

Installing the CO₂ Cryogenic Oven Cooling Kit

**Agilent 6850 Series II Network GC System
Accessory G2625B**

This kit contains:

Description	Quantity
Chassis	1
Chassis Cover	1
Ship kit:	1
• Cooling coil	1
• Coil bracket	1
• Coolant filter	1
• 1/16-inch Vespel ferrule	2
• Port connector	1
• Stainless steel nut for 1/16-inch tubing	2
Restrictor tube	1
Machine screws, M4 x .712 mm	8
Installation sheet (this document)	1

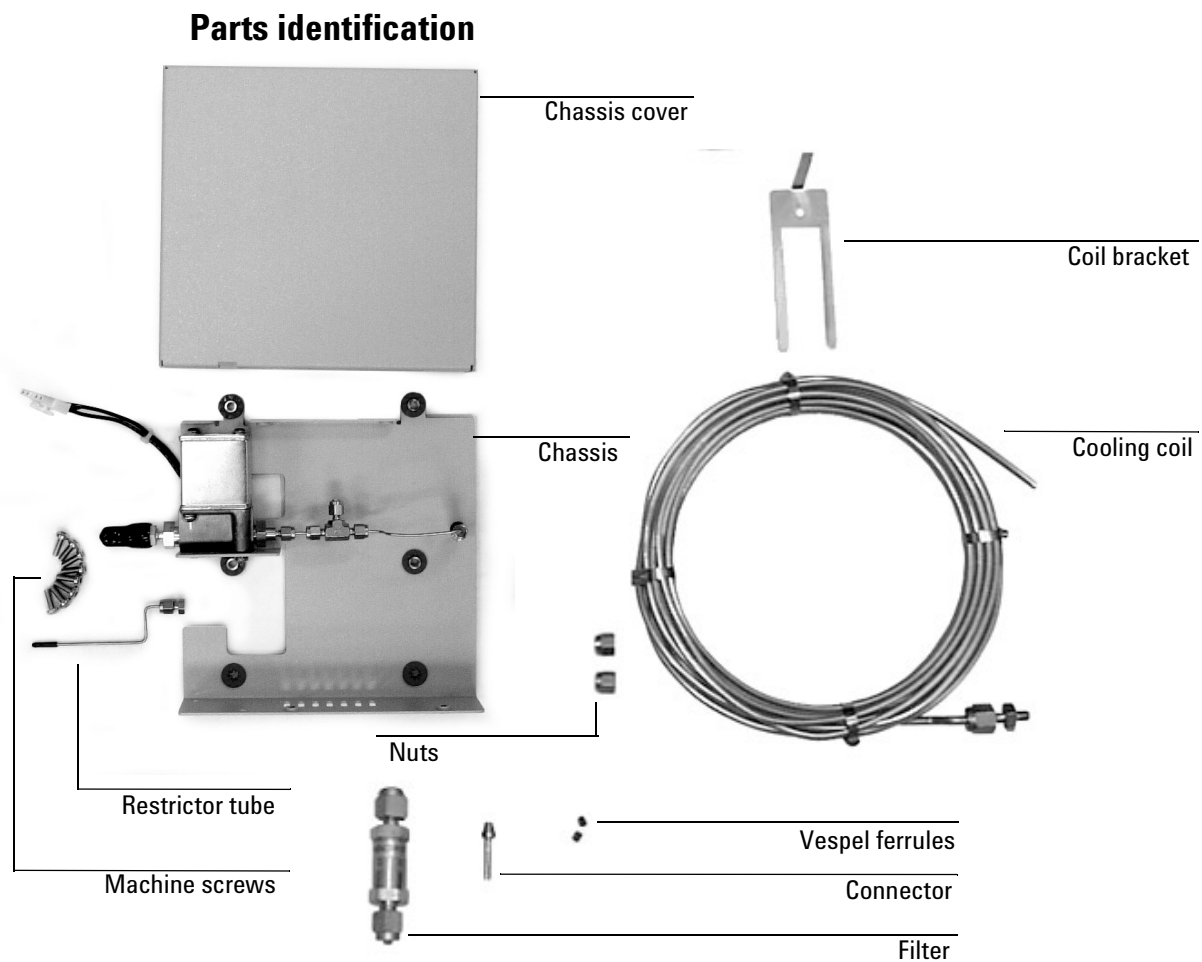
The kit is factory-assembled. Do not disassemble it during installation. The GC must have firmware revision A.03.00 or higher.



