

7890 Series GC Site Preparation Checklist

Thank you for purchasing an **Agilent Instrument**. To get you started and to assure a successful and timely installation of your 7890 GC, please refer to this site prep checklist.

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 a **checklist** prepared for you that outlines the space, utilities, supplies and consumable requirements for your equipment for your site.

For more detailed site preparation information, refer to the

"**Agilent GC, GC/MS, and Automatic Liquid Sampler (ALS) Site Preparation Guide**" :

http://www.agilent.com/cs/library/usermanuals/public/7890B_SitePrepGuide.pdf

Customer Responsibilities

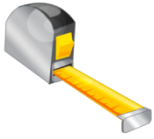
Make sure your site meets the following specifications before the installation date. For details, see specific sections within this checklist, including:

- The necessary laboratory bench space is available
- The environmental conditions for the lab and gas venting
- Laboratory gases and plumbing
- The power requirements related to the product
- The required operating supplies necessary for the product at installation
- Please consult the "Other Requirements" section for other product-specific information.

If Agilent is delivering installation and familiarization services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.

Important Customer Information

1. If you have questions or problems in providing anything described under "Customer Responsibilities" above, 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.
2. Should your site not be ready for whatever reasons, please contact Agilent as soon as possible to re-arrange any services that have been purchased.
3. 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.

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Laboratory Bench Space - 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.

Special Notes

1. Allow at least 25 cm clearance between back of GC and wall to dissipate heated air. See picture below. A simple system that includes a GC and a computer requires about 86 cm of bench space.
2. Avoid bench space with overhanging shelves. A 7683 or 7693 automatic liquid sampler will add to the height of the instrument as shown below.
3. G1888A Headspace, 5977 GCMS and QQQ MS are installed to the left of the 7890 and the 7697 Headspace and 220/240 Ion Trap MS are installed to the right. Refer to the "Dimensions and Weight" section of the "Agilent GC, GC/MS, and ALS Site Preparation Guide" for more detail.

Instrument Dimensions

Component	Height (cm)	Width (cm)	Depth (cm)	Weight (kg)
G3440A Agilent 7890 GC	50 to 58	59	54	50
G3440A with 3rd detector	50 to 58	68	54	57
G2913A 7683 Auto-injector	42 above GC			3.1
G2614A 7683 Tray		30 Left of GC		3.0
G4513A 7693 Auto-injector	50 above GC			3.9
G4514A 7693 Tray		45 Left of GC	2 cm in front of GC	6.8



Conversions: 1 kg = 2.2 pounds; 1 cm = 0.39 inches.

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Environmental Conditions

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

Special Notes

1. Performance can be affected by sources of heat & cold e.g. direct sunlight, heating/cooling from air conditioning outlets, drafts and/or vibrations.
2. The site's ambient temperature conditions must be stable for optimum performance.
3. For storage or shipping, the allowable temperature range is -40 to 70°C and the allowable humidity range is 5-95%, non-condensing. After exposing the GC to extremes of temperature or humidity, allow 2 hours for it to return to the recommended ranges.
4. Refer to the "Environmental Conditions" section of the "Agilent GC, GC/MS, and ALS Site Preparation Guide" for more detail.

Instrument Description	Operating temp range °C	Operating humidity range (%)	Maximum altitude (m)
Agilent 7890 GC, Standard Oven	15 to 35	5 - 95%	4,615
Agilent 7890 GC, Fast Oven (Options 002 and 003)	15 to 35	5 - 95%	4,615
Agilent 7890 GC, Storage	-40 to 70	5 - 95%	4,615

Conversions: 1 meter = 3.28 feet
 1 BTU = 1055 Joules

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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 BTU's 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 GC, GC/MS, and ALS Site Preparation Guide" for more detail.

Oven type	Heat dissipation
Standard oven ramp	7681 BTU / hour maximum
Fast oven ramp (options 002 and 003)	10,071 BTU / hour maximum

Venting the Oven - Oven Heat Deflector Option 306 or Part Number G1530-80650

Below is a picture that shows the back view of an installed 7890 GC - with the Oven Heat Deflector installed. The exhaust duct is 10 cm (4 inches) in diameter and adds 14 cm (5.5 inches) to the back of the GC.

