

Electron Capture Detector on a 6820 GC, Accessory G4314A

Installation Guide

This installation guide provides procedures for installing an Electron Capture Detector (ECD) on an Agilent 6820 Gas Chromatograph (GC). Before following these procedures, refer to safety information at the end of this document.

Parts list

| Description | Quantity |
|-----------------------------------|----------|
| T-20 Torx screw M4 | 1 |
| Screw, M4 × 12 mm | 4 |
| Cable tie 100 × 3 mm | 4 |
| Screw machine assembly M3 × 8 mm | 1 |
| 1/8-inch union tee brass Swagelok | 1 |
| 1/8-inch front ferrule brass | 2 |
| Nut 1/8-inch brass tubing | 2 |
| 1/8-inch back ferrule brass | 2 |
| Plumbing adapter | 1 |
| Heater block insulation | 1 |
| Nut warmer insulation | 3 |
| Insulation | 1 |



Parts list (continued)

| Description | Quantity |
|-----------------------|----------|
| Press plane | 1 |
| Trap bracket | 1 |
| ECD sticker - English | 1 |
| ECD sticker - Chinese | 1 |
| ECD caution label | 1 |
| ECD body | 1 |
| Micro ECD interface | 1 |
| Micro ECD ship kit | 1 |

Tools

- Electrostatic protection such as a grounded wrist strap
- T-20 and T-10 Torx screwdrivers
- Diagonal cutter
- 7/16-inch wrench

Configuration considerations

To achieve a standard factory configuration, it may be necessary to move an already existing detector. For a two-detector configuration, factory placement rules are as follows:

- A thermal conductivity detector (TCD) is always placed in the front location.
- A flame ionization detector (FID) is always placed in the back location.

Steps

- 1 Preparing the GC
- 2 Positioning and Securing the Detector
- 3 Connecting the Detector
- 4 Installing the Flow Control Module and Vent Tube
- 5 Installing the Insulation Cup
- 6 Restoring the GC to Operating Condition

Preparing the GC

WARNING

Hazardous voltages are present in the mainframe when the GC is connected to electrical power. Avoid potentially dangerous shock hazards by disconnecting the power cord before removing the side panels.

- 1 Switch off electrical power to the GC and disconnect the power cord. Allow time for the oven and heated zones to cool. Then switch off supply gases at their sources.
- 2 Remove column(s) and any associated hardware from inside the column oven.
- 3 Lift the hinged GC top cover at its front edge to expose the detector area. Remove the cover by raising it to vertical, lifting its left hinge pin from its bracket, and then sliding the cover to the left to free its right hinge pin.
- 4 Remove two screws along the lower edge of the left side (flow control) panel. Slide the panel slightly to the rear and lift it off.

CAUTION

Electronic components can be damaged by static electricity; use a properly grounded static control wrist strap when removing the electronics panel.

- 5 In the same manner, remove two screws along the lower edge of the right side (electronics) panel. Slide the panel slightly to the rear and lift it off.
- 6 Remove the back panel by removing two screws at its bottom edge, loosening two screws at its top edge, and then lifting off the two top screws.
- 7 Finally, remove the rear top cover by removing four screws, two at each end.
- 8 At this time, if necessary to achieve a standard factory configuration, completely remove and reinstall an existing detector into its required location. If an existing detector is being completely replaced by this new detector, carefully store the old detector assembly and all associated parts in a safe place for possible future use.

Positioning and Securing the Detector

CAUTION

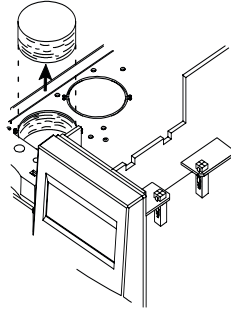
It is neither necessary nor advisable to separate a detector from its flow control module, as doing so may cause leaks. Although handling the detector and connected flow module as a unit is awkward, it can be managed.

- 1 If necessary, remove the round metal cutout on the oven top in the detector position to be used. Cut the metal circle with diagonal cutters so its nibs are connected to the piece removed. Discard the cutout.

CAUTION

GC insulation is made of refractory ceramic fibers. Ventilate your work area. Wear long sleeves, gloves, safety glasses, and a disposable dust/mist respirator. Dispose of unneeded insulation in a sealed plastic bag.

- 2 Lift out the die-cut insulation plug from the front or back detector position, if necessary.

