



The ICS-5000 Ion Chromatography System is the world's first capillary ion chromatography (IC) system on the market and provides an impressive combination of increased productivity, expanded capabilities, and improved performance. Modular versatility, functional integration, and superior performance 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 advanced applications.

- 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
- Just-add-water technology allows several months of continuous operation with just two liters of water at capillary flow rates
- Hydroxide, carbonate, and MSA eluents for Reagent-Free™ Ion Chromatography systems with Eluent Generation (RFIC-EG™ systems) 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 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
- New electrochemical detector with optimized cell for capillary and analytical flow rates including long-lasting, calibration-free Palladium Hydrogen (PdH) reference electrode
- Chromeleon® Chromatography Data System software unifies and simplifies system control, operation, data collection, and reporting



Passion. Power. Productivity.

Modular Capabilities and Performance

The modular ICS-5000 meets a wide and ever-increasing range of application needs. Basic system configuration for routine, dedicated analysis to the high-throughput, dual RFIC™ system, the ICS-5000 is truly designed for versatility and productivity. The system can be upgraded to a dual system configuration (supporting standard, microbore, and capillary formats)—without taking up more valuable bench space.

IC Cube

At the heart of the ICS-5000 is the IC Cube module, the latest innovation from Dionex. The IC Cube module integrates all the capillary consumables used in the IC system. With pre-cut, pre-formed tubing, and easy to use cartridge-based consumables, the ICS-5000 takes usability to a whole new level. Half the connections of an analytical-based IC system and color-coded connections round-out the usability improvements on the ICS-5000 with the IC Cube modules.

Better still, the ICS-5000 holds two 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 ICS-5000 is designed for 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.

Unique System Control

Instead of individual module front panels, the ICS-5000 gives you one convenient control system. The Chromeleon Chromatography Data System 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 3.000 mL/min (capillary).

Fast IC

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

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) 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 eliminate variability and potential contamination compared to systems with manually prepared eluents, and provide superior performance, higher sensitivity, and excellent reproducibility. 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 analysis and MSA for cation separations. RFIC-EG systems are only available from Dionex.

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

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 conductivity detector temperature control and column temperature control further improve sensitivity.

RFIC-ESP

The RFIC-ESP™ system provides automation for many sample preparation techniques with multiple valving configurations and support for electrolytic sample preparation devices. (Analytical version only.)

TC Thermal Compartment (Analytical only)

The TC Thermal Compartment is for UV-vis or IC-MS applications that do not require an ED or CD detector. It provides precise temperature control over a wide temperature range with fast heat-up and cool-down times. The single zone oven design minimizes tubing connection lengths and reduces delay volumes, yet allows single and dual valve configurations.

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 new 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 and signal measurements can be collected as a complete three-dimensional data set for post-run analysis and characterization of different compound classes (Chromeleon Chromatography Data System 6.8 software only).

The new CD detector for capillary flow rates is volume optimized and does not require a heat exchanger. Chromeleon conveniently autodetects the presence of either the analytical or capillary version of the ICS-5000 CD detector.

Optical Detectors

The ICS-5000 can be configured with any of the optical detectors available from Dionex, 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 includes options for 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 software, providing complete automation for even the most complex applications. (Not available for capillary IC).

AS Autosampler

The AS Autosampler can be configured for simultaneous or sequential sample delivery. In simultaneous delivery mode, sample is 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 AS also provides sample preparation options and variable sample size loading for preconcentration on various trap concentrator columns.

The ICS-5000 can also be configured with all other Dionex IC autosamplers which supports 1.5 mL and 10 mL vials and well plates.

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 Dual Pump module

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 Chromeleon allow additional responses to status or alarm conditions
- Front panel indicates the status of power, pump flow, priming, connectivity (Chromeleon Control), and alarms



EG Eluent Generator module (Analytical)



EG Eluent Generator module (Capillary)

- 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
- Consumables cleanup or startup preparation; 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 continues Dionex's technology leadership, allowing you to generate high-purity eluents on-line and run gradient separations as easily as isocratic applications. Reagent-Free IC is the powerful combination of Dionex "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 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 on 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 (CR-TCs)

- The RFIC carbonate-based eluent generation system, using a carbonate cartridge and EPM Electrolytic pH Modifier, is available in analytical format
- In addition to KOH for anion separations, NaOH and LiOH cartridges are available for specialized applications (analytical only)
- 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 software
- A slide-out tray provides easy access to the EG cartridges and CR-TCs 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

RFIC-ER Option (Standard bore only)

RFIC-ER systems can regenerate eluent for analytical flow rate 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

The DC Detector/Chromatography module houses and organizes chromatography components such as valves and columns. 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, and is under independent temperature control. The conductivity and electrochemical detectors are housed above the separation columns. The Automation Manager option or IC Cubes can be configured in the upper compartment to support switching valves and other hardware required for advanced applications.

