

## Agilent CrossLab Start Up Services

# 8860A/B Gas Chromatograph Site Preparation Checklist



## Introduction

Thank you for purchasing an instrument from Agilent. CrossLab Start Up is focused on helping customers shorten the time it takes to start realizing the full value of their instrument investment.

Correct site preparation is the key first step in ensuring that your instruments and software systems operate reliably over an extended lifetime. This document is an information guide and checklist prepared for you that outlines the supplies, space, and utility requirements for the system set up in your lab.

## Customer Information

- If you have questions or problems in providing anything described as part of Customer Responsibilities below, please contact your local Agilent or partner support / service organization for assistance prior to delivery. In addition, Agilent and/or its partners reserve the right to reschedule the installation dependent upon the readiness of your laboratory.
- Should your site not be ready for whatever reasons, please contact Agilent as soon as possible to re-schedule any services that have been purchased.
- Other optional services such as additional training, operational qualification (OQ) and consultation for user-specific applications may also be provided at the time of installation when ordered with the system but should be contracted separately.
- Please refer to the other peripheral products (i.e., samplers etc.) for site preparation requirements.

## Customer Responsibilities

Ensure that your site meets the following specifications before the installation date.

For details, see specific sections within this checklist, including:

- The necessary laboratory or bench space is available.
- The required **environmental conditions for the lab** as well as laboratory gases, tubing.
- The **power requirements** related to the product (e.g. **number & location** of electrical outlets).
- The **required operating supplies** necessary for the product and installation.
- While Agilent is delivering **Installation and Introduction** services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.
- Please consult the **Special Requirements and Other Considerations** section below for other product-specific information

## Important Customer Web Links

- To access Agilent training and education, visit <https://www.agilent.com/en/training-events/events/agilent-education> to learn about training options, which include online, classroom, and onsite delivery. A training specialist can work directly with you to help determine your best options.



- To access the **Agilent Resource Center** web page, visit <https://community.agilent.com/technical/consumables/w/wiki/4953/agilent-collection-of-columns-supplies-and-standards-resources>. Some of the topics include:
  - Columns, Supplies, Sample Prep, and Containment
  - Chemical Standards
  - Service and Support



- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit <https://community.agilent.com>.



- **Need to place a service call?** <https://explore.agilent.com/repairs-done-right>.



