Thermo Scientific

Continuously Regenerated Trap
(CR-TC 500, Capillary)

Column Product Manual

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Thermo SCIENTIFIC

Product Manual

for

Continuously Regenerated Trap Column (CR-TC 500, Capillary)

CR-ATC 500, P/N 075550
CR-CTC 500, P/N 075551
CR-ATC (Capillary), P/N 072078
CR-CTC (Capillary), P/N 072079

Revision History:

Revision 01, November, 2012, Original Publication.

For Research Use Only. Not for use in diagnostic procedures.

Safety and Special Notices

Make sure you follow the precautionary statements presented in this guide. The safety and other special notices appear in boxes.

Safety and special notices include the following:

 **SAFETY**	***Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.***
 **WARNING**	***Indicates a potentially hazardous situation which, if not avoided, could result in damage to equipment.***
 **CAUTION**	***Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Also used to identify a situation or practice that may seriously damage the instrument, but will not cause injury.***
 **NOTE**	***Indicates information of general interest.***
IMPORTANT	***Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or might contain information that is critical for optimal performance of the system.***
Tip	***Highlights helpful information that can make a task easier.***

Contents

1. Introduction

The CR-TC is a high-pressure electrolytically regenerated trap column designed for use with Eluent Generator Devices. The CR-TC can operate long-term without the need for frequent chemical regeneration. The device, when plumbed after the Eluent Generator, removes all anionic or cationic contaminants in the eluent or water continuously and provides low drift during gradient operations. The CR-TC is available in formats for anion or cation applications using analytical or capillary scales, as shown below.

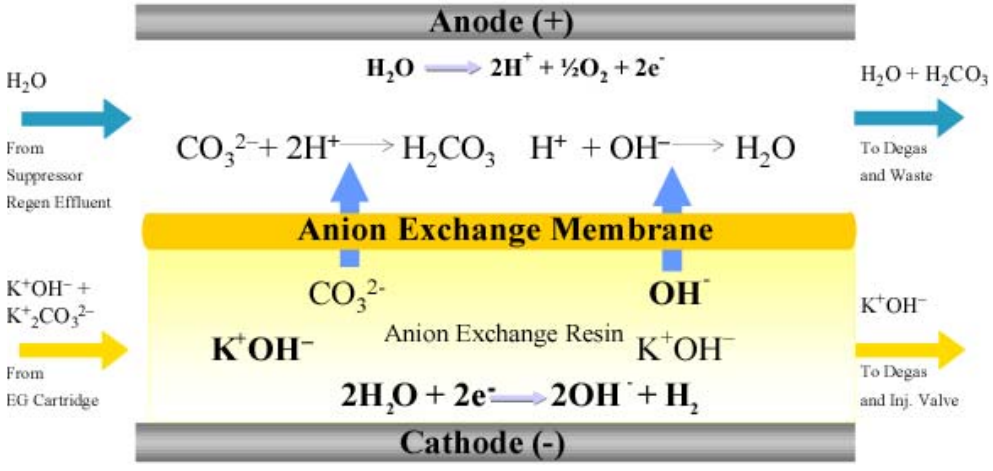
CR-ATC 500 Continuously Regenerated Anion Trap Column 500, P/N 075550
CR-CTC 500 Continuously Regenerated Cation Trap Column 500, P/N 075551
CR-ATC (Capillary) Continuously Regenerated Anion Trap Column (Capillary), P/N 072078
CR-CTC (Capillary) Continuously Regenerated Cation Trap Column, (Capillary) P/N 072079

A single format CR-TC 500 is used for analytical (1 – 5 mm i.d.) columns. The CR-TC (Capillary) is recommended for capillary (0.25 – 0.5 mm i.d.) columns.

1.1 CR-ATC 500 and CR-ATC (Capillary) Trap Column Theory

The CR-ATC 500 and CR-ATC (Capillary) consist of an anion exchange bed with a cathode at the eluent outlet as illustrated in Figure 1. An anion exchange membrane interface separates the anode from the eluent pathway. Anionic impurities from the basic eluent are retarded by the anion exchange bed and are driven towards the anode. The anions are swept through the anion exchange membrane as illustrated in Figure 1. The hydroxide generated at the cathode continuously regenerates the anion exchange bed while the hydronium ions generated at the anode combine with the removed anionic contaminants to form acids. The base eluent solution coming out of the CR-ATC device is thus free of anionic impurities.

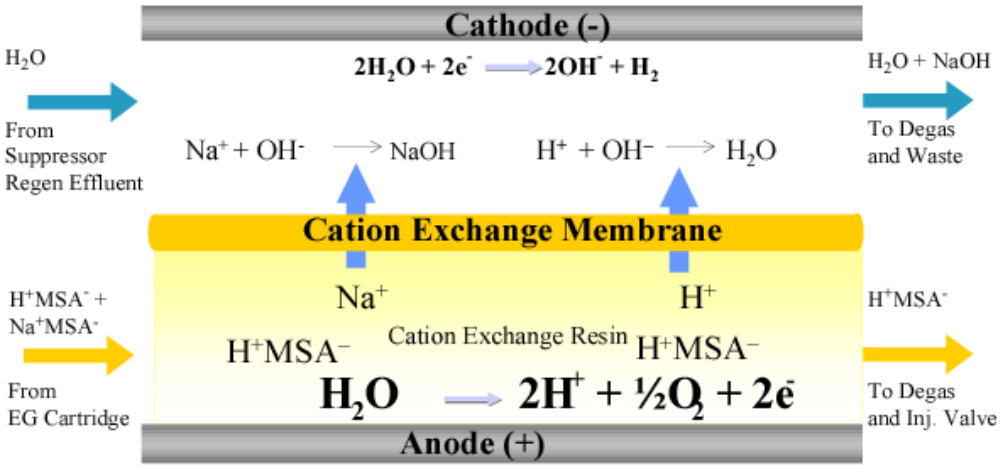
Figure 1 Operational Schematic for CR-ATC Continuously Regenerated Anion Trap Column



1.2 CR-CTC 500 and CR-CTC (Capillary) Trap Column Theory

The CR-CTC 500 and CR-CTC (Capillary) consist of a dual layer carboxylate and sulfonate based cation exchange bed with an anode at the eluent outlet as illustrated in Figure 2. A cation exchange membrane interface separates the cathode from the eluent pathway. Cationic impurities from the acidic eluent are retarded by the cation exchange bed and are driven towards the cathode. The cations are swept through the cation exchange membrane toward the cathode. The hydronium ions generated at the anode continuously regenerate the cation exchange bed while the hydroxide ions generated at the cathode combine with the removed cationic contaminants to form bases. The acid eluent solution coming out of the CR-CTC device is thus free of cationic impurities.

