

# **Dionex ICS-6000 Ion Chromatography System Installation Instructions**

Document No. 22181-97001  
Revision 01  
February 2018

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Revision history: Revision 01 released February 2018; initial release of instrument

Software version: Chromeleon 7.2.7 (or later)

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## 1.1 Overview

The modular design of the Thermo Scientific Dionex™ ICS-6000 Ion Chromatography System lets you configure and customize components for a wide range of applications. This manual provides instructions for initial installation of the components that make up typical ion chromatography (IC) systems and Reagent-Free™ IC (RFIC™) systems with eluent generation (RFIC-EG™). Configurations for both capillary IC and analytical IC applications are described. Analytical IC applications can be configured with either standard bore or microbore plumbing.

Installation instructions for the following Thermo Scientific modules and components are included:

- Dionex ICS-6000 Dual Pump (DP)
- Dionex ICS-6000 Single Pump (SP)
- Dionex ICS-6000 Eluent Generator (EG)
- Dionex ICS-6000 Detector/Chromatography Module (DC)
- Dionex ICS-6000 Conductivity Detector (CD)
- Dionex ICS-6000 Electrochemical Detector (ED)
- Dionex ICS-6000 IC Cube™ (IC Cube)
- Dionex ICS-6000 Automation Manager (AM)
- Dionex AS-AP Autosampler
- Dionex AS-DV Autosampler

## **1.2 Related Documentation**

In addition to this manual, the following documents are available for download from the Thermo Scientific website or by contacting your local office.

- *Dionex ICS-6000 Ion Chromatography System Operator's Manual* (Document No. 22181-97002)
- *Dionex ICS Series Photodiode Array Detector Operator's Manual* (Document No. 065147)
- *Dionex ICS Series Variable Wavelength Detector Operator's Manual* (Document No. 065141)
- *Dionex AS-AP Autosampler Operator's Manual* (Document No. 065361)
- *Dionex AS-DV Autosampler Operator's Manual* (Document No. 065259)
- Manuals for consumable products (columns, suppressors, Dionex CR-TC 600, Dionex EGC, Dionex CRD)
- *Chromeleon 7 Installation Guide* (Document No. 7229.0003)

## **1.3 Safety Information**

The Dionex ICS-6000 system was manufactured by Thermo Fisher Scientific at the following location: 355 River Oaks Parkway, San Jose, CA 95134-1991 U.S.A. The Dionex ICS-6000 system is designed for IC (ion chromatography) and HPLC (high-performance liquid chromatography) applications and should not be used for any other purpose. Operation of a Dionex ICS-6000 module in a manner not specified by Thermo Fisher Scientific may result in personal injury.

If there is a question regarding appropriate usage, contact Technical Support for Dionex products. In the U.S. and Canada, call 1-800-532-4752. Outside the U.S. and Canada, call the nearest Thermo Fisher Scientific office.

### 1.3.1 Safety Messages and Notes

This manual contains warnings and precautionary statements that can prevent personal injury and/or damage to the system when properly followed. Safety messages appear in bold type and are accompanied by icons, as shown below.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



Indicates that the function or process of the instrument may be impaired. Operation does not constitute a hazard.

#### Messages d'avertissement en français



Signale une situation de danger immédiat qui, si elle n'est pas évitée, entraînera des blessures graves à mortelles.



Signale une situation de danger potentiel qui, si elle n'est pas évitée, pourrait entraîner des blessures graves à mortelles.



Signale une situation de danger potentiel qui, si elle n'est pas évitée, pourrait entraîner des blessures mineures à modérées. Également utilisé pour signaler une situation ou une pratique qui pourrait gravement endommager l'instrument mais qui n'entraînera pas de blessures.

#### Warnhinweise in Deutsch



Bedeutet unmittelbare Gefahr. Mißachtung kann zum Tod oder schwerwiegenden Verletzungen führen.



Bedeutet eine mögliche Gefährdung. Mißachtung kann zum Tod oder schwerwiegenden Verletzungen führen.



Bedeutet eine mögliche Gefährdung. Mißachtung kann zu kleineren oder mittelschweren Verletzungen führen. Wird auch verwendet, wenn eine Situation zu schweren Schäden am Gerät führen kann, jedoch keine Verletzungsgefahr besteht.

### Notes

Informational messages appear throughout the manual. These are labeled NOTE and are in bold type:

**NOTE** NOTES call attention to certain information. They alert you to an unexpected result of an action, suggest how to optimize instrument performance, etc.

Capillary  
IC

Sections preceded by the Capillary IC flag contain information that applies to capillary IC systems only.

Analytical  
IC

Sections preceded by the Analytical IC flag contain information that applies to analytical IC systems only.

If a section is not flagged, the information in the section applies to both capillary IC and analytical IC systems.

### 1.3.2 Safety Symbols

These symbols appear on the Dionex ICS-6000 modules or on labels affixed to the modules:







Alternating current



Primary protective conductor terminal



Secondary protective conductor terminal

	Power supply is on
	Power supply is off
	Hot surface
	Indicates a potential hazard. Refer to this operator's manual for an explanation of the hazard and how to proceed.

## 1.4 Regulatory Information

Thermo Fisher Scientific performs complete testing and evaluation of its products to ensure full compliance with applicable domestic and international regulations. When the system is delivered to you, it meets all pertinent electromagnetic compatibility (EMC) and safety standards.

Changes that you make to your system may void compliance with one or more of these EMC and safety standards. Changes to your system include replacing a part or adding components, options, or peripherals not specifically authorized and qualified by Thermo Fisher Scientific. To ensure continued compliance with EMC and safety standards, replacement parts and additional components, options, and peripherals must be ordered from Thermo Fisher Scientific or one of its authorized representatives.

The regulatory symbols on the model/data label on each Dionex ICS-6000 module indicate that the module is in compliance with the following safety and EMC standards:

- UL 61010-1:2012
- UL 61010-2-010:2015
- CAN/CSA-C22.2 No. 61010-1-12
- CAN/CSA-C22.2 No. 61010-2-010:15
- FCC Part 15 Subpart B (per ANSI C63.4: 2009) and Industry Canada ICES-003 Issue 5, August 2012 for a Class A Device

- Standards of countries other than Canada and the United States, as applicable (see [Section 1.4.2](#))

The CE mark on the model/data label on each Dionex ICS-6000 module indicates that the module is in compliance with the following European Union Directives as is evidenced by compliance to the associated standard where appropriate:

- LVD Directive: 2014/35/EU by conforming to IEC/EN 61010-1:2010 (3rd edition) and IEC/EN 61010-2-010:2014 (3rd edition)
- EMC Directive: 2014/30/EU by conforming to EN 61326-1:2013, EN 61326-2-6:2006
- RED Directive: 2014/53/EU conforming to ETSI EN 301 489-1/3 V2.1.1:2017

### 1.4.1 FCC/IC Notices

This product may contain:

RFID Module	
FCC ID:	WZ4-NOVA001
IC:	5893A-NOVA2011

These devices comply with Part 15 of the FCC rules and Industry Canada license-exempt RSS standards. Operation of this device is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any modifications could void the user's authority to operate the equipment.

Refer to the RFID module data sheet for additional module information.

### **AVIS FCC/IC**

Ce produit peut contenir:

RFID Module	
FCC ID:	WZ4-NOVA001
IC:	5893A-NOVA2011

Cet appareil est conforme à la partie 15 des règles de la FCC et d'Industrie Canada RSS normes exemptes de licence. Le fonctionnement de cet appareil est soumis à la deux conditions suivantes:

1. Ce dispositif ne doit pas causer d'interférences nuisibles, et
2. Cet appareil doit accepter toute interférence reçue, y compris les interférences qui peuvent causer un mauvais fonctionnement.

Cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe A, conformément à la partie 15 des règles de la FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet équipement génère, utilise et peut émettre de l'énergie radiofréquence et, se il ne est pas installé et utilisé conformément aux instructions, peut causer des interférences nuisibles aux communications radio. Cependant, il ne est pas garanti que des interférences ne se produiront pas dans une installation particulière. Si cet équipement provoque des interférences nuisibles à la réception radio ou de télévision, ce qui peut être déterminé en mettant l'équipement hors et sous

tension, l'utilisateur est encouragé à essayer de corriger l'interférence par une ou plusieurs des mesures suivantes:




- Réorienter ou déplacer l'antenne de réception.
- Augmentez la distance entre l'équipement et le récepteur.
- Branchez l'appareil dans une prise sur un circuit différent de celui sur lequel le récepteur est branché.
- Consulter le revendeur ou un technicien radio / TV expérimenté.

Toute modification peut annuler le droit de l'utilisateur à utiliser l'équipement.

Pour plus d'information sur le module RFID, veuillez-vous référer à leur fiche technique.



### 1.4.2 International Compliance

The table below lists regulatory certificate numbers for the DC Consumable Device Monitor.

Country	Regulatory Certificate
Argentina	 COMISION NACIONAL DE COMUNICACIONES Contiene modulo CNC ID C-20414
Australia/New Zealand	 R-NZ ABN 81 145 810 206
Bahrain	2992
Bermuda	CTYPE-01228
Bolivia	ATT-DJ-RA-H-TL LP 15/2018
Brazil	 ANATEL 1431-16-2716
Brunei	DTA-000621
Canada	5893A-NOVA001
Chile	14031/DO N42508/F26
China	N/A



Country	Regulatory Certificate					
Costa Rica	 10206-SUTEL-DGC-2017					
European Union	CS22357					
India	NR-ETA/7576-RLO (NR)					
Indonesia	52847/SDPPI/2017					
Japan	 R 005-101230					
Korea, Republic of	 <table border="1" data-bbox="817 687 1119 791"> <tr> <td>1. 기기명 명칭(모델명) : Dionex DC Consumable Device Monitor</td> </tr> <tr> <td>2. 등록번호 : MSP-REM-Div-DionexDCCDM</td> </tr> <tr> <td>3. 적합성 평가를 받은 자의 상호 : Dionex Corporation</td> </tr> <tr> <td>4. 제조년월일 : 01-2018</td> </tr> <tr> <td>5. 제조자 및 제조국가 : Dionex Corporation / 미국</td> </tr> </table>	1. 기기명 명칭(모델명) : Dionex DC Consumable Device Monitor	2. 등록번호 : MSP-REM-Div-DionexDCCDM	3. 적합성 평가를 받은 자의 상호 : Dionex Corporation	4. 제조년월일 : 01-2018	5. 제조자 및 제조국가 : Dionex Corporation / 미국
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2. 등록번호 : MSP-REM-Div-DionexDCCDM						
3. 적합성 평가를 받은 자의 상호 : Dionex Corporation						
4. 제조년월일 : 01-2018						
5. 제조자 및 제조국가 : Dionex Corporation / 미국						
Kuwait	2126					
Malaysia						
Mexico	IFETEL: RCPSKSM16-0940					
Peru	TRSS39743					
Philippines	 TYPE APPROVED No. ESD-1715941C					
Qatar	CRA/SA/2017/R-6477					
Russia	RU Д-US. АГ03.В.89713					
						
Saudi Arabia	16022017-16022019-19346					

Country	Regulatory Certificate
Singapore	<div style="border: 1px solid black; padding: 5px; text-align: center;">                     Complies with                      IDA Standards                      Dealer's License No. N3167-17                 </div>
South Africa	
Taiwan	N/A
Thailand เครื่องโทรคมนาคมและอุปกรณ์นี้ มีความสอดคล้องตามข้อกำหนดของ กทช. This telecommunication equipment is in compliance with NTC requirements.	
Turkey	32423510-254.01-E.69329
United Arab Emirates	<div style="border: 1px solid black; padding: 5px; text-align: center;">                     TBA                      REGISTERED No:                      DA48560/16                      DEALER No:                      ER59193/17                 </div>
United States of America	WZ4-NOVA001
Vietnam	

### 1.4.3 WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:



Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. See [www.thermoscientific.rohs](http://www.thermoscientific.rohs) for further information on Thermo Fisher Scientific's compliance with these Directives and the recyclers in your country.

#### Conformité DEEE

Ce produit est conforme avec la directive européenne (2002/96/EC) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant:



Thermo Fisher Scientific s'est associé avec une ou plusieurs sociétés de recyclage dans chaque état membre de l'Union Européenne et ce produit devrait être collecté ou recyclé par celle(s)-ci. Pour davantage d'informations, rendez-vous sur la page [www.thermoscientific.fr/rohs](http://www.thermoscientific.fr/rohs).

### WEEE Konformität

Dieses Produkt entspricht der EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96/EC. Es ist mit dem folgenden Symbol gekennzeichnet:



Thermo Fisher Scientific hat Vereinbarungen mit Verwertungs-/Entsorgungsfirmen in allen EU-Mitgliedsstaaten getroffen, damit dieses Produkt durch diese Firmen wiederverwertet oder entsorgt werden kann. Weitere Informationen finden Sie unter [www.thermoscientific.de/rohs](http://www.thermoscientific.de/rohs).

## 1.5 Facility Requirements

- Make sure the Dionex ICS-6000 system installation site meets the power and environmental specifications for each module. Refer to Appendix A of the Dionex ICS-6000 operator's manual for specifications.
- Make sure the installation site has enough power outlets for all system components.
- Provide a sturdy, vibration-free lab bench of a height that ensures convenient access to the interior of each Dionex ICS-6000 module.
- Allow at least 6 cm (2.4 in) of clearance behind and at least 2.5 cm (1 in) to the sides of the system for power connections and ventilation.
- Provide a suitable waste container or drain system for system waste and sample waste.

- For eluent generation, or when manually preparing eluent and regenerant, use ASTM Type I (18 megohm-cm) filtered and deionized water that meets the specifications listed in [Table 1-1](#).

Contaminant	Specification
Ions–Resistivity	>18.0 (megohm-cm)
Organics–TOC	<10 ppb
Iron/Transition Metals*	<1 ppb
Pyrogens	<0.03 (Eu/mL)
Particulates >0.2 µm	<1 (units/mL)
Colloids–Silica	<10 ppb
Bacteria	<1 (cfu/mL)
* Iron/transition metal content not specified for ASTM Type I water	

**Table 1-1.** ASTM Filtered, Type I Deionized Water Specifications for Ion Chromatography

- (Optional) If eluent reservoirs will be pressurized, provide a clean helium or nitrogen source regulated to approximately 0.17 to 0.34 MPa (25 to 50 psi).



Never pressurize eluent reservoirs above 0.07 MPa (10 psi). Pressurizing reservoirs above this limit can cause the reservoir to explode.



Ne mettez jamais les réservoirs d'éluants sous une pression supérieure à 0,07 MPa (10 lb/po<sup>2</sup>).



Setzen Sie den Eluentbehälter auf keinen Fall einem Druck über 0,07 MPa aus.

- (Optional) For pressurized reagent delivery, provide a clean helium or nitrogen source regulated to between 0.60 and 0.85 MPa (80 and 120 psi).

## 1.6 Configurations

The table below describes some common Dionex ICS-6000 system configurations. For detailed plumbing diagrams for these configurations, refer to Chapter 3 of the Dionex ICS-6000 operator's manual.

System Configuration	Typical Modules and Components Included
Single-Analysis Capillary IC or RFIC-EG System with Conductivity Detector	<ul style="list-style-type: none"> <li>• SP</li> <li>• DC with one IC Cube, including an injection valve, and capillary versions of the following: EG degasser, suppressor, and Thermo Scientific Dionex Carbonate Removal Device (CRD) (an option for anion analyses)</li> <li>• Capillary CD</li> <li>• Capillary column set</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with one capillary Thermo Scientific Dionex EGC (Dionex EGC) and one capillary Thermo Scientific Dionex Continuously Regenerated Trap Column (Dionex CR-TC 600)</li> </ul>
Single-Analysis Capillary IC or RFIC-EG System with Electrochemical Detector	<ul style="list-style-type: none"> <li>• SP</li> <li>• DC with one IC Cube, including an injection valve and a capillary EG degasser</li> <li>• Capillary ED</li> <li>• Capillary column set</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with one capillary Dionex EGC and one capillary Dionex CR-TC 600</li> </ul>
Single-Analysis Analytical IC or RFIC-EG System with Conductivity Detector	<ul style="list-style-type: none"> <li>• SP</li> <li>• DC with one injection valve, one analytical column set, and one analytical suppressor</li> <li>• Analytical CD</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with one analytical Dionex EGC, one analytical Dionex CR-TC 600, and one Thermo Scientific Dionex RFIC<sup>+</sup> Eluent Degasser</li> </ul>

System Configuration	Typical Modules and Components Included
Single-Analysis Analytical IC or RFIC-EG System with Electrochemical Detector	<ul style="list-style-type: none"> <li>• SP</li> <li>• DC with one injection valve and one analytical column set</li> <li>• Analytical ED</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with one analytical Dionex EGC, one analytical Dionex CR-TC 600, and one Dionex RFIC<sup>+</sup> Eluent Degasser</li> </ul>
Single-Analysis Analytical IC or RFIC-EG System with Variable Wavelength Detector, Photodiode Array Detector, or Mass Spectrometer	<ul style="list-style-type: none"> <li>• SP</li> <li>• DC with one injection valve and one analytical column set</li> <li>• One detector: Thermo Scientific Dionex ICS Series Variable Wavelength Detector (Dionex VWD), Thermo Scientific Dionex ICS Series Photodiode Array Detector (Dionex PDA), or Thermo Scientific MSQ™ Mass Spectrometer</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with one analytical Dionex EGC, one analytical Dionex CR-TC 600, and one Dionex RFIC<sup>+</sup> Eluent Degasser</li> </ul>
Dual-Analysis Capillary IC or RFIC-EG System	<ul style="list-style-type: none"> <li>• DP</li> <li>• DC with two IC Cubes</li> <li>• Two capillary detectors—two CDs, two EDs, or one CD and one ED</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with two capillary Dionex EGCs and two capillary Dionex CR-TC 600s</li> </ul>
Dual-Analysis Analytical IC or RFIC-EG System	<ul style="list-style-type: none"> <li>• DP</li> <li>• DC with two injection valves, two analytical column sets, and two analytical detectors—two CDs, two EDs, or one CD and one ED</li> <li>• Dionex AS-AP</li> <li>• <b>For RFIC-EG:</b> EG with two Dionex EGCs, two Dionex CR-TC 600s, and two Dionex RFIC<sup>+</sup> Eluent Degassers</li> </ul>

System Configuration	Typical Modules and Components Included
Dual-Analysis Capillary and Analytical RFIC-EG Hybrid System	<ul style="list-style-type: none"> <li>• DP with one capillary pump and one analytical pump</li> <li>• DC with one IC Cube in the upper compartment, one column set and one injection valve in the lower compartment, and two detectors</li> <li>• EG with one capillary Dionex EGC and one analytical Dionex EGC</li> </ul>

For detailed plumbing diagrams for these configurations, refer to Chapter 3 of the Dionex ICS-6000 operator’s manual.

[Figure 1-1](#) illustrates a typical dual-analysis IC system.



**Figure 1-1.** *Dionex ICS-6000 System for Dual-Analysis RFIC-EG*

## 1.7 Fitting and Tube Connection Guidelines

Most Dionex ICS-6000 tubing connections (even in low-pressure systems) use two types of high-pressure fittings:

- Thermo Scientific™ Dionex™ IC PEEK™ Viper™ fittings



- 10-32 fitting bolts (P/N 22000-98001) with 10-32 double-cone ferrules (P/N 043276)

Installation and tightening requirements are different for each fitting type. To ensure a correct seal and avoid damage to fittings and tubing, carefully follow the installation and tightening instructions provided here.

### 1.7.1 Installing and Tightening IC PEEK Viper Fittings

IC PEEK Viper fittings are used for tubing connections throughout the system. The ferrule-free IC PEEK Viper design reduces the dead volume of any fluidic connection to virtually zero by sealing at the tip of the tubing.

IC PEEK Viper fittings require much less torque to tighten than other types of PEEK fittings (although they may look similar to other fittings). The effort required to create a seal for 34 MPa (5000 psi) of pressure is similar to the effort needed to turn a dial on a combination lock. Overtightening will damage the fitting and the port. To avoid damaging the fitting and port, please follow the tightening procedure provided here.

**IMPORTANT**

**DO NOT OVERTIGHTEN THE FITTING. Do not use any tools to tighten the fitting. IC PEEK Viper fittings require very little torque to seal.**

**To extend the life of IC PEEK Viper fittings, do not connect or disconnect a fitting under pressure.**

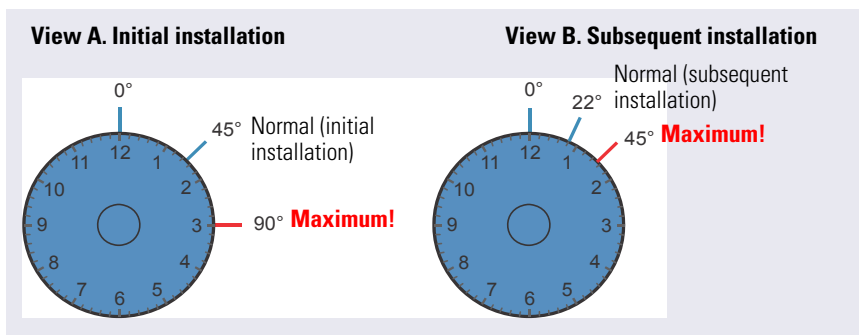
**When using IC PEEK Viper fittings with columns, ensure that the columns have the Viper Fittings Ready label.**

#### Installing an IC PEEK Viper Fitting

1. IC PEEK Viper fittings are preinstalled on tubing. Specific tubing assemblies are required for the various system plumbing connections. Make sure you have the correct tubing and fitting assembly for the connection. For details, refer to Chapter 10 of the Dionex ICS-6000 operator's manual.
2. Insert the tubing and fitting into the port until it stops.
3. Tighten the fitting by following the instructions in the next section.

### **Tightening an IC PEEK Viper Fitting**

1. If the pump is on, stop the pump and allow the system to reach zero pressure.
2. Slide the Viper fitting into the port and use your fingers to gently tighten the bolt until you feel the first contact or resistance. This is the “0” mark. Then, tighten the bolt according to the following guidelines.
  - For the initial installation of the fitting: Use your fingers to tighten the bolt one-eighth of a turn from the “0” mark (45° or between 1 and 2 on a clock face) (see [Figure 1-2](#), View A).
  - For subsequent installations: Use your fingers to tighten the bolt one-sixteenth of a turn from the “0” mark (22° or 4 minutes past 12 on a clock face) (see [Figure 1-2](#), View B).



**Figure 1-2. IC PEEK Viper Fitting Installation**

3. Turn on the pump and begin operating the system at the regular operating pressure.
4. Check for leaks. If a leak is present, follow the instructions in the next section.

### **Fixing a Leaking IC PEEK Viper Fitting**

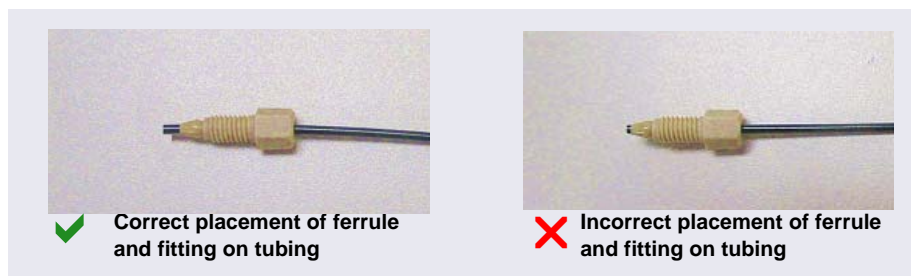
1. Gently tighten the fitting a little more.
  - For the initial installation of the fitting: Fingertighten the bolt another **one-eighth** turn only.
  - For subsequent installations: Fingertighten the bolt another **one-sixteenth** turn only.

2. If the leak continues, stop the pump and wait for the system to reach zero pressure before continuing.
3. Remove the fitting and clean it thoroughly with deionized water. Also, clean the port with deionized water and inspect it for any foreign objects or damage to the bottom of the port (for example, deformations or scratches).
4. Reinstall the fitting. If the leak continues, replace the entire Viper assembly.

## 1.7.2 Installing and Tightening Ferrule Fittings

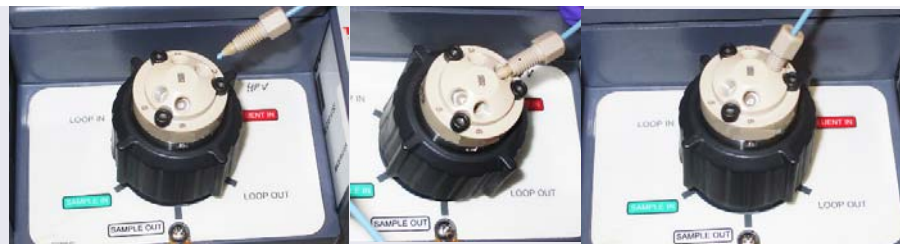
### Installing a 10-32 Double-Cone Ferrule Fitting

1. Install the fitting bolt and ferrule onto the tubing. Position the ferrule at least 2 mm (0.1 in) from the end of the tubing (see [Figure 1-3](#)).



**Figure 1-3.** Correct and Incorrect Ferrule and Fitting Bolt Placement for Tubing Connections

2. Insert the tubing into the port until it stops (see [Figure 1-4](#)).



**Figure 1-4.** Ferrule and Fitting Bolt Placement for Tubing Connections

3. While maintaining pressure on the tubing to keep it in place in the port, tighten the fitting bolt fingertight and then tighten the fitting further by following the instructions in the next section.

### Tightening a 10-32 Double-Cone Ferrule Fitting

1. Use your fingers to tighten the fitting bolt as tight as you can.
2. After finger-tightening, use a wrench to tighten the fitting an additional three-quarter turn (270 degrees).
3. If leaks occur, replace the fitting bolt (P/N 22000-98001), ferrule (P/N 043276), and tubing.

### Cutting Tubing with a 10-32 Double-Cone Ferrule Fitting

If a connection does not require precision cut capillary tubing, you can use a tubing cutter to cut tubing to the required length. Make sure the cut is at a right angle to the length of the tubing and there are no nicks or burrs on the end. A tubing cutter (P/N 049584) is included in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC). Refer to the instructions provided with the cutter.

### Notes

#### Capillary IC

- If you are installing a capillary system, do not shorten or lengthen the 0.062 mm (0.0025 in) ID blue PEEK (polyether ether ketone) tubing (capillary tubing) used for Dionex IC Cube connections, and do not substitute different tubing. This tubing is precision cut at the factory, using a specialized cutter. Precision cut tubing is included in the Dionex IC Cube Tubing Kit (P/N 072186).
- Do not cut tubing on which IC PEEK Viper fittings are installed.

## 2 • Unpacking Instructions

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### 2.1 Unpacking Guidelines

This section provides instructions for unpacking the Dionex ICS-6000, an autosampler (if included), a detector module (if included), the computer, a tablet (if included), and the consumable devices shipped with the system.

- Check the shipping containers for any external signs of damage. If a container shows signs of damage, contact Thermo Fisher Scientific immediately.
- Unpack modules in the following order (this order reflects the left-to-right location of modules in the installed system):

Dionex AS-AP Autosampler

Dionex ICS-6000 Detector/Chromatography Module (DC)

Dionex ICS-6000 Eluent Generator (EG)

Dionex ICS-6000 Dual Pump (DP) or Dionex ICS-6000 Single Pump (SP)

- Unpack these system components:
  - Dionex ICS-6000 IC Cube (IC Cube) or Dionex ICS-6000 Automation Manager (AM)
  - Dionex ICS-6000 Conductivity Detector (CD)
  - Dionex ICS-6000 Electrochemical Detector (ED)
  - Dionex ICS-6000 Eluent Organizer (EO)
- Unpack the computer (for Chromeleon)
- Unpack the tablet (for the ICS-6000 App)
- Unpack the consumable devices
- After unpacking, save the shipping container (and all packing material) for each product. These items will be needed if the product is ever shipped, or is moved to a new location.

## 2.2 Unpacking the Dionex AS-AP



Two or more persons must lift the Dionex AS-AP, which weighs more than 23 kg (50 lb). Lift the Dionex AS-AP only from each side of the cabinet bottom. Lifting from the front door will damage the door hinges.

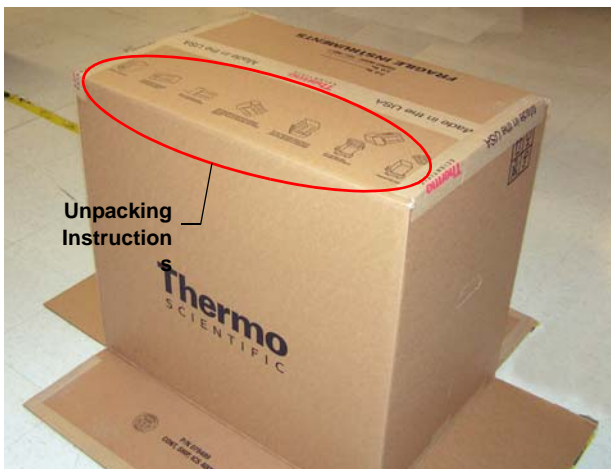


Au moins deux personnes peuvent soulever l'Dionex AS-AP, qui pèse plus de 23 kg (50 lb). Ne soulevez l'Dionex AS-AP que par chaque côté du fond de l'armoire. Son soulèvement par la porte du panneau avant endommagera les charnières de la porte.



Der Dionex AS-AP wiegt über 23 kg. Daher sollte das Gerät nur von zwei oder mehr Personen angehoben werden. Greifen Sie dazu an beiden Seiten unter das Gerät. Heben Sie den Autosampller nicht an der Vordertür an, da dadurch die Türangeln beschädigt werden könnten.

1. Follow the instructions printed on the shipping container to turn the container on its side, open the bottom flaps, and turn it right-side up again (see [Figure 2-1](#)).



**Figure 2-1.** Shipping Container with Bottom Flaps Opened

2. Lift up the shipping container to remove it (see [Figure 2-2](#)), and then set the container aside. Remove the top foam packing insert.



**Figure 2-2.** Lift Up the Shipping Container

3. Remove the Ship Kit box from the top of the module (see [Figure 2-3](#)).



**Figure 2-3.** Ship Kit on Top of the Module

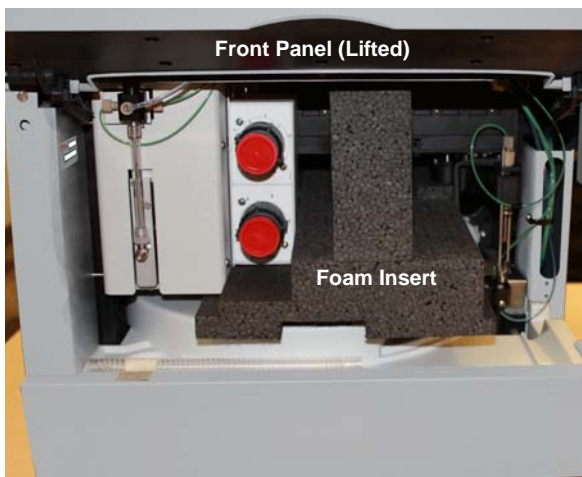
4. Remove the foam packing cage (see [Figure 2-4](#)).
5. With two or more persons, grasp each side of the Dionex AS-AP cabinet bottom, lift up the module, and then place it on the bench.
6. Remove the polyethylene bag the module is shipped in.
7. Check that the main power switch on the rear panel is turned off.



**Figure 2-4.** Module with Packing Cage Removed

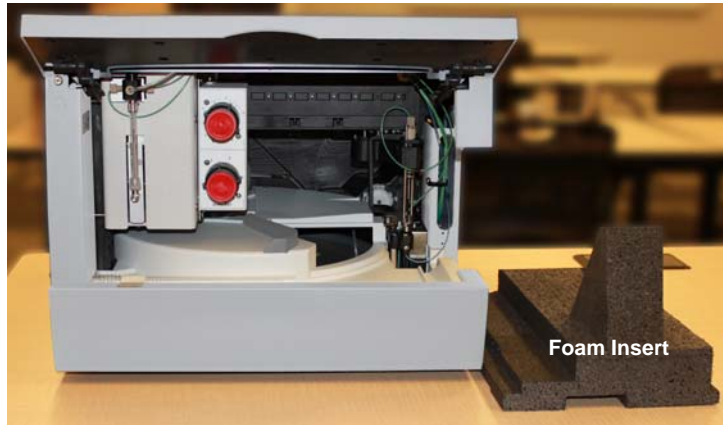
8. Lift up the Dionex AS-AP front panel (see [Figure 2-5](#)) and pull out the foam insert that secures the needle arm and carousel cover during shipment (see [Figure 2-6](#)).

**NOTE** Save the foam insert. It is required to protect the needle when the autosampler is moved or shipped.



**Figure 2-5.** Dionex AS-AP with Foam Insert for Protecting the Needle Arm and Carousel (Dionex AS-AP with Optional Valves Shown)





**Figure 2-6.** Dionex AS-AP with Foam Insert Removed

9. Unpack the Dionex AS-AP Ship Kit (P/N 074929) (see [Figure 2-7](#) and [Figure 2-8](#)).
10. Place the items in a convenient location and check them against the packing list (see [Figure 2-9](#)). If there are any discrepancies, contact Technical Support for Dionex products immediately.



**Figure 2-7.** Ship Kit with Packing List



**Figure 2-8.** Ship Kit Items Removed from Box



**Figure 2-9.** Ship Kit Items Unpacked

**IMPORTANT**

Save the shipping container and all other shipping materials for later use. Should it be necessary to return the Dionex AS-AP during the warranty period, Thermo Fisher Scientific recommends repacking the autosampler in the original shipping container.

## 2.3 Unpacking the Dionex ICS-6000 Modules

This section contains step-by-step guidelines for unpacking the Dionex ICS-6000 modules. Although the Dionex ICS-6000 Eluent Generator is pictured here, the procedure is the same for the other modules. Unpack modules in the order specified in [Section 2.1](#).



Two or more persons must lift the Dionex ICS-6000 Dual Pump (DP), Dionex ICS-6000 Single Pump (SP), Dionex ICS-6000 Detector/Chromatography Module (DC), or Dionex ICS-6000 Eluent Generator (EG). Each module weighs more than 18 kg (40 lb).



Au moins deux personnes peuvent soulever l'Dionex ICS-6000 Dual Pump (DP), Dionex ICS-6000 Single Pump (SP), Dionex ICS-6000 Detector/Chromatography Module (DC), ou Dionex ICS-6000 Eluent Generator (EG). Chaque module pèse plus de 18 kg (40 lb).



Die folgenden Geräte sollten von zwei oder mehr Personen angehoben werden: Dionex ICS-6000 Dual Pump (DP), Dionex ICS-6000 Single Pump (SP), Dionex ICS-6000 Detector/Chromatography Module (DC), und Dionex ICS-6000 Eluent Generator (EG). Jedes dieser Geräte wiegt mehr als 18 kg.

1. Open the shipping container from the top and remove the foam spacer (see [Figure 2-10](#)).



**Figure 2-10.** Fully-packed Module with Foam Spacer on Top

2. Remove the Ship Kit from the shipping container (see [Figure 2-11](#)).
3. Using the handholds in the cardboard cradle, remove the module from the shipping container.



**Figure 2-11.** Ship Kit Packed with Module (EG Module Shown)

4. Place the module on the bench (see [Figure 2-12](#)).
5. Raise the front of the module about 5 cm (2 in) and remove the cardboard cradle.



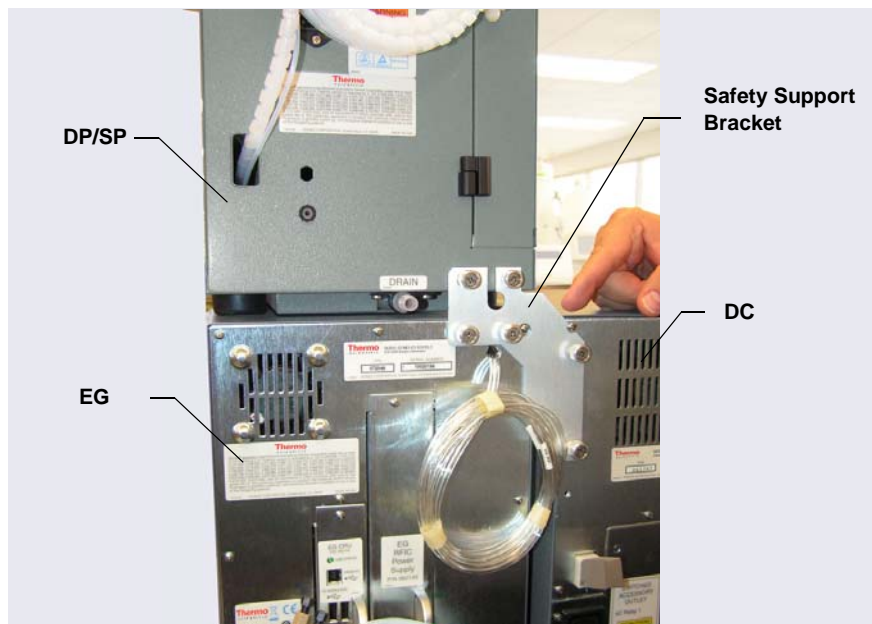
**Figure 2-12.** Module Sitting on Cardboard Cradle (EG Module Shown)

6. Remove the polyethylene bag the module is shipped in.  
**Remember to save all shipping containers and packing material.**
7. Check that the main power switch on the rear panel is turned off.

## 2.4 Installing the Safety Support Bracket

The safety support bracket performs the following functions:

- Stabilizes the system and prevents modules from tipping over
  - Creates enough space between the detector compartment (DC) and the adjacent module to ensure proper ventilation
1. Locate the safety support bracket. Two versions of the bracket are available:
    - For a standard DC, use P/N AAA-062225, provided in the standard DC Ship Kit (P/N 072011).
    - For a low-temperature DC, use P/N 22171-10001, provided in the low-temperature DC Ship Kit (P/N 22171-62000).
  2. Hold the safety support bracket firmly against the rear panels of the adjacent modules (see [Figure 2-13](#)).
  3. Tighten the captive thumbscrews.

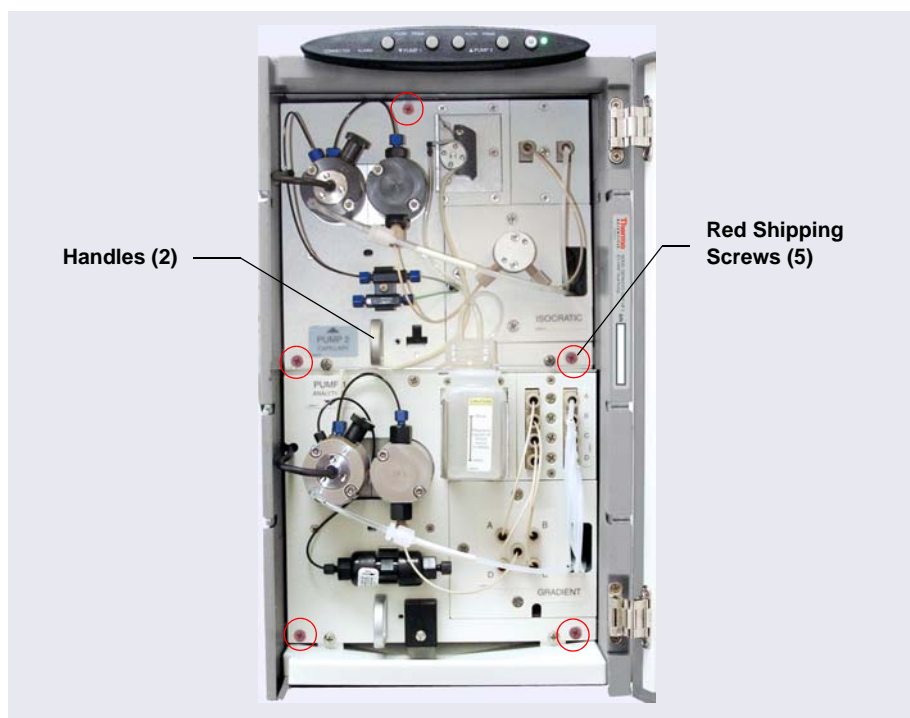


**Figure 2-13.** Safety Support Bracket Installed on Module Rear Panels (P/N 062225 for a Standard DC Shown)

## **2.5 Removing the Pump Shipping Screws (Optional)**

For easier access to pump components during initial installation or when performing service procedures, remove the five red shipping screws on the pump component panel. The component panel can then be pulled forward to the front of the pump compartment, using one of the handles.

**NOTE** The upper and lower component panels slide forward together.



**Figure 2-14.** Removing Pump Shipping Screws

## 2.6 Unpacking the Computer

**IMPORTANT**

Chromeleon 7.2.7 (or later) is required for support of the Dionex ICS-6000. Chromeleon runs under the Microsoft® Windows® 10, Windows 8.1, or Windows 7 operating system. When you purchase Chromeleon and a PC from Thermo Fisher Scientific, the software is installed at the factory.

If you purchased a PC outside of North America, you are responsible for ensuring that it meets current system specifications. Refer to <http://www.thermoscientific.com/dionex>.

Remove the computer and all documentation from the computer box and place them on a workbench.

## 2.7 Installing the Computer

Configuration options include:

- Desktop or laptop PC with the Thermo Scientific™ Dionex™ Chromeleon™ 7 Chromatography Data System
  - Keyboard and mouse (wired or wireless)
1. Follow the instructions in the computer installation guide to hook up the computer components.
  2. Follow the instructions in the user manual for the computer monitor to hook up the monitor.