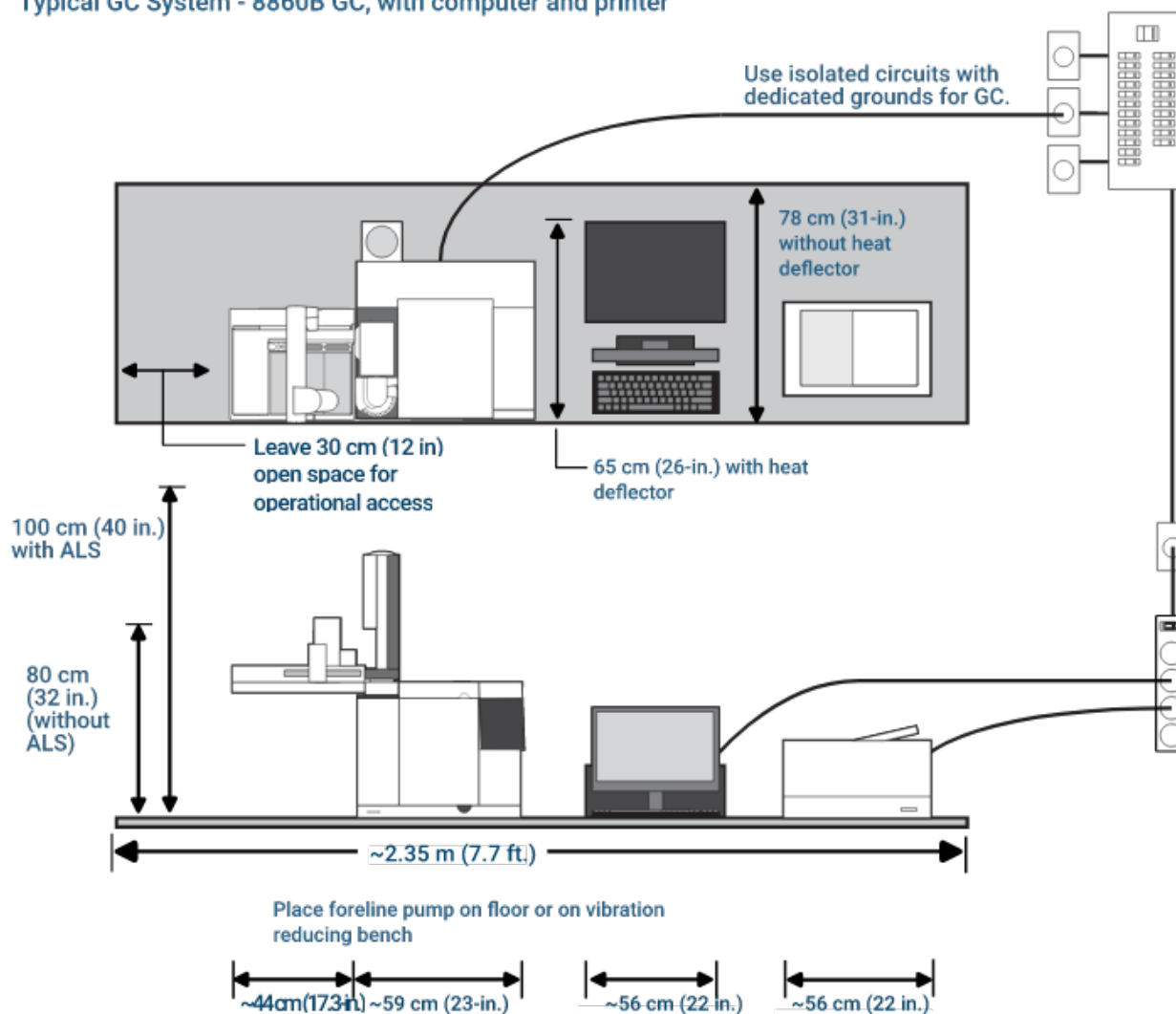
## Site Preparation

Complete site preparation details and requirements can be found in the instrument's site preparation guide. Find this guide on Agilent's web site by searching for the instrument model and "site preparation guide," or use the QR code shown below.



## Typical System Summary

### Typical GC System - 8860B GC, with computer and printer



Typical weight: ~84 kg (186 lb)

