thermo scientific

PRODUCTION SPECIFICATIONS

Modular high-pressure ion chromatography system

Thermo Scientific Dionex ICS-6000 HPIC System

Benefits

The Dionex ICS-6000 HPIC System offers:

- High-pressure operation for fast analyses and high resolution
- Reagent-Free™ system operation for reproducibility and ease-of-use
- Modular system for adaptability/ upgradability

The Thermo Scientific™ Dionex™ ICS-6000 HPIC™ System is a high-pressure ion chromatography system that provides an impressive combination of increased productivity, expanded capabilities, and improved performance. Modular versatility, functional integration, superior performance and the capability to operate continuously at up to 5000 psi culminate in the most advanced ion chromatography system.

By combining capillary and analytical formats into one highly versatile system, today's analytical challenges are met while resolving potential future challenges and addressing advanced applications. The system offers:

- Capillary (0.2–0.6 mm column i.d.), microbore (1–3 mm column i.d.), and standard bore (3–7 mm column i.d.) flow rates
- Operation at capillary, microbore and standard bore flow rates at pressure up to 5000 psi, allowing for faster analysis with higher flow rates and better separations with higher resolution columns
- Just-add-water technology allows several months of continuous operation with just two liters of water at capillary flow rates

ThermoFisher SCIENTIFIC

- Hydroxide, carbonate, and MSA eluents for Reagent-Free Ion Chromatography (RFIC™) systems with Eluent Generation offer high purity and unparalleled control and reproducibility for isocratic and gradient elutions, now up to 200 mM in capillary formats
- Excellent flow rate accuracy, eluent generator electronics stability, and conductivity cell temperature control deliver high retention time reproducibility, baseline stability, and sensitivity
- Modular design allows versatility in configuring the system for a wide variety of applications
- Innovative Thermo Scientific™ Dionex™ ICS-6000 IC Cube™ cartridge is a revolutionary way to add, configure, and use capillary consumables
- Integrated Detector/Chromatography module with precisely controlled temperature zones maintains baseline stability and increases application flexibility
- Automation Manager simplifies and automates complex applications including sample preparation, preconcentration, matrix elimination, and postcolumn reagent addition
- Electrochemical detector with optimized cell for capillary and analytical flow rates including long-lasting, calibration-free Palladium Hydrogen (PdH) reference electrode
- Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) software unifies and simplifies system control, operation, data collection, and reporting

Your workflow, simplified

Consumables tracking

The Dionex ICS-6000 HPIC system enables tracking and monitoring of performance and usage across all consumables to enable proactive maintenance and replacement. Tracking of electrolytic consumables is standard on all systems; tracking via radio frequency identification (RFID)* is included on models equipped with the optional DC Consumables Device Monitor. The DC Consumables Device Monitor (CDM) is an optional feature. The CDM module is inserted into the backplane of the DC module, which provides power to the unit, and is configured as an independent Chromeleon CDS software device.

- Maintains information on the consumable, regardless of the system it is installed in
- Monitors up to 16 key performance metrics on up to 25 different consumables simultaneously
- Verifies consumable performance against product specifications and production quality assurance data
- Facilitates verification of consumable compatibility
- Accomodates regional RFID requirements with selectable frequency
- Supports dual system / multiple flow path configurations

Metrics

1. Date of First Install
2. Number of Injections
3. Number of Samples Concentrated
4. Total Volume of Injections
5. Total Volume Concentrated
6. Maximum Flow Rate Seen
7. Maximum Temperature Seen
8. Maximum Pressure Seen
9. Maximum Voltage Seen
10. Maximum Current Seen
11. Last Separator Column Paired With
12. Last Guard Column Paired With
13. Total Eluent Volume Seen
14. Total Voltage Hours Seen
15. Total Current Hours Seen
16. Eluent Types Exposed To
17. Weekly Flow Rate Data Array
18. Weekly Pump Pressure Data Array
19. Weekly Background Conductivity Data Array
20. Weekly Current Data Array
21. Weekly Voltage Data Array

Consumables

a. Guard Columns (GC)

b. Separator Columns (SC)

c. Concentrator Columns (CC)

d. Trap Columns (TC)

e. Electrolytically Regenerated Suppressors (ERS)

f. Dynamically Regenerated Suppressors (DRS)

g. Continuously Regenerated Trap Columns (CRTC)

* The wireless transmitter devices may not be authorized as required by the laws of your country. This feature will not be, offered for sale or lease, or sold or leased, until proper authorization is obtained. Please consult your local sales representative for details.

Tablet interface

The Dionex ICS-6000 HPIC system supports wired or wireless tablet control, providing the ability to have full, detailed front panel control and view system status wherever you need it.

- Secured WiFi or wired communication to the instrument
- Control and monitor one instrument at a time, with easy instrument switching
- Access to consumable installation guides and troubleshooting knowledge base

Remote monitoring

Optional remote monitoring and diagnostic software notifies operators, lab managers, or other personnel when maintenance is required. Alerts are sent to service engineers at Unity Lab Services when the system is not functioning correctly so that remote troubleshooting can be performed.

- Monitors only instrument performance, not sample data
- Features encrypted 128-bit SSL point-to-point communication
- Works with most commercially available antivirus and firewall software programs

Modular capabilities and performance

The modular Dionex ICS-6000 system meets a wide and ever-increasing range of application needs. From the basic system configuration for routine, dedicated analysis to the high-throughput, dual RFIC system, the Dionex ICS-6000 HPIC system is truly designed for versatility and productivity. This system can be upgraded to a dual system configuration (supporting standard, microbore, and capillary formats)—without taking up more valuable bench space.

Dionex IC Cube

At the heart of the Dionex ICS-6000 capillary system is the IC Cube module, which integrates all the capillary consumables used in the IC system. With pre-cut tubing, color-coded connections, only half the connections of an analytical system, and easy-to-use cartridge-based consumables, the Dionex ICS-6000 system and Dionex ICS-6000 IC Cube take usability to a whole new level.

The Dionex ICS-6000 system holds two Dionex ICS-6000 IC Cubes, making dual channel analysis in capillary mode simple. Each of the column temperature zones can be set to a different temperature, so you can perform anion analysis at 30 °C and cation analysis in the second channel at 60 °C.

Performance

The Dionex ICS-6000 system is designed for the highest performance, making it the most reproducible, stable, and sensitive ion chromatography system available. State-of-the-art flow rate accuracy, eluent generator electronics, and detector robustness increase baseline stability and improve sensitivity.

Chromeleon CDS software control

The Chromeleon CDS software provides a panel so that all module control parameters, status, calibration, and diagnostics are easily available. A convenient Home screen shows overall system status while individual module tabs provide quick access to module functions and to detailed status and diagnostics. Wizards take the uncertainty out of setting up customized analyses. System Wellness features alert you to potential system issues before they become problems.

