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Thermo Scientific Dionex DRS 600, ERS 500e and ERS 500 Carbonate Suppressor Installation Checklist

Thank you and congratulations on your recent purchase of a DIONEX suppressor product from Thermo Fisher Scientific. To ensure a smooth installation experience, please review and complete the following actions prior to installing the new suppressor:

Complete this Installation Checklist **Sections I-II** and check the box next to it to indicate completion. If needed, complete **Section III** and check the box next to it to indicate completion. If the instruction is unclear at any step, refer to the **Installation Summary** at the end of this document.

I. Backpressure Check of Detector Cell and Backpressure Coils

Before putting the new suppressor to use, we recommend measuring the backpressure to the suppressor, ensuring that the suppressor is not exposed to high backpressure inadvertently. Care should be taken not to exceed 100 psi of backpressure to the suppressor (150 psi for 2 mm anion versions). The backpressure to the suppressor comes from any tubing, detector cell, backpressure coils, or any other components that are fluid-connected to the eluent out port of the suppressor.

Step 1: Disconnect the **column out/eluent in** tubing from the old suppressor and direct it to waste. Turn on the pump at the application flow rate for 10 minutes. Record the system pressure 1 ($\mathbf{P_1}$) and turn off the pump.	☐
$\mathbf{P_1}$, _____ psi	☐
Step 2: Connect the **column out/eluent in** tubing to the detector cell **inlet**, remove the backpressure coils after the detector cell if installed, and direct the detector cell **outlet** tubing to waste. Turn on the pump at the application flow rate for 10 minutes. Record the system pressure 2 ($\mathbf{P_2}$) and turn off the pump.	☐
$\mathbf{P_2}$, _____psi	☐
Calculate the backpressure across the detector cell ($\mathbf{BP_1}$): $\mathbf{BP_1} = \mathbf{P_2} - \mathbf{P_1}$ = _____psi The backpressure of the detector cell is typically **≤ 70 psi** at a flow rate of 2 mL/min. If the backpressure exceeds this specification, see **Detector Cell Backflush** Section	☐
Step 3: Connect the recommended number of backpressure coil(s) (see table below) to the detector cell **outlet** and direct the backpressure coil **outlet** to waste. Turn on the pump at the application flow rate for 10 minutes. Record the system pressure ($\mathbf{P_3}$) and turn off the pump.	☐

4 mm Chromatography	2 mm Chromatography	
P/N: 045877	P/N: 045878	
1 Coil = 1.5 – 3.0 mL/min	1 Coil = 0.37 – 0.75 mL/min	
2 Coils = 0.5 – 1.5 mL/min	2 Coils = 0.12 – 0.37 mL/min	
P_3, _____ psi		☐
Calculate the backpressure across the backpressure coil(s) (**BP_2**): **BP_2, = P_3 – P_2** = _____ psi **Pass:** 30-40 psi for carbonate eluent or 10-40 psi for other eluents If the back pressure exceeds the specification, see **Backpressure Coil Adjustment** section		☐

II. Hydration & Backpressure Check of Suppressor

Before putting the new suppressor to use, hydrate it properly first. Improper hydration will result in irreversible damage to suppressor. **This will void the warranty!**

Step 4: Connect the **column out** tubing to the suppressor **Eluent Inlet** and direct the suppressor **Eluent Outlet** to the **Regen Inlet** of the suppressor using ~ 6” of green PEEK tubing (ID 0.030”) provided with the system ship kit. Direct the suppressor **Regen Outlet** to waste (see **Figure 1** below).	☐
Turn on the pump and flow ≤10 mM eluent or DI water at **0.5 mL/min** for 4mm suppressor or **0.125 mL/min** for 2mm suppressor for 20 minutes. **The power to the suppressor must be turned off during this step.**	☐