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 (ft³/min / 1.840 m³/min). Without the deflector, the exhaust rate is about 99 CFM (ft³/min / 2.8 m³/min).

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



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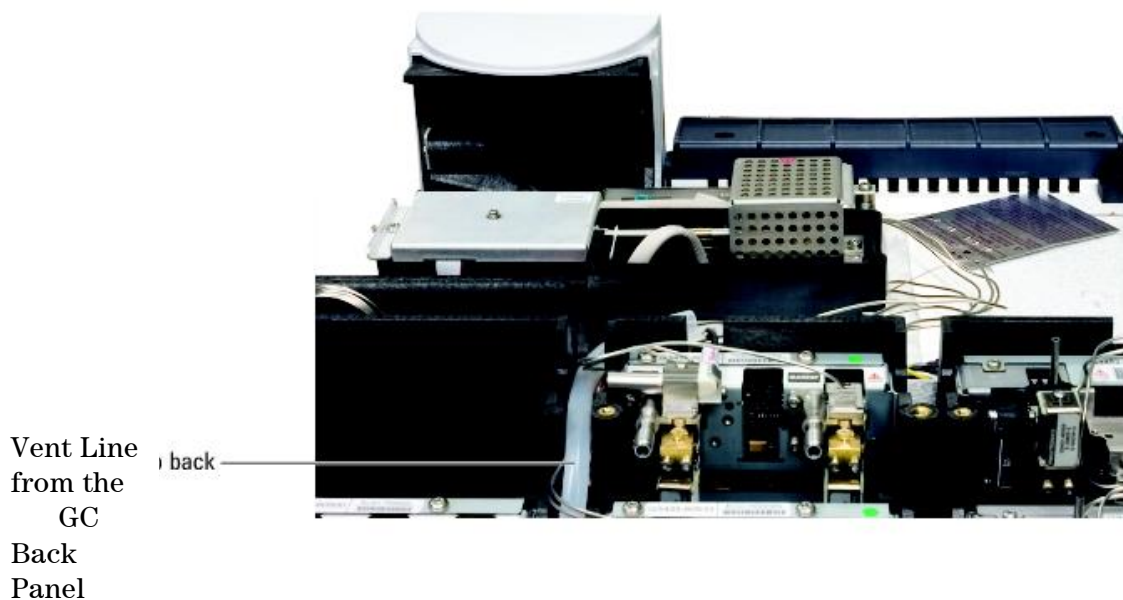
Venting the uECD, TCD or Split-Splitless Inlet Vent gas flows to a Fume Hood or venting manifold

If using a micro Electron Capture Detector, or if using hydrogen carrier gas that will be uncombusted, you must either safely vent the exhaust gas, or operate the GC inside a fume hood.

For example, if using hydrogen carrier gas with a thermal conductivity detector (TCD) the GC would vent uncombusted hydrogen from the detector and from the inlet split and septum purge vents.

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 a 7890 GC with the micro Electron Capture Detector vent tube exiting the back of the instrument.



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Power Consumption

The GC power consumption and requirements depend on the type of oven that you ordered and the country the unit is shipping to.

The following table Lists the AC Power requirements for various 7890 GC configurations:

Oven Type	Line Voltage (VAC) +/- 10%	Frequency (Hz)	Maximum Continuous Power (VA)	Current Rating (Amps)	Power Outlet Rating
Standard	Americas 120 Single Phase	48-63	2250	18.8	20 Amp Dedicated
Fast	220/230/240 Single or Split Phase	48-63	2950	13.4/12.8/12.3	15 Amp Dedicated
Standard	220/230/240 Single or Split Phase	48-63	2250	10.2/9.8/9.4	10 Amp Dedicated
Fast	200 Japan Split Phase	48-63	2950	14.8	15 Amp Dedicated

Notes

1. The number and type of electrical outlets depends on the size and complexity of your system. For example, a GC system with a computer, monitor, printer, and HUB/Switch requires 5 outlets.
2. The outlet for the GC must be dedicated to the GC with a dedicated ground.
3. The GC will have a label next to the power cord connector that lists the line voltage requirements.



