

ULTRAPURE WATER SYSTEMS

Crystal E series

The Crystal E ultrapure systems are economy class, multi-purpose, water purification systems.

Crystal E ultrapure water systems are available in the following configurations:

- **Crystal E Trace System** (P/N CE-1001) produces water for inorganic trace analysis. This water is recommended for atomic absorption spectrometry (with graphite furnace atomizer), ICP-OES analysis, ICP-MS and other inorganic analytical methods.
- **Crystal E HPLC System** (P/N CE-1101) produces water with very low organic carbon content (TOC) to comply with the requirements of liquid chromatography methods. Crystal E HPLC water can also be used for some microbiological and molecular biology applications.
- **Crystal E Bio System** (P/N CE-1201) produces water with very low organic and RNase/DNase content, intended for molecular biology, including RNase-sensitive applications.



All Crystal E systems produce two types of water: Ultrapure (ISO 3696 Grade 1) and Pure (ISO 3696 Grade 2). Ultrapure water produced by the Crystal E systems has resistivity 18.2 MegaOhm*cm (conductivity 0.055 $\mu\text{S}/\text{cm}$). This exceeds requirements of all the relevant standards (ISO 3696 Grade 1, ASTM Type I, CLSI Type I). Purified water is collected in a storage tank. The recirculation system ensures a consistent quality of water, and a low level of organic carbon content (TOC). TOC is <2ppb for "HPLC" and "Bio" configurations; and 5-10 ppb for the "Trace" configuration.

The dispensing rate of high-quality, Ultrapure water is 2 L/min.

Pure water produced by Crystal E systems can be used for labware washing, wet chemistry methods, flame spectrophotometers, etc.. Pure water is dispensed directly from the storage tank. The dispensing flow rate of Pure water is 4 L/min.

All systems have a graphic LCD display that provides a clear water-quality readout. The display also provides information about the system status. This includes current resistivity and remaining pre-filter service life. The smart deionization (DI) module performance monitoring system provides a reduction in running costs. All cartridge and filter replacement can

Ordering Information

Model	Part number
Crystal E Trace	CE-1001
Crystal E HPLC	CE-1101
Crystal E Bio	CE-1201



be done by the operator and no tools are required. The Crystal E systems include important safety functions, such as:

