Eliminates problems with turbidity and suspended solids in samples, provides true accuracy in measuring total fluoride concentrations
- Holds calibration for long cycles between reagent changes
- Correlates to online IC for QA/QC validation
- Long life sensor technology offers stability and high performance

## Product Benefits

- Detection limit of 10 ppb – the Orion 2109XP offers continuous fluoride analysis in a wide variety of samples
- Protect against over-fluoridation of samples with sensitive, selective, reliable and verifiable measurements that provide early detection of fluoride
- 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 fluoride 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 on line with security and confidence
- Easy installation has your plant up and running in minutes – the Orion 2109XP is retrofitable to the Orion 1809AO 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

Orion 2109XP installation dimensions shown without optional protective enclosure.



## Product Specifications

Specific Ion Measurements	Range: 10 ppb to 200 ppm	Physical Size	Electronics: 144 x 144 x 187 mm
	Resolution: 2, 3 or 4 digits		Entire system: 65 x 45 x 27 cm (26" x 17" x 11")
	Accuracy (with DKA cal): $\pm 10\%$ or 10 ppb, whichever is greater		Fits on 1809AO panel mounting footprint.
	Reagent: Reagent: Formic acid		
Response Time	Reach 95% of final reading within 2 minutes of injecting a standard solution	Power	Input: 85-132 or 170-264 V AC
Units Displayed	ppb, ppm (auto ranging)	Software Features	Self-test & diagnostics: YES
mV Measurement	Range: $\pm 1999.9$ mV		Real time clock: YES
	Resolution: 0.1 mV		Meter serial number: YES
	Relative accuracy: $\pm (0.5 \text{ mV} + 0.1\%)$		Password protection: YES
Temperature Measurement	Range: - 10 to 120 °C		Programmable alarms: High, low, error, calibration/ offline
	Resolution: 0.1 °C		Reset function: YES
	Relative accuracy: $\pm 0.5$ °C	Meter Features	Startup reset: YES
	Continuous temperature readings: YES		Hardware calibration function: YES
	ATC probe connection detection: YES		Non-volatile memory: YES
Specific Ion Calibrations	DKA calibration: YES		Battery backup: YES
	DKA calibration points: 3 points	Electronics	Expansion bus: Serial communication & power
	Offline calibration: YES		Waterproof enclosure: IP66 & NEMA 4X
	Offline calibration points: 1 point	Regulatory and Safety	CE, CSA, FCC Class A limits
	Pre-programmed standard values: YES	Environmental Operating Conditions	Ambient operating temperature: 5 to 45 °C
Custom programmed standard values: YES	Relative humidity: 5 to 95% non-condensing		
	Storage temperature: - 20 to 60 °C		
Sample Conditions	Temperature: 5 to 35 °C		Storage humidity: 5 % to 95 %, non-condensing
	Total alkalinity: Less than 250 ppm CaCO <sub>3</sub>	Case Material	Valox 364
	Inlet pressure: 8 to 100 psig		Shock and Vibration
	Flow rate: 40 mL/min nominal set by pressure regulator		Vibration, shipping/handling: 0 - 60 Hz @ 1 G Load
	Sample inlet: 1/4" NPTF tube fitting		Shock, drop test in packaging: 36" on all sides and corners
	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 fluoride, 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 V AC, 5 A, 30 V DC		
	Minimum value alarm: YES		
	Maximum value alarm: YES		
	Error alarm: YES		
Calibration/offline alarm: YES			
Programmable min & max values: YES			

## Orion 2109XP Fluoride 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.	Fluoride Analyzer Packages
2109XPEN	<b>Fluoride Analyzer with Protective Enclosure Package</b> — includes fluoride analyzer with protective enclosure, fluoride electrode (100029), reference electrode (100056), ATC probe (2100TP), standard solution kit (180940), CD user guide and options kit.
2109XP	<b>Fluoride Analyzer Instrument Only Package</b> —includes fluoride analyzer with fluoride electrode (100029), reference electrode (100056), ATC probe (2100TP), standard solution kit (180940), CD user guide and options kit.

Cat. No.	Reagent Kits and Accessories
210960XP	<b>Fluoride Consumables Kit</b> — for one year operation, includes (6) x 1 L bottles formic acid reagent and (6) x 2 ft diffusion tubing with O-rings (182011), fluoride standard solution kit (180940), fluoride electrode (100029), reference electrode (100056), (1) x 2 oz bottle reference electrode filling solution (181073), O-ring kit (21000K), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)
210960XP*	<b>Reagent-less Fluoride 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 diffusion tubing with O-rings (181060), fluoride standard solution kit (180940), fluoride electrode (100029), reference electrode (100056), (1) x 2 oz bottle reference electrode filling solution (181073), O-ring kit (21000K), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)
182011	<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)
182011F*	<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 diffusion tubing with O-rings (181060)
182011F6*	<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 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

Cat. No.	Fluoride Electrodes and Accessories
2109XPEK	<b>Fluoride Electrode Kit</b> — includes fluoride electrode (100029), reference electrode (100056) and (1) x 2 oz bottle reference electrode filling solution (181073)
100029	<b>Fluoride Sensing Electrode</b> — for use with 2109XP
100056	<b>Fluoride Reference Electrode</b> — for use with 2109XP, includes (1) x 2 oz bottle reference electrode filling solution
181073	<b>Reference Electrode Filling Solution</b> — (5) x 2 oz bottles, for use with reference electrode (100056)
2100TP	<b>2100 Series Automatic Temperature Probe</b> — with ground (30 kΩ)

\* For International Use Only



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Chelmsford, MA USA  
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Cat. No.	Fluoride Electrodes and Accessories (cont'd)
2001XT	<b>2100 Series Automatic Temperature Probe</b> — with 10 meter extension cable and ground (30 kΩ)
2100EC	<b>Electrode Cables</b> — (2) x 1 meter cables, for 100029 and 100056 electrodes
21003M	<b>Extension Cables</b> — (2) x 3 meter cables, for 100029 and 100056 electrodes
2109XPCAL	<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 fluoride standard 1 (100 ppm), (1) x 2 oz bottle fluoride standard 2 (1000 ppm) and (1) inlet filter
180940	<b>Fluoride Standard Solution Kit</b> — includes (2) x 2 oz bottles of fluoride standard 1 (100 ppm) and (2) x 2 oz bottles of fluoride standard 2 (1000 ppm)
940907	(1) x 1 pint bottle 100 ppm fluoride standard solution
110902	(1) x 1 pint bottle 1000 ppm fluoride standard solution

Cat. No.	Field Replaceable Units
2100EN	2100 series enclosure
2100FP	Fluidics panel assembly only
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
2100FC	Flow cell assembly
2100PA	Air pump assembly
2100AF	Air filter assembly
2100DV	Diverter valve assembly
2100VC	Check valve
2109RBA	2109XP reagent bottle adapter
2100OK	O-ring kit
2100EC	(2) x 1 meter electrode cables
2100FK115	Fuse kit assembly 115 V
2100FK230	Fuse kit assembly 230 V
2100PS	Power supply assembly
2109XPEP	2109XP electronics faceplate
2109XPSK	Service Kit— includes (1) electronics faceplate (2109XPEP), (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)

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

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