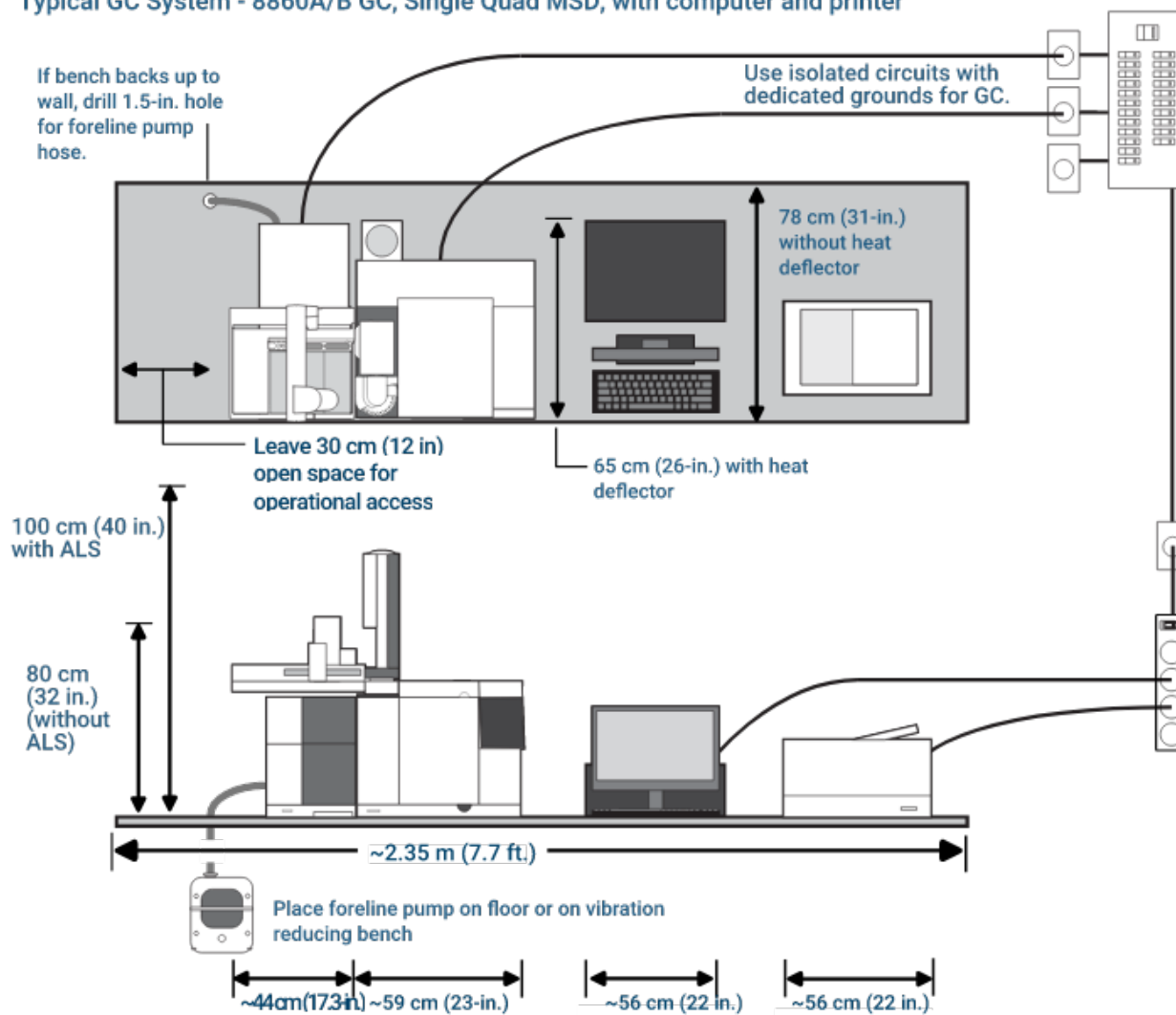
Maximum power consumption: ~3,250 VA (11,090 btu/hr)

| Application             | Gas*     | Purity     | Supply Pressure (psi)† |
|-------------------------|----------|------------|------------------------|
| Carrier                 | Helium   | 99.9995    | 50 - 80                |
|                         | Hydrogen | 99.9995    | 50 - 80                |
|                         | Nitrogen | 99.9995    | 50 - 80                |
| Detectors               |          |            |                        |
| TCD                     | Helium   | 99.9995    | 50 - 80                |
| FID, NPD, FPD, TCD      | Hydrogen | 99.9995    | 50 - 80                |
| ECD, FID, FPD, NPD, TCD | Nitrogen | 99.9995    | 50 - 80                |
| FID, NPD, FPD           | Air      | Zero grade | 50 - 80                |

\* Use 1/8-in Swagelok gas connections

† 1 psi = 6.89 kPa

### Typical GC System - 8860A/B GC, Single Quad MSD, with computer and printer



Typical weight: 123 kg (271 lb)