DP dual and SP single pump

The DP Dual Pump and SP Single Pump are each available in multiple configurations to suit application requirements including analytical and capillary. Analytical formats can be configured for gradient or isocratic eluent delivery. Any SP pump can be field-upgraded to a DP pump. Pump assemblies slide out for easy access and serviceability. The pumps feature a variable-speed, serial-piston design that delivers consistent flow rates and quiet detector baselines. The pumps support flow rates from 0.001 to 10.000 mL/min (analytical) or 0.001 to 0.100 mL/min and up to 3 mL/min for priming (capillary).

Fast IC

All Dionex ICS-6000 systems support Fast IC. By increasing the pressure tolerance of the pump to 6000 psi (5000 psi with continuous operation) and increasing linear flow rates, the Dionex ICS-6000 system can achieve substantially shorter run times. Shorter run times (< 5 min) provide higher throughput and higher productivity.

Better separations

HPIC systems provide the ability to run at up to 5000 psi with eluent generation. Better separations can now be achieved using new 4 µm particle columns.

EG eluent generator

The EG Eluent Generator module provides the benefits of an RFIC system with Eluent Generation (RFIC-EG system) in a dual-system format. Robust electronics provide an extremely stable baseline and precise gradient generation. You can generate high-purity eluents (up to 200 mM for capillary systems) on demand, and run gradient separations as easily as isocratic separations. RFIC-EG systems combine “Just Add Water” eluent generation, eluent purification, and electrolytic suppression technologies. RFIC-EG systems provide superior performance, higher sensitivity, and excellent reproducibility while eliminating variability and potential contamination of systems using manually prepared eluents. The EG can be configured for a single system or for dual-system support, along with an expanded set of eluent chemistry options for carbonate and hydroxide applications for anion and MSA for cation determinations, respectively. Electrolytic eluent generation is only available with Thermo Scientific Dionex IC systems.

Eluent regeneration option (Standard bore only)

With the eluent regeneration option, a single preparation of eluent can be used for up to four weeks with standard bore column(s). The RFIC-ER system uses the electrolytic suppressor to regenerate returning eluent as it suppresses eluent before detection. Trap and catalytic columns purify returning eluent, assuring consistent, high quality eluent for separations.

DC Detector/Chromatography module

The DC Detector/Chromatography module houses and organizes chromatography components such as valves and IC Cube module(s), as well as conductivity and electrochemical detectors, and cells. The module keeps plumbing organized and minimizes connection lengths to reduce delay volumes and improve peak efficiencies. The DC is separated into three sections for automation, detection, and separation. The automation section can be configured to house two IC Cube modules or the automation manager (standard bore and microbore only). The DC offers up to six separate temperature zones that can be maintained simultaneously (separation section, detection section, two conductivity detectors, and IC Cube modules or post-column reaction coils). This flexible and precise temperature control improves stability and enhances sensitivity. Improvements in temperature control of the conductivity detector and columns further improves sensitivity.

RFIC-ESP (analytical only)

The Dionex ICS-6000 system provides automation for many sample preparation techniques with multiple valving configurations and support for electrolytic sample preparation (ESP) devices.

Conductivity (CD) and Electrochemical Detectors (ED)

The CD and ED detectors are installed inside the DC compartment, minimizing tubing lengths and providing optimum thermal stability. The detectors are easy-to-install snap-in devices, and can be configured in series for dual detection or as separate detectors for a dual system—all in the same enclosure.

The ED features a cell design with an improved reference electrode and minimized dead volume for lower band-broadening and lower noise. This new PdH reference electrode has improved lifetimes and better robustness. Multiple waveforms optimize detection conditions for individual analytes.

The new CD detector for capillary flow rates is volume optimized and does not require a heat exchanger. Chromeleon CDS software conveniently autodetects the presence of either the analytical or capillary version of the CD detector.

Optical detectors

The Dionex ICS-6000 system can be configured with any of our optical detectors, such as the VWD, and the PDA, which cover the range of wavelengths from visible to ultraviolet. The ICS Series Variable Wavelength Detector can be configured to monitor single or multiple wavelengths—up to four simultaneously. The PDA can monitor single or multiple wavelengths in addition to performing full 3-D scanning during each run.

AM Automation Manager

The AM Automation Manager option (for standard bore and microbore chemistries only) can be configured in the upper compartment of the DC module. The AM options include two high pressure rotary valves and two low pressure solenoid valves for automated sample preparation, preconcentration, matrix elimination, and postcolumn (AutoPrep and RFIC-ESP) reagent addition. Components are recognized, configured, and controlled through Chromeleon CDS software, providing complete automation for even the most complex applications. (Not available for capillary IC.)

Thermo Scientific Dionex AS-AP Autosampler

The Dionex AS-AP Autosampler can be configured for simultaneous or sequential sample delivery. In simultaneous delivery mode, samples are delivered through a splitter to two injection valves for dual full-loop injections. With this configuration, you can perform two separate analyses on one sample (e.g., anions and cations). For sequential delivery, valves are configured to divert the sample stream to the appropriate injection valve for loading.

The Dionex AS-AP also provides optional in-line sample conductivity and pH measurement, fraction collection, AutoDilution, sample preparation, and variable sample size loading for preconcentration on various trap concentrator columns. The Dionex ICS-6000 system can also be configured with other Thermo Scientific Dionex IC autosamplers.

DP Dual Pump module

Module features
DP dual and SP single pump

The Dionex DP and SP Pumps are each available in isocratic or proportioning gradient (analytical only) configurations. The pumps support standard bore, microbore, and capillary applications. Gradient configurations at analytical flow rates provide low-pressure mixing of up to four mobile phases per pump at precisely controlled proportions and flow rates.

DP and SP features

- Variable-speed, serial dual-piston design delivers consistent flow rates and quiet detector baselines
- Pressure ripple < 0.2% at capillary flow rates, < 1.0% at analytical flow rates
- Pump flow components are chemically inert, made with high-quality PEEK™ heads and fittings, inert polymer seals, and sapphire pistons
- Automated integrated piston seal wash prolongs seal lifetime by preventing eluent crystallization on the seal surfaces
- Pump assemblies slide out for easy access and serviceability
- User-selectable pressure limits automatically stop pump flow in the event of leaks, flow restrictions, or depleted eluent reservoirs
- User-configurable alarm features in the Chromeleon CDS software allow additional responses to status or alarm conditions

- Front panel indicates the status of power, pump flow, priming, connectivity (Chromeleon CDS software control), and alarms
- Quaternary proportioning and a low-volume mixer deliver reproducible eluent mixtures (analytical only)
- Linear, concave, and/or convex gradients are possible (analytical only)
- Vacuum degas provides sealed, in-line degassing for flow reproducibility

Benefits of dual pump configurations

Dual configurations provide independent pumping capabilities in the same module and same space-saving footprint. Configure a DP-based system according to one of the following scenarios:

- Hybrid systems:
  – Two dimensional (standard bore, microbore, and capillary)
- Configure the system for dual applications, either running simultaneously or independently:
  – Anion and cation separations
  – Two different anion or two different cation separations
- Use the second pump for:
  – Two-dimensional IC (IC x IC)
  – Sample preconcentration or matrix elimination
  – Postcolumn reagent delivery for postcolumn reaction (PCR applications)
  – External water and chemical regenerant delivery
  – A backup pump for the primary application
  – Cleanup or startup preparation of consumables; preventing primary system downtime when reconfiguring

EG eluent generator module

The EG Eluent Generator module provides the benefits of an RFIC-EG system in a dual system format. The EG allows you to generate high-purity eluents in line and run gradient separations as easily as isocratic applications. Reagent-Free IC is the powerful combination of “Just Add Water” electrolytic technologies, eluent generation, purification, and suppression. The EG can be configured for a single system or for dual system support.