Agilent Technologies

Installing the CO₂ Cryogenic Oven Cooling Kit

Parts identification



Tools required

- Torx® T-20 screwdriver
- Open-end wrench
- Cylinder wrench
- Long, flat-blade screwdriver

Overview

Caution

Before continuing, read the safety information at the end of this document.

1. Disconnect the GC.
2. Install the inlet if you will be using a cool on-column inlet with cryo blast or PTV inlet with cryo cooling.
3. Open the GC.
4. Install the chassis.
5. Install the restrictor tube.
6. Install the cooling coil.
7. Install the chassis cover.
8. Install the coolant filter.
9. Close the GC.
10. Connect the cryogenic coolant supply.
11. Return the GC to operating condition.

Disconnect the GC

WARNING

Pressurized liquid CO₂ is a hazardous material. Take precautions to protect personnel from high pressures and low temperatures. CO₂ in high concentrations is toxic to humans; take precautions to prevent hazardous concentrations. Consult your local supplier for recommended safety precautions and delivery system design.

WARNING

Do not use copper tubing or thin-wall stainless steel tubing with liquid CO₂. Both harden at stress points and may explode.

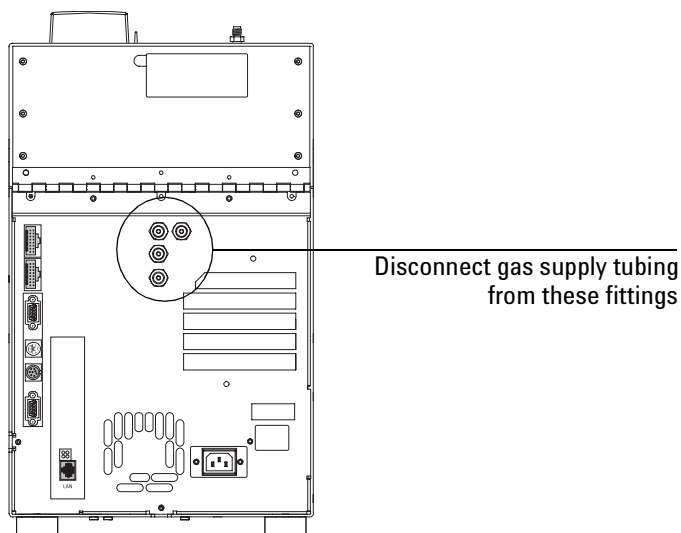
Caution

Liquid CO₂ should not be used as a coolant for temperatures below -40°C because the expanding liquid may form solid CO₂—dry ice—in the GC oven. If dry ice builds up in the oven, it can seriously damage the GC.

Installing the CO₂ Cryogenic Oven Cooling Kit

Install the inlet

1. Turn off the GC and unplug the power cord. Allow time for all heated zones to cool.
2. Open the lid. If a column is installed, disconnect it at the detector end. Remove the nut warmer, insulation, and capillary adapter, if present. Close the lid.
3. Turn off all gases at their sources. Disconnect the carrier and detector gas tubing from the back panel of the instrument.

