

# Thermo Scientific Orion 2120XP Calcium Hardness Analyzer

Real time calcium hardness detection

We provide calcium hardness detection unsurpassed at pinpointing breakthrough – creating confidence in your water purification results.



## Superior Performance and Ease of Operation

Water acts as a universal solvent in nature by dissolving many minerals and salts from the surrounding environment. Regional changes in source water must be carefully analyzed to maximize the purity of the water. Many industrial and commercial applications must efficiently and economically produce the highest quality feedwater – for high purity steam for power generation or the best tasting bottled water available to consumers.

The Thermo Scientific™ Orion™ 2120XP calcium hardness analyzer detects calcium as the major component of hardness in real time – providing accurate and reliable results that you can count on. Limiting the costly effects of improper water purification has never been easier.

The analyzer continuously displays levels of calcium hardness to prevent against boiler tube scaling, corrosion, water flow restriction and the loss of heat transfer efficiency for power generation applications.

The Orion 2120XP provides early detection of breakthrough due to zeolite softening depletion – maximizing your process integrity while maintaining the best possible return on investment.

Let our analyzer be your step by step guide to reliable and cost effective calcium hardness measurements.

## Advantages

- Holds calibration up to 60 days between reagent changes
- Fast and most accurate calibration has you back online in minutes
- Long life 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:

- Bottled Water
- Municipal Water
- Food and Beverage
- Power
- Pulp and Paper

## Applications:

- Water Softening
- Zeolite Softener Effluent Analysis
- Blending Applications

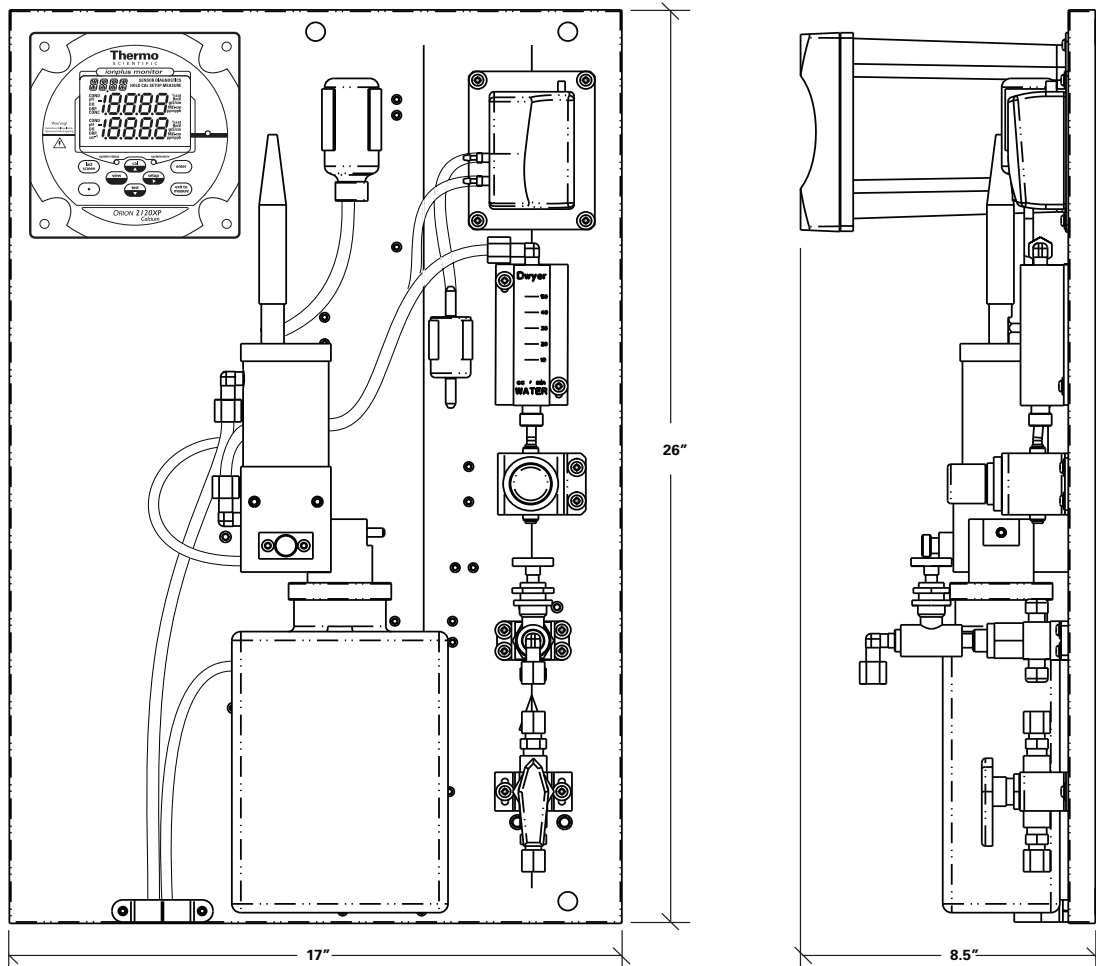
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## Product Benefits