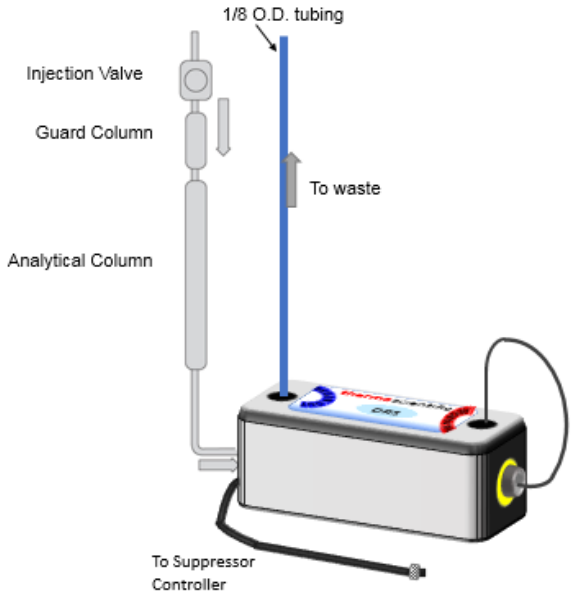


Figure 1: Suppressor Hydration Configuration

Allow the suppressor to **rest undisturbed** for 20 minutes to fully hydrate the resin, screens, and membranes.	☐
Turn on the pump at the application flow rate for 10 minutes; record the system pressure 4 (**P_4**) and turn off the pump.	
P_4, _____ psi	☐
Calculate the backpressure across the suppressor (**BP_3**): **BP_3** = **P_4** – **P_1** = _____ psi **Pass:** ≤ 200 psi If the backpressure exceeds this specification, see **Suppressor Backflush with DI Water** section	☐
<u>Step 5:</u> Connect the suppressor **Eluent outlet** tubing to the detector cell **inlet.** Then connect the detector cell **outlet** tubing with backpressure coil(s) to the **Regen Inlet** of the suppressor, as shown in **Figure 2**, for the Auto Suppression Recycle Mode Configuration. **For External Water Mode Configuration, refer to the suppressor manual for detailed installation guide.**	☐
The suppressor is now ready to be installed and configured (see **Configuration of the New Suppressor** below). Normal operation using the application eluent strength, flow rate, and recommended current/voltage power settings can be applied.	☐

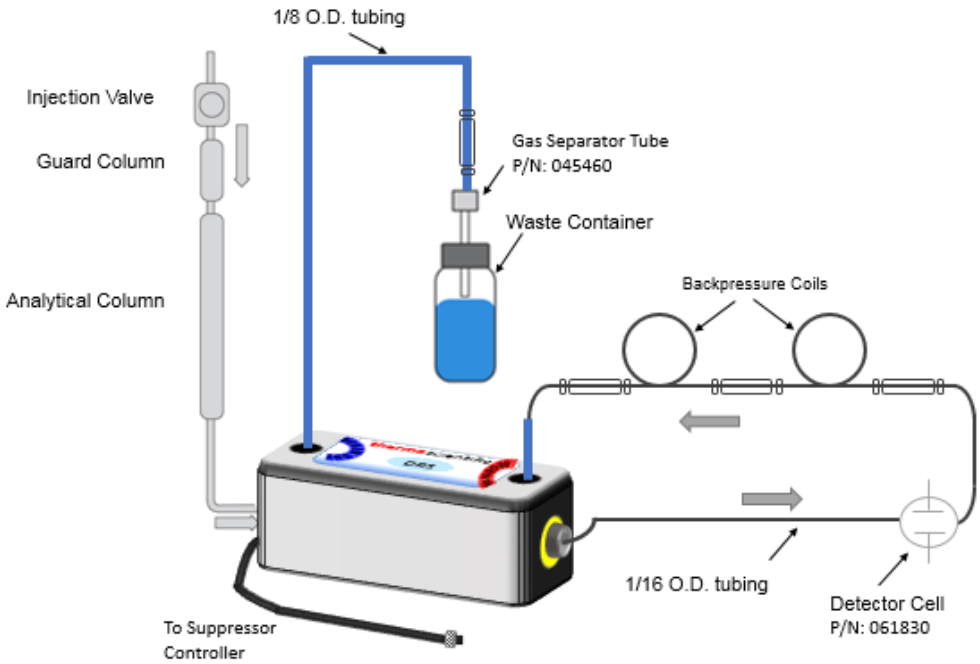


Figure 2: AutoSuppression Recycle Mode Configuration

III. Troubleshooting Tips

Flow restriction or blockage from detector cell or backpressure coils should be eliminated first to avoid irreversible damage to the suppressor.

Detector Cell Backflush:

Bypass the suppressor and connect the column **outlet** tubing to the detector cell **outlet** port and direct the detector cell **inlet** tubing to waste.	☐
Turn on the pump and flow eluent at the application flow rate for 10 minutes. Turn off the pump. Re-measure the detector cell backpressure by following the steps in **Section I** above.	☐

Note: Repeat the backflush procedure if the backpressure remains high. If the backpressure of the detector cell doesn't come below 70 psi after multiple attempts, replace the detector cell.

Backpressure Coil Adjustment:

If the pressure is greater than 40 psi for carbonate eluent or other eluents, trim the backpressure coil and repeat the backpressure coil test in **Section I**.	☐
If it is less than 30 psi for carbonate eluent or less than 10 psi other eluents, add more tubing and repeat the backpressure coil test in **Section I**.	☐

Note: Backpressure coils help to prevent gases generated during AutoSuppression from out-gassing by compressing the bubbles. The bubbles can be occasionally trapped in the detector cell causing noise. For example, carbonate eluent is suppressed to carbonic acid, which is CO_2 gas in equilibrium with DI water, and CO_2 gas can come out of solution if adequate pressure is not applied. Therefore, we highly recommend the addition of 30-40 psi for carbonate eluent or 10-40 psi for other eluents.