EG Eluent Generator module (Capillary)

EG features

- Capillary EG allows up to 200 mM eluent concentrations for KOH and MSA
- Ten microliter per minute flow rates of capillary IC means the system consumes only 15 mL of eluent per day
- Supports analytical and capillary Eluent Generation in one system
- Eluents are generated from deionized water using an EG cartridge and then polished of contaminants using one of the Continuously Regenerating Trap Columns (Dionex CR-TCs)
- The RFIC carbonate-based eluent generation system, using a carbonate cartridge and EPM Electrolytic pH Modifier, is available in analytical format (3000 psi max pressure)
- In addition to KOH for anion separations, NaOH and LiOH cartridges are available for specialized applications (analytical format only, 3000 psi max pressure)
- The EG delivers eluent concentrations from 0.1–200 mM (capillary) or 0.1–100 mM (analytical)
- Control, status, and diagnostics are provided with Chromeleon CDS software
- A slide-out tray provides easy access to the EG cartridges and Dionex CR-TC Continuously Regenerated Trap Columns for maintenance
- Using on-line eluent generation actually extends the lifetime of pump pistons and seals because the pumps only deliver water

Benefits of an RFIC-EG system

- Minimizes baseline drift
- Improves retention time stability and resolution
- Provides excellent run-to-run reproducibility
- Supports both gradient and isocratic applications
- Minimizes labor and operating costs

Dionex EGC 500 Eluent Generator Cartridge (Analytical)

RFIC-ER option (Standard bore only)

RFIC-ER systems can regenerate eluent at analytical flow rates for isocratic IC separations using carbonate, carbonate/bicarbonate, or methanesulfonic acid. These always on, always ready systems are ideal for the analysis of drinking waters, ground waters, and surface waters.

Benefits of eluent regeneration

- A single preparation of eluent can be used for up to four weeks, reducing labor and waste
- Trap, purification, and catalytic columns purify returning eluent, assuring consistent, high quality eluent
- Consistent eluent regeneration provides reproducible results
- Because it is a closed loop, the always on, always ready RFIC-ER system remains equilibrated and calibrated between eluent changes, up to four weeks

DC Detector/Chromatography module

DC Detector/chromatography module

The DC Detector/Chromatography module houses and organizes chromatography components such as valves and columns. The DC is available in two versions: The Standard DC, for applications requiring an upper zone temperature of 18-40 °C, and a Low Temperature version for applications requiring an upper zone temperature of 10-40 °C, such as the 2-D haloacetic acid (HAA) method.

The DC module contains three sections: (1) separation, (2) detection, and (3) automation. The lower separation compartment holds injection valves, analytical guard, and analytical separation columns with independent temperature control. The conductivity and electrochemical detectors are housed above the separation columns. The Automation Manager option can be configured in the upper compartment to support switching valves and other hardware required for advanced applications, or up to two Dionex IC Cube modules can be installed for capillary separations.

DC features

- Three distinct sections keep plumbing organized while minimizing connection lengths, reducing delay volumes, and improving peak efficiencies
- Dual temperature zone configuration controls the injection valve and column compartment separately from the upper compartments
- Up to six separate temperatures can be maintained simultaneously (separation section, detection section, two detectors, two Dionex IC Cube modules, or reaction coil) providing maximum application flexibility
- Independent compartment doors allow independent access to the separation or detector section without disturbing the other thermal section
- Automatic detection of valves, CD/ED cells, and suppressor devices by software

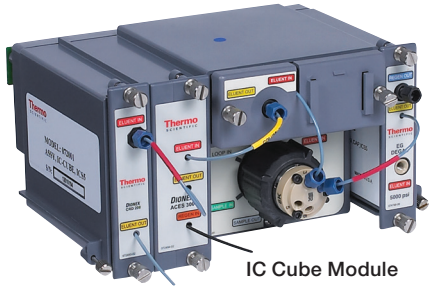
- Manual loading of sample is possible
- Column compartment can be configured with two independent injection valves (analytical only)
- Column/injection valve panel slides forward for easy access (lower section)
- Optional analog output board provides analog detection signals to data recorders
- Optional analog board also includes eight user-assignable TTL inputs that are provided for basic valve and detector operation
- Front panel displays the status of module power, injection valve position, and alarms
- Optional Dionex IC Cube module consolidates all capillary consumables, minimizing dead volume and maximizing convenience

Expand your capabilities with dual detection configurations

- Easy-to-install CD and ED detectors are plug-in devices, giving you a dual system with a single system footprint
  - Run anion/cation determinations simultaneously on each sample
  - Run confirmatory separations in parallel to verify analytes
  - Different sample loop sizes; eliminate reanalysis of samples at different dilutions
- Implement innovative detection schemes by pairing conductivity and electrochemical detection techniques in series on the same system
  - Determine classic ions with conductivity along with sensitive and selective ED detection of electroactive species such as iodide, sulfide, cyanide, amines, amino acids, carbohydrates, and phenols

Dionex IC Cube (optional)

The IC Cube module is our latest innovation, which allows using capillary consumables on the Dionex ICS-6000 HPIC system. Any Dionex ICS-6000 analytical system can be easily converted to a capillary system by using a Dionex ICS-6000 capillary pump and adding the IC Cube (with consumables) to the DC upper compartment.



IC Cube Module

The IC Cube module consolidates the cartridges used in capillary IC, such as:

- Capillary EG degasser
- Injection valve (4-port, 2 position). An optional IC Cube module with a 6-port, 2-position valve is available to support large loop and concentrator applications
- Capillary separation and guard column
- Capillary electrolytic suppressor
- Capillary carbonate removal device

The Dionex ICS-6000 system houses one or two IC Cube modules, both with independent temperature control of the separation column. In this way, a dual channel, capillary-based system can perform analyses with columns running at two different temperatures (i.e., 30 °C on channel one and 60 °C on channel two).

AM Automation Manager for analytical flow rates (optional)

Simplify complex applications with the AM Automation Manager option. This option, which fits in the upper section of the DC module, organizes and controls high-pressure rotary valves, low-pressure solenoid valves, the RCH Reaction Coil Heater, and a variety of reaction coils.