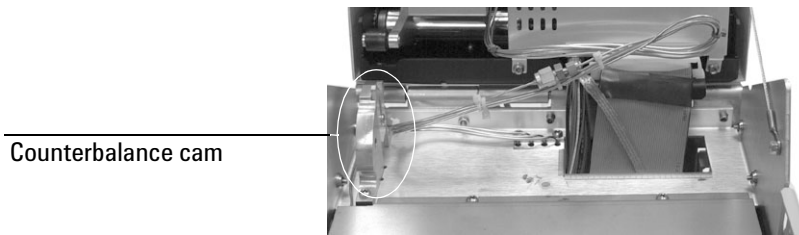


Install the inlet

See the installation sheet for the particular inlet you are using to learn how to install it.

Open the GC

1. Open the lid and locate the counterbalance cam in the left rear corner under the lid. Keeping the lid open with one hand, loosen the screw on the right side of the cam and lower the stop plate (on the right side of the counterbalance cam).



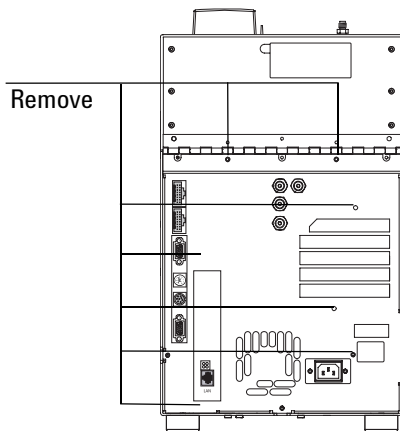
2. Raise the lid until it is stopped by the safety cable.
3. Raise the stop plate and tighten the screw to lock the lid in the upright service position.

WARNING

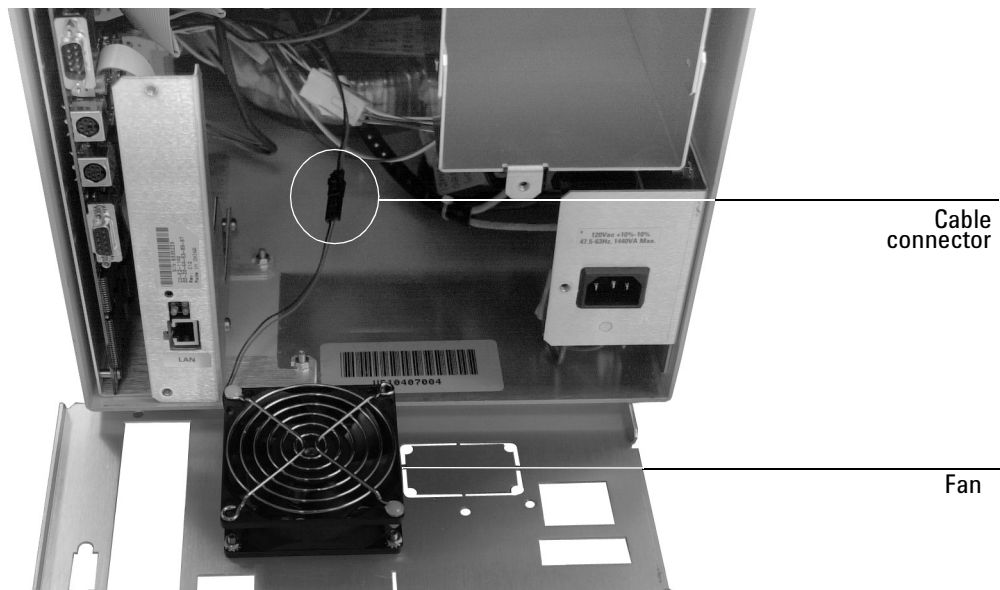
The lid is heavy. Always lock the lid when it is in the service position.