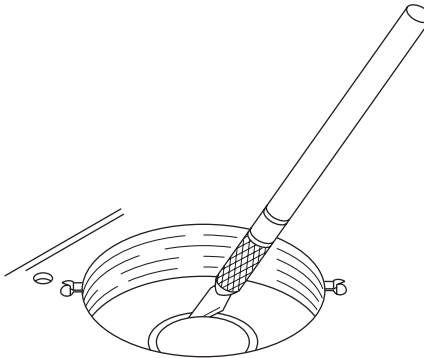


CAUTION

Be careful to remove only insulation within the scribed circle.

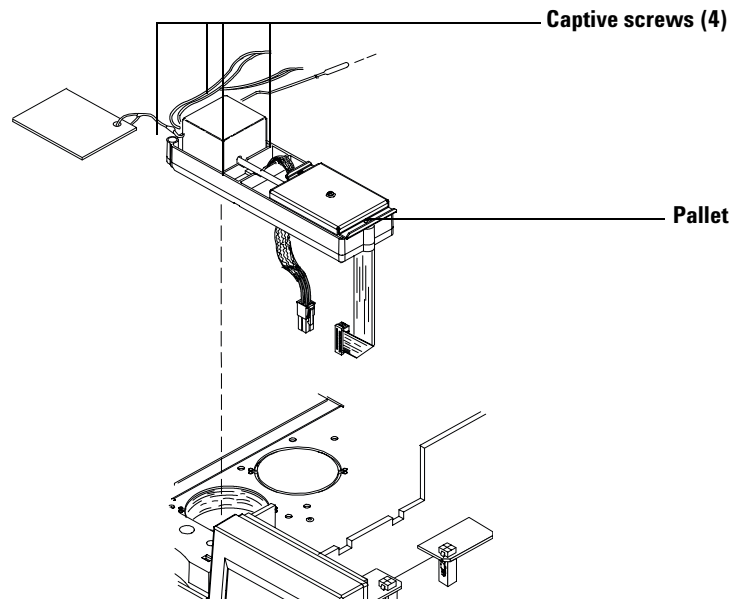
- 3 Carefully remove the scribed circle of insulation from the oven top to create an opening into the oven.

Method 1: Use a sharp knife to cut out insulation using the scribed circle as a guide.



Method 2: Pierce the insulation with a screwdriver. Rotate the screwdriver around the edge of the scribed circle to remove excess insulation. Remove any pieces of insulation that fall inside the oven.

- 4 While positioning the detector into the cavity, use both supplied insulation and removed oven insulation to pack around the bottom and sides of the detector. The goal is to fill all voids around the detector body as it is placed into the cavity.
- 5 Partially tighten the four screws with a T-20 Torx screwdriver, then tighten them evenly.



