thermo scientific

Real time calcium hardness detection

Superior performance, ease of use and create confidence in water purification results

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.

The Orion 2120XP 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. Maximize process integrity while maintaining the best possible return on investment with an all-in-one system that provides early detection of breakthrough due to zeolite softening depletion.

Advantages

- Holds calibration up to 60 days between reagent changes

- Fast and accurate calibration has the system back online in minutes

- Long life sensor technology offers stability and high performance

- No moving parts for simple operation and minimal maintenance required

- 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 softenereffluent analysis
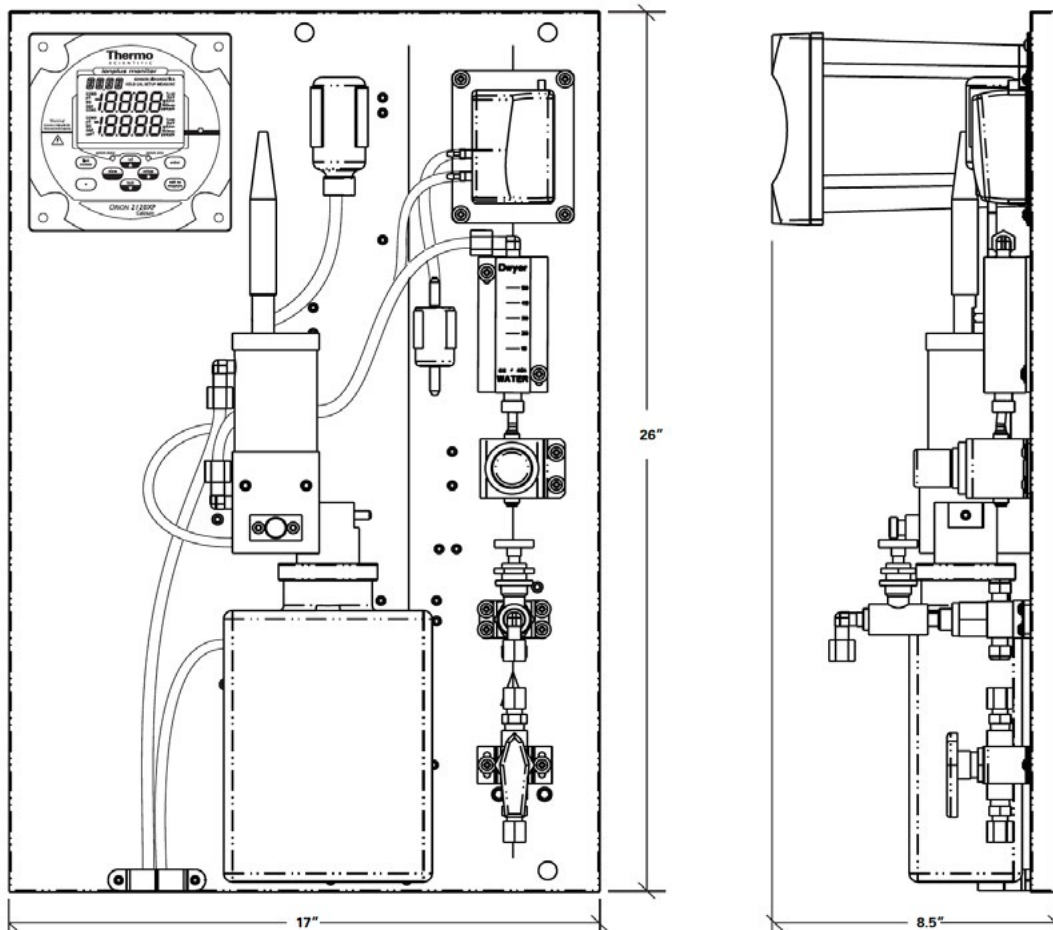
- Blending applications

Orion 2120XP Calcium Hardness Analyzer

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Features

- Detection limit of 25 ppb offers continuous calcium hardness analysis in a wide variety of samples

- Protect against early softener breakthrough with sensitive, and verifiable measurements that provide early detection of calcium hardness

- 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 for viewing measurements even with the lowest light conditions

- Superior Orion calcium electrode technology provides fast and stable measurements, limiting unnecessary calibration cycles due to drift

- Minimize operator time and maintenance without the 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 for desired level of performance and all password protected if preferred

- Simple and fast calibration cycles using double known addition to securely and quickly get the system back online

- Retrofitable to the Thermo Scientific™ Orion™ 1820AO 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 2120XP 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.

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: 25 ppb to 500 ppm
	Resolution: 1, 2 or 3 digits
	Accuracy (with DKA cal): ± 10% or 10 ppb $CaCO_3$, 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: ± (0.5 mV + 0.1%)
Temperature measurement	Range: -10 to 120℃
	Resolution: 0.1℃
	Relative accuracy: ± 0.5℃
	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℃
	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

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 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
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: 100-120V 200mA / 200-240V 100mA; 50-60 Hz AC
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℃
	Relative humidity: 5 to 95% non-condensing
	Storage temperature: -20 to 60℃
	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.
Calcium hardness analyzer packages	
Calcium Hardness Analyzer with Protective Enclosure Package – 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.	2120XPEN
Calcium Hardness Analyzer Instrument Only Package – includes calcium hardness analyzer with calcium electrode (100049), reference electrode (100056), ATC probe (2100TP), standard solution kit (182040), CD user guide and options kit.	2120XP
Reagent kits and accessories	
Calcium Hardness 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), 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)	212050XP
Reagent-less Calcium Hardness 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), 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*
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

*For International Use Only

Description	Cat. No.
Calcium electrodes and accessories	
Calcium Electrode Kit – includes calcium electrode (100049), reference electrode (100056) and (1) x 2 oz bottle reference electrode filling solution (181073)	2120XPEK
Calcium Sensing Electrode – for use with 2120XP	100049
Calcium Reference Electrode – for use with 2120XP, 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
Electrode Cables – (2) x 1 meter cables, for 100049 and 100056 electrodes	2100EC
Electrode Cables – (2) x 3 meter cables, for 100049 and 100056 electrodes	21003M
2100 Series Automatic Temperature Probe – with ground (30 kΩ)	2100TP
2100 Series Automatic Temperature Probe – with 10 meter extension cable and ground (30 kΩ)	2001XT
Calibration Kit – 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	2120XPCAL
Calibration Standard Solution Kit – includes (2) x 2 oz bottles calcium standard 1 (191 ppm) and (2) x 2 oz bottles calcium standard 2 (1920 ppm)	182040
Field replaceable units Refer to user guide for complete list	
2100 series enclosure	2100EN
Fluidics panel assembly only	2100FP
Bypass/needle valve assembly	2100BV
Regulator assembly	2111RG
Flow meter assembly	2111FM
Restrictor tube assembly	2111RT
Flow cell assembly	2100FC
Air pump assembly	2100PA
Air filter assembly	2100AF
Diffusion bottle adapter	2100FABA
O-ring kit	2100OK
(2) x 1 meter electrode cables	2100EC
Power supply assembly	2100PS
2120XP electronics faceplate	2120XPEP
Service Kit – 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)	2120XPSK

Find out more at **thermofisher.com/processwater**

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