- Configure up to two 6- or 10-port high-pressure rotary valves for automated sample preparation, preconcentration, matrix elimination, or flow-diversion applications
- Configure up to two low-pressure 2-port or 3-port switching valves for selection of reagents for postcolumn reagent addition, rinse solutions, or regenerants
- Install the optional RCH for heated reactions, or simply mount non-heated reaction coils to support ambient reagent addition
- Installed components are automatically recognized through the Chromeleon CDS software

- All valves and positions are recognized with the Chromeleon CDS software
- Preconcentrate samples during a run to increase throughput

CD Conductivity Detector

CD conductivity and ED electrochemical detectors

The CD and ED detectors are installed inside the DC compartment as snap-in devices. They can be configured in series for dual detection, or as separate detectors for a dual system.

CD Features

- Microprocessor-controlled digital signal processing detects high and low concentrations of analytes in the same run
- Capillary CD detector is optimized for minimum dead volume
- Supports all IC and RFIC system applications with maximum range up to 15,000 µS
- Control through Chromeleon CDS software or locally through TTL inputs
- Mounts inside the DC compartment in either of two locations
- No tools are required
- Minimizes noise and maximizes thermal stability
- Electronics are integrated between cell and detector for greater stability
- Analytical CD cell heats independently from other chromatography components
- Innovative built-in electronics allow for easy calibration and diagnostics
- Analytical CD Detector is optimized for highest signal-to-noise up to flow rates of 10 mL/min

ED Features

- New Palladium Hydrogen (PdH) reference electrode available for capillary formats
- New one-piece reference electrode provides consistency and reliability
- Handle design provides consistent torque to cell electrode for consistent installation and mounting of working electrode
- Uses microprocessor-controlled digital signal processing
- Supports DC amperometry, pulsed amperometry, or integrated pulsed amperometry detection modes
- Ability to utilize either pH-Ag/AgCl, Ag/AgCl, or PdH reference electrode
- Detection capabilities include use of multiple waveforms and multiple integration times (post-run data processing only) to optimize detection conditions for individual analytes
- The integrated pulsed amperometry mode provides complete freedom to change the waveform profile's number of segments, duration of each segment, and voltage applied at each segment
- Control through Chromeleon CDS software or locally through TTL inputs
- Mounts within the DC compartment in either of two locations
- No tools are required for installation
- Cell and detector electronics are integrated to minimize noise, maximize electrical isolation and shielding, and maximize thermal stability
- Innovative, built-in electronics for easy calibrations and diagnostics
- Can be used in dual-detection configuration (detectors in series or systems in parallel)

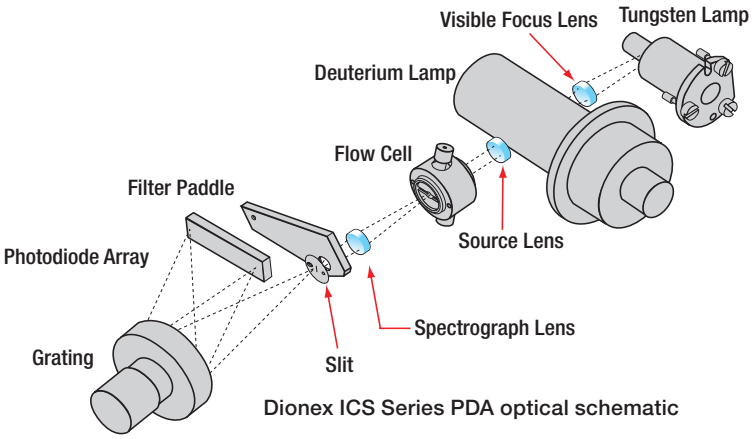
Optical detectors

The Dionex ICS-6000 system can be configured with any of several optical IC detectors.

ICS series PDA Photodiode array detector

PDA Photodiode Array detector

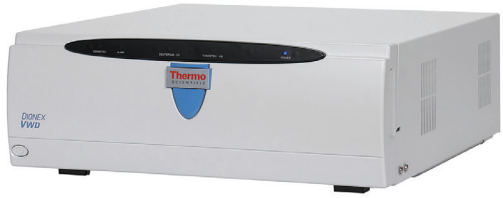
The PDA is a high-resolution, 1024-element photodiode array detector with low noise and low drift. Two light sources, a deuterium lamp and a tungsten lamp, provide a broad spectral range. The PDA is operated using Chromeleon CDS software with the 3-D data acquisition option.



Dionex ICS Series PDA optical schematic

Achieve the benefits of performance and versatility of the PDA Photodiode Array detector through the following unique features:

- Photodiode array (1024-element) provides optimum wavelength resolution
- Low noise and high light intensity over the full spectral range via deuterium and tungsten lamps
- Full control and data collection through Chromeleon CDS software with 3-D data acquisition option
- USB-based digital data collection for simple installation
- Four analog outputs support alternate data collection
- Built-in holmium oxide filter provides verification of wavelength accuracy
- Low baseline drift for excellent reliability and reproducibility
- Front access to prealigned cells and lamps for easy maintenance
- Five front-panel LEDs that clearly indicate detector status

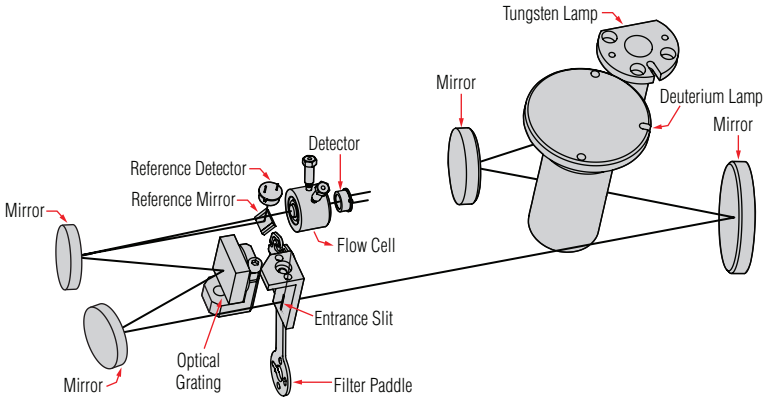


VWD UV-vis detector

VWD absorbance detector

Experience the performance and versatility of the VWD through the following features:

- Deuterium and tungsten lamps provide high sensitivity over the entire wavelength range of 190–900 nm
- PEEK flow cells for standard bore (11 µL volume), microbore (2.5 µL volume), or capillary (0.180 µL volume) flow rates
- Compact design for optimal plumbing of liquid flow path and minimal use of bench space
- Built-in holmium oxide filter for automated wavelength verification
- High signal-to-noise ratio for maximum sensitivity
- Data collection rate up to 100 Hz allows detection of even the sharpest peaks
- Low baseline drift for reliable results
- Excellent resolution that yields high linearity
- Integrated flow cell heat exchanger for thermal stability
- Lamp lifetime monitor to prevent downtime
- Front access to prealigned lamps and flow cell to simplify detector maintenance



Dionex ICS Series VWD optical schematic

- Identification chips integrated into lamps and flow cells (automatically logged to audit trail)
- Multiple wavelength monitoring; up to four different wavelengths simultaneously

Autosamplers

Dionex AS-AP Autosampler

Dionex AS-AP Autosampler

The Dionex AS-AP Autosampler delivers precision, reliability, ruggedness and ease of use. Options include sample conductivity and pH measurement, tray temperature control, fraction collection and sequential injections.