Figure 2 Operational Schematic for CR-CTC 500 and CR-CTC (Capillary) Continuously Regenerated Cation Trap Columns



WARNING

Do not use the P/N 060478 (CR-CTC) or P/N 072079 (CR-CTC, Capillary) for sample preparation applications.

For assistance, contact Technical Support for Dionex Products. In the U.S., call 1-800-346-6390. Outside the U.S., call the nearest Thermo Fisher Scientific office.

2. Equipment Requirements and Settings

A dedicated power controller is used to power the CR-TC unit. All EG modules with the exception of the EG40 are shipped with built in CR-TC control. The EG40 module requires a standalone power controller supplied in the EG40 CR-TC Add-on Kit (P/N 060476).

2.1 Power Connections

2.1.1 All EG modules except EG40

For all EG modules, except the EG40, current to the CR-TC is provided when the CR-TC power is turned on. No TTL or relay control is needed. For operational instructions, refer to the EG module Operator's Manual.

2.1.2 EG40

For the EG40, the external A/C power needs to be connected to the universal power supply adapter unit using a suitable power cord. Upon connecting the A/C power, the power adapter unit will have the green LED ON. Connect the 24 V DC power output line from the power adapter to the CR-TC controller. See the EG40 CR-TC Add-on Kit Manual (Document No. 031921) for installation details.

2.2 System Compatibility

2.2.1 Analytical (1 – 5 mm i.d. column) systems

The CR-TC 500 is compatible with all analytical RFIC-EG systems (with the exception of the EG40 without CR-TC Add-on Kit). The CR-TC 500 is compatible with High-Pressure Ion Chromatography (HPIC) systems capable of delivering up to 5,000 psi.

WARNING

Do not use the CR-ATC (P/N 060477) or CR-CTC II (P/N 066262) in High Pressure Ion Chromatography (HPIC) systems such as the ICS-5000$^+$, only the CR-ATC 500 and CR-CTC 500 are designed for high backpressure (> 3,000 psi) operation.

2.2.2 Capillary (0.25 – 0.5 mm i.d. column) systems

The CR-TC (Capillary) is compatible with all capillary RFIC-EG systems.

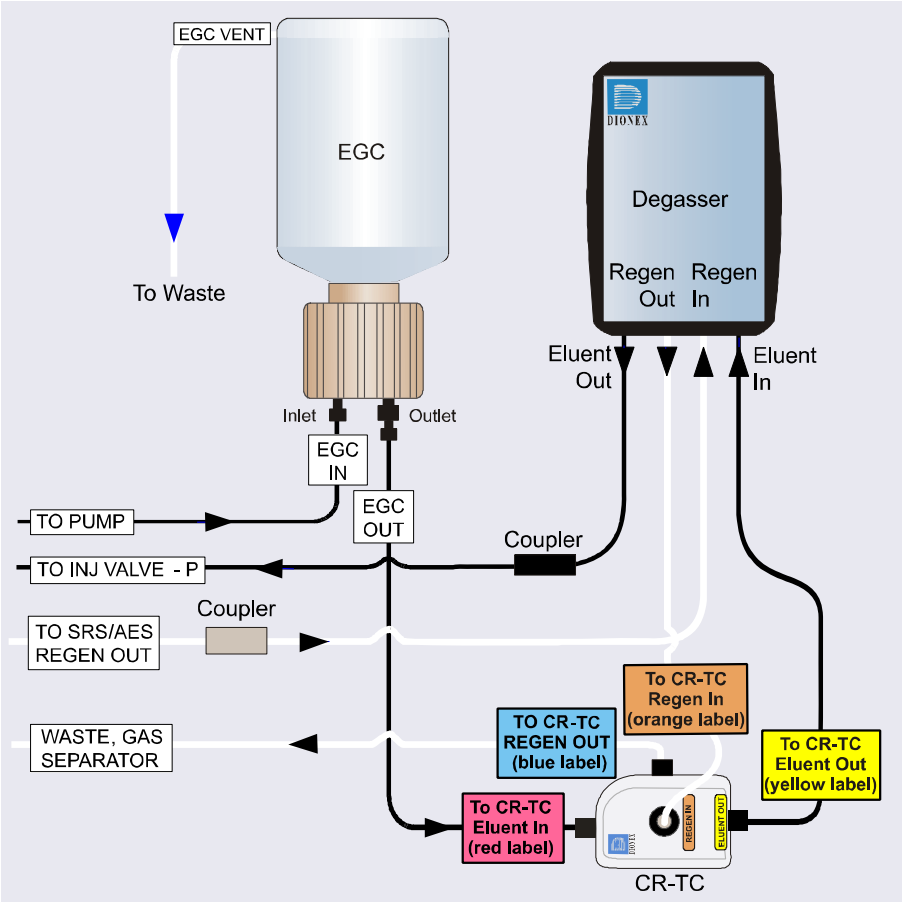
WARNING

Do not use the CR-ATC 500 or CR-CTC 500 in Capillary IC systems.
Do not use the CR-ATC (Capillary) or CR-CTC (Capillary) in Analytical IC systems.