Installing the CO₂ Cryogenic Oven Cooling Kit
Open the GC

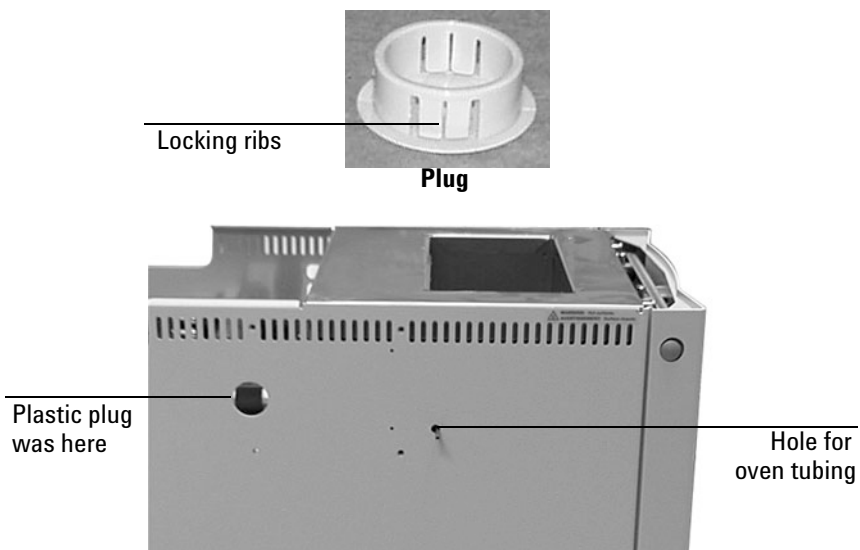
4. Remove the seven T-20 Torx screws on the back panel. Tilt the top of the panel away from the GC.



5. Follow the wires from the ventilating fan to the cable connector. (**Not all units have this fan.**) Disconnect the cable and set the panel aside.



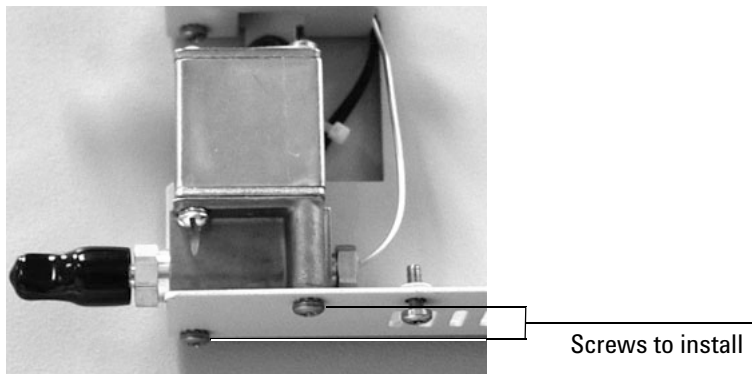
6. Locate the plastic plug in the large hole on the left side of the GC. From the back of the unit, depress the locking ribs on the sides of the plug with a long, flat-blade screwdriver and remove it.



Install the chassis

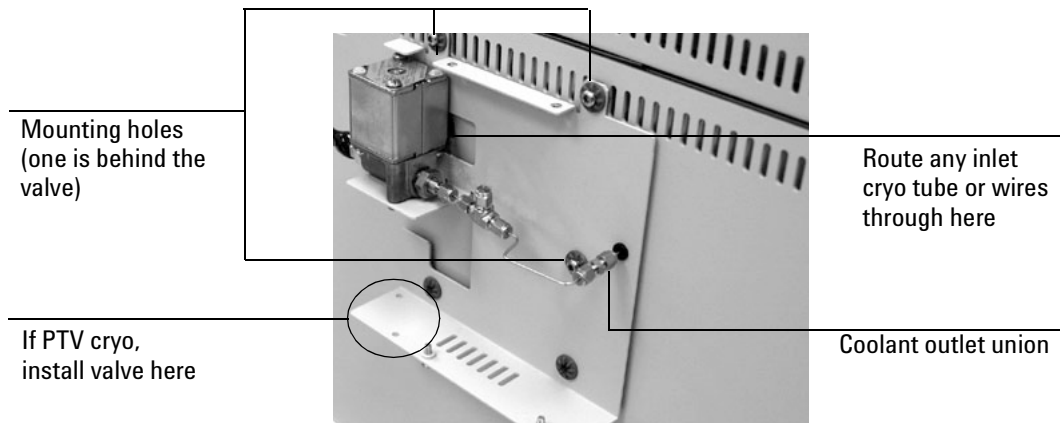
The chassis holds the cryo valve and related hardware.

