

Optimal, real-time fluoride analysis

Measurement of fluoride easily, reliably and accurately

For many, water is simple to access at the turn of a faucet - a silent process that consistently delivers without delay. Thermo Fisher Scientific offers an extensive portfolio of water process analytical systems and equipment, designed to improve water quality and help ensure safe drinking water for communities today as well as those emerging globally.

As a leader of fluoride electrode technology, the Thermo Scientific™ Orion™ 2109XP Fluoride Analyzer is based on the Standard Test Method for Fluoride Ion in Water (ASTM D 1179-04) and capable of an extended range of 0.01-200ppm. The Orion 2109XP Analyzer measures and controls fluoride levels between an optimum range of 0.7-1.2mg/L*.

Made to provide accuracy, reliability and ease-of-use to best meet the demands for fluoride analysis, the all-in-one system maximizes uptime and keeps manufacturing plants operating efficiently by offering superior versatility and performance.

Advantages

- Recognized EPA method for fluoride analysis using an ion selective electrode (ISE)
- Helps alleviate challenges with turbidity and suspended solids in samples to provide true accuracy when 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



Markets

- Bottled water
- Municipal water
- Food and beverage
- Semiconductor

Applications

- Fluorination control
- Fluoride level analysis

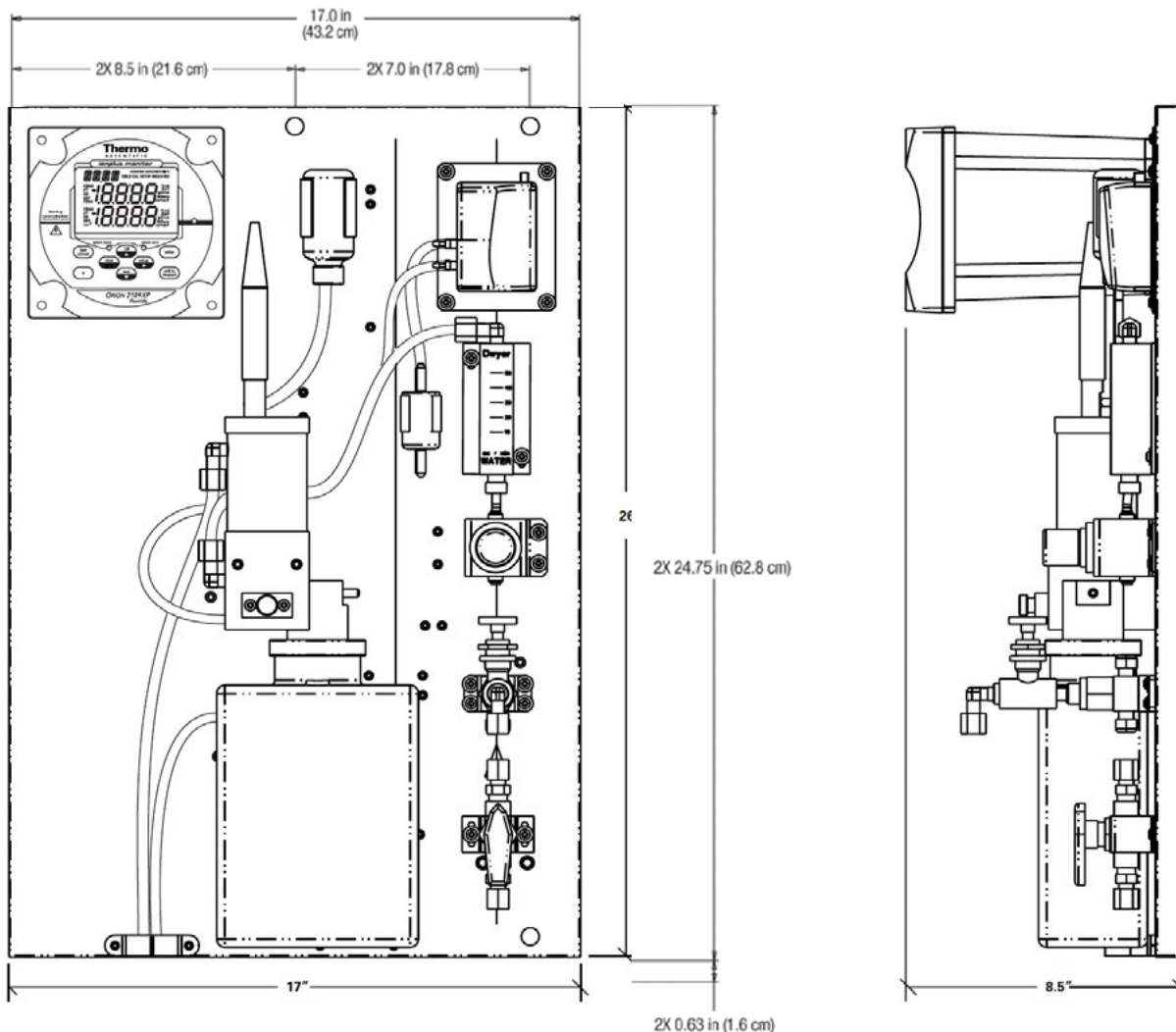
*As recommended by the US Department of Health and Human Services to prevent tooth decay. The EPA National primary drinking water standard enforced limit is 4mg/L.