3. Installation

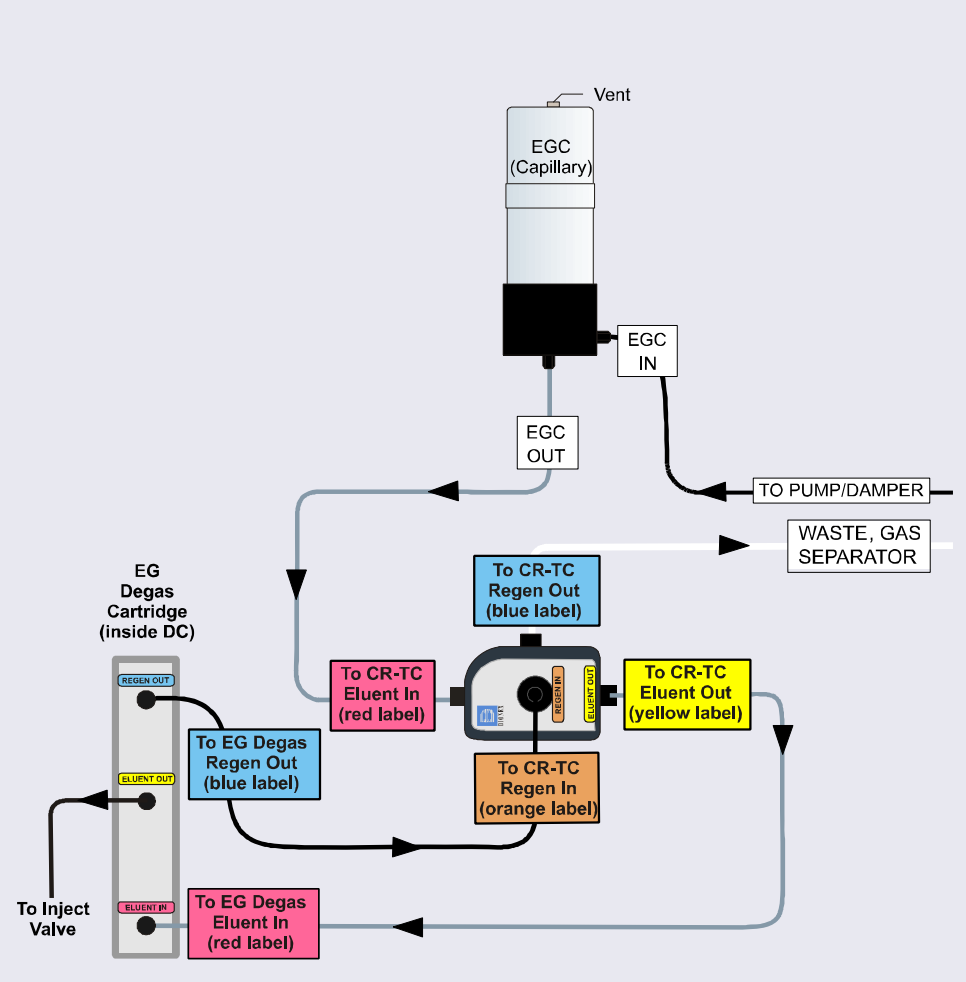
3.1 System Flow Diagram of Eluent Generator with CR-TC 500

Figure 3 System Flow Diagram of Eluent Generator with CR-TC 500



3.2 System Flow Diagram of Eluent Generator with CR-TC (Capillary)

Figure 4 System Flow Diagram of Eluent Generator with CR-TC



3.3 Plumbing the CR-TC

RFC-30, ICS-2000 or ICS-2100 Plumbing:

1. The RFC-30, ICS-2000 and ICS-2100 are shipped with tubing installed for the CR-TC connections. Connect the CR-TC as outlined in Figure 6. Match the colors of the tubing labels with the colored port labels on the CR-TC.

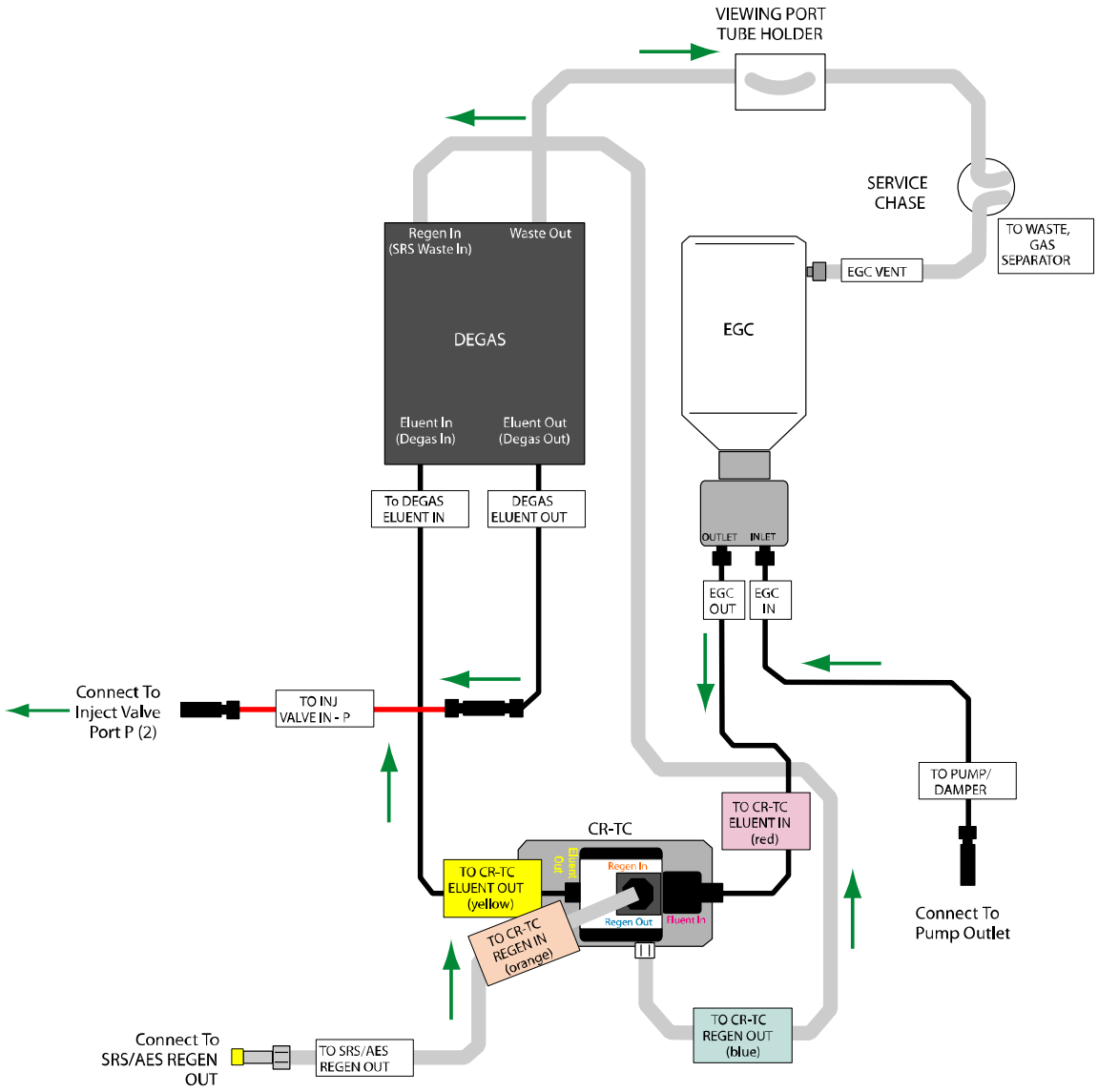
All other system Plumbing:

