

**Thermo Scientific Dionex ICS-4000**  
Integrated Capillary HPIC System



**Always ready, better results**  
capillary high-pressure ion chromatography

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# Integrated capillary ion chromatography system

## The Dionex ICS-4000 HPIC System The World's First Dedicated Capillary High-Pressure Reagent-Free Ion Chromatography System

The Thermo Scientific™ Dionex™ ICS-4000 HPIC™ system combines a new level of resolution and speed with capillary ion chromatography, delivering high-pressure IC on demand with a system that is always on and always ready for the next analysis.

### Benefits of Capillary HPIC

- Fast separations without compromising resolution
- True on-request IC analysis for 24/7 uptime with no equilibration
- HPIC performance for high chromatographic resolution
- Low eluent consumption and waste generation resulting in low cost of operation

### Versatility

- Reagent-Free™ (RFIC™) system operation for isocratic and gradient separations with consistent results—day-to-day, lab-to-lab and operator-to operator
- Integrated system with greater performance and adaptability than a modular system
- Conductivity, electrochemical, and charge detection capabilities
- High performance system in a small footprint—occupies minimal bench space

#### Did You Know?

RFIC systems use deionized water to electrolytically generate precise eluent concentrations, and to regenerate suppressors, trap columns, and carbonate removal devices. This improves reproducibility, reduces labor, and improves detection limits.



### Touchpad Display

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

### Dual-Stepper Motor Pump

- Precise and accurate capillary flow performance
- High-pressure, to support 4  $\mu\text{m}$  particle columns and HPIC separations

### Seal Wash (Option)

- Extra measure of reliability for pump seals where manually prepared eluents are used

### Thermally Controlled Chromatography and Detection Zone

- Circulating air for cooling and heating
- Stable environment for column, suppressor, and detectors

### Vacuum Degas

- In-line vacuum degassing of eluent
- Prevents eluent contamination from dissolved gases

### Versatile Detector Options

- Conductivity or Electrochemical Detector
- New QD Charge Detector can also be configured with Conductivity Detector for complimentary detection

### Tilt-Up Lid

- RFIC consumables located out-of-sight yet readily accessible
- Display tilts forward to allow local control while servicing



### Reagent-Free Ion Chromatography

- Eluents generated electrolytically through software-control
- Reagent use of only 15 mL of water per day with continuous operation
- Eluent generator cartridge lasts up to 18 months of continuous operation under typical conditions

### Eluent Shut-Off Valve

- Electrically controlled valve provides positive shut-off of source for easy pump servicing

### Innovative Capillary IC Cube Design

- Dionex IC Cube™ design provides convenient plumbing of columns, suppressors, and other flow components
- Includes precut tubing and color-coded connections for ease of configuration and plumbing
- Heating for the column cartridge

### Space-Saving Footprint

- Integrated system delivers dedicated performance in a small footprint



# Versatile detection capabilities

The Dionex ICS-4000 Capillary HPLC system offers versatile detection options, from electrochemical detection to suppressed conductivity detection to our newest innovation, the QD charge detector, which is designed for detecting all ions.



## CD Conductivity Detection

- Innovative, self-contained conductivity detector
- Supported by industry leading self-regenerating suppressor technology
- Optimized for capillary flow rates

## QD Charge Detection

- New detector used in combination with CD detection for peak purity and identification
- Simplified calibration with only one standard
- Provides an equivalent signal for all ions of the same charge and molar concentration
- High linear response for weakly and strongly disassociated ions such as amines, organic acids, and silicate

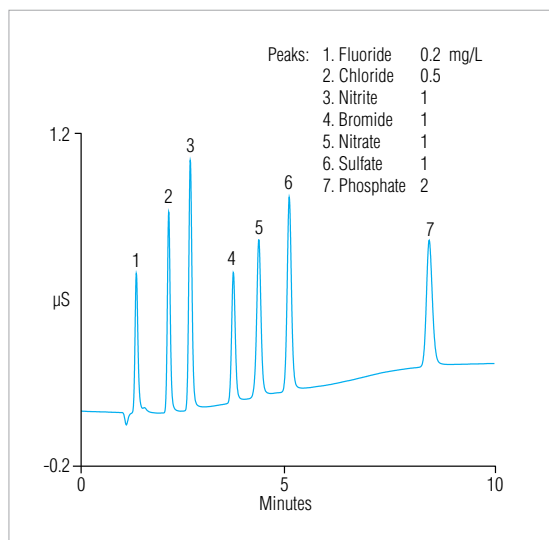
## ED Electrochemical Detection

- Sensitive and selective detection of cyanide, azide, biogenic amines and carbohydrates
- Innovative palladium hydrogen (PdH) reference electrode for superior reproducibility and long lifetime