Maximum power consumption: ~4300 VA (14,843 btu/hr)

| Application             | Gas*     | Purity     | Supply Pressure (psi)† |
|-------------------------|----------|------------|------------------------|
| Carrier                 | Helium   | 99.9995    | 50 - 80                |
|                         | Hydrogen | 99.9995    | 50 - 80                |
|                         | Nitrogen | 99.9995    | 50 - 80                |
| Detectors               |          |            |                        |
| TCD                     | Helium   | 99.9995    | 50 - 80                |
| FID, NPD, FPD, TCD      | Hydrogen | 99.9995    | 50 - 80                |
| ECD, FID, FPD, NPD, TCD | Nitrogen | 99.9995    | 50 - 80                |
| FID, NPD, FPD           | Air      | Zero grade | 50 - 80                |

\* Use 1/8-in Swagelok gas connections

† 1 psi = 6.89 kPa

## Dimensions and Weight

Identify the laboratory bench space before your system arrives based on the table below. Pay special attention to the total height and total weight requirements for all system components you have ordered and avoid bench space with overhanging shelves. Also pay special attention to the total weight of the modules you have ordered to ensure your laboratory bench can support this weight.

- ☐ Requires 30 cm (12-inch) open space above GC/ALS.
- ☐ Requires 27 cm (10.7-inch) open space in front of GC.
- ☐ Requires 25 cm (10-inch) clearance between back of instrument and wall to dissipate hot air and allow for routine maintenance.

| Instrument description         | Height            | Width           | Depth           | Weight           |
|--------------------------------|-------------------|-----------------|-----------------|------------------|
| 8860 Series GC                 | 50 cm (19.2-inch) | 59 cm (23-inch) | 54 cm (21-inch) | 50 kg (112 lb)   |
| 8860 Series GC (with side box) | 50 cm (19.2-inch) | 68 cm (27-inch) | 54 cm (21-inch) | 57 kg (125.4 lb) |

## Environmental Conditions

Operating your instrument within the recommended temperature ranges ensures optimum instrument performance and lifetime.

- ☐ Performance can be affected by sources of heat and cold, such as direct sunlight, heating/cooling from air conditioning outlets, drafts and/or vibrations.
- ☐ The bench or supporting surface must be vibration free.
- ☐ The laboratory's ambient temperature conditions must be stable for optimum performance
- ☐ During normal operation of the GC with many detector and inlet types, some of the carrier gas and sample vents outside the instrument through the split vent, septum purge vent, and detector exhaust. If any sample components are toxic or noxious, or if hydrogen is used as the carrier gas or detector fuel gas, these exhausts must be vented to a fume hood.

| Product            | Condition | Temperature range | Humidity range | Maximum altitude |
|--------------------|-----------|-------------------|----------------|------------------|
| Standard oven ramp | Operation | 15 to 35 °C       | 5 to 95%       | 4,615 m          |
| All                | Storage   | -40 to 70 °C      | 5 to 95%       |                  |

## Heat Dissipation

Your facilities manager may wish to know the amount of heat that the system generates in order to establish its contribution to the overall room ventilation requirements.

The following table may help you calculate the additional BTUs of heat dissipation from this new equipment. Maximums represent the heat given off when heated zones are set for maximum temperatures.

Refer to the "Heat Dissipation" section of the Agilent 88xx GC, GC/MS, HS, and ALS Site Preparation Guide for more detail.

| Instrument Description | Heat Dissipation                                       |
|------------------------|--------------------------------------------------------|
| Standard oven ramp     | 7681 BTU/hour maximum (8103 kJ/h)                      |
|                        | 5120 BTU/hour maximum (100 V power option) (5402 kJ/h) |

## Exhaust Venting Requirements

Allow at least 25 cm (10 in) clearance between back of GC and wall to dissipate heated air.

Installing the optional oven heat deflector reduces the required clearance to 14 cm (5.5 in).

Although the deflector adds 14 cm (5.5 inches) to the back of the GC, the GC can be installed closer to the wall because hot air is vented up and away from the GC/wall.

The following picture shows the back view of an installed 88xx GC with the Oven Heat Deflector installed. The exhaust duct exit is 10 cm (4 inches) in diameter.



The connecting duct should provide unrestricted flow for the oven air and be as short and straight as possible.