Configure the sampler for simultaneous injection and perform concurrent injection of a sample or standard onto two (analytical, capillary, or hybrid) systems running unique or similar applications. Improve efficiency by controlling dual Dionex ICS-6000 systems with one autosampler through sequential injections. This setup allows different applications to be run, or doubles the throughput of one application. With simultaneous and sequential injection, you can increase sample throughput and eliminate errors associated with multiple operators and sampling locations.

Features include fraction collection and re-injection, AutoDilution, and in-line sample conductivity and pH measurement. Reagent prime, reagent flush, and concentrate capabilities offer additional flexibility that ranges from matrix elimination to concentration applications. Sequences can also be run in overlap with the previous sample to minimize overall cycle time.

- Free up your schedule and lab time with automated sample handling for your IC
  - Simultaneous injection
  - Sequential injection
  - In-line sample pH and conductivity measurement
  - Preconcentration
  - Matrix elimination
  - Automated dilutions and re-injections with AutoDilution
  - Fraction collection and re-injection
- Eliminate complex laboratory procedures with automated standard preparation

Key Dionex AS-AP Autosampler features provide speed, performance, and versatility

- Capable of simultaneous injection
- Excellent reproducibility with at RSDs less than 0.3% for full loop injections
- 10 mL polystyrene sample vials with wide openings for large-volume injections and trace analysis
- All-PEEK flow paths, compatible with aqueous and reversed-phase eluents, safe from metal contamination
- Moving-needle design to guarantee reliable sampling from a variety of vial sizes
- High sample capacity, 81 × 10 mL vials to 3 × 384 well plates
- Well Plate capabilities
- Sample preparation function to automate sample and standard preparations, saving time and labor
- Optional sample conductivity and pH measurement with conditional dilutions
- Optional fraction collection and re-injection
- Optional valves, one or two 6-port or 10-port valves for sequential injections, sample preparation, fraction collection, or sample injection

- Chemistry-switching option to provide fully automated switching between two independent applications on the same IC system
- Sample tray temperature control option for thermally sensitive sample that offers precise, reliable control over a temperature range of 4–60 °C

Dionex ICS-6000 HPIC system control

Powerful Chromeleon CDS software integrates system control and data handling, providing a convenient command center. Run with direct control, or set up a sequence of samples and methods for your system to run automatically overnight. It's easy and convenient.

For data analysis, Chromeleon CDS software gives you all the power and versatility of the world's most complete chromatography data system.

- **Prepare**
  Set up and start running your routine analyses in seconds
- **Develop**
  Customize your methods for advanced analysis
- **Control**
  Take complete control of your chromatography instruments
- **Acquire**
  Get accurate results for peaks of all sizes with autoranging digital data acquisition
- **Diagnose**
  Maintain high confidence in your results with System Wellness
- **Interpret**
  Process your data quickly and accurately for dependable results
- **Organize**
  Find the data you need quickly and easily with powerful queries
- **Report**
  Produce the reports you need with an easy-to-use spreadsheet
- **Comply**
  Satisfy requirements of GLP, GMP, and 21CFR Part 11

EO eluent organizer

The EO Eluent Organizer holds eluent containers in a liner for spill and leak containment. The EO holds and organizes eluent tubing and air lines. The EO is designed for placement on top of or adjacent to Dionex ICS-6000 modules.

EO features

- The flexible design of the EO Eluent Organizer accommodates:
  – Four 1 or 2 L plastic containers
  – Two 4 L plastic containers
- Up to two EO eluent organizers stack on top of the DC or TC module
- Translucent liner contains spills and allows view of liquid levels
- Materials are corrosion-proof polypropylene and epoxy resin
- Pressure regulator option available

Eluent containers

Features

- Available in 1, 2, and 4 L sizes constructed from polypropylene
- Non-twist stopper with separate retaining ring prevents tubing from tangling
- Graduations marked on containers in 100 mL increments
- Includes polyethylene end-line filters with 5 µm pores

DIONEX ICS-6000 SP SINGLE AND DP DUAL PUMPS SPECIFICATIONS

Pump	
Type	Dual-piston (in series), microprocessor controlled, constant stroke, variable speed, patented Isokinetic Eluent Precompression
Construction	Chemically inert, metal-free PEEK pump heads and flow path; compatible with aqueous eluents from pH 0–14 and reversed-phase solvents
Pressure Range	Analytical: 0–35 MPa (0–5000 psi) Capillary: 0–41 MPa (0–6000 psi)
Flow Rate Range	Analytical: 0.000–10.000 mL/min with settable flow increments at 0.001 mL/min, without changing pump heads. Optional heads allow flow up to 22.4 mL/min. Capillary: 0.001–0.100 mL/min flow rate and up to 3.000 mL/min for pump priming mL/min with settable flow increments at 0.0001 mL/min, typical working range of 5–30 µL/min
Flow Rate Precision (Analytical and Capillary)	< 0.1%
Flow Rate Accuracy	< 0.1%
Pressure Ripple	< 1% at 1.0 mL/min/typical, < 0.2% (with damper) at 10 µL/min, < 1.0% (without damper) typical
Pressure	None required
Vacuum Degasser (Analytical and Capillary)	Integrated, optional 1 channel for isocratic pump or 4 channel for quaternary pump
Piston Seal Wash	Standard, automatic operation
Gradient Formation (Analytical and Capillary)	Quaternary low pressure (analytical only) or electrolytic eluent generation at high pressure
RFIC-EG Gradients	Analytical: 0.1–100 mM Capillary: 0.1–200 mM
Gradient Profiles	Any combination of an unlimited number of linear, convex, and concave positive and negative gradient profiles
Gradient Proportioning Accuracy and Precision (Analytical Only)	±0.5 at 2 mL/min
Gradient Mixing (Analytical Only)	Passive mixers for 2 mm and 4 mm i.d. columns, optional
Eluent Generation (Analytical and Capillary)	Optional eluent generation (RFIC-EG)
Eluent On/Off Valve	Electrically actuated, standard
Leak Sensor	Optical, standard
System Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft® Windows® 7, operating systems
Automated Procedure Wizards	Standard feature
System Smart Startup and Shutdown	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments including	Fully controls over 300 different instruments from more than 30 manufacturers, GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Signal Channels	Pump pressure
Data Trending Plots	All numerical device parameters
System Status Virtual Channels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Contitionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
System Calibration Storage	Factory, present and previous. Completely user selectable
Customized Reporting	Standard feature with unlimited report workbooks
GLP Compliance	Optional
Physical Specifications	
Power Requirements	90–265 V ac, 47–63 Hz
Dimensions (h × w × d)	41 × 23 × 56 cm (16 × 8.75 × 21.5 in.)
Weight	SP: 20.4 kg (45 lb) — DP: 24.1 (55 lb)
Flow Path:	All polymeric (PEEK), anion or cation configuration