**NOTE** Plug in the receiver for the wireless keyboard and/or mouse into a USB port on the instrument PC.

## 2.8 Unpacking the Tablet

1. Remove the tablet and all documentation from the tablet box and place them on the workbench.
2. Follow the instructions in the tablet installation guide to charge the device.

## **2.9 Unpacking Consumable Devices**

Remove the consumable devices (for example, columns, suppressor, Dionex EGC, Dionex CR-TC 600, and Dionex CRD) from their shipping boxes. Save the Dionex EGC shipping container; it may be required for storage or disposal of consumable devices.



The Dionex EGC contains one of the following: a corrosive base (KOH, LiOH, or NaOH), a corrosive acid (MSA), or a concentrated  $K_2CO_3$  solution. Wear protective eyewear and gloves when handling the cartridge.



La cartouche de Dionex EGC contient un de ce qui suit: une base corrosive (KOH, LiOH, ou NaOH), un acide corrosif (MSA), ou une solution concentrée de  $K_2CO_3$ . Porter des lunettes et des gants protectives en manipulant la cartouche.



Die Dionex EGC-Kartusche enthält eine korrosive Base (KOH, LiOH oder NaOH), eine korrosive Säure (MSA) oder eine konzentrierte  $K_2CO_3$ -Lösung. Tragen Sie daher beim Umgang mit der Kartusche eine Schutzbrille und Handschuhe.



## 3 • System Setup

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This section provides instructions for setting up the system hardware, Chromeleon software, and the tablet. After completing the setup steps, go on to the plumbing instructions in [Chapter 4](#).

### Notes on RFID

RFID tag location and orientation are critical to ensuring reliable communication. Before performing an RFID read or write operation, check each installed consumable to verify that the following criteria are met:

- Columns should be installed in column clips. RFID tags should not touch the clips.
- RFID tags should be free in the air (for example, a tag must not be wrapped around a separator or guard column).
- RFID tags should be spaced far enough apart that the tags do not overlap.
- RFID tags should not touch bare metal.
- RFID tags should not be in direct contact with the floor, ceiling, sides, or front door of the DC.
- RFID tags should be parallel to the floor of the DC.
- RFID tags can extend toward the front or rear of the DC.

**NOTE** For help with troubleshooting issues related to the location and orientation of RFID tags, refer to Chapter 9 of the Dionex ICS-6000 operator's manual.

### Notes on USB Connections

Always install Chromeleon *before* connecting the USB (Universal Serial Bus) cables and turning on the power to the modules and the PC. This ensures that the USB driver for the modules is automatically loaded and the Windows operating system can detect the new modules when their power is turned on.

## 3.1 Connecting the Power Cords

1. Locate the power cords for the Dionex ICS-6000 system in the box that contains accessory parts.
2. Verify that the main power switch on the rear panel of each module is turned off. (The power switch may be turned on accidentally when the module is unpacked.)
3. Connect a power cord (IEC 320 C13) (ordered separately) from the main power receptacle on the rear panel of each module to a grounded power source. No adjustment is needed to select the line voltage (the power supply is auto-sensing).



**SHOCK HAZARD**—To avoid electrical shock, use a grounded receptacle. Do not operate the Dionex ICS-6000 modules, or connect them to an AC power source, without an earthed ground connection.



The power supply cord is used as the main disconnect device. Make sure the socket-outlet is located near the Dionex ICS-6000 modules and is easily accessible.



Operation at AC input levels outside of the specified operating voltage range may damage the Dionex ICS-6000 modules.

**DANGER D'ÉLECTROCUTION**—Pour éviter toute électrocution, il faut utiliser une prise de courant avec prise de terre. Ne l'utilisez pas et ne le branchez pas au secteur C.A. sans utiliser de branchement mis à la terre.



Le cordon d'alimentation principal est utilisé comme dispositif principal de débranchement. Veillez à ce que la prise de base soit située/installée près du module et facilement accessible.



**STROMSCHLAGGEFAHR**—Zur Vermeidung von elektrischen Schlägen ist eine geerdete Steckdose zu verwenden. Das Gerät darf nicht ohne Erdung betrieben bzw. an Wechselstrom angeschlossen werden.



Das Netzkabel ist das wichtigste Mittel zur Stromunterbrechung. Stellen Sie sicher, daß sich die Steckdose nahe am Gerät befindet und leicht zugänglich ist.

## 3.2 Plugging in the Dionex EGC and Dionex CR-TC 600 (RFIC-EG System Only)

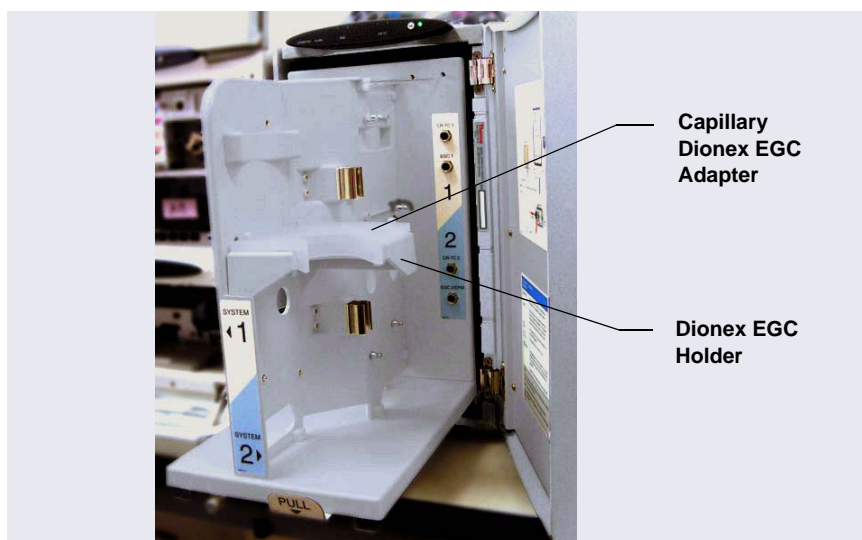
**NOTE** If your system does not include an eluent generator (EG), you can skip this section and go directly to one of the following sections:

- To set up the DC for capillary applications, go to [Section 3.3](#).
- To set up the DC for analytical applications, go to [Section 3.4](#).

1. Open the EG door.
2. Pull the tray forward until it reaches the stop.

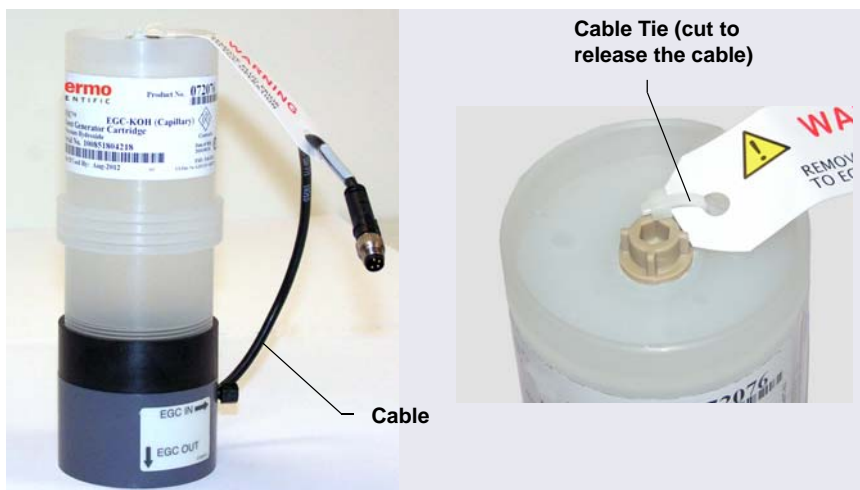
Capillary  
IC

3. If you are installing a capillary system, locate the capillary IC Dionex EGC adapter (P/N 072133) in the EG Ship Kit (P/N 072047). Install the adapter on top of the Dionex EGC holder (see [Figure 3-1](#)).



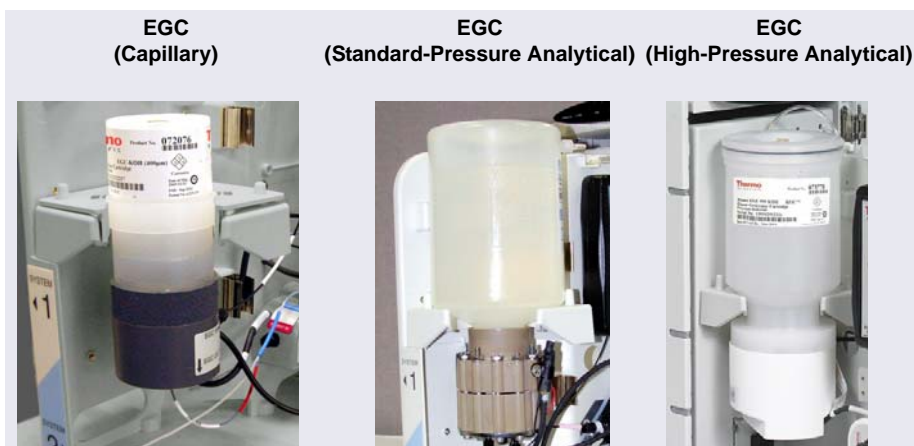
**Figure 3-1.** Capillary IC Dionex EGC Adapter Installed

- The Dionex EGC cable is attached to the cartridge with a cable tie (see [Figure 3-2](#)). Cut the cable tie to release the cable.



**Figure 3-2.** Dionex EGC Cable Attached to Cartridge (Capillary Version Shown)

- Orient the Dionex EGC with the electrolyte reservoir on top and slide it down into the holder (see [Figure 3-3](#)). Install the Dionex EGC on the left side for system 1 and the right side for system 2.



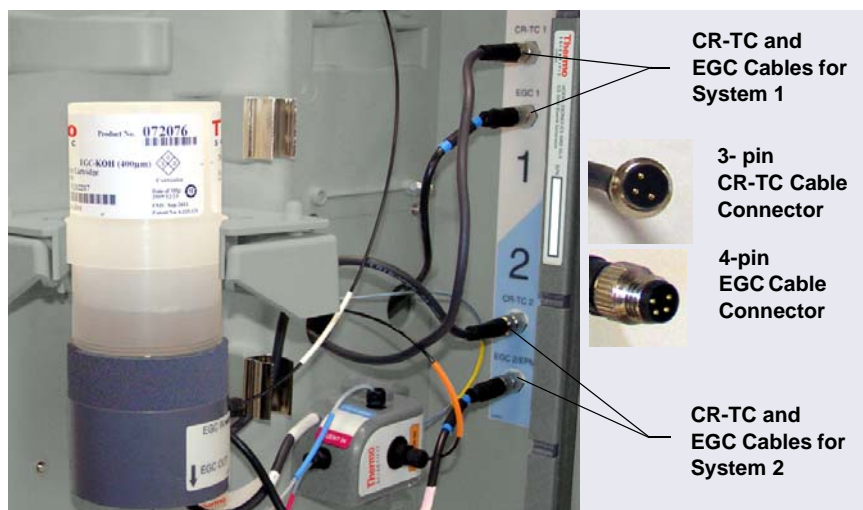
**Figure 3-3.** Dionex EGC Installed in Holder

6. To install system 1:
  - a. Orient the Dionex CR-TC 600 with the **ELUENT IN** port (yellow label) toward the front of the EG and push the Dionex CR-TC 600 firmly onto the ball studs on the left side of the EG.
  - b. Route the Dionex EGC and Dionex CR-TC 600 electrical cables to the right side of the EG tray.

7. To install system 2:

Orient the Dionex CR-TC 600 with the **ELUENT IN** port (yellow label) toward the back of the EG and push the Dionex CR-TC 600 firmly onto the ball studs on the right side of the EG.

8. Connect the Dionex CR-TC 600 and Dionex EGC electrical cables:
  - a. Align the three pins inside the Dionex CR-TC 600 cable connector with the holes in the **CR-TC 1** (or **CR-TC 2**) bulkhead connector. Push the cable connector firmly onto the connector (see [Figure 3-4](#)). Twist the locking ring on the cable connector fingertight to secure it.
  - b. Align the four pins inside the Dionex EGC cable connector with the holes in the **EGC 1** (or **EGC 2**) bulkhead connector. Push the cable connector firmly onto the bulkhead connector (see [Figure 3-4](#)). Twist the ring on the cable connector fingertight to secure it.



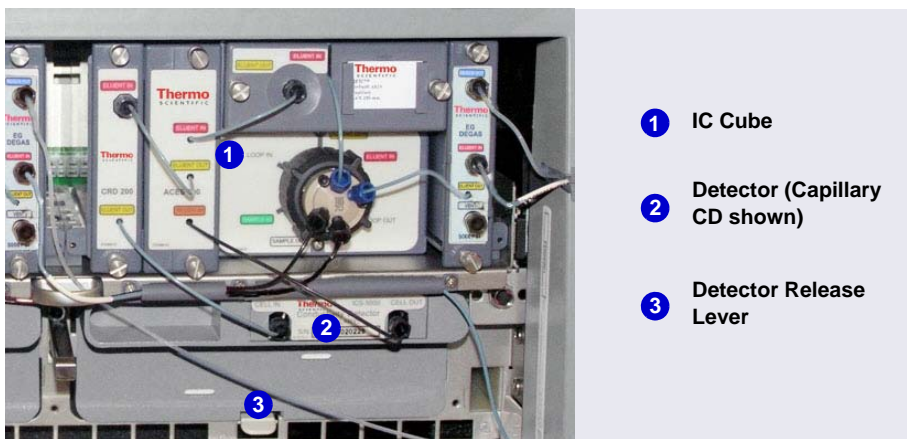
**Figure 3-4.** Dionex EGC and Dionex CR-TC 600 Electrical Cables Installed (Capillary Dionex EGC Version Shown)

9. Go on to one of the following sections:
- To set up the DC for capillary applications, go to [Section 3.3](#).
  - To set up the DC for analytical applications, go to [Section 3.4](#).

Capillary  
IC

### 3.3 Setting Up the DC for Capillary IC Applications

[Figure 3-5](#) is an example of the upper compartment of a DC after the components for a capillary IC system have been installed and the plumbing is completed.

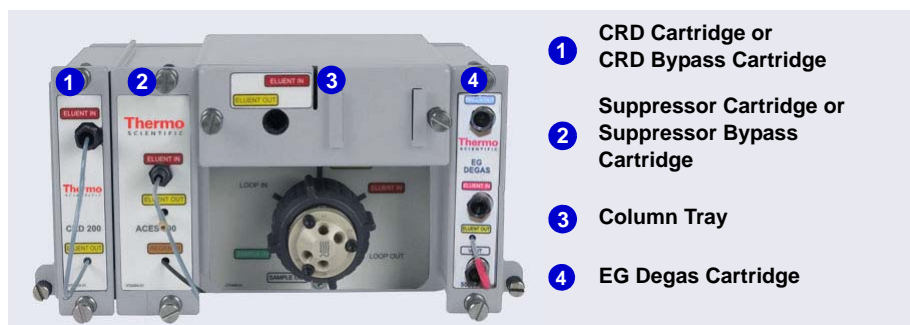


**Figure 3-5.** Example DC Upper Compartment with Capillary IC Components Installed for System #2

**NOTE** The 0.062 mm (0.0025 in) ID blue PEEK tubing (capillary tubing) used for IC Cube connections is cut at the factory using a specialized precision cutter. Do not cut this tubing or substitute different tubing.

### 3.3.1 Installing the IC Cube Component Cartridges

The Dionex IC Cube houses three removable component cartridges and one column tray for running capillary IC applications. [Figure 3-6](#) shows an IC Cube after these items have been installed.



**Figure 3-6.** Example Dionex IC Cube with Cartridges and Column Tray Installed

The required cartridges depend on the detection type (see [Table 3-1](#)).

Detection Type	Required Cartridges
Conductivity	<ul style="list-style-type: none"> <li>EG degas (typically installed at the factory)</li> <li>CES</li> <li>CRD (an option for anion applications)</li> <li>CRD bypass (required if a CRD cartridge is not installed)</li> <li>Column tray</li> </ul>
Electrochemical <sup>a</sup>	<ul style="list-style-type: none"> <li>EG degas (typically installed at the factory)</li> <li>Suppressor bypass</li> <li>CRD bypass</li> <li>Column tray</li> </ul>

**Table 3-1.** Dionex IC Cube Cartridge Requirements

a. If you are setting up the system for electrochemical detection and the EG degas cartridge is already installed, no additional cartridges are required. Leave the suppressor bypass and CRD bypass cartridges in place and go on to [“Installing the CD or ED in the DC”](#) on page 42.

### 3.3.2 Installing the EG Degas, CRD, or CES Cartridge

1. To install an EG degas cartridge:
  - a. Remove the cap from the regenerant port on the rear of the cartridge. Slide the cartridge into the right-most slot of the Dionex IC Cube (see [Figure 3-6](#)). Push the cartridge firmly into the slot and tighten the thumbscrews fingertight only.
  - b. Connect the green PEEK vent line (P/N 088271) supplied with the cartridge to the **VENT** port on the cartridge. Route the vent line through the tubing chase to the rear panel.
2. To install a CRD or CES cartridge:
  - a. Loosen the thumbscrews on the CRD or CES bypass cartridge and pull the bypass cartridge out of the Dionex IC Cube. Save the bypass cartridge.
  - b. Remove the caps from the regenerant ports on the rear of the CRD or CES cartridge. Slide the cartridge into its slot in the Dionex IC Cube (see [Figure 3-6](#)). Push the cartridge firmly into the slot and tighten the thumbscrews fingertight.

**NOTE** Install the saved regenerant port caps onto the CRD and CES cartridge ports. Save the bypass cartridges. The bypass cartridges must be reinstalled if the Dionex IC Cube is used for an application that does not require a CRD or suppressor.



### 3.3.3 Installing a Capillary CD or ED in the DC

**NOTE** Before installing an ED (P/N 072042), follow the instructions in [Section B.1](#) to install the ED amperometry cell.

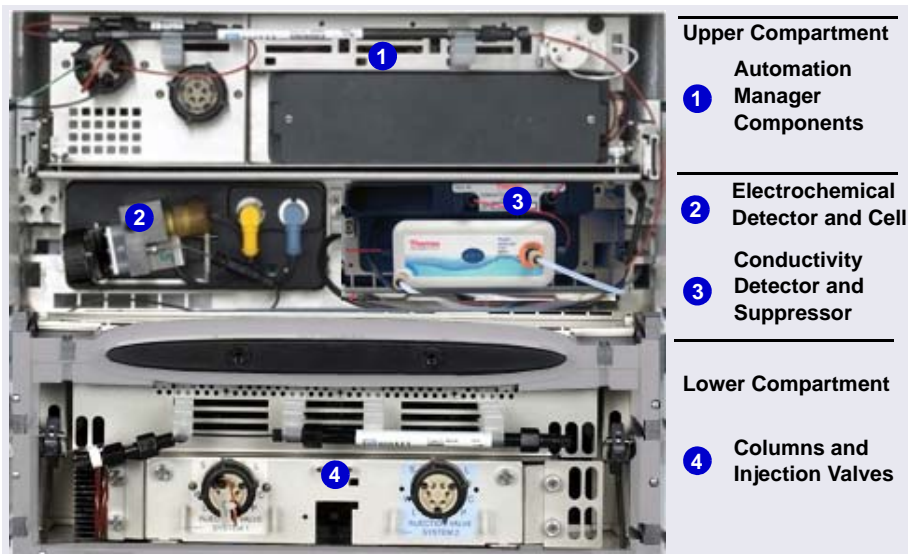
1. Verify that the main power switch on the rear panel of the DC is off.
2. Insert the capillary CD (P/N 072041) or ED (P/N 072042) into the upper compartment of the DC (see [Figure 3-5](#)).
  - For a single-system configuration, it does not matter on which side of the compartment the detector is installed. Typically, the left side is used.
  - For a dual-system configuration, install the detector for system #1 on the left side and the detector for system #2 on the right side.
3. Push firmly to plug the electrical plug on the back of the detector into the receptacle on the rear wall of the DC compartment. You should hear a click when the detector is fully seated.
4. For an ED, connect the cell cable and the reference electrode cable.

#### **If it is necessary to remove the detector from the DC:**

1. Press the release lever located below the detector (see [Figure 3-5](#)).
2. Grasp the top of the detector and pull outward to remove the detector from the compartment. **Do not pull from the CELL IN and CELL OUT fittings.**

## 3.4 Setting Up the DC for Analytical IC Applications

[Figure 3-7](#) is an example of the interior of the DC after the components for two analytical IC systems have been installed.



**Figure 3-7.** Example DC Interior View: Dual-Analytical System

### 3.4.1 Installing the CD or ED in the DC

**NOTE** Before installing an ED (P/N 072042), follow the instructions in [Section B.1](#) to install the ED amperometry cell.

1. Verify that the main power switch on the rear panel of the DC is off.
2. Pull out the DC upper compartment tray until it stops.
3. Install the analytical CD (P/N 079829) and/or the ED in the bottom half of the DC upper compartment (see [Figure 3-7](#)).
  - For a single-system configuration, it does not matter on which side of the compartment the detector is installed.
  - For a dual-system configuration, install each detector above the corresponding injection valve.

4. Insert the detector into the compartment and push firmly to plug the electrical plug on the back of the detector into the receptacle on the rear wall of the DC compartment.

You should hear a click when the detector is fully seated.

5. For an ED, connect the cell cable and the reference electrode cable.

**If it is necessary to remove the detector from the DC:**

1. Press the release lever located below the detector.
2. Grasp the top of the detector and pull outward to remove the detector from the compartment. **Do not pull from the CELL IN and CELL OUT fittings.**

Analytical  
IC

### 3.4.2 Installing the Suppressor in the DC

1. Note the two slots on the CD (below the cell) and the two mounting tabs on the rear of the suppressor.
2. Press the suppressor tabs into the slots and slide the suppressor to the right to secure it onto the detector.
3. Pull out slightly on the center of the suppressor to verify that it is securely fastened.
4. Plug the suppressor cable into the appropriate connector next to the CD (see [Figure 3-8](#)).



**Figure 3-8.** *Installing the Suppressor (Right-Side Installation)*

**If it is necessary to remove the suppressor from the detector:**

Unplug the suppressor and then slide it to the left a few millimeters (to detach it from the detector). Then, pull the suppressor toward you.

If you are installing an autosampler, go on to [Section 3.6](#). If not, go directly to [Section 3.7](#) to connect Dionex ICS-6000 modules to the computer.

## **3.5 Installing a Consumable Device Monitor**

When the DC Consumable Device Monitor is installed, the Dionex ICS-6000 system can determine operational conditions for wired and RFID-enabled consumables, as well as track and store usage and Wellness data. Recorded data is displayed in the Consumables Inventory window in Chromeleon.

The Consumable Device Monitor Kit (P/N 22181-60031) contains all the parts needed to install the monitor.

**NOTE** Do not remove the Consumable Device Monitor from its package until instructed to do so.

**NOTE** The Consumable Device Monitor and the I/O option board (P/N 062201) are installed in the same opening in the DC rear panel. Therefore, only one of these options can be installed. For installation instructions for the I/O option board, refer to Chapter 10 of the Dionex ICS-6000 operator's manual.

1. Verify that the main power switch on the rear panel of the DC is off.
2. If necessary, disconnect the main power cord from both its source and from the DC rear panel.



**HIGH VOLTAGE**—Disconnect the main power cord from its source and also from the rear panel of the DC.



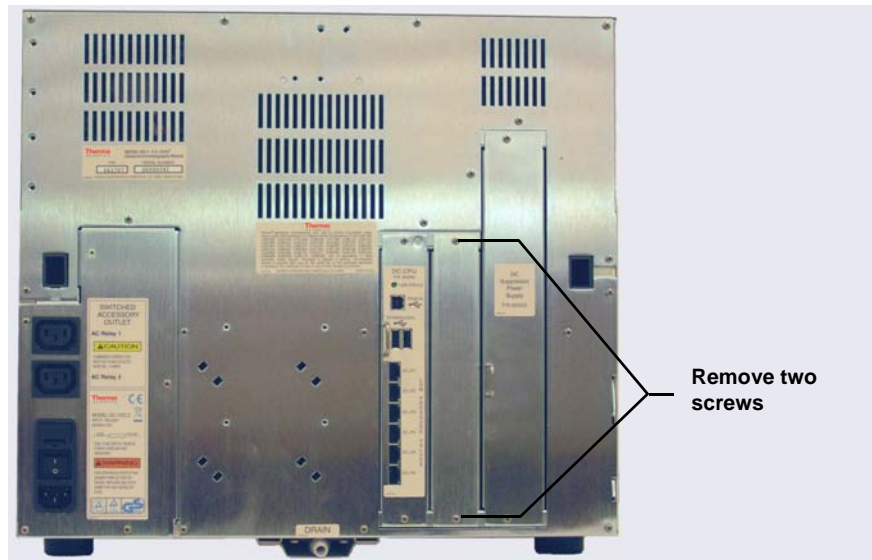
**HAUTE TENSION**—Débranchez le cordon d'alimentation principal de sa source et du panneau arrière du DC.



**HOCHSPANNUNG**—Ziehen Sie das Netzkabel aus der Steckdose und der Netzbuchse auf der Rückseite des DC.

3. Remove the two screws that attach the cover plate to the DC slot (see [Figure 3-9](#)). Save the screws.

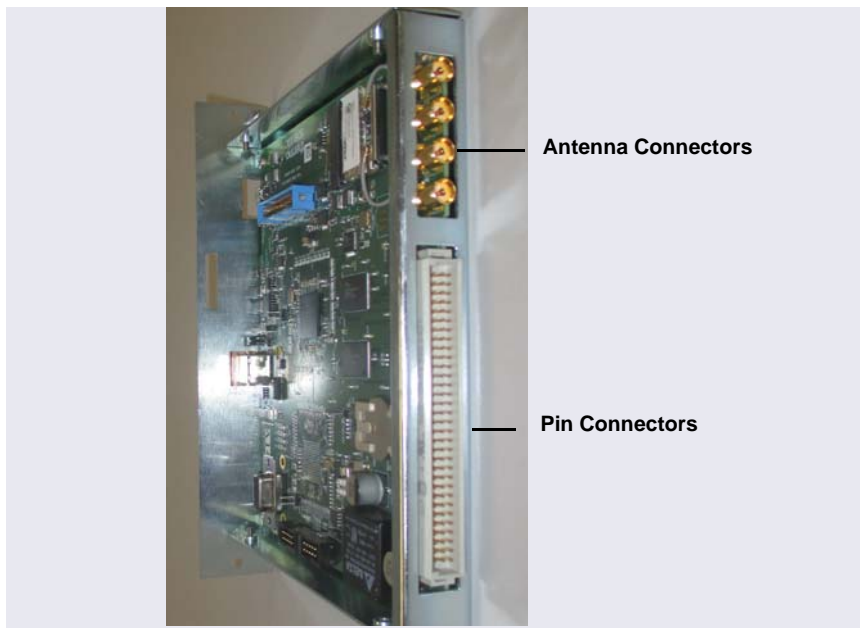
4. Installation of the Consumable Device Monitor involves handling static-sensitive devices. Before proceeding, put on a wrist (grounding) strap and be sure both feet are grounded.
5. Remove the existing cover plate or board and set it aside.
6. Touch a metal surface to discharge any static electricity.
7. Remove the Consumable Device Monitor from its package, being careful not to touch any of the connectors on the rear.



**Figure 3-9.** DC Rear Panel: Removing the Cover Plate

8. While still being careful not to touch the connectors on the rear of the Consumable Device Monitor, orient the Consumable Device Monitor so

that the four antenna connectors are on top and the pin connectors are below (see [Figure 3-10](#)).



**Figure 3-10.** Consumable Device Monitor Connectors

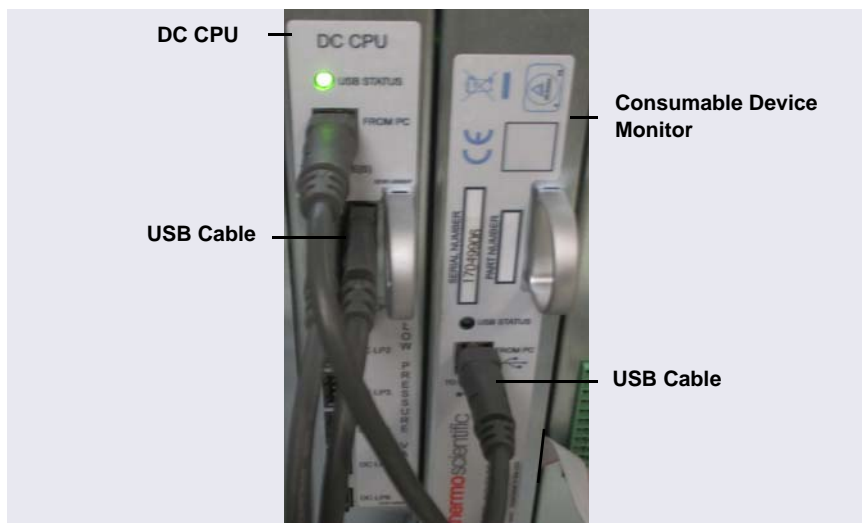
9. Align the rails (or wings) on the top and bottom of the Consumable Device Monitor with the card guides in the rear of the DC, and then *firmly* push the Consumable Device Monitor into place.

**IMPORTANT**

**Failure to align the rails on the Consumable Device Monitor with the card guides may bend the pin connectors.**

10. Use the two screws removed previously ([see Step 3](#)) to secure the Consumable Device Monitor.
11. Locate the USB port on the Consumable Device Monitor and the two USB ports on the DC CPU board (see [Figure 3-11](#)).
12. Connect the USB cable (P/N 00302-99-00132) provided in the Consumable Device Monitor Kit to the Consumable Device Monitor.

Connect the other end of the cable to one of the USB ports on the DC CPU board.



**Figure 3-11.** Consumable Device Monitor Connected to CPU Board

13. If necessary, reconnect the main power cord to the outlet and the DC rear panel.

**NOTE** Before beginning operation, add the Consumable Device Monitor to the Dionex ICS-6000 instrument in the Chromeleon Instrument Configuration Manager.

## 3.6 Connecting the Autosampler

This section provides brief instructions for connecting an autosampler to a single injection valve in a DC. For detailed instructions, refer to the operator's manual for the autosampler.

### 3.6.1 Connecting the Autosampler Sample Transfer Line

1. Place the autosampler to the left of the DC on the workbench. A Dionex AS-DV can be placed on top of the DC, if preferred.
2. Route the sample transfer line from the autosampler to the injection valve in the DC.
3. Connect the line to port 5 on the injection valve.

**NOTE** In a capillary system, port 5 is labeled **SAMPLE IN**. In an analytical system, port 5 is labeled **S**.

### 3.6.2 Connecting the Injection Valve Waste Line

#### For a Dionex AS-DV

1. Cut a length of 0.25 mm (0.010 in) ID black PEEK tubing (analytical, P/N 042690; capillary, P/N 082647) long enough to reach from the injection valve to the waste container.
2. Connect one end of the tubing to port 6 on the injection valve.

**NOTE** In a capillary system, port 6 is labeled **SAMPLE OUT**. In an analytical system, port 6 is labeled **W**.

3. Route the other end of the tubing to waste.

#### For a Dionex AS-AP

Capillary  
IC

1. For a capillary system:
  - a. Locate the following items in the Dionex AS-AP Ship Kit (P/N 074929):
    - 0.75 mm (0.030 in) ID green PEEK tubing (P/N 044777)



- 0.25 mm (0.010 in) ID black PEEK tubing (P/N 042690, for analytical; P/N 082647, for capillary)
  - 10-32 fitting bolt (P/N 22000-98001) and 10-32 double-cone ferrule (P/N 043276)
- b. Cut a 61 cm (24 in) length of black tubing. If this is not long enough to reach from the injection valve to the Dionex AS-AP waste port, add an additional length of green PEEK tubing.

Analytical  
IC

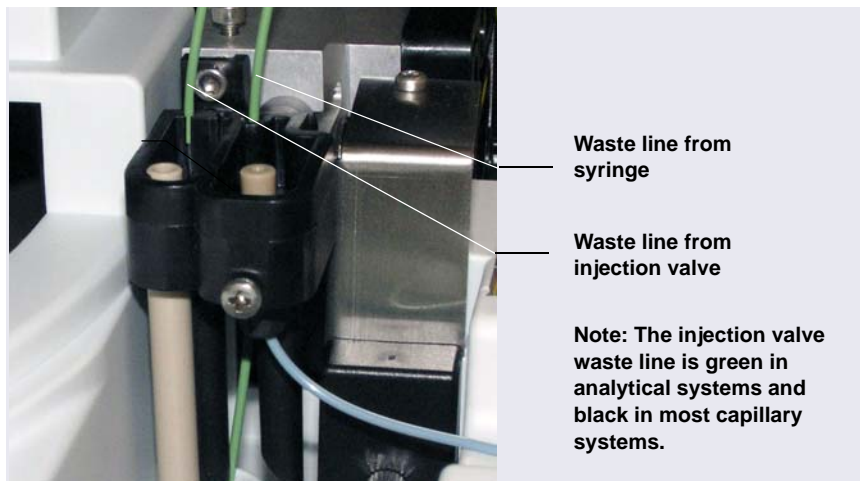
2. For an analytical system:
- a. Locate the system tubing package supplied with the injection valve. One tubing package with precut and labeled tubing (either microbore or standard bore) is provided for each valve installed in the DC.
- b. In the system tubing assembly bag, locate the 0.75 mm (0.030 in) ID green PEEK tubing assembly, labeled **TO INJ VALVE-W**.

**NOTE** To improve injection loading precision in analytical systems, add a 51 cm (20 in) piece of black PEEK tubing to the green waste line.

3. Connect one end of the waste line to port 6 on the injection valve. For a capillary system with a two-piece waste line, connect the black tubing to the injection valve.

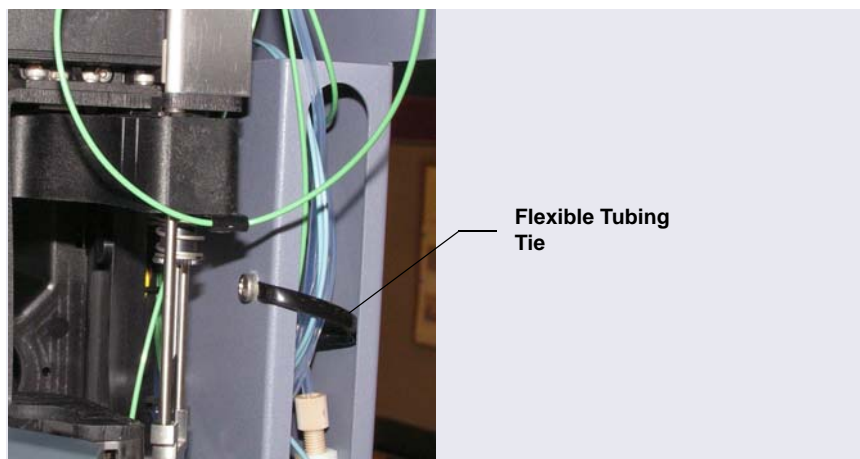
**NOTE** In a capillary system, port 6 is labeled **SAMPLE IN**. In an analytical system, port 6 is labeled **W**.

4. Route the line to the Dionex AS-AP waste port and insert the line into one of the round openings in the waste port (see [Figure 3-12](#)).



**Figure 3-12.** Injection Valve Waste Line Installed in Dionex AS-AP Waste Port

5. To ensure that the waste lines do not interfere with needle arm movement in the Dionex AS-AP, secure the excess tubing with the flexible tubing tie in the slotted compartment next to the needle (see [Figure 3-13](#)).

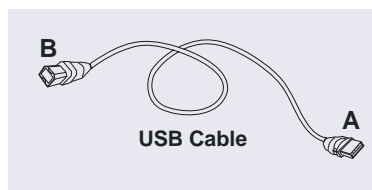


**Figure 3-13.** Flexible Tubing Tie in Dionex AS-AP Slotted Compartment

## 3.7 Connecting Modules to the Computer

### 3.7.1 USB Cables

All USB connections require standard A-to-B cables. The “A” connector is the flat, rectangular end of the cable; the “B” connector is the smaller, hexagonal end (see [Figure 3-14](#)).



*Figure 3-14. USB Cable*

**IMPORTANT**

The USB standard limits the USB cable length to 5 m (5.5 yds). Each USB module can be separated from the PC by no more than five hubs. Thus, each USB module can be located no more than 30 m (32 yds) from the PC.

These USB cables are shipped with Dionex ICS-6000 modules:

- The DC Ship Kit (standard DC, P/N 072011; low-temperature DC, P/N 22171-62000) includes a 1.8 m (6 ft) USB cable (P/N 960777).
- The DP, EG, and SP Ship Kits include a 1 m (3 ft) USB cable (P/N 063246).

### 3.7.2 USB Compatibility

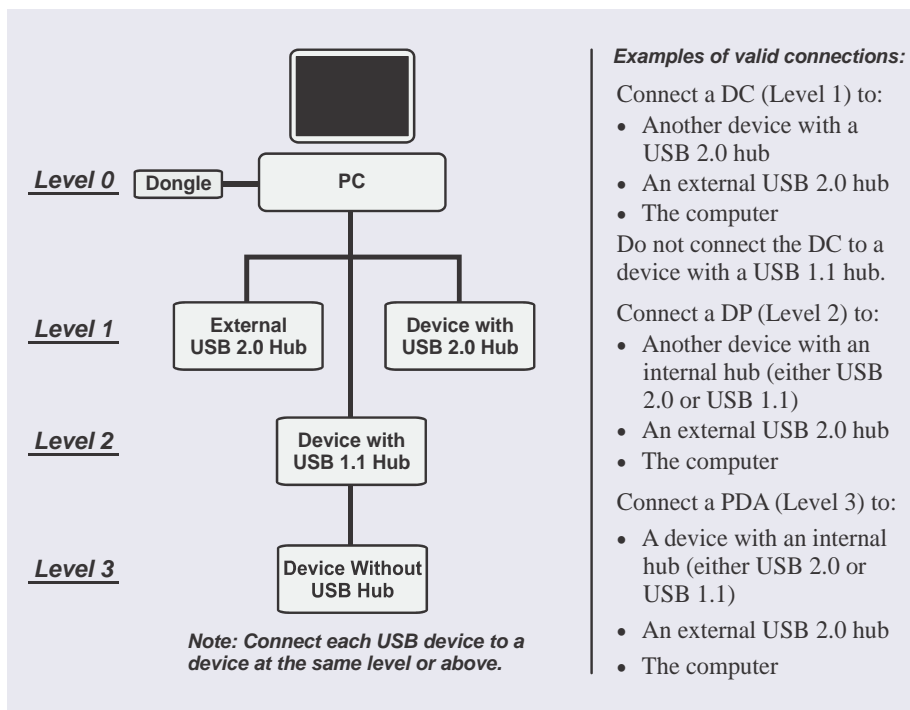
All Dionex ICS-6000 modules, as well as other Dionex modules connected to them (for example, an autosampler), are equipped with USB receptacles. Your system may include a combination of the following:

- Dionex modules with an internal USB 2.0 hub (powered)
- Dionex modules with an internal USB 1.1 hub (unpowered)
- Dionex modules with no internal USB hub
- An external USB 2.0 hub

To avoid problems caused by incompatibility between USB 2.0 and USB 1.1, identify the USB version of each system component to be installed (see [Table 3-2](#)) and observe the rules for connections shown in [Figure 3-15](#).

Type of Hub	Module	Notes
USB 2.0 internal hub (powered)	Dionex ICS-6000 DC Dionex ICS-6000 EG	When you turn off the power using the <b>POWER</b> button on the front of the module (and the main power cord is connected and the primary power switch on the rear panel of the module is still on), the USB 2.0 hub remains powered on. Thus, all modules connected downstream will remain connected to Chromeleon.
USB 1.1 internal hub (unpowered)	Dionex AS-AP Dionex ICS-6000 DP Dionex ICS-6000 SP	When you turn off the power using the <b>POWER</b> button on the front of the module, the USB 1.1 hub is powered off and all modules downstream are disconnected from Chromeleon.
No internal hub	Dionex PDA Dionex VWD	

**Table 3-2.** USB Versions of Dionex Modules



**Figure 3-15.** Overview of Dionex ICS-6000 System USB Connections

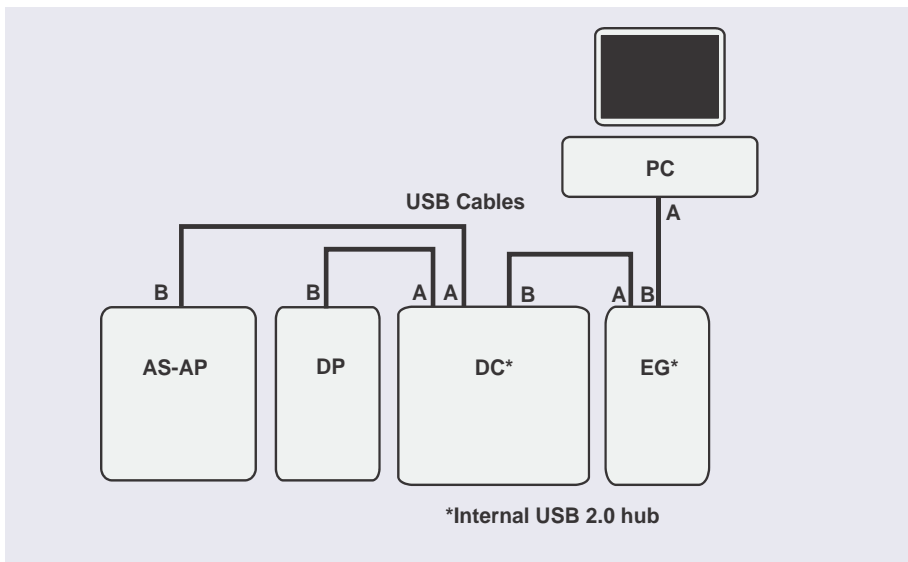
### 3.7.3 USB Connection Examples

**IMPORTANT**

Before connecting the USB cables, verify that Chromeleon was installed on the PC and the license code was entered. If the chromatography software is not installed first, Windows will be unable to identify the modules when the power is turned on. See [“Setting Up the Piston Seal Wash System” on page 103](#) for software installation information.