With the exhaust deflector installed the exhaust is about 65 CFM (ft<sup>3</sup>/min /1.840 m<sup>3</sup>/min). Without the deflector, the exhaust rate is about 99 CFM (ft<sup>3</sup>/min /2.8 m<sup>3</sup>/min).

Refer to the "Exhaust Venting" section of the Agilent 88xx GC, GC/MS, HS, and ALS Site Preparation Guide for more detail.

## Power Requirements

If a computer system is supplied with your instrument, be sure to account for those electrical outlets.

The GC requires a dedicated circuit with an isolated ground.

**Table 1. Power requirements**

| Product                                   | Oven type | Line voltage (VAC)                           | Frequency (Hz) | Power Rating (VA) | Current rating (amps) | Power outlet current rating |
|-------------------------------------------|-----------|----------------------------------------------|----------------|-------------------|-----------------------|-----------------------------|
| 8860/8860B GC                             | Standard  | 100<br>single phase<br>(-10% / +10%)         | 48-63          | 1500              | 15                    | 15 Amp<br>Dedicated         |
| 8860 GC                                   | Standard  | 120<br>single phase<br>(-10% / +10%)         | 48-63          | 2250              | 18.8                  | 20 Amp<br>Dedicated         |
| 8860 GC                                   | Standard  | 220/230/240<br>single phase<br>(-10% / +10%) | 48-63          | 2250              | 10.2/9.8/9.4          | 10 Amp<br>Dedicated         |
| 8860 GC                                   | Standard  | 200<br>single phase<br>(-10% / +10%)         | 48-63          | 2250              | 11.2                  | 15 Amp<br>Dedicated         |
| 8860B GC                                  | Standard  | 120<br>single phase<br>(-10% / +10%)         | 48-63          | 2350              | 19.6                  | 20 Amp<br>Dedicated         |
| 8860B GC                                  | Standard  | 220/230/240<br>single phase<br>(-10% / +10%) | 48-63          | 2350              | 10.7/10.2/9.8         | 10 Amp<br>Dedicated         |
| 8860B GC                                  | Standard  | 200<br>single phase<br>(-10% / +10%)         | 48-63          | 2350              | 11.8                  | 15 Amp<br>Dedicated         |
| <b>All</b>                                |           |                                              |                |                   |                       |                             |
| Data system PC<br>(monitor, CPU, printer) |           | 100/120<br>(-10% / +5%)                      | 50/60 ± 5%     | 1000              | 10/8.3                | 15 Amp<br>Dedicated         |
| Data system PC<br>(monitor, CPU, printer) |           | 200/240<br>(-10% / +5%)                      | 50/60 ± 5%     | 1000              | 4.1-5                 | 10 Amp<br>Dedicated         |

**Notes**

- The number and type of electrical outlets depends on the size and complexity of your system. For example, in addition to the dedicated outlet for the GC, a system with a computer, monitor, printer, and HUB/Switch requires 4 additional outlets on a separate circuit.
- The GC will have a label next to the power cord connector that describes the line voltage requirements.



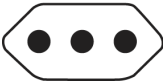
3. Power line conditioners that contribute any power line distortion should not be used with the Agilent GC.

Refer to the "System Power Requirements" section of the Agilent 88xx GC, GC/MS, HS, and ALS Site Preparation Guide for more detail.

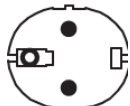
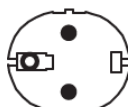
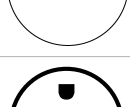
## Common instrument power cord plugs

Table 2, "Power cords" [11] shows common Agilent power cord plugs.