1. The Flow Diagram for an IC system using an Eluent Generator and a CR-TC Trap Column is shown above in Figure 3 and Figure 4. The CR-TC connections for a system using an EG40 with EG40 CR-TC Add-on- Kit are outlined in Figure 5. The required tubing to install the CR-TC is provided in the System Ship Kit or the EG40 CR-TC Add-on Kit (P/N 060476).
2. Match the colored tubing labels with the colored port labels on the CR-TC. All fittings should be finger tight plus 1/4 turn.

NOTE

It is recommended that the CR-TC be installed after the EGC cartridge.

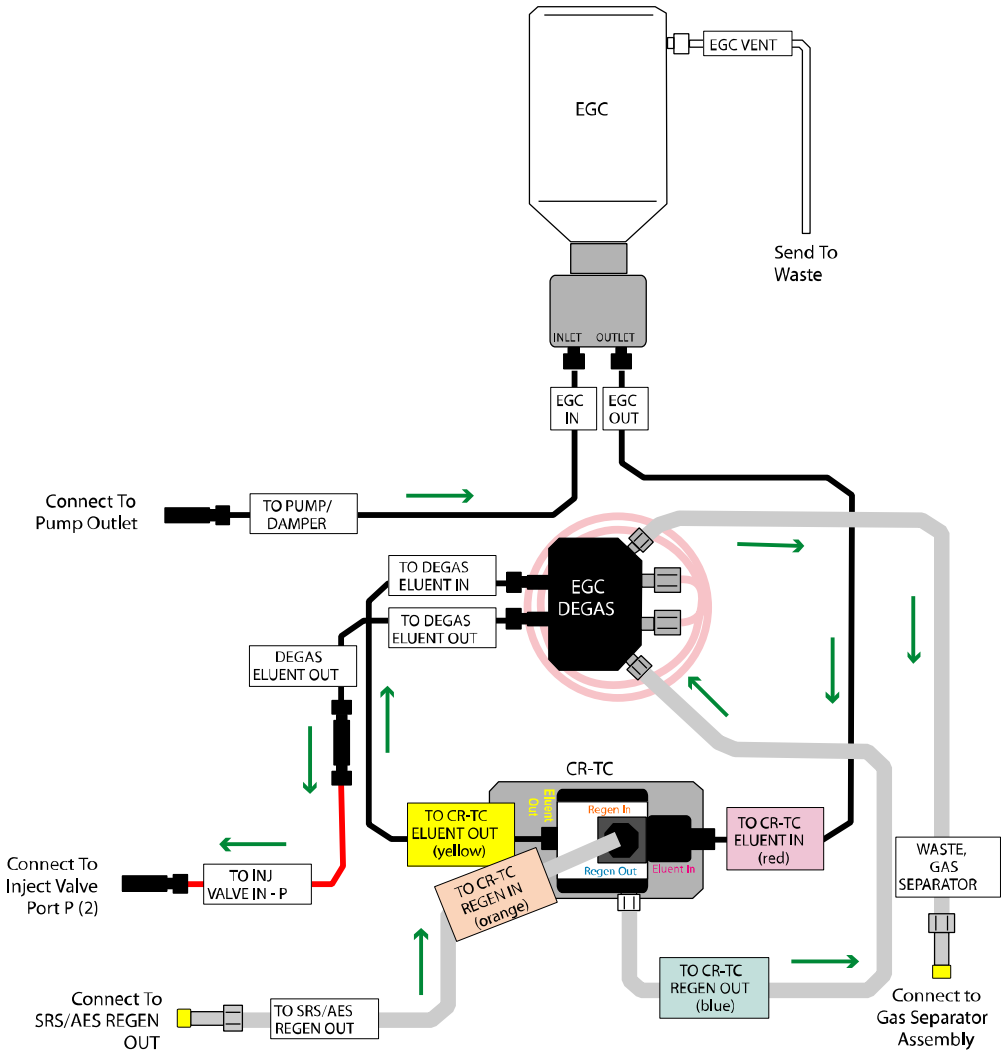
Figure 5 Flow Diagram of the EG40, or EG50 with CR-TC



NOTE

Please note the labels indicated on the Degas Module. The connector labels for older EG40 Degas Assemblies are indicated in parenthesis, for example (DEGAS IN), (DEGAS OUT) and (SRS WASTE IN).

Figure 6 Flow Diagram of ICS-2000, ICS-2100 or RFC-30 with CR-TC



3.4 Plumbing the CR-TC Trap Column

Follow sections 3.3, 3.4 and 3.5 to install the CR-TC. The CR-TC has color-coded labels to direct you in the installation of the CR-TC in the Eluent Generator modules. All fittings should be finger tight plus 1/4 turn.

A. The CR-TC is installed between the EGC cartridge and the Degas Module as shown in Figures 3 through 6. Ensure that the Eluent Generator is properly installed on the system. If the Eluent Generator is not installed, follow the Eluent Generator installation instructions listed in the EG Module's Product Manual.

B. To begin installation of the CR-TC tubing:

   1. Turn off the pump and the suppressor (SRS/AES/CES) before making any connections.
   2. If present, disconnect all trap columns (ATC or CTC) installed between the Eluent Generator and the Degas Assembly and all trap columns (ATC or CTC) installed between the pump and the Eluent Generator module.
   3. Remove the plugs in the CR-TC ports. Note: Do not loosen or remove the fittings with the electrical connections (fittings with wires attached).