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



- ← **Automation**
Capillary columns and valves
- ← **Detection**
CD and ED detectors
- ← **Separation**
Standard and micro bore columns and valves

DC Detector/Chromatography module

- Up to six separate temperatures can be maintained simultaneously (separation section, detection section, two detectors, two IC Cubes, 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 IC Cube consolidates all capillary consumables, minimizing dead volume and maximizing convenience

Expand Your Capabilities with Dual Detection Configurations

- Easily install the CD and ED detectors as plug-in devices to get a dual system in a single system footprint
 - Run anion/cation analyses 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



IC Cube Module

IC Cube (optional)

The IC Cube module is the latest innovation from Dionex which allows using capillary consumables on the ICS-5000. Any ICS-5000 analytical system can be easily converted to a capillary system by using an ICS-5000 capillary pump and adding the IC Cube (with consumables) to the DC upper compartment.

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

- Capillary EG degasser
- Injection valve (4-port, 2 position)
- Capillary separation and guard column
- Capillary electrolytic suppressor
- Capillary carbonate removal device

The ICS-5000 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 software
- All valves and positions are recognized with the Chromeleon software
- Preconcentrate samples during a run to increase throughput
- Control through Chromeleon software or locally through TTL inputs
- Mount 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

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.



ED Electrochemical Detector and Cell



CD Conductivity Detector

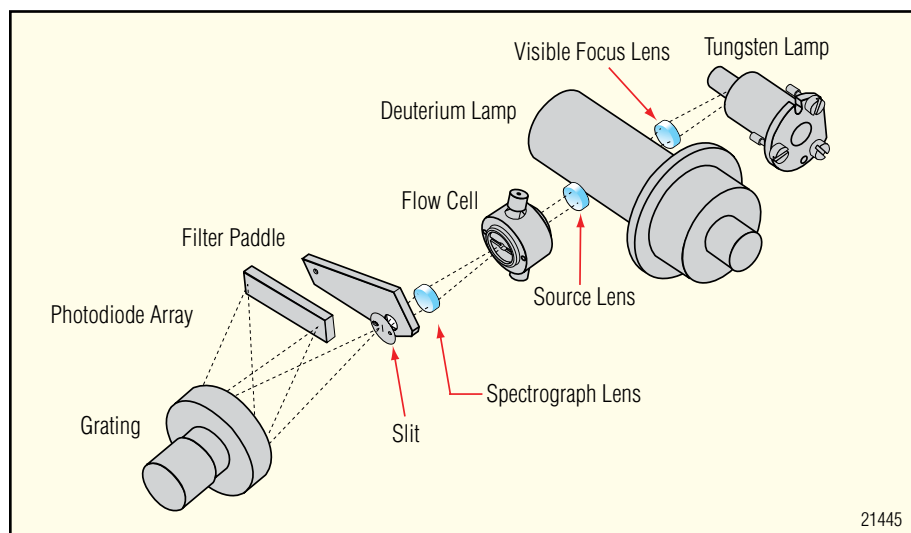
CD Features

- 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

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
- New detection capabilities include use of multiple waveforms and multiple integration times (post-run data processing only) to optimize detection conditions for individual analytes
- Three-dimensional display of the raw integrated amperometry data set similar to PDA data display, with cross-hairs on an isoamperometric plot used to select sections of the plot along the applied voltage axis (to render a chromatogram) and along the time axis (to render a voltammogram) (currently Chromeleon 6.8 software only)

- Three-dimensional wireframe rendering, printing, color selection, display of apex, and other spectra on peaks in chromatograms are echoed in the integrated amperometry implementation (currently Chromeleon 6.8 software only)
- 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 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)



ICS Series PDA optical schematic



TC Thermal Compartment



PDA Photodiode Array detector

Optical Detectors

The ICS-5000 can be configured with any of several optical IC detectors available from Dionex.

ICS Series 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 software with the 3-D data acquisition option.

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 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

TC Thermal Compartment (Analytical only)

The TC Thermal Compartment houses and organizes the chromatography columns and valves. The TC can be configured with up to two valves. The TC can be configured on a single timebase or shared between two timebases for sequential analysis.