DIONEX ICS-6000 EG ELUENT GENERATOR SPECIFICATIONS

Minimum and Maximum Eluent Concentration	Analytical: 0.1–100 mM Capillary: 0.1–200 mM
Flow Rates	Analytical: 0.1–3.000 mL/min Capillary: 0.001–0.030 mL/min
Eluent Types	Analytical: KOH, LiOH, NaOH; Carbonate; Carbonate/Bicarbonate; MSA Capillary: KOH, MSA
Maximum Operating Pressure	Analytical: Dionex EGC III: 21 MPa (3000 psi); Dionex EGC 500: 35 MPa (5000 psi) Capillary: 35 MPa (5000 psi)
Maximum Solvent Concentration (Analytical and Capillary)	Cations: None Anions: 25% methanol (KOH, NaOH and LiOH cartridges); None (Carbonate cartridge and EPM)
Gradient Profiles	Standard - any combination of an unlimited number of linear, convex and concave positive and negative gradient profiles
Number of Cartridges Supported	Two–dual cartridge support RFIC Eluent Degasser (Analytical only) Eluent degasser housed in the EG Module
System Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft Windows 7 operating systems
Automated Procedure Wizards	Standard feature
System Smart Startup and Shutdown	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments	Fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Signal Channels	Eluent concentration
Data Trending Plots	Device numerical parameters plotted
System Status Virtual Channels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Contitionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
Eluent Cartridge Information Storage	Serial number and expiration date
Customized Reporting	Standard feature with unlimited report workbooks
GLP Compliance	Optional package provides security, modification history, and electronic signatures
Physical Specifications	
Power Requirements	90–265 V ac, 47–63 Hz
Dimensions (h × w × d)	41 × 23 × 56 cm (16 × 8.75 × 21.5 in.)
Weight	25 kg (40 lb) without optional items
Flow Path	All polymeric (PEEK), anion or cation configuration
Eluents	Carbonate and carbonate/bicarbonate combinations up to 20 mM MSA up to 34 mM
Flow Rates	1.00–2.00 mL/min
Continuous Operation with 4 L of Eluent	Up to 28 days or 2000 samples, typically
Always on, Always Ready Capable	Standard feature
Remains Fully Calibrated for Extended Periods of Time (≤ 28 Days):	Standard feature, results are traceable to a single calibration
System Wellness	Consumables usage monitoring for predictive maintenance
Maximum Operating Pressure	21 MPa (3000 psi)
Operating Temperature Range	4–40 °C

DIONEX ICS-6000 DC DETECTOR/CHROMATOGRAPHY COMPARTMENT SPECIFICATIONS	
Standard DC Model:	Upper Zone Temp Range: 18–40 °C (minimum temperature: ambient -15 °C); (maximum temperature: ambient +20 °C)
	Lower Zone Temp. Range: 10–70 °C (minimum temperature: ambient -15 °C) (maximum temperature: ambient +50 °C)
	Temperature Accuracy: ±0.15 °C
	Temperature Stability: <0.05 °C
	Temperature Precision: ±0.2 °C
Low Temperature DC Model	Upper Zone Temp. Range: 10–40 °C (minimum temperature: ambient -17 °C); (maximum temperature: ambient +20 °C)
	Lower Zone Temp. Range: 10–70 °C (minimum temperature: ambient -15 °C or upper zone -20 C) (maximum temperature: ambient +50 °C)
	Temperature Accuracy: ± 0.15 °C
	Temperature Stability: <0.05 °C
	Temperature Precision: +/-0.2 °C
Lower Zone (Analytical)	Injection Valves: Up to two high-pressure valves,either 6- or 10-port, 2-position
	Low Pressure Valves: Up to 2 inert, 2- or 3-way
	Reaction Coil Heater (RCH): Holds two reaction coils
	RCH Temperature Range: 5 °C above upper zone, 80 °C maximum
	AutoPrep Kit: Dual loop for sample preconcentration
	All valves and heater upgradable and field installable
Automation Manager (Optional – Analytical Only) capillary chemistries)	Injection Valves: Up to two high-pressure valves, either 6- or 10-port, 2-position
	Low Pressure Valves: Up to 2 inert, 2- or 3-way
	Reaction Coil Heater (RCH): Holds two reaction coils
	RCH Temperature Range: 5 °C above upper zone, 80 °C maximum
	AutoPrep Kit: Dual loop for sample preconcentration
	All valves and heater upgradable and field installable
Capillary Dionex IC Cube Module (Optional – but required for Injection	One or two Dionex IC Cube models holding the folllowing:
	Injection Valves: Up to two (one per cube(high-pressure valves, 4-port, 2-position. An optional 6-port, 2-position valve is available to support large loop and concentrator applications
	EG Degasser
	Column and Guard
	Carbonate Removal Device
	Capillary Suppressor (See Suppressor section)
	Dionex IC Cube modules and cartridges are customer installable with pre-formed tubing and color-coded labeling
	Capillary column heater 15 to 80 °C)
Flow Path	Plumbing configurations for 4 mm, 2 mm, and 0.4 mm columns, fully inert, PEEK
Detectors	Any combination of two conductivity or electrochemical detectors, upgradeable and field installable. Dual detectors can be operated simultaneously or independently. Optional remote operation up to 3 m from instrument.
Analog Signal Output	Two analog output channels, two 24 V relays, 2 TTL Out and 8 TTL In lines, upgradable and field installable, optional
Leak Detection	Optical leak sensor standard
Application Control Automation	Standard. All DC modules come equipped with two switched AC controllers built-in to automate external devices and the ability to control up to six low pressure 2-way or 3-way valves for fluidic automation

DIONEX ICS-6000 DC DETECTOR/CHROMATOGRAPHY COMPARTMENT SPECIFICATIONS (CONTINUED)