1. If you are installing PTV cryo, install the valve onto the lower-left position of the chassis, including the screws to hold it in place. See the figure on the next page.



2. Pull any inlet cryo tube or wires through the hole on the side of the GC.

3. There are four mounting holes for the chassis on the left side of the GC (two of them are in the row of ventilation slots at the top). Place the chassis over the holes. Insert screws through the brass eyelets and secure them loosely. The small black grommet behind the coolant outlet union should be over the smaller hole in the side panel.



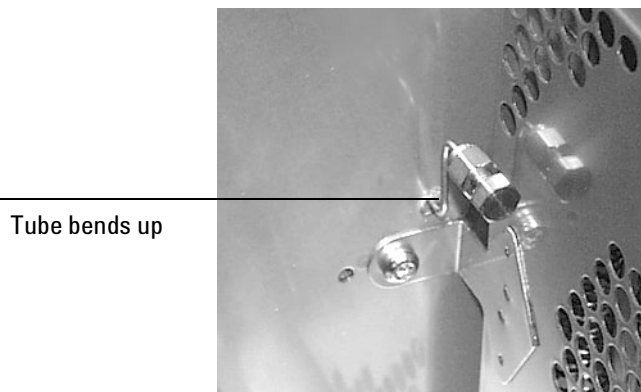
4. See the installation document for the inlet you are using to complete this procedure.

Install the restrictor tube

1. There is a hole in the oven inside wall that lines up with the hole for oven tubing on the side panel. Use a thin tool to make a hole through the insulation from the interior of the oven to the grommet in the chassis. *Do not use any of the tubing to make the hole through the insulation.*
2. The restrictor tube has a protective plastic cap on the long end. Push this end *with the cap in place*, from inside the oven, through the hole in the oven wall, the insulation, the hole in the side panel, and the rubber grommet on the chassis.
3. Remove the plastic cap on the end of the tube. Install a stainless steel 1/16-inch nut and a Vespel ferrule. Insert the tube in the coolant outlet union as far as it will go and finger tighten the nut.

Installing the CO₂ Cryogenic Oven Cooling Kit
Install the cooling coil

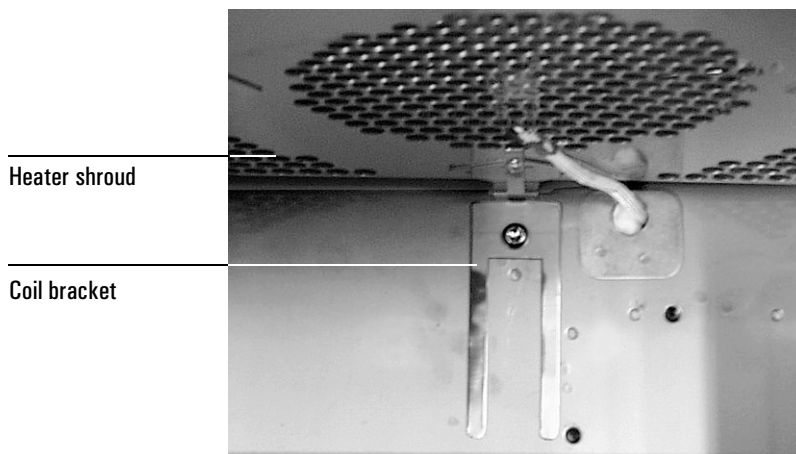
4. Inside the oven, check that the bend on the end of the restrictor tube points up. Tighten the union nut an additional 1/2 turn.



Install the cooling coil

The cooling coil is part of the ship kit.