- Ideal for UV-vis applications which do not require an ED or CD detector
- Single zone oven minimizes tubing connection lengths, reduces delay volumes, and improves peak efficiencies
- Valve configurations include no valves, one 6-port injection valve, two 6-port injection valves or one injection valve and one 10-port chemistry switching valve
- Column ID chip system monitors column properties and usage (automatically logged to audit trail)
- Front panel displays power up status, injection valve position, and alarm status

- Wide temperature range; (5–85 °C)
- Precise temperature control
- Fast heat-up and cool-down times
- Optional heat exchangers for optimal eluent temperature and improved reproducibility

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
- Compact design for optimal



VWD UV-Vis detector

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

Autosamplers

AS Autosampler

The AS Autosampler delivers precision, reliability, ruggedness, and ease of use. Options include sample preparation, temperature control, and chemistry switching.

Configure the sampler for simultaneous injection and perform concurrent injections of a sample or standard onto two (analytical, capillary, or hybrid) systems running unique or similar applications. Improve efficiency by controlling dual ICS-5000 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.

New features include reagent prime,



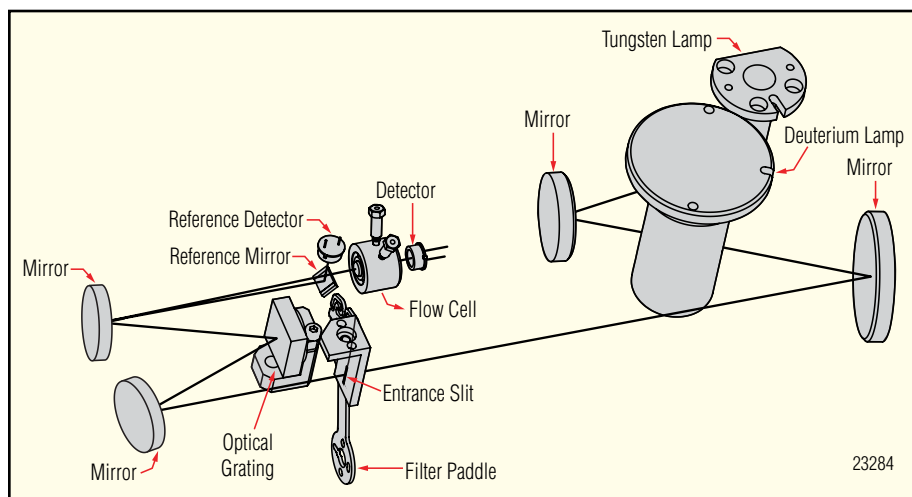
AS Autosampler

reagent flush, and concentrate. These capabilities offer additional flexibility that ranges from matrix elimination to concentration. 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
 - Preconcentration
 - Matrix elimination
 - Automated dilutions
- Eliminate complex laboratory procedures with automated standard preparation

Key AS Autosampler Features Provide Performance and Versatility

- Consistent operation at RSDs of less than 0.3% provides reproducible, accurate results
- Flexible sample container options include 10 mL polystyrene sample vials with wide openings that are easy to fill, easy to handle, and permit large-volume injections as well as standard 1.5 mL vials that also support 0.3 mL conical inserts
- Optional well plates facilitate processing large numbers of samples
- All-PEEK flow path—including the sample needle—ensures compatibility with aqueous and reversed-phase eluents, protects sensitive samples from metallic contamination, and eliminates corrosion



ICS Series VWD optical schematic

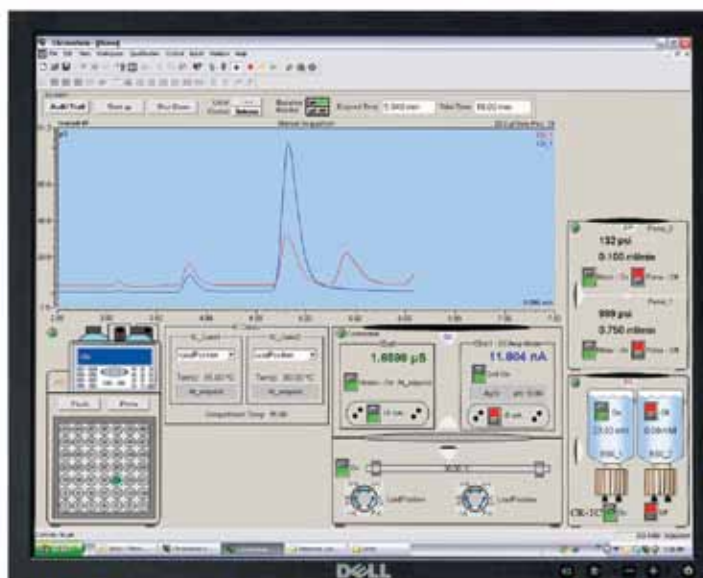
- Control through Chromeleon software or module front panel
- Moving-needle design guarantees reliable sampling from a variety of vial sizes
- Sample preparative option saves time and labor by automating your sample and standard preparations
- Sample tray temperature control option for thermally sensitive samples offers precise, reliable control over a temperature range of 4–60 °C