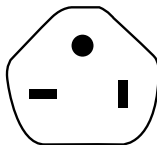
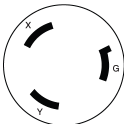
**Table 2. Power cords**

| Part number | Country                 | Voltage | Amps | Cable length (m) | GC connector type | Termination type  | Plug                                                                                  |
|-------------|-------------------------|---------|------|------------------|-------------------|-------------------|---------------------------------------------------------------------------------------|
| 8121-3116 # | Argentina               | 220     | 10   | 2.5              | C13               | IRAM 2073         |    |
| 8121-3119   | Argentina               | 220     | 16   | 2.5              | C19               | IRAM 2073         |    |
| 8121-3115   | Australia/ New Zealand  | 230     | 10   | 2.5              | C13               | AS 3112           |    |
| 8120-8619   | Australia / New Zealand | 230     | 15   | 2.5              | C19               | AS 3112           |   |
| 8121-1809 # | Brazil                  | 220     | 10   | 2.5              | C13               | NBR 14136 BR/3    |  |
| 8121-3321   | Brazil                  | 120/220 | 16   | 2.5              | C19               | NBR 14136 BR/3/20 |  |
| 8120-6978 # | Chile/Italy             | 230/220 | 10   | 2.5              | C13               | CEI 23-50         |  |
| 8121-1084   | Chile/Italy             | 230/220 | 16   | 2.5              | C19               | CEI 23-50         |  |
| 8121-1766   | China                   | 220     | 16   | 2.5              | C19               | GB 1002 GB 2099   |  |
| 8121-0723   | China                   | 220     | 10   | 2.5              | C13               | GB 1002 GB 2099   |  |
| 8120-8622   | Denmark                 | 230     | 16   | 2.5              | C19               | IEC60309          |  |

# 8860A/B Gas Chromatograph Site Preparation Checklist

| Part number | Country        | Voltage         | Amps | Cable length (m) | GC connector type | Termination type       | Plug                                                                                  |
|-------------|----------------|-----------------|------|------------------|-------------------|------------------------|---------------------------------------------------------------------------------------|
| 8121-3112   | Denmark        | 230             | 10   | 2.5              | C13               | SB 107-2-D1 DK2-5a     |    |
| 8120-4416   | Switzerland    | 230             | 10   | 2.5              | C13               | SEV 1011<br>SEV 6534/2 |    |
| 8121-1222   | Europe / Korea | 220 / 230 / 240 | 16   | 2.5              | C19               | CEE 7/7                |    |
| 8121-3121   | Europe / Korea | 220 / 230 / 240 | 10   | 2.5              | C13               | CEE 7/7                |    |
| 8121-0710   | South Africa   | 230             | 16   | 2.5              | C19               | SANS 164/1             |    |
| 8121-3118 # | South Africa   | 230             | 10   | 2.5              | C13               | SANS 164/1             |   |
| 8121-3201 # | India          | 230             | 10   | 2.5              | C13               | IS 1293                |  |
| 8121-3232   | India          | 230             | 16   | 2.5              | C19               | IS 1293                |  |
| 8121-3111 # | Israel         | 230             | 10   | 2.5              | C13               | SI 32                  |  |
| 8121-0161   | Israel         | 230             | 16   | 2.5              | C19               | SI 32                  |  |
| 8121-1763   | Japan          | 100             | 15   | 2.5              | C19               | JIS C8303              |  |