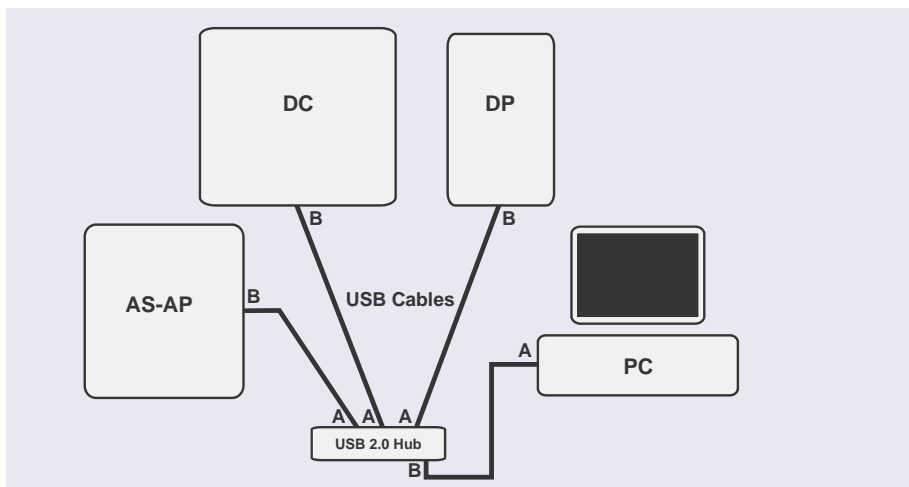
**IMPORTANT**

Do not turn on the power to any of the modules until you have connected all of the USB cables.



**Figure 3-16.** Example Connections:  
Multiple Modules Connected via Internal Hubs

If the number of Dionex ICS-6000 modules exceeds the number of available USB ports, connect the modules to the system with an external USB 2.0 hub (see [Figure 3-17](#)).



**Figure 3-17.** Example Connections:  
Multiple Modules Connected via an External Hub

**IMPORTANT**




Carefully secure all USB cables, the external hub, and the hub power cable so that they cannot be accidentally disconnected.

## 3.8 Setting Up the Chromatography Software

Software setup consists of installing Chromeleon software and the software license on the computer, starting the Chromeleon Instrument Controller Service, installing the USB device driver, and configuring the system in Chromeleon.

### 3.8.1 Installing Chromeleon

1. For instructions on how to install the Chromeleon software and license (if this was not done at the factory), refer to *Chromeleon 7 Installation Guide*. The guide is provided on the Chromeleon DVD.

2. Start the Chromeleon Instrument Controller Service:
  - a. If you have not already done so, turn on the computer power and log on to Windows as a user with local computer administrator privileges.
  - b. On the Windows taskbar, right-click the Chromeleon icon  in the system tray and click **Start Chromeleon Instrument Controller**. The icon changes to  to indicate that the Instrument Controller Service is starting. When the Instrument Controller Service is running (idle), the icon changes to gray .

**NOTE** If the Chromeleon tray icon is not on the Windows taskbar, click **Start > All Programs > Thermo Chromeleon 7 > Services Manager** and then click **Start Instrument Controller**.

3. To enhance system performance, Thermo Fisher Scientific recommends having Chromeleon automatically start the Instrument Controller every time the computer is turned on. To enable automatic server start:
  - a. Right-click the Chromeleon tray icon and click **Show Chromeleon Services Manager**. The Chromeleon Services Manager dialog box appears.
  - b. Select the **Start service on system start** check box.

### **3.8.2 Installing the USB Device Drivers**

**IMPORTANT** Do not turn on the power to any Dionex ICS-6000 modules until instructed to do so.

1. Before proceeding, complete the following tasks:
  - a. Verify that Chromeleon is installed on the computer and that the software license code was entered.

**IMPORTANT** If you do not install Chromeleon before turning on the power to the modules, Windows will be unable to identify the modules.

- b. Verify that all accessory devices equipped with electrical connections (the Dionex EGC, Dionex CR-CTC 600, detector, IC Cube, suppressor, and so on) are plugged in to their respective modules.



2. Turn on the main power switch on the rear panel of each Dionex ICS-6000 module.

**NOTE** Always leave the main power switch on unless instructed to turn it off. Use the **POWER** button on the front of each Dionex ICS-6000 module for on/off control. To turn off a module, press and hold the **POWER** button for 2 seconds.

3. If the system includes an autosampler, turn on the autosampler power.
4. Windows automatically detects the new USB devices. A message is displayed briefly to inform you that new hardware was found.
5. Select the USB controller properties:
  - a. On the Windows taskbar, click **Start > Control Panel > Device Manager**.
  - b. Click the right arrow beside **Universal Serial bus controllers** to expand the view. For each USB hub listed, complete the following steps:
    - a. Right-click the USB hub name, and then click **Properties**. The Hub Properties dialog box appears.
    - b. Click the **Power Management** tab. (If the dialog box does not include a **Power Management** tab, click **Cancel** and go on to the next controller in the list.)
    - c. Clear the **Allow the computer to turn off this device to save power** check box.
    - d. Click **OK**.

### 3.8.3 Selecting Configuration Properties

When you add an Dionex ICS-6000 module or the optional Consumable Device Monitor to a Chromeleon instrument, default configuration properties are selected. For each device, verify the default settings and select other settings as required.

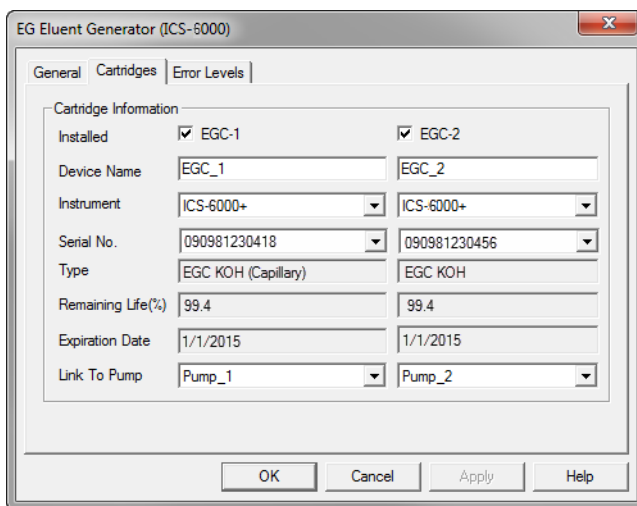
To open a configuration properties dialog box, right-click the module or Consumable Device Monitor name in the instrument and click **Properties**. The tab pages available in the dialog box, as well as the options on each tab

page, depend on the type of device. Some example tab pages are described in the following sections. For details about a tab page, refer to the Chromeleon Help.

### **EG Configuration Properties**

On the **Cartridges** tab page (see [Figure 3-18](#)), select the following settings for each Dionex EGC:

- In the **Instrument** box, select the instrument to which this cartridge is assigned.
- In the **Link to Pump** box, select the pump name. The EG must be linked to a pump in order to receive flow rate information. This prevents damage to the cartridge by ensuring that the EG does not operate when the pump is off or the flow rate is too low (see [Figure 3-18](#)).

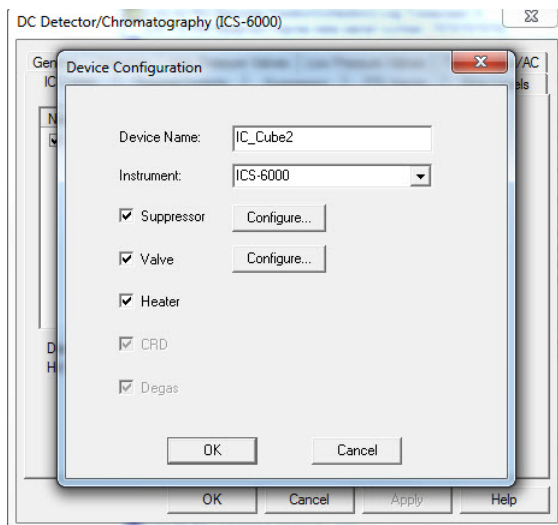


**Figure 3-18.** EG Configuration Example: Cartridges Tab Page

Capillary  
IC

### DC Configuration Properties

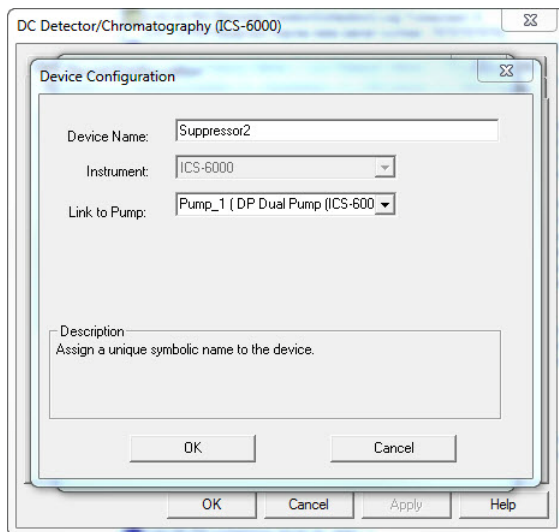
On the **IC Cubes** tab page, double-click the IC Cube name. The Device Configuration dialog box appears (see [Figure 3-19](#)).



**Figure 3-19.** IC Cube Configuration Example

- Verify that the IC Cube is assigned to the correct instrument. If a suppressor is installed, click **Configure** next to **Suppressor**. Verify that

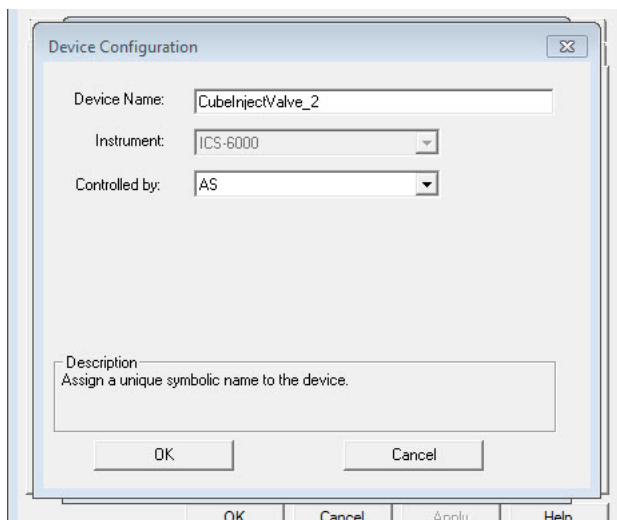
the suppressor is assigned to the correct instrument and that it is linked to the pump (see [Figure 3-20](#)).



**Figure 3-20.** IC Cube Suppressor Configuration Example

- Click **Configure** next to **Valve** and verify that the IC Cube injection valve is assigned to the correct instrument (see [Figure 3-21](#)).
- For **Controlled by**, verify that **AS** is selected. This setting assigns control of the valve to the autosampler. Use this setting for both the Dionex AS-

AP and Dionex AS-DV. If an autosampler is not installed, select **DC** in the **Controlled by** list.

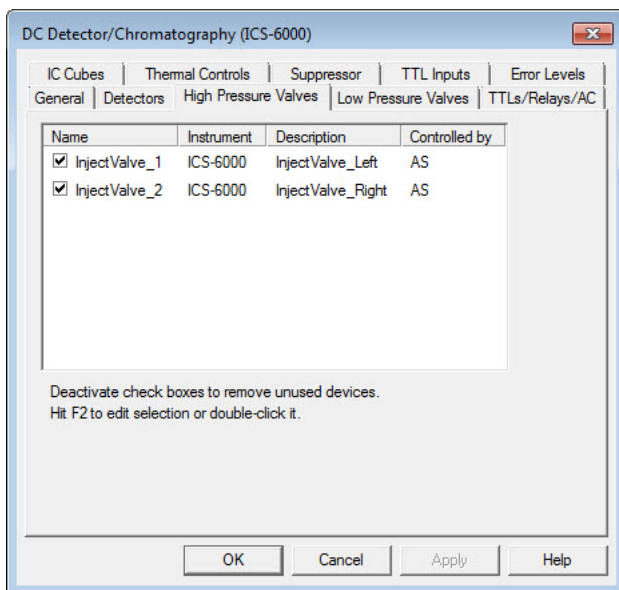


**Figure 3-21.** IC Cube Valve Configuration Example

### DC Configuration Properties

On the **High Pressure Valves** tab page (see [Figure 3-22](#)), under **Controlled by**, verify that **AS** is selected for InjectValve\_1 (and InjectValve\_2, if

installed). This setting assigns control of the injection valve in the DC to the autosampler. Use this setting for both the Dionex AS-AP and Dionex AS-DV.

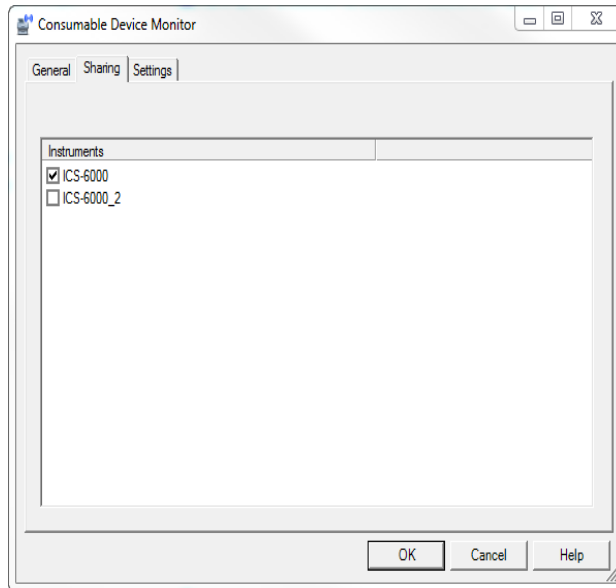


**Figure 3-22.** DC High Pressure Valves Configuration Example

If an autosampler is not installed, select **DC** for the **Controlled by** setting. To change the setting, select the injection valve name and press **F2**.

### Consumable Device Monitor Configuration Properties

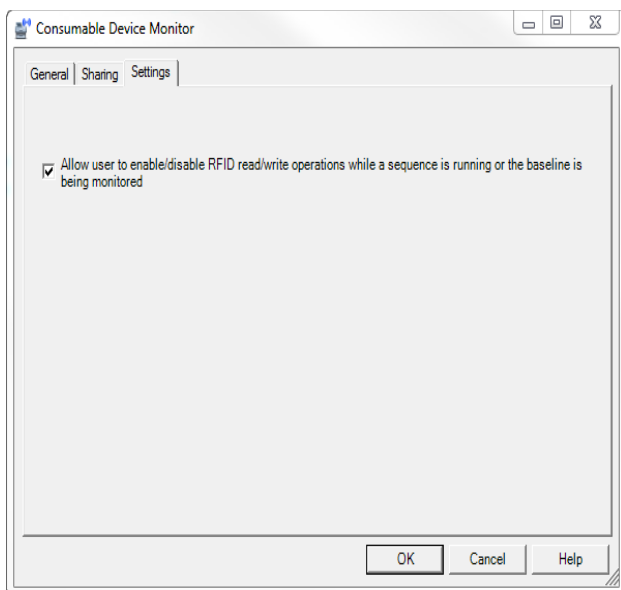
On the **Sharing** tab page (see [Figure 3-23](#)), select the instrument to which the Consumable Device Monitor is assigned.



**Figure 3-23.** *Consumable Device Monitor Configuration Example: Sharing Tab Page*

By default, the Consumable Device Monitor is assigned to the instrument in which it is installed. To share the monitor, click a second instrument. The monitor will then appear in both instruments and can be configured.

On the **Settings** tab page (see [Figure 3-24](#)) specify constraints on when RFID read/write operations are allowed.



**Figure 3-24.** Consumable Device Monitor Configuration Example: Settings Tab Page

By default, the Consumable Device Monitor can neither read information from, nor write information to, RFID tags attached to consumables while a sequence is running or the baseline is being monitored.

To enable read/write operations at those times:

1. Select the check box labeled **Allow user to enable/disable RFID read/write operations while a sequence is running or the baseline is being monitored**. Click **OK**.
2. In the Chromeleon Console, press the **F8** key to open the Command window. Set the **TagsReadWriteWhileRunningInjectionsEnabled** property to **True**.



### 3.8.4 Starting the Chromeleon Client

1. Click **Start > All Programs > Thermo Chromeleon 7 > Chromeleon 7**.
2. Click the **Instruments** category bar. Chromeleon connects to the instrument and displays the ePanel Set (see [Figure 3-25](#)).

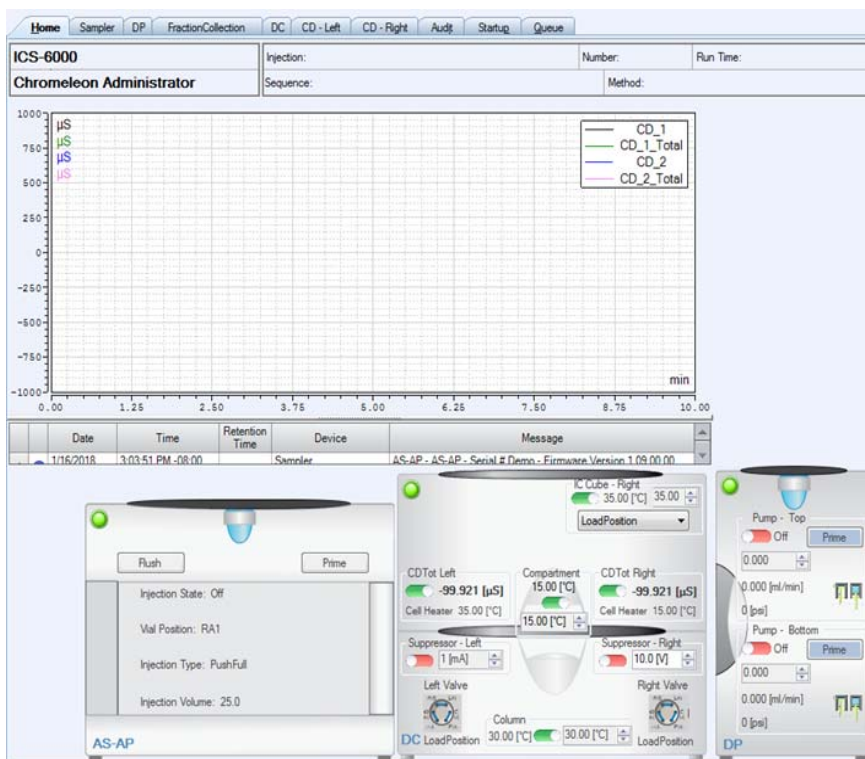


Figure 3-25. Example Chromeleon ePanel Set

### 3.9 Installing the Tablet

This section contains instructions for attaching the tablet to the DC. The procedure requires parts from two kits:

- The Tablet Kit (P/N 22181-62020) contains the tablet and its power supply. When the tablet is purchased from Thermo Fisher Scientific, the ICS-6000 App is installed on the tablet at the factory and a predefined user account is created.
- The Tablet Arm/Holder Kit (P/N 22181-62016) contains the parts required to attach the arm and holder assembly to the DC.

#### Installation of a Third-Party Tablet

When the tablet is purchased separately from the Dionex ICS-6000, you are responsible for making sure the tablet meets current specifications (see [Table 3-3](#)).

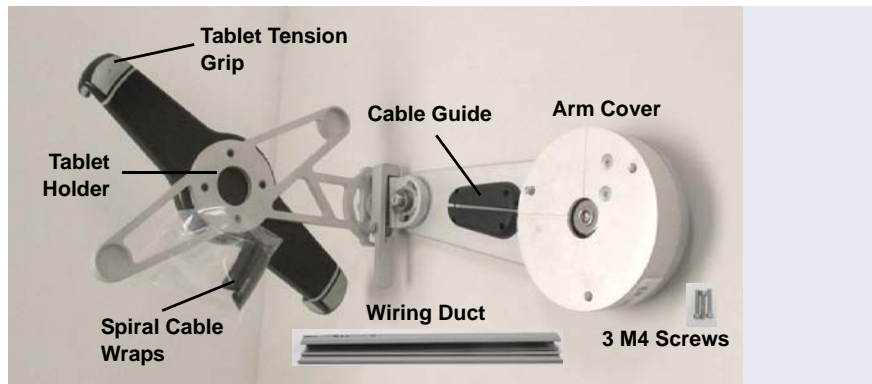
**NOTE** If you do not purchase the tablet from Thermo Fisher Scientific, you must also install the ICS-6000 App (see [Section 3.11.1](#)) and manually pair the tablet and instrument PC (see [Section 3.12.2](#)).

Specification	Requirement
Screen	10-inch or 12-inch screen with multi-touch technology
Screen Resolution (Minimum)	1920 x 1080 pixels
Operating System	Microsoft Windows 10 Pro
Processor	Intel® Core™ m3 (recommended), i5, i7, or equivalent
Memory (RAM)	4 GB
Internal Storage	128 GB SSD
Ports	USB 2.0 or better, Wi-Fi 802.11 ac, Ethernet or Ethernet via USB

**Table 3-3.** Tablet Specifications

### 3.9.1 Getting Started

1. Unpack the Tablet Kit (P/N 22181-62020). The kit contains the tablet and tablet power supply (P/N HAZMAT-01-00136), as well as setup instructions from the tablet vendor. (You can disregard the vendor instructions.)
2. Unpack the Tablet Arm/Holder Kit (P/N 22181-62016). The kit contains all the parts needed to attach the tablet arm to the DC (see [Figure 3-26](#)).



**Figure 3-26.** Tablet Arm/Holder Kit Contents Unpacked

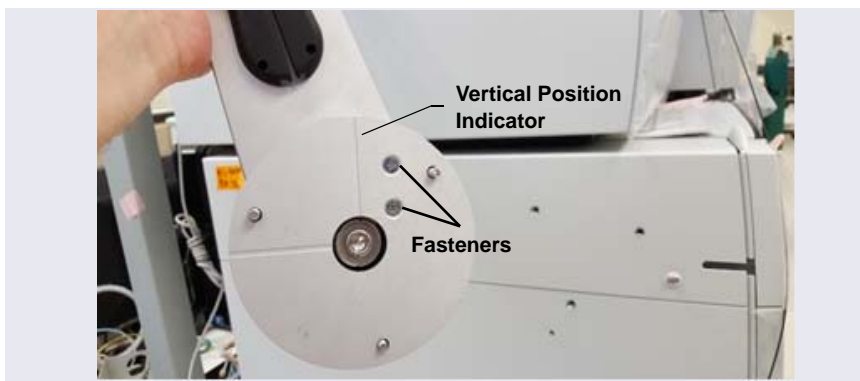
3. The mounting arm cover (P/N 22181-60500) is held in place by magnets. Pull the cover off the mounting arm (see [Figure 3-27](#)) and set it aside. (You will reinstall the cover later.)



**Figure 3-27.** Removal of the Mounting Arm Cover

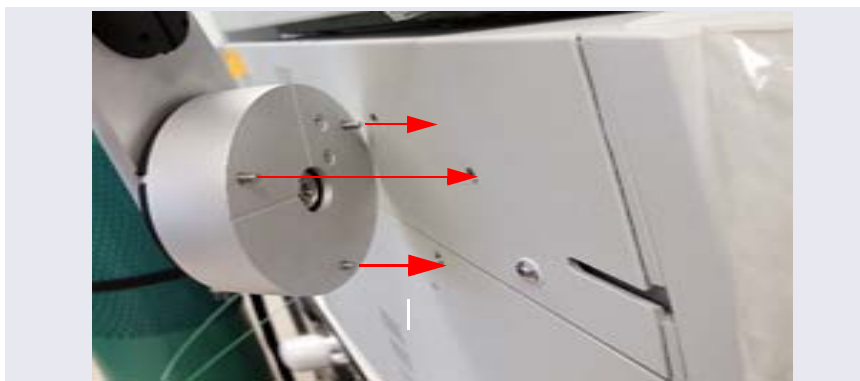
### **3.9.2 Installing the Tablet Arm/Holder**

1. Attach the mounting arm (P/N 22181-60500) to the left side of the DC:
  - a. Note the two lines molded into the base of the tablet mounting arm, on the inside of the arm (the side of the arm which is installed against the DC). When installing the mounting arm, make sure the line to the left of the two fasteners (see [Figure 3-28](#)) is in the vertical position.



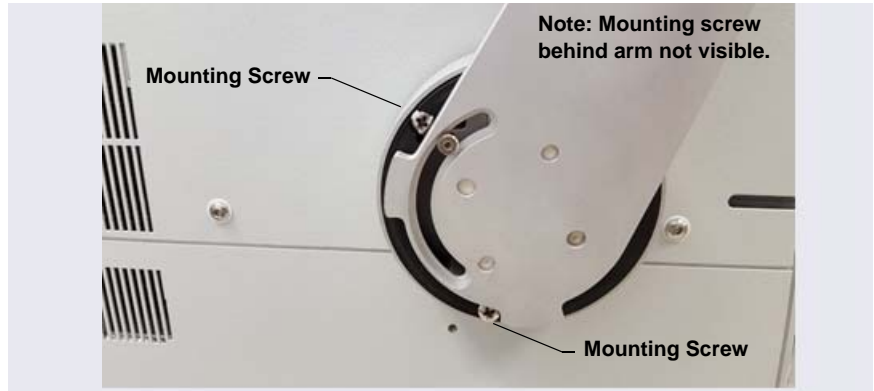
**Figure 3-28.** Position Indicator on the Tablet Mounting Arm/Holder

- b. Align the three mounting screws on the base of the mounting arm with the three mounting holes on the side of the DC (see [Figure 3-29](#)).



**Figure 3-29.** Tablet Arm/Holder Mounting Screws on the DC

- c. Use a 3 mm socket driver to tighten the screws from the front of the mounting arm (see [Figure 3-30](#)). You will need to move the arm to access all three screws.



**Figure 3-30.** Tightening the Tablet Arm Mounting Screws

2. Reattach the mounting arm cover by aligning it with the arm and moving it toward the arm until the magnets “grab” (see [Figure 3-31](#)).



**Figure 3-31.** Reattaching the Cover of the Tablet Mounting Arm/Holder

### 3.9.3 Routing the Tablet Power and Ethernet Cables

This section explains how to perform a partial installation of the tablet power cable and (if required) the Ethernet cable. The connections will be completed later in the network installation procedure.

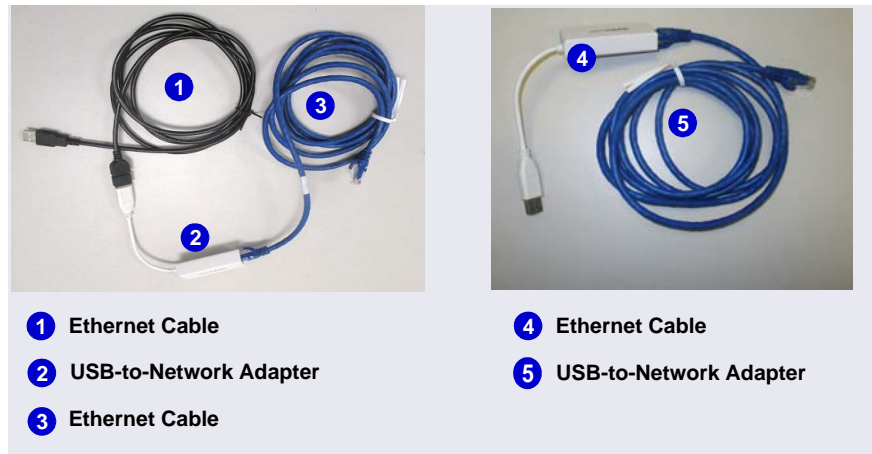
1. Connect the tablet power cable (with the round power connector attached) to the power port on the tablet.

**NOTE** The tablet is shipped with an AC power cable with a U.S. NEMA plug. You are responsible for obtaining a locally sourced plug adapter.

**NOTE** If a wireless tablet connection will be used, the Ethernet cable and network adapter are not needed. The power adapter for the tablet still must reach the tablet in any chosen tablet arm orientation.

2. Assemble the cable(s) required to connect the tablet USB port to the network adapter (see [Figure 3-32](#)). The parts are provided in the Tablet Connectivity Kit (P/N 22181-62017).
  - a. Connect the 2 m (7 ft) Ethernet cable (P/N 00302-99-00129) to the USB network adapter (P/N 00302-99-00131).
  - b. If the Ethernet cable is not long enough, connect the USB cable (male-to-female) (P/N 00302-99-00130) to the adapter.

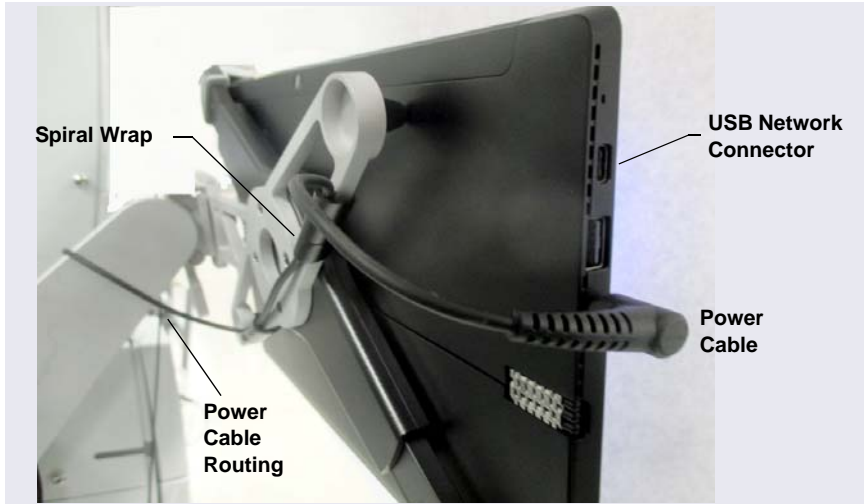
**NOTE** Set the rest of the kit contents aside for use later.



**Figure 3-32.** Tablet Cable Options

3. Working from the mounting arm backward, route the tablet power and Ethernet cables from the tablet holder.
4. Check that the power cable can reach the tablet in any desired orientation, and then secure the power cable with the spiral cable wraps. If the setup includes an Ethernet cable, it should be routed similarly.
5. Route the network connector (a USB cable that is either attached to the network adapter or part of the network adapter) as follows (see [Figure 3-33](#)):
  - a. Route the cable from the top of the tablet holder downward (leaving about 254 mm (10 in) of cable beyond the top of the tablet holder), over the arm of the tablet holder, and toward the DC.
  - b. Secure the cable with the spiral wraps on the upper and lower sections of the tablet holder arm.
6. Route the tablet power cable as follows (see [Figure 3-33](#)):
  - a. Route the power cable from the top of the tablet holder downward (leaving about 254 mm (10 in) of cable beyond the top of the tablet holder), over the arm of the tablet holder, and toward the DC.

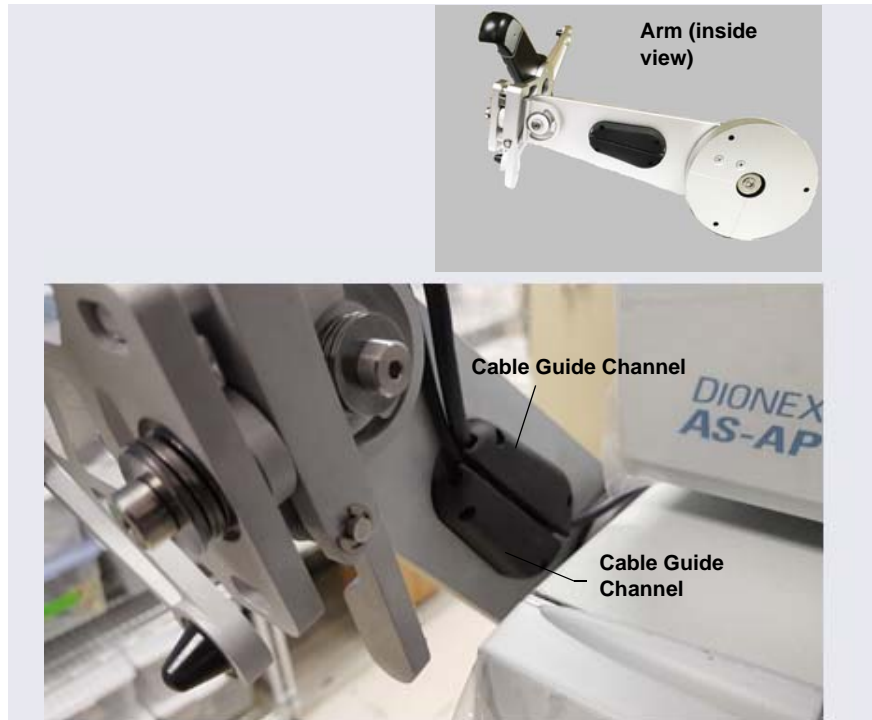
- b. Secure the cable with the spiral wraps on the upper and lower sections of the tablet holder arm.



**Figure 3-33. Tablet Power Cable Setup**



7. Route both the Ethernet and tablet power cables through the tablet arm cable guide (see [Figure 3-34](#)) and back toward the tablet holder.



**Figure 3-34.** Mounting Arm Cable Guide

8. Route the cable from the cable guide, down and under the tablet arm, and toward the rear of the DC.
9. Use the wiring duct (P/N 22181-98020) provided in the Tablet Arm/Holder Kit (P/N 22181-62016) to organize the cable run across the side of the DC (see [Figure 3-35](#)):
  - a. Slide the plastic cover off the wiring duct (or flex the duct).

- b. Remove the paper backing from the adhesive strip and press the base of the wiring duct firmly onto the side of the DC. Route the cables through the duct cover and attach it to the base (see [Figure 3-35](#)).



**Figure 3-35.** *Tablet Wiring Duct Attached to the DC*

### **3.9.4 Positioning the Tablet**

1. Decide whether to locate the tablet in front of the DC or to the left of the module.
2. Pull the tablet holder release lever (see [Figure 3-36](#)) toward yourself and swivel the holder to move the tablet to the preferred location.



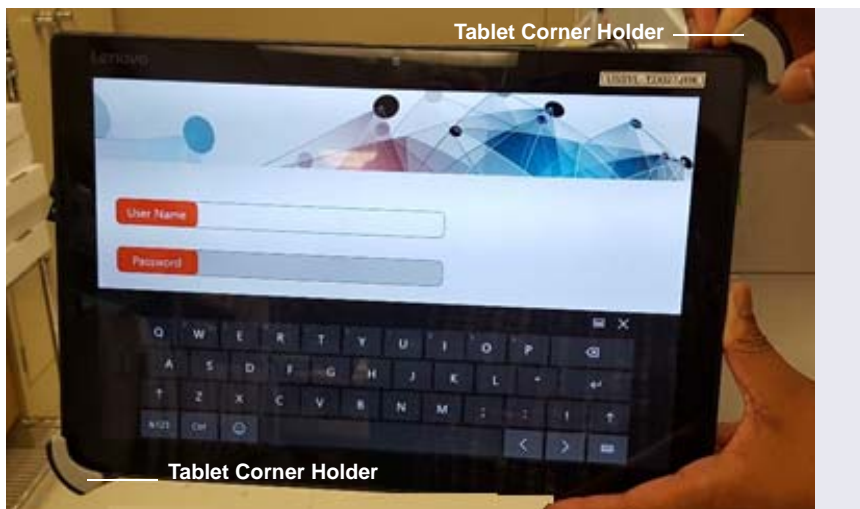
**Figure 3-36.** *Tablet Connection and Viewing Adjustment*

3. You can now attach the tablet to the tablet holder. [Figure 3-37](#) shows an example installation. If the setup includes an Ethernet cable, the routing for the cable would be the same as the power cable in the photo.



**Figure 3-37.** *Tablet Connections and Viewing Adjustment*

4. Place the lower-left corner of the tablet into the tablet arm/holder (see [Figure 3-38](#)). Pull up the upper-right corner of the tablet and release it to hold the tablet in place.



**Figure 3-38.** Inserting the Tablet into the Holder

5. Adjust the cables to allow enough slack for all the tilt and rotation positions.
6. While holding down the release lever, use the two hex screws on the tablet holder to adjust the tablet until it is level (see [Figure 3-40](#)).
  - When the tablet is to the left of the DC, turning the top screw counterclockwise loosens the tablet and rotates it in the clockwise direction.
  - When the tablet is in front of the DC, turning the bottom screw clockwise tightens the tablet and rotates it in the counterclockwise direction.
7. When you finish, release the lever to lock the tablet into place.

## 3.10 Installing a Network for Tablet Access

Configuration options for networking of the Chromeleon instrument PC (IPC) and the tablet include:

- Ethernet (cabled) connection to IPC (see [Section 3.10.2](#)) and Ethernet (cabled) connection to tablet (see [Section 3.10.3](#))
- Ethernet (cabled) connection from IPC to router (see [Section 3.10.2](#)) and wireless connection from router to tablet (see [Section 3.10.4](#))
- Installations that include a local area network (LAN) in addition to the IPC and tablet may be possible, but are outside the scope of this manual. For assistance, contact your network system administrator.

### Notes on Network Configurations

- Before selecting a network configuration, verify that corporate IT policy does not prohibit wireless connections.
- The Tablet Connectivity Kit (P/N 22181-62017) provides a router that is compatible with Ethernet and wireless connections, cables, and other parts required for communication (see [Section 3.10.1](#)).
- The adapter provided in the Tablet Connectivity Kit does not provide wireless capability. The adapter changes the connector from Ethernet to USB; this enables a connection to a USB port if a LAN port is not available.

### PC and Tablet Communication Test

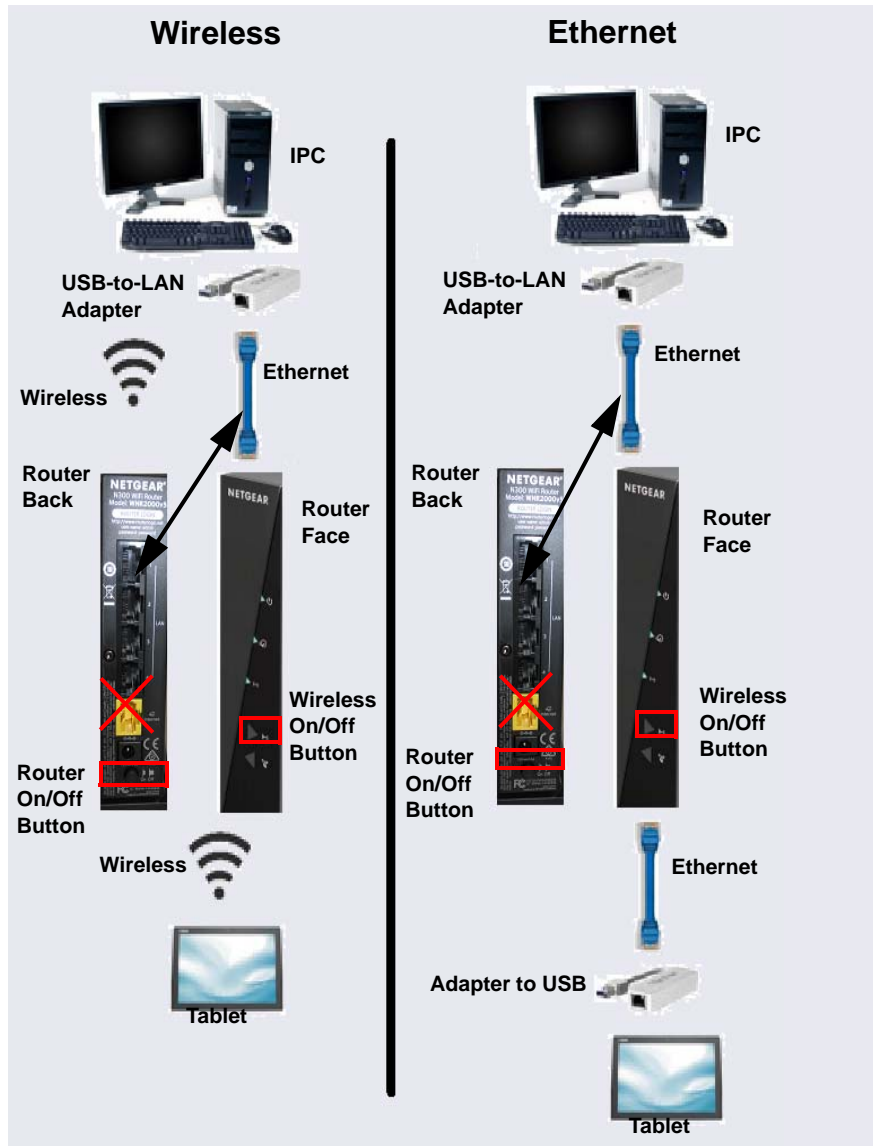
Test network communication at the following times:

- After completing installation of the router, tablet, and IPC.
  - Whenever you want to verify that the network is working and that the tablet and IPC are on the same network.
  - Whenever a communication error is suspected.
1. On the tablet desktop, tap the Windows start bar.