Features

- Detection limit of 10 ppb, offering continuous fluoride analysis in a wide variety of samples
- Protect against over-fluoridation of samples with sensitive and verifiable measurements that provide early detection of fluoride
- Simple step-by-step scrolling instruction for setup, calibration, operation and diagnostics menus is easy to use while maximizing uptime
- Large operator friendly backlit display helps view measurements with even the lowest light conditions
- Superior Orion fluoride electrode technology provides fast and stable measurements, limiting unnecessary calibration cycles due to drift
- Minimize operator time and maintenance without use of complicated moving parts that often require frequent attention and expensive spare part expenditures
- Advanced user interface with detailed calibration, measurement and diagnostic logs for early action level notification, configurable to facility's desired level of performance, and password protected if preferred
- Simple and fast calibration cycles using double known addition to securely quickly get the system back online
- Orion 2109XP Analyzer is retrofittable to the Thermo Scientific™ Orion™ 1809AO Analyzer 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
- Modbus® communication card option available

Dimensions

Orion 2109XP Analyzer 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.

Product Specifications

Specification	Description
Specific ion measurements	Range: 10 ppb to 200 ppm
	Resolution: 2, 3 or 4 digits
	Accuracy (with DKA cal): $\pm 10\%$ or 10 ppb, whichever is greater
	Reagent: Formic acid
Response time	Reach 95% of final reading within 2 minutes of injecting a standard solution
Units displayed	ppb, ppm (auto ranging)
mV measurement	Range: ± 1999.9 mV
	Resolution: 0.1 mV
	Relative accuracy: $\pm (0.5 \text{ mV} + 0.1\%)$
Temperature measurement	Range: -10 to 120°C
	Resolution: 0.1°C
	Relative accuracy: $\pm 0.5^\circ\text{C}$
	Continuous temperature readings: Yes ATC probe connection detection: Yes
Specific ion calibrations	DKA calibration: Yes
	DKA 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 35°C
	Total alkalinity: Less than 250 ppm CaCO_3
	Inlet pressure: 8 to 100 psig
	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: Yes
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

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.

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
Physical size	Electronics: 144 x 144 x 187 mm; (5.7" x 5.7" x 7.4")
	Entire system: 65 x 45 x 27 cm (26" x 17" x 11")
	Fits on 1809AO panel mounting footprint
Power	Input: 100 to 120 V, 200 mA or 200 to 240 V, 100 mA, 50/60 Hz
Software features	Self-test & diagnostics: Yes
	Real time clock: Yes
	Meter serial number: Yes
	Password protection: Yes
	Programmable alarms: High, low, error, calibration/offline Reset function: Yes
Meter features	Startup reset: Yes
	Hardware calibration function: Yes
	Non-volatile memory: Yes
	Battery backup: Yes
Expansion bus: Serial communication & power	
Electronics	Waterproof enclosure: IP66 & NEMA 4X
Regulatory and safety	CE, CSA, FCC Class A limits
Environmental operating conditions	Ambient operating temperature: 5 to 45°C
	Relative humidity: 5 to 95% non-condensing
	Storage temperature: -20 to 60°C 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.
Fluoride analyzer packages	
Fluoride Analyzer with Protective Enclosure Package – 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.	2109XPEN
Fluoride Analyzer Instrument Only Package – includes fluoride analyzer with fluoride electrode (100029), reference electrode (100056), ATC probe (2100TP), standard solution kit (180940), CD user guide and options kit.	2109XP
Reagent kits and accessories	
Fluoride Consumables Kit – 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 (2100OK), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)	210960XP
Reagent-less Fluoride Consumables Kit – 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 (2100OK), check valve (2100VC), pipette tips (204846-001), restriction tube assembly (2100RT) and inlet filter with gaskets (181170)	
Formic Acid Reagent – 60 day supply, includes (1) x 1 L bottle formic acid reagent and (1) x 2 ft long 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
Fluoride electrodes and accessories	
Fluoride Electrode Kit – includes fluoride electrode (100029), reference electrode (100056) and (1) x 2 oz bottle reference electrode filling solution (181073)	2109XPEK
Fluoride Sensing Electrode – for use with 2109XP	100029
Fluoride Reference Electrode – for use with 2109XP, includes (1) x 2 oz bottle reference electrode filling solution	100056
Reference Electrode Filling Solution – (5) x 2 oz bottles, for use with reference electrode (100056)	181073
2100 Series Automatic Temperature Probe – with ground (30 kΩ)	2100TP

Fluoride electrodes and accessories (cont'd)	
2100 Series Automatic Temperature Probe – with 10 meter extension cable and ground (30 kΩ)	2001XT
Electrode Cables – (2) x 1 meter cables, for 100029 and 100056 electrodes	2100EC
Extension Cables – (2) x 3 meter cables, for 100029 and 100056 electrodes	21003M
Calibration Kit – 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	2109XPCAL
Fluoride Standard Solution Kit – includes (2) x 2 oz bottles of fluoride standard 1 (100 ppm) and (2) x 2 oz bottles of fluoride standard 2 (1000 ppm)	180940
(1) x 1 pint bottle 100 ppm fluoride standard solution	940907
(1) x 1 pint bottle 1000 ppm fluoride standard solution	110902
Field replaceable units	
2100 series enclosure	2100EN
Fluidics panel assembly only	2100FP
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 cell assembly	2100FC
Air pump assembly	2100PA
Air filter assembly	2100AF
Diverter valve assembly	2100DV
Check valve	2100VC
Diffusion bottle adapter	2100FABA
O-ring kit	2100OK
(2) x 1 meter electrode cables	2100EC
Fuse kit assembly 115 V	2100FK110
Fuse kit assembly 230 V	2100FK230
Power supply assembly	2100PS
2109XP electronics faceplate	2109XPEP
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)	2109XPSK

*For International Use Only

Find out more at thermofisher.com/processwater

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