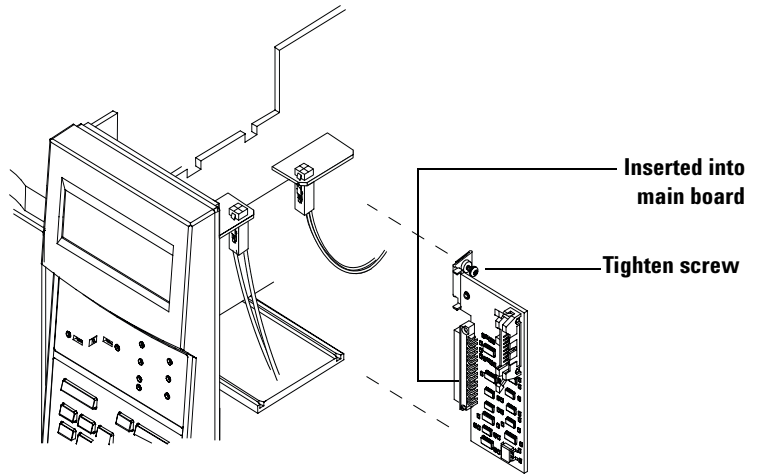
Connecting the Detector

CAUTION

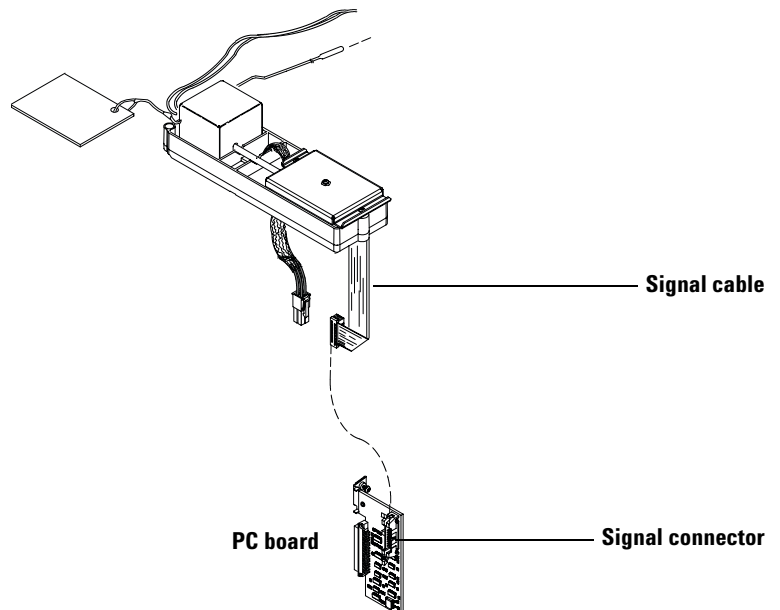
Printed circuit board components can be damaged by static electricity; use a properly grounded static control wrist strap when handling the detector board.

- 1 Remove the PC board from its antistatic bag and slide it fully into the slot and main circuit board connector associated with the installed detector. Tighten the screw on the PC

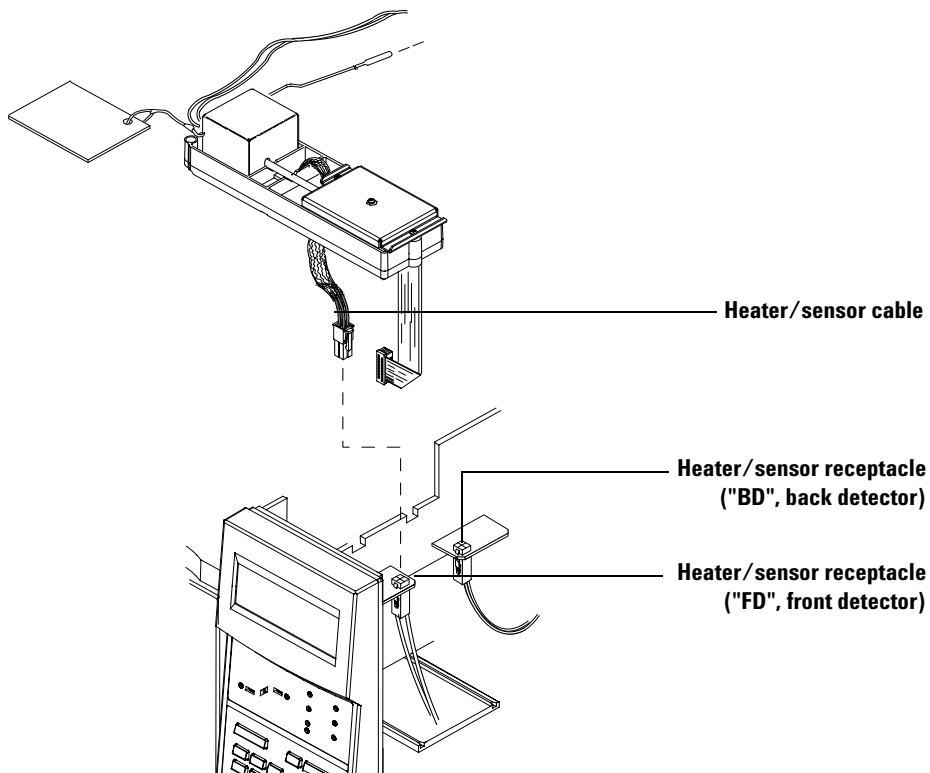
board bracket with a T-20 Torx screwdriver to secure the board.



2 Attach the signal cable to the PC board.



- 3 Connect the heater/sensor plug to the square receptacle closest to the installed detector ("FD" for front detector, or "BD" for back detector).



Installing the Flow Control Module and Vent Tube

This section describes installing the flow control module and vent tube.