**NOTE** If the tablet was not purchased from Thermo Fisher Scientific, you must install the ICS-6000 App (see [Section 3.11.1](#)) before testing communication.

2. Tap the search bar and enter “CMD.” A command prompt window is displayed.
3. Type “ping 192.168.0.1.” This command pings the PC. If the test is successful, a response appears on the screen showing the number of packets successfully transferred.
4. To check tablet IP repeat the previous step; this time, use the PC CMD prompt to ping the tablet IP address (192.168.0.1).

[Figure 3-39](#) provides an overview of connections for both the wireless and Ethernet networks.



**Figure 3-39.** Network Connections: Tablet to IPC

### Unpacking the Tablet Connectivity Kit

Unpack the Tablet Connectivity Kit (P/N 22181-62017) and verify the kit contents (see [Figure 3-40](#)).

**Reminder:** The following items may have been removed from the kit in order to install the tablet arm and tablet (see [Section 3.9.3](#)): one of the two network USB-to-Ethernet adapters, one of the two Ethernet cables, and the USB cable.

- 1 Wireless Router (P/N 00825-01-00269)
- 2 USB Cable (Male-to-Female) (P/N 00302-99-00130)
- 3 USB-to-Network Adapter (2) (P/N 00302-99-00131)
- 4 Ethernet Cable (2) (P/N 00302-99-00129)
- 5 Power Adapter (P/N 00825-01-00269)



**Figure 3-40.** Tablet Connectivity Kit Items Unpacked



### 3.10.1 Installing the Router

The router should be installed as close as possible to the DC and IPC because of the limited Ethernet cable length and wireless broadcast range.

1. Unpack the router (P/N 00825-01-00269) and the router power adapter (P/N 00825-01-00269).

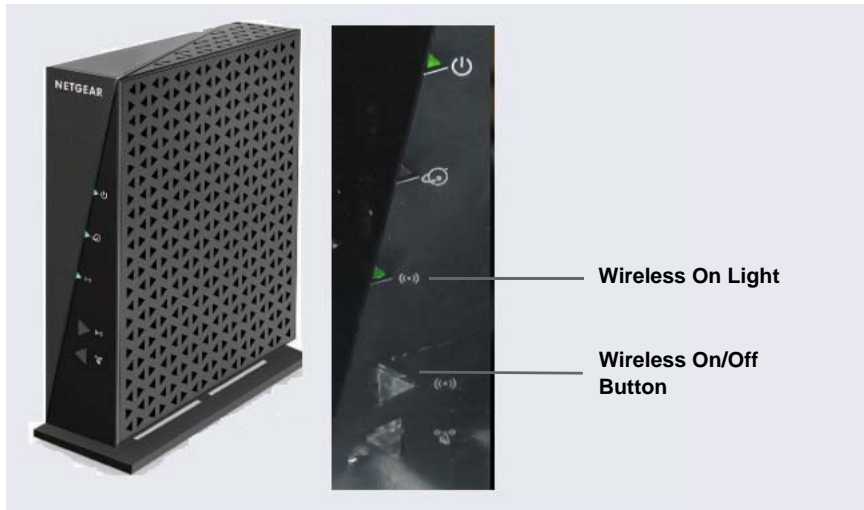
**NOTE** The router is shipped with an AC power cable with a U.S. NEMA plug. You are responsible for obtaining a locally sourced plug adapter.

2. Each router is assigned a unique network SSID (service set identifier) and password at the factory. The SSID and password are printed on a label on the base of the router. Write down this information before proceeding.
3. Connect the outlet prongs of the router power adapter to an electrical outlet near the Dionex ICS-6000 to which the tablet is attached. If the tablet arm is not attached, see [Section 3.9.2](#).
4. Attach the connector end of the power adapter to the router.

**NOTE** If the electrical service is not 120 V 60 Hz, an AC plug adapter (not provided with the system) is required to plug in the router power adapter.

5. Press the **ON/OFF** button on the rear of the router (near the bottom) to turn on the power.
6. Check the status of the wireless on light on the router (see [Figure 3-41](#)). The light should be green for operation in wireless mode, and red

otherwise. If necessary, push the wireless on/off button to change the mode.



**Figure 3-41.** *Wireless Router On/Off Button and Status Light*

### **3.10.2 Installing an Ethernet Instrument PC**

#### **IPC to Router Connection**

This section contains setup instructions for an IPC connected via Ethernet. An Ethernet connection is required if the IPC does not have wireless connectivity or if IT policy prohibits wireless connections.

1. If an Ethernet port is not available on the IPC, attach the cable connector on the USB-to-Ethernet adapter (P/N 00302-99-00131) in the kit to a USB port on the IPC (see [Figure 3-43](#), item **1**).

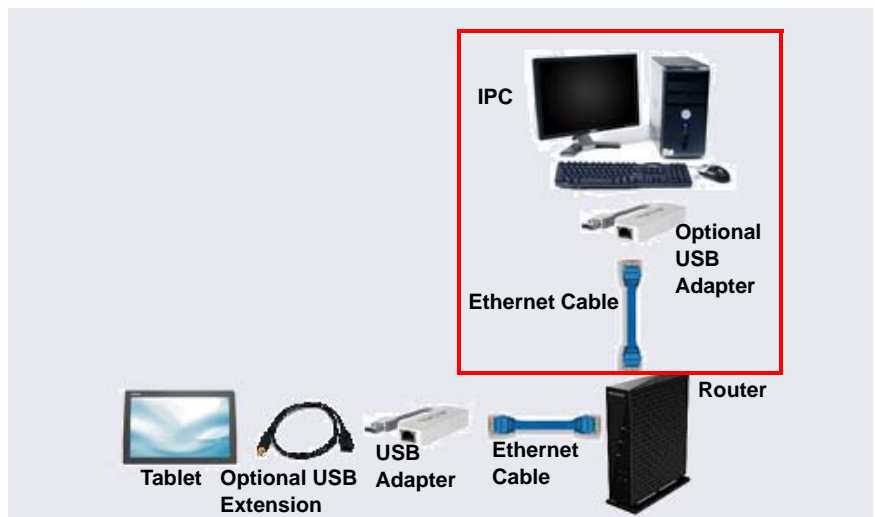
2. Connect an Ethernet cable (P/N 00302-99-00129) to the USB port on the USB-to-Ethernet adapter (see [Figure 3-43](#), item 2).



**Figure 3-42.** Ethernet USB-to-LAN Connection

3. Connect the other end of the Ethernet cable (P/N 00302-99-00129) to any available LAN port on the router.

**NOTE** Do not connect the cable to the yellow Internet port.



**Figure 3-43.** Cabling IPC to Router to Tablet

### **3.10.3 Installing an Ethernet Tablet**

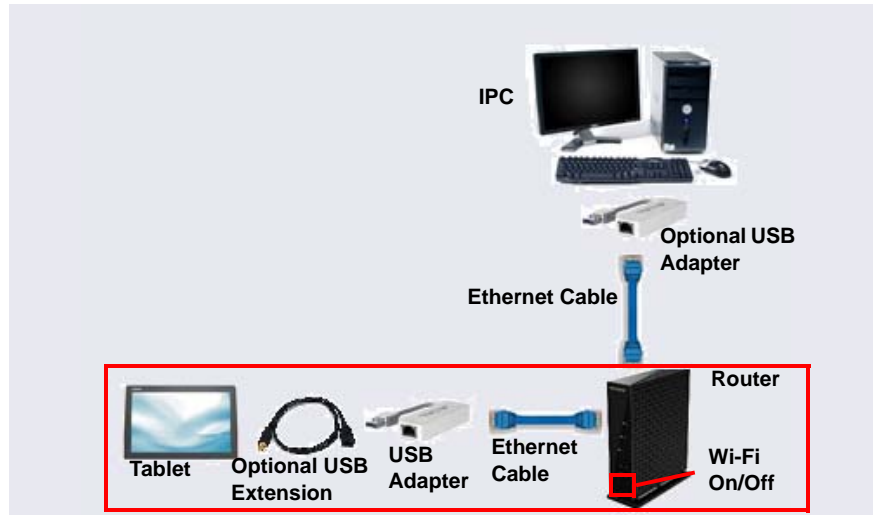
The hardware installation allows the tablet to send commands through the router to the IPC. The commands are carried out when they are received from the router.

1. An Ethernet cable (P/N 00302-99-00129) was routed to the rear of the DC when the tablet was cabled for the Ethernet connection (see [Section 3.9.4](#)). Connect the free end of the Ethernet cable to any LAN port on the rear of the router (P/N 00302-99-00131).

**NOTE** Do not connect the cable to the yellow Internet port.

2. The tablet may already be installed in the tablet holder; if not, place it in the tablet holder.
3. Connect the Ethernet cable to the tablet, if it is not already connected. Because the tablet supplied in the Thermo Fisher Scientific tablet kit does not have a LAN port, the Ethernet connection uses one of the USB-to-Ethernet adapters provided in the Tablet Connectivity Kit to connect to the tablet USB port (see [Figure 3-44](#)). If necessary, use the USB extension cable (P/N 00302-99-00130) provided in the Tablet Connectivity Kit between the adapter and the tablet.

4. Connect the tablet power, if it is not already connected (see [Section 3.9.3](#)).



**Figure 3-44.** Ethernet Connections from the Tablet to the Router

### 3.10.4 Installing a Wireless Tablet

The wireless tablet does not require any physical connections to send data to the IPC, although it is necessary to install a wireless router (see [Section 3.10.1](#)).

#### Connecting the Tablet OS

1. Verify that the tablet power is on.
2. On the Windows taskbar, locate the network icon in the system tray (in the lower-right corner of the startup screen). Tap the icon to display a list of available networks.
3. On the **Wi-Fi** menu, tap **Locate SSID**.
4. Find the entry for the router SSID, and tap the corresponding **Connect automatically** option.
5. Tap **Connect** to close the menu.
6. When prompted for a password, enter the router password copied from the bottom of the router.

7. The Netgear genie dialog box appears, confirming that the network is recognized. To close the dialog box, tap the close button at the top of the window. Do not tap the **Continue** button in the Netgear dialog box.

### Connecting the IPC OS


1. Verify that the IPC power is on.
2. On the Windows taskbar, locate the network icon in the system tray (in the lower-right corner of the startup screen). Tap the icon to display a list of available networks.
3. Find the router connection name that matches the router name copied from the bottom of the wireless router, and click the connection.
4. Find the entry for the router SSID, and click the corresponding **Connect automatically** option.
5. Click **Connect** to close the menu.
6. When prompted for a password, enter the router password.
7. The Netgear genie dialog box appears, confirming that the network is recognized. To close the dialog box, click the close button at the top of the window. Do not click the **Continue** button in the Netgear dialog box.
8. Verify the IPC and tablet are communicating

## 3.11 Connecting the Tablet to the Instrument PC

### 3.11.1 Installing the ICS-6000 App

Follow the instructions in this section if the tablet that will be used with the Dionex ICS-6000 is not purchased from Thermo Fisher Scientific.

1. Connect the tablet that will be used with the Dionex ICS-6000 to the Internet.
2. Use Windows Search on the taskbar (or press **Windows Key + S**) to find “Store.”
3. Tap the Store best match link to start the Microsoft Store App.
4. In the Microsoft Store App, tap the magnifying glass icon and enter “ICS-6000” in the search field.

5. Tap the **Dionex ICS-6000 Automation Manager Tablet App** entry in the search results.
6. Tap **Get** to download and install the ICS-6000 App.
7. When the ICS-6000 App installation is complete, a **Launch** button is displayed on the tablet.
8. For ease of use, localize the ICS-6000 App immediately. Language options include Chinese (simplified and traditional), French, German, Italian, Japanese, Korean, Portuguese, Russian, and Spanish.
  - a. Go to the tablet Home page.
  - b. On the quick access toolbar at the top of the page, tap the gear  icon.
  - c. Tap the name of the preferred language.
9. Verify that the tablet and IPC are able to see the same network (see [“PC and Tablet Communication Test” on page 77](#)).

Go on to [Section 3.11.2](#) to install the ICS-6000 Tablet Setup Utility.

### 3.11.2 Installing the ICS-6000 Tablet Setup Utility

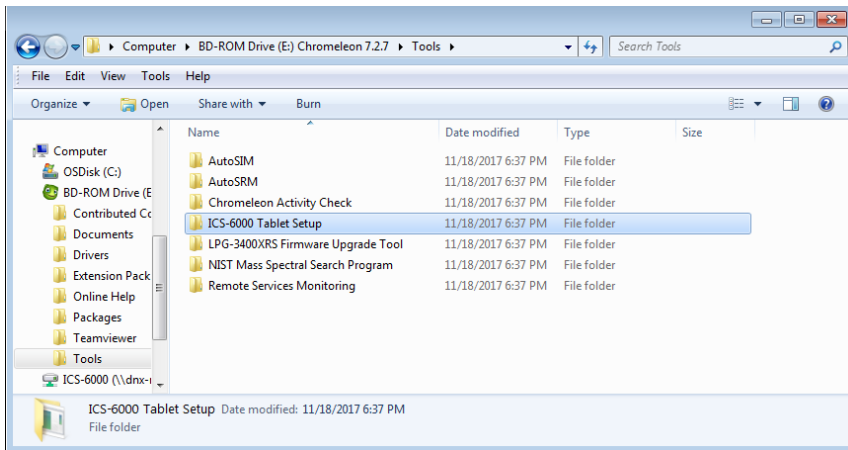
Follow the instructions in this section if the tablet that will be used with the Dionex ICS-6000 was not purchased from Thermo Fisher Scientific.

**NOTE** The ICS-6000 Tablet Setup Utility must be installed in order to automatically pair the tablet with the Chromeleon instrument PC (IPC) (see [Section 3.12.2](#)).

1. Insert the Chromeleon DVD into the DVD drive of the tablet.

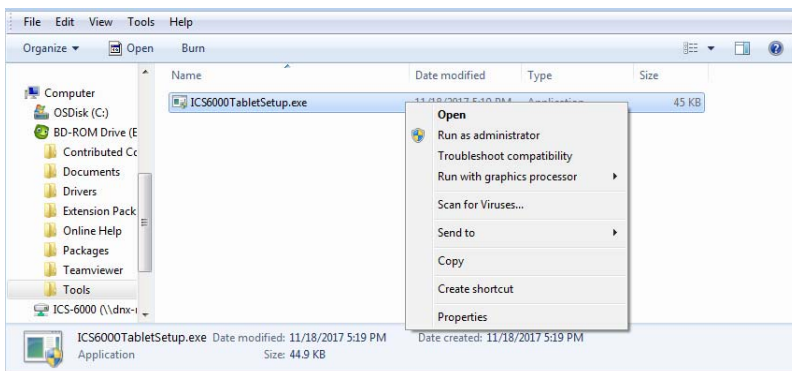
**NOTE** If the tablet does not have a DVD drive, copy the **Tools/ICS-6000 Tablet Setup** folder from the DVD onto a USB drive (or other compatible medium) and then copy the folder to the tablet.

2. Locate the **Tools/ICS-6000 Tablet Setup** folder (see [Figure 3-45](#)).



**Figure 3-45.** ICS-6000 Tablet Setup Utility Location

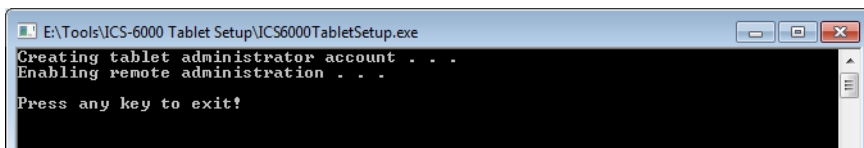
3. Right-click the folder, and then click **Open**.
4. Right-click the **ICS6000TabletSetup.exe** file, and then click **Run as Administrator** (see [Figure 3-46](#)).



**Figure 3-46.** Run the ICS-6000 Tablet Setup Utility



- The utility begins running automatically. When installation is complete (within a few seconds, press any key to close the command window (see [Figure 3-47](#)).



**Figure 3-47.** ICS-6000 Tablet Setup Utility Command Window

Go on to [Section 3.12](#).

## 3.12 Introduction to Pairing

Pairing is the process of linking, or *associating*, the tablet with the Chromeleon instrument PC (IPC). Pairing enables communication between the tablet and the IPC, which can then transmit commands to the Dionex ICS-6000 via Chromeleon.

There are two pairing procedures:

- Thermo Fisher Scientific recommends the *automatic* pairing procedure (see [Section 3.12.1](#)).
- If automatic pairing is unsuccessful, repeat the automatic pairing procedure or perform the *manual* pairing procedure (see [Section 3.12.2](#)).

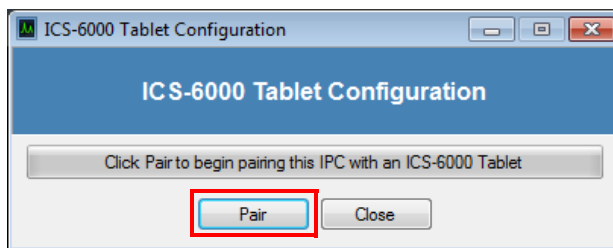
### Prerequisites for Pairing

- Decide which tablet and IPC to pair for mobile access to the Dionex ICS-6000.
  - A tablet can pair with (and control) only one Dionex ICS-6000 IPC at a time. After pairing, the tablet cannot be used with any other Dionex ICS-6000 until it is paired with another IPC.
  - In order for a paired tablet and an IPC to communicate with each other, they must be connected to the same network.
- Verify that Chromeleon is installed on the selected IPC.
- Verify that you have Chromeleon administrator rights on the selected IPC.

- If the tablet was not purchased from Thermo Fisher Scientific, verify that the ICS-6000 Setup Utility is installed (see [Section 3.11.2](#)).

### 3.12.1 Automatically Pairing the Tablet and Instrument PC

1. On the Windows taskbar, click **Start > All Programs > Thermo Chromeleon 7 > ICS-6000 Tablet Configuration**. The ICS-6000 Tablet Configuration dialog box appears (see [Figure 3-48](#)).



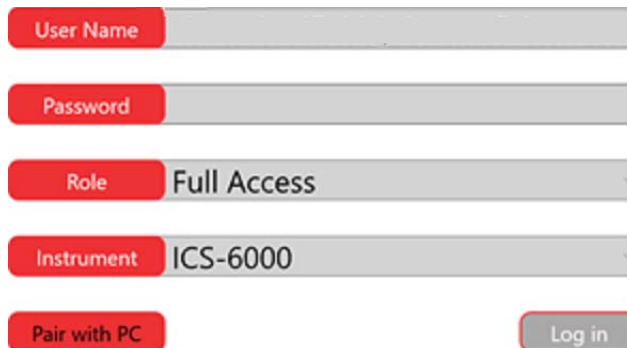
**Figure 3-48.** ICS-6000 Tablet Configuration Dialog Box

2. Click **Pair** to generate a QR code (see [Figure 3-49](#)). The QR code is a two-dimensional barcode that contains the information needed for the tablet to connect to the IPC.



**Figure 3-49.** QR Code for the ICS-6000 Tablet Configuration

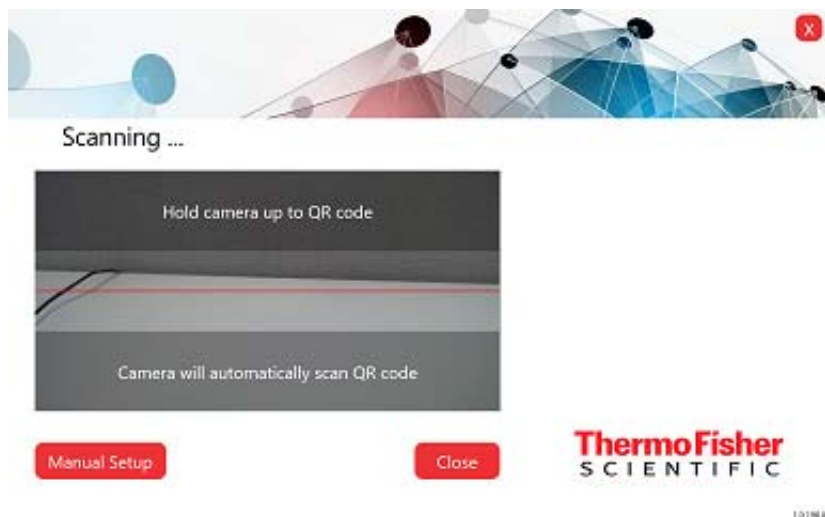
3. Upon reading the QR code, the tablet powers up and the startup screen is displayed. Tap the Thermo Fisher Scientific icon in the center of the screen to display the Log In page (see [Figure 3-50](#)).



The image shows the login interface of the ICS-6000 app. It features five input fields with red labels: 'User Name', 'Password', 'Role' (set to 'Full Access'), and 'Instrument' (set to 'ICS-6000'). Below these fields are two buttons: 'Pair with PC' and 'Log in'.

**Figure 3-50.** ICS-6000 App Log In Page

4. Tap **Pair with PC**. This selects camera mode for the tablet.
5. When the Scanning window is displayed (see [Figure 3-51](#)), prepare to scan the QR code with the tablet camera. To do so, hold the tablet so that the entire QR code is displayed squarely on the tablet. When properly aligned, the QR code is captured and the tablet camera is turned off.



**Figure 3-51.** Scanning the QR Code

6. Click **Close** to exit the ICS-6000 App.
7. Restart the app and verify that the message “Connected to <IPC>” is displayed at the bottom of the log in page.

**NOTE** If the message is not displayed, repeat the automatic pairing procedure or go to [Section 3.12.2](#) to manually pair the tablet and IPC.

8. If user mode is enabled in Chromeleon, log in to the app, using the credentials required to log into Chromeleon on the IPC.

**NOTE** If user mode is not enabled, login information is hidden and the operator is automatically authenticated. For more information about user mode, refer to the Chromeleon Help.

### 3.12.2 Manually Pairing the Tablet and Instrument PC

Perform the manual pairing procedure only if the automatic pairing procedure (see [Section 3.12.1](#)) is not successful.

#### Tasks Performed from the Instrument PC

1. Obtain the IP address of the instrument PC:
  - a. On the Windows taskbar, click **Start > All Programs > Accessories > Command Prompt**. The command prompt window appears.
  - b. Type “ipconfig.”
  - c. Locate the **IPv4 Address** and write it down.
  - d. Close the window.
2. Obtain the computer name of the instrument PC:
  - a. On the Windows taskbar, click **Start > Control Panel**.
  - b. Click **System and Security**.
  - c. In the right-hand pane, under **System**, click **See the name of this computer**.
  - d. Under **Computer name, domain, and workgroup settings**, locate the **Full computer name** and write it down.

- e. Close the **System** window.
3. Add the instrument PC IP address to the tablet “hosts” file:
  - a. On the tablet taskbar, tap **Start**.
  - b. On the **Start** menu, tap **All Programs > Accessories > Notepad**.
  - c. Tap the Notepad icon and select **Run as administrator**.
  - d. Navigate to the C:/Windows/System32/drivers/etc/ folder and open the “hosts” file (the file has no extension).
  - e. Press **Enter** after the end of the last line in the file. On the new line, type the full IP address, space once, and type the full computer name.
  - f. In Notepad, tap **File** and then tap **Save As**.
  - g. Under **Save as type**, tap the **\*select All Files (\*.\*)** option.
  - h. Accept “hosts” as the file name.
  - i. In Notepad, tap **Save** and then tap **Close**.
4. Save and copy the pairing certificate:
  - a. On the Windows taskbar, click **Start > All Programs > Accessories > Command Prompt**. The command prompt window appears.
  - b. Type “mmc.exe” to launch the Microsoft Management Console. The User Account Control dialog box appears.
  - c. When prompted whether to allow the console to make changes, click **Yes**. The Console1 - [Console Root] window appears.
  - d. On the **File** menu, click **Add/Remove Snap-in**. The Add or Remove Snap-ins dialog box appears.
  - e. In the **Available snap-ins** list box, click **Certificates**, and then click **Add**. The Certificates snap-in dialog box appears.
  - f. Click **Computer account**, and then click **Next**. The Select Computer dialog box appears.
  - g. Click **Local computer** and click **Finish**.
  - h. In the Add or Remove Snap-ins dialog box, click **OK** to create a new Snap-in.

- i. On **Console1 - [Console Root]**, in the left navigation pane, click **Console Root > Certificates > Personal > Certificates** and right-click to select the **Chromeleon 7 Web API Self-Signed** certificate.
5. In the Chromeleon 7 Web API Self-Signed drop-down list, select **All Tasks** and then click **Export**. The Certificate Export Wizard dialog box appears.
  - a. Click **Next** in the dialog box.
  - b. Click **No, do not export the private key**, and then click **Next**.
  - c. Select a certificate format, and click **Next**.

**NOTE** The selected certificate format does not matter, provided that you use the same format to access the certificate by both the IPC and the tablet.

  - d. Select the file name of the new certificate (for example, “MyCertificate.cer” on the C:\ drive), and click **Next**.
  - e. Click **Finish**.
  - f. When the “The export was successful.” message is displayed, click **OK**.
6. In **Console1 - [Console Root]**, click the **Close** button to exit the console.
7. Copy the export file containing the Chromeleon 7 Web API Self-Signed certificate to a USB drive or other device the tablet can read.

### Tasks Performed from the Tablet

1. Verify that the tablet is connected to the same network as the IPC:
  - Check the physical hardware.
  - Check the network IP address. Follow the procedure used to obtain the IP address for the IPC in [Step 1](#) of [Section 3.12.2](#).
2. Copy the Chromeleon certificate created on the IPC in the previous section ([see Step 7](#)) to the tablet.
3. Double-click to open the certificate file.
4. In the Certificate dialog box, click **Install Certificate**. The Certificate Import Wizard dialog box appears.

5. Select **Local Machine**, and then click **Next**.
6. Click **Place all certificates in the following store**, browse to locate “Trusted Root Certification Authorities,” and click **Next**.
7. Click **Finish**.
8. In the Certificate dialog box, click **Install Certificate**.
- g. When the “The import was successful.” message is displayed, click **OK**.

### 3.13 Connecting Drain Lines

Any leaks or condensation that may occur are routed to the drain port on the rear of each module.

#### Connecting Drain Hoses to the DP/SP and EG

1. Locate the corrugated drain hose (P/N 055075) in the Ship Kit for each module.
2. Push the hose onto the drain port on the rear of each module.
3. Place the open end of each hose into a waste container or appropriate drain. Verify that the line lays flat on the bench (this ensures that liquid drains over the edge of the bench).

**IMPORTANT**

For correct drainage, make sure drain hoses lay flat on the bench and are not bent, pinched, or elevated at any point. Do not allow the ends of the drain hoses to be submerged in waste liquid.

**NOTE** To remove a corrugated drain hose from a drain port, grasp the hose at the area over the port where the hose is solid (not corrugated) and pull the hose straight off.

### Connecting a Drain Line to the DC

The DC includes parts for assembling a rigid drain line that can be routed from the drain port on the DC rear panel to either the rear, side, or front edge of the lab bench. A corrugated drain hose then connects to the rigid drain line and is directed to the waste container or drain.

This design prevents the drain line from being accidentally elevated or crimped as it is routed to the drain. A vent to help prevent vapor lock and improve liquid flow to the drain is also included.

1. Locate the drain line parts in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC) (see [Table 3-4](#) and [Figure 3-52](#)).

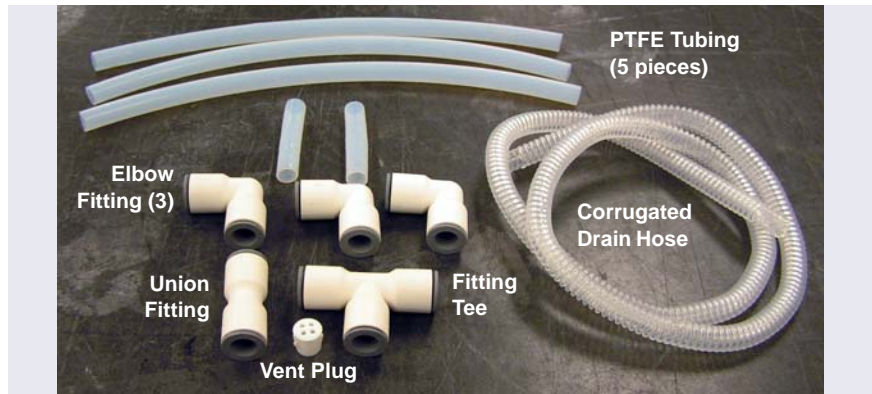
Part	Part Number	Quantity
Corrugated drain hose	055075	1
PTFE tubing, 1.3 cm (0.5 in) OD, 6.5 cm (2.5 in) long	22171-30001	2
PTFE tubing, 1.3 cm (0.5 in) OD, 33.0 cm (13.0 in) long	22171-30002	3
Fitting tee, push-in, RoHS, 1.3 cm (0.5 in)	00101-06-00010	1
Fitting elbow, push-in, RoHS, 1.3 cm (0.5 in)	00101-05-00008	3
Fitting union, push-in, RoHS, 1.3 cm (0.5 in)	00101-01-00049	1
Nylon vent plug, RoHS, 1.3 cm (0.5 in)	00201-99-00406	1

**Table 3-4.** Parts for the DC Drain Line

- 2.

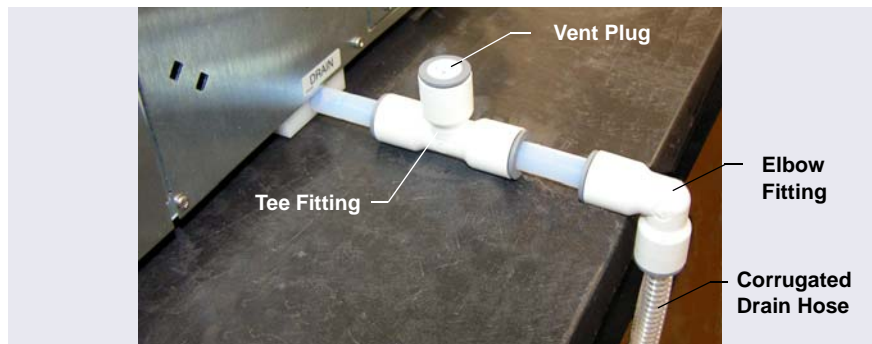


**NOTE** The fittings and shorter tubing pieces are bagged together in the Ship Kit.

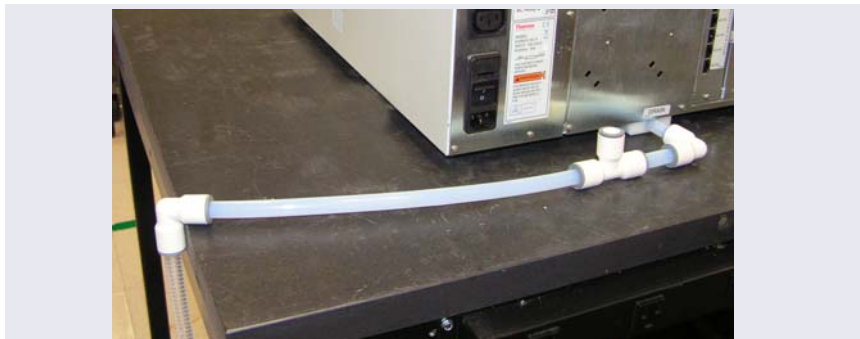


**Figure 3-52.** DC Drain Line Parts

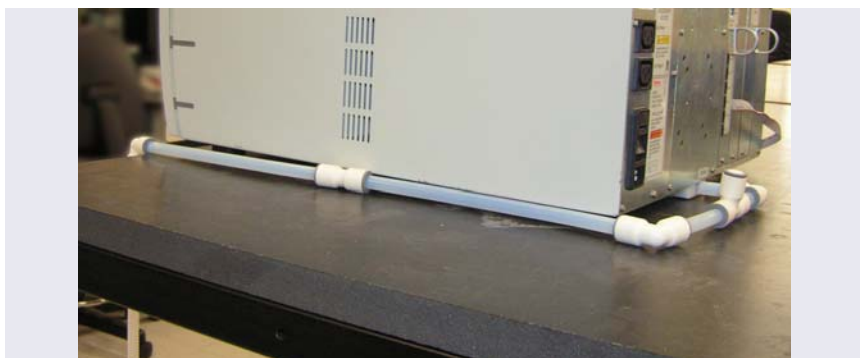
3. The drain line can be assembled in various configurations to accommodate your installation site. The figures below show some typical configurations. You can use one of these configurations or customize the assembly as required.



**Figure 3-53.** Drain Line Routed to Rear of Bench



**Figure 3-54.** *Drain Line Routed to Side of Bench*



**Figure 3-55.** *Drain Line Routed to Front of Bench*

4. Determine how you want to route the drain line to the waste container or drain. Then, lay out parts on the bench to determine which parts will be required. Observe the following guidelines:
  - Use one of the short pieces of tubing to connect to the DC drain port.
  - Position an elbow fitting at the edge of the bench. The corrugated drain hose connects to this fitting. For stability, make sure the horizontal leg of the elbow fitting is supported on the bench.
  - Use the tee fitting in the configuration; it can be placed in any location. Install the vent plug (with the holes facing up) in the open port on the tee.

**NOTE** If the supplied tubing lengths do not fit your installation site, you can cut the tubing to create the length

you need. Make sure to cut the tubing squarely to ensure a good connection between the tubing and the fittings.

5. To assemble the rigid drain line:
  - a. Push the PTFE tubing into the fittings.
  - b. Verify that the black O-ring inside the drain port opening on the DC is fully seated in the groove, and then push the short length of tubing straight into the drain port.

**NOTE** The O-ring inside the drain port ensures a leak-free fit between the drain line and drain port. If the drain line is pushed into the port at an angle, it can force the O-ring out of its groove.

6. Push the corrugated drain hose into the elbow fitting at the edge of the bench. Place the open end of the line into a waste container or appropriate drain.

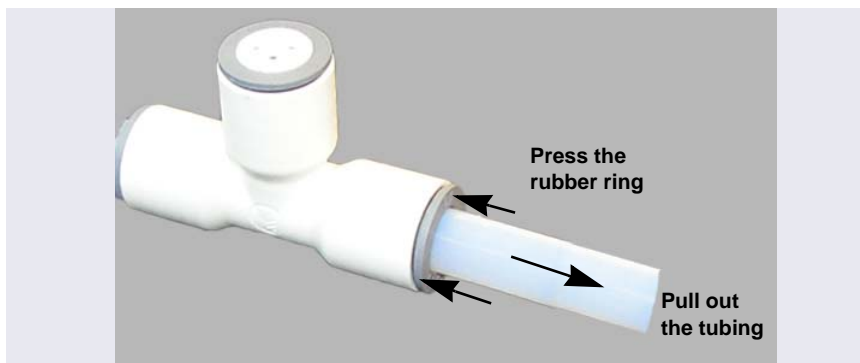
**IMPORTANT**

For correct drainage, make sure the entire rigid drain assembly (from the DC drain port to the edge of the bench) lays flat on the bench.

**Make sure the corrugated drain hose is not bent, pinched, or elevated at any point. Do not allow the end of the drain hose to be submerged in waste liquid.**

### Removing a Tube from a Fitting

After a tube has been pushed fully into a fitting, it is locked in place. To remove the tube, use the fingers of one hand to press the rubber ring on the fitting and simultaneously pull out the tubing with the other hand.



**Figure 3-56.** Removal of a Drain Tube from a Fitting

## 3.14 Degassing the Water

Degas the deionized water that will be used to fill the eluent reservoir. For deionized water specifications for ion chromatography, see [Table 1-1](#).

## 3.15 Setting Up the Reservoirs

The following reservoirs are available for use with the DP/SP:

- 1-liter plastic reservoir (P/N 063291)
- 2-liter plastic reservoir (P/N 062510)
- 4-liter plastic reservoir (P/N 063292)



**Do not use the plastic reservoirs for offline vacuum degassing of eluents. The reservoirs were not designed for this purpose.**



**N'utilisez pas le réservoir en plastique pour le dégazage à vide hors ligne d'éluants. Le réservoir n'a pas été conçu à cette fin.**



Verwenden Sie den Plastikbehälter zum Offline Vakuum-Entgasen von Eluenten. Die Behälter sind dafür nicht ausgelegt.

**IMPORTANT**

Always use ASTM filtered, Type I (or better) (18 megohm-cm) deionized water that meets the specifications in [Table 1-1](#) on [page 13](#) to rinse reservoirs, fill reservoirs used for eluent generation or seal washing, or to manually prepare eluent.

1. Rinse the eluent reservoir with deionized water and then fill it with degassed deionized water. This water will be used to:
  - Flush the system
  - Condition and hydrate consumable devices (Dionex EGC, Dionex CR-TC 600, Dionex ERS, Dionex CRD)
  - Generate eluent (in RFIC-EG systems)

**For non-RFIC-EG systems:** You can prepare the eluent for the application now or wait until after completing the system installation and the IQ. For eluent preparation instructions, refer to the manual for the column that will be installed.

2. Place the reservoir in the Dionex ICS-6000 Eluent Organizer (EO):
  - EO with four 2-liter reservoirs (P/N 072058)
  - EO with two 2-liter reservoirs (P/N 072057)
  - EO without reservoirs (P/N 072059)

**NOTE** If an EO is not available, place the reservoir in appropriate secondary containment.

3. If an end-line filter is not installed, locate the filter (P/N 045987) and install on each reservoir's eluent line. The filters are in the pump ship kit:

Pump Ship Kit	Part Number
DP Ship Kit, Dual-Capillary	072112
DP Ship Kit, Capillary and Analytical	072111
SP Ship Kit, Capillary	072110
DP Ship Kit, Dual-Analytical	062463
SP Ship Kit, Analytical	063342

4. Thoroughly rinse the end-line filters with deionized water.
5. Install the reservoir cap, making sure the end of the line extends to the bottom of the reservoir, and that the filter is submerged in liquid. (This prevents air from being drawn through the eluent lines.) Hand-tighten the cap.

**NOTE** A Thermo Scientific™ Dionex™ High-Pressure Inline Filter (P/N 044105) can be used to remove microparticulate matter from eluent. Connect the inline filter between the pump outlet and the eluent inlet port on the injection valve. For details, see the instructions provided with the inline filter.

6. Locate the 10 mL syringe (P/N 079803) in the pump ship kit and a luer adapter (P/N 024305) in the DC Ship Kit (standard DC, P/N 072011; low-temperature DC, P/N 22171-62000).
7. Using the syringe and luer adapter, draw water through each reservoir **ELUENT BOTTLE OUT** line to flush the line.
8. Connect the liquid lines from the DP/SP to the **ELUENT BOTTLE OUT** line of each reservoir. If an eluent line is not used, retain the cap on the end of the line.

9. The DP/SP does not require pressurized eluent reservoirs. However, Thermo Fisher Scientific recommends pressurizing reservoirs with helium or nitrogen when:
  - Using eluents that are sensitive to contamination.
  - Combining aqueous and nonaqueous components (for example, water and acetonitrile).

For instructions on how to pressurize eluent reservoirs, [Appendix A](#).

**NOTE** If an eluent reservoir will not be pressurized, make sure that one of the ports in the reservoir cap is vented to the atmosphere.

## 3.16 Setting Up the Piston Seal Wash System

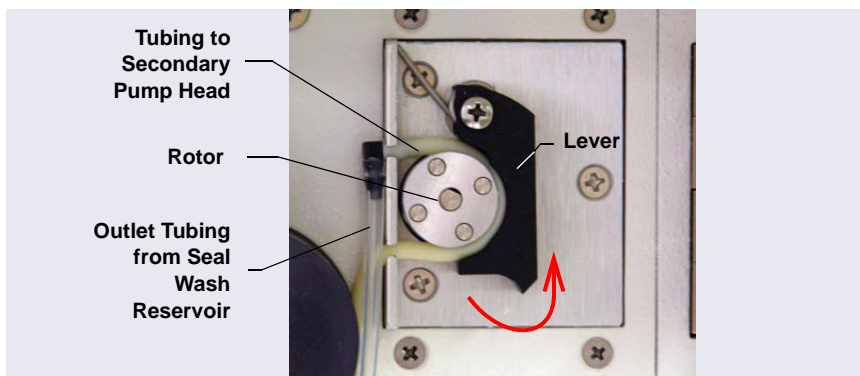
### Notes for Dual Pump (DP) Modules

- The seal wash system is connected to the bottom pump (pump 1) at the factory. To connect the seal wash system to the top pump (pump 2), follow the replumbing instructions in [Section A.2](#).
- To operate a piston seal wash system for both pumps, order one of the following options. Installation instructions are included with each kit.
  - Dual-Serial External Seal Wash Kit (P/N 063518):  
After installation of this option, the DP seal wash pump will pump wash liquid from an external reservoir to pump 2, then to pump 1, and out to waste.
  - Dual-Parallel External Seal Wash Kit (P/N 068661):  
After installation of this option, wash liquid from an external reservoir is pumped through each DP pump separately.

