



The next generation in reagent-free ion chromatography

Thermo Scientific Dionex IC Pure
water purification system

Redefining “just add water” for reagent-free ion chromatography

The Thermo Scientific™ Dionex™ IC Pure™ water purification system brings reagent-free ion chromatography (RFIC) to the next level by producing ultrapure water up to (18.2 MΩ.cm) used in the analysis of anions, cations, organic acids, carbohydrates, and amines in water samples. Ultrapure water is produced by adding tap or pretreated laboratory water, redefining “just add water” and improving operator experience with RFIC™ systems, whether for development or research — regulated or not.

Benefits of the Dionex IC Pure water purification system

- Generates a continuous, reliable source of ultrapure water with convenient connections for eluent generator and suppressors
- Minimizes presence of microorganisms to prevent system contamination and downtime
- Produces low background conductance and lowers method detection limits
- Improves peak resolution of low level analytes by lowering background noise from the suppressor
- Helps achieve trace (µg/L) and ultratrace (ng/L) level ion analysis





The Dionex IC Pure water purification system meets the requirements of international water standards for ultrapure water. These include the American Society for Testing and Materials (ASTM) D1193 and International Organization for Standardization (ISO) 3696 standards, summarized in the table below.

Measurement (unit)	ASTM D1193 Type 1 Water	ISO 3696 Grade 1 Water	Water Produced by Dionex IC Pure System
Resistivity (M Ω ·cm)	> 18	> 10	Up to 18.2
Conductivity (μ S/cm)	< 0.056	< 0.1	0.055
Total Organic Carbon (μ g/L)	< 50	n/a	< 5
Sodium (μ g/L)	< 1	n/a	< 1
Chloride (μ g/L)	< 1	n/a	< 1
Total Silica (μ g/L)	< 3	< 10	< 3
Bacteria (CFU/mL)	< 1	n/a	< 1

The Dionex IC Pure system provides a continuous ultrapure water supply to RFIC systems using tap water and is designed to eliminate the final key variable of IC performance – water quality.

Removing common water impurities

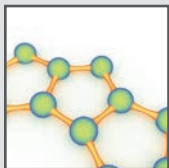
The Dionex IC Pure water purification system is engineered to remove impurities that threaten your results so you can focus on what is important – the sensitivity and resolution of your ion chromatography analysis.

The Dionex IC Pure water purification system minimizes the following impurities from laboratory water feed sources to produce high quality IC results.



Inorganic ions

Inorganic ions in feed water can interfere with ion chromatography and jeopardize a system's ability to perform trace-level analysis. Impurities such as silicates, chlorides, fluorides, bicarbonates, sulfates, phosphates, nitrates, and ferrous compounds are present as cations and anions in feed water. These need to be removed prior to using any IC instrument.



Dissolved organics

Organic compounds such as proteins, alcohols, chloramines, and residues of herbicides, pesticides, and detergents may be present in feed water. These compounds can foul ion-exchange resins and may cause interference with ion chromatography analyses.



Microorganisms

Bacteria, fungi, and algae are found in all natural water. Chlorination may eliminate harmful bacteria, but tap water still contains live microorganisms that may plug and contaminate instrument flow paths. Such microorganisms may also consume analytes such as phosphate from samples causing inaccurate results.



Particulates

Sand, silt, clay, and other suspended particles range from 1–10 μm in size. These suspended particles can interfere with instrument operation, plug valves and flow paths, and foul reverse osmosis membranes.



Colloids

Colloidal particles typically have a net negative charge, range in size from 0.01–1.0 μm , and can be either organic or inorganic. Colloids can bypass ion-exchange resins, resulting in elevated background conductance, thus, affecting the sensitivity of the analysis.



Sterile Filter

- 0.2 μm final filter can be autoclaved up to five times
- Point-of-use filter is designed to remove particles and bacteria

Dionex IC Pure water purification system features

Inline connection for RFIC systems

- 3 psi pressurized ultrapure water for electrolytic eluent generation
- 30 psi pressurized ultrapure water for electrolytic suppressors operating in external water mode

External 20 L tank with automated refilling station

- Provides large reservoir of pretreated or tap water for ultrapure water production
- Never needs refilling—the 20 L tank is automatically refilled when levels are low

Multiple RFIC system support

- Provides ultrapure water for one or two RFIC systems
- Point-of-use system designed to simplify operation

Ergonomic touchpad display

- Displays key operating conditions
- Provides system set up and control at the instrument

Ultrapure polishing cartridge

- Contains high quality resin for consistent purity and long cartridge life
- Thermo Scientific™ Aquastop™ quick connections for fast replacement