Suppressor Backflush with DI Water:

Turn off the pump and disconnect the column **outlet** and cell **inlet** tubing from the suppressor eluent ports (if not already disconnected).	☐
Connect the DI water tubing from the pump **outlet** directly to the suppressor **eluent out** port and direct the **eluent in** tubing to waste. (Effectively plumbing the eluent ports backwards to reverse flow through the eluent chamber).	☐
Turn on the pump and flow DI water at 1.0 mL/min for 4 mm suppressor and 0.25 mL/min for 2 mm suppressor for 10 minutes. Turn off the pump. Re-measure the suppressor backpressure by following the steps in **Section II**.	☐

Note: Repeat the backflush procedure if the backpressure remains high. If the backpressure of the suppressor doesn't come below 200 psi after multiple attempts, replace the suppressor or contact your Service Engineer or Technical Support team.

Configuration of New Suppressor

When a new suppressor is plugged in, you'll need to get into CM Configuration and open up the Suppressor tab (ICS-6000) or Electrolytics tab (Integrion). Double click on the Suppressor option and click OK to save the new configuration (see **Figures 3 & 4** below). If this is not done, CM will not recognize the new suppressor.

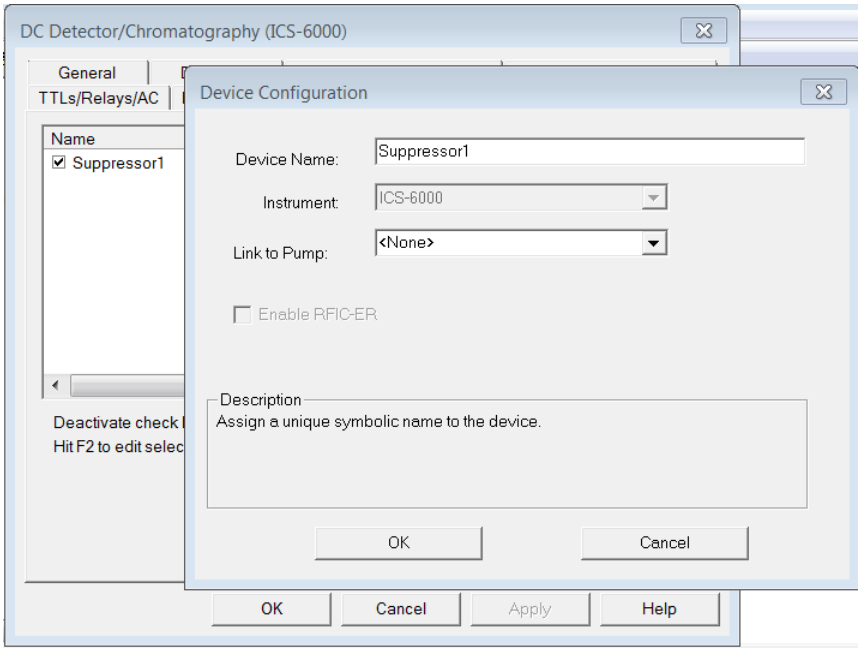


Figure 3: Suppressor Configuration in ICS-6000 DC Detector

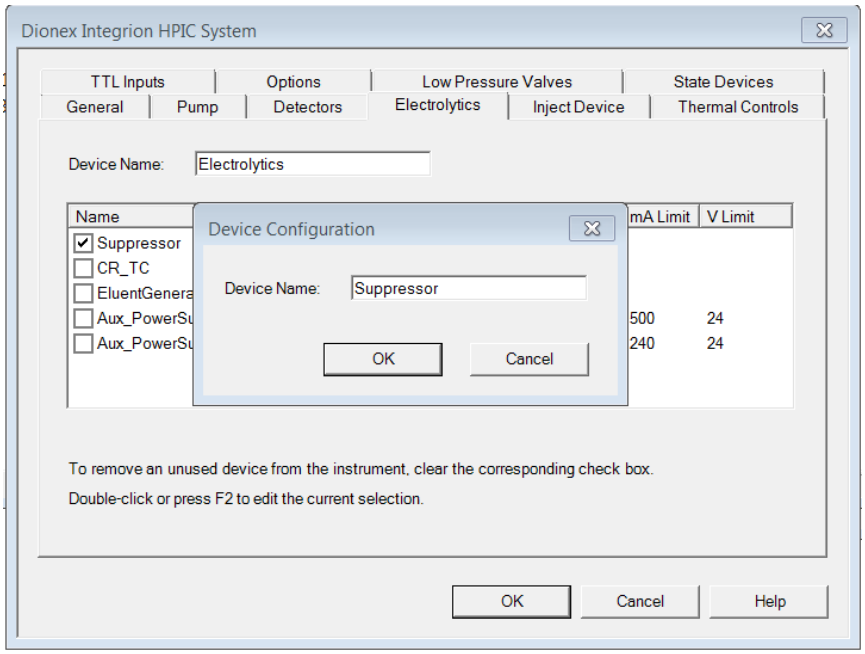
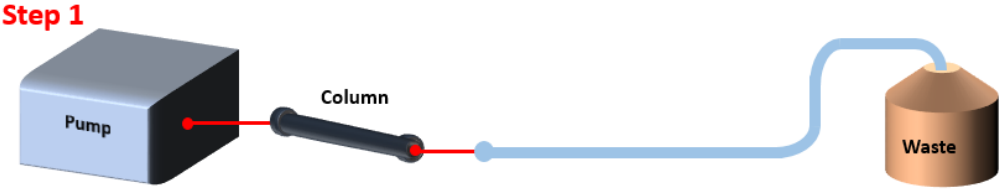


Figure 4: Suppressor Configuration in Integrion

Installation Summary

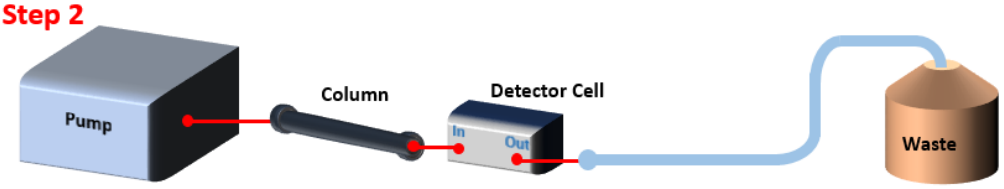
Step 1



Pump → Column → Waste

P_1

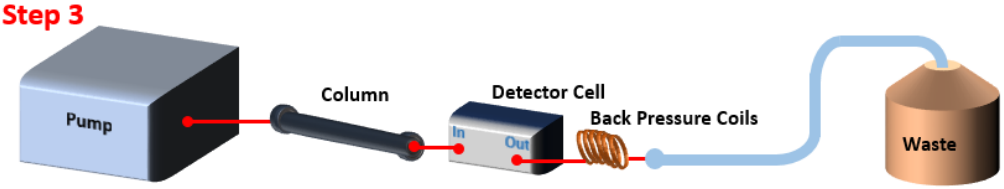
Step 2



Pump → Column → Detector Cell → Waste

P_2 BP_1, psi = P_2-P_1 Pass: ≤ 70 psi

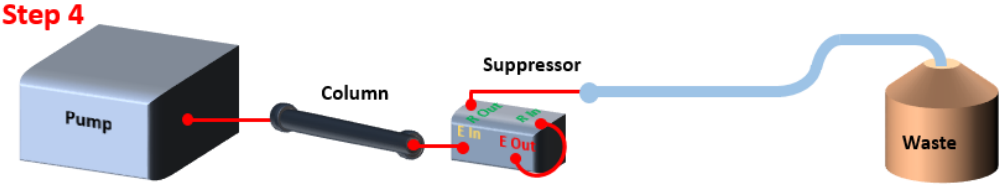
Step 3



Pump → Column → Detector Cell → Back Pressure Coils → Waste

P_3 BP_2, psi = P_3-P_2 Pass: 30-40 psi for carbonate or 10-40 psi for other eluents

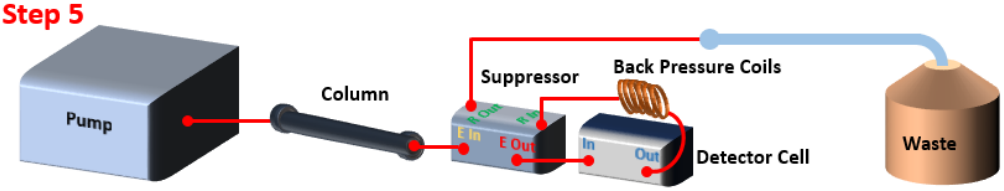
Step 4



Pump → Column → Suppressor (Eluent In → Eluent Out → Regen In → Regen Out) → Waste

P_4 BP_3, psi = P_4-P_1 Pass: ≤ 200 psi

Step 5



Pump → Column → Suppressor (Eluent In → Eluent Out) → Detector Cell → Back Pressure Coils → Suppressor (Regen In → Regen Out) → Waste