### 3.16.1 Setting Up the System

1. Add ASTM Type I (or better) (18 megohm-cm) filtered and deionized water to the seal wash reservoir (P/N 064155). The liquid level should be between the **Min.** and **Max.** markers on the reservoir label. **Do not overfill the reservoir.**
2. Place the cap on the reservoir and tighten fingertight.

3. Insert the reservoir into the holder on the component panel.
4. Check that the tubing is engaged in the peristaltic pump (see [Figure 3-57](#)). If it is not, lift the lever on the peristaltic pump to the right, insert the tubing neatly between the lever and the rotor, and release the lever to secure the tubing.



**Figure 3-57.** Peristaltic (Piston Seal Wash) Pump

### 3.16.2 Activating the Piston Seal Wash Function

You can use either Chromeleon or the ICS-6000 App to activate the piston seal wash function.

#### For Chromeleon operation:

1. Open the Chromeleon ePanel Set.
2. Press the **F8** key to open the Command window.
3. Select the pump name.
4. Click the **Properties** tab in the right pane of the window.
5. Select the **RearSealWashSystem** property and select the **Interval** option.

### 3.17 Priming the Pump

Before priming, verify that the following tasks have been done:

- Eluent reservoirs are filled.

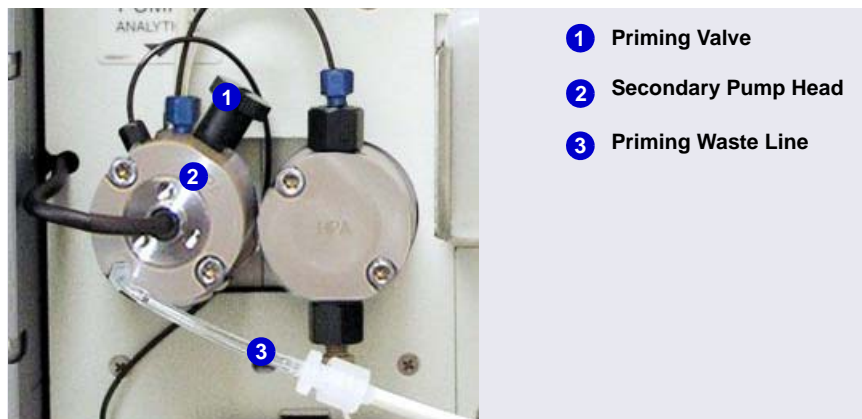


- Reservoir caps are installed and hand-tightened.
  - Liquid lines from the pump to the reservoir caps are connected.
  - (Optional) Piston seal wash system is set up.
  - (Optional) Reservoirs are pressurized.
1. Place the waste line from each pump priming valve (see [Figure 3-58](#)) into a waste container or appropriate drain.
  2. You can use either Chromeleon or the ICS-6000 App to prime the pump.
    - For Chromeleon operation: On the ePanel Set, click the **Pump\_ECD** tab.
    - For ICS-6000 App operation: Tap the **PUMP** button on the Home page to open the Pump page.
  3. Open the priming valve on the secondary pump head (see [Figure 3-58](#)) by turning the knob one-half turn counterclockwise.

**IMPORTANT**

Open or close the priming valve only when the system pressure is less than 0.7 MPa (100 psi).

**NOTE** If the priming valve is opened too much, air is drawn through the valve and air bubbles can be seen exiting the waste line.



**Figure 3-58.** DP/SP Priming Valve

4. On the Chromeleon ePanel Set, click the pump tab.
  5. **Gradient pump only:** Enter 100% for the channel (A, B, C, or D) to be primed.
  6. Set the **Purge Rate** to 2.0 mL/min for a capillary IC pump and 6.0 mL/min for an analytical IC pump. Set the **Duration** to 1800 s.
  7. Start the priming flow.
    - For Chromeleon operation: Click **Prime** on the ePanel. A warning message asks you to verify that the priming valve is open. After doing so, click **Execute despite warnings**.
    - For ICS-6000 App operation: On the Pump page, in the PRIME group, tap **ON**.
  8. Prime the pump until all air is purged and no air bubbles can be seen exiting the waste line. Click the **Prime** button to stop priming.
- NOTE** Priming will stop automatically after the number of seconds specified in the **Duration** box is reached.
9. **Gradient pump only:** To prime additional eluent lines, select another eluent channel and repeat the priming procedure.
  10. Close the priming valve by turning the knob clockwise. Tighten no more than fingertight.

**IMPORTANT**

Do not use any tools to tighten the priming valve! Overtightening may destroy the cap seal. Open or close the priming valve only when the system pressure is down.

### 3.18 Checking the Conductivity of the Water

If the system is configured for conductivity detection, check the background conductivity of the water that you plan to use for eluent generation through the cell.

**IMPORTANT**

Always use ASTM filtered, Type I (or better) (18 megohm-cm) deionized water that meets the specifications in [Section 1.5](#) to rinse reservoirs, fill reservoirs used for eluent generation or piston seal washing, or manually prepare eluent.

1. Connect a short piece of tubing to the CD cell inlet port.
2. Connect a luer adapter to the tubing and use a 1 mL syringe to flush a fresh sample of the water that you plan to use for eluent generation through the cell.

**NOTE** A luer adapter is shipped with the EGC.

3. Verify that the conductivity is 1  $\mu\text{S}$  or below.

If the conductivity is greater than 1  $\mu\text{S}$ , refill the reservoir with fresh water (or use water from a different source) and recheck the conductivity.



## 4 • System Plumbing

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This section provides instructions for plumbing the Dionex ICS-6000 system. Instructions for setting up and installing electrolytic devices and columns and equilibrating the system are also included.

If you plan to use IC PEEK Viper fittings, specific tubing assemblies are required for the various system plumbing connections. For details, refer to Chapter 6 of the Dionex ICS-6000 operator's manual.

- Instructions for plumbing a capillary IC system begin below.
- For instructions for plumbing an analytical IC system, go to [Section 4.2](#).

Capillary  
IC

### 4.1 Plumbing a Capillary IC System

This section describes how to plumb the components of a capillary IC system.

Capillary  
IC

#### 4.1.1 Tubing and Fittings

##### Dionex IC Cube Tubing Kit

The Dionex ICS-6000 IC Cube Ship Kit (P/N 072003) includes a Dionex IC Cube Tubing Kit (P/N 072186) for each IC Cube installed in the system. The tubing kit contains precision cut tubing and the fittings required for installing various capillary column configurations.

### Pre-Assembled Tubing Chain

A pre-assembled tubing chain is included in the Dionex ICS-6000 IC Cube Ship Kit (P/N 072003). The chain includes several lengths of tubing connected to each other with unions (see [Figure 4-1](#)). The tubing will be used to plumb the pump outlet, Dionex EGC, Dionex CR-TC 600, and EG degas.

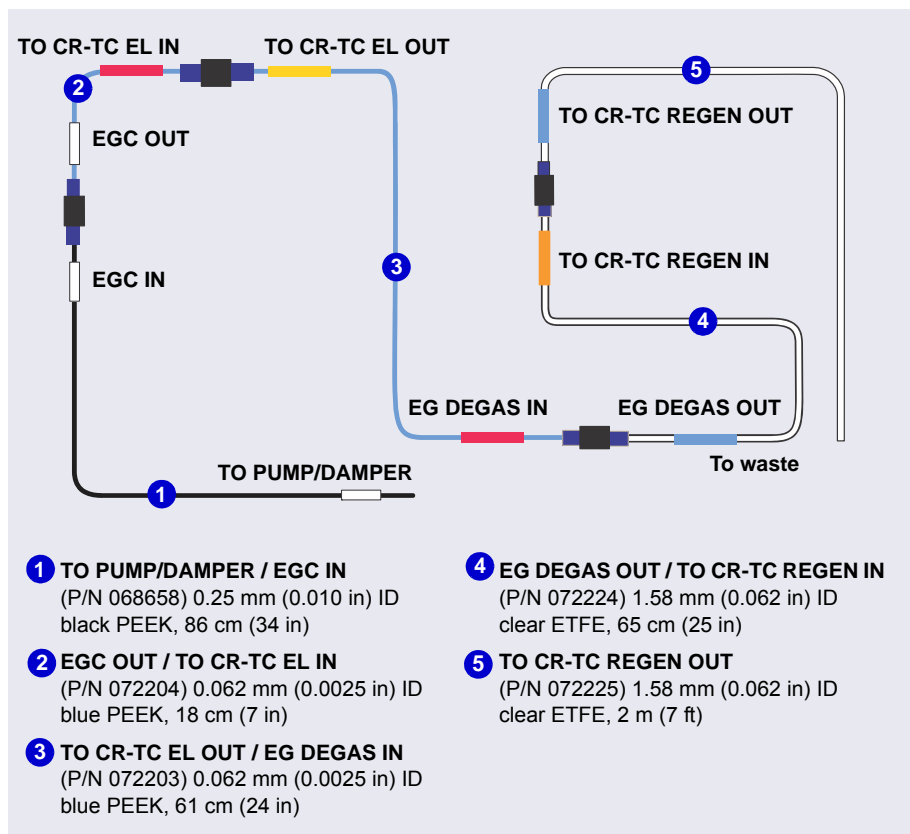


Figure 4-1. Pre-Assembled Tubing Chain

## 4.1.2 System Plumbing Checklists

The system plumbing steps and the order in which they are performed vary slightly, depending on the detector to be installed. The following checklists outline the steps for each detection type.

CD System Plumbing Checklist for Capillary IC	Page
<input type="checkbox"/> Install and flush the trap column (KOH-based separations only)	<a href="#">page 112</a>
<input type="checkbox"/> Connect the pump outlet	<a href="#">page 113</a>
<input type="checkbox"/> Fill and flush the regenerant path	<a href="#">page 113</a>
<input type="checkbox"/> Check the background conductivity	<a href="#">page 115</a>
<input type="checkbox"/> Complete the IQ and system function test	<a href="#">page 115</a>
<input type="checkbox"/> Complete the OQ (optional)	<a href="#">page 116</a>
<input type="checkbox"/> Flush and condition the electrolytic devices	<a href="#">page 118</a>
<input type="checkbox"/> Flush and install the columns	<a href="#">page 124</a>
<input type="checkbox"/> Complete the plumbing	<a href="#">page 130</a>
<input type="checkbox"/> Connect waste lines to the gas separator waste tube	<a href="#">page 155</a>
<input type="checkbox"/> Equilibrate the system	<a href="#">page 157</a>

ED System Plumbing Checklist for Capillary IC	Page
<input type="checkbox"/> Install the ED amperometry cell	<a href="#">page 169</a>
<input type="checkbox"/> Connect the pump outlet	<a href="#">page 113</a>
<input type="checkbox"/> Fill and flush the liquid path	<a href="#">page 116</a>
<input type="checkbox"/> Flush and condition the electrolytic devices	<a href="#">page 118</a>
<input type="checkbox"/> Complete the IQ and system function test	<a href="#">page 115</a>
<input type="checkbox"/> Complete the OQ (optional)	<a href="#">page 116</a>
<input type="checkbox"/> Flush and install the columns	<a href="#">page 124</a>
<input type="checkbox"/> Complete the plumbing	<a href="#">page 132</a>
<input type="checkbox"/> Connect waste lines to the gas separator waste tube	<a href="#">page 155</a>
<input type="checkbox"/> Equilibrate the system	<a href="#">page 157</a>

### 4.1.3 Installing the Trap Column for KOH-Based Separations

Installation of a Thermo Scientific Dionex ASTC 500 Anion Trap Column (P/N 085359) is recommended for all KOH-based separations performed on capillary systems. The Dionex ASTC 500 trap column removes trace contaminants from deionized water. Install the trap column between the pump pulse damper and the Dionex EGC inlet.

1. Locate the trap column and the trap column tubing assembly (P/N 078497) in the IC Cube Ship Kit (P/N 072003).
2. Connect one end of the Dionex ASTC 500 tubing assembly (P/N 078497) to the pulse damper outlet (see [Figure 4-2](#)) and connect the other end to the trap column inlet.
3. (Optional) Connect a temporary waste line to the outlet of the trap column. Use the **TO CR-TC REGEN OUT** line, which is part of the pre-assembled tubing chain (see [Figure 4-1](#)).
4. Set the pump **Purge** flow rate to 2.0 mL/min and the **Duration** to 1800 s. Click **Prime**. Do not open the purge valve (you can cancel the Ready Check message that appears). The trap column is flushed for 30 minutes.

**NOTE** When flushing is complete, there should be no bubbles present and the effluent should be colorless.

5. On the pre-assembled tubing chain (see [Figure 4-1](#)), connect the black PEEK tubing labeled **TO PUMP/DAMPER** to the outlet of the trap column. Keep the remaining tubing in the chain connected.

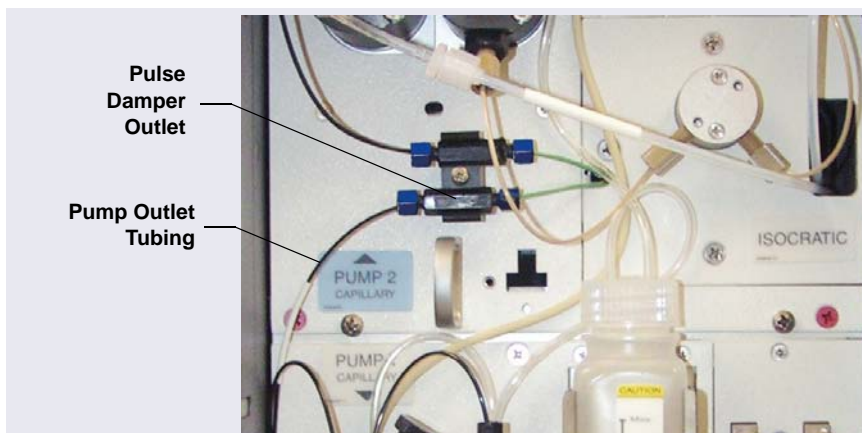


Capillary  
IC

#### 4.1.4 Connecting the Pump Outlet

If you did not install the Dionex ASTC 500 Anion Trap Column (see [Section 4.1.3](#)), connect the pump outlet tubing directly to the pump pulse damper.

On the pre-assembled tubing chain (see [Figure 4-1](#)), connect the black PEEK tubing labeled **TO PUMP/DAMPER** to the pump pulse damper outlet. Keep the remaining tubing in the chain connected.



**Figure 4-2.** Capillary Pump Outlet Connection

Capillary  
IC

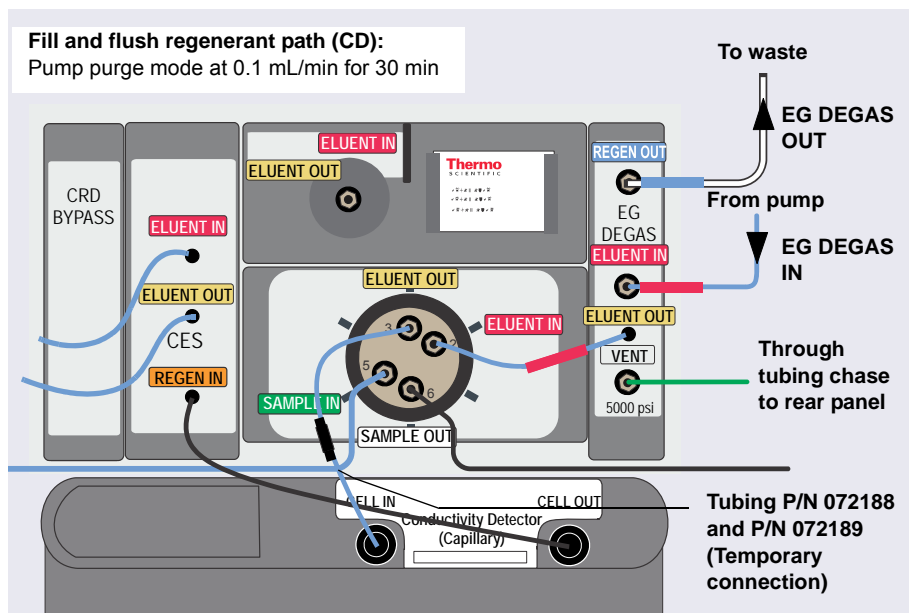
#### 4.1.5 Filling and Flushing the CD Regenerant Path

**NOTE** If you are installing a system with an ED, go on to [“Filling and Flushing the ED Liquid Path”](#) on page 116.

If you are installing a system with a CD, follow the steps below to fill and flush the suppressor and CRD regenerant pathways, including the connecting path in the interior of the Dionex ICS-6000 IC Cube.

1. If you have not already done so, install the CES cartridge and CRD cartridge (if used) in the Dionex ICS-6000 IC Cube.
2. In the Dionex ICS-6000 IC Cube Tubing Kit (P/N 072186), locate the following two tubing assemblies: 65 mm (2.56 in) precision cut (P/N 072188) and 125 mm (4.92 in) precision cut, labeled **VALVE PORT 3** (P/N 072189).

- Use the two tubing assemblies to connect the injection valve **ELUENT OUT** port to the cell **IN** port (see [Figure 4-3](#)).



**Figure 4-3.** Flow Schematic for Filling and Flushing the Regenerant path in a Capillary CD System

- Remove the union between the **EG DEGAS IN** and **EG DEGAS OUT** lines on the pre-assembled tubing chain (see [Figure 4-1](#)). Connect the lines to their respective ports on the EG degas cartridge.
- Connect the **EG DEGAS ELUENT OUT** line to the injection valve **ELUENT IN** port.
- Set the pump **Purge** rate to 0.1 mL/min and the **Duration** to 1800 s. Click **Prime**. Do not open the purge valve (you can cancel the Ready Check message that appears). The regenerant path is flushed for 30 minutes.

**NOTE** The pump pressure is typically 3 to 5 MPa (400 to 700 psi) at 0.100 mL/min.

- Monitor the waste flow from the EG degas. When no bubbles are present, the path is completely filled and flushed.

8. Check the backpressure to confirm that the regenerant path is ready:
  - a. Note the pump pressure.
  - b. Disconnect the CES **REGEN IN** from the CD **OUT** (the high-pressure side) and note the difference in the pump pressure.
  - c. If the difference is less than 0.7 MPa (100 psi), the low-pressure flow path is ready and you can proceed to the next step.

**NOTE** If the pressure difference is greater than 0.7 MPa (100 psi), refer to the operator's manual for troubleshooting information on high system backpressure.

Capillary  
IC

#### 4.1.6 Checking the Background Conductivity

If you are installing a CD, check the background conductivity before continuing.

1. Set the pump **Purge** flow rate to 0.03 mL/min and the **Duration** to 900 s. Click **Prime**.
2. Monitor the background conductivity. Verify that the conductivity is <1  $\mu$ S before proceeding.
3. Remove the tubing assemblies between the injection valve **ELUENT OUT** and the CD **IN**.

Capillary  
IC

#### 4.1.7 Completing the Installation Qualification

Complete the Installation Qualification (IQ) and system function test to confirm that the Dionex ICS-6000 system is correctly installed. For instructions, refer to *Dionex ICS-5000/Dionex ICS-6000 System Installation Qualification* (Document No. 065404), provided in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC).

**NOTE** If you are installing an ED, fill and flush the liquid path (see [Section 4.1.9](#)) and set up the eluent generator (see [Section 4.1.10](#)) before completing the IQ and performing the system function test. The system function test for an ED requires KOH eluent. The test for a CD requires deionized water only.

Capillary IC **4.1.8 Completing the Operational Qualification**

Complete the Operational Qualification (OQ) procedure, if purchased for your system.

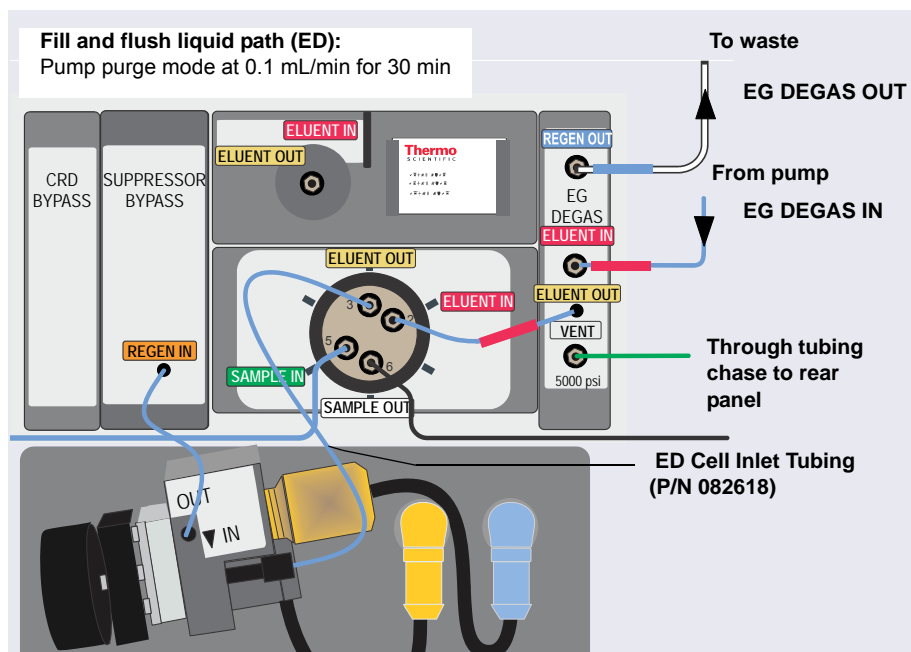
**NOTE** For an ED system, complete the OQ after filling and flushing the liquid path, setting up the EG, and performing the system function test.

Capillary IC **4.1.9 Filling and Flushing the ED Liquid Path**

**IMPORTANT** Before beginning the fluidic connections, install the working electrode and the reference electrode in the cell. For instructions, see [“Installing the ED Amperometry Cell” on page 169.](#)

1. Locate the cell inlet line and fittings (P/N 074221) which come in the ED Cell Inlet Tubing Kit shipped with the cell. The cell inlet line is a 23 cm (9.00 in) length of blue capillary tubing (P/N 082618).

2. Connect the cell inlet line as shown in [Figure 4-4](#). Use the long 10-32 fitting bolt (P/N AAA-057227) and split-cone ferrule (P/N 062978) for the cell IN connection.



**Figure 4-4.** Flow Schematic for Filling and Flushing the ED Liquid Path

3. Remove the **EG DEGAS IN** and **EG DEGAS OUT** lines from the pre-assembled tubing chain (see [Figure 4-1](#)) and connect them to their respective ports on the EG degas cartridge.
4. Connect the EG degas **ELUENT OUT** line to the injection valve **ELUENT IN** port.
5. Set the pump **Purge** rate to 0.1 mL/min and the **Duration** to 1800 s. Click **Prime**. Do not open the purge valve (you can cancel the Ready Check message that appears). The regenerant path is flushed for 30 minutes.

**NOTE** The pump pressure is typically 3 to 5 MPa (400 to 700 psi) at 0.100 mL/min.

6. Monitor the waste flow from the EG degas. When no bubbles are present, the path is completely flushed and filled.

7. Check the backpressure to confirm that the liquid path is ready:
  - a. Note the pump pressure.
  - b. Disconnect the Suppressor Bypass **REGEN IN** from the ED cell **OUT** (the high-pressure side) and note the difference in the pump pressure.
  - c. If the difference is  $<0.7$  MPa (100 psi), the low-pressure flow path is ready and you can proceed to the next step.

**NOTE** If the pressure difference is greater than 0.7 MPa (100 psi), refer to the operator's manual for troubleshooting information on high system backpressure.

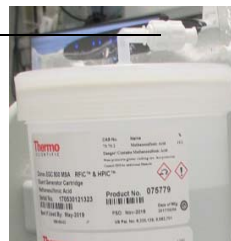
Capillary  
IC

### 4.1.10 Flushing and Conditioning the Electrolytic Devices

#### Preparing the Dionex EGC

1. Verify that the vent fitting is tightened. This prevents cartridge leaks during installation.
2. While holding the Dionex EGC with the ports on the bottom, shake the cartridge vigorously and tap it with the palm of your hand 10 to 15 times to dislodge air bubbles that may be trapped in the chamber.
3. Remove the fitting plugs from the **EGC IN** and **EGC OUT** ports.
4. Unscrew the vent fitting from the top of the cartridge and install the luer fitting shipped with the Dionex EGC. Save the vent fitting.

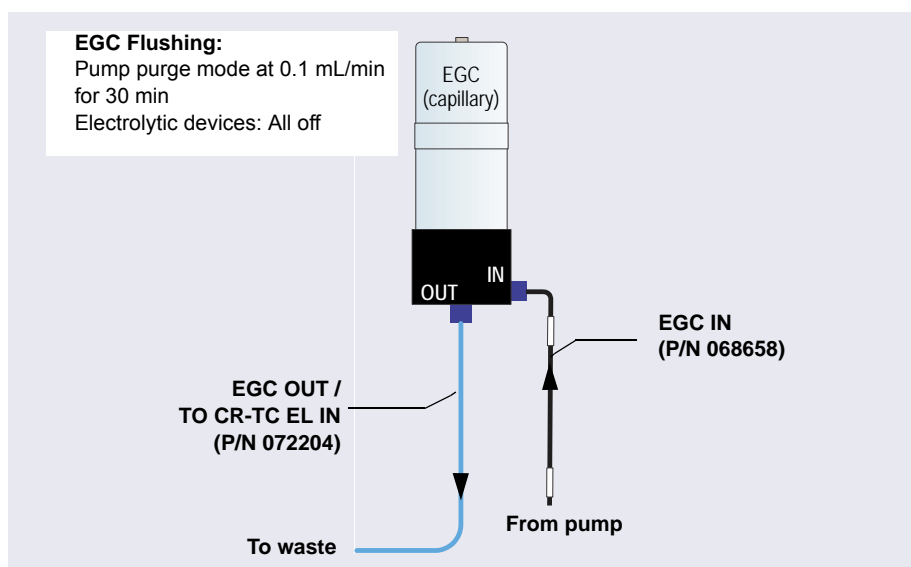
Luer  
Fitting



**IMPORTANT**

To ensure proper ventilation, always install the luer fitting before operation. If you need to remove the Dionex EGC from the system, re-install the vent fitting to prevent leaks.

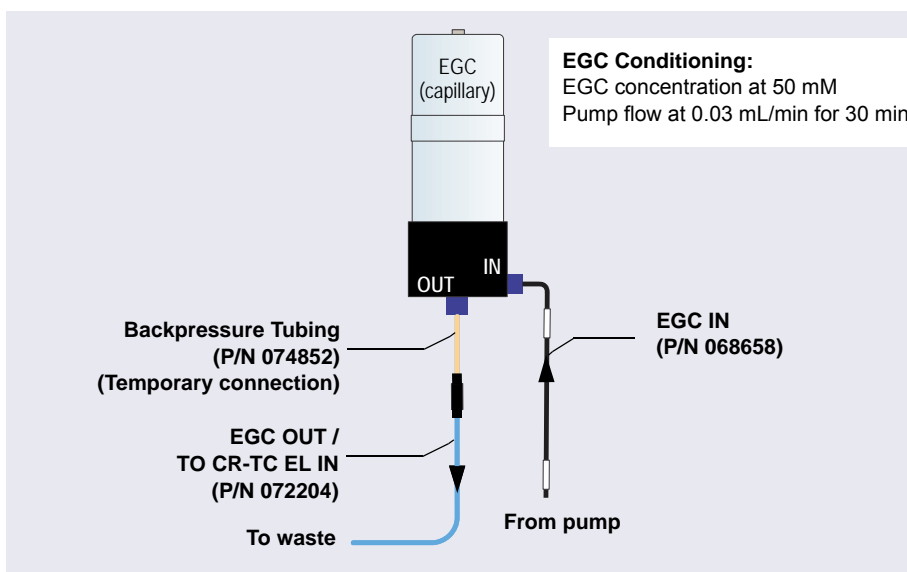
## Flushing the Dionex EGC



**Figure 4-5.** Flow Schematic for Flushing the Dionex EGC (Capillary)

1. Connect the **EGC IN** line to the **EGC IN** port.
2. Set the pump **Purge** rate to 0.1 mL/min and the **Duration** to 1800 s. Click **Prime**. Wait for fluid to flow from the **EGC OUT** port on the bottom of the Dionex EGC.
3. Connect the **EGC OUT** line to the **EGC OUT** port. Direct the open end of the tubing to waste. The Dionex EGC will be flushed for 30 minutes.

## Conditioning the Dionex EGC



**Figure 4-6.** Flow Schematic for Conditioning the Dionex EGC (Capillary)

1. Locate the backpressure tubing (P/N 074852) in the IC Cube Ship Kit (P/N 072003) and connect it between the **EGC OUT** line and the **EGC OUT** port.
2. Select the pump flow rate.
  - For Chromeleon operation: On the ePanel, set the flow rate to 0.03 mL/min. Click **On** to turn on the pump.
  - For mobile app operation: On the Home page, set the flow rate to 0.03 mL/min and then tap the **ON** button.
3. Verify that the luer adapter is installed on the top of the Dionex EGC to allow venting of the Dionex EGC.

**IMPORTANT**

To ensure proper ventilation, always install the luer fitting on the top of the Dionex EGC before operation. If you need to remove the Dionex EGC from the system, install the vent fitting plug to prevent leaks.

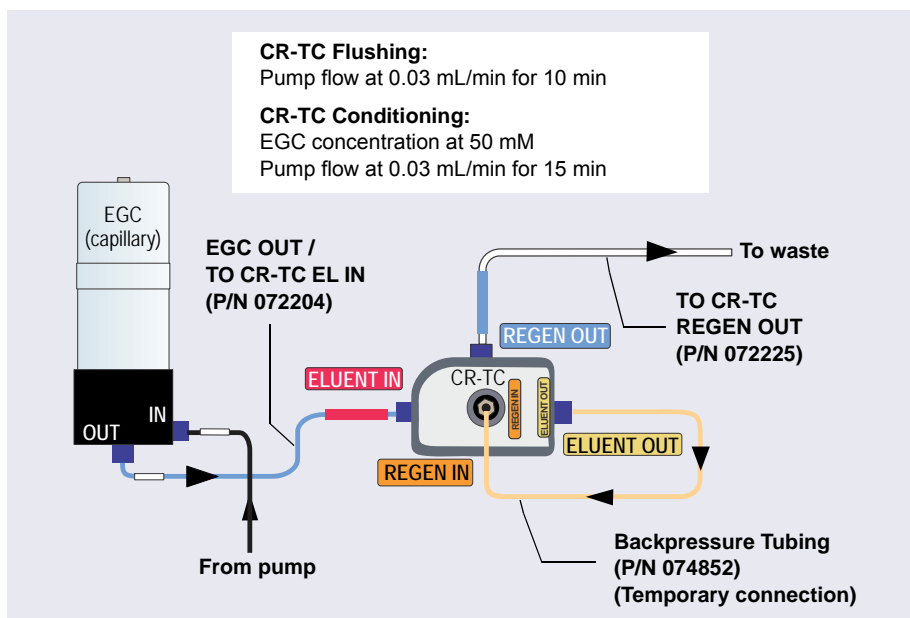
4. On the Eluent Generator ePanel, set the EG concentration to 50 mM and turn on the Dionex EGC power. Verify that the Dionex CR-TC 600 voltage is off and the suppressor current is off.



- Condition the Dionex EGC for 30 minutes and then turn off the Dionex EGC and the pump flow.
- Remove the backpressure tubing and reconnect the **EGC OUT** line.

### Flushing the Dionex CR-TC 600

- Remove the plugs from the ports on the Dionex CR-TC 600.
- Connect the plumbing for flushing the Dionex CR-TC 600 as shown in [Figure 4-7](#). The same plumbing is also used for conditioning the Dionex CR-TC 600.



**Figure 4-7.** Flow Schematic for Flushing and Conditioning the Dionex CR-TC 600 (Capillary)

- On the Eluent Generator ePanel in Chromeleon, verify that the Dionex EGC current is off and the Dionex CR-TC 600 voltage is off.
- Set the pump **Flow** rate to 0.03 mL/min and turn on the pump. Flush the Dionex CR-TC 600 for 10 minutes. Verify that liquid is flowing steadily from the Dionex CR-TC 600 **REGEN OUT** line.

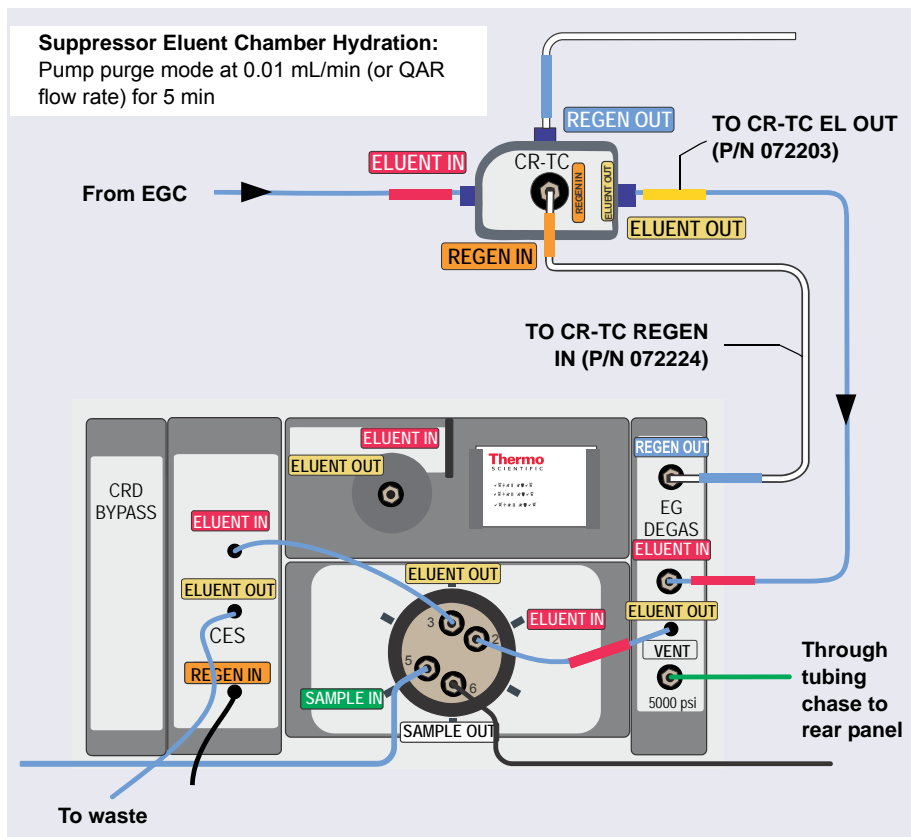
### **Conditioning the Dionex CR-TC 600**

1. Verify that the pump **Flow** rate is 0.03 mL/min.
2. On the Eluent Generator ePanel in Chromeleon, set the EG concentration to 50 mM and turn on the Dionex EGC current and the Dionex CR-TC 600 voltage. Condition the Dionex CR-TC 600 for 15 minutes. Bubbles will be present in the Dionex CR-TC 600 **REGEN OUT** line.
3. Turn off the Dionex EGC current, the Dionex CR-TC 600 voltage, and the pump flow. Remove the backpressure tubing.

**NOTE** If you are installing an ED system, complete the IQ checklist, system function test, and OQ (if purchased) now.

### Hydrating the Suppressor Eluent Chamber

1. Connect the plumbing for suppressor hydration as shown in [Figure 4-8](#).



**Figure 4-8.** Flow Schematic for Hydrating the Suppressor Eluent Chamber in a Capillary IC System

**NOTE** If a Dionex CRD is installed, connect the **CES ELUENT OUT** line to the **CRD ELUENT IN** port and direct the **CRD ELUENT OUT** line to waste.

2. Set the pump **Purge** rate to 0.01 mL/min or select the flow rate specified in the Quality Assurance Report (QAR) shipped with the column. Set the **Duration** to 300 s and click **Prime**. Using purge mode prevents low-pressure alarms.

3. Verify that the Dionex EGC current, the Dionex CR-TC 600 voltage, and the suppressor current are off.
4. Hydrate the suppressor eluent chamber for 5 minutes and then turn off the pump flow.
5. Disconnect the Dionex CES **ELUENT IN** line from the injection valve to remove the Dionex CES from the flow path during column flushing.

### **4.1.11 Flushing and Installing the Columns**

**NOTE** For detailed information about a column, refer to the column manual.

#### **Flushing the Capillary Columns**

1. Locate the Dionex IC Cube Tubing Kit (P/N 072186) in the IC Cube Ship Kit (P/N 072003) or the Viper tubing assembly. The kit contains precision cut tubing and the fittings required for installing various column configurations.
2. To flush the guard column (if included):
  - a. Connect the 125 mm (4.92 in) precision cut tubing, labeled **VALVE PORT 3** (P/N 072189) or the 0.18 mm (0.007 in) ID Viper tubing assembly (P/N 088909), to the **ELUENT OUT** port (3) of the injection valve. Connect the other end to the guard column.
  - b. Select the flow rate specified in the Quality Assurance Report (QAR) shipped with the column and turn on the pump.
  - c. Set the Dionex EGC current to the setting specified in the QAR and turn on the Dionex EGC current. Verify that the Dionex CR-TC 600 is off.
  - d. Flush the guard column to waste for 10 minutes.
  - e. Connect the separator column to the guard column, using the 65 mm (2.56 in) precision cut tubing (P/N 072188).
3. To flush the separator column:
  - a. If you did not install a guard column, connect the 210 mm (8.27 in) precision cut tubing, labeled **VALVE PORT 3** (P/N 072187), to the

**ELUENT OUT** port (3) of the injection valve. Connect the other end to the separator column.

- b. Verify that the Dionex CR-TC 600 is off and the pump flow and Dionex EGC are set to the conditions specified in the QAR.
- c. Flush the separator column to waste for 20 minutes.

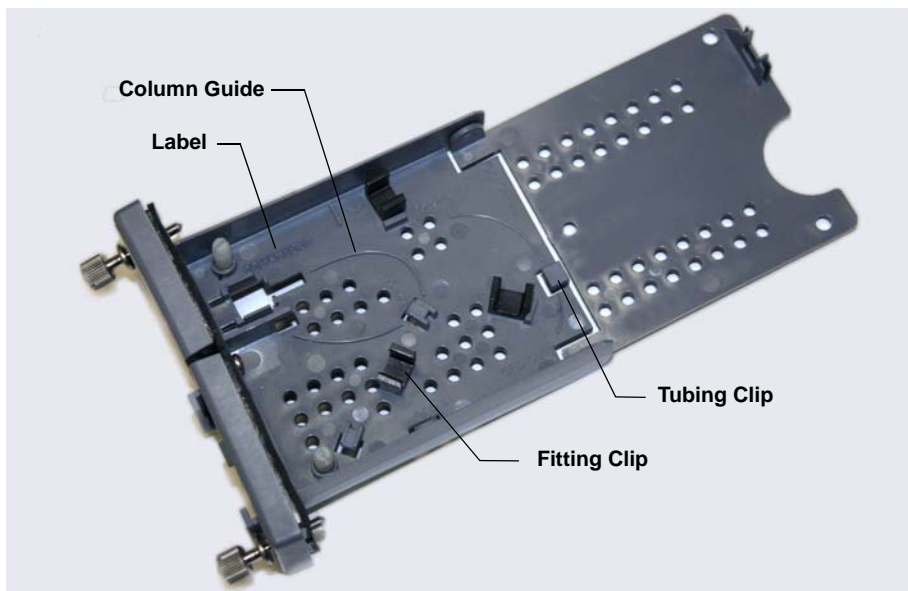
### Installing the Columns in the Capillary Column Tray

1. Temporarily disconnect the column inlet tubing from the **ELUENT OUT** port (3) of the injection valve.
2. Cut off the label from the separator column along the dotted line and slide the label into the holder on the front of the tray (see [Figure 4-9](#)).



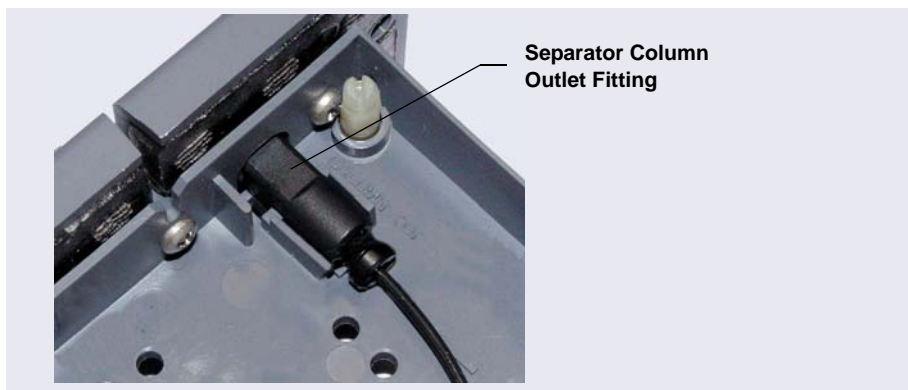
**Figure 4-9.** Capillary Column Tray with Column Label

3. Raise the lid of the column tray to open it. Note the fitting and tubing clips on the base of the tray (see [Figure 4-10](#)). To indicate the placement of columns in the tray, labels and tubing guides are molded into the tray.