- Detection limit of 25 ppb – the Orion 2120XP offers continuous calcium hardness analysis in a wide variety of samples
- Protect against early softener breakthrough with sensitive, selective, reliable and verifiable measurements that provide early detection of calcium hardness
- 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 calcium 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 2120XP is retrofitable to the Thermo Scientific Orion 1820AO 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 2120XP installation dimensions shown without optional protective enclosure.



## Product Specifications

Specific Ion Measurements	Range: 25 ppb to 500 ppm	Outputs	Analog output: Galvanically isolated
	Resolution: 1, 2 or 3 digits		Number of analog outputs: 2, one dedicated to calcium hardness, one to temperature; shared ground
	Accuracy (with DKA cal): $\pm 10\%$ or 10 ppb CaCO <sub>3</sub> , whichever is greater		Output selections: 0 - 20 mA or 4 - 20 mA
	Reagent: Formic acid		Programmable range: YES
Response Time	Reach 95% of final reading within 2 minutes of injecting a standard solution		Log & linear output options: YES, user selectable
Units Displayed	ppb, ppm (auto ranging)		Alarm outputs: 3
mV Measurement	Range: $\pm 1999.9$ mV		Number of relay outputs: 3
	Resolution: 0.1 mV		Maximum relay load: 250 VAC, 5 A, 30 VDC
	Relative accuracy: $\pm (0.5 \text{ mV} + 0.1\%)$		Minimum value alarm: YES
Temperature Measurement	Range: - 10 to 120 °C		Maximum value alarm: YES
	Resolution: 0.1 °C		Error alarm: YES
	Relative accuracy: $\pm 0.5$ °C		Calibration/offline alarm: YES
	Continuous temperature readings: YES		Programmable min & max values: YES
	ATC probe connection detection: YES	Physical Size	Electronics: 144 x 144 x 187 mm
Specific Ion Calibrations	DKA calibration: YES		Entire system: 65 x 45 x 27 cm (26" x 17" x 11") Fits on 1820A0 panel mounting footprint.
	DKA calibration points: 3 points	Power	Input: 85-132 or 170-264 VAC
	Offline calibration: YES	Software Features	Self-test & diagnostics: YES
	Offline calibration points: 1 point		Real time clock: YES
	Pre-programmed standard values: YES		Meter serial number: YES
Custom programmed standard values: YES		Password protection: YES	
Sample Conditions	Temperature: 5 to 35 °C		Programmable alarms: High, low, error, calibration/ offline
	Total alkalinity: Less than 250 ppm CaCO <sub>3</sub>		Reset function: YES
	Inlet pressure: 8 to 100 psig	Meter Features	Startup reset: YES
	Flow rate: 40 mL/min nominal set by pressure regulator		Hardware calibration function: YES
	Sample inlet: 1/4" NPTF tube fitting		Non-volatile memory: YES
Sample drain: 3/4" NPT male		Battery backup: YES	
Grab sampler supported: YES		Expansion bus: Serial communication & power	
Display	Custom backlit LCD with temperature, concentration, mV, error codes and menu driven prompts	Electronics	Waterproof enclosure: IP66 & NEMA 4X
Inputs	ATC: 2 x NTC 30K	Regulatory and Safety	CE, CSA, FCC Class A limits
	Specific ion input & reference: Potentiometric	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