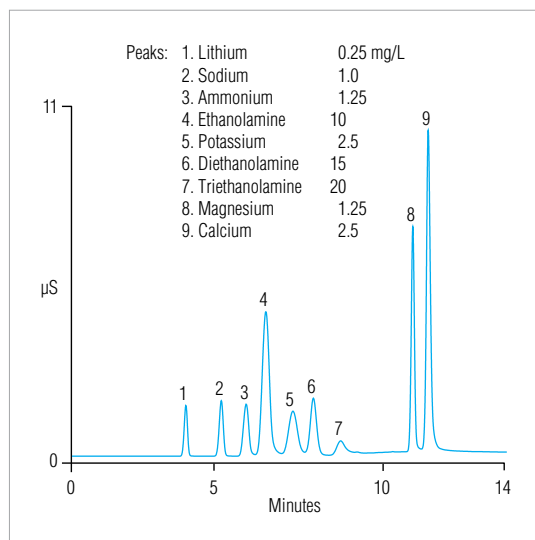


# High resolution and speed

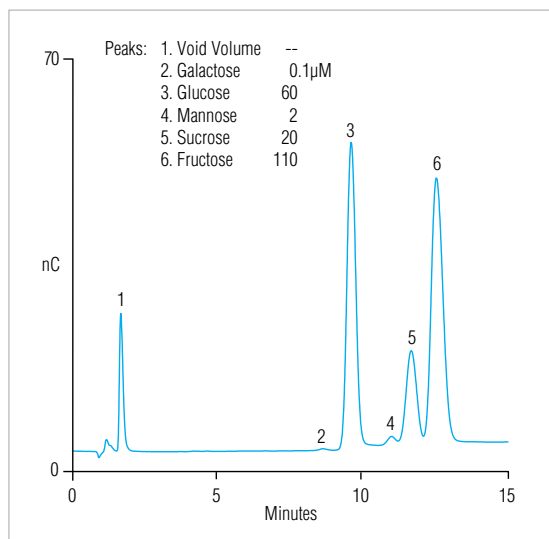
With over 20 different column chemistries now available for capillary IC, the Dionex ICS-4000 HPIC system delivers state-of-the-art chromatographic performance for a wide range of applications.



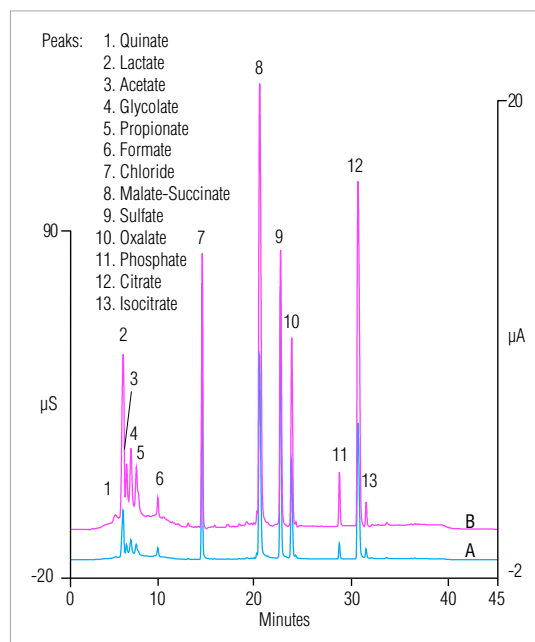
Gradient separation of inorganic anions in water using a Thermo Scientific Dionex IonPac™ AS18-4µm column and conductivity detection. The high-pressure capillary system and programmable electrolytic gradient lets you choose the proper balance between resolution and speed.



Gradient separation of ethanolamines in water using a Dionex IonPac CS19-4µm capillary column and conductivity detection. The high-pressure system and 4 µm column enables high resolution in half the time of a standard system.