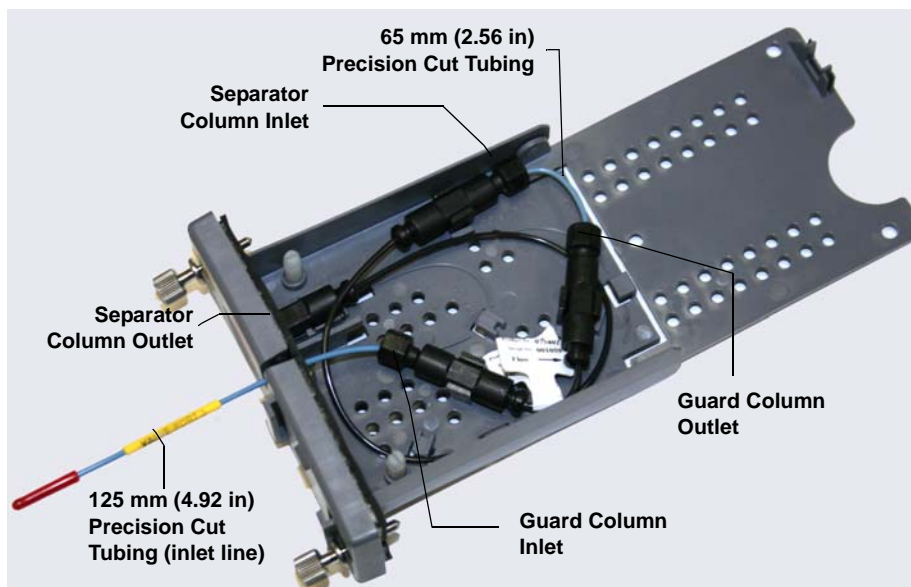
**Figure 4-10.** Empty Capillary Column Tray

4. Orient the separator column's outlet fitting with a flat side facing up and push the fitting into the opening at the front of the column tray until it stops. Press the fitting down into the clip (see [Figure 4-11](#)).

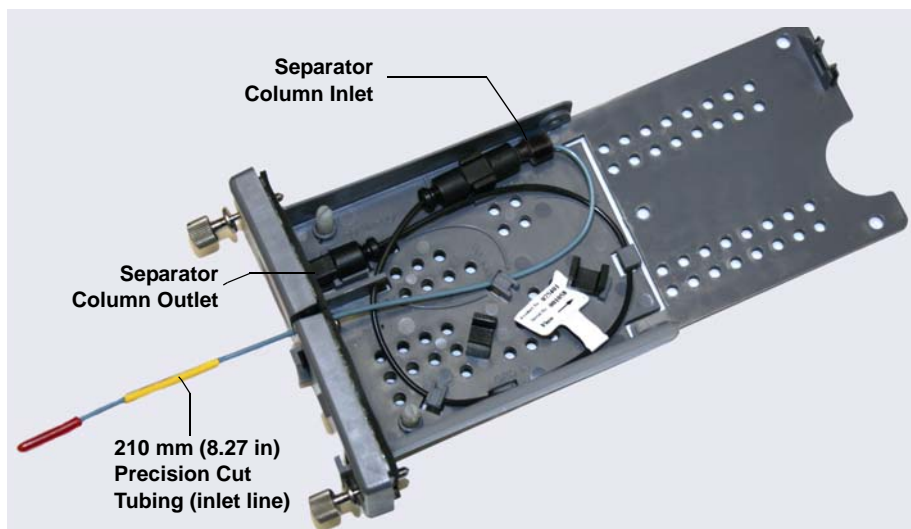


**Figure 4-11.** Separator Column Outlet Fitting in Capillary Column Tray

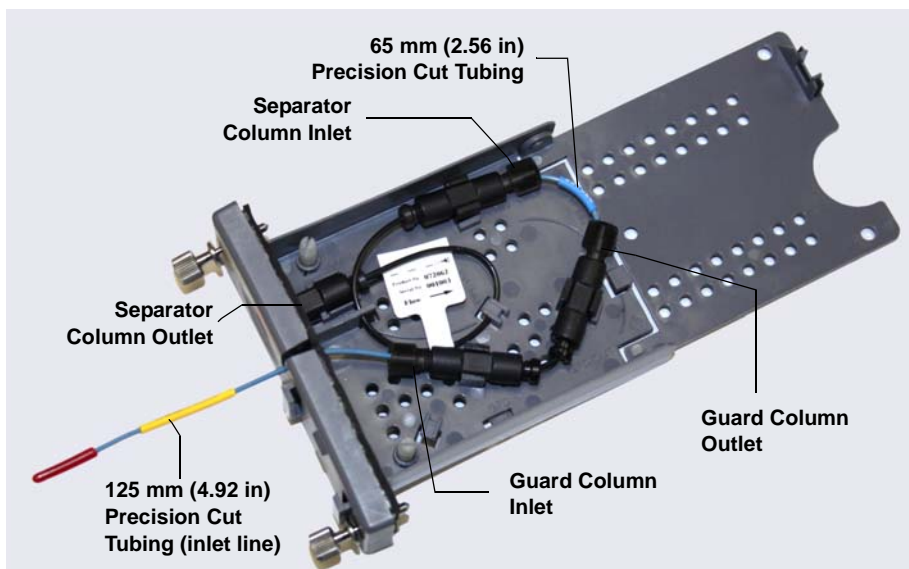
5. Coil the columns and precision cut tubing inside the cartridge as required for your configuration (see [Figure 4-12](#) through [Figure 4-15](#)). Secure the tubing under the tubing clips and press the fittings onto the fitting clips.



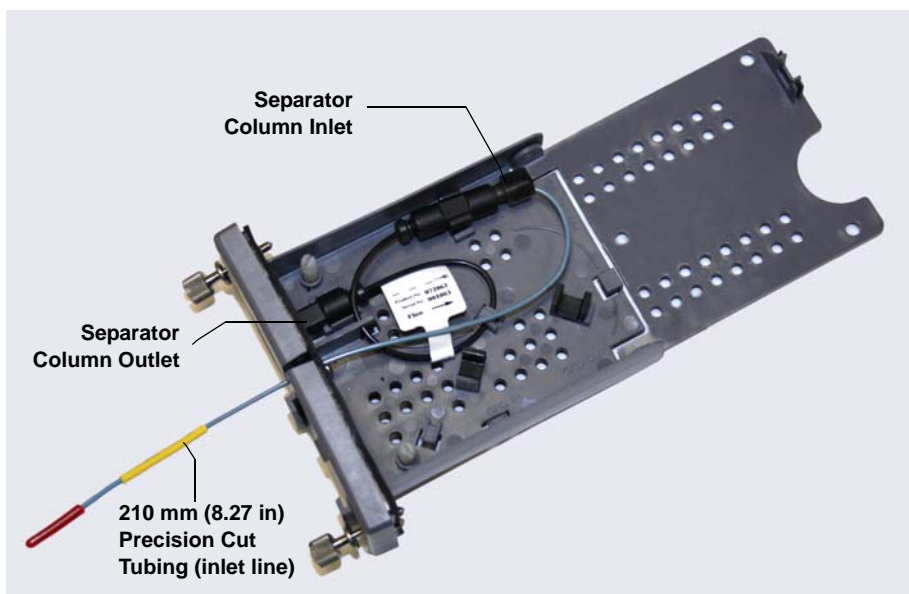
**Figure 4-12.** 250 mm Separator Column and 50 mm Guard Column Installed in Capillary Column Tray



**Figure 4-13.** 250 mm Separator Column Installed in Capillary Column Tray



**Figure 4-14.** 150 mm Separator Column and 35 mm Guard Column Installed in Capillary Column Tray



**Figure 4-15.** 150 mm Separator Column Installed in Capillary Column Tray

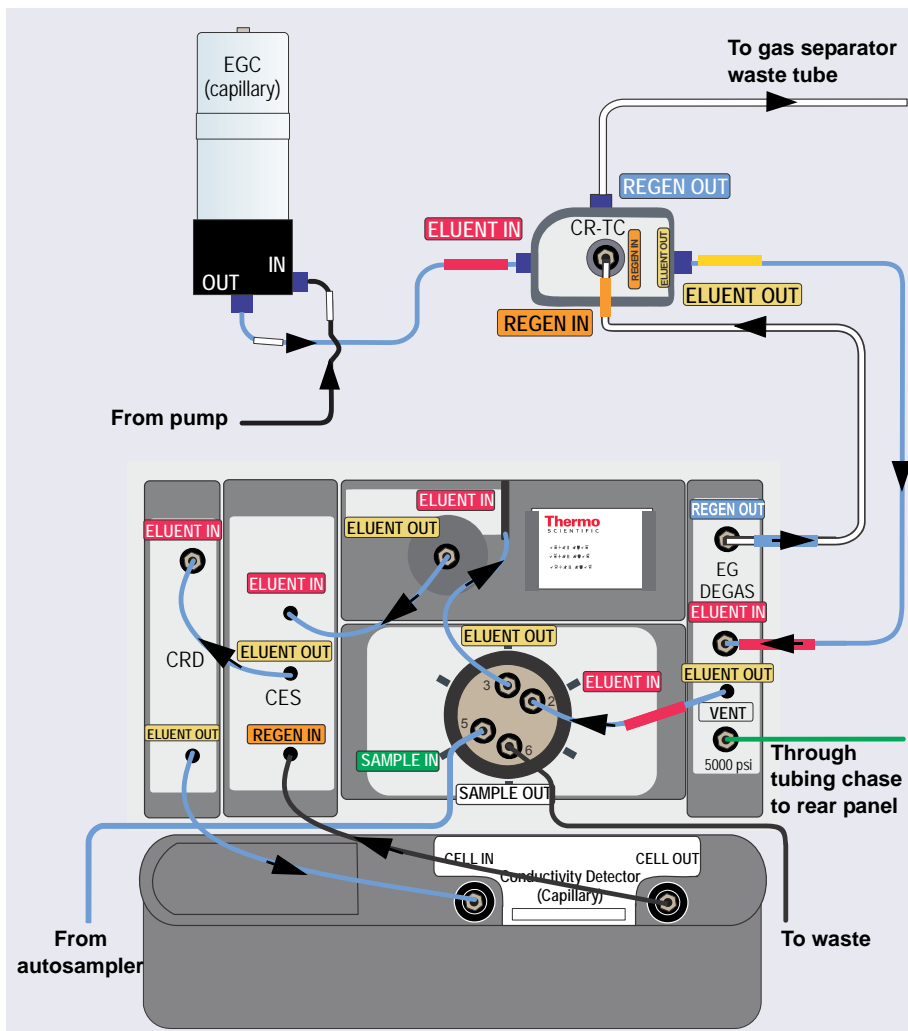


6. Press the inlet line down into the slot on the front of the column tray and close the lid (you should hear a click).

**NOTE** The column tray lid should close easily. If not, do not force it. Open the lid and verify that the columns and tubing are installed correctly and secured in the clips.

7. Slide the column tray into the Dionex ICS-6000 IC Cube column heater and tighten the two thumbscrews.
8. Reconnect the column inlet tubing to the injection valve.

### 4.1.12 Completing the Plumbing for Conductivity Detection

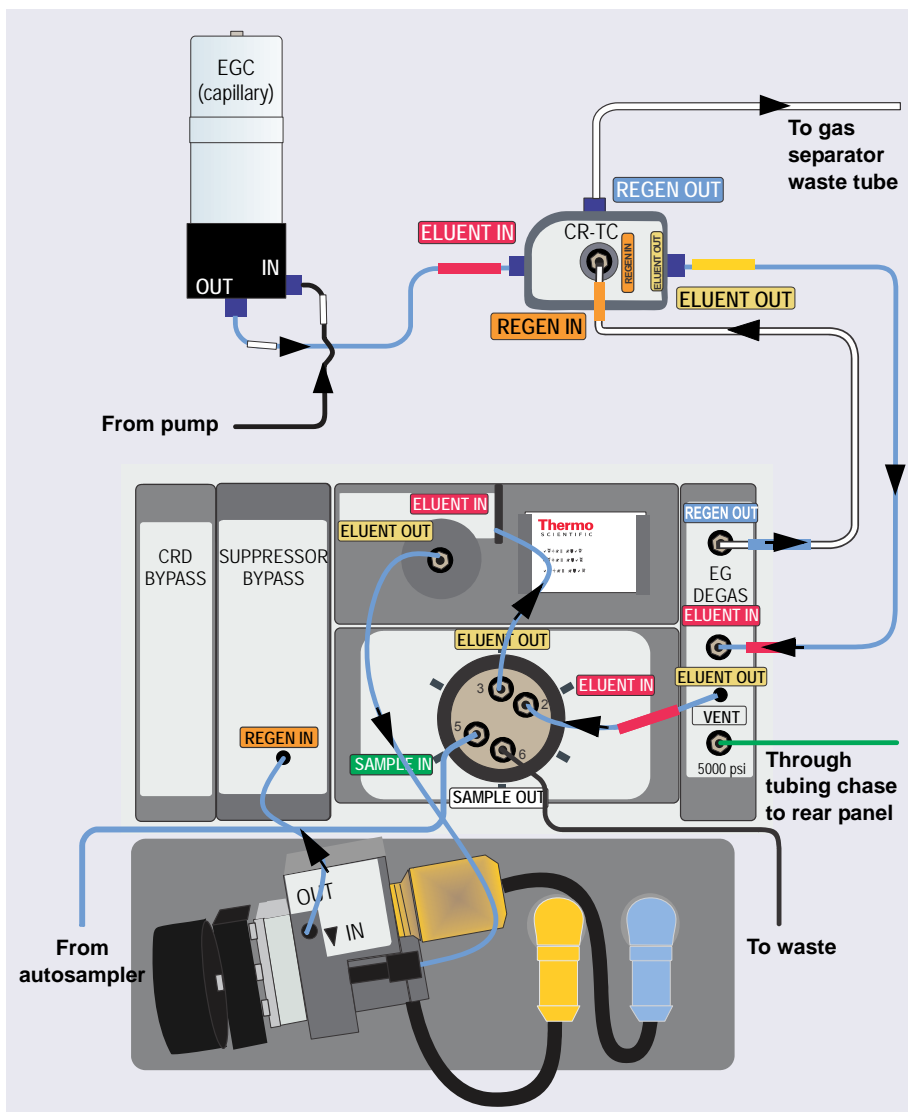


**Figure 4-16.** Flow Schematic for Equilibration and Operation of a Conductivity Detection System with a CRD Installed

1. Connect the CES **ELUENT IN** line to the column **ELUENT OUT** port (see [Figure 4-16](#)).

2. If a CRD is installed, connect the CES **ELUENT OUT** line to the CRD **ELUENT IN** port and connect the CRD **ELUENT OUT** line to the CD **IN** port.  
If a CRD is *not* installed, connect the Dionex CES **ELUENT OUT** line to the CD **IN** port.
3. Connect the waste line from the Dionex CR-TC 600 **REGEN OUT** port to the gas separator waste tube (see [Section 4.3](#)).
4. Route the IC Cube tubing as described in [Section 4.1.14](#). The flow path is ready for equilibration (see [Section 4.4](#)).

### 4.1.13 Completing the Plumbing for Electrochemical Detection



**Figure 4-17.** Flow Schematic for Equilibration and Operation of a Electrochemical Detection System (Final Flow Path)

1. Connect the cell inlet line (P/N 082618) to the column **ELUENT OUT** port (see [Figure 4-17](#)).

2. Connect the Suppressor Bypass **REGEN IN** line to the ED cell **OUT** port.
3. Connect the waste line from the Dionex CR-TC 600 **REGEN OUT** port to the gas separator waste tube (see [Section 4.3](#)).
4. Route the IC Cube tubing as described in [Section 4.1.14](#). When you finish, the flow path is ready for equilibration (see [Section 4.4](#)).

**NOTE** If a PdH reference electrode is installed, go on to the next section to condition the electrode before initial use.

### Conditioning the PdH Reference Electrode

The PdH reference electrode conditioning procedure varies slightly, depending on your application. After plumbing the cell, follow the appropriate instructions below to condition the electrode.

#### To condition the PdH reference electrode for alkaline (carbohydrate) applications

Alkaline applications include the Au working electrode under hydroxide eluent for a Dionex ICS-6000 RFIC-EG system.

1. On the Chromeleon Home ePanel, set the pump flow rate to the recommended value for the column (for example, **0.50 mL/min** for a Thermo Scientific™ Dionex™ CarboPac® PA20 column [3 x 150 mm]) and click the slider to turn on the pump.
2. Under **Eluent Generator**, enter **100 mM**. The eluent generator will turn on automatically.
3. Under **CR-TC**, if **Mode Off** is displayed, click the slider to turn on the power.
4. Verify that eluent is exiting the cell.
5. On the ED ePanel, set the ED reference electrode type to **PdH** and turn on the PdH power.

**IMPORTANT**

**Do not turn on the ED cell. An incorrect reference electrode potential from the unconditioned PdH reference electrode can damage the working electrode.**

6. If an external vacuum pump is installed, turn off the pump before conditioning the electrode ([see Step 7](#)).

**NOTE** If you condition the PdH reference electrode while the vacuum pump is on, the background reading during the run will be excessively high.

7. Condition the electrode for 2 hours at the selected settings.
8. Turn on the external vacuum pump, if installed.

### To condition the PdH reference electrode for acidic applications

Acidic applications include the Pt working electrode under MSA (methanesulfonic acid) eluent.

1. On the Chromeleon Home ePanel, set the pump flow rate to the recommended value for the column (for example, **0.20 mL/min** for a Thermo Scientific™ Dionex™ IonPac® ICE-AS1 column [4 x 250 mm]) and click the slider to turn on the pump.
2. Under **Eluent Generator**, enter **100 mM**. The eluent generator will turn on automatically.
3. Under **CR-TC**, if **Mode Off** is displayed, click the slider to turn on the power.
4. On the ED ePanel, set the ED reference electrode type to **PdH** and turn on the PdH power.

**IMPORTANT** Do not turn on the ED cell. An incorrect reference electrode potential from the unconditioned PdH reference electrode can damage the working electrode.

5. Condition the electrode for 2 hours at these settings.

### 4.1.14 Routing the IC Cube Tubing

1. For a neater appearance, and to ensure that the DC doors close properly, route tubing that connects to other modules through the appropriate side slots on the DC and the other modules.

2. Route tubing inside the DC through the tubing trays below the IC Cube (see [Figure 4-18](#)):
  - a. Press the sample in and sample out lines from the injection valve into the tubing tray on the front of the IC Cube and then route the lines through the DC left-side slot to the autosampler.



**Figure 4-18.** IC Cube Tubing Trays (System #2 of Dual System Shown)

- b. If you are installing a dual system:
  - Press the sample in and sample out lines from both valves into the tubing trays and then route all four lines through the DC left-side slot to the autosampler (see [Figure 4-19](#)).
  - Press the **Eluent In** line from the EG degas cartridge of system #1 into the tubing trays below the IC Cube of system #2 and then route the line out the DC right-side slot to the EG.



**Figure 4-19.** Completed IC Cube Plumbing for a Dual Conductivity Detection System

## 4.2 Plumbing an Analytical IC System

### 4.2.1 Tubing and Fittings

One tubing package with precut and labeled tubing (either microbore or standard bore) is included for each system configured in the Dionex ICS-6000 (see [Table 4-1](#)). The tubing is used for plumbing the columns, detector cell, suppressor, and system waste. Tubing and fittings for plumbing an injection valve waste line are also included in each package.

Before connecting each piece of tubing, remove the unions that connect the tubing in the tubing package. Use tubing with white labels for system 1 (left side) and tubing with blue labels for system 2 (right side).

Plumbing Configuration	System Number	Color of Tubing Labels	Part Number
Microbore	1	White	062035
	2	Blue	062036
Standard Bore	1	White	AAA-062031
	2	Blue	AAA-062062

**Table 4-1.** System Tubing Packages

Tubing and fittings for other connections (for example, the pump and Dionex EGC outlet lines) are provided in the module ship kits.

- 0.25 mm (0.010 in) ID black PEEK tubing (P/N 052306) is provided for standard bore systems
- 0.125 mm (0.005 in) ID red PEEK tubing (P/N 052310) is provided for microbore systems



## 4.2.2 System Plumbing Checklists

The system plumbing steps and the order in which they are performed vary slightly, depending on the installed detector. The following checklists outline the steps for each detection type.

CD System Plumbing Checklist for Analytical IC	Page
<input type="checkbox"/> Plumb the static mixer or trap column	<a href="#">page 138</a>
<input type="checkbox"/> Complete the IQ checklist	<a href="#">page 140</a>
<input type="checkbox"/> Perform the system function test	<a href="#">page 140</a>
<input type="checkbox"/> Complete the OQ (optional)	<a href="#">page 140</a>
<input type="checkbox"/> Plumb the EG	<a href="#">page 140</a>
<input type="checkbox"/> Plumb the DC	<a href="#">page 151</a>
<input type="checkbox"/> Connect waste lines to the gas separator waste tube	<a href="#">page 155</a>
<input type="checkbox"/> Equilibrate the system	<a href="#">page 157</a>

ED System Plumbing Checklist for Analytical IC	Page
<input type="checkbox"/> Plumb the static mixer or trap column	<a href="#">page 138</a>
<input type="checkbox"/> Plumb the EG	<a href="#">page 140</a>
<input type="checkbox"/> Complete the IQ checklist	<a href="#">page 140</a>
<input type="checkbox"/> Perform the system function test	<a href="#">page 140</a>
<input type="checkbox"/> Complete the OQ (optional)	<a href="#">page 140</a>
<input type="checkbox"/> Install the ED amperometry cell	<a href="#">page 169</a>
<input type="checkbox"/> Plumb the DC	<a href="#">page 151</a>
<input type="checkbox"/> Connect waste lines to the gas separator waste tube	<a href="#">page 155</a>
<input type="checkbox"/> Equilibrate the system	<a href="#">page 157</a>

### 4.2.3 Plumbing the Static Mixer or Trap Column

A static mixer is mounted on the pump component panel at the factory and the inlet of the static mixer is pre-plumbed to the pump outlet. In addition, several high-pressure trap columns are available for use with the Dionex ICS-6000 system. When a trap column is used, it replaces the static mixer.

#### Plumbing the Static Mixer

1. Cut an 86 cm (34 in) piece of 0.25 mm (0.010 in) ID black PEEK tubing.
2. Connect the tubing to the static mixer outlet (see [Figure 4-20](#)).

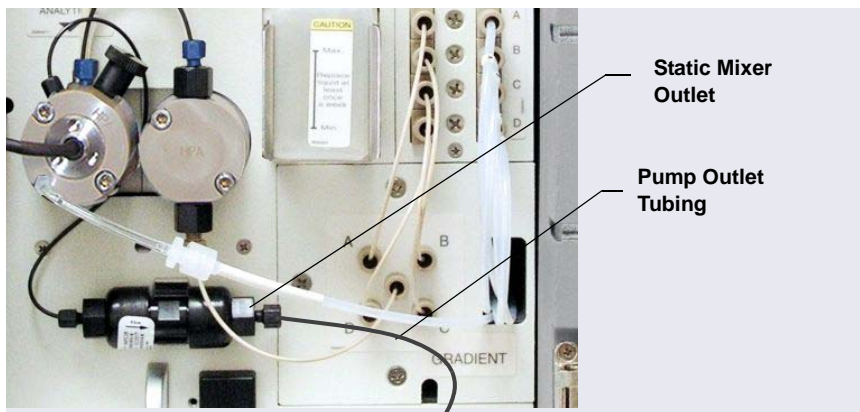


Figure 4-20. Analytical Pump Outlet Connection

#### Installing a Trap Column

Thermo Fisher Scientific recommends installation of trap columns in the lower compartment. Before installing a trap column, refer to the trap column manual for conditioning, equilibration, or plumbing details required for your application.

1. Remove the static mixer from the mounting clip on the component panel (see [Figure 4-20](#)).
2. Remove the plugs from the trap column inlet and outlet. Install the plugs in the inlet and outlet of the static mixer. Set the mixer aside.
3. For a Dionex MFC 500 (P/N 079017): Connect the tubing from the secondary pump head to the trap column inlet and press the trap column into the mounting clip (P/N 064552) on the component panel.

4. For a Dionex ATC 500, ATC-HC 500, ATC-HC Borate, or CTC 500:
  - a. Locate the mounting clip required for your column in the pump ship kit.

Thermo Scientific High-Pressure Trap Column	Use This Mounting Clip...
Dionex ATC 500, 2 mm (P/N 079018) Dionex CTC 500, 2 mm (P/N 079019)	Dual-component clip (P/N 074010)
Dionex ATC 500, 4 mm (P/N 075976) Dionex CTC 500, 4 mm (P/N 075977)	Component clip (P/N 075985)
Dionex ATC-HC 500 (P/N 075978) Dionex ATC-HC 500 Borate (P/N 075979)	Component clip (P/N 075985)

- b. Remove the screw and mounting clip used to secure the static mixer to the component panel. Attach the mounting clip for the trap column to the component panel, using the screw from the mixer clip.

**NOTE** When using a dual-component clip, you can install the trap column in either set of clips.

  - c. Connect the tubing from the secondary pump head to the trap column inlet and press the trap column into the mounting clip.
5. Cut an 86 cm (34 in) piece of 0.25 mm (0.010 in) ID black PEEK tubing (for standard bore systems) or 0.125 mm (0.005 in) ID red PEEK tubing (for microbore systems).
6. Connect the tubing to the trap column outlet.
7. Store the static mixer (and its mounting clip, if removed) for future use.

## 4.2.4 Completing the IQ Checklist

Complete the Installation Qualification (IQ) checklist to confirm that the Dionex ICS-6000 system is correctly installed. For instructions, refer to *Dionex ICS-5000/Dionex ICS-6000 System Installation Qualification* (Document No. 065404), provided in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC).

**NOTE** If you are installing an ED, set up the eluent generator (see [Section 4.2.5](#)) before completing the IQ checklist and performing the system function test. The test for an ED requires KOH eluent. The test for a CD requires only deionized water.

## 4.2.5 Performing the System Function Test

Complete the system function test to verify that the basic system components (injection valve, pump, and detector) are functioning correctly. For instructions, refer to *Dionex ICS-5000/Dionex ICS-6000 System Installation Qualification* (Document No. 065404), provided in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC).

## 4.2.6 Completing the Operational Qualification

If you purchased the Operational Qualification (OQ) option, complete the procedure now for a CD system.

**NOTE** For an ED system, complete the OQ after plumbing the ED.

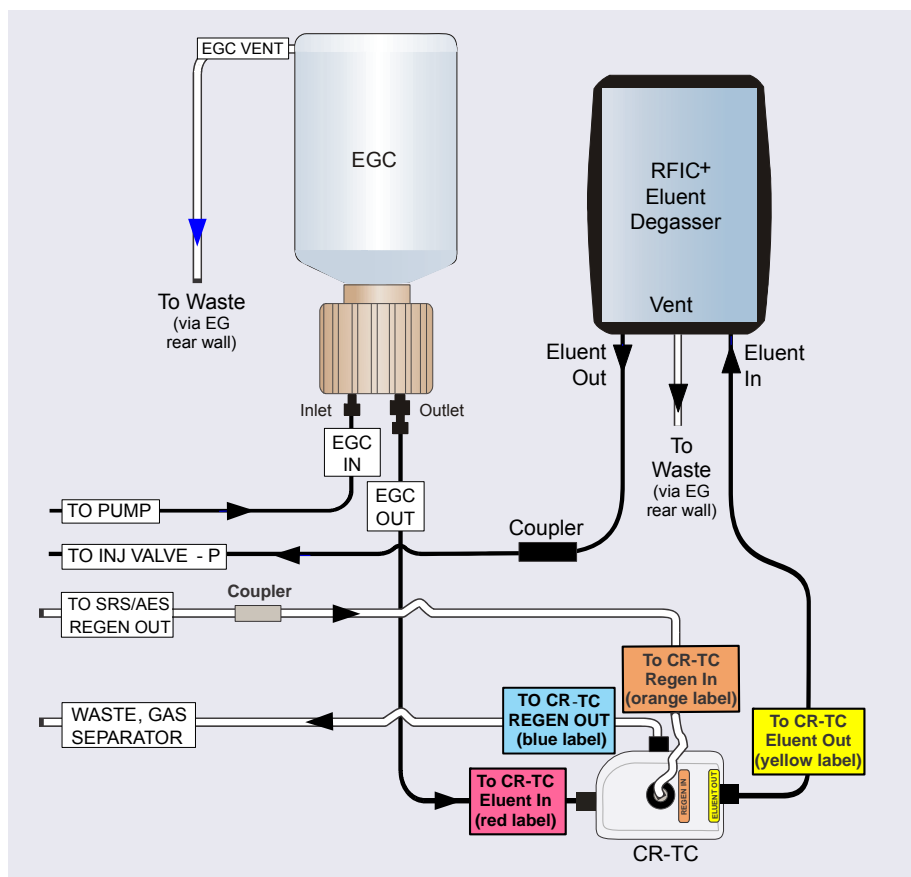
## 4.2.7 Plumbing the EG for Analytical IC Applications

Refer to the Dionex EGC and Dionex CR-TC 600 manuals for the optimal operating conditions for your application.

**NOTE** The Dionex EGC-CO<sub>3</sub> EGC and Thermo Scientific Dionex EPM Electrolytic pH Modifier require specialized procedures for installation and conditioning. For details, refer to the product manuals.

For an illustration of the liquid flow path through the EG components after all conditioning and plumbing connections are complete, see [Figure 4-21](#) (for standard-pressure analytical systems) or [Figure 4-22](#) (for high-pressure analytical systems).

**NOTE** Some RFIC systems require a backpressure coil. If the system pressure is below 14 MPa (2000 psi) at system equilibration (see [Section 4.4](#)), install a backpressure coil between the injection valve and the **ELUENT OUT** port on the Dionex EGC (see [Section 4.4.1](#)).



**Figure 4-21.** EG Flow Schematic: Analytical (Standard-Pressure) Flow Version

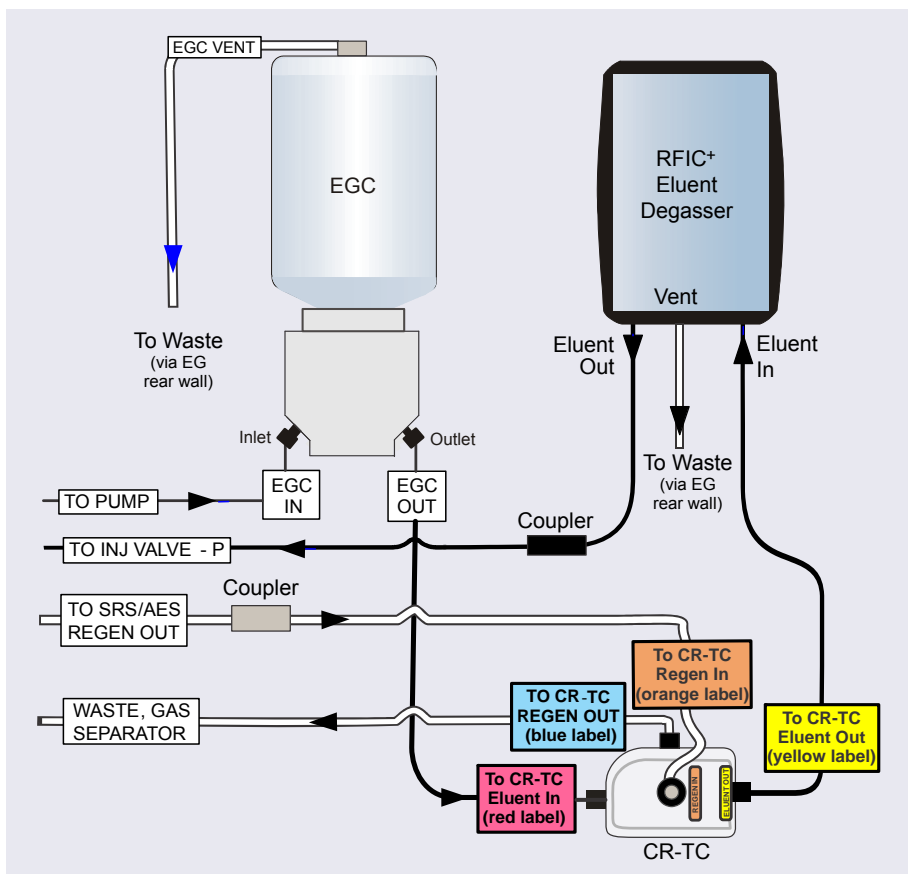


Figure 4-22. EG Flow Schematic: Analytical (High-Pressure) Flow Version

Analytical IC

Installing the Eluent Generator Cartridge (Dionex EGC)

1. Open the EG door.
2. Push down on the slide release latch and pull the tray forward until it reaches the stop.



The Dionex EGC contains one of the following: a corrosive base (KOH, LiOH, or NaOH), a corrosive acid (MSA), or a concentrated  $K_2CO_3$  solution. Wear protective eyewear and gloves when handling the cartridge.



La cartouche de Dionex EGC contient un de ce qui suit: une base corrosive (KOH, LiOH, ou NaOH), un acide corrosif (MSA), ou une solution concentrée de  $K_2CO_3$ . Porter des lunettes et des gants protectives en manipulant la cartouche.



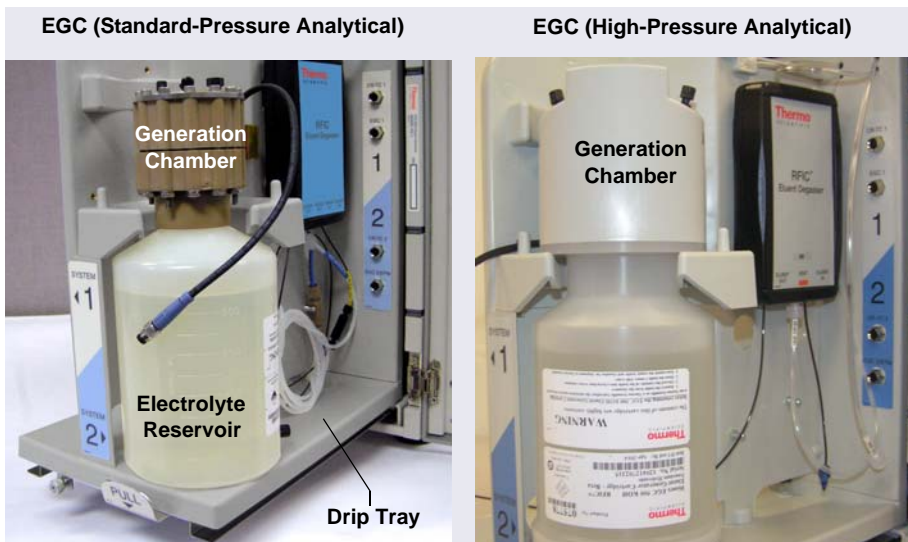
Die Dionex EGC-Kartusche enthält eine korrosive Base (KOH, LiOH oder NaOH), eine korrosive Säure (MSA) oder eine konzentrierte  $K_2CO_3$ -Lösung. Tragen Sie daher beim Umgang mit der Kartusche eine Schutzbrille und Handschuhe.

3. Verify that a 10-32 plug (standard-pressure Dionex EGC) or a fitting (high-pressure Dionex EGC) is installed in the Dionex EGC vent opening (see [Figure 4-23](#)). This prevents leakage from the vent opening when you turn over the cartridge.



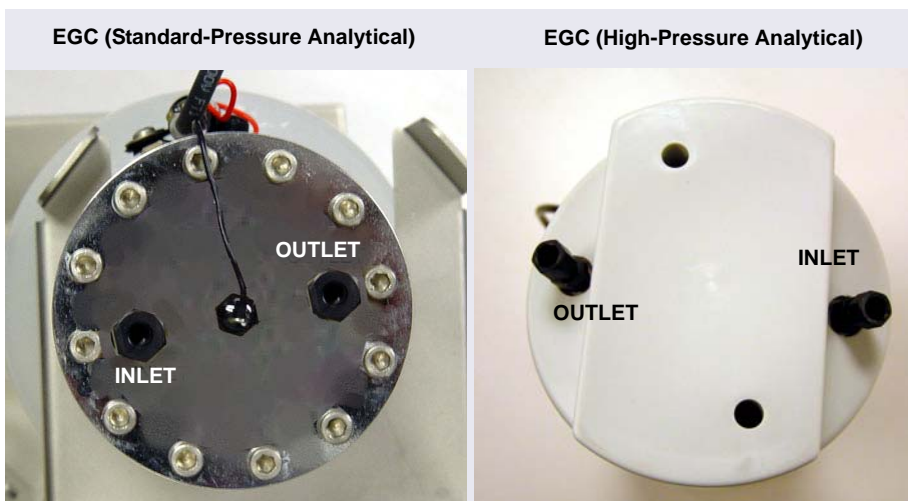
**Figure 4-23.** Dionex EGC Vent Opening

4. Turn the Dionex EGC upside down and place it on the EG drip tray (see [Figure 4-24](#)). This is the “service position” for the cartridge.



**Figure 4-24.** Dionex EGC Service Position

5. Remove the plugs from the INLET and OUTLET fittings (see [Figure 4-25](#)).



**Figure 4-25.** Dionex EGC Inlet and Outlet Fittings with Plugs



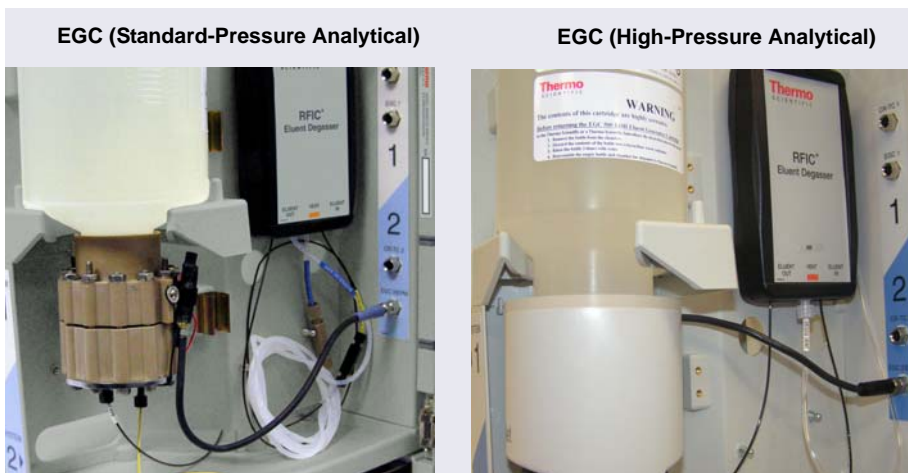
6. Connect the outlet line from the pump to the Dionex EGC **INLET** port.
7. Connect the line from the **ELUENT IN** port of the Dionex RFIC<sup>+</sup> Eluent Degasser to the Dionex EGC **OUTLET** port (see [Figure 4-28](#)). This is a temporary connection.
8. Turn over the Dionex EGC (fittings facing down). Shake the cartridge vigorously and tap it with the palm of your hand 10 to 15 times to dislodge any air bubbles trapped in the eluent generation chamber.

**NOTE** Be sure to dislodge air bubbles each time the Dionex EGC has been turned upside down.

9. Slide the Dionex EGC into the cartridge holder in the EG.
10. Remove the 10-32 plug from the vent opening on the side of the standard-pressure Dionex EGC or remove the fitting from the top of the high-pressure Dionex EGC. Install a 10-32 luer adapter (P/N 063517) in the opening. The luer adapter is shipped with the cartridge. Remove the luer cap.

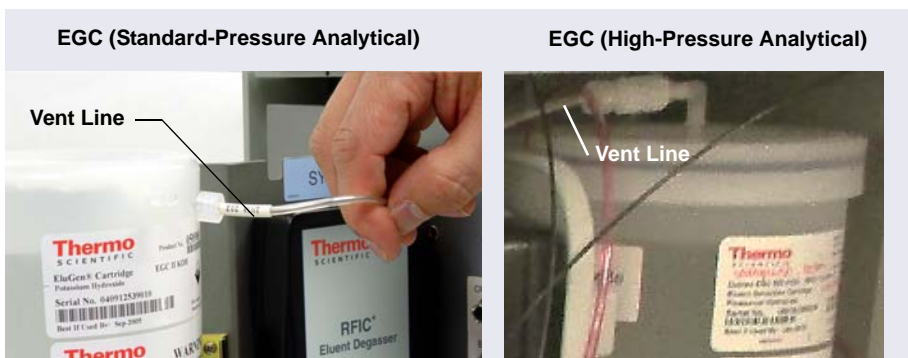
**NOTE** Store the 10-32 plug or fitting in a safe place. The plug or fitting is required when shipping or storing the cartridge.

11. Push the Dionex EGC electrical cable firmly onto the **EGC 1** (or **EGC 2**) bulkhead connector (see [Figure 4-26](#)). Twist the ring on the cable connector fingertight to secure it.



**Figure 4-26.** Connecting the Dionex EGC Electrical Cable

12. Pull the line labeled **EGC VENT** through the opening in the rear wall (above the bulkhead connectors) and connect the line to the luer adapter in the Dionex EGC vent opening (see [Figure 4-27](#)).