# 8860A/B Gas Chromatograph Site Preparation Checklist

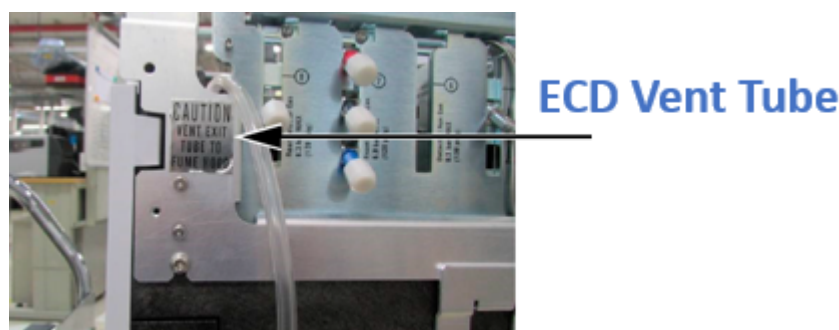
| Part number | Country                                        | Voltage | Amps | Cable length (m) | GC connector type | Termination type | Plug                                                                                  |
|-------------|------------------------------------------------|---------|------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------|
| 8121-2569   | Japan                                          | 200     | 15   | 2.5              | C19               | NEMA L6-20 Japan |    |
| 8120-8620   | United Kingdom, Hong Kong, Singapore, Malaysia | 220/230 | 13   | 2.5              | C19               | BS1363/A SS145   |    |
| 8121-3110 # | United Kingdom, Hong Kong, Singapore, Malaysia | 230     | 10   | 2.5              | C13               | BS1363/A SS145   |    |
| 8121-3132   | United States/South America (general)          | 120     | 20   | 2.5              | C19               | NEMA 5-20P       |    |
| 8121-0075   | United States / South America (unspecified)    | 240     | 15   | 2.5              | C19               | NEMA L6-15P      |    |
| 8121-3132   | Taiwan                                         | 110     | 20   | 2.5              | C19               | NEMA 5-20P       |   |
| 8121-2932 # | Taiwan                                         | 220     | 15   | 2.5              | C13               | CNS 690          |  |
| 8121-2989   | Taiwan                                         | 220     | 15   | 2.5              | C19               | CNS 690          |  |
| 8120-0674 # | Thailand and Philippines                       | 220     | 10   | 2.5              | C13               | NEMA 5-15        |  |
| 8121-1764   | Thailand and Philippines                       | 220     | 15   | 2.5              | C19               | NEMA 5-15        |  |

# 8860B GC only

## Venting the Micro-ECD, TCD or Split-Splitless Inlet Vent gas flows to a Fume Hood or venting manifold

- If using hydrogen carrier gas with either a micro Electron Capture (uECD) or Thermal Conductivity (TCD) Detector the GC will vent uncombusted hydrogen from the detector exit. In addition, if a Split/Splitless or Multimode Inlet is used, hydrogen will dissipate from both the inlet split and septum purge vents. In both cases you must either safely vent the exhaust gas or operate the GC inside a fume hood.
- The uECD exhaust vents through a stainless-steel tube, connected to a length of large I.D. tubing that exits the back panel. This should be routed to a fume hood or appropriate venting system. Agilent Technologies recommends a vent line internal diameter of 6 mm (1/4-inch) or greater. With a line of this diameter, the length is not critical.
- **Make sure that the venting system does not put a direct negative pressure on the vent tube from the GC.**

Below is a picture that shows the back view of an 88xx GC with the micro Electron Capture Detector vent tube exiting the back of the instrument.



## General Site Preparation Checklist

Use the following checklist to ensure that the site is properly prepared for GC system installation.

- ☐ Ensure that the appropriate installation hardware has been acquired.
- ☐ Ensure that system components are oriented so that they can be connected properly.
- ☐ Ensure that the location in which the GC system is being installed meets the requirements for environmental conditions.
- ☐ Prepare bench space for the GC system. Ensure that the bench has the size and weight capacity to accommodate the GC and associated components.
- ☐ If the system being installed includes an MSD, ensure that the bench allows for proper installation and connection of the fore-line pump.
- ☐ Ensure that appropriate venting is provided for the GC system.
- ☐ Ensure that a dedicated power circuit is available for each device in the system.
- ☐ Ensure that appropriate gas and reagent supplies are provided for the GC system.

- ☐ Ensure that appropriate gas plumbing is provided for the GC system.
- ☐ If the GC system being installed includes a data system, ensure that the PC meets the requirements necessary to properly support the GC system. For more information, see the site prep guide for your data system.
- ☐ If the GC being installed is to be connected to a site LAN, ensure that the appropriate cabling is available.

### Special Notes

- For information on Agilent consumables, accessories, and laboratory operating supplies, see the Important Customer Web Links above.

## Operating Supplies Required for Installation

Prior to installation, you must have sufficient and appropriate gas supplies, fittings, tubing, and filters on hand.