1. Inside the oven, locate the coil bracket. It is secured by the same screw that holds the bottom of the heater shroud.



Installing the CO₂ Cryogenic Oven Cooling Kit
Install the cooling coil

2. Place the cooling coil in the oven with the fitting at the upper left. The bottom center of the coil should rest on the coil bracket.
3. Remove the stainless steel plug from the fitting on the end of the restrictor tube. Leave the rest of the fitting in place.
4. Connect the fittings on the restrictor tube and the coil. Finger tighten the 1/16-inch nut.

Restrictor tube

Cooling coil



5. Press the coil against the oven floor and bend the three bracket legs around it.

Coil bracket



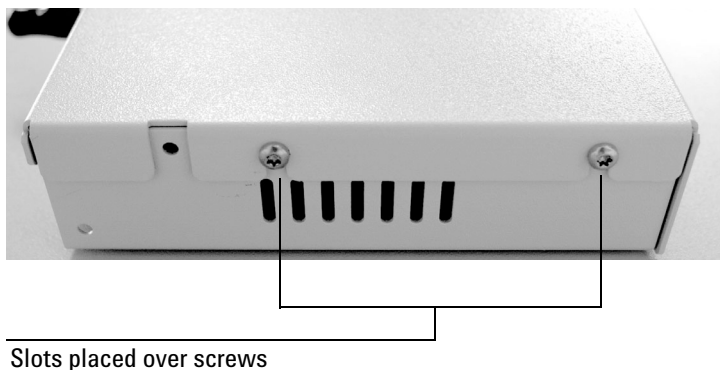
Installing the CO₂ Cryogenic Oven Cooling Kit

Install the chassis cover

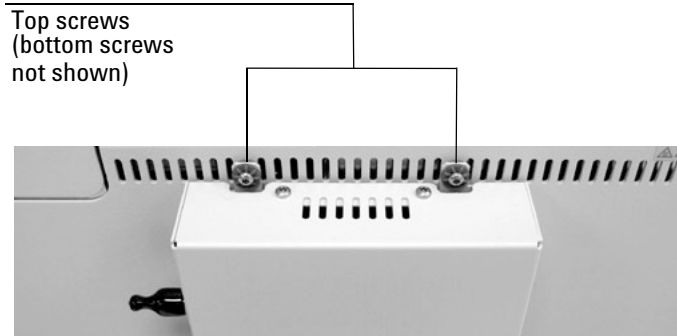
6. Check that:
 - The restrictor tube enters the oven and turns upward.
 - The restrictor tube is connected to the coil and the fittings are finger tight.
 - The coil is near to, but makes minimal contact with the heater shroud.
7. Tighten the nut on the restrictor tube 1/2 turn past finger tight. Use open-end and cylinder wrenches.

Install the chassis cover

1. Start two screws into the chassis from the bottom. Do not tighten them.
2. Place the cover over the chassis with the slots over the screws.



3. Add two more screws at the top, and tighten all four.



Install the coolant filter

Some GC owners have problems with particles in the CO₂ supply that clog the cryo valve. The filter and connector prevent this. The filter is part of the ship kit.

Locate the arrows (flow direction) on the body of the filter. Add the connector to the exit end of the filter. Assemble the parts as shown. Tighten the nut with a wrench.

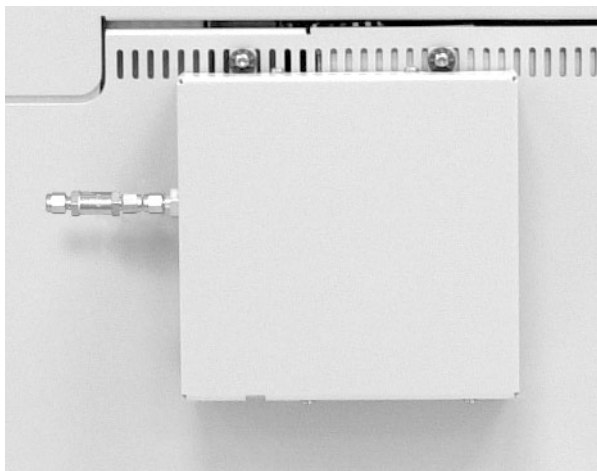


The cryo chassis contains one or two coolant fittings.