ICS-5000 System Control

Powerful Chromeleon 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 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 ICS-5000 modules.

A pressure regulator is available to provide an inert blanket of helium or nitrogen over the mobile phase.

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

ICS-5000 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:

0–35 MPa (0–5000 psi)
(Analytical)
0–41 MPa (0–6000 psi)
(Capillary)

Flow Rate Range: (Analytical)

0.000–10.000 mL/min with settable flow increments at 0.001 mL/min, without changing pump heads

Flow Rate Range: (Capillary)

0.001–3.000 mL/min with settable flow increments at 0.0001 mL/min, typical working range of 5–20 µL/min

Flow Rate Precision:

< 0.1% (both analytical and capillary)

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:

Quaternary low pressure (analytical only) or electrolytic eluent generation at high pressure (capillary and analytical)

RFIC-EG Gradients:

0.1–200 mM (Capillary)
0.1–100 mM (Analytical)

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: (Capillary and Analytical)

Optional eluent generation (RFIC-EG)

Eluent On/Off Valve:

Electrically actuated, standard

Leak Sensor:

Optical, standard

System Software

Software:

Chromeleon Chromatography Data System software, supports Microsoft Windows® XP or Vista

Automated Procedure Wizards:

Yes, standard feature

System Smart Startup and Shutdown:

Yes, standard feature

System Wellness and Predictive Performance:

Yes, standard feature

Application Templates:

Yes, standard feature

Automation Support of 3rd Party Instruments:

Yes, fully controls over 300 different instruments from more than 30 manufacturers, including GC, HPLC, and MS

Customizable System Control Panels:

Yes, standard feature

Signal Channels:

Pump pressure

Data Trending Plots:

Yes, all numerical device parameters

System Status Virtual Channels:

Yes, standard feature

Power Failure Protection:

Yes, standard feature

System Trigger Commands and Conditionals:

Yes, standard feature

Daily Audit Trail:

Yes, standard feature

Sample Audit Trail:

Yes, standard feature

System Calibration Storage:

Yes, factory, present and previous. Completely user selectable.

Customized Reporting:

Yes, standard feature with unlimited report workbooks

GLP Compliance:

Yes, optional

Physical Specifications

Power Requirements:

90–265 V ac, 47–63 Hz

Dimensions (h × w × d):

36 × 21 × 48 cm
(14 × 8.25 × 19 in)

Weight:

SP: 20.4 kg (45 lb)
DP: 24.1 kg (55 lb)

Flow Path:

