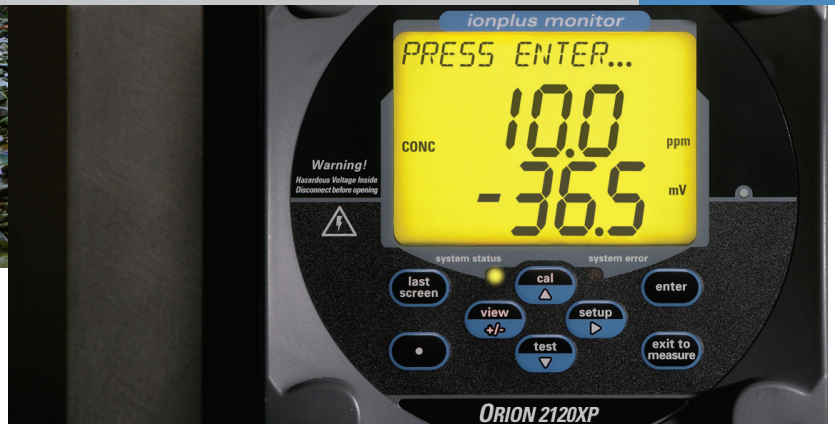


Thermo Fisher Scientific provides  
calcium hardness detection  
unsurpassed at pinpointing  
breakthrough – creating  
confidence in your water  
purification results.

## Thermo Scientific Orion 2120XP Calcium Hardness Monitor



### 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 monitored 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 NEW Thermo Scientific Orion 2120XP calcium hardness monitor 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 monitor 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 monitor 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:

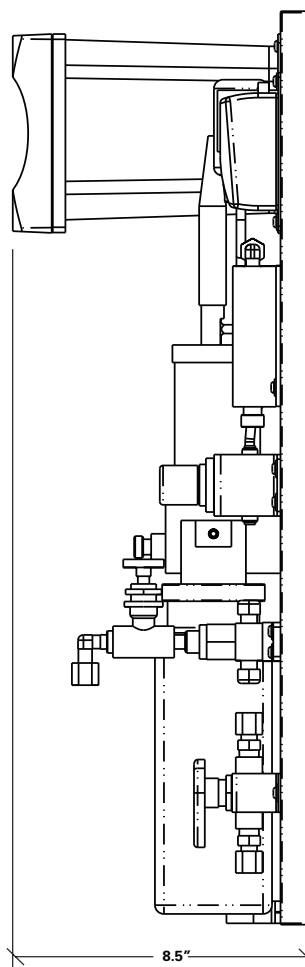
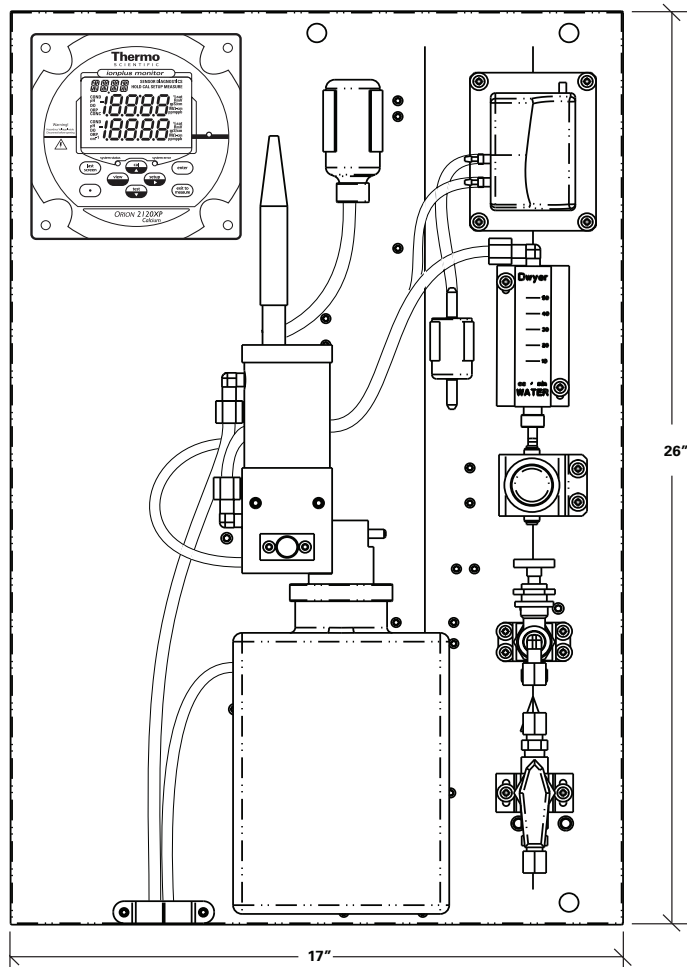
- Water Softening
- Zeolite Softener Effluent Monitoring
- Blending Applications