C. Identify the tubing with the red label in the ship kit and connect the white label end marked **EGC OUT** to the outlet port of the EGC cartridge. The red label end of the tubing should be connected to the **Eluent In** port of the CR-TC.

D. Connect the tubing with the Orange label to the CR-TC **Regen In** port.

E. Connect the tubing with the Blue label to the CR-TC **Regen Out** port.

F. Connect the tubing with the Yellow label to the CR-TC **Eluent Out** port.

G. The CR-TC is now ready for the hydration step.

3.5 Hydrating the CR-TC Trap Column

The CR-TC should be hydrated prior to operation, at first installation, or after long-term storage. This process ensures that the CR-TC resin and membranes are fully hydrated and ready for operation

Figure 7 CR-TC 500 Plumbing Diagram for Hydration of CR-TC 500 Trap Column

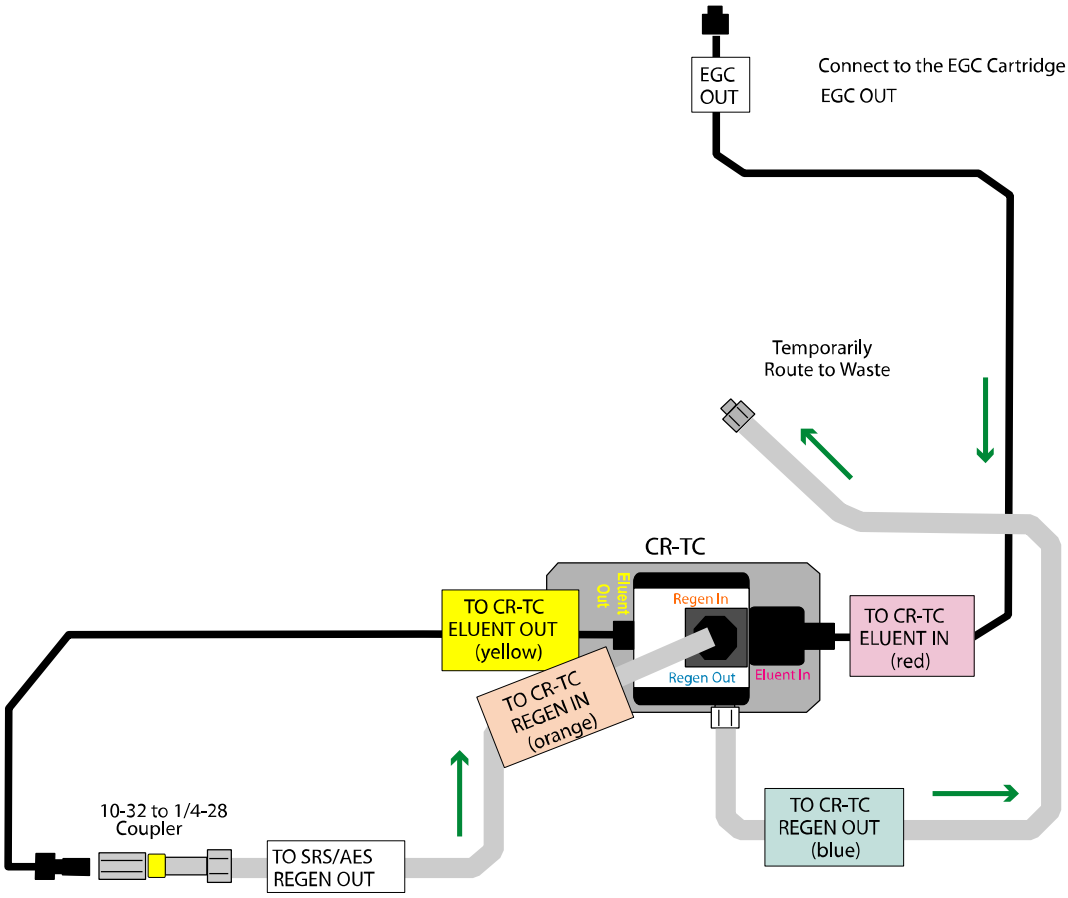
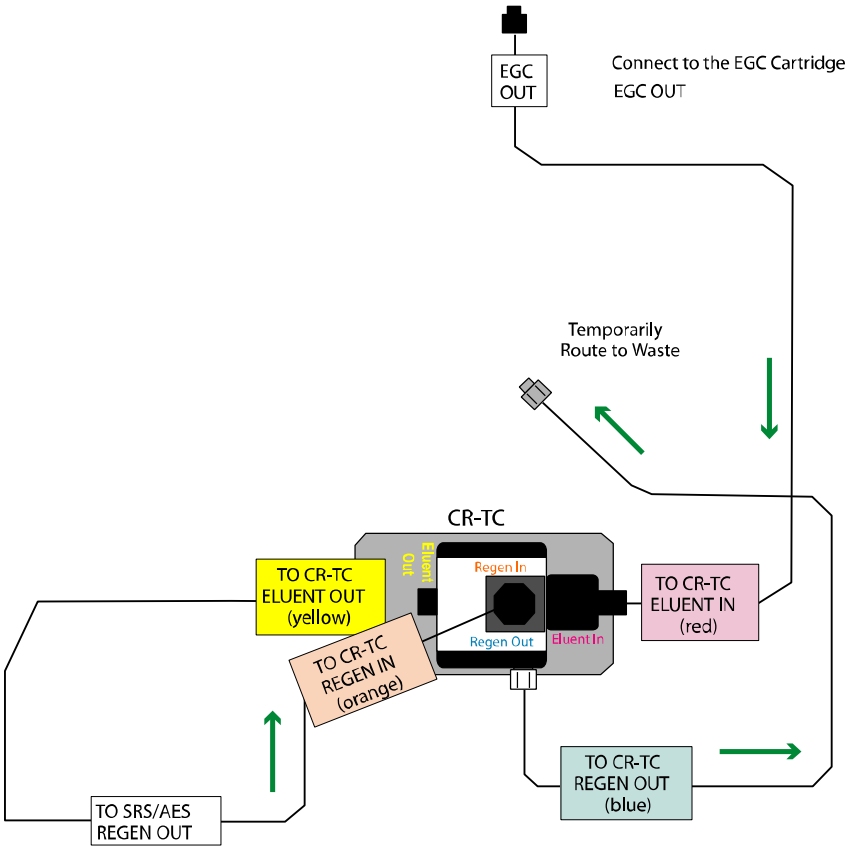


Figure 8 CR-TC (Capillary) Plumbing Diagram for Hydration of CR-TC (Capillary) Trap Column



A. For the EG40 with EG40 Add-on-Kit use a 10/32 to 1/4-28 coupler (P/N 042806) supplied with the EG40 Add-on Kit to temporarily connect the tubing between the CR-TC **Outlet** port and the CR-TC **Regen In** port. The line from the **Regen Out** port of the CR-TC should be diverted to waste. See Figure 8 above.

