

Dionex Electrolytic Water Purifier Installation Guide

This guide describes how to install a Thermo Scientific Dionex™ Electrolytic Water Purifier (Dionex EWP) in a Thermo Scientific Dionex Reagent Free Ion Chromatography (RFIC™) system (for example, a Dionex ICS-2100 Ion Chromatography System or a Dionex ICS-5000 Ion Chromatography System). The Dionex EWP produces *ultrapure* water (water with very low ionic contamination) from the conductivity cell waste of a Dionex RFIC system. The Dionex EWP is used in automated online sample and standard preparation in IC analyses using the techniques of RFIC-ESP™. For example, ultrapure water from the Dionex EWP can be used to transfer the sample contained in a large sample loop to a concentrator column.

This guide provides installation and operating instructions for the Dionex EWP. For additional information about using the Dionex EWP in trace analyses and other applications, refer to the appropriate manual.

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CAUTION The Dionex EWP is an electrolytic device and should not be operated if there is no eluent or regenerant flowing through it. Always make sure there is fluid flowing through the Dionex EWP before turning on the power to the device. If the Dionex EWP will be unused for an extended period (longer than overnight), reinstall the fitting plugs into the Dionex EWP ports.

Principles of Operation

The Dionex EWP is a dual-chamber water purifier. The first chamber purifies the conductivity cell effluent, which can then be used for inline sample or standard preparation. The analytical pump precisely regulates the flow of the effluent to the Dionex EWP. The second chamber purifies the waste from the injection valve, which can then be used for suppressor regeneration.

The Dionex EWP has six ports: ports 1, 2, and 3 are inlet ports, and ports 4, 5, and 6 are outlet ports. [Table 1](#) describes the port connections and functions.



Table 1. Dionex EWP port connections and functions

Inlet Port	Description	Outlet Port	Description
1	Receives flow from the conductivity cell outlet (requires an inline filter and pressure relief valve)	4	Sends ultrapure water out to the system (for example, to the sample loop)
2	Receives flow from the injection valve waste port (requires an inline filter)	5	Sends ultrapure water to the suppressor Regen In port
3	Receives flow from the EGC degasser Regen Out port	6	Sends spent regenerant water to waste

Kit Contents

Two application-specific versions of Dionex EWP are available:

- For anion applications, use the anion electrolytic water purifier kit (P/N 072629)
- For cation applications, use the cation electrolytic water purifier kit (P/N 072630)

Each kit includes a Dionex EWP (either an anion or a cation version) and a Dionex EWP Installation Kit (P/N 071968). [Table 2](#) lists the items included in the installation kit.

Table 2. Contents of the Dionex EWP Installation Kit (P/N 071968)

Item	Quantity
Pressure relief valve and inline filter assembly for Dionex EWP port 1	1
Inline filter assembly for Dionex EWP port 2	1
Tubing and fittings for connecting to Dionex EWP ports 3, 4, 5, and 6	4 sets
Power cable for the Dionex ICS-2100 Auxiliary Power Supply	1

Power Supply Requirements

The Dionex EWP requires a power supply. If you are connecting to a Dionex ICS-2100, the second EGC power supply (EGC-2) on the Dionex ICS-2100 can be configured as an auxiliary power supply for the Dionex EWP. If you are connecting to a Dionex ICS-5000, a Thermo Scientific Dionex CR-TC power supply in the EG can supply power for the Dionex EWP. The cable for this purpose must be ordered separately (P/N 076589).

Assembling the Dionex EWP

To protect the Dionex EWP from excessive backpressure (more than 0.5 MPa; 75 psi), a pressure relief valve must be installed on port 1. In addition, inline filters must be installed on ports 1 and 2.