Space saving design

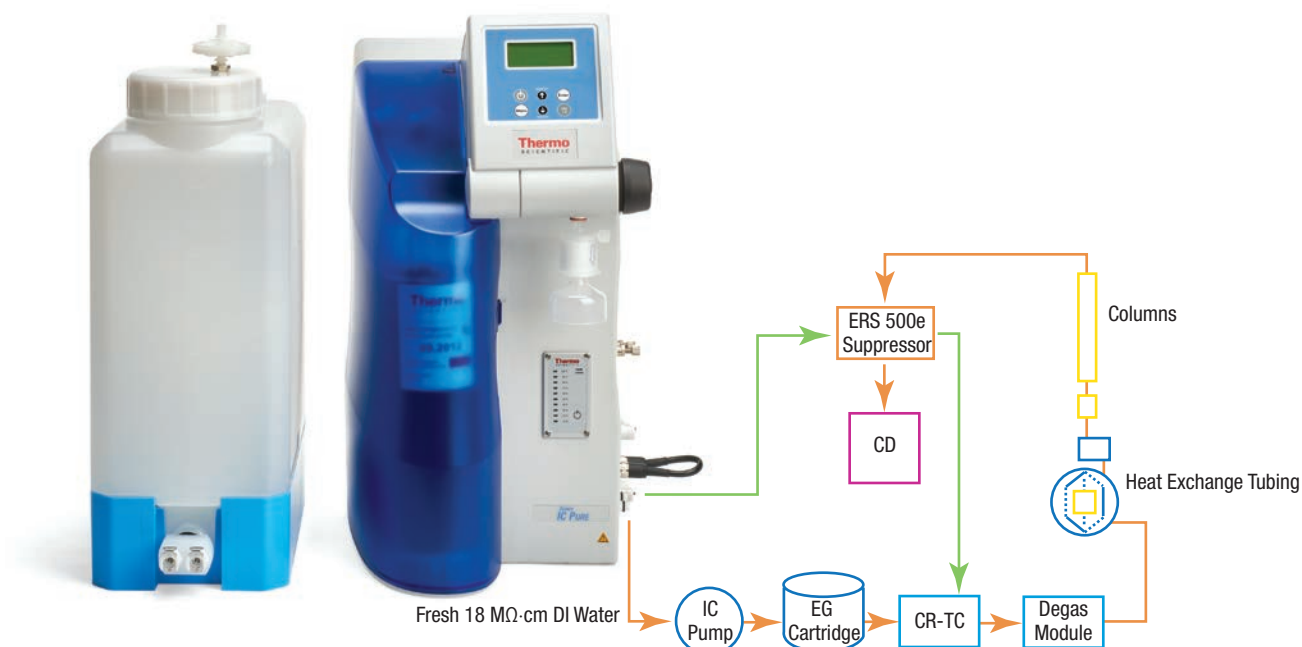
- System footprint measures 55 cm (21.65 in) H x 30.6 cm (12.05 in) W x 38.5 cm (15.16 in) D
- Optional wall mounting bracket for additional space savings

Internal 5 L tank

- Easy addition of pretreated or tap water
- Long refill cycle requires less operator time and attention

Onboard conductivity/TOC meters

- Direct readout of water quality
- Warns when consumable change is needed
- Alarms when feed water quality is compromised



Reagent-free ion chromatography

The Dionex IC Pure water purification system provides ultrapure water to the entire Thermo Scientific Dionex RFIC product line. This includes the dual channel high-pressure ion chromatography, integrated capillary, integrated standard and microbore, and online process monitoring systems.



Dionex ICS-5000+ System

The Thermo Scientific™ Dionex™ ICS-5000+ Reagent-Free™ HPIC™ system was developed with flexibility, modularity, and ease-of-use in mind. With the ability to analyze samples using capillary, microbore, or standard flow rates at up to 5000 psi, this system is our most adaptable IC.



Dionex Integrion HPIC System

The Thermo Scientific™ Dionex™ Integrion™ HPIC™ system performs versatile and efficient analyses through comprehensive application solutions and interactive wellness features. Its high-pressure capabilities enable faster analysis without compromising data quality. Eliminate error-prone manual preparation and achieve better method reproducibility with the system's automated eluent generation.



Dionex ICS-4000 System

The Thermo Scientific™ Dionex™ ICS-4000 HPIC™ system delivers best-in class sensitivity; from routine analyses to your most demanding application challenges. The high-pressure capability brings a new level of resolution and speed to dedicated capillary ion chromatography.