All polymeric (PEEK), anion or cation configurations

ICS-5000 EG ELUENT GENERATOR SPECIFICATIONS

<i>Minimum and Maximum Eluent Concentrations:</i> 0.1–100 mM (Analytical) 0.1–200 mM (Capillary)	RFIC Eluent Degasser (Analytical only) Eluent degasser housed in the EG Module	<i>System Status Virtual Channels:</i> Yes, standard feature <i>Power Failure Protection:</i> Yes, standard feature
<i>Flow Rates:</i> 0.100–3.000 mL/min (Analytical) 0.001–0.030 mL/min (Capillary)	System Software <i>Software:</i> Chromleon Chromatography Data System software, supports Microsoft Windows® XP and Vista	<i>System Trigger Commands and Conditionals:</i> Yes, standard feature
<i>Eluent Types: (Capillary)</i> KOH MSA	<i>Automated Procedure Wizards:</i> Yes, standard feature	<i>Daily Audit Trail:</i> Yes, standard feature <i>Sample Audit Trail:</i> Yes, standard feature
<i>Eluent Types: (Analytical)</i> KOH, LiOH, NaOH; Carbonate; Carbonate/ Bicarbonate; Carbonate with pH modifier; MSA	<i>System Smart Startup and Shutdown:</i> Yes, standard feature <i>System Wellness and Predictive Performance:</i> Yes, standard feature	<i>Eluent Cartridge Information Storage:</i> Yes, serial number and expiration date <i>Customized Reporting:</i> Yes, standard feature with unlimited report workbooks
<i>Maximum Operating Pressure:</i> 35 MPa (5000 psi) (Capillary only) 21 MPa (3000 psi) (Analytical)	<i>Application Templates:</i> Yes, standard feature <i>Automation Support of 3rd Party Instruments:</i> Yes, fully controls > 300 different instruments including GC, HPLC, and MS from more than > 30 manufacturers.	<i>GLP Compliance:</i> Yes, optional package provides security system, modification history, and electronic signatures
<i>Maximum Solvent Concentration: (Analytical and Capillary)</i> Cations: None Anions: 25% methanol	<i>Customizable System Control Panels:</i> Yes, standard feature	Physical Specifications <i>Dimensions (h × w × d):</i> 41 × 23 × 56 cm (16 × 8.75 × 21.5 in.)
<i>Gradient Profiles:</i> Standard - any combination of an unlimited number of linear, convex and concave positive and negative gradient profiles	<i>Signal Channels:</i> Eluent concentration	<i>Weight:</i> 25 kg (40 lb) (without optional items)
<i>Number of Cartridges Supported:</i> Two–dual cartridge support	<i>Data Trending Plots:</i> Device numerical parameters plotted	<i>Power requirements:</i> 90–265 V ac, 47–63 Hz <i>Flow Path:</i> All polymeric (PEEK), anion or cation configurations

ICS-5000 ER ELUENT REGENERATION SPECIFICATIONS (ANALYTICAL)

<i>Eluents:</i> Carbonate and carbonate/bicarbonate combinations up to 20 mM MSA up to 34 mM	<i>Remains Fully Calibrated for Extended Periods of Time (≤ 28 Days):</i> Yes, standard feature. Results are traceable to a single calibration.
<i>Flow Rates:</i> 1.00–2.00 mL/min	<i>System Wellness:</i> Consumables usage monitoring for predictive maintenance
<i>Continuous Operation with 4 L of Eluent:</i> Up to 28 days or 2000 samples, typically	<i>Maximum Operating Pressure:</i> 21 MPa (3000 psi)
<i>Always-On, Always-Ready Capable:</i> Yes, standard feature	<i>Operating Temperature Range:</i> 4–40 °C

ICS-5000 DC DETECTOR/CHROMATOGRAPHY COMPARTMENT SPECIFICATIONS

Dual Temperature Zone Model: Independent Temperature Control of Each Zone:

Upper Zone Temp. Range:
10–40 °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: ± 0.5 °C

Temperature Stability: ± 0.2 °C

Temperature Precision: ± 0.2 °C

Lower Zone: (Analytical)

Injection Valves:

Up to two 6- or 10-port valves
(upgradeable, field installable)

Up to two column sets

1–9 mm diameter

Maximum Column Length:
250 mm plus 50 mm guard
column

Precolumn Heat Exchangers:
two (2 mm or 4 mm column i.d.
version)

Automation Manager:

(Optional - analytical only)

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

Cap IC Cube: (Optional - but required for capillary chemistries)

One or two IC Cube module
hold the following:

Injection Valves: Up to two
(one per cube) high pressure
valves, 4-port, 2 position

EG Degasser

Column and Guard

Carbonate Removal Device

Capillary Suppressor (See
Suppressor section)

IC Cubes and cartridges are
customer installable with pre-
formed tubing and color-coded
labeling

Capillary column heater 15 to
85 °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:

Yes, 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.

Suppression

Non-suppressed conductivity:

Yes, supported

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,

Self-Regenerating:

0.4 mm (with optional IC Cube)
2 mm and 4 mm anion
and cation. Membrane and
MonoDisc suppression bed
types available. Membrane for
capillary (0.4 mm) suppressor.

Electrolytic Suppression,

Self-Regenerating, External

Water Mode:

0.4 mm (with optional IC
Cube), 2 mm and 4 mm anion
and cation. Membrane and
MonoDisc suppression bed
types available for 4 mm and
2 mm. Membrane for capillary
(0.4 mm) suppressor.