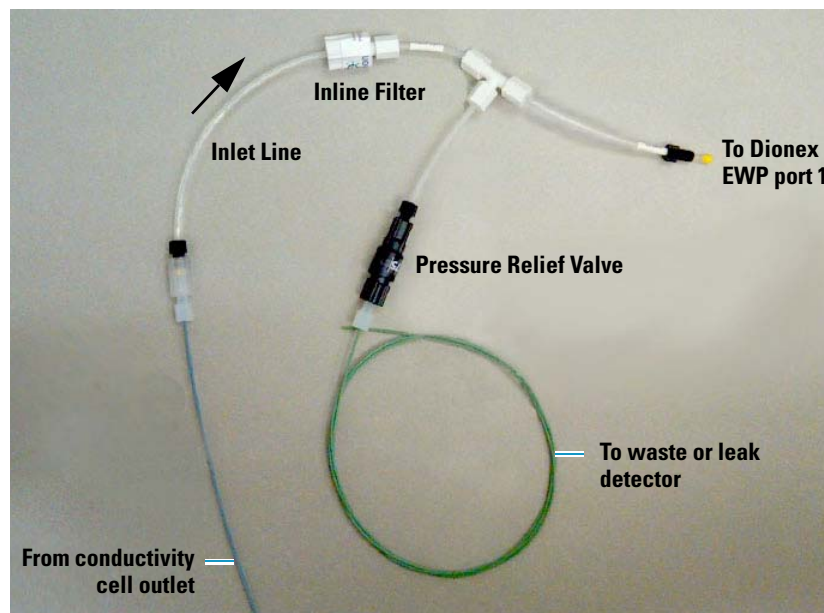


CAUTION The warranty is void if the pressure relief valve and inline filters are not installed.

❖ To connect to Dionex EWP port 1

1. Locate the pressure relief valve and inline filter assembly for port 1 in the kit. See [Figure 1](#).

Figure 1. Pressure relief valve and inline filter assembly for port 1

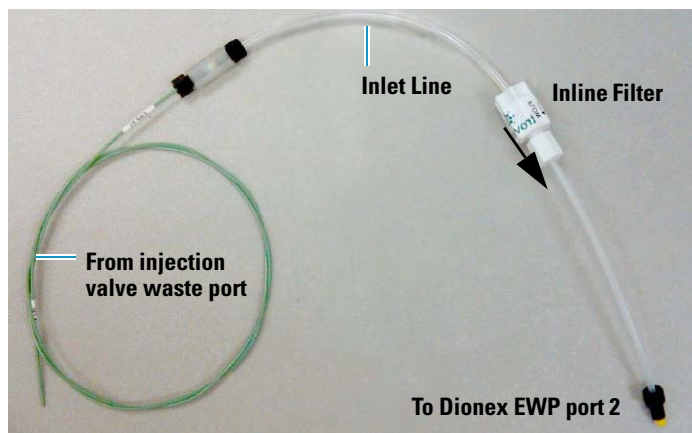


2. Connect the tubing from the inlet of the inline filter to port 1 of the Dionex EWP.
3. Route the tubing connected to the pressure relief valve to waste or to the leak detector of the RFIC system.
4. To connect the inline filter inlet to the conductivity cell outlet, refer to [“Plumbing the Dionex EWP in the IC System”](#) on [page 3](#).

❖ To connect to Dionex EWP port 2

1. Locate the inline filter assembly for port 2 in the kit. See [Figure 2](#).

Figure 2. Inline filter assembly for port 2



2. Connect the tubing from the outlet of the inline filter to port 2 of the Dionex EWP.
3. Connect the tubing from the union on the inlet of the inline filter to the waste port of the injection valve.

The exact plumbing of the Dionex EWP in the IC system varies, depending on the application. In the most basic application, the Dionex EWP provides a source of ultrapure loading water to transfer the sample contained in a large sample loop to a concentrator column. Two plumbing schematics for large loop sample transfer are provided in this section.



CAUTION You must use an extremely low pressure concentrator column with the Dionex EWP. A UTAC-XLP2 (P/N 072781) or TCC-XLP1 (P/N 063889) can be used.