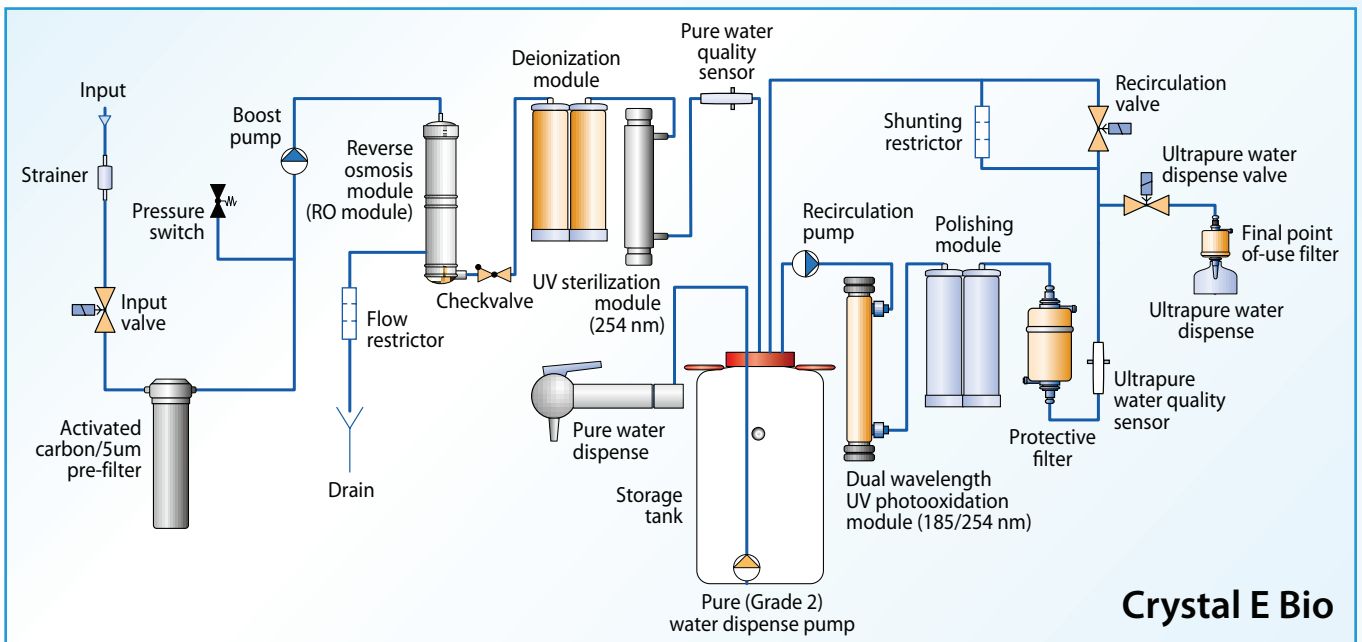
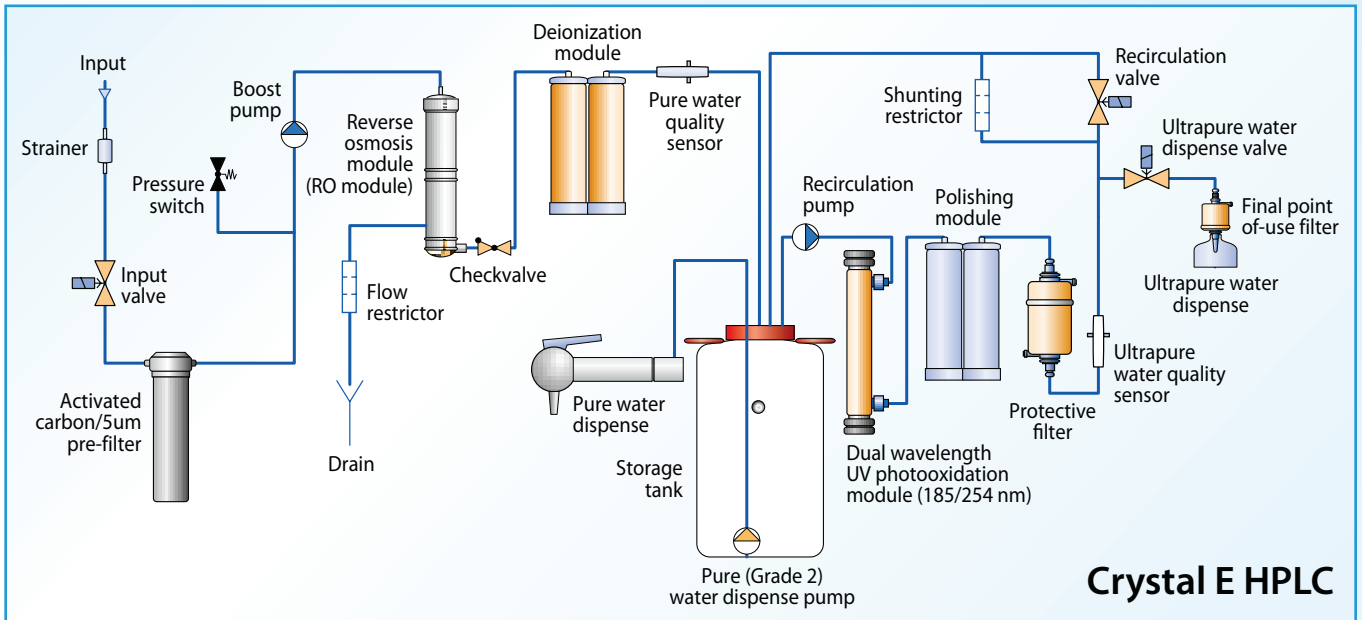
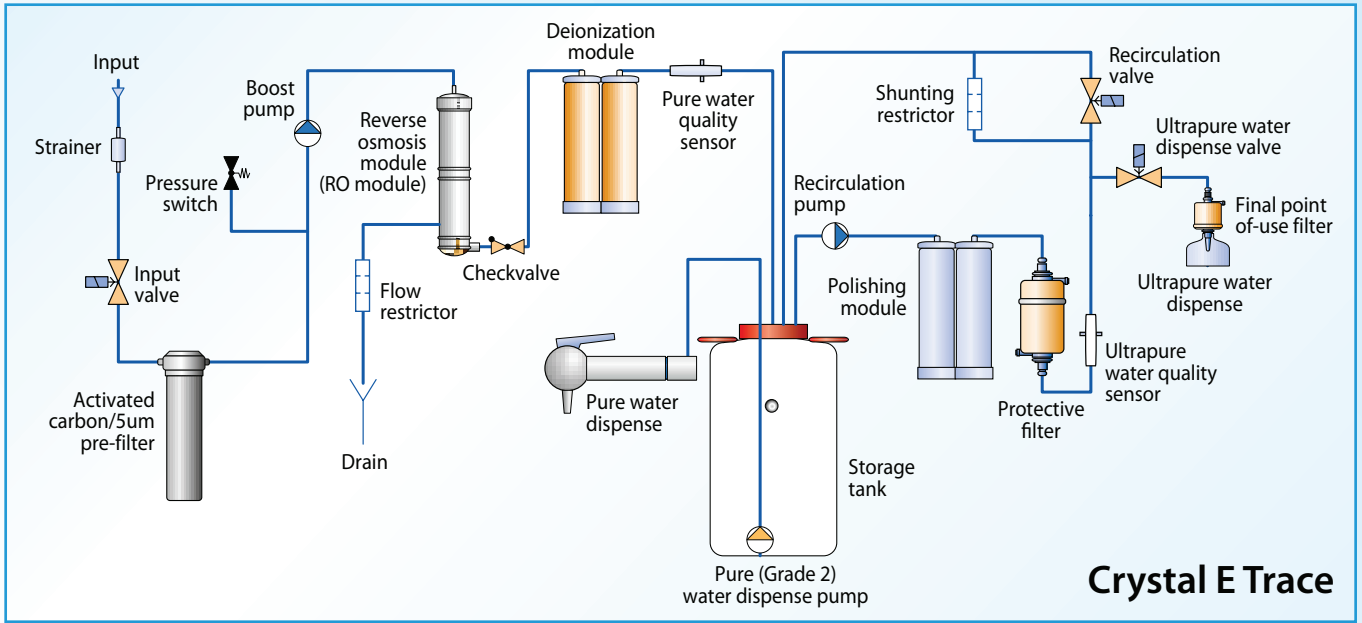
- tank filling control
- tap water pressure control
- protection from a tank sensor failure

Running costs can be decreased even more by installing an 8L deionization module option (P/N 10101).