### Benefits

- Detection limit of 25 ppb - the Orion 2120XP offers continuous calcium hardness monitoring 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 set-up, calibration, operation and diagnostics menus
- Measurements at a glance from any distance for even the lowest light conditions using the large operator friendly visible backlit display
- Fastest 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 retrofittable to the 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.





## Thermo Scientific Orion 2120XP Calcium Hardness Monitor

<b>Specific Ion Measurements</b>	<b>Range:</b> 25 ppb to 500 ppm
	<b>Resolution:</b> 1, 2, 3 digits
	<b>Accuracy (with DKA cal):</b> $\pm 10\%$ or 10 ppb $\text{CaCO}_3$ , whichever is greater
	<b>Reagent:</b> Formic Acid
<b>Response Time</b>	Reach 95% of final reading within 2 minutes of injecting a standard solution
<b>Units Displayed</b>	ppb, ppm (auto ranging)
<b>mV Measurement</b>	<b>Range:</b> $\pm 1999.9$ mV
	<b>Resolution:</b> 0.1 mV
	<b>Relative accuracy:</b> $\pm (0.5 \text{ mV} + 0.1\%)$
<b>Temperature Measurement</b>	<b>Range:</b> $-10$ to $120$ °C
	<b>Resolution:</b> 0.1 °C
	<b>Relative accuracy:</b> $\pm 0.5$ °C
	<b>Continuous temperature readings:</b> YES
	<b>ATC probe connection detection:</b> YES
<b>Specific Ion Calibrations</b>	<b>DKA calibration:</b> YES
	<b>DKA calibration points:</b> 3 points
	<b>Offline calibration:</b> YES
	<b>Offline calibration points:</b> 1 point
	<b>Pre-programmed standard values:</b> YES
	<b>Custom programmed standard values:</b> YES
<b>Sample Conditions</b>	<b>Temperature:</b> 5 to 35 °C
	<b>Total alkalinity:</b> less than 250 ppm $\text{CaCO}_3$
	<b>Inlet pressure:</b> 8 to 100 psig
	<b>Flow rate:</b> 40 mL/min nominal set by pressure regulator
	<b>Sample inlet:</b> 1/4" NPTF tube fitting
	<b>Sample drain:</b> 3/4" NPT male
	<b>Grab sampler supported:</b> YES
<b>Display</b>	Custom backlit LCD with temperature, concentration, mV, error codes, menu driven prompts
<b>Inputs</b>	<b>ATC:</b> 2 x NTC 30K
	<b>Specific ion input &amp; reference:</b> Potentiometric

## Outputs

Analog output: Galvanically isolated

**Number of analog outputs:** 2, one dedicated to calcium hardness, 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

**Error alarm:** YES

**Calibration/offline alarm:** YES

**Programmable min & max values:** YES

## Physical Size

**Electronics:** 144 x 144 x 187 mm

**Entire system:** 65 x 45 x 27 cm (26" x 17" x 11")  
Fits on 1820AO panel mounting footprint.

## Power

**Input:** 85-132 or 170-264 VAC

## 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

**Waterproof enclosure:** IP66 & NEMA 4X

## Regulatory and Safety

CE, CSA, UL, 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

## Thermo Scientific Orion 2120XP Calcium Hardness Monitor

- **Global support**— with experience that comes from supporting our calcium hardness 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 monitor 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.thermo.com/water](http://www.thermo.com/water).