Figure 3 shows the plumbing for an IC system in which the Dionex EWP is used to transfer sample from a sample loop to a concentrator column. In this system, two 6-port valves are installed. The sample flow is equal to the eluent flow for the analysis, so the loop size must be scaled appropriately. To avoid long transfer times, if a 5 mL or larger loop is installed, a 4 mm column application is recommended. For example, if a 10 mL loop is installed on a 4 mm column system running at 1 mL/min, the sample transfer time is 10 minutes. However, the transfer time increases to 40 minutes if a 10 mL loop is installed on a microbore system running at 0.25 mL/min.

Figure 3. IC system plumbing with two 6-port valves and a Dionex EWP used for sample transfer

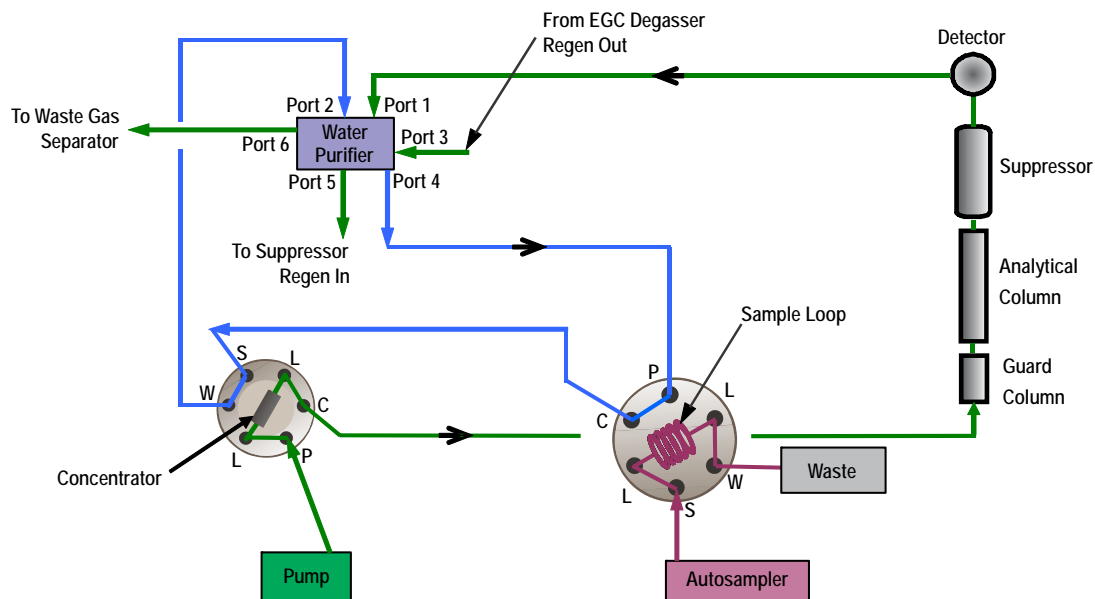
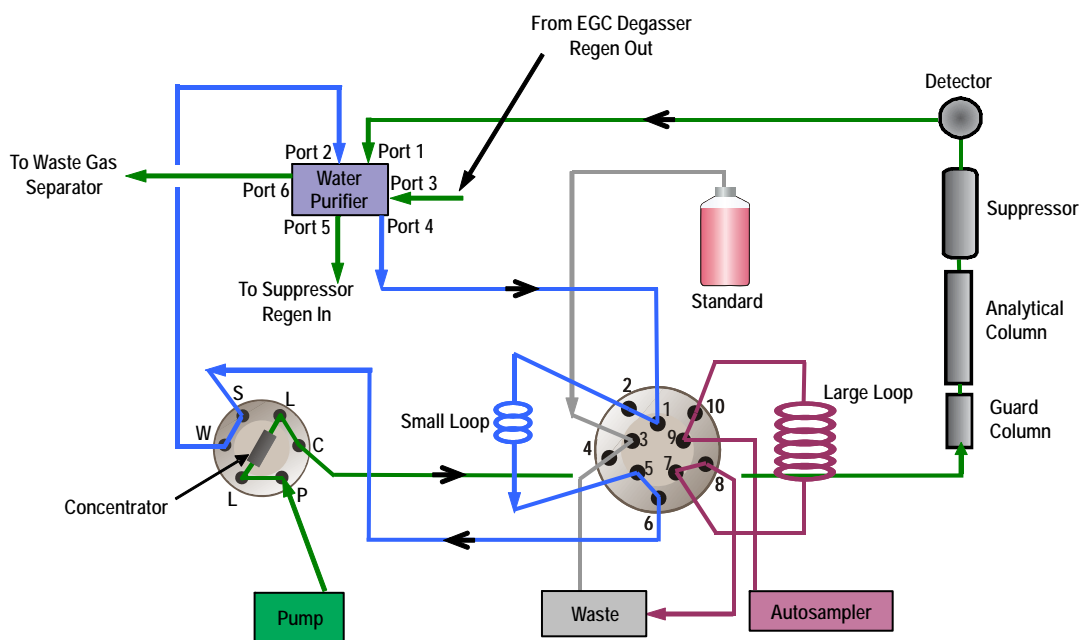