Crystal E systems include:

- Boost pump
- Pre-filter
- RO module
- Deionization module
- Polishing module
- 25L storage tank with integrated Grade 2 dispensing pump
- Recirculation system
- Point-of-use Final Filter:
 - 0.22 μm microfilter for Crystal E Trace and HPLC systems
 - ultrafilter for Crystal E Bio systems
- Photo-oxidation module for reduction of organics (for HPLC and Bio configurations)
- UV sterilization module (for the Bio configuration)

Flow diagrams



Components

Part	Accessory	Crystal E Trace	Crystal E HPLC	Crystal E Bio
10009	Pre-filter for chlorine and organics reduction	+	+	+
	Boost pump	+	+	+
	Reverse osmosis module	+	+	+
10310	Deionization module, standard	+	+	+
10101	High capacity deionization module, (replaces standard module)	option	option	option
10029	Polishing module	+	+	+
10105	Photo-oxidation module	-	+	+
10012	Point-of-use microfilter	+	+	-
10109	Point-of-use ultrafiltration module	-	-	+
10102	UV sterilization module	-	-	+

Applications

Application	Crystal E Trace	Crystal E HPLC	Crystal E Bio
Reagent preparation	●	●	●
Ion chromatography	●	●	●
ICP-MS	●	●	●
Atomic absorption	●	●	●
ICP-OES	●	●	●
HPLC	-	●	●
Gas chromatography	-	●	●
Total Organic Carbon	-	●	●
Flow cytometry	-	-	●
Cell and tissue culture	-	-	●
Molecular biology	-	-	●

Consumables

Part number	Description	Replacement criteria	Comments
10009	Replacement pre-filter, Crystal E	Filter life counter is zero or the filter is clogged	
10310	Replacement deionization module	„DI Err” message is shown, or water conductivity is consistently > 0.5 µS/cm	
10113	Replacement high-capacity deionization module	„DI Err” message is shown, or water conductivity is consistently > 0.5 µS/cm	Systems with 10101 option only
10029	Replacement polishing module	Every 1–2 years, depending on operation	
10011	Replacement sterilization UV bulb	As required (on average every 3 years)	“Bio” systems only
10018	Replacement photo-oxidation UV bulb	As required (on average every 3 years)	“HPLC” and “Bio” systems only
10012	Replacement 0.22 µm dispense microfilter	Every 6–12 months	“Trace” and “HPLC” systems
10120	Replacement ultrafilter	Every 6–12 months	“Bio” systems only

Specifications

Purified water specifications	Crystal E Trace	Crystal E HPLC	Crystal E Bio
Grade 2 water resistivity	>10 MΩ x cm	>10 MΩ x cm	>10 MΩ x cm
Grade 2 water conductivity	<0.1 µS/cm	<0.1 µS/cm	<0.1 µS/cm
Grade 1 water resistivity	18.2 MΩ x cm	18.2 MΩ x cm	18.2 MΩ x cm
Grade 1 water conductivity	0.055 µS/cm	0.055 µS/cm	0.055 µS/cm
TOC	5 – 10 ppb	<2 ppb	<2 ppb
RNase	N/A	N/A	<0.01 ng/mL
DNase	N/A	N/A	<4 pg/µL
Bacteria	< 1 cfu/mL	< 1 cfu/mL	< 1 cfu/mL
Endotoxins	<0.15 EU/mL	<0.15 EU/mL	< 0.001 EU/mL
Particles > 0.22 µm	<1 per mL	<1 per mL	<1 per mL
Nominal flow, pure water (to storage tank)	10 L/h	10 L/h	10 L/h
Nominal dispense flow, ultrapure water	2 L/min	2 L/min	2 L/min
Nominal dispense flow, pure water	4 L/min	4 L/min	4 L/min
Deionization module life (standard module)	1 m ³	1 m ³	1 m ³
Deionization module life (high capacity module)	3 m ³	3 m ³	3 m ³
Recovery	>30 %	>30 %	>30 %
Dimensions (WxDxH), cm	40x35x55	40x35x55	40x35x55
Storage tank	25 L	25 L	25 L
Tank dimensions (WxDxH), cm	30x25x50	30x25x50	30x25x50
Feed water pressure	0.5 – 5 bar	0.5 – 5 bar	0.5 – 5 bar
Feed water conductivity	< 900 µS/cm	< 900 µS/cm	< 900 µS/cm