CAUTION

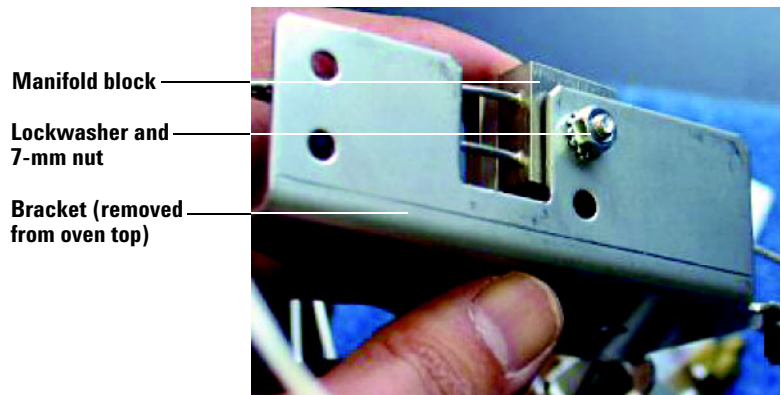
It is neither necessary nor advisable to separate a detector from its flow control module, as doing so may cause leaks. Although handling the detector and connected flow module as a unit is awkward, it can be managed.

- 1 Determine the correct location for the detector flow control module:
 - **Detector in the front position**– use the upper detector flow control module location.
 - **Detector in the back position**– use the lower detector flow control module location.

CAUTION

Handle the module carefully to avoid damaging its components and/or connected tubing.

- 2 Starting from the detector, the tubing between the detector and its manifold block should remain located within the oven top area. This makes it possible to remove the detector cell itself for servicing and/or replacement at a later time without having to remove instrument side and back panels.
- 3 Secure the manifold block to the support bracket using a screw, lockwasher, and nut. If necessary, temporarily remove the bracket from the oven top to secure the manifold block, then resecure the bracket.



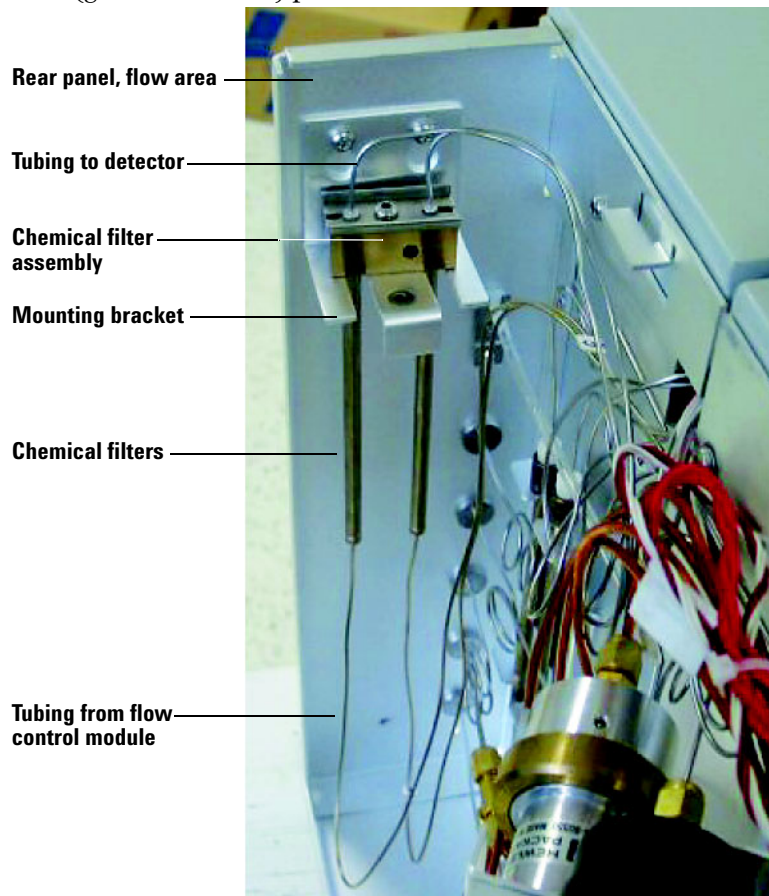
- 4 Install the plastic ECD vent tube onto the stainless steel vent tube from the detector.
- 5 Route detector tubing through either slot at the rear of the oven top, and then alongside existing tubing and wiring located behind the oven top into the flow control (left) side of the GC. Avoid making sharp bends in the tubing.

WARNING

The effluent gas stream from the detector must be vented to a fume hood to prevent possible contamination of the laboratory with radioactive material.