Salt Converter:

Available in 2 and 4 mm
versions

AMMS-ICE:

Available in 2 and 4 mm
versions

Carbonic Acid Removal for Anions:

ASRS® and AMMS® plus
CRD 300 for 2 and 4 mm
versions, CRD (0.4 mm) for
capillary suppressors

IGS-5000 DC DETECTOR/CHROMATOGRAPHY COMPARTMENT SPECIFICATIONS (CONTINUED)

Suppressor

Suppression Capacities:

Anion SRS 300 (4 mm): 200 µeq/min
Cation SRS 300 (4 mm): 110 µeq/min
Anion SRS 300 (2 mm): 50 µeq/min
Cation SRS 300 (2 mm): 37.5 µeq/min
Anion MMS 300 (4 mm): 150 µeq/min
Cation MMS 300 (4 mm): 150 µeq/min
Anion MMS 300 (2 mm): 37.5 µeq/min
Cation MMS 300 (2 mm): 37.5 µeq/min
Anion AES: 25 µeq/min
Cation AES: 25 µeq/min
AMMS-ICE: N/A
Anion CES (0.4 mm): 2 µeq/min
Cation CES (0.4 mm): 1.5 µeq/min

Suppressor Void Volumes:

SRS 300 (4 mm): < 50 µL
SRS 300 (2 mm): < 15 µL
MMS 300 (4 mm): < 50 µL
MMS 300 (2 mm): < 15 µL
AMMS-ICE 300 (4 mm): < 50 µL
AMMS-ICE 300 (2 mm): < 15 µL
AES (Anion or Cation): < 35 µL
Anion CES (0.4 mm): < 1.0 µL
Cation CES (0.4 mm): < 1.0 µL

System Software

Software:

Chromeleon Chromatography Data System software, supports Microsoft Windows XP and Vista

Automated Procedure Wizards:

Yes, standard feature

System Smart Startup and Shutdown:

Yes, standard feature

System Wellness and Predictive Performance:

Yes, standard feature

Application Templates:

Yes, standard feature

Automation Support of 3rd Party Instruments:

Yes, fully controls > 300 different instruments from more than > 30 manufacturers, including GC, HPLC, and MS.

Customizable System Control Panels:

Yes, standard feature

Signal Channels:

Detector signals, detector background signals, temperatures

Data Trending Plots:

Yes, all device numerical parameters plotted

System Status Virtual Channels:

Yes, standard feature

Power Failure Protection:

Yes, standard feature

System Trigger Commands and Conditionals:

Yes, standard feature

Daily Audit Trail:

Yes, standard feature

Sample Audit Trail:

Yes, standard feature

System Calibration Storage:

Yes, factory, current, and previous.
Completely user selectable

Customized Reporting:

Yes, standard feature with unlimited report workbooks

GLP Compliance:

Yes, 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):

44.5 × 42 × 57 cm (17.5 × 16.5 × 22.5 in)

Weight:

38 kg (84 lb)

Flow Path:

All polymeric (PEEK), anion or cation configurations

ICS-5000 CD CONDUCTIVITY DETECTOR SPECIFICATIONS

Electronics Type:

Microprocessor controlled digital signal processing, autoranging

Cell Drive:

8 kHz square wave

Linearity:

1%

Resolution:

0.00238 nS/cm

Output Range:

Digital Signal Range:

0–15,000 μ S/cm

Analog Signal Range:

0–15,000 μ S/cm

Noise, Wet:

< 0.2 nS at 23 μ S/cm background

< 0.1 nS at 1 μ S/cm background

Filter:

Rise times 0 to 10 s, programmable

Sampling 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:

0.7 μ L (Analytical)

0.02 μ L (Capillary)

Cell Electrodes:

Passivated 316 stainless steel. Compatible with MSA

Cell Body:

Chemically inert polymeric material

Heat Exchanger:

Inert, tortuous-path for low axial dispersion

System Software

Software:

Chromeleon Chromatography Data System software, supports Microsoft Windows® XP or Vista

Automated Procedure Wizards:

Yes, standard feature

System Smart Startup and Shutdown:

Yes, standard feature

System Wellness and Predictive

Performance:

Yes, standard feature

Application Templates:

Yes, standard feature

Automation Support of 3rd Party

Instruments:

Yes, fully controls over > 300 different instruments from more than > 30 manufacturers, including GC, HPLC, and MS

Customizable System Control Panels:

Yes, standard feature

Signal Channels:

Conductivity, Total Conductivity

Data Trending Plots:

Detector numerical parameters plotted

System Status Virtual Channels:

Yes, standard feature

Power Failure Protection:

Yes, standard feature

System Trigger Commands and Conditionals:

Yes, standard feature

Daily Audit Trail:

Yes, standard feature

Sample Audit Trail:

Yes, standard feature

System Calibration Storage:

Yes, factory, present, and previous. Completely user selectable.