## Thermo Scientific Orion 2120XP Calcium Hardness 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.	Calcium Hardness Analyzer Packages
2120XPEN	<b>Calcium Hardness Analyzer with Protective Enclosure Package</b> — includes calcium hardness analyzer with protective enclosure, calcium electrode (100049), reference electrode (100056), ATC probe (2100TP), standard solution kit (182040), CD user guide and options kit.
2120XPENG	<b>Calcium Hardness Analyzer with Protective Enclosure Package</b> — includes calcium hardness analyzer with protective enclosure and integral grab sampler, calcium electrode (100049), reference electrode (100056), ATC probe (2100TP), standard solution kit (182040), CD user guide and options kit.
2120XP	<b>Calcium Hardness Analyzer Instrument Only Package</b> — includes calcium hardness analyzer with calcium electrode (100049), reference electrode (100056), ATC probe (2100TP), standard solution kit (182040), CD user guide and options kit.
2120XPG	<b>Calcium Hardness Analyzer Instrument Only Package</b> — includes calcium hardness analyzer and integral grab sampler with calcium electrode (100049), reference electrode (100056), ATC probe (2100TP), standard solution kit (182040), CD user guide and options kit.

Cat. No.	Reagent Kits and Accessories
212050XP	<b>Calcium Hardness 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), calcium standard solution kit (182040), calcium electrode (100049), 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)
212050XPF*	<b>Reagent-less Calcium Hardness 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), calcium standard solution kit (182040), calcium electrode (100049), 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)
182011	<b>Formic Acid Reagent</b> — 60 day supply, includes (1) x 1 L bottle formic acid reagent and (1) x 2 ft 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

\* For International Use Only



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Cat. No.	Calcium Electrodes and Accessories
2120XPEK	<b>Calcium Electrode Kit</b> — includes calcium electrode (100049), reference electrode (100056) and (1) x 2 oz bottle reference electrode filling solution (181073)
100049	<b>Calcium Sensing Electrode</b> — for use with 2120XP
100056	<b>Calcium Reference Electrode</b> — for use with 2120XP, 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)
2100EC	<b>Electrode Cables</b> — (2) x 1 meter cables, for 100049 and 100056 electrodes
21003M	<b>Extension Cables</b> — (2) x 3 meter cables, for 100049 and 100056 electrodes
2100TP	<b>2100 Series Automatic Temperature Probe</b> — with ground (30 kΩ)
2001XT	<b>2100 Series Automatic Temperature Probe</b> — with 10 meter extension cable and ground (30 kΩ)
2120XPCAL	<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 calcium standard 1 (191 ppm), (1) x 2 oz bottle calcium standard 2 (1920 ppm) and (1) inlet filter
182040	<b>Calcium Standard Solution Kit</b> — includes (2) x 2 oz bottles calcium standard 1 (191 ppm) and (2) x 2 oz bottles calcium standard 2 (1920 ppm)

Cat. No.	Field Replaceable Units - For a complete listing of FRUS refer to the user guide
2100EN	2100 series enclosure
2100FP	Fluidics panel assembly only
2100BV	Bypass/needle valve assembly
2100RG	Regulator assembly
2100FM	Flow meter assembly
2100RT	Restrictor tube assembly
2100FC	Flow cell assembly
2100PA	Air pump assembly
2100AF	Air filter assembly
2120RBA	2120XP reagent bottle adapter
2100OK	O-ring kit
2100EC	(2) x 1 meter electrode cables
2100PS	Power supply assembly
2120XPEP	2120XP electronics faceplate
2120XPSK	<b>Service Kit</b> — includes (1) electronics faceplate (2120XPEP), (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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