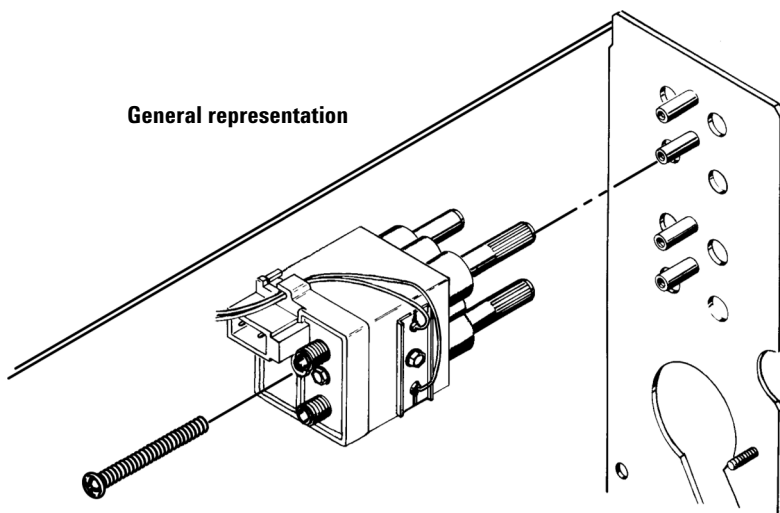
USA Owners: Detector venting must be in conformance with the latest revision of Title 10, Code of Federal Regulations, Part 20 (including Appendix B).

- 6** As tubing enters the flow control portion of the GC, separate the plastic vent tube from tubing leading to the chemical filter assembly and flow control module:
- a** Route the plastic vent tube through the appropriate vent location (hole) at the rear (gas connections) panel of the flow control area.
 - b** Mount the chemical filter assembly and bracket to the rear (gas connections) panel of the flow control area.



- c** Route the flow control module and connected tubing to the appropriate location at the front panel in the flow control portion of the GC.

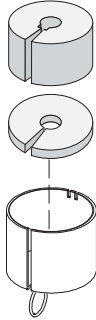
- 7** Remove the existing detector label plate from the module location to be used and install the new one provided.
- 8** Verify that the two valves on the flow module are in their respective midway positions (rotated fully clockwise to a stop, then rotated two to three turns counterclockwise) and then slide the module onto two studs provided at the rear of the flow panel.
- 9** Secure the module with a 1-3/4-inch screw. The screw passes through a hole at the center of the rear of the flow module.



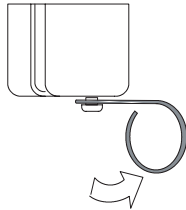
- 10** Use cable ties to secure installed tubing to existing wiring and tubing running behind the oven top.
- 11** Refer to your *Getting Started* manual both for factory standard plumbing configurations and for proper swage techniques to connect hydrogen and air supply gases to the installed detector flow module.

Installing the Insulation Cup

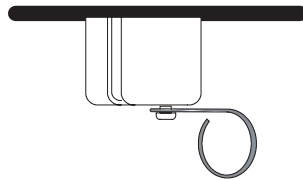
- 1 Install insulation into the cup.



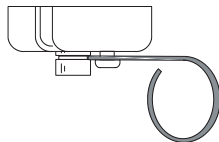
- 2 Push the wire spring lever at the bottom of the cup to the right to uncover the hole.



- 3 From inside the oven, place the cup over the detector fitting so its top edge touches the top of the oven.



- 4 Release the spring while making certain it fits into the groove in the detector fitting.



Restoring the GC to Operating Condition

- 1 Restore gas supplies and, following leak test procedures described in your *Maintenance and Troubleshooting* manual, check for leaks, particularly at all new connections.
- 2 Reinstall GC covers and panels.
- 3 Restore GC electrical power.
- 4 Switch off electrical power, then switch it on again to ensure the new configuration is properly retained in GC memory.
- 5 Press [前检测] or [后检测] ([**Front Det**] or [**Back Det**], respectively). If the detector has been properly installed, you will see the display:

| 后检测器 (ECD) | | |
|------------|----------|---|
| 温度 | 40 | 关 |
| 输出 | 846769.2 | |

| BACK DET (ECD) | | |
|----------------|----------|-----|
| Temp | 40 | Off |
| Output | 846769.2 | |

- 6 Verify detector operation by following the checkout procedure described in your *Getting Started* manual.



Notices

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.



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