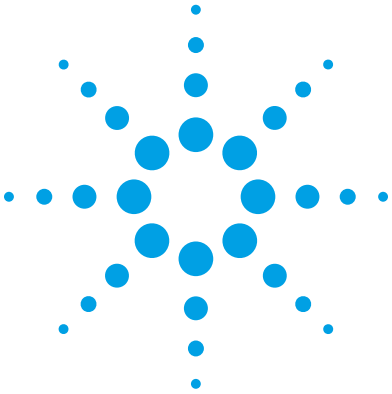

Agilent 6000 Series LC/MS System

Site Preparation Guide

Agilent Technologies

Notices

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Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

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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.

In This Guide...

The guide is a supplement to the *Site Preparation Checklist* for your specific instrument.

In this guide, “Agilent” refers to Agilent Technologies or one of its representatives.

1 Before You Begin

This chapter describes what you need to know before you begin.

2 Site Preparation

This chapter describes how to properly prepare your site for a new 6000 series LC/MS. Follow these instructions carefully. Delays due to improper site preparation can result in loss of instrument use during the warranty period.

3 Delivery and Installation

This chapter describes what the customer is expected to do at the time of delivery and installation.

4 Reference

This chapter contains reference information for your 6000 series LC/MS system.

Content

1 Before You Begin

NOTE This guide is a supplement to the *Site Preparation Checklist* for your specific instrument. Make sure that you have a copy of that checklist before you begin.

This chapter describes what you need to know before you begin.

Inadequate site preparation can cause loss of instrument use during the warranty period. Additional time required to complete the installation are subject to charges. Agilent provides service during the warranty period and under maintenance agreements only if the specified site requirements are met.

Customer Responsibility

Unless previous arrangements are made with Agilent, site preparation is the responsibility of the customer. The customer is expected to:

1. Plan, schedule, and prepare the site according to the specifications in this guide.
2. Verify that the electrical environment is safe and adequate for the 6000 series LC/MS system installation and operation.
3. Comply with all local laws (codes, ordinances, and regulations) for mechanical, building, and electrical distribution systems, hazardous waste disposal, and chemical storage. *The site must be in compliance before installation.*
4. Provide adequate lifting equipment to unload the system from the delivery vehicle and transport it to the site where it will be installed.
5. Provide at least two people to lift the 6100 Series LC/MS. For all other 6000 Series LC/MS systems, provide at least four people to lift the instrument onto the laboratory bench.
6. Provide adequate secure storage space for the system until it can be installed by an Agilent Technologies representative.

Customer responsibility for site preparation is not limited to this list.

Agilent Responsibility

An Agilent service representative will install the 6000 series LC/MS and verify its performance. The service representative is expected to:

1. Unpack the 6000 series LC/MS system and verify that all components are present and undamaged.
2. Connect the carrier gas line to the instrument from the tank, regulators, and lines previously installed by the customer.
3. Install, connect, and turn on the 6000 series LC/MS system components.
4. Verify that the system meets Agilent Technologies performance standards.
5. Provide *basic* user familiarization for system hardware and software.
6. Sign up the customer through the Response Centers for instrument and software support.

Activities not covered as part of installation

Agilent is not responsible for:

- Any task not listed in the 6000 series LC/MS *Installation Guide* or in the installation guides for the LC, data system, and other accessories.
- Installation of a nitrogen gas generator and/or air compressor unless additional installation time is purchased (except when installation is included as indicated by Agilent).
- The connection or performance verification of hardware and software not provided by Agilent.
- The use of customer standards or samples to test the 6000 series LC/MS.
- Detailed instructions in the operation of the computer operating system and MassHunter Workstation software. Contact Agilent for training classes.
- Laboratory set-up procedures. Contact Agilent for assistance with laboratory procedures, application development, or chemical analysis consulting, at additional cost.
- Operation of the 6000 series LC/MS after installation.
- Connection to or establishment of communication with your site LAN network. The service representative will test the ability of the LC/MS to communicate with the bundled system only.