B. For all other modules except capillary systems, temporarily disconnect the **ELUENT OUT** line out of the Degas Assembly at the end labeled **TO INJECTION VALVE IN-P** and connect this end to a 10-32 to 1/4-28 coupler (P/N 042806). Connect the free end of the tubing labeled **TO SRS/AES REGEN OUT** to the 1/4-28 end of the coupler. The line labeled **TO WASTE OUT** should be diverted to waste.

C. For capillary systems, temporarily disconnect the **ELUENT OUT** line of the Degas Assembly at the end labeled **TO INJ VALVE IN-P** and connect this end to a 10-32 coupler. Connect the end of the tubing labeled **TO DEGAS REGEN OUT** to the 10-32 coupler.

D. After the above hydration step, disconnect the coupler and complete the CR-TC installation by following the steps in Section 5. For EG50 and RFC-30 modules, ensure that the tubing labeled **TO INJECTION VALVE IN-P** is connected to the injection valve. An optional restrictor tubing may be inserted before the injection valve.

3.6 Connecting the CR-TC Trap Column for Operation

A. Verify that the tubing with the Red label **(TO CR-TC ELUENT IN)** is connected to the **Eluent In** port of the CR-TC. See Figure 9. Verify that the other end of this tubing with the White label **(EGC OUT)** is connected to the **OUTLET** port of the EGC Cartridge.

B. Verify that the tubing with the Yellow label **(TO CR-TC ELUENT OUT**) is connected to the CR-TC **Eluent Out** port. See Figure 9.

NOTE

For the EG40, connect the other end of this tubing with the White label (TO DEGAS ELUENT IN) to the ELUENT IN port on the EG40 Degas Assembly. This port may be labeled DEGAS IN on older EG40 Degas Assemblies. For the RFC-30 and EG50 modules, this connection to the Degas Assembly is already made.

C. Verify that the tubing with the Orange label **(TO CR-TC REGEN-IN)** is connected to the CR-TC **Regen In** port. See Figure 9. Connect the other end of this tubing with the White label **(TO SRS/AES, REGEN OUT)** to the SRS or AES **REGEN OUT** port.

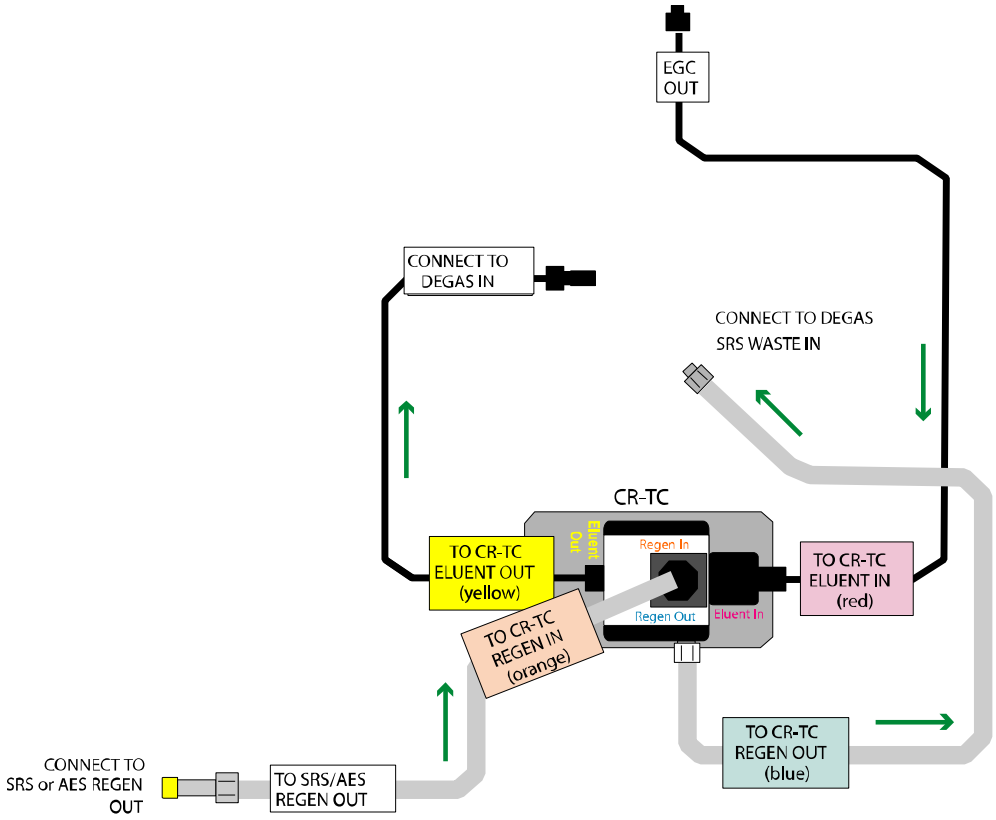
D. Verify that the tubing with the Blue label **(TO CR-TC REGEN-OUT)** is connected to the CR-TC **Regen Out** port. See Figure 9.

NOTE

For the EG40, connect the other end of this tubing with the White label (TO DEGAS REGEN IN) to the REGEN IN port of the Degas Assembly. This port may be labeled SRS WASTE IN on older EG40 Degas Assemblies. For the RFC-30 and the EG50 modules, this connection to the Degas Assembly is already made.