Determination of monosaccharides and disaccharides in apple cider using a Thermo Scientific Dionex CarboPac™ PA20 column and electrochemical detection. A wide range of concentrations can be separated and quantified.



Comparison of A) suppressed conductivity and B) charge detection analysis of organic acids in guava juice, separated using a Dionex IonPac AS11-HC-4µm column and a KOH gradient.

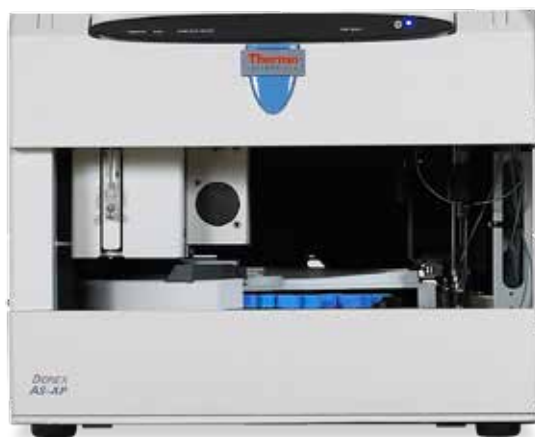
# Reliable sample handling

## Versatile Sample Preparation and Automation Solutions

Dionex autosamplers integrate seamlessly with the Dionex ICS-4000 system, providing effortless automation and advanced sample preparation capabilities. All wetted surfaces are nonmetallic and chemically inert, protecting columns and sensitive samples from contamination.

### Dionex AS-DV

- Affordable automation
- Precise mechanics for high reproducibility
- Sample filters integrated into vial caps
- Optional high-pressure valve for automated sample preparation
- Random access and sample overlap capabilities



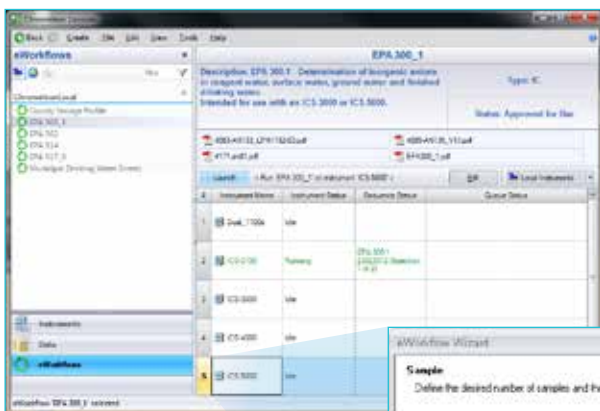
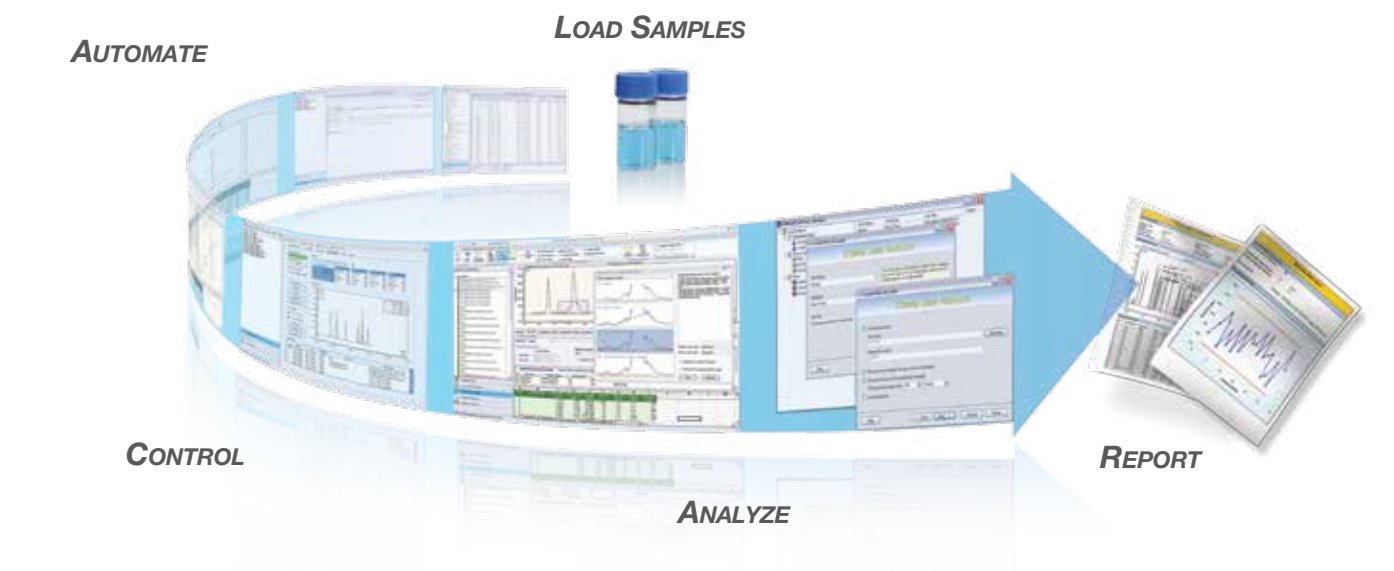
### Dionex AS-AP