Line Voltage
Frequency
Power



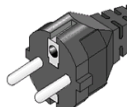



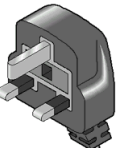


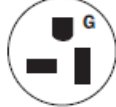


Special Notes:

1. **Option 003 is for any Country with standard 120/240 VAC to accommodate 208 VAC Power.**
2. Power line conditioners that contribute any power line distortion should not be used with the Agilent 7890 GC.
3. Refer to the "Power Consumption" section of the "Agilent GC, GC/MS, and ALS Site Preparation Guide" for more detail.
4. It is important to measure the line voltage at the receptacle for the GC to insure compatibility with the power configuration of the GC.

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7890 Power Cords

Refer to the "Power Consumption" section - "Common Instrument Power Cord Plugs" - of the "Agilent GC, GC/MS, and ALS Site Preparation Guide" for more detail.

Country	Voltage/Amps	Wall Termination	Length	Plug
Australia	240 Volts - 16 Amps	AS3112	2.5m	
China	220 Volts - 15 Amps	GB 1002	4.5m	
Europe, Korea	220/230/240 - 10 Amps	CEE/7/V11	2.5m	
Denmark, Switzerland	230 Volts - 16 Amps	SWISS/DENMARK 1302	2.5m	
India, South Africa	240 Volts - 15 Amps	AS3112	4.5m	
Israel	230 Volts - 16 Amps, 16 AWG	ISRAELI SI32	2.5m	
Japan	200 Volts - 20 Amps	NEMA L6-20P	4.5m	
United Kingdom, Hong Kong, Singapore, Malaysia	240 Volts - 13 Amps	BS89/13	2.5m	
United States	120 Volts - 20 Amps, 12 AWG	NEMA 5-20P	4.5m	
United States	240 Volts - 15 Amps (Standard) 14 AWG 208 Volts - 15 Amps (Opt 003)	NEMA L6-15P	2.5m	
Taiwan, South America	120 Volts - 20 Amps, 12 AWG	NEMA 5-20P	2.5m	

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Gas Selection
Special Notes

1. Refer to the "Gas and Reagent Selection" section in the "Agilent GC, GC/MS and ALS Site Preparation Guide" for more detail.
2. Agilent recommends a carrier and detector gas purity of 99.9995% or better. Air for flame detectors should be zero grade. Agilent also recommends using traps to remove hydrocarbons, water, and oxygen.
3. When used with capillary columns, GC detectors require a separate makeup gas for optimum sensitivity. This table lists gas recommendations for capillary columns and the preferred makeup gas types.
4. The inlet electronic pressure control (EPC) modules are calibrated for up to 4 carrier gases: Split/Splitless capillary (SS), Purged packed (PP), Programmable temperature vaporization (PTV), Multi-Mode (MM), and cool on-column (COC) are calibrated for Helium, Hydrogen, Nitrogen, and Argon methane 5%. Volatiles inlet VI is calibrated for only Helium and Hydrogen.
5. For GC/MS requirements, refer to the "GC/MS Gas and Reagent Requirements" section in the "Agilent GC, GC/MS and ALS Site Preparation Guide"

Detector	Carrier gas	Make up 1st choice	Make up 2nd choice	Purge or reference
Electron capture	Hydrogen* Helium Nitrogen Argon/methane	Argon/methane 5% Argon/methane 5% Nitrogen Argon/methane 5%	Nitrogen Nitrogen Argon/methane 5% Nitrogen	Note: ArMe makeup provides maximum Dynamic Range Nitrogen makeup provides maximum Sensitivity
Flame ionization	Hydrogen Helium Nitrogen	Nitrogen Nitrogen Nitrogen	Helium Helium Helium	Hydrogen* and air for detector
Flame photometric	Hydrogen* Helium Nitrogen Argon	Nitrogen Nitrogen Nitrogen Nitrogen	None	Hydrogen* and air for detector
Nitrogen phosphorous	Helium Nitrogen	Nitrogen Nitrogen	Helium Helium	Hydrogen* and air for detector
Thermal conductivity	Hydrogen* Helium Nitrogen	Must be same as carrier and reference	Must be same as carrier and reference	Reference must be same as carrier and makeup

* See "Considerations For Hydrogen Carrier Gas" in this document.