Installing the CO₂ Cryogenic Oven Cooling Kit
Install the coolant filter

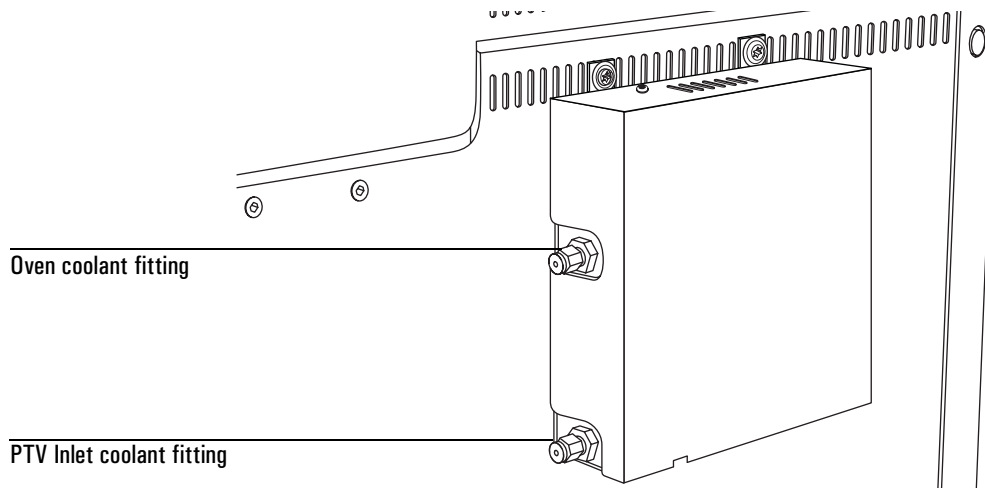
One fitting

Remove the nut and ferrules from the coolant inlet fitting. Use these parts to attach the filter/connector assembly to the inlet fitting.



Two fittings

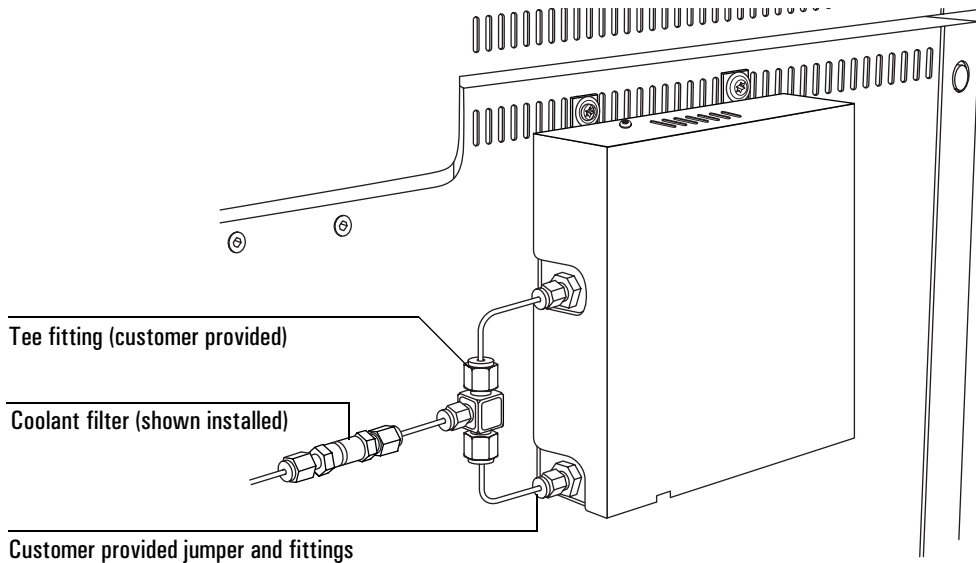
The following graphic identifies the fittings for the oven and the inlet.