Available Kits for 88xx GC system installation:

| Kit                                               | Part Number | Contents                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended for GCs with FID, NPD, FPD            |             |                                                                                                                                                                                                                                                                                                       |
| GC Supply Gas Installation Kit with Gas Purifiers | 19199N      | Includes Gas Clean Filter system kit CP736530 (with 1 oxygen, 1 moisture, and 2 charcoal filters), 1/8-inch brass nuts and ferrules, copper tubing, 1/8-inch brass tees, tubing cutter, 1/8-inch brass caps, universal external split vent trap with replacement cartridges, and 1/8-inch ball valve. |
| Recommended for GCs with TCD/ECD, MS, and MSD     |             |                                                                                                                                                                                                                                                                                                       |
| GC Supply Gas Installation Kit                    | 19199M      | Includes 1/8-inch brass nuts and ferrules (20), copper tubing, 1/8-inch brass tees, tubing cutter, 1/8-inch brass caps, 7-mm nut driver, T-10 Torx driver, T-20 Torx driver, 4 open-end wrenches, and 1/8-inch ball valve.                                                                            |
| Gas Clean carrier gas filter kit, 1/8-inch        | CP17974     |                                                                                                                                                                                                                                                                                                       |

### Available GC Pressure regulators

All Agilent regulators are supplied with the 1/8-inch Swagelok female connector.

**Table 3. Tank regulators**

| Gas type                              | CGA number | Max pressure       | Part number |
|---------------------------------------|------------|--------------------|-------------|
| Air (Medical Grade)                   | 346        | 125 psig (8.6 Bar) | 5183-4641   |
| Air (Zero Grade, for GC applications) | 590        | 125 psig (8.6 Bar) | 5183-4645   |
| Hydrogen, Argon/Methane               | 350        | 125 psig (8.6 Bar) | 5183-4642   |
| Oxygen                                | 540        | 125 psig (8.6 Bar) | 5183-4643   |
| Helium, Argon, Nitrogen               | 580        | 125 psig (8.6 Bar) | 5183-4644   |

### Considerations for Hydrogen Carrier Gas

#### Hydrogen Safety

- Be sure that the Hydrogen gas supply is turned off until all connections are made and ensure the inlet and detector column fittings are always either connected to a column or capped when hydrogen gas is supplied to the instrument.
- In any application using hydrogen, leak test all connections, lines, and valves before operating the instrument. Agilent highly recommends the G3388B Leak Detector or equivalent to safely check for leaks.

#### Supply tubing for Hydrogen Gas

- Agilent recommends using NEW, chromatographic quality copper or stainless-steel tubing and fittings when using hydrogen.
- Do not re-use old tubing when installing or switching to hydrogen carrier gas. Hydrogen gas tends to remove contaminants left on old tubing by previous gases (by helium, for example). These contaminants can appear in detector output as high background noise or hydrocarbon contamination for several weeks.
- Do not use old copper tubing with hydrogen gas. Old copper tubing can become brittle and create a safety hazard.

#### Hydrogen Gas Supplies

- Hydrogen can be supplied from a gas generator or from a cylinder.
- Agilent recommends use of a high-quality, properly maintained hydrogen gas generator. A high-quality generator can consistently produce purity > 99.9999%, and the generator can include built-in safety features such as limited flow rates, and auto-shutdown.
- If using a hydrogen gas cylinder, Agilent recommends use of Gas Clean Filters to purify the gas.
- Consider additional safety equipment as recommended by your company safety personnel.

## Signature Page

### Service Engineer Comments (optional)

If there are any specific points you wish to note as part of performing this service review or other items of interest for the customer, please write in this box.

### Service Verification

|                                         |
|-----------------------------------------|
| Service Order Number:                   |
| Date of Service Completion:             |
| Customer Name:                          |
| Service Engineer Name:                  |
| Service Engineer Signature:             |
| Total number of pages in this document: |