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Gas Supply Pressures
Special Notes

1. Refer to the "General Requirements" section under "Gas Supplies" in the "Agilent GC, GC/MS and ALS Site Preparation Guide" for more detail.
2. The following tables list minimum and maximum pressures in psi for each electronic pneumatic control module (EPC). These requirements are for the input to the EPC module located at the back of the gas chromatograph. Conversions: 1 psi = 6.8947 kPa = 0.068947 Bar = 0.068 ATM.

Detectors

	FID	NPD	TCD	ECD	FPD
Hydrogen	35-100	35-100			45-100
Air	55-100	55-100			100-120
Make up	55-100	55-100	55-100	55-100	55-100
Reference			55-100		

Auxiliary EPC and Pneumatic Control channels

The minimum supply pressure for AUX and PCM modules is 20 psi greater than pressure used in your method. For example, if you need a pressure of 20 psi for the method, the supply pressure must be at least 40 psi.

	AUX EPC	PCM 1	PCM 2 or PCM Aux
Maximum pressure	120	120	120 with Forward pressure control 50 with Back pressure control

Inlets

The minimum supply pressure for inlet modules is 20 psi greater than pressure used in your method. For example, if you need a pressure of 40 psi for the method, the supply pressure must be at least 60 psi.

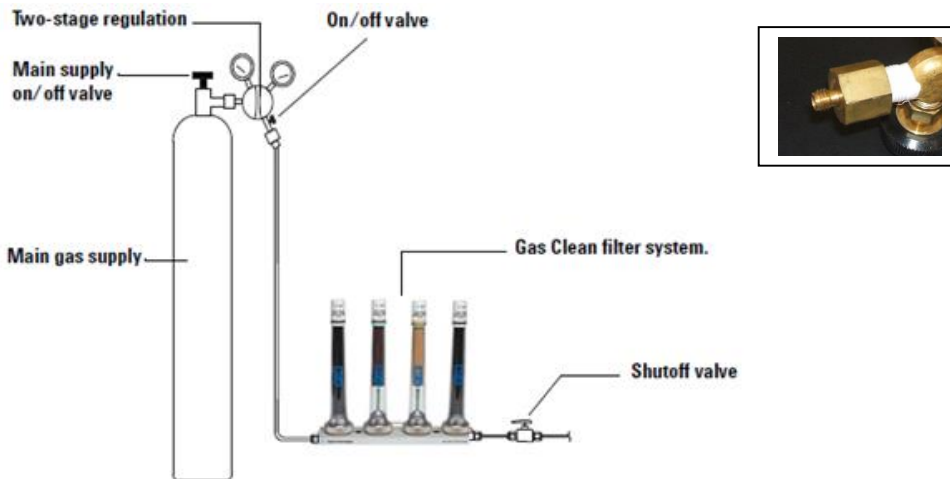
	SSL 150	SSL 100	MMI	PPIP	PCOC	PTV
Carrier max	170	120	170	120	120	120