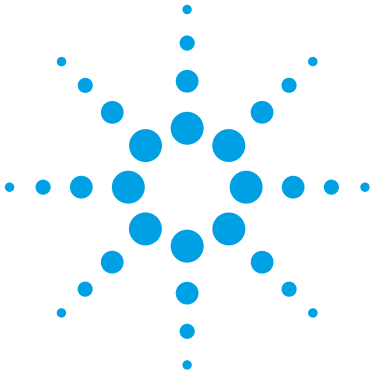
Items for which Agilent does not provide installation must be installed by the customer.

Other Documentation

Find additional information in:

- *Site Preparation Checklist* for your specific instrument
- Agilent 6000 Series LC/MS *Maintenance Guide*
- *System Installation Guide* for your specific instrument
- Agilent Infinity Series LC user guides
- MassHunter Workstation user guides and online Help
- Sensitivity specifications for your instrument. Go to:

  http://www.agilent.com/chem



2
Site Preparation

This chapter describes how to properly prepare your site for a new 6000 series LC/MS. Follow these instructions carefully. Delays due to improper site preparation can result in loss of instrument use during the warranty period.

Lab Space Requirements

Bench Requirement

The bench on which the 6000 series LC/MS will sit must meet these requirements:

- Large enough to fit the LC instrument, the LC/MS instrument, computer, and accessories.
- Enough space for ventilation and maintenance access. Sturdy enough to support the weight of the entire system.

Workbench setup considerations include:

- For the 6100 Series Single Quadrupole LC/MS, you can stack up to three LC modules on top of the LC/MS instrument. The three recommended modules are the binary pump, the degasser, and the solvent tray. Do not stack any liquid bottle on top of the LC/MS instrument as this configuration poses a safety hazard.
- For the 6200, 6400 and 6500 Series LC/MS instruments, you cannot stack the LC instrument on top of the LC/MS instrument. This configuration is unstable and dangerous.
- The foreline pump emits vibration. Do not plan to put the foreline pump on the bench if vibration-sensitive equipment is located on the bench.
- The supporting surface for the instrument must be kept relatively vibration-free. Agilent recommends the G3215A Mass Spec Bench.
- For 6538, 6540, 6545 or 6550, the distance between the table top and the ceiling must exceed 193 cm (6 feet 4 inches). The height of the bench in a lab with a 9-feet ceiling cannot exceed 81 cm (32 inches). The height of the bench in a lab with a ceiling 3-meter (10-feet) high or lower cannot exceed 1.0 meter (40 inches) due to fire codes.
- Removal of ceiling tiles compromises the fire rating of the plenum which violates fire safety codes. Agilent recommends the G3215A Mass Spec Bench.

- For the 6560 Ion Mobility Q-TOF, the bench or table where the instrument will be installed must be able to maintain a flat plane even when the load from the instrument is applied. The 6560 includes the G3215A Mass Spec Bench with IM-QTOF table extension. The table extension allows for precise leveling, even when the floor has small defects.
- Make sure the foreline pump can be located close to the LC/MS instrument to be connected by a 200-cm (79-inch) vacuum hose. For the 6100 Series LC/MS, approximately 30 cm (12 inches) of that hose will be inside the LC/MS instrument. The hose exits from the back of the LC/MS instrument. The hose is stiff and cannot be bent sharply.
- The drain bottle must be connected to the LC/MS instrument. The drain bottle must sit below the LC/MS instrument. A 180-cm (72-inch) PTFE hose is included with the LC/MS instrument. The G1946-67002 hose extension kit can add 120 cm (48 inches) to the length of the hose. *The total hose length must not exceed 300 cm (120 inches).*

Operating Environment

The 6000 series LC/MS is designed for use in environmental conditions for Class 1 Laboratory Equipment.

Refer to the *Site Preparation Checklist* for specific environment conditions.