E. Connect the line **TO WASTE** to a Gas Separator Waste Tube and then divert it to waste.

Figure 9 Connecting the CR-TC Trap Column for Operation



4. Operation

4.1 Operational Precautions

A. The recommended maximum operating pressure for the CR-TC 500 is 5,000 psi (34.5 MPa). However, in conjunction with older non high-pressure ion chromatography (HPIC) systems such as the ICS-2100, ICS-5000 and earlier, the maximum operating pressure is 3,000 psi (21 MPa). This pressure limit protects the degas tubing assembly in the Eluent Generator from mechanical failure. For the CR-TC (Capillary) the maximum operating pressure is 5000 psi (34.5 MPa)

B. Do not operate the CR-ATC 500 in conjunction with the EGC KOH cartridge with solvents other than methanol (maximum 25% methanol) for anion separations.

C. Solvents should **not** be used with the EGC MSA cartridge, CR-CTC 500 Trap Column or CR-CTC (Capillary) Trap Column.

D. To prevent the buildup of hydrogen and oxygen gases, install the CR-TC/Eluent Generator module in a well ventilated site.

E. Background and Drift:

1. A system functioning correctly with equilibrated consumables (pump/Eluent Generator/CR-TC/column/suppressor), the expected background for most Eluent Generator applications (up to 50 mM KOH) is < 1 µS/cm. For higher eluent strengths, the background may be slightly higher. Note the background may be higher at start-up with new consumables (EGC cartridge, suppressor, columns).
2. The expected baseline drift values using the EGC KOH cartridge and CR-ATC are shown below:

AS11 standard gradient (0.5 - 38.3 mM KOH)	< 100 nS/cm per run
AS15 standard gradient (1- 50 mM KOH)	< 140 nS/cm per run

3. The expected baseline drift values using the EGC MSA cartridge and CR-CTC are shown below:

CS12A standard gradient (11 - 57 mM MSA)	< 100 nS/cm per run
CS17 standard gradient (1 - 50 mM MSA)	< 50 nS/cm per run

F. Carbohydrate Applications:
The Eluent Generator with CR-ATC 500 installed may be used for carbohydrate applications. See the EG Module manual for installation requirements for carbohydrate applications.

5. Troubleshooting

5.1 General Troubleshooting

5.1.1 LED Light is OFF on the CR-TC Controller on the EG40 Module

A. Ensure that the TTL connector is plugged in and is configured correctly. Refer to TTL control section in the EG40 CR-TC Add-on-Kit (Document No. 031921), RFC-30 Getting Started (Document No. 031895) and the Reagent-Free Controller Operator's Manual (Document No 031880).

B. Ensure that the CR-TC power-supply is ON and the pump is ON.

C. If (a) and (b) are true then the problem may be associated with the CR-TC Controller or with the Pump TTL output.

1. The pump TTL output can be checked with a voltmeter across the TTL pins. If the TTL is on, the voltage should be 0 V. If the TTL is switched off, the voltage should be 5.0 V.
2. If in the voltmeter test in Step 1 the TTL output is functional, then the CR-TC controller must be replaced.

5.2 Unstable Pressure or High Noise

Unstable pressure can cause high baseline drift and noise.

5.2.1 Unstable Pressure

A. Ensure that the pump is properly primed.

B. Disconnect the tubings to ensure that there are no trapped bubbles and reconnect the tubings.

C. Check the system pressure. If the total system pressure is < 2000 psi, add sufficient backpressure, preferably using 0.003" ID tubing between the degas assembly and the injection valve and ensure that the total system pressure is between 2000 – 5000 psi (2,000 – 3,000 psi in conjunction with older non high-pressure ion chromatography (HPIC) systems such as the ICS-2100, ICS-5000 and earlier).

5.2.2 High Noise

A. Ensure that the system pressure is stable. If the system pressure is unstable refer to previous Section 6.2.1.

B. For analytical systems, if the total system pressure is < 2000 psi, add sufficient backpressure, preferably using 0.003" ID tubing between the degas assembly and the injection valve and ensure that the total system pressure is between 2000 – 5000 psi (2,000 – 3,000 psi in conjunction with older non high-pressure ion chromatography (HPIC) systems such as the ICS-2100, ICS-5000 and earlier).

5.3 High Background and Drift

A. Check if the CR-TC unit is powered.

B. If the CR-TC was operated without any power and with eluent flowing, the capacity of the device is depleted. Under these conditions follow the cleanup procedure outlined in Section 5.

C. Check the backpressure to the CES, SRS or AES suppressor and ensure that it is approximately 40 psi.

D. Check the system backpressure.

1. If the total system pressure has decreased to a lower value after installing the CR-TC, bypass the CR-TC eluent channel by coupling the **TO CR-TC ELUENT IN** (red) line to **TO CR-TC ELUENT OUT** (yellow) line and check the backpressure.

If the system pressure is higher (without the CR-TC) than before (with the CR-TC), this suggests that the CR-TC has an internal leak. Verify the pressure drop by reconnecting the CR-TC eluent channel. If the pressure is lower, the CR-TC must be replaced.

5.4 Leakage

A. Always operate analytical RFIC-EG systems with the system backpressure between 2000 – 5000 psi (2,000 – 3,000 psi in conjunction with older non high-pressure ion chromatography (HPIC) systems such as the ICS-2100, ICS-5000 and earlier). Lower the backpressure if the system pressure exceeds the recommended maximum backpressure. Check the pressure restrictor after the Degas module. Capillary RFIC-EG systems should be operated between 1000-5000 psi.

B. If leakage is observed at the **Regen In** and **Eluent Out** fittings where the electrodes are located, do not tighten the fittings. Replace the CR-TC unit.

C. If the tubing pops from a fitting during high pressure operation, the tubing may be deformed. The fitting should be removed. For analytical systems, cut new tubing using the tubing cutting tool (P/N 049584) and remake the fitting. Do not cut tubing on capillary systems; replace tubing with factory pre-cut tubing. All fittings should be finger tight plus 1/4 turn.

5.5 Lower System Pressure

A. If the total system pressure is changed to a lower value after the CR-TC was installed. Bypass the CR-TC eluent channel by coupling the **TO CR-TC ELUENT IN** (red) line to **TO CR-TC ELUENT OUT** (yellow) line and check the backpressure.

B. If the system pressure is lower (without the CR-TC) than before (with the CR-TC) examine individual components of the system (including pump and consumables) and ensure that they are working correctly.