Customized Reporting:

Yes, standard feature with unlimited report workbooks

GLP Compliance:

Yes, 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.)

ICS-5000 ED ELECTROCHEMICAL DETECTOR SPECIFICATIONS

Electronics Type:

Microprocessor controlled digital signal processing

Electronic Noise (Wet Noise):

Capillary and Analytical

IPAD (Au electrode)
< 50 pC at 10 mM KOH, DC Amperometry (GC) < 10 pA at catecholamine eluent

Potential Range:

-2.0 to 2.0 V in 0.001 V increments

Signal Range: (Digital and Analog)

Integrated Amperometry:
50 pC to 200 μ C
DC Amperometry: 5 pA to 74 μ A

Filter:

0–10 s response time, user settable

Control Mode:

Local or remote control using relay closures or TTL, or control using Chromeleon 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 μ L

Maximum Cell Operating Pressure:

0.7 MPa (100 psi)

System Software and Control

Software:

Chromeleon Chromatography Data System software, supports Microsoft Windows XP or Vista

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.

3-D Amperometry:

(Chromeleon 6.8 only)

Three-dimensional display of the raw integrated amperometry data set, with crosshairs on an isoamperometric plot used to select slices of the plot along the applied voltage axis (to render a chromatogram) and along the time axis (to render a voltammogram).

Automated Procedure Wizards:

Yes, standard feature

System Smart Startup and Shutdown:

Yes, standard feature

System Wellness and Predictive Performance:

Yes, standard feature

Application Templates:

Yes, standard feature

Automation Support

of 3rd Party Instruments:

Yes, fully controls > 300 different instruments from more than > 30 manufacturers, including GC, HPLC, and MS.

Customizable System Control Panels:

Yes, standard feature

Signal Channels:

Electrochemical and total electrochemical signals

Data Trending Plots:

Yes, all detector numerical parameters plotted

System Status Virtual Channels:

Yes, standard feature

Power Failure Protection:

Yes, standard feature

System Trigger Commands and Conditionals:

Yes, standard feature

Daily Audit Trail:

Yes, standard feature

Sample Audit Trail:

Yes, standard feature

System Calibration Storage:

Yes, factory, present, and previous. Completely user selectable.

Customized Reporting:

Yes, standard feature with unlimited report workbooks

GLP Compliance:

Yes, optional

Physical Specifications

Dimensions (h \times w \times d):

6.9 \times 16.7 \times 9.9 cm
(2.7 \times 6.5 \times 3.9 in)

Weight:

400 g (1.6 lb.)

ICS-SERIES PDA PHOTODIODE ARRAY DETECTOR SPECIFICATIONS

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

<p>TC Models:</p> <p><i>Temperature Range:</i> 5–85 °C (max 18 °C below ambient) in 0.1 °C increments</p> <p><i>Temperature Performance:</i> Accuracy: ± 0.5 °C Stability: ± 0.1 °C Precision: ± 0.1 °C</p> <p><i>Heat up / Cool down Time:</i> Typically 15 minutes 20 °C to 50 °C and 50 °C to 20 °C</p>	<p><i>High-Pressure Valve Types:</i> Six-port/two position Rheodyne PEEK (injection) valve Ten-port/two position Rheodyne PEEK (switching) valve</p> <p><i>Column Capacity:</i> Three column sets, 1–9 mm</p> <p><i>Maximum Column Length:</i> 300 mm + 50 mm guard column</p> <p><i>Precolumn Heat Exchangers (optional):</i> Two low delay volume exchangers</p>	<p>General Specifications</p> <p><i>Control:</i> Chromeleon</p> <p><i>Computer Connection:</i> USB</p> <p><i>Leak Detection:</i> Humidity and vapor sensors</p> <p><i>TTL and Relay inputs and outputs:</i> Two digital inputs/outputs, two relay outputs</p>	<p>Physical Specifications</p> <p><i>Power Requirements:</i> 90–265 V ac, 47–63 Hz</p> <p><i>Operating Temperature Range:</i> 10–35 °C (50–95 °F)</p> <p><i>Operating Humidity Range:</i> 5–80% relative, noncondensing</p> <p><i>Dimensions (h × w × d):</i> 17.4 × 44.4 × 50.3 cm 6.8 × 17.5 × 19.8 in.</p> <p><i>Weight:</i> 15.4 kg, 34 lb</p>
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ICS-SERIES VARIABLE WAVELENGTH DETECTOR SPECIFICATIONS