Suppression	
Non-Suppressed Conductivity	Supported - both anion and cation
Suppressor Wear Parts	None. No valves, pumps, peristaltic pump tubing, or inline filters required
Chemical Suppression	2 mm and 4 mm anion and cation membrane suppression available
Displacement Chemical Suppression	2 mm and 4 mm anion and cation membrane suppression available
Electrolytic Suppression, Recycle Mode External Water Mode	0.4 mm (with optional Dionex IC Cube module) 2 mm and 4 mm anion and cation. Micro-membrane (2 mm and 4 mm) or capillary tube membrane (0.4 mm).
Salt Converter	Available in 2 and 4 mm versions
Dionex ACRS-ICE	Available in 9 mm and 4 mm version
Carbonic Acid Removal for Anions	Thermo Scientific™ Dionex™ ADRS 600 Anion Dynamically Regenerated Suppressor or Thermo Scientific™ Dionex™ ACRS™ Anion Chemically Regenerated Suppressor plus Thermo Scientific Dionex CRD 200 or Dionex CRD 300 Carbonate Removal Device for 2 and 4 mm versions, Therm Scientific™ Dionex™ ACES™ 300 Anion Capillary Electrolytic Suppressor plus Dionex CRD 200 Carbonate Removal Device (0.4 mm) for capillary suppressors
Suppressors	
Suppression Capacities	Dionex ADRS 600 (4 mm) 200 µeq/min Dionex ADRS 600 (2mm) 50 µeq/min Dionex AERS 500 Carbonate (4 mm) 30 µeq/min . Dionex AERS 500 Carbonate (2 mm) 7.5 µeq/min Dionex AERS 500e (4 mm) 200 µeq/min Dionex AERS 500e (2 mm) 50 µeq/min Dionex CDRS 600 (4 mm) 100 µeq/min Dionex CDRS 600 (2 mm) 35 µeq/min Dionex CERS 500e (4 mm) 100 µeq/min Dionex CERS 500e (2 mm) 35 µeq/min Dionex ACES 2 µeq/min Dionex CCES 1.5 µeq/min Dionex ACRS (4 mm) 150 µeq/min Dionex ACRS (2 mm) 37.5 µeq/min Dionex CCRS (4 mm) 150 µeq/min Dionex CCRS (2 mm) 37.5 µeq/min Dionex ACES 300 (0.4mm) 2 µeq/min Dionex CCES 300 (0.4 mm) 1.5 µeq/min
Suppressor Void Volumes	Dionex ADRS 600 (4 mm) < 50 µL Dionex ADRS 600 (2mm) < 15 µL Dionex AERS 500 Carbonate (4 mm) < 50 µL Dionex AERS 500 Carbonate (2 mm) < 15 µL Dionex AERS 500e (4 mm) < 50 µL Dionex AERS 500e (2 mm) < 15 µL Dionex CDRS 600 (4 mm) < 50 µL Dionex CDRS 600 (2 mm) < 15 µL Dionex CERS 500e (4 mm) < 50 µL Dionex CERS 500e (2 mm) < 15 µL

DIONEX ICS-6000 DC DETECTOR/CHROMATOGRAPHY COMPARTMENT SPECIFICATIONS (CONTINUED)

System Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft Windows operating systems
Automated Procedure Wizards	2 mm and 4 mm anion and cation membrane suppression available
Electrolytic Suppression, Self-Regenerating	Standard feature
System Smart Startup and Shutdown	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments	Fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Signal Channels	Detector signals, detector background signals, temperatures
Data Trending Plots	All device numerical parameters plotted
System Status Virtual Channels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Conditionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
System Calibration Storage	Factory, present, and previous. Completely user selectable
GLP Compliance	Optional
Physical Specifications	
Power Requirements	90–265 V ac, 47–63 Hz; (auto-sensing power supply; no manual voltage or frequency adjustment required)
Dimensions (h × w × d)	Standard Model 44.5 × 42 × 57.5 cm (17.5 × 16.0 × 22.6 in.) Low Temp Model 44.5 × 42 × 59.7 cm (17.5 × 16.0 × 23.5 in.)
Weight	Standard Model 38 kg (84 lb) Low Temp Model 43 Kg (94 lb)
Flow Path	All polymeric (PEEK), anion or cation configuration

DIONEX ICS-6000 CD CONDUCTIVITY DETECTOR SPECIFICATIONS	
Electronics Type	Microprocessor controlled digital signal processing
Cell Drive	8 kHz square wave
Linearity	$R^2 \geq 0.999\%$
Resolution	0.00238 nS/cm
Flow Path	Plumbing configurations for 4 mm, 2 mm, and 0.4 mm columns, fully inert, PEEK
Output Range	Digital Signal Range: 0–18,000 µS/cm
	Analog Signal Range: 0–18,000 µS/cm
Noise, Wet	< 0.2 nS at 23 µS/cm background
	< 0.1 nS at 1 µS/cm background
Filter	Rise times 0 to 10 s, programmable
Sample Rate	1 to 100 Hz, user settable or automatic
Cell Temperature	5 °C above DC upper zone temperature to 60 °C maximum. User settable, working range is identical to settable range.
Cell Temperature Stability	< 0.001 °C
Cell Temperature Compensation	Default 1.7% per °C; programmable from 0–3% per °C
Flow Cell Maximum Pressure	10 MPa (1500 psi)
Flow Cell Volume	Analytical: 0.7 µL
	Capillary: 0.02 µL
Cell Electrodes	Passivated 316 stainless steel. Compatible with MSA
Cell Body	Chemically inert polymeric material
Heat Exchanger	Inert, tortuous-path for low axial dispersion
Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft Windows 7, operating systems
Automated Procedure Wizards	Standard feature
System Smart Startup and Shutdown	Standard feature
System Wellness and Predictive Performance	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments	Fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Signal Channels	Electrochemical and total electrochemical signals
Data Trending Plots	All detector numerical parameters plotted
System Status Virtual Channels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Conditionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
System Calibration Storage	Factory, present, and previous. Completely user selectable.
Customized Reporting	Standard feature with unlimited report workbooks
GLP Compliance	Optional
Physical Specifications	
Dimensions (h × w × d)	6.9 × 16.7 × 9.9 cm (2.7 × 6.5 × 3.9 in.)
Weight	400 g (1.6 lb)

DIONEX ICS-6000 ED ELECTROCHEMICAL DETECTOR SPECIFICATIONS	
Electronics Type	Microprocessor controlled digital signal processing
Electronic Noise (Wet Noise) (Analytical and Capillary)	IPAD (Au electrode) < 30 pC at 10 mM KOH, DC Amperometry (GC) < 5 pA at catecholamine eluent
Potential Range	-2.0 to 2.0 V in 0.001 V increments
Signal Range (Digital and Analog)	Integrated Amperometry: 0.0008 pC to 200 µC DC Amperometry: 0.00008 pA to 74 µA
Filter	0–10 s response time, user settable
Control Mode	Local or remote control using relay closures or TTL, or control using Chromeleon CDS software via DC module
Cell Body	Titanium body with narrow-bore PEEK inlet tubing for capillary format, titanium inlet tubing for analytical format. Compatible with 0.2–0.6 mm i.d. columns (PEEK inlet), 2–7 mm i.d. columns (Ti inlet)
Working Electrodes	Conventional: gold, glassy carbon, platinum, and silver Disposable: gold, platinum, carbon, and silver
Reference Electrode	pH-Ag/AgCl combination, one piece design (Analytical and Capillary) PdH, one piece design (Capillary Only)
Autoranging	Yes
Analog Output	User selectable full scale of 10, 100, or 1000 mV
Cell Volume at Working Electrode	< 0.2 µL
Maximum Cell Operating Pressure	0.7 MPa (100 psi)
Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft Windows 7, operating systems
Detection Modes	DC amperometry, pulsed amperometry, and integrated amperometry. Detection modes include use of multiple waveforms and multiple integration times to optimize detection conditions for individual analytes. Integrated amperometry mode—unlimited changes to the waveform profile's number of segments, duration of each segment, and voltage applied at each segment.
Automated Procedure Wizards	Standard feature
System Smart Startup and Shutdown	Standard feature
System Wellness and Predictive Performance	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments	Fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Signal Channels	Electrochemical and total electrochemical signals
Data Trending Plots	All detector numerical parameters plotted
System Status Virtual Channels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Conditionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
System Calibration Storage	Factory, present, and previous. Completely user selectable.
Customized Reporting	Standard feature with unlimited report workbooks
GLP Compliance	Optional
Physical Specifications	
Dimensions (h × w × d)	6.9 × 16.7 × 9.9 cm (2.7 × 6.5 × 3.9 in.)
Weight	400 g (1.6 lb)