Dionex Integral System

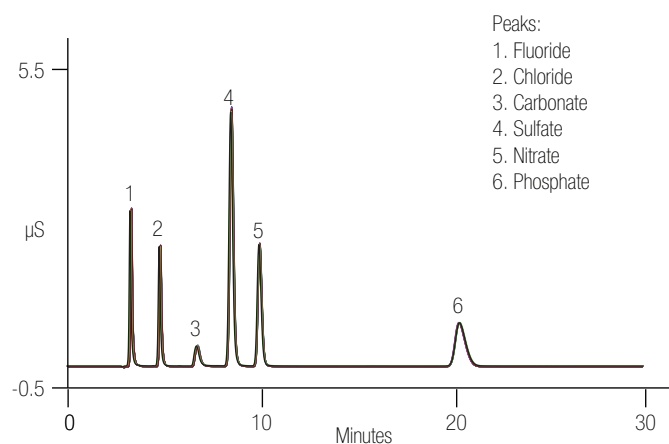
The Thermo Scientific™ Dionex™ Integral™ systems provide a versatile approach to online IC and LC. An unsurpassed range of RFIC capabilities can be combined with configurable sampling systems and adaptable off-the-shelf industrial enclosure options. Integral sampling modules and enclosures can be configured with any Thermo Scientific Dionex IC system, including but not limited to Dionex ICS-5000+, Dionex ICS-4000, and Dionex Integrion systems.

Ultrapure water improves sensitivity and resolution for reagent-free ion chromatography

The Dionex IC Pure water purification system provides purified water to:

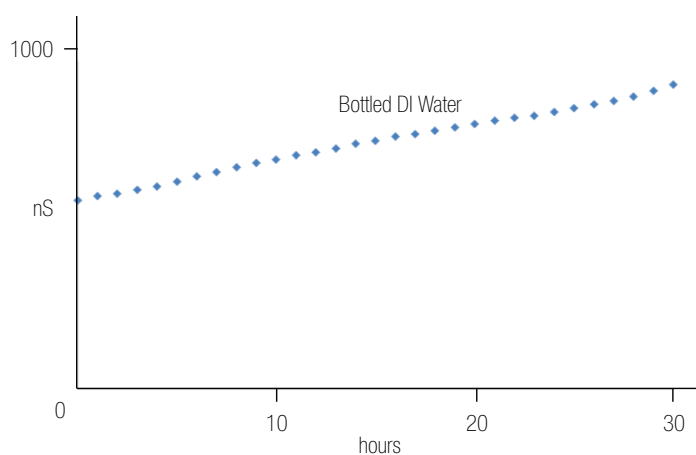
- The pump as feed for the eluent generator cartridge
- The suppressor as regenerant (External Water Mode)

The Thermo Scientific™ Dionex™ ERS™ 500e Electrolytically Regenerated Suppressor is optimized for External Water Mode. This suppressor allows parallel regenerant flow to isolate electrolytically active components originating from the eluent, such as borate and organic solvents, leading to stable baselines and longer suppressor life.



The chromatogram on the left is an overlay of 20 injections. It demonstrates excellent reproducibility for retention time (< 0.1 %RSD) and area (< 1.0 %RSD) for all analytes detected.

Advantages of on-demand versus bottled water



The figure on the left shows the conductivity changes of bottled DI water over time. Due to the absorption of carbon dioxide from the air and other volatile chemicals used in the laboratory, the conductivity of bottled DI water continually increases.

The Dionex IC Pure water purification system provides purified water on demand, which eliminates problems associated with contaminated eluent bottles and deteriorating water quality in those bottles.



Water purification challenges resolved

The Dionex IC Pure water purification system employs multiple chemistries and technologies synergistically to minimize impurities in feed water sources. Ion-exchange resins and activated carbon reverse osmosis membranes, ultrafilters and UV bulbs produce ultrapure water to reduce noise and improve detection limits when using RFIC.



Ultrapure cartridge

- Produces ultrapure water with maximum resistivity (18.2 MΩ·cm) and low TOC (< 5 µg/L)
- Mixed-bed anion and cation exchange resins remove ionic contaminants
- Activated carbon removes organic contaminants and Chlorine



Reverse osmosis membrane with additional pretreatment

- Allows the use of tap water for the feed source
- Reverse osmosis membrane removes bacteria, colloids, inorganic and organic solids



Inline ultrafilter

- Removes microorganisms and particulates from feed water
- Size exclusion membrane filter with pore sizes <10 nm
- Prevents plugging of valves and flow paths in the RFIC system



Inline UV lamp

- Photochemical oxidation with UV light (185 and 254 nm) eliminates trace organics and inactivates microorganisms
- UV light generated at 254 nm reacts with microbial DNA resulting in inactivation
- Combination of 185/254 nm light oxidizes organic compounds allowing TOC levels < 5 µg/L

Discover the Dionex IC Pure water purification system

The Dionex IC Pure water purification system is the latest addition to our reagent-free ion chromatography product line, offering the ability to produce ultrapure water, improving the data produced by our instruments. To find additional resources for the Dionex IC Pure water purification system, our reagent-free ion chromatography systems, and our level of commitment to becoming the total solution provider for our customers in the water analysis community, visit our website:

www.thermofisher.com/chromatography

Find out more at thermofisher.com/purewater

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