Cat. No.	Calcium Hardness Monitor Packages
<b>2120XPEN</b>	<b>Calcium Hardness Monitor with Protective Enclosure Package</b> — Includes calcium hardness monitor with protective enclosure, calcium sensing electrode (100049), reference electrode (100056), ATC (2100TP), standards solution kit (182040), CD user guide and options kit.
<b>2120XP</b>	<b>Calcium Hardness Monitor Instrument Only Package</b> — Includes calcium hardness monitor with calcium sensing electrode (100049), reference electrode (100056), ATC (2100TP), standards solution kit (182040), CD user guide and options kit.
Cat. No.	Reagent Kits and Accessories
<b>212050XP</b>	<b>Calcium Hardness Consumables Kit</b> — for one year operation, includes (6) x 1 L bottles formic acid reagent and (6) x 2 ft long diffusion tubing with O-rings (182011), calcium standard solution kit (182040), calcium sensing 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)
<b>212050XPF*</b>	<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 long diffusion tubing with O-rings (181060), calcium standard solution kit (182040), calcium sensing electrode (100049), reference electrode (100056), (1) x 2 oz bottles 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)
<b>182011</b>	<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)
<b>182011F*</b>	<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 long diffusion tubing with O-rings (181060)
<b>182011F6*</b>	<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 long diffusion tubing with O-rings (181060)
<b>181060</b>	(1) x 2 ft long diffusion tubing and O-rings
<b>181160</b>	(3) x 5'8" long thin-walled diffusion tubing and O-rings for high alkalinity samples, 6 month supply
Cat. No.	Calcium Electrodes and Accessories
<b>2120XPEK</b>	<b>Calcium Electrode Kit</b> — includes calcium sensing electrode (100049), reference electrode (100056), and reference electrode filling solution (181073)
<b>100049</b>	<b>Calcium Sensing Electrode</b> — for use with 2120XP
<b>100056</b>	<b>Calcium Reference Electrode</b> — for use with 2120XP, includes reference electrode filling solution (181073)
<b>181073</b>	<b>Reference Electrode Filling Solution</b> — (5) x 2 oz bottles for use with reference electrode (100056)

Cat. No.	Calcium Electrodes and Accessories (cont'd)
<b>2100TP</b>	<b>2100 Series Automatic Temperature Probe</b> — with ground (30 kΩ), for use with 2120XP
<b>2001XT</b>	<b>2100 Series Automatic Temperature Probe</b> — with 10 meter extension cable and ground (30 kΩ), for use with 2120XP
<b>21003M</b>	<b>Extension Cables</b> — (2) x 3 meter cables, for 100049 and 100056 electrodes
<b>2120XPCAL</b>	<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
<b>182040</b>	<b>Calcium Standard Solution Kit</b> — includes (2) x 2 oz bottles of calcium standard 1 (191 ppm) and (2) x 2 oz bottles of calcium standard 2 (1920 ppm)
Cat. No.	Field Replaceable Units
<b>2100EN</b>	2100 series enclosure
<b>2100FP</b>	Fluidics panel assembly only
<b>2100BP</b>	Steel back panel assembly
<b>2100NV</b>	Inlet valve assembly
<b>2100BV</b>	Bypass/needle valve assembly
<b>2100RG</b>	Regulator assembly
<b>2100DA</b>	Drain and clamp assembly
<b>2100FM</b>	Flow meter assembly
<b>2100RT</b>	Restrictor tube assembly
<b>2100FC</b>	Flow cell assembly
<b>2100PA</b>	Air pump assembly
<b>2100AF</b>	Air filter assembly
<b>2100DV</b>	Diverter valve assembly
<b>2100VC</b>	Check valve
<b>2120RBA</b>	2120XP reagent bottle adapter
<b>2100OK</b>	O-ring kit
<b>2100EC</b>	(2) x 1 meter electrode cables
<b>2100FK115</b>	Fuse kit assembly 115 V
<b>2100FK230</b>	Fuse kit assembly 230 V
<b>2100PS</b>	Power supply assembly
<b>2120XPEP</b>	2120XP electronics faceplate
<b>2120XPSK</b>	<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)

\* For International use only