

G3440A Site Preparation

Purpose of site preparation

Your site must meet this specification to assure a successful and timely installation of your Agilent 7890A gas chromatograph (GC). This document is designed to prevent delays during installation, familiarization, and the initial use of the GC system in your application. It outlines the space and utility requirements for an Agilent 7890A GC. It also recommends tools and consumables that may help you get started. Additional information is available from you sales representative, the Agilent consumables catalog, and Agilent Technologies, Inc.'s website.

Customer responsibilities

Make sure your site meets this specification, including: the necessary space, electric outlets, gases, tubing, and operating supplies. Operating supplies include consumables, such as, columns, vials, syringes and solvents required for the successful installation of instruments and systems. 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.

NOTE

If you need assistance, please contact your local Agilent Technologies office. Assistance with this specification and with user specific applications is available and will be contracted separately.

Dimensions and weight

Select the laboratory bench space before your system arrives. Pay special attention to the total height requirements. Avoid bench space with overhanging shelves. Allow at least 20 cm clearance between the back of GC and a wall to dissipate hot air. A simple system that includes a GC, an automatic liquid sampler, and a computer requires about 135 cm wide by 74 cm deep (5 feet by 3 feet) of bench space.



Component	Height (cm)	Width (cm)	Depth (cm)	Weight (kg)
G3440A Agilent 7890A GC	50 to 58	58	54	45
G3440A with 3rd detector	50 to 58	68	54	50
G2913A Auto-injector	46	12	12	3.1
G2614A Tray	20	40	34	3.0

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

Power consumption

The number and type of electrical outlets depends on the size and complexity of your system. A GC system with a computer, monitor, printer, and HUB requires 5 outlets. The outlet for the GC must have a dedicated ground.

Each GC will have a label next to the power cord connector that lists the line voltage requirements.



The GC power consumption and requirements depend on the type of oven that you ordered and the country the unit is shipping to. Fast oven options 002 and 003 require more power.

Oven	Line voltage	Frequency	Current	Power
Standard	Americas: 120V AC (1) single phase +10 to -10%	47.5-63 Hz	18.8 amps	2250 VA
Standard	220/230/240V single/split phase +10 to -10%	47.5-63 Hz	10.2 / 9.8 / 9.4 amps	2250 VA
Fast	Japan: 200V split phase +10 to -10%	47.5-63 Hz	14.8 amps	2950 VA
Fast	220/230/240V (2)(3) single/split phase +10 to -10%	47.5-63 Hz	13.4 / 12.8 / 12.3 amps	2950 VA

Notes:

- Americas 120V requires 20 amp dedicated line. Americas 240V requires 15 amp dedicated line.
- Option 003, 208V fast oven, uses a 220V unit with operating range of 193 to 231V. Most labs have 4-wire service resulting in 208V at the wall receptacle. It is important to measure the line voltage at the receptacle for the GC.
- Power line conditioners should not be used with the G3440A Agilent 7890A GC.

Heat dissipation

Your facilities manager may wish to know the amount of heat that the system creates to understand 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.

Oven type	Agilent 7890A series
Standard oven ramp	7681 BTU / hour maximum
Fast oven ramp (options 002 and 003)	10,071 BTU / hour maximum

An oven exhaust deflector kit is available for attaching 10-cm exhaust duct to exhaust the hot air. This adds about 13 cm to the back of the GC. Order option 306 or part number 19247-60510.

Environmental conditions

Performance can be affected by sources of heat and cold from heating, air conditioning systems, or drafts.

Temperature

- Recommended operating temperature range is 15 to 35°C
- Full operational temperature range is 0 to 50°C

Humidity

- Recommended operating humidity range 50 to 60%, non-condensing
- Full humidity range is temperature dependent

Up to 31°C, humidity range is 5 to 80%

At 40°C, humidity range is 5 to 50%

Altitude

- Recommended operating altitude up to 2,000 m
- Maximum altitude is 4,615.38 m

NOTE

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.

Gas supplies

Gases are supplied by tanks, internal distribution system, or gas generators. Tank supplies require two staged, 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.

The following tables lists minimum and maximum pressures in psi for inlets and detectors measured at the bulkhead fitting 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		

Inlets

	SSL 150	SSL 100	PCOC	PPIP	PTV
Carrier max	170	120	120	120	120
Carrier min	Must supply 20 psi greater than pressure used in method				

- If you have not requested option 305, 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.
- Cryogenic cooling with Liquid N2 requires 1/4-inch insulated copper tubing.
- Cryogenic cooling with Liquid CO2 requires 1/8-inch heavy-walled, stainless steel tubing.
- Valve actuation requires a separate pressurized, dry air at 55 psi.
- Never use liquid thread sealer to connect fittings. Never use chlorinated solvents to clean tubing or fittings.