DIONEX ICS-SERIES PDA PHOTODIODE ARRAY SPECIFICATIONS

Optics	
Photodiode Array	1024 element
Pixel Resolution	0.7 nm
Lamps	Tungsten and deuterium
Optical Resolution	1.0 nm
Wavelength Range	190–800 nm
Electronics	
Analog Outputs	Four, 0–3 AU, 1000 mV range
Control Modes	Software remote control through Chromeleon CDS software
Flow Cell	
Standard	PEEK or SST, 13 µL, 10 mm path length
Semi-Prep	PEEK, 0.7 µL, 0.4 mm path length
Maximum Flow Operating Pressure	300 psi (< 2 MPa) PEEK 500 psi (< 3 MPa) SST
Performance	
Noise	±10 µAU at 254 nm (flowing water, 2s rise time) ±15 µAU at 520 nm (flowing water, 2s rise time)
Drift	< 500 µAU/h
Wavelength Accuracy	±1 nm, self-calibration with deuterium lines, verification with built-in holmium oxide filter
Linearity	> 2 AU
Physical Specifications	
Power Requirements	90–265 V ac, 47–63 Hz
Operating Temperature Range	4–40 °C (40–104 °F)
Operating Humidity Range	5–95% relative, noncondensing
Dimensions (h × w × d)	17.4 × 44.4 × 50.3 cm (6.8 × 17.5 × 19.8 in.)
Weight	18.1 kg (40 lb)

DIONEX ICS-SERIES VARIABLE WAVELENGTH DETECTOR SPECIFICATIONS

Optics	
Optical System wavelength UV-vis	Dual beam forward optics design (monochromator) single or multiple (4-channel) detector options
Light Source	Deuterium lamp for UV range; tungsten lamp for visible range
Wavelength Range	190 to 900 nm in 1 nm increments
Electronics	
Analog Output Ranges (optional)	0.001–3.0 AU
Rise Time	0.00–4.55 s
Full-Scale Recorder Output	1 V or 10 V
Data Collection rate up to 100 Hz Digital Output	Full dynamic autoranging digital absorbance signal output to Chromeleon CDS software
Control Modes	Software remote control through Chromeleon CDS software
Flow Cells	
Cell	PEEK
Cell Path Length	10 mm (Standard and Capillary), 7 mm (Micro)
Cell Volume	11 µL (Standard) 2.5 µL (Micro) 0.18 µL (Capillary)
Heat Exchanger Volume	8.8 µL
Maximum Flow Cell Operating Pressure	725 psi (5 MPa)
Performance	
Wavelength Accuracy	±1 nm
Linearity	> 2 AU
Bandwidth	6 nm at 254 nm
Noise	Typically - < ±2.5 × µAU at 254 nm
Drift	< 0.1 m µAU/h at 254 nm
Physical Specifications	
Power Requirements	85–265 V ac, 47–63 Hz
Operating Temperature Range	10–35 °C (50–95 °F)
Operating Humidity Range	5–80% relative, noncondensing
Dimensions (h × w × d)	15.2 × 44.4 × 50.3 cm (6.0 × 17.5 × 19.8 in.)
Weight	15.4 kg (34 lb)

DIONEX AS-AP AUTOSAMPLER SPECIFICATIONS	
Sample Capacity	10 mL vials: 81 1.5 mL vials: 120 0.3 mL vials: 120 Well Plates: 288 (3 × 96 standard or deep well) Well Plates: 1152 (3 × 384 standard well)
Minimum Sample Volume	10 µL can be sampled from a 300 µL microvial; 20 µL can be sampled from a 500 µL microvial
Maximum Injection Volume	7500 µL
Variable Volume Range	1–100 µL in 0.1 µL increments; 100–7500 µL in 1 µL increments
Injection Cycle Time (including sample prep such as dilution)	15 s with sample overlap function; 30 s for a 5 µL full loop without sample overlap
Injection Modes	Full Loop; Partial Loop; Limited Sample; Capillary
Sampling Technique	Pull Mode; Push Mode
Injection Precision	Fixed Loop: < 0.3% RSD at 20 µL; Partial Loop: < 0.5% RSD at 20 µL Capillary Mode: < 0.5% RSD at 0.4 µL
Dilution	1:1 to 1:1000
AutoDilution	With post-run functionality and Chromeleon AutoDilution License
Dilution Precision	< 1.0% RSD for a 1:10 dilution
Carryover	< 0.01% with 500 µL flush volume
Sample Tray Thermostatting	4 °C to 60 °C, optional
Sample Conductivity and pH	Inline measurement of sample conductivity and pH with postrun functionality, optional
Dual Instrument Support	Sequential (asynchronous) and Simultaneous modes, field upgradeable, optional
Sample Degassing	CRD 200/300, upgradeable, user installable
Injection Valves	One or two 2-position, 6- or 10-port
Diverter Valve	One 2-position, 6- or 10-port
Sample Preparation	Dilution, addition of internal standards, concentration/matrix elimination, derivatization, etc.
Inline Sample Filtration	Dual filter, backflush, optional
Software	
Software	Chromeleon 7.2 CDS software, supports Microsoft Windows 7, operating systems
Automated Procedure Wizards	Standard feature
System Smart Startup and Shutdown	Standard feature
System Wellness and Predictive Performance	Standard feature
Application Templates	Standard feature
Automation Support of 3rd Party Instruments	Fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS
Customizable System Control Panels	Standard feature
Power Failure Protection	Standard feature
System Trigger Commands and Conditionals	Standard feature
Daily Audit Trail	Standard feature
Sample Audit Trail	Standard feature
System Calibration Storage	Factory, present, and previous. Completely user selectable.
Customized Reporting	Standard feature with unlimited report workbooks
GLP Compliance	Optional
Physical Specifications	
Dimensions (h × w × d)	44.5 × 35.9 × 51.6 cm (17.5 × 14.1 × 20.3 in.)
Weight	< 25.2 kg (< 55.5 lb) < 26.8 kg (< 59.0 lb) with sample temperature control
Power	90–265 V ac, 47–63 Hz
Flow Path	All polymeric (PEEK), anion or cation configurations

Validation services

Thermo Fisher Scientific offers a full range of validation services and kits for the Dionex ICS-6000 product line. Validation procedures include Installation Qualification (IQ) and Operational Qualification (OQ) for the Dionex ICS-6000 system modules.

All validation kits include detailed procedures for performing the validation. Also included are calibration tools, data worksheets, methods, and validation certificates.

Ordering Information

Part numbers for Dionex ICS-6000 systems and modules are available from your local Thermo Fisher Scientific office or distributor. Please consult your representative for the system configuration and modules best suited to your analytical needs.

Find out more at **www.thermofisher.com/IC**