Figure 4 shows the plumbing for an IC system in which the Dionex EWP is used for sample transfer from two loops. In this system, a 10-port valve and a 6-port valve are installed. A large loop and small loop are installed on the 10-port valve and a concentrator column is installed on the 6-port valve. This configuration would be used with a Thermo Scientific Dionex AutoPrep system.

Figure 4. IC system plumbing with a 10-port and a 6-port valve and a Dionex EWP used for sample transfer

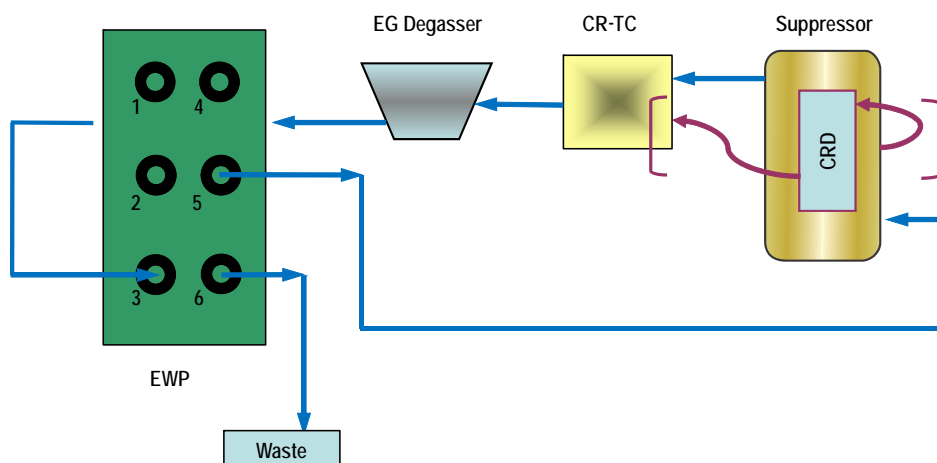


Regeneration Cycle

Figure 5 is a diagram of the regeneration cycle in an IC system with a Dionex EWP. Port 5 of the Dionex EWP supplies regenerant flow for the entire system, including the Dionex EWP. The Dionex EWP is placed last in the flow path. The flow order through system components for regeneration is important. Flow must be in the following order:

Suppressor → CRD (if used) → CR-TC → EG degasser → Dionex EWP (port 3).

Figure 5. Regeneration cycle plumbing in an IC system with a Dionex EWP



Dionex AutoPrep Application

The Dionex EWP can be used to provide loading water for the Dionex AutoPrep application. With AutoPrep, a loop for standards (which is approximately 1/1000 the volume of the sample loop) is installed on the 10-port valve in addition to the sample loop. Refer to the *AutoPrep Installation Instructions* (P/N 065181) and the *AutoPrep User's Guide* (P/N 065180) for additional details. The manuals are available on the Dionex Reference Library DVD-ROM (P/N 053891).