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Gas Plumbing and Supplies

Plumbing Considerations

1. Refer to the "Gas Plumbing" section in the "Agilent GC, GC/MS and ALS Site Preparation Guide" for more detail.
2. Gases are supplied by tanks, internal distribution system, or gas generators. Tank supplies require two stage, pressure regulation. To connect tubing to the supply, it must have one 1/8-inch Swagelok® female connector for each gas. Make sure that your regulator has the appropriate sized adapter to end with a 1/8-inch Swagelok® female connector.
3. If your order did NOT include parts to connect the gas supply to your 7890 GC, you must supply pre-cleaned, 1/8-inch copper tubing and a variety of 1/8-inch Swagelok® fittings to connect the gas supply(s). Refer to the "GC Installation Kits" and "GC Plumbing" sections of this checklist for Part Numbers.
4. **Never use liquid thread sealer to connect fittings. Never use chlorinated solvents to clean tubing or fittings.**
5. Agilent also recommends using traps to remove water, hydrocarbons, and oxygen or a combination trap such as the "Gas Clean" Filter System that removes all three.



Special Notes

1. Shutoff Valves are recommended at both front and back Inlet Carrier Connections
2. FID, FPD and NPD need dedicated detector air supply
3. For Gas supply runs longer than 15 feet, use 1/4 inch tubing to prevent pressure drop
4. Do not reuse old copper tubing which can become brittle and break

Gas Clean Filter Configurations

Refer to the "Gas Plumbing/Filters and Traps" section of the "Agilent GC, GC/MS, and ALS Site Preparation Guide" for more detail. Another good resource is the "Agilent Gas Clean Filter System User Manual" - http://www.chem.agilent.com/Library/usermanuals/Public/GasCleanFilter_5973-1528.pdf

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Tank Regulator Table

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

Gas Type	CGA Number	Pressure Range	Part Number
Air	346	0-125 PSIG (8.6 Bar)	5183-4641
Hydrogen, Argon/Methane	350	0-125 PSIG (8.6 Bar)	5183-4642
Oxygen	540	0-125 PSIG (8.6 Bar)	5183-4643
Helium, Argon, Nitrogen	580	0-125 PSIG (8.6 Bar)	5183-4644
Air	590	0-125 PSIG (8.6 Bar)	5183-4645

Common Plumbing Supplies

Recommended Supplies to make the GC system installation go smoother.

Description	Part number
1/8 inch Copper Tubing - pre-washed - 50 feet	5180-4196
1/8 inch thick wall Stainless Steel Tubing - 20 Feet	7157-0210
1/8 inch Ball Shutoff Valve for Carrier Gas Supplies (order 1 for each inlet system)	0100-2144
PTFE tape (Never use liquid thread sealer to connect fittings.)	0460-1266

Miscellaneous Gas Plumbing Information

1. Cryogenic cooling with Liquid N₂ requires 1/4-inch insulated copper tubing – 25-30 PSI supply.
2. Cryogenic cooling with Liquid CO₂ requires 1/8-inch heavy-walled, stainless steel tubing – 750-1000 PSI supply – tank with dip (syphon) tube.
3. Cryogenic Liquid CO₂ coolant must be free of particulate material, oil, and other contaminants - A 2 micron particulate filter is provided with the Liquid CO₂ Cryogenic cooling accessories.
4. Internal Valco® rotary Valve actuation requires a separate pressurized, dry air at 55 psi.
5. If you have not requested option 305 (pre-plumbed GC), you must supply pre-cleaned, 1/8-inch copper tubing and a variety of 1/8-inch Swagelok® fittings to connect the GC to inlet and detector gas supplies.

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Considerations for Hydrogen Carrier Gas

If planning to use hydrogen carrier gas, note that special considerations apply due to hydrogen's flammability and chromatographic properties. Refer to the "Gas Supplies/Requirements for Hydrogen as a Carrier Gas" section in the "Agilent GC, GC/MS and ALS Site Preparation Guide" for more detail.

Hydrogen Safety

When using hydrogen as the carrier gas or fuel gas, be aware that hydrogen gas can flow into the GC oven and create an explosion hazard. Therefore, be sure that the Hydrogen gas supply is turned off until all connections are made and ensure the inlet and detector column fittings are either connected to a column or capped at all times 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 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.

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GC Installation Kits

Pre-configured kits to make the GC system installation go smoother.

All kits include two Shutoff valves - one for each inlet carrier supply.