- Advanced performance autosampler with capillary mode and simultaneous and sequential injection support
- Automated sample preparation (dilution, concentration, matrix elimination, precolumn derivatization)
- Temperature control for thermally labile samples
- Fast injection cycle time, < 30 s per 5  $\mu$ L
- Flexible formats—10 mL vials to 0.45 mL well plates
- Optional Sample Conductivity and pH Accessory with conditionals

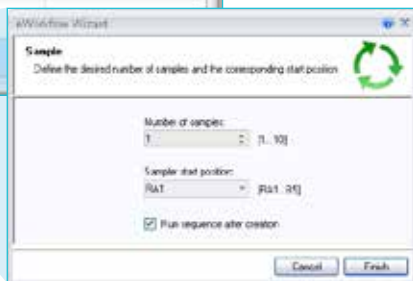
# Simply intelligent software

## Powerful Capabilities and Outstanding Usability

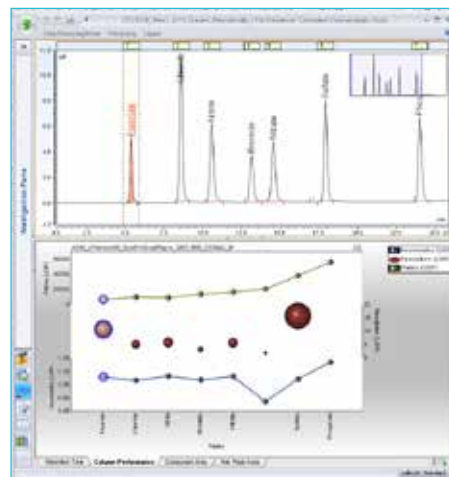
The natural complement to your IC system is Thermo Scientific™ Dionex™ Chromeleon™ software, the world's leading chromatography data system. With its inviting user interface and time-saving innovations, Chromeleon 7 software streamlines your path from samples to results. You'll find all the tools you need to tackle your toughest challenges without getting distracted from your goals. Get both rich functionality and outstanding usability with Chromeleon – the Simply Intelligent™ chromatography software.



Use eWorkflows to perform complete analyses perfectly, from sequence setup to final report, with just a few mouse clicks.



Gain an instant and intuitive understanding of your data at a glance with the Chromeleon 7 software's unique MiniPlots and Interactive Charts.



## Discover the Dionex ICS-4000 system and HPIC

The Dionex ICS-4000 Capillary HPIC system is the next generation dedicated ion chromatography system, offering the ability to use 0.2–0.6 mm diameter column sets at high pressure. The high-pressure capability offers the flexibility to use small-particle columns for higher resolution or higher flow rates with standard or short columns for fast results.

The reduced eluent flow rate of capillary IC systems reduces eluent consumption and produces less waste. The Dionex IC Cube uses cartridge based consumables with color coded fittings, that are also compatible with alternate systems. Additionally, with an array of detectors and options, the ICS-4000 add up to a adds up to be a very versatile system.

For more information or to place an order, contact the Thermo Scientific Dionex Products office nearest you or your local distributor. Phone numbers and addresses for worldwide subsidiaries can be found in the About Us section of [www.thermoscientific.com/dionex](http://www.thermoscientific.com/dionex).

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