Powering the Dionex EWP

With a Dionex ICS-2100

The column size determines the typical current setting for the Dionex EWP:

- For 4 mm columns, use a current setting of 20 to 30 mA
- For 2 mm columns, use a current setting of 5 to 8 mA

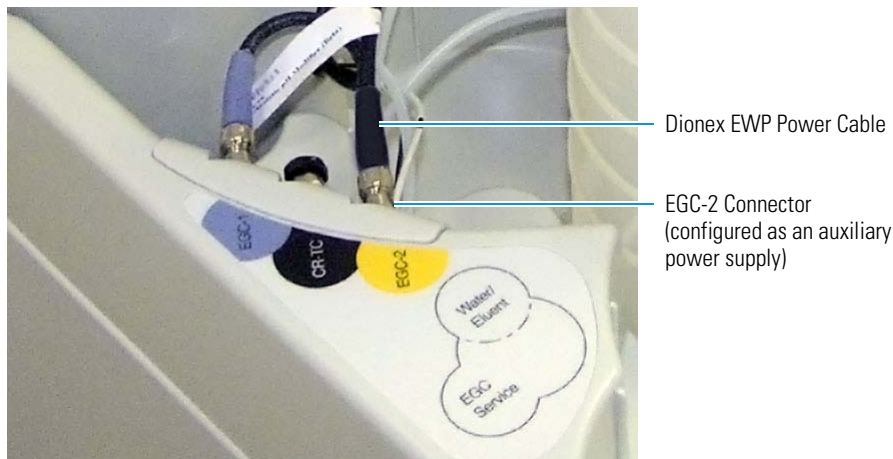
For detailed application information, please refer to the appropriate application notes.

When the Dionex EWP is installed in a Dionex ICS-2100, power for the Dionex EWP is provided by the EGC-2 power supply, which has been configured as an auxiliary power supply.

❖ To connect the Dionex EWP to the Dionex ICS-2100 auxiliary power supply

1. Locate the cable provided in the Dionex EWP Installation Kit.
2. Route the end of the cable that will connect to the EGC-2 connector through the tubing chase in the upper rear panel of the Dionex ICS-2100.
3. Plug the cable into the EGC-2 connector on the top cover of the Dionex ICS-2100. See [Figure 6](#).

Figure 6. EGC-2 connector on Dionex ICS-2100 top cover



4. Plug the other end of the cable into the connector plug on the top of the Dionex EWP.
5. In the Thermo Scientific Dionex Chromeleon™ 7 Instrument Configuration Manager or the Thermo Scientific Dionex Chromeleon 6.8 Server Configuration program, configure the auxiliary power supply. For instructions, refer to the *Dionex ICS-2100 Ion Chromatography System Installation Instructions* (Document No. 065294).

With a Dionex ICS-5000

When the Dionex EWP is installed in a Dionex ICS-5000, one of the two CR-TC power supplies in the EG can provide power for the Dionex EWP.

Note The Dionex EWP-to-CR-TC cable (P/N 076589) that is required for connecting the Dionex EWP to the CR-TC power supply is not provided with the Dionex EWP. It must be ordered separately.

❖ To connect the Dionex EWP to the CR-TC power supply in the Dionex ICS-5000 EG

1. Place the Dionex EWP inside the EG compartment.
2. Plug the Dionex EWP-to-CR-TC cable into the connector plug on the top of the Dionex EWP.
3. Plug the other end of the cable into an available CR-TC connector in the EG (you can use either CR-TC 1 or CR-TC 2).
4. Configure the CR-TC for water purification mode.