Description	Part number
<p>Installation Kit for FID/NPD/FPD (Includes Gas Clean Filter Kit CP736538) for Moisture, O2 and Hydrocarbon removal.</p> 	<p>19199N</p>
<p>Installation Kit for TCD/ECD/MSD - no Gas Filters Included - order separately for ECD - Gas Clean Filter is included with MSD.</p> 	<p>19199M</p>

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Other Requirements

Your Agilent 7890 GC comes with an analytical column: 19091J-413 (HP5, 30 meter, 0.32mm x 0.25 μ m). Our checkout standards are designed to work with this column. In many cases, you will need to select a different column for your application. For information on GC Column Selection, refer to:

http://www.agilent.com/cs/library/catalogs/Public/5990-9867EN_GC_CSG.pdf

Tools and Consumables Supplied with your GC

Tool or consumable	Used for
Inlet wrench for Turn Top - Split/Splitless and Multimode Inlets only.	Replacing inlet septa and liners
¼-inch nut driver - FID Only	FID/NPD jet replacement
¼-inch X 5/16 inch wrenches	Column Installation
FID flow measuring insert	FID troubleshooting
Ceramic wafer column cutter	Column installation
1/8-inch nuts & ferrules, Swagelok, brass	Connect gas supplies
Inlet septa appropriate for type	Injection port seal
Inlet insert or liner	Injection port
Capillary Column Ferrules - Graphite	Column installation
2 Capillary Column Nuts	Column installation
2 Column Hangers	Column installation
Gas ID Labels	For Labeling Gas Supply Tubing to Inlets and Detectors
LAN Cable	Communication to the GC

Recommended Tools for GC Maintenance

Tool	Used for
GC Tool Kit - 5182-3456	Basic Tools in a zipper tool bag (Included with the Installation Kit Part Number 19199M)
ECD/TCD Detector plug, 5060-9055	Inlet pressure decay test.
Digital flow meter 220-1170	Verifying flows, checking for leaks and plugs.
Electronic gas leak detector - G3388B	Pin pointing gas leaks. Safety checks when using Hydrogen.
T10 Torx driver - 5182- 3466 T20 Torx driver - 5182- 3465	Remove FID Collector. Remove covers to access EPC modules, traps. Replace NPD Bead.
Tubing cutter for 1/8-inch Copper and 1/16 inch Stainless Steel. - 5190-1442	Cut gas supply tubing
Assorted wrenches: ¼, 3/8, 7/16, 9/16 inch	Gas supply and plumbing fittings.
Electric vial crimper - 5190-3188-P	Assure consistently air tight vial closure no matter who does the crimping.

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Recommended Supplies for GC Maintenance

First time GC users should consider stocking the following supplies to maintain their system. Please refer to the Agilent Consumables and Supplies Catalog for part numbers and recommended maintenance periods or visit <http://www.chem.agilent.com/en-US/Promotions/pages/catalog.aspx>

Supply	Used for
Inlet supplies	Septa, O-rings, liners, adapter, and seals
Inlet PM kits	Kits with individual parts needed to maintain an inlet.
Column supplies	Nuts, ferrules, adapters, guard columns, retention gaps
Detector supplies	Jets, beads, liners, adapters, cleaning kits
Application supplies	Standards, columns, syringes
Sampler supplies	Vials, caps, electronic crimpers, and syringes.

Autosampler Hardware from Older Systems

If you previously purchased samplers and would like to use these on your new GC, the samplers may need firmware updates. Sampler models that are compatible include: 7683A and 7693A ALS; and 7694B and 7697A Headspace Samplers.

This information is subject to change. For more details on software and hardware compatibility, please contact your sales representative.

Important Customer Web Links

- For additional information about our solutions, please visit our web site at: <http://www.agilent.com/home>
- Customer Education – <http://www.agilent.com/crosslab/university/>
- Detailed Site Preparation Manual: http://www.agilent.com/cs/library/usermanuals/public/7890B_SitePrepGuide.pdf
- Need supplies? – <http://www.agilent.com/chem/supplies>

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