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

<p><i>Sample Capacity:</i> 10 mL vials: 49 1.5 mL vials: 100 Well Plates: 192 (two standard or deep well 96 well plates)</p> <p><i>Injections per Vial:</i> 1–99</p> <p><i>Minimum Sample Volume:</i> 10 µL can be sampled from a 300 µL microvial; 20 µL can be sampled from a 500 µL microvial</p> <p><i>Maximum Injection Volume:</i> 8200 µL</p> <p><i>Variable Volume Range:</i> 1–100 µL in 0.1 µL increments; 100–8200 µL in 1 µL increments</p> <p><i>Injection Cycle Time (including sample prep such as dilution):</i> 15 seconds, with sample overlap function</p> <p><i>Injection Modes:</i> Full Loop Partial Loop Limited Sample</p> <p><i>Injection Precision:</i> Fixed Loop: < 0.3% RSD at 20 µL; Partial Loop: < 0.5% RSD at 20 µL</p> <p><i>Dilution:</i> 1:1 to 1:1000</p> <p><i>Autodilution:</i> With post-run functionality and Chromeleon Autodilution License</p> <p><i>Dilution Precision:</i> < 1.0% RSD for a 1:100 dilution</p> <p><i>Dispensing Precision:</i> < 0.2% RSD (by weight)</p>	<p><i>Carryover:</i> < 0.01% with 500 µL flush volume</p> <p><i>Sample Tray Thermostating:</i> 4 °C to 60 °C, optional</p> <p><i>Dual Instrument Support:</i> Sequential (asynchronous) and Simultaneous modes, field upgradeable, optional</p> <p><i>Sample Degassing:</i> CRD 200/300, upgradeable, user installable</p> <p><i>Injection Valves:</i> One or two two-position six-port</p> <p><i>Diverter Valve:</i> One two-position six-port</p> <p><i>Sample Preparation:</i> Dilution, addition of internal standards, concentration/matrix elimination, derivatization, etc. optional</p> <p><i>Inline Sample Filtration:</i> Dual filter, backflush, optional</p> <p>System Software <i>Software:</i> Chromeleon Chromatography Data System software, supports Microsoft Windows XP or Vista</p> <p><i>Automated Procedure Wizards:</i> Yes, standard feature</p> <p><i>System Smart Startup and Shutdown:</i> Yes, standard feature</p> <p><i>System Wellness and Predictive Performance:</i> Yes, standard feature</p> <p><i>Application Templates:</i> Yes, standard feature</p> <p><i>Automation Support of 3rd Party Instruments:</i> Yes, fully controls > 300 different instruments from more than > 30 manufacturers, including GC, HPLC, and MS.</p>	<p><i>Customizable System Control Panels:</i> Yes, standard feature</p> <p><i>Data Trending Plots:</i> Yes, all device numerical parameters</p> <p><i>System Status Virtual Channels:</i> Yes, standard feature</p> <p><i>Power Failure Protection:</i> Yes, standard feature</p> <p><i>System Trigger Commands and Conditionals:</i> Yes, standard feature</p> <p><i>Daily Audit Trail:</i> Yes, standard feature</p> <p><i>Sample Audit Trail:</i> Yes, standard feature</p> <p><i>System Calibration Storage:</i> Yes, factory, current and previous. Completely user selectable.</p> <p><i>Customized Reporting:</i> Yes, standard feature with unlimited report workbooks</p> <p><i>GLP Compliance:</i> Yes, Optional</p>
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AS AUTOSAMPLER SPECIFICATIONS (CONTINUED)

Physical Specifications

Dimensions:

58 × 30 × 46 cm

(23 in × 12 in × 19 in.)

65 × 30 × 46 cm

(27.5 in × 12 in × 19 in)

with sample temperature control

Weight:

< 30 kg (< 65 lb)

< 38 kg (< 81 lb) with sample temperature control

Power:

90–265 V ac, 47–63 Hz

Flow Path:

All polymeric (PEEK), anion or cation configurations

Validation Services

Dionex offers a full range of validation services and kits for the ICS-5000 product line. Validation procedures include Installation Qualification (IQ) and Operational Qualification (OQ)/Performance Qualification (PQ) for the ICS-5000 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 ICS-5000 systems and modules are available from your local Dionex office or distributor. Please consult your Dionex representative for the system configuration and modules best suited to your needs.

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