1. Install a “Tee” (part number 0100-0542) at the coolant fittings. Agilent recommends that you use spectral-link tubing (part SL-8).

WARNING

The high pressure LCO₂ requires thick-walled, high pressure stainless steel tubing to avoid ruptures.



2. Remove the nut and ferrules from the coolant inlet fitting. Use these parts to attach the filter/connector assembly to the inlet fitting or tee fitting.

Close the GC

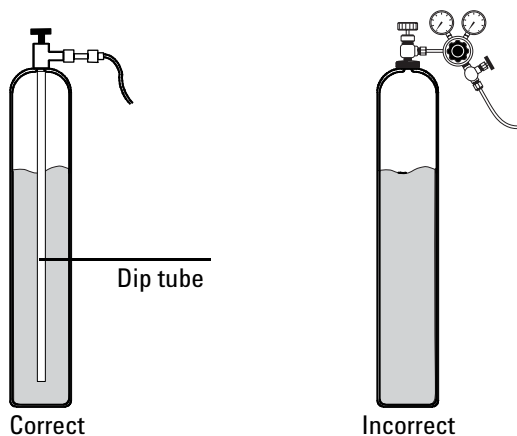
1. Reconnect the fan cable.
2. Place the back panel against the GC. Reinstall the seven screws that hold the panel to the GC.
3. Lower the stop plate on the lid cam. Pull the lid forward until the cam follower rests on the curved surface of the cam in front of the stop plate.
4. Raise the stop plate and tighten the screw. Close the lid.

Connect the cryogenic coolant supply

Liquid CO₂ is available in high-pressure tanks containing 50 pounds of liquid. The tank must have an internal dip tube or eductor tube to deliver liquid CO₂ instead of gas. Do not use a padded tank (one to which another gas is added to increase the delivery pressure).

Caution

Do not install a pressure regulator on the CO₂ tank, as vaporization and cooling would occur in the regulator instead of the oven.



WARNING

All fittings and tubing should be stainless steel. The pressure inside a liquid tank can be as high as 1000 psi.

1. Connect a CGA 320 to 1/4-inch male NPT fitting to the tank followed by a Swagelok[®] 1/4-inch female NPT to 1/8-inch tube fitting (part number SS-200-7-4).
2. Connect the tank to the cryogenic filter inlet with 1/8-inch diameter heavy-wall stainless steel tubing. The tubing may be up to 50 feet long. Allow some slack in the line to make movement of the tank or GC easier. Coil and fasten the ends of the tubing to keep it from “whipping” if it breaks.

Restore the GC to operating condition

1. Install the capillary adapter, if used.
2. Restore the column connection.
3. Restore carrier and other gases to the instrument.
4. Restore power.
5. Apply your normal operating pressures. Leak-check the manifold, back panel, and column fittings.



Agilent Technologies

© Agilent Technologies, Inc. 2004

All Rights Reserved. Reproduction, adaptation, or translation without permission is prohibited, except as allowed under the copyright laws.

Part number G2625-90117
First Edition, May 2004
Replaces part number G2625-90107
Printed in USA

Agilent Technologies, Inc.
2850 Centerville Road
Wilmington, DE 19808-1610

Acknowledgements

Torx[®] is a U.S. registered trademark of Textron, Inc.
Swagelok[®] is a U.S. registered trademark of the Swagelok Company.

Safety Symbols

Warnings in the manual or on the instrument must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions violates safety standards of design and the intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

In the manual

A warning calls attention to a condition or possible situation that could cause injury to the user.

A caution calls attention to a condition or possible situation that could damage or destroy the product or the user's work.

On the instrument



See accompanying instructions for more information.



Indicates a hot surface.



Indicates hazardous voltages.



Indicates earth (ground) terminal.



Indicates explosion hazard.



Indicates radioactivity hazard.



Indicates electrostatic discharge hazard.



Indicates pinch hazard.



G2625-90117