**Figure 4-27.** Dionex EGC Vent Opening

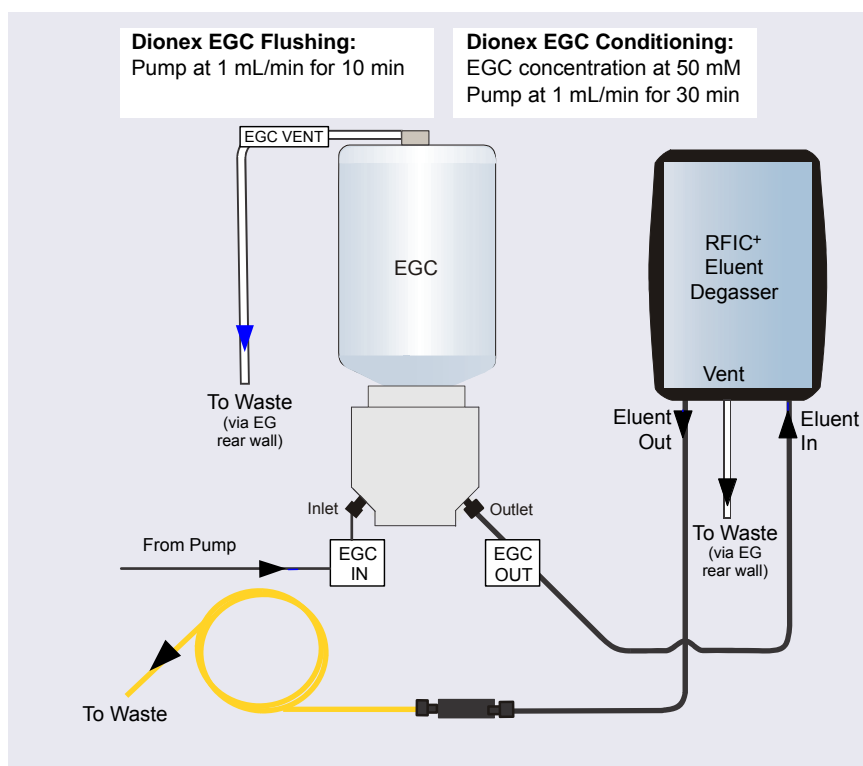
**IMPORTANT**

The vent line must be connected to the Dionex EGC to ensure proper ventilation.

Analytical  
IC**Flushing and Conditioning the Dionex EGC**

1. Locate the yellow 0.5 mL/min, 7 MPa (1000 psi) backpressure coil (P/N 053765) in the EG Ship Kit (P/N 072047).
2. Connect the coil to the **ELUENT OUT** port of the RFIC<sup>+</sup> Eluent Degasser (see [Figure 4-28](#)). Direct the open end to a waste container. (This is a temporary connection.)

**NOTE** The backpressure must be at least 14 MPa (200 psi).



**Figure 4-28.** Flow Schematic for Conditioning the Dionex EGC: Analytical Flow Version

3. On the Chromeleon ePanel Set:

- Verify that the suppressor and the Dionex CR-TC 600 are off.

**IMPORTANT**

To avoid damaging the suppressor and Dionex CR-TC 600, always turn them off before conditioning the Dionex EGC. The pump flow is on during conditioning; however, no flow reaches the suppressor and Dionex CR-TC 600.

- **Gradient pump only:** Enter 100% for the reservoir containing the deionized water.
  - Set the pump flow to 1.0 mL/min. This turns on the pump flow, also.
4. Pump deionized water for 10 minutes.
5. Set the EGC concentration to 50 mM. This turns on the Dionex EGC power, also.
6. Run at the selected settings (1.0 mL/min at 50 mM) for 30 minutes.
7. Turn off the pump flow. This turns off the power to the Dionex EGC, also.

Analytical  
IC

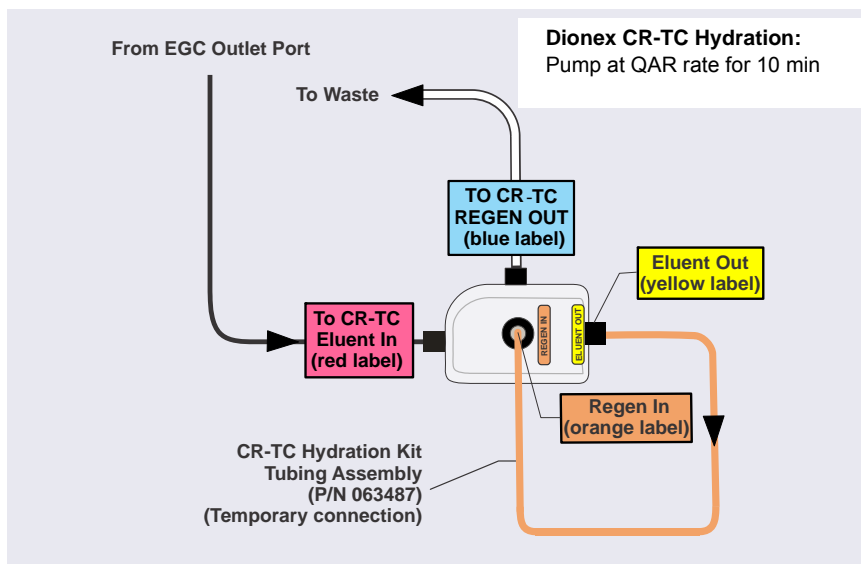
### Completing the Dionex EGC Plumbing

1. Unplug the Dionex EGC electrical cable.
2. Disconnect the backpressure tubing from the RFIC<sup>+</sup> Eluent Degasser eluent out line.
3. Temporarily remove the luer adapter and vent line and replace the 10-32 plug or fitting in the vent opening.
4. Lift the Dionex EGC out of the holder, turn it upside down, and place it on the drip tray in the service position (see [Figure 4-24](#)).
5. Disconnect the RFIC<sup>+</sup> Eluent Degasser inlet line from the Dionex EGC **OUTLET** port.
6. Cut a length of 0.25 mm (0.010 in) ID black PEEK tubing long enough to connect from the Dionex EGC to the Dionex CR-TC 600 **ELUENT IN** port. Connect one end of this line to the EGC **OUTLET** port.
7. Turn the Dionex EGC right-side up. Shake and tap the cartridge to dislodge bubbles from the eluent generation chamber.
8. Reinstall the Dionex EGC in the holder.
9. Reinstall the luer adapter and vent line.

10. Reconnect the Dionex EGC electrical cable.

Analytical  
IC**Hydrating the Dionex CR-TC 600**

1. Remove the plugs from the Dionex CR-TC 600 ports.
2. Locate the CR-TC Hydration Tubing Kit (P/N 063487) provided in the EG Ship Kit (P/N 072047).
3. Connect the hydration tubing as shown in [Figure 4-29](#).



**Figure 4-29.** Dionex CR-TC 600 Plumbing for Hydration: Analytical Flow Version

4. Connect the Dionex EGC outlet line to the Dionex CR-TC 600 **ELUENT IN** port.
5. Disconnect the 1.58 mm (0.062 in) ID ETFE (ethylene tetrafluoroethylene) tubing labeled **WASTE, GAS SEPARATOR / SRS/AES REGEN OUT** from the system tubing package (see [page 136](#)).
6. Connect this tubing to the Dionex CR-TC 600 **REGEN OUT** port.
7. Route the **WASTE, GAS SEPARATOR** line through the slot on the EG and connect it to the gas separator waste tube. For instructions, see [page 155](#).

8. In Chromeleon:

- a. Verify that the suppressor and Dionex EGC are turned off.

**IMPORTANT**

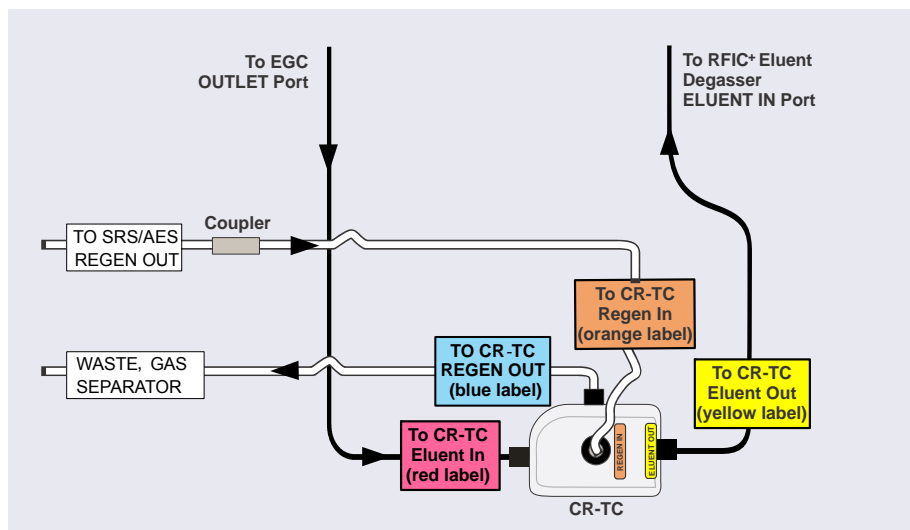
To avoid damaging the suppressor, always turn off the suppressor before hydrating the Dionex CR-TC 600. The pump flow is on during conditioning; however, no flow reaches the suppressor.

- b. **Gradient pump only:** Enter 100% for the reservoir containing the deionized water.
  - c. Set the pump flow to the rate specified in the Quality Assurance Report (QAR) shipped with your separator column.
9. Allow the pump to run for at least 10 minutes. Turn off the pump flow.
10. Disconnect the hydration tubing assembly from the **ELUENT OUT** and **REGEN IN** ports on the Dionex CR-TC 600.

Analytical  
IC

**Completing the Dionex CR-TC 600 Plumbing**

See [Figure 4-30](#) and the following steps to complete the Dionex CR-TC 600 plumbing.



**Figure 4-30.** Dionex CR-TC 600 Plumbing Diagram: Analytical Flow Version Installation Completed

1. In the tubing chase on the lower-left side of the EG, locate the line labeled **TO CR-TC REGEN IN** (orange label). Connect this line to the Dionex CR-TC 600 **REGEN IN** port. Route the other end of the line from the EG rear panel to the DC.
2. Connect the line from the Dionex RFIC<sup>+</sup> Eluent Degasser labeled **TO CR-TC ELUENT OUT** (yellow label) to the Dionex CR-TC 600 **ELUENT OUT** port.
3. Pull the line labeled **DEGAS VENT** through the opening in the rear wall above the bulkhead connectors and connect the line to the luer adapter in the **VENT** port on the Dionex RFIC<sup>+</sup> Eluent Degasser. Direct the free end of the line to a waste container.
4. Check that no liquid lines are caught under the Dionex CR-TC 600 and then push the device firmly onto the ball studs on the mounting plate. The Dionex CR-TC 600 clicks into place when properly installed.
5. Connect the Dionex CR-TC 600 electrical cable.
6. For a dual-analysis system, repeat the steps above to install the second Dionex EGC and Dionex CR-TC 600.

## 4.2.8 Plumbing the DC for Analytical IC Applications

This section provides brief installation and plumbing instructions for the guard column, separator column, and suppressor.

### Before Beginning

1. Refer to the column and suppressor manuals for detailed installation and start-up instructions (including backpressure requirements for the suppressor).

Also refer to the example plumbing diagrams on the DC lower door or in Chapter 3 of the Dionex ICS-6000 operator's manual.

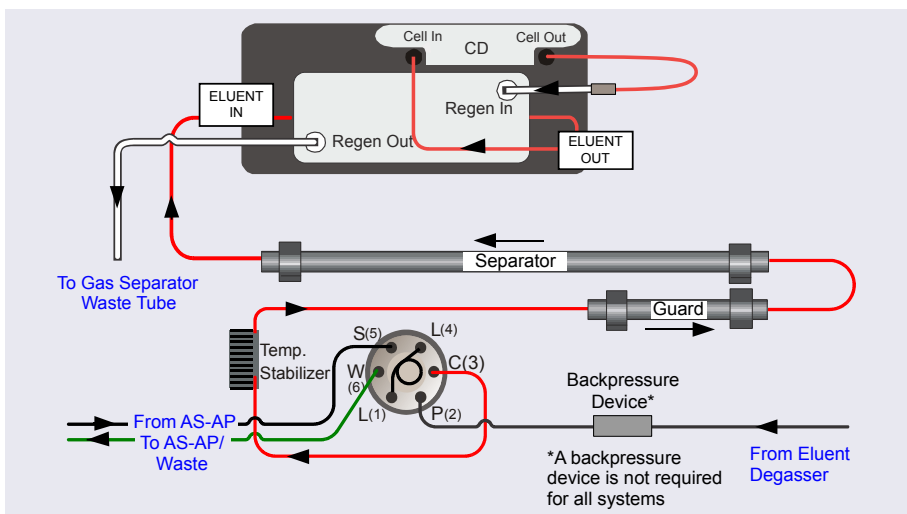
2. Remove the guard column, separator column, and suppressor from their boxes.
3. Remove the fitting plugs from the ends of each column and from all ports on the suppressor.

4. Discard any tubing temporarily connecting the suppressor ports.

**NOTE** Unless instructed otherwise, use tubing from the system tubing package (described in [Table 4-1 on page 136](#)) for DC plumbing connections.

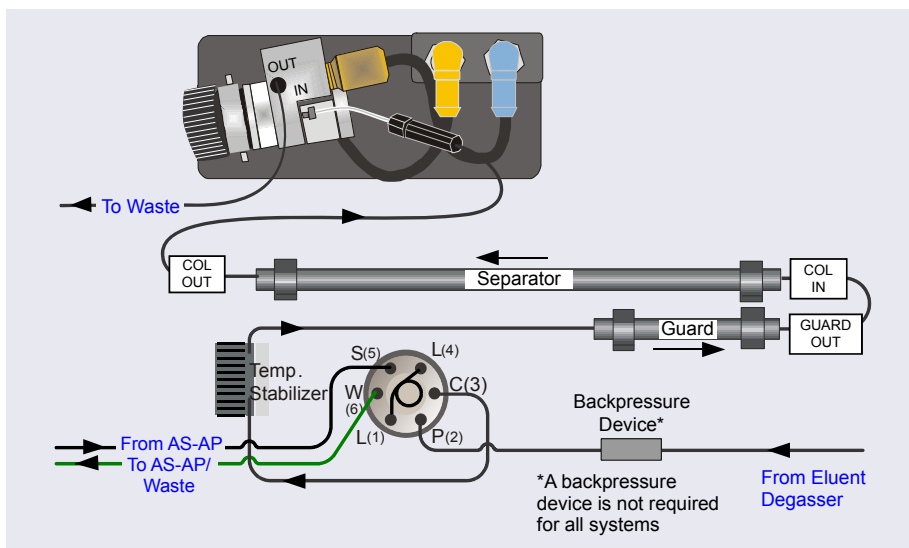
[Figure 4-32](#) shows the liquid flow path through the DC components for conductivity detection after all plumbing connections are complete.

[Figure 4-31](#) shows the flow path for electrochemical detection.



**Figure 4-31.** Example DC Plumbing for Analytical IC with Conductivity Detection: System 1 (Left Side) Shown



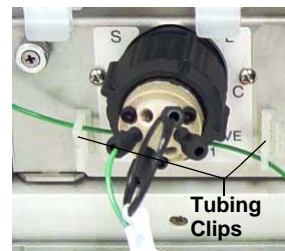


**Figure 4-32.** Example DC Plumbing for Analytical IC with Electrochemical Detection: System 1 (Left Side) Shown

#### Analytical IC

### Plumbing the DC Injection Valve

1. Cut a length of 0.25 mm (0.010 in) ID black PEEK tubing long enough to connect from the Dionex RFIC<sup>+</sup> Eluent Degasser to the injection valve.
2. Connect one end of this tubing to the coupler on the line from the Dionex RFIC<sup>+</sup> Eluent Degasser labeled **TO INJ VALVE-P** (white label). Route the line to the injection valve and connect it to port **P** (2).
3. If required for your system, connect backpressure tubing to the pump outlet (see [page 159](#)).
4. Connect the line from the temperature stabilizer to port **C** (3).
5. Route all lines through the appropriate tubing slots and secure the tubing in the tubing clips (see [Figure 4-33](#)).



**Figure 4-33.** Tubing Clips

**NOTE** After all system plumbing is completed, the valve panel should slide forward and backward relatively easily, without kinking or catching any of the tubing.

### Analytical IC

#### Plumbing the Columns in the DC

1. Before connecting the columns to the suppressor, pump eluent through the columns to waste for at least 30 minutes as described in the column manual. Pump at the standard flow rate for the column.
2. Connect the tubing to the columns as shown in [Figure 4-31](#) or [Figure 4-32](#).
3. Check the arrow on each column label; it should point in the direction of flow (away from the injection valve).
4. Push the guard and separator columns onto the column clips in the lower compartment of the DC, being careful to ensure that the clips do not touch the RFID tags attached to the columns.
5. Open the DC upper door and route the line from the separator column outlet through the tubing slot to the upper compartment of the DC.

### Analytical IC

#### Plumbing the Suppressor and Conductivity Cell in the DC

1. Hydrate the suppressor. Refer to the suppressor manual for the recommended number of backpressure coils.
2. Connect the tubing to the suppressor and cell as shown in [Figure 4-31](#).
3. Close the DC door.
4. Go on to system equilibration (see [Section 4.4](#)).

### Analytical IC

#### Plumbing the Electrochemical Cell in the DC

1. Before completing the electrochemical cell plumbing, follow the instructions in [Section B.1](#) to install the cell electrodes and the cell inlet tubing.
2. Connect the tubing to the cell as shown in [Figure 4-32](#).

3. Place the waste line from the cell out port into a waste container or appropriate drain.

**IMPORTANT** For correct drainage, make sure waste lines are not bent, pinched, or elevated at any point. Do not allow the ends of the lines to be submerged in waste liquid.

4. Close the DC door.
5. Go on to system equilibration (see [Section 4.4](#)).

### 4.3 Connecting Waste Lines to the Gas Separator Waste Tube

**NOTE** A gas separator waste tube is required if the Dionex ICS-6000 system includes an EG or a DC with an electrolytic suppressor. The EG and electrolytic suppressor generate small amounts of electrolytic gases (hydrogen or oxygen). The gas separator waste tube is used to avoid concentrating these gases in the waste container.

Follow the instructions below to connect each EG or suppressor regenerant waste line to the gas separator waste tube.

1. Locate the gas separator waste tube assembly (P/N 045460) in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC).
2. Place the gas separator waste tube assembly into a waste container or appropriate drain.
3. Make sure the junction of the white PTFE tubing and the black polyethylene tubing is above the top of the container and that the gas separator waste tube and the waste container are open to the atmosphere (see [Figure 4-34](#)).

If necessary, you can extend the black tubing. Locate the compression coupler (P/N 045463) and 13 mm (0.52 in) ID tubing (P/N 045822) provided in the DC Ship Kit (P/N 072011, standard DC; P/N 22171-62000, low-temperature DC); attach the parts to the black tubing.

4. Connect the **WASTE, GAS SEPARATOR** line from the suppressor or EG to one of the lengths of 3 mm (1/8 in) ID white PTFE tubing on the gas separator waste tube assembly (see [Figure 4-34](#)).
5. If you are installing a dual-channel system, connect the other **WASTE, GAS SEPARATOR** line to the second length of white PTFE tubing on the assembly.

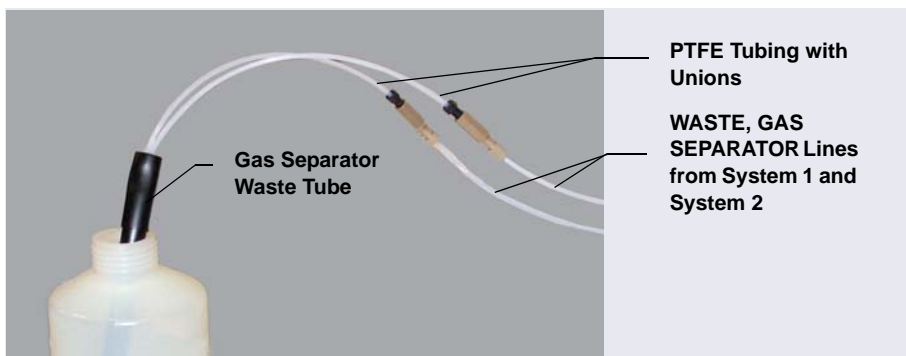


Figure 4-34. Gas Separator Waste Tube Installation

**IMPORTANT**

For correct drainage, make sure waste lines are not bent, pinched, or elevated at any point. Do not allow the ends of the lines to be submerged in waste liquid.



CAUTION

**DO NOT CAP THE WASTE CONTAINER:** The Dionex ICS-6000 Eluent Generator (EG) and the electrolytic suppressors use an electrolytic process that results in the production of small amounts of oxygen or hydrogen gas. To ensure that the gas is not trapped in a closed container and allowed to concentrate, install a 1.3 cm (0.52 in) ID black gas separator waste tube (P/N 045460) in an uncapped waste container. Connect the **WASTE, GAS SEPARATOR** line to the waste tube (see [Figure 4-34](#)).



MISE EN GARDE

**NE FERMEZ PAS LE CONTENEUR DE GAZ RÉSIDUEL:** Le Dionex ICS-6000 Eluent Generator (EG) et les electrolytic suppressor travaillent avec un proces d'électrolyse, qui produit des petites quantités de gaz d'oxygène ou d'hydrogène. Afin de garantir que le gaz ne soit pas enfermé dans un conteneur fermé et puisse s'y concentrer, connectez un tube noir à gaz résiduel (diamètre intérieur = 1,3 cm; n° de commande 045460) à un conteneur ouvert (non fermé). Connectez le conteneur résiduel au tube résiduel/gaz séparateur (désigné: « Waste, Gas Separator»).



**VERSCHLIESSEN SIE DEN ABFALLBEHÄLTER NICHT:** Der Dionex ICS-6000 Eluent Generator (EG) und electrolytic suppressors verwenden einen Elektrolyseprozess, durch welchen kleine Mengen an Sauerstoff und Wasserstoff gebildet werden. Führen Sie einen schwarzen Gasabscheiderschlauch (ID = 1,3 cm; Bestell-Nr. 045460) in einen offenen (unverschlossenen) Abfallbehälter, damit sich das Gas nicht in einem geschlossenen Behälter sammeln kann und aufkonzentriert. Verbinden Sie die mit Waste, Gas Separator bezeichnete Leitung mit dem Abfallschlauch.

## 4.4 Equilibrating the System

**NOTE** This section describes how to manually equilibrate the system. If you want to automate system startup and equilibration, use the Smart Startup feature in Chromeleon. Refer to the Chromeleon Help for details.

1. On the Chromeleon ePanel Set, verify that each Dionex device listed below (if installed in the system) is turned on and the selected setting for the device (flow rate, eluent concentration, temperature, and so on) is correct for your application:
  - Pump
  - EGC
  - Dionex CR-TC 600
  - EPM
  - Suppressor
  - Temperature control devices (DC upper and lower compartments, IC Cube column heater, CD cell heater, reaction coil heater)



**CAUTION:** Before servicing the instrument, allow any heated components to cool.



**MISE EN GARDE:** Permettre aux composants chauffés de refroidir avant tout intervention.



**VORSICHT: Warten Sie erhitzte Komponenten erst nachdem diese sich abgekühlt haben.**

If a Dionex IC Cube is installed, set the temperature of the DC upper compartment to 15 °C. Set the IC Cube column heater to the recommended temperature for your application.

2. Click **Monitor Background** on the toolbar above the Chromeleon ePanel Set. Chromeleon begins plotting the detector signal and pump pressure readings.
3. View the detector signal and monitor the background. Refer to the column manual for the appropriate background for your application.
4. Offset the detector background and zero the reading by clicking the **Autozero** button.
5. Verify that the detector baseline is at the expected reading for your application and is stable.
6. Monitor the DP/SP pressure to be sure the pressure is at the expected reading for the installed column and is stable.

### Analytical IC

For an analytical system, if the system pressure is below 14 MPa (2000 psi), install a backpressure coil (see [Section 4.4.1](#)).

7. Verify that all installed temperature control devices are at their set points and are stable.

**NOTE** Equilibration time varies, and it may take some time to reach the expected values.

### Capillary IC

Because capillary IC systems use low flow rates and consume very little eluent, you can leave a capillary IC system on at all times, allowing it to remain equilibrated and always ready to run the next injection.

### 4.4.1 Installing a Backpressure Coil

In an analytical IC system, if the system pressure is below 14 MPa (2000 psi) during system equilibration (see [Section 4.4](#)), install a backpressure coil between the injection valve and the **ELUENT OUT** port on the Dionex EGC.

Connect one end of the backpressure coil to port **P (2)** on the injection valve; connect the other end to the **TO INJ VALVE IN - P** line.

The EG Ship Kit (P/N 072047) includes four backpressure coils (see [Table 4-2](#)).

Part Number	Backpressure Coil Description	Flow Rate	Approximate Backpressure Added
AAA-053762	4 mm (0.005 in) ID, red	1.0 mL/min	1.75 MPa (250 psi)
		2.0 mL/min	3.5 MPa (500 psi)
AAA-053763	4 mm (0.005 in) ID, red	1.0 mL/min	3.5 MPa (500 psi)
		2.0 mL/min	7 MPa (1000 psi)
053764	2 mm (0.003 in) ID, yellow	0.25 mL/min	1.75 MPa (250 psi)
		0.50 mL/min	3.5 MPa (500 psi)
053765	2 mm (0.003 in) ID, yellow	0.25 mL/min	3.5 MPa (500 psi)
		0.50 mL/min	7 MPa (1000 psi)

**Table 4-2.** Backpressure Coils

**IMPORTANT**

The recommended maximum operating pressure for the EG in a standard-pressure analytical system is 21 MPa (3000 psi). The recommended maximum operating pressure for the EG in a high-pressure analytical system is 34 MPa (5000 psi). Excessive backpressure may rupture the tubing inside the Dionex RFIC<sup>+</sup> Eluent Degasser.

## 4.5 Verifying the Compatibility of Consumables

Many of the consumables used with the Dionex ICS-6000 are equipped with a memory chip that allows automatic identification of the consumable, as well as tracking of several consumable parameters. This functionality is implemented as follows:

- Wired communication is used for consumables with electrical cables, including eluent generator cartridges and electrolytic suppressors.
- RFID (radio-frequency identification) communication is used for non-powered consumables, including analytical columns and chemically-regenerated suppressors.

**NOTE** If the Consumable Device Monitor (see [Section 4.4](#)) is not installed in the Dionex ICS-6000, only devices equipped with wired communication are tracked.

When at least one device capable of tracking consumables is installed in the Dionex ICS-6000, Chromeleon automatically checks that all trackable consumables are compatible with each other, as well as with the Dionex ICS-6000. Before beginning operation, review the results and make any changes needed.

1. On the Instrument toolbar above the Chromeleon ePanel, click the down arrow on the **Consumables** button.
2. Click **Inventory**. The Consumables Inventory window opens.
3. Review the list of installed consumables and take the required action:
  - If an RFID-enabled consumable that does not belong to the instrument is being tracked, clear the corresponding **Tracked** check box.
  - If a consumable is missing from the list, check all connections, check the location and orientation of all RFID tags (see [“Notes on RFID” on page 33](#)), and then click **Rescan**.



4. Check the Compatibility Check Results pane for messages and select one of the following options:
  - To track and approve all consumables in the list, click **Track & Approve**. (This option is available only if the list includes at least one consumable that is not selected for tracking.)
  - To approve only those consumables that are currently selected for tracking, click **Approve**. (If necessary, click the down arrow on the **Track & Approve** button to display the **Approve** option.)
5. Click **Close**.



## A • Installing Pump Options

---

This appendix provides instructions for the following pump options:

- Pressurizing eluent reservoirs ([Section A.1](#))
- Replumbing the piston seal wash system ([Section A.2](#))

### A.1 Pressurizing Eluent Reservoirs

The DP/SP does not require pressurized eluent reservoirs. However, Thermo Fisher Scientific recommends pressurizing reservoirs with helium or nitrogen under the following circumstances:

- When using eluents that are sensitive to contamination.
- When combining aqueous and nonaqueous components (for example, water and acetonitrile). Pressurizable reservoirs allow eluents to be stored under a specific atmosphere.

All eluent reservoirs available for use with the DP/SP can be pressurized. To pressurize the eluent reservoirs, a regulator kit is required. The kit is available in two versions:

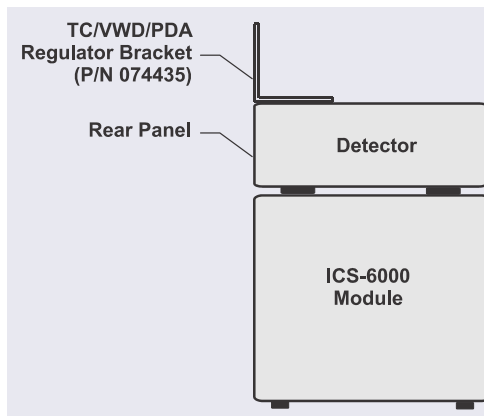
- The EO Regulator Kit (P/N 074422) is required when the DC is installed as the topmost module in the system. The kit includes a pressure regulator and gauge assembly with four outputs (for connections to four eluent reservoirs), as well as the tubing and fittings required.
- When the Dionex VWD or Dionex PDA is installed as the topmost module in the system, the TC/VWD/PDA Regulator Bracket Kit (P/N 074424) is required. The kit includes the EO Regulator Kit described above, as well as a right-angle regulator bracket and mounting hardware. After attaching the bracket to the detector, you will mount the gas regulator assembly on the bracket.

If more reservoirs are required, order a second regulator (P/N 074425).

### A.1.1 Installing the TC/VWD/PDA Regulator Bracket

The TC/VWD/PDA Regulator Bracket Kit (P/N 074424) includes a regulator bracket (P/N 074435), two screws (P/N 045687), and two washers (P/N 010645).

1. Place one leg of the regulator bracket on top of the detector. Orient the bracket as shown in [Figure A-1](#).
2. Secure the regulator bracket to the module, using the screws and washers provided in the Regulator Bracket Kit.

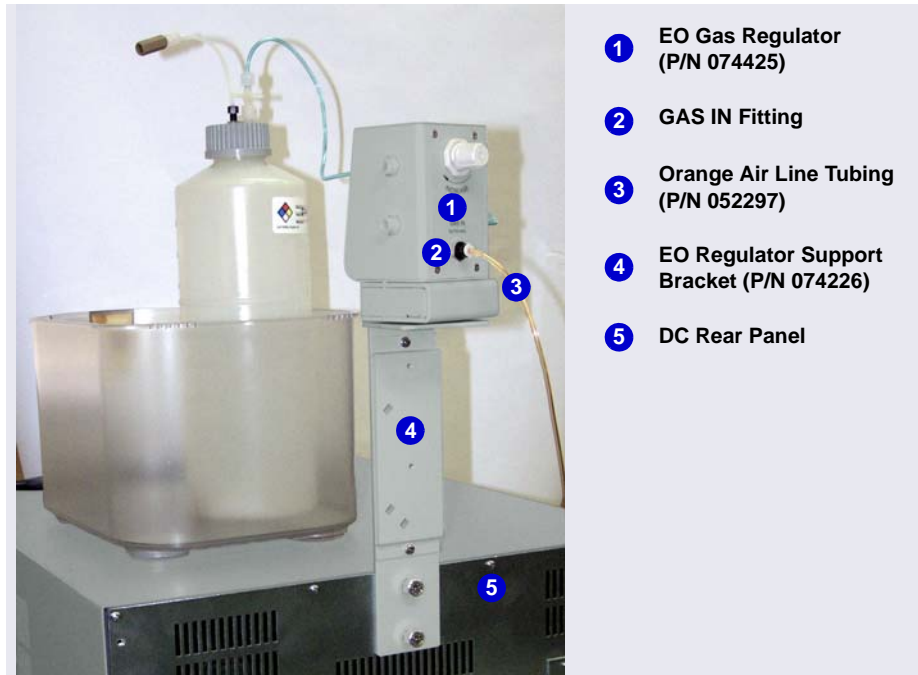


**Figure A-1.** TC/VWD/PDA Regulator Bracket Orientation

### A.1.2 Connecting the Gas Source

1. Attach the EO regulator support bracket (P/N 074426) to the rear panel of the DC (see [Figure A-2](#)) or to the regulator bracket on the VWD or PDA.
2. Push the EO Gas Regulator (P/N 074425) onto the top of the support bracket.
3. Locate the 1/4 in NPT to 1/8 in adapter (P/N 063505) and the orange, 3 mm (1/8 in) ID air line tubing (P/N 052297) provided in the EO Regulator Kit.
4. Push one end of the orange tubing into the **GAS IN** fitting on the EO Gas Regulator.
5. Connect the other end of the orange tubing to a clean helium or nitrogen source regulated to between approximately 0.17 and 0.34 MPa (25 and

50 psi). If needed for your gas source, use the adapter to connect the tubing to the gas source.



**Figure A-2.** EO Gas Regulator Connections

6. For each reservoir to be connected, locate a gas source tubing assembly (P/N 063942). Each assembly consists of a length of blue, 3 mm (1/8 in) ID air line tubing with a quick-disconnect fitting on one end and a one-way valve fitting on the other end (see [Figure A-3](#)).
7. Push the one-way valve fitting onto the luer fitting on the top of the reservoir cap. This is the gas shutoff valve for the reservoir.

8. Remove the black cap from the quick-disconnect fitting, twist off the end of the quick-disconnect fitting, and then connect the free end of the blue tubing to a quick-disconnect fitting on the side of the EO Gas Regulator.



**Figure A-3.** Gas Connections to Reservoir

**NOTE** Low-pressure valves can be installed on the EO regulator support bracket (see [Section B.2](#)).

### **A.1.3 Pressurizing the Eluent Reservoir**

**NOTE** Do not pressurize the system until after the reservoir is plumbed.

1. Turn the gas regulator knob fully counterclockwise to ensure that there is no pressure to the reservoir when the gas source is turned on.
2. Close the gas shutoff valve on each reservoir cap.
3. Turn on the gas source; the upper limit is 0.34 MPa (50 psi).

4. Turn the gas regulator knob clockwise to pressurize the eluent reservoir. Adjust the pressure to between 30 and 40 kPa (5 and 6 psi).



**Never pressurize eluent reservoirs above 70 kPa (10 psi). Pressurizing reservoirs above this limit can cause the reservoir to explode.**



**Ne mettez jamais les réservoirs d'éluants sous une pression supérieure à 0,07 MPa (10 lb/po<sup>2</sup>).**



**Setzen Sie den Eluentbehälter auf keinen Fall einem Druck über 0,07 MPa aus.**

5. If the liquid lines have been plumbed to the pump, you may open the gas shutoff valve on each reservoir cap.

## A.2 Replumbing the Seal Wash System (DP Only)

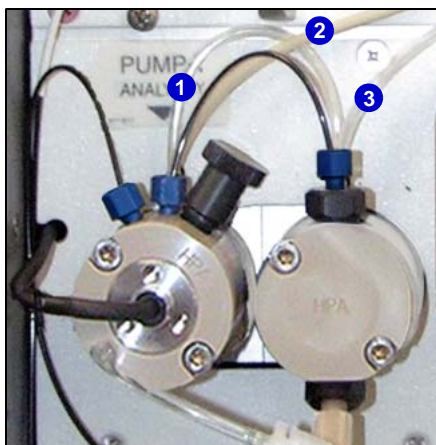
In a DP, the standard piston seal wash system is designed for use with only one of the two pumps. When the DP is shipped from the factory, the seal wash system is connected to the bottom pump (pump 1). If you want to connect the seal wash system to the top pump (pump 2), follow the replumbing instructions in this section.

When you finish these connections, follow the instructions in [Section 3.16](#) to set up the piston seal wash system.

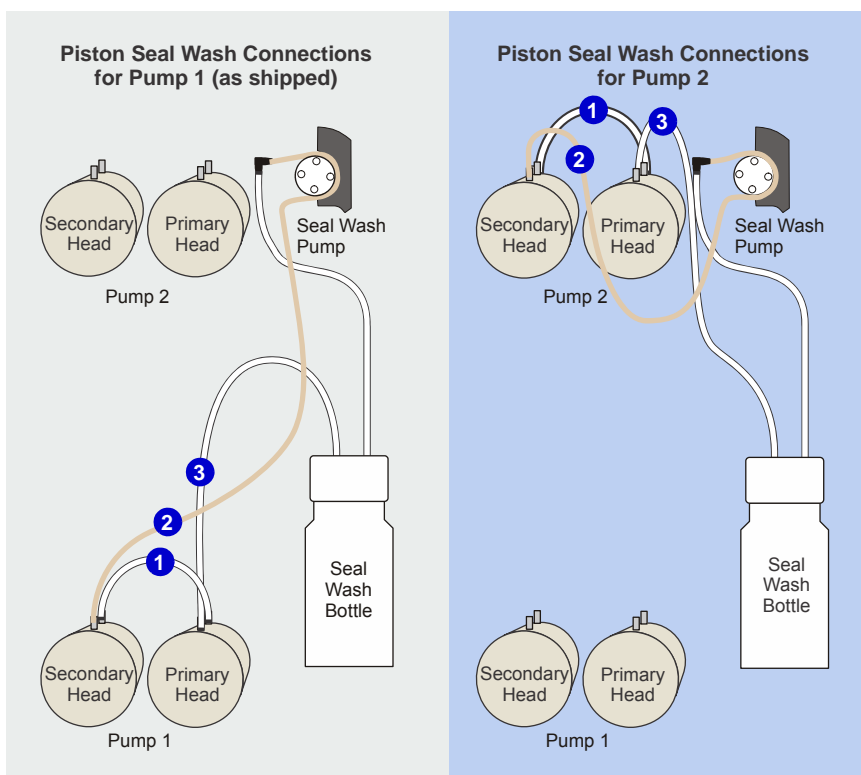
1. To connect the seal wash system to pump 2, disconnect three piston seal wash lines from pump 1 (see [Figure A-4](#)) and reconnect the lines to their respective locations on pump 2 (see [Figure A-5](#)).

2. Move these lines from pump 1 to pump 2:

- The short piece of tubing between the primary and secondary pump heads **1**.
- The tubing from the secondary pump head that connects to the seal wash pump **2**.
- The seal wash reservoir inlet line from the primary pump head **3**.



**Figure A-4.** Piston Seal Wash Connections to Pump 1



**Figure A-5.** DP Piston Seal Wash Connections (Pump 1 or Pump 2)



## B • Installing DC Options

This appendix provides instructions for installing the following DC options:

Analytical  
IC

- ED amperometry cell ([Section B.1](#))

- Low-pressure valves ([Section B.2](#))

Analytical  
IC

- Injection valve panel ([Section B.3](#))

- Dionex ICS-6000 Automation Manager ([Section B.4](#))

Capillary  
IC

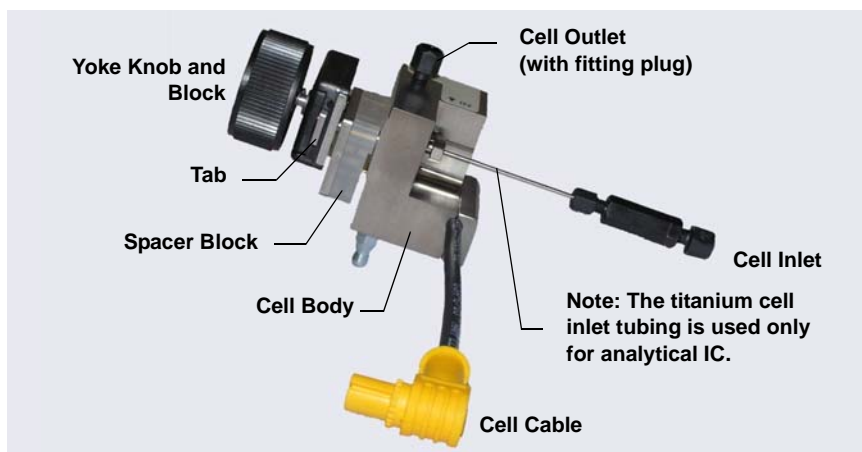
- Dionex ICS-6000 IC Cube ([Section B.5](#))

### B.1 Installing the ED Amperometry Cell

**NOTE** Always wear gloves when handling the ED cell. Never touch the electrode surface.

#### B.1.1 Unpacking and Disassembling the Cell

1. Remove the ED cell from the box. See [Figure B-1](#) to identify the cell parts.

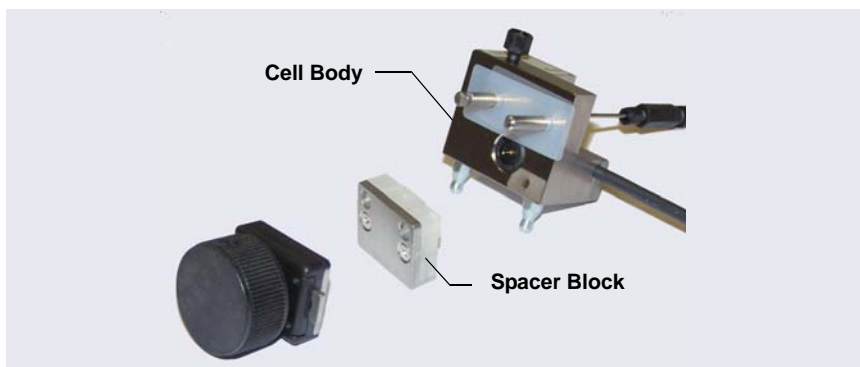


**Figure B-1.** ED Cell Components

2. Loosen the yoke knob that holds the spacer block to the cell body by unscrewing it two to three turns.
3. Squeeze the tabs on the sides of the yoke block and pull the knob with yoke block off the spacer block.