Gas purity and selection

Agilent recommends that carrier and detector gases be 99.9995% pure. Air needs to be zero grade or better. Agilent also recommends using traps to remove hydrocarbons, water, and oxygen.

When used with capillary columns, GC detectors require a separate makeup gas for optimum sensitivity. For each detector and carrier gas, there is a preferred choice for makeup gas. This table lists gas recommendations for capillary columns.

Detector	Carrier gas	Make up 1st choice	Make up 2nd choice	Purge or reference
Electron capture	Hydrogen Helium Nitrogen Argon/methane	Argon/methane Argon/methane Nitrogen Argon/methane	Nitrogen Nitrogen Argon/methane Nitrogen	Anode purge must be same as makeup
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
Mass selective	Hydrogen Helium	None	None	
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

Other considerations

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

Refer to <http://www.chem.agilent.com/cag/cabu/gcreflib.htm> for information on column selection, phase selection, guard columns, retention gaps, conditioning, and method development.

Your GC comes with a few basic tools and consumables depending on the specific inlet and detector that you ordered. Here is a general list of what you will get with your instrument.

Tool or consumable	Used for
Inlet wrench	Replacing inlet septa and liners.
T10 and T20 Torx wrenches	Remove tray. Remove covers to access EPC modules, traps, and possible leaks.
¼-inch nut driver	FID jet replacement.
FID flow measuring insert	FID troubleshooting.
Ceramic wafer column cutter	Column installation.
1/8-inch Tee, Swagelok, brass	Connect gas supplies
1/8-inch nuts & ferrules, Swagelok, brass	Connect gas supplies
Inlet septa appropriate for type	Injection port seal
Inlet insert or liner	Injection port

This table lists other useful tools that do not come with your GC.

Tool	Used for
ECD/TCD Detector plug, 5060-9055	Inlet pressure decay test.
1/8-inch Ball Valve, 0100-2144	Inlet pressure decay test. One per inlet.
Digital flow meter, Flow tracker 1000	Verifying flows, checking for leaks and plugs.
Electronic gas leak detector	Pin pointing gas leaks. Safety checks when using Hydrogen.
Column cutters	Cutting columns
T10 and T20 Torx drivers	Remove tray. Remove covers to access EPC modules, traps, and possible leaks.
1/8-inch tubing cutter (wire cutter type)	Cut gas supply tubing
Assorted wrenches: ¼, 3/8, 7/16, 9/16	Gas supply and plumbing fittings.
Electronic vial crimper	Assure consistently air tight vial closure no matter who does the crimping.

This table lists consumables that you may wish to order. First time GC users should consider adding the following supplies to maintain their system and prevent interruptions in the use of their system. Please refer to the Agilent Consumables and Supplies Catalog for part numbers and recommended maintenance periods. New instrument purchasers can get a 15% discount on their 1st order of supplies for 60 days after the equipment order.

Consumable category	Consumable
Inlet supplies	Septa, o-rings, liners, adapter, and seals
Inlet PM kits	Kits with individual parts needed to maintain an inlet.
Pneumatic supplies	Gases, traps, o-rings, seals, Swagelok® fittings
Column supplies	Nuts, ferrules, adapters, guard columns, retention gaps
Detector supplies	Jets, beads, liners, adapters, cleaning kits
Application supplies	Standards, columns, syringes

Non-Agilent computer or software

Agilent hardware, recommended computers, and software are thoroughly tested for compatibility and reliable operation. Your company may have selected other suppliers for parts of your system. This list summarizes some of the key requirements for computers and software.

The following Agilent software products are thoroughly tested and compatible:

- Multi-technique ChemStation, version B.03.01.
- MSD ChemStation, version E.00.00.
- EZChrom Elite, version 3.2.1.
- Agilent Lab Monitor & Diagnostic Software

These software packages require the following:

- Microsoft® Windows® XP Professional with service pack 2. Microsoft TCP/IP only. TCP/IP must be installed before installing the software.
- Internet Explorer 6.0 service pack 1
- Framework.NET 2.0
- The minimum requirements for the computer include: a Pentium 4 processor operating at 1.5 GHz or higher; at least 512 MByte of RAM for a single instrument; at least 40 GByte hard driver; ATAPI CD, CD-RW or DVD drive; video with 1280 x 1024 resolution (SXGA); 10/100baseT LAN port.

If you previously purchased samplers and would like to use these on your new GC, the samplers may need firmware updates.

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