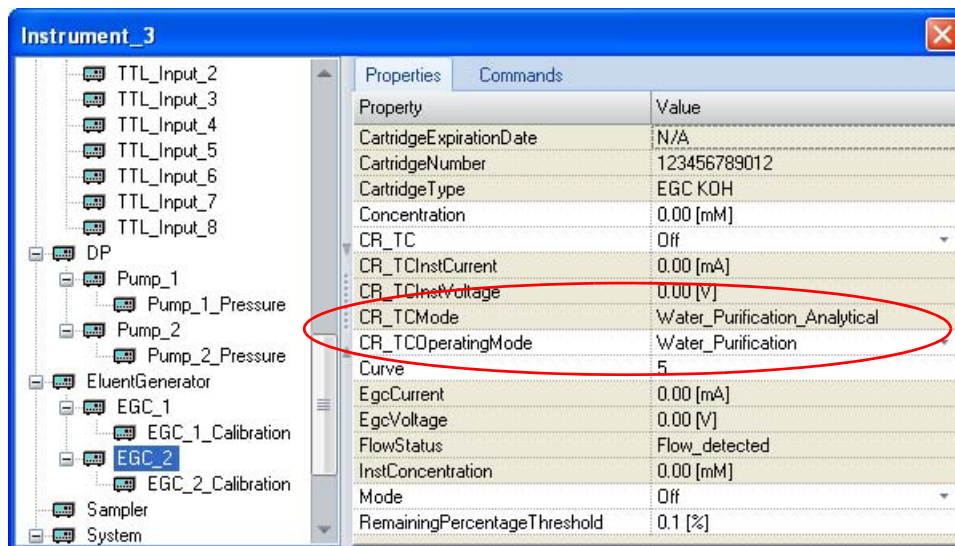
❖ To configure the CR-TC for water purification mode

1. Verify that an EGC is connected to the EG channel used for the Dionex EWP. For example, if you plugged the Dionex EWP into the CR-TC 2 connector, plug an EGC into the EGC 2 connector.
2. In the Chromeleon 7 Instrument Configuration Manager or the Chromeleon 6.8 Server Configuration program, enable the EGC in the instrument or timebase. Save the configuration.

Note During operation of the Dionex EWP, the EGC must be turned on, but the concentration can be set to 0.

3. Open the ePanel Set (in Chromeleon 7) or panel tabset (in Chromeleon 6.8) and press **F8** to see the commands and parameters for the instrument or timebase.
4. Verify that the user mode for commands is set to Expert (or Service) (right-click to see the user mode).
5. Under Eluent Generator, select the EGC device for the EG channel used for the Dionex EWP (EGC_1 or EGC_2). In the list of properties and commands, locate the **CR-TCOperatingMode** property and select the **Water_Purification** option. Also, verify that the **CR-TCMode** property is set to **Water_Purification_Analytical**. See the example in [Figure 7](#).

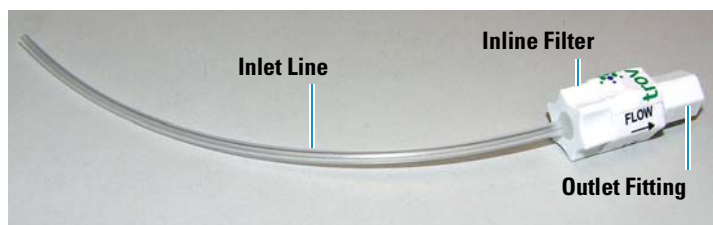
Figure 7. CR-TC water purification mode settings (Chromeleon 7 Command Window shown)



Replacing an Inline Filter

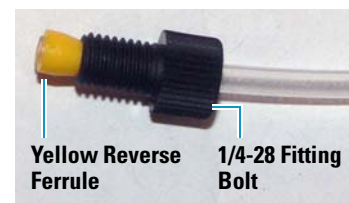
Replace the inline filters connected to ports 1 and 2 every 3 months. Replacement inline filters (P/N 078722) must be ordered separately. Each replacement filter includes the filter, an outlet fitting, and an inlet line. See [Figure 8](#).

Figure 8. Inline filter assembly



❖ To replace an inline filter

1. Disconnect the fitting from the outlet end of the inline filter being replaced and disconnect the inlet line from the union.
2. Remove the yellow reverse ferrule and 1/4-28 fitting bolt from the inlet line and install them on the inlet line of the new inline filter.
3. Connect the inlet line to the union and reconnect the outlet fitting to the new inline filter.



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