C. If the system pressure is higher (without the CR-TC) than before (with the CR-TC), this suggests that the CR-TC has an internal leak. Verify the pressure drop by reconnecting the CR-TC eluent channel. If the total system pressure is lower then replace the CR-TC unit.

5.6 High Pressure CR-TC (Eluent Channel)

If the CR-TC develops a pressure > 100 psi in the eluent channel, the column inlet bed support of the CR-TC may need to be replaced. To change the inlet bed support assembly, refer to the following instructions, using one of the two spare inlet bed support assemblies included in the Ship Kit. Be sure to filter DI water used for eluents before use to eliminate the DI water as a source of particulates.

A. Disconnect the CR-TC column from the system.

B. Using two open end wrenches, carefully unscrew the inlet (top) column fitting.

C. Turn the end fitting over and tap it against a benchtop or other hard, flat surface to remove the bed support and seal assembly. If the bed support must be pried out of the end fitting, use a sharp pointed object such as a pair of tweezers, but be careful that you **DO NOT SCRATCH THE WALLS OF THE END FITTING.** Discard the old bed support assembly.

D. Place a new bed support assembly into the end fitting. Make sure that the end of the column tube is clean and free of any particulate matter so that it will properly seal against the bed support assembly. Use the end of the column to carefully start the bed support assembly into the end fitting.

Product	**(P/N)**
Bed Support Assembly	042955
End Fitting	052809

CAUTION

If the column tube end is not clean when inserted into the end fitting, particulate matter may obstruct a proper seal between the end of the column tube and the bed support assembly. If this is the case, additional tightening may not seal the column but instead damage the column tube or the end fitting.

E. Screw the end fitting back onto the column. Tighten it fingertight, then an additional 1/4 turn (25 in x lb). Tighten an additional 1/4 turn further only if leaks are observed. If a leak still is observed, remove the end fitting and re-clean the sealing surfaces.

F. Reconnect the column to the system and resume operation.

CAUTION

Do NOT replace the CR-TC outlet bed support in the CR-TC Eluent Out port.

5.7 High Pressure CR-TC (Regen Channel)

If the CR-TC develops a pressure > 20 psi in the Regen channel due to particulate matter, then

A. Fill a 5 mL syringe with DI water and push 5 mL of DI water into the CR-TC **Regen Out** port. If liquid flows out of the **Regen In** port, then the particle has been dislodged.
B. Reverse the flow by pushing 5 mL of DI water from the **Regen In** port to the **Regen Out** port.
C. If liquid does not flow out of the Regen ports in step A or B, the CR-TC Trap Column must be replaced.

5.8 Blockage Between Suppressor and CR-TC

If no gas stream is observed out of the SRS/AES suppressor when the CR-TC is installed and powered,

A. Check for leaks.
B. The CR-TC Regen flow may be blocked, troubleshoot following the steps in Section 5.7.
C. Check whether the EG Degas Assembly has developed high pressure in the **REGEN IN** (**SRS WASTE IN**) or **WASTE OUT** channel.
D. Check if the SRS/AES has developed high pressure in the regenerant channel. Refer to appropriate suppressor Product Manual.

For assistance, contact Technical Support for Dionex Products. In the U.S., call 1-800-346-6390. Outside the U.S., call the nearest Thermo Fisher Scientific office.

6. Clean-Up

6.1 CR-ATC 500 and CR-ATC (Capillary) Cleanup

The CR-ATC 500 and CR-ATC (Capillary) for normal day-to-day operation do not require a cleanup. However if the CR-ATC is exposed accidentally to high levels of anionic contaminants or is converted from the OH^- form to other anionic forms such as carbonate then the device may require a cleanup using 2.0 M NaOH.

A. Disconnect all the lines to the CR-ATC.

B. Connect a line from the **Eluent In** port to the **Regen In** port on the CR-ATC. Direct the **Regen Out** port to waste.

C. Prepare a fresh solution of 2.0 M NaOH from a 50% w/w NaOH solution (available from Fisher Scientific Catalogue No. SS254) with at least the following purity specifications: iron < 5 ppm, Chloride < 0.005%; and sodium carbonate $\leq$ 0.1%.

D. Use the Trap Column / Suppressor Clean-up Kit (P/N 059659) to deliver 100 mL of 2.0 M NaOH solution through the **Eluent Out** port of the CR-ATC column, or 10 mL to a CR-ATC capillary column. Do not use the analytical pump to deliver this solution as it may be difficult to remove the residual NaOH from the pump heads.

E. Rinse the CR-ATC unit with 10 mL (1.0 mL for CR-ATC Capillary) DI water before plumbing it back into the system.

6.2 CR-CTC 500 and CR-CTC (Capillary) Cleanup

The CR-CTC 500 and CR-CTC (Capillary) for normal day-to-day operation do not require a cleanup. However if the CR-CTC is exposed accidentally to high levels of cationic contaminants or is converted from the hydronium ion form to other cationic forms such as ammonium, then the device requires a cleanup using 1.0 M methanesulfonic acid (MSA).

A. Disconnect all the lines to the CR-CTC.

B. Connect a line from the **Eluent In** port to the **Regen In** port on the CR-CTC. Direct the **Regen Out** port to waste.

C. Prepare a fresh solution of 1.0 M MSA from a concentrated MSA solution.

D. Use the Trap Column / Suppressor Clean-up Kit (P/N 059659) to deliver 100 mL of 1.0 M MSA solution through the **Eluent Out** port of the CR-CTC column or 10 mL to a CR-CTC capillary column. Do not use the analytical pump to deliver this solution as it may be difficult to remove the residual MSA from the pump heads.

E. Rinse the CR-CTC unit with 10 mL (1.0 mL for CR-CTC Capillary) of DI water before plumbing it back into the system.

Appendix – Specifications

Dimensions:	(H x W x L) 5.1 cm x 5.5 cm x 8.4 cm (2.0 in x 2.15 in x 3.3 in)
Weight:	50 g (0.13 lb.)
Current Output:	< 125 mA
Void Volume:	< 100 µL (Analytical)
	< 2 µL (Capillary)
Maximum Backpressure:	5,000 psi (eluent channel)
	100 psi (regen channel)