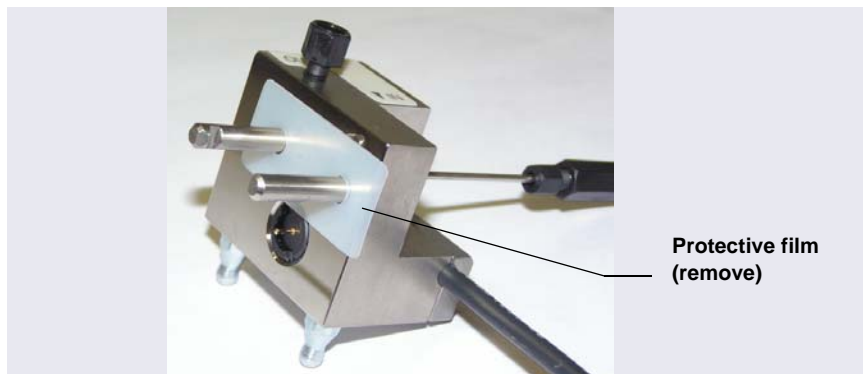
**NOTE** Handle the inside surfaces of the cell carefully to prevent scratches, which may subsequently cause leaks.

4. Slide the spacer block off the alignment pins on the cell body (see [Figure B-2](#)). The spacer block is for use only with disposable working electrodes. If you will be installing a conventional working electrode, you can remove the spacer block and save it for possible future use.



**Figure B-2.** *Disassembling the ED Cell*

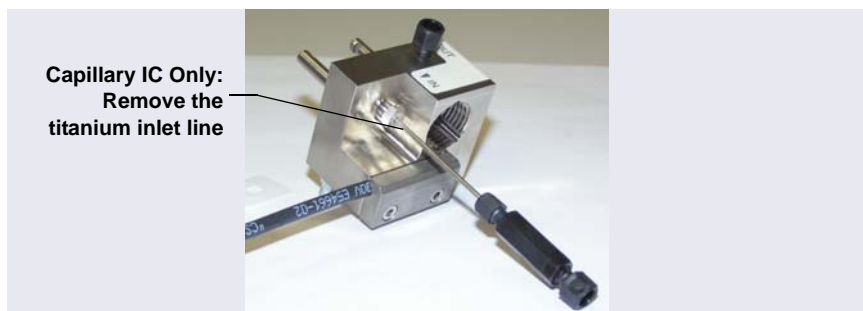
5. Remove the protective film from the alignment pins on the cell body (see [Figure B-3](#)).



**Figure B-3.** Removing the ED Cell Protective Film

Capillary  
IC

6. If you are installing the ED cell in a capillary IC system, use an open-end wrench to remove the titanium inlet line from the cell (see [Figure B-4](#)).



**Figure B-4.** Capillary IC Only: Removing the Titanium Inlet Line

7. Rinse the surface of the cell with ASTM Type I (18 megohm-cm) filtered and deionized water.
8. Clean the polished surface of the cell with a damp clean, lint-free tissue.

## B.1.2 Installing a Disposable Working Electrode

For installation instructions for disposable working electrodes, refer to the installation guide shipped with the electrodes (see below) or to *Product Manual for Disposable Electrodes* (Document No. 065040).

- *Disposable Silver Electrode Installation Guide for ED* (Document No. 065137)
- *Disposable Platinum Electrode Installation Guide for ED* (Document No. 065139)
- *Disposable Gold Electrode Installation Guide* (Document No. 065191)

### IMPORTANT

When installing a disposable electrode, be sure to install the correct gasket for your system:

- For a capillary system, use a 0.001 in PTFE gasket (P/N 072117, Pkg. of 2).
- For an analytical system with a gold, silver, or platinum disposable electrode, use a 0.002 in PTFE gasket (P/N 060141, Pkg. of 4).
- For an analytical system with a carbon disposable electrode, use a 0.001 in Ultem™ gasket (P/N 069339).

After installing a disposable working electrode, install the reference electrode:

- To install a pH-Ag/AgCl reference electrode, go on to [Section B.1.4](#).
- To install a PdH reference electrode, go on to [Section B.1.5](#).

## B.1.3 Installing a Conventional Working Electrode

### Notes on Polishing Conventional (Nondisposable) Working Electrodes

- **Do not polish new conventional working electrodes before installation.**

After an electrode has been used for a period of time, a layer of contamination may build up. When this occurs, the electrode must be polished. For details, refer to *Polishing Gold Working Electrodes* (Document No. 031154).

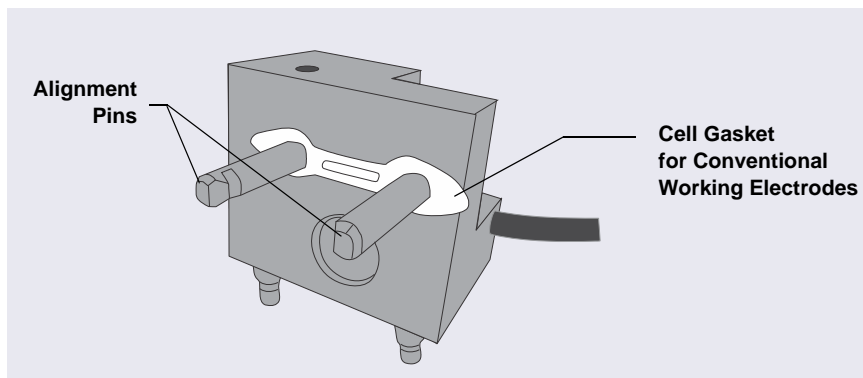
### Items Needed for Installing a Conventional Working Electrode

- ED cell gasket for conventional working electrodes (P/N 045972)

- Blunt-end tweezers

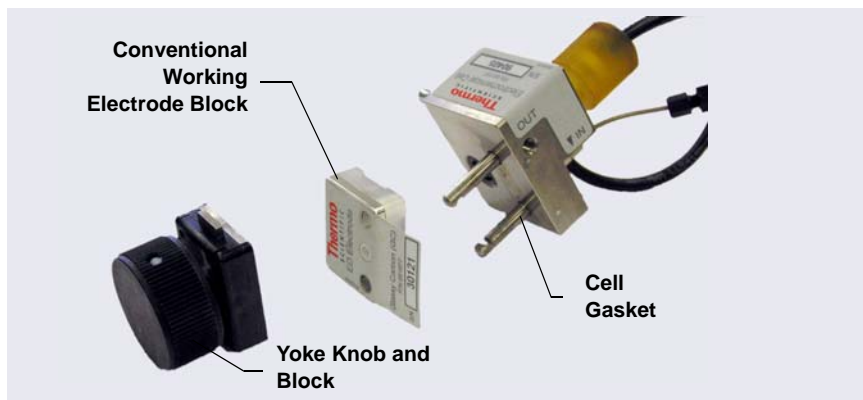
**NOTE** Install the working electrode before connecting the cell to the ED.

1. Use tweezers to install the gasket over the alignment pins on the cell body (see [Figure B-5](#)). When correctly installed, one end of the gasket extends beyond the cell body, to facilitate gasket installation and removal.



**Figure B-5.** ED Cell Gasket for Conventional Working Electrodes

2. Verify that the gasket is flat against the cell body and is not wrinkled.
3. Orient the working electrode block as shown in [Figure B-6](#) and then slide it onto the alignment pins.



**Figure B-6.** ED Cell Components

4. Install the yoke knob on the alignment pins and fingertighten the knob by turning it a full 360 degrees.

**NOTE** It is not possible to overtighten the yoke knob. After the knob clicks into place, it cannot be tightened any further. The yoke knob ensures that constant pressure is applied to the cell.

After installing a conventional working electrode, install the reference electrode:

- To install a pH-Ag/AgCl reference electrode, go on to [Section B.1.4](#).
- To install a PdH reference electrode, go on to [Section B.1.5](#).

## **B.1.4 Installing the pH-Ag/AgCl Reference Electrode**

### **Preparing the pH-Ag/AgCl Reference Electrode**

1. Orient the cell assembly with the yoke knob on the left and push the cell onto its mounting location on the ED.
2. Remove the pH-Ag/AgCl reference electrode (P/N 061879) from its box (see [Figure B-7](#)).



**Figure B-7.** pH-Ag/AgCl Reference Electrode in Storage Cap

3. Hold the electrode vertically, with the cable up and the storage cap down, to prevent spilling the storage fluid in the cap. Unscrew the storage cap from the electrode. Save the cap.

**IMPORTANT**

Always store the pH-Ag/AgCl reference electrode in the storage cap filled with saturated KCl solution when the cell is not in use. This prevents the pH-Ag/AgCl reference electrode membrane from drying out and damaging the electrode.

4. Rinse the pH-Ag/AgCl reference electrode thoroughly in ASTM Type I (18 megohm-cm) filtered and deionized water to remove any precipitated salt.

### **Calibrating the pH-Ag/AgCl Reference Electrode**

#### **Items Needed**

- A buffer solution with a pH of 7
- A second buffer solution with a different pH (typically one that matches the pH of the eluent used in your application; for example, pH 10 or pH 4)

#### **Calibration Procedure**

1. Connect the cell and the reference electrode electrical cable to the ED. **Do not install the electrode in the cell yet.**
2. On the Chromeleon ePanel Set, click the **Eluent Generator** tab and then click the **Calibration** button. The Wellness panel opens.
3. Follow the instructions on the Wellness panel to calibrate the electrode.
4. Disconnect the reference electrode cable and the cell cable.
5. Grasp the cell body and pull straight out to remove the cell from the detector.
6. Install the pH-Ag/AgCl reference electrode in the cell:
  - For a capillary IC system, follow the instructions in the next section.
  - For an analytical IC system, go on to [page 178](#).

Capillary  
IC

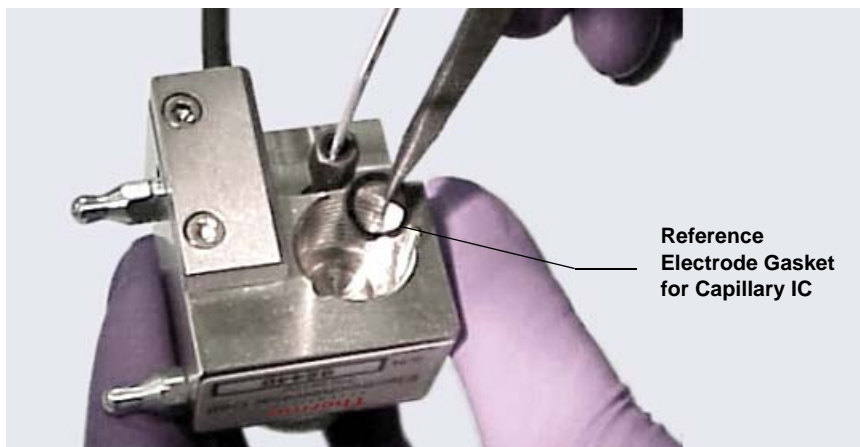
**Installing the pH-Ag/AgCl Reference Electrode in the Cell for Capillary IC Systems**

1. To avoid any hydraulic pressure buildup when inserting the reference electrode into the cell, make sure that fitting plugs are not installed on the cell inlet and outlet fittings.
2. Use a sharp tool (for example, the tip of a safety pin or a straight pin) to remove the pH-Ag/AgCl reference electrode O-ring (see [Figure B-8](#)).



**Figure B-8.** *pH-Ag/AgCl Reference Electrode O-Ring*

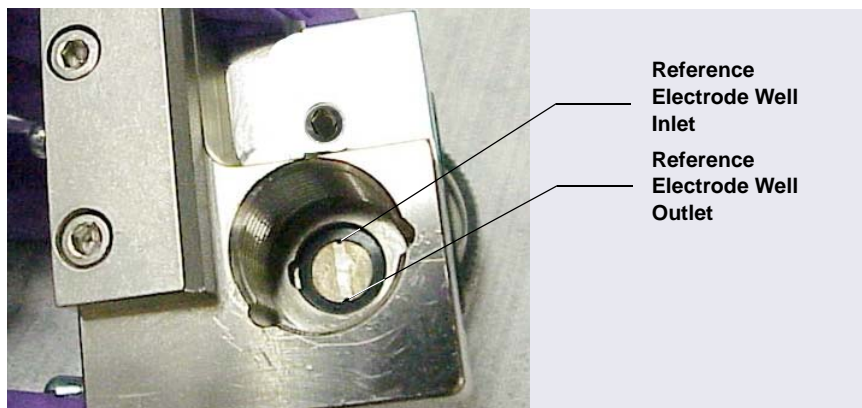
3. Using tweezers, install the reference electrode gasket for capillary IC (P/N 072162) into the bottom of the reference electrode well (see [Figure B-9](#)).



**Figure B-9.** *Reference Electrode Gasket for Capillary IC*



4. Verify that the gasket is centered in the bottom of the well and that it does not block the inlet or outlet of the well. The inlet and outlet are small round openings in the bottom of the well (see [Figure B-10](#)).



**Figure B-10.** Reference Electrode Well with Reference Electrode Gasket for Capillary IC Installed

5. Verify that the reference electrode O-ring has been removed and the reference electrode gasket is correctly installed in the bottom of the well.
6. Screw the pH-Ag/AgCl reference electrode into the reference electrode well and tighten it fingertight (see [Figure B-11](#)).



**Figure B-11.** Installing the pH-Ag/AgCl Reference Electrode In the Reference Electrode Well

Go on to [Section 4.1.13](#) to complete the cell plumbing.

Analytical  
IC

### Installing the pH-Ag/AgCl Reference Electrode in the Cell for Analytical IC Systems

1. To avoid any hydraulic pressure buildup when inserting the reference electrode into the cell, make sure that fitting plugs are not installed on the cell inlet and outlet fittings.
2. Verify that the pH-Ag/AgCl reference electrode O-ring is present (see [Figure B-8](#)) and then screw the pH-Ag/AgCl reference electrode into the reference electrode well and tighten it fingertight (see [Figure B-11](#)).



**Figure B-12.** pH-Ag/AgCl Reference Electrode O-Ring

3. Orient the cell assembly with the yoke knob on the left and then push the cell onto its mounting location on the ED (see [Figure B-13](#)).
4. If the detector is already installed, connect the reference electrode cable and the cell cable.

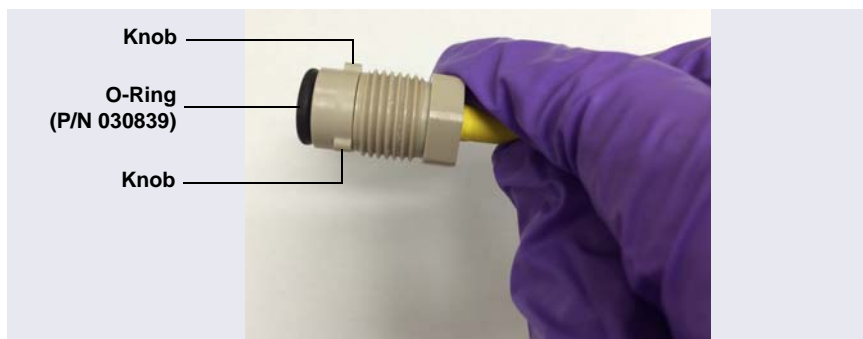


**Figure B-13.** ED Cell Installed on ED

Go on to [“Plumbing the Electrochemical Cell in the DC” on page 154](#) to complete the cell plumbing.

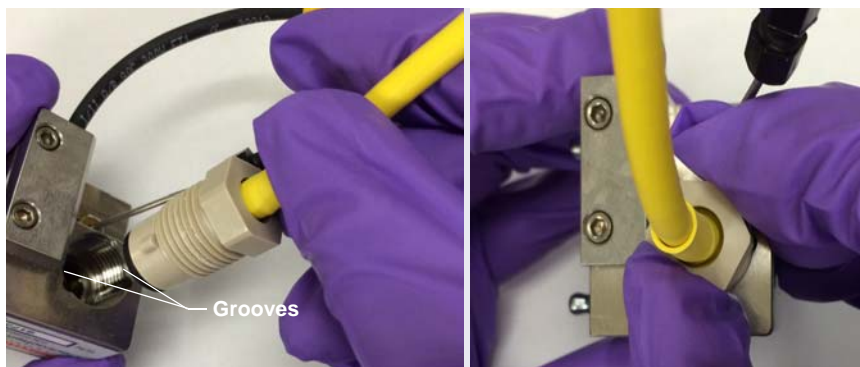
### **B.1.5 Installing the PdH Reference Electrode**

1. To avoid any hydraulic pressure buildup when inserting the PdH reference electrode into the cell, verify that fitting plugs are not installed on the cell inlet and outlet fittings.
2. Remove the PdH reference electrode (P/N 072075) from its box.
3. Install the O-ring (P/N 030839) on the end of the PdH reference electrode (see [Figure B-14](#)).



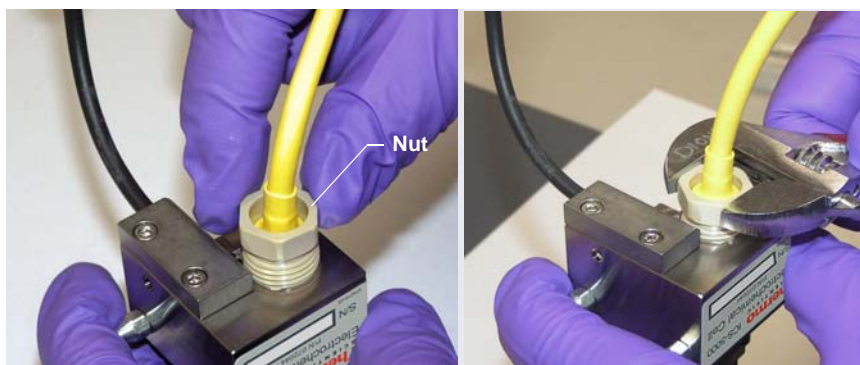
**Figure B-14.** PdH Reference Electrode with O-Ring

4. Align the fitting on the end of the PdH reference electrode so that the knobs on the fitting align with the grooves in the reference electrode well (P/N 072044) (see [Figure B-15](#)), and then insert the fitting into the well.



**Figure B-15.** *Inserting the PdH Reference Electrode Fitting into the Reference Electrode Well*

5. Screw the nut on the PdH reference electrode into the reference electrode well and tighten it fingertight. Use a wrench to tighten the nut an additional 20 to 30 degrees (see [Figure B-16](#)).



**Figure B-16.** *Installing the PdH Reference Electrode Nut*

6. Orient the cell assembly with the yoke knob on the left and then push the cell onto its mounting location on the ED.
7. If the detector is already installed, connect the reference electrode cable and the cell cable.

To complete the cell plumbing, go on to [Section 4.1.13](#).

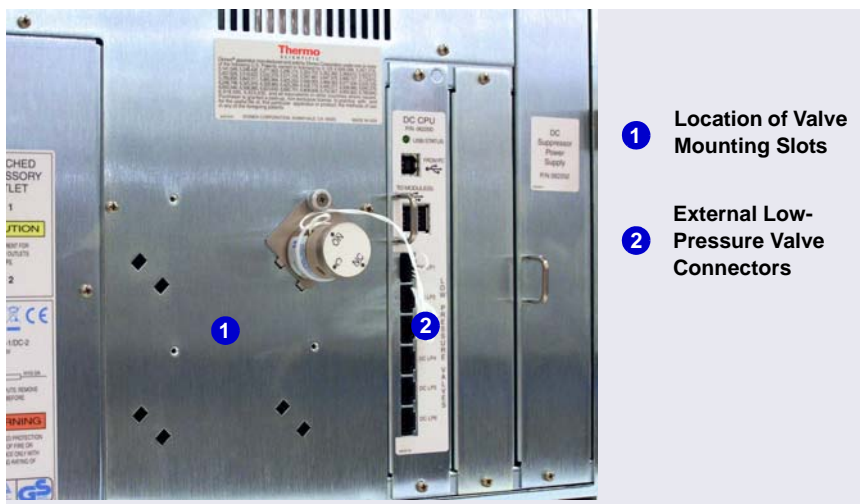
## **B.2 Installing Low-Pressure Valves in the DC**

Three locations are available for installing low-pressure valves in the DC: on the rear panel, in the lower compartment, and on the Dionex ICS-6000 Automation Manager (AM). To install low-pressure valves on the rear panel or in the lower compartment, see the instructions in the next section. To install low-pressure valves on the AM, see [Section B.4](#).

### **B.2.1 Installing a Low-Pressure Valve on the DC Rear Panel**

1. Insert the two tabs on the valve mounting plate into available slots on the DC rear panel (see [Figure B-17](#)) or EO regulator stand bracket.
  - Four low-pressure valves can be installed on the DC rear panel.
  - If an EO Regulator Kit (P/N 062582) is installed (see [Appendix A.1](#)), two low-pressure valves can be installed on the EO bracket.
2. While holding the valve mounting plate firmly in place, tighten the captive thumbscrew.
3. Plug the valve into one of the low-pressure valve connectors on the DC rear panel (see [Figure B-17](#)). Plumb the valve as required.

4. Note which rear panel connector each valve is connected to. This information is required to control the valves in Chromeleon.



**Figure B-17.** DC Rear Panel: External Low-Pressure Valve Connections

## **B.2.2 Installing a Low-Pressure Valve Inside the DC**

1. Insert the two tabs on the valve mounting plate into available slots in the lower compartment of the DC, above the columns.
2. While holding the valve mounting plate firmly in place, tighten the captive thumbscrew.
3. Route the valve cable to the back of the DC, through the slot on the side of the module. Connect the cable to one of the low-pressure valve connectors on the DC rear panel (see [Figure B-17](#)).

## B.3 Installing the Injection Valve Panel in the DC

Follow the instructions in this section to install the injection valve panel in the lower compartment of the DC. The panel can be ordered with 0, 1, or 2 valves mounted on the panel, and with either microbore or standard bore plumbing.

Valves	Plumbing Configuration	Part Number
0	Microbore	062660
1		075948
2		075949
0	Standard Bore	063776
1		075946
2		075947

**Table B-1.** Injection Valve Panels

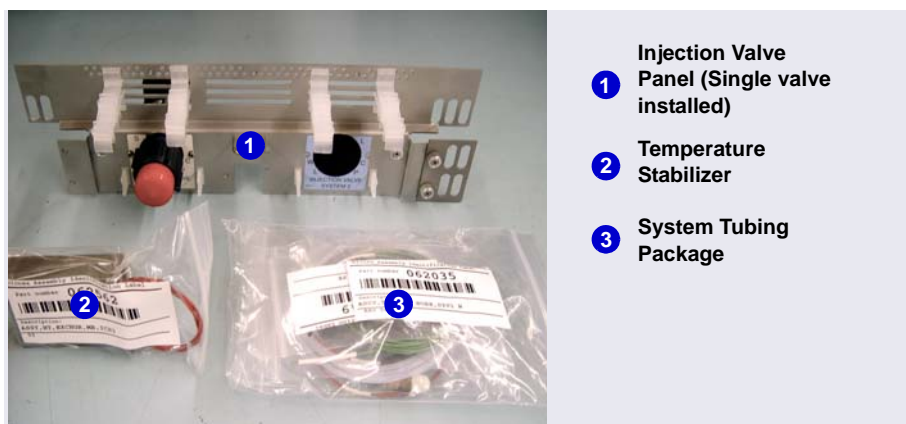
Each panel is shipped with the following items:

- A temperature stabilizer that has been preplumbed with either microbore (red) tubing (P/N 062562) or standard bore (black) tubing (P/N 062561). Dual-valve panels include two temperature stabilizers.
- One tubing package with precut and labeled tubing (either microbore or standard bore) for each valve installed on the panel. Labels on the tubing for system 1 (left side) are white; labels on the tubing for system 2 (right side) are blue.

Plumbing Configuration	System Number	Color of Tubing Labels	Part Number
Microbore	1	White	062035
	2	Blue	062036
Standard Bore	1	White	AAA-062031
	2	Blue	AAA-062062

**Table B-2.** System Tubing Packages

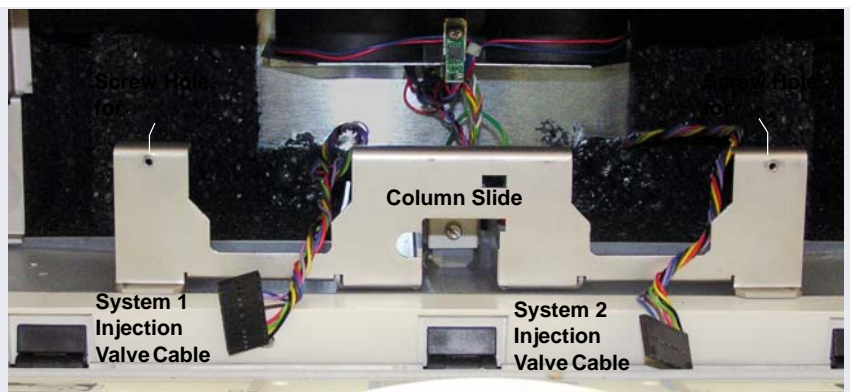
[Figure B-18](#) shows the components shipped with a single-valve panel.



**Figure B-18.** Injection Valve Panel Ship Kit: Single-Valve Configuration

**IMPORTANT** Always turn off the DC power before installing a valve panel.

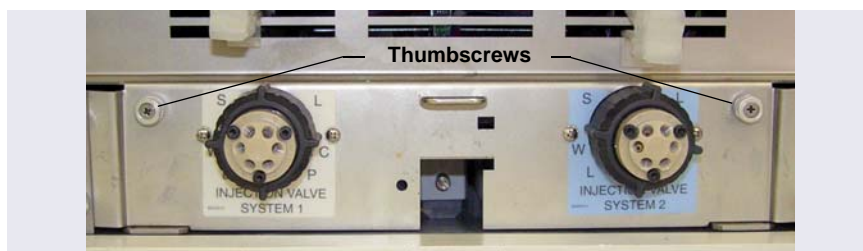
1. If the DC power is on, press the **POWER** button on the front of the DC for 2 seconds to turn off the power before continuing.
2. Open the DC lower door.
3. Pull the column slide forward (see [Figure B-19](#)).



**Figure B-19.** DC Lower Compartment Column Slide and Injection Valve Cables



4. Connect the system 1 injection valve cable (labeled **SYS 1**) (see [Figure B-19](#)) to the connector on the back of the system 1 valve (left side). For a dual-valve panel, also connect the **SYS 2** cable to the system 2 valve (right side).
5. Align the captive thumbscrews on the panel (see [Figure B-20](#)) with the screw holes on the column slide (see [Figure B-19](#)).
6. While holding the column slide in place, tighten the thumbscrews to secure the panel onto the column slide.

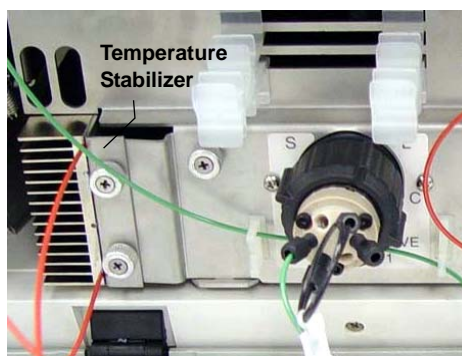


**Figure B-20.** DC Lower Compartment Injection Valve Panel: Dual-Valve Configuration

### Installing the Temperature Stabilizer

Install the temperature stabilizer for system 1 (or a single system) on the left side of the injection valve panel (see [Figure B-21](#)). Install the temperature stabilizer for system 2 on the right side of the panel.

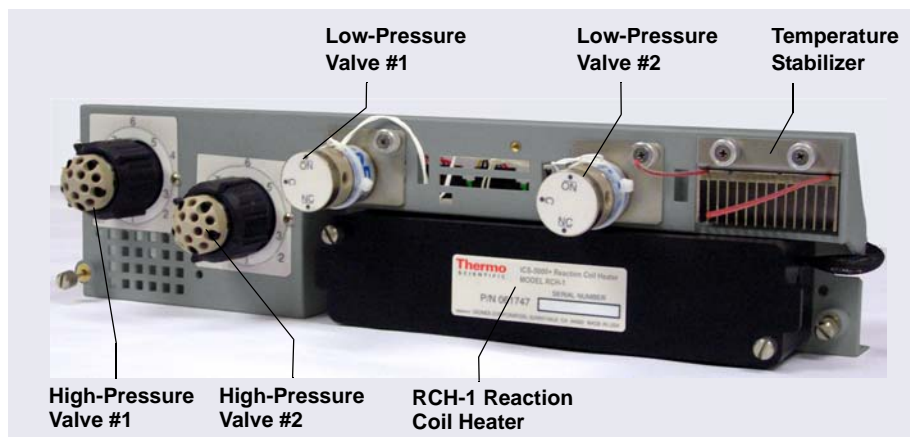
1. Slide the temperature stabilizer into the opening next to the valve.
2. Tighten the thumbscrews.



**Figure B-21.** Temperature Stabilizer Installed on the Left Side of the Injection Valve Panel

## B.4 Installing the Automation Manager (AM) in the DC

The AM consists of a tray for installation of valves and other components that are used for performing matrix elimination, large volume preconcentration, and other functions (see [Figure B-22](#)). The AM is installed into the upper compartment of the DC.



**Figure B-22.** *Dionex ICS-6000 Automation Manager: Example Configuration*

**NOTE** Because the AM requires the full width of the DC upper compartment, an IC Cube cannot be installed in the DC when an AM is installed.

Connections from the AM to other components in the system (pump, injection valve, reagent reservoirs, and so on) depend on the application. Refer to Chapter 3 of the Dionex ICS-6000 operator's manual for the configuration schematic for your application.

The AM is available in the following configurations:

AM Configuration	Part Number
Two 10-port high-pressure valves, two low-pressure 3-way valves	075950
One 10-port high-pressure valve, one low-pressure 3-way valve	075951
One 6-port high-pressure valve, one low-pressure 3-way valve	075952
AutoPrep configuration: 10-port high-pressure valve AutoPrep sample loop AutoPrep standard loops	075953
AM tray with no valves	079833

Thermo Fisher Scientific offers the following optional components for the AM:

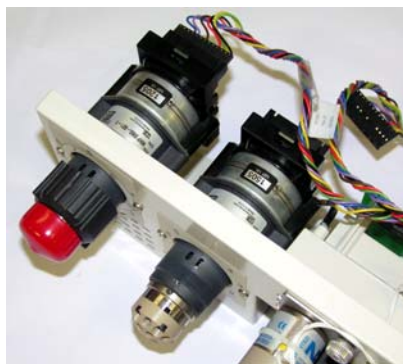
AM Component	Part Number
High-pressure valve, 6-port	075917
High-pressure valve, 10-port	075918
Low-pressure valve, 2-way	079848
Low-pressure valve, 3-way	061971
RCH-1 Reaction Coil Heater	079849
Temperature stabilizer, standard bore, 0.25 mm (0.010 in) ID	062561
Temperature stabilizer, microbore, 0.125 mm (0.005 in) ID	062562

*Table B-1. AM Optional Components*

- If an application requires any of these options, attach it to the AM now (before installing the AM in the DC).
- If you are not installing optional components, go on to [page 190](#) to install the AM in the DC.

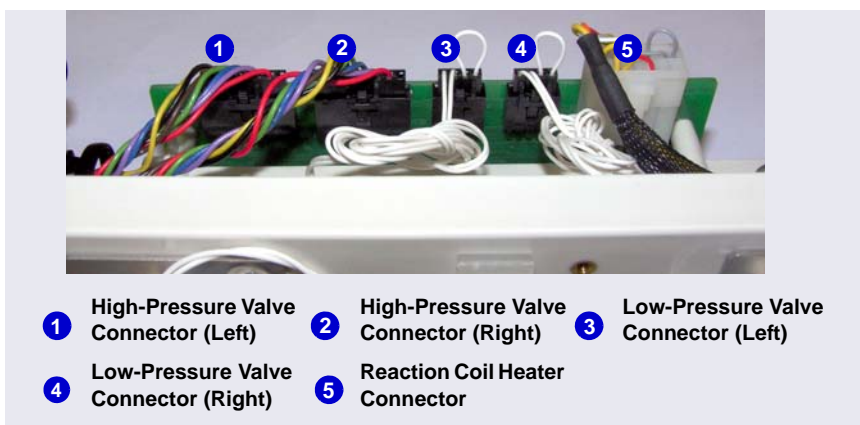
### **B.4.1 Installing a High-Pressure Valve on the AM**

1. While facing the rear of the AM, squeeze the release tabs on the outside edge of the plug that is installed in the valve mounting hole. Remove the plug.
2. Unscrew the black locking ring on the front of the high-pressure valve.
3. Attach the appropriate label (6-port or 10-port) to the front of the AM.
4. Remove the two Phillips screws and washers from the valve.
5. Orient the valve with the model label on top (see [Figure B-23](#)).
6. Hold the valve behind the AM and insert it through the valve mounting hole.
7. Reinstall the two Phillips screws and washers and tighten the screws.



**Figure B-23.** High-Pressure Valve Installation

8. Replace the black locking ring and tighten it fingertight.
9. Two high-pressure valve cables are connected to the AM prep board (see [Figure B-24](#)). Uncoil the appropriate valve cable and plug it into the connector on the valve.



**Figure B-24.** Connections to the AM Prep Board

## B.4.2 Installing a Low-Pressure Valve on the AM

1. Insert the two tabs on the valve mounting plate into the slots for either the left or right valve mounting position.
2. While holding the valve mounting plate firmly against the AM, tighten the captive thumbscrew (see [Figure B-24](#)).
3. Thread the connector and wires through the opening next to the valve.



**Figure B-25.** *Low-Pressure Valve Installation (Left Valve Mounting Position)*

4. Plug the valve connector into the appropriate connector on the AM prep board (see [Figure B-24](#)).

**NOTE** For instructions on how to install low-pressure valves outside the AM, see [Section B.2](#).

## B.4.3 Installing the RCH-1 Reaction Coil Heater on the AM

1. Note the two ball studs on the back of the heater. Align the ball studs with the two receivers on the wall of the AM heater compartment.
2. Push the heater firmly onto the receivers and snap it into place.
3. Route the heater cable through the cutout to the right of the heater. Plug the cable into the **HEATER** connector on the AM prep board (see [Figure B-24](#)).

#### B.4.4 Installing the Temperature Stabilizer on the AM

1. Remove the plate on the right side of the AM that covers the temperature stabilizer mounting location.
2. Slide the temperature stabilizer into the opening and tighten the captive thumbscrews (see [Figure B-22](#)).

#### B.4.5 Installing the AM in the DC Upper Compartment

**IMPORTANT**

Always turn off the DC power before installing an AM.

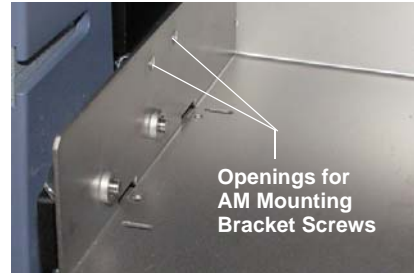
1. If the DC power is on, press the **POWER** button on the front of the DC for 2 seconds to turn off the power before continuing.
2. Locate the high-pressure valve labels shipped with the AM.
3. Unscrew the black locking ring on the front of the high-pressure valve. Attach the appropriate label (6-port or 10-port) to the front of the AM. Replace the black locking ring.
4. Pull the DC top component tray all the way forward (see [Figure B-26](#)).



*Figure B-26. DC with Top Component Tray Pulled Forward*

5. Locate the pair of mounting brackets (P/N 071260) shipped with the AM.

6. For each bracket, align the two captive screws on the bracket with the openings on the AM component tray. See [Figure B-26](#) for the right-side location and [Figure B-27](#) for the left-side location. Tighten the screws.



**Figure B-27.** *Openings for AM Mounting Bracket Screws (Left Side)*

7. Place the AM on the component tray and slide it back into the mounting brackets.
8. Continue sliding until the AM is connected to the electrical receptacle on the back of the DC top component tray (see [Figure B-26](#)). Push firmly to seat the AM.
9. Tighten the locking screws in the right and left corners of the AM with a screwdriver. **Do not overtighten the screws.**
10. Push the component tray all the way back into the DC (see [Figure B-28](#)).



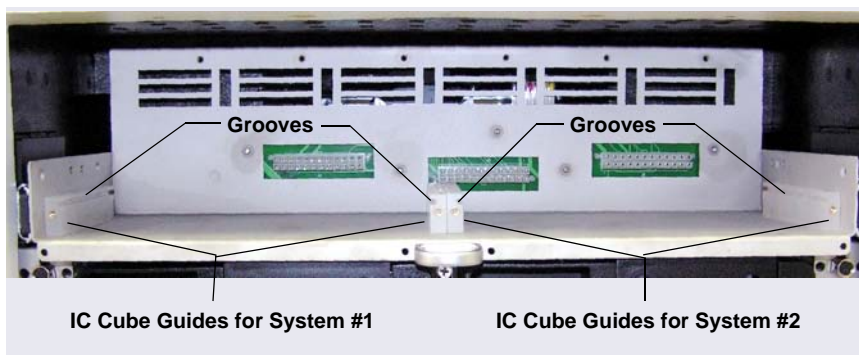
**Figure B-28.** *DC with AM Installed*

## B.5 Installing an IC Cube in the DC

**IMPORTANT**

Always turn off the DC power before installing an IC Cube.

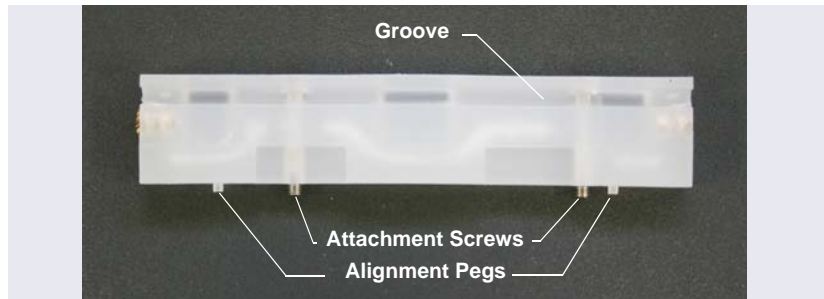
1. If the DC power is on, press the **POWER** button on the front of the DC for 2 seconds to turn off the power before continuing.
2. Open the DC upper door.
3. Pull out the DC upper compartment tray until it stops.
4. Locate the two IC Cube installation guides (P/N 071264) shipped with the IC Cube.
5. For reference, [Figure B-29](#) shows the completed installation of four guides (for two IC Cubes) installed in the upper compartment of the DC.



**Figure B-29.** IC Cube Guides Installed in DC Upper Compartment

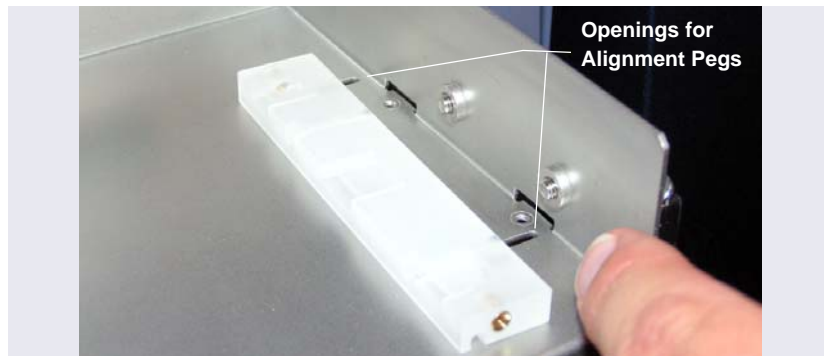


6. To install an IC Cube guide:
  - a. Note that one side of the guide is grooved (see [Figure B-30](#)). Also, note the two alignment pegs and the two attachment screws on the bottom of the guide.



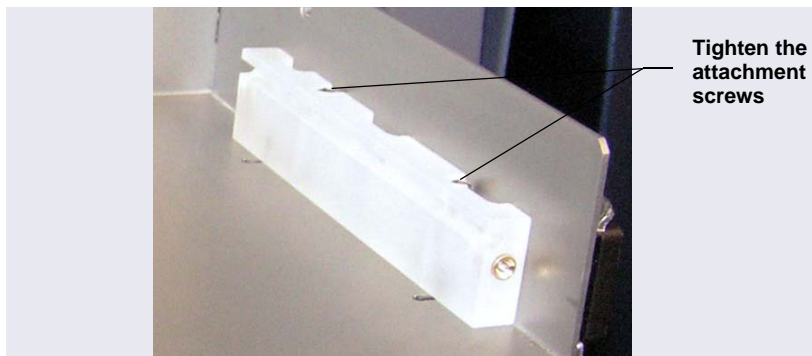
**Figure B-30.** IC Cube Guide

- b. Orient the guide with the grooved edge on top and facing in (toward the IC Cube mounting location) (see [Figure B-29](#)). Align the pegs with the openings on the bottom of the DC upper compartment tray. The openings for the guides on the outside edges of the tray are slotted (see [Figure B-31](#)). The openings for the guides in the center of the tray are round.



**Figure B-31.** Openings for IC Cube Guide Alignment Pegs (Right Side of DC Upper Compartment Tray Shown)

- c. Press the guide onto the tray (see [Figure B-27](#)). Use a slotted screwdriver to tighten the attachment screws.



**Figure B-32.** IC Cube Guide Installed

7. Slide the IC Cube into the guides. Push the IC Cube firmly into the back wall of the DC until the connector on the rear of the IC Cube is fully seated.
8. Use a slotted screwdriver to tighten the screws on each side of the IC Cube. This attaches the IC Cube securely to the guides.

**NOTE** The screws on the front of the IC Cube must be tightened to ensure that the connection between the electrical connector on the rear of the IC Cube and the Dionex ICS-6000 electronics board is secure.