If you suspect your site exceeds the airborne dust limit, contact Agilent to test for airborne particle density. Agilent can suggest steps to reduce airborne dust.

Exhaust Vents

The 6000 series LC/MS has two sources of exhaust, the foreline pump and the spray chamber.

Agilent will not install a 6000 series LC/MS unless an adequate exhaust system is present and functioning.

Exhaust vent considerations include:

- The maximum combined exhaust flow of gas and vapor is dependent on the model of LC/MS instrument. Refer to the *Site Preparation Checklist* for more details.

Table 1 Minimum 6100 Series LC/MS exhaust vent requirements

Output Source	Ventilation Draw Range	Minimum Flow	Maximum Flow
Rough Pump	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	1.0 liters/minute (2.1 ft3/hr)	≤ 3 liters/minute (6.4 ft^3/hr)
6100 Series LC/MS without Agilent Jet Stream	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	5 liters/minute (10.6 ft3/hr)	≤ 16 liters/minute (33.9 ft^3/hr)
6100 Series with Agilent Jet Stream	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	5 liters/minute (10.6 ft3/hr)	≤ 30 L/min (63.6 ft^3/hr)

Table 2 Minimum 6200 Series LC/MS exhaust vent requirements

Model	Ventilation Draw Range	Combined Exhaust Flow
All	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤20 L/min (≤1080 L/hour)

Table 3 Minimum 6400 Series LC/MS exhaust vent requirements

Model	Ventilation Draw Range	Combined Exhaust Flow
G6410A G6410B G6420A G6430A G6460A#100 G6460C#100	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤20 L/min (≤1080 L/hour)
6460A 6460C	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤30 L/min (≤1800 L/hour)
6490A 6495A	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤50 L/min (≤3000 L/hour)

Table 4 Minimum 6500 Series LC/MS exhaust vent requirements

Model	Ventilation Draw Range	Combined Exhaust Flow
6510 6520	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤20 L/min (≤1080 L/hour)
6530 6540 6545	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤30 L/min (≤1800 L/hour)
6550	0.025 to 0.25 mbar (0.01 to 0.1 inches of water)	≤50 L/min (≤3000 L/hour)

- Flow is continuous as long as the instrument is on.
- The spray chamber exhaust must not have positive pressure. Positive pressure in the spray chamber exhaust tubing and drain bottle can affect instrument performance and can contribute to excessive background contaminant levels.

- The spray chamber exhaust and foreline pump exhaust must be vented with separate lengths of exhaust hose. *Failure to vent the foreline pump and spray chamber separately will void the warranty for the 6000 series LC/MS.* These hoses can be connected into a common exhaust manifold. The separation of the exhaust minimizes the chances of foreline pump fluid vapor entering the spray chamber when drying gas is not flowing.
- The spray chamber exhaust and the foreline pump exhaust must be vented externally to the building and *not* recirculated by the environmental control system. Health hazards include chemical toxicity of solvents, samples, buffers, pump fluid vapor, and aerosolized biological samples.
- Exhaust gas venting must comply with all local environmental codes. Health hazards include chemical toxicity of solvents, samples, buffers, pump fluid vapor, and aerosolized biological samples.

Fume Hood

An auxiliary work space and fume hood are required for some maintenance procedures.

Telephone

A telephone with a long cord or a cordless phone to be used at the computer allows the operator to communicate with Agilent support personnel.

Site LAN Network

Network considerations include:

- If you intend to connect the 6000 series LC/MS system to your site LAN network, you must have an additional shielded twisted pair network cable.
- Internet access for the control PC is strongly recommended to allow remote control and diagnosis of the 6000 series LC/MS through remote access software. Some service contracts require Internet access.
- Agilent Technologies is not responsible for connection to or establishment of communication with your site LAN network. The service representative will test the ability of the LC/MS to communicate with the bundled system only.
- The IP address for the 6000 series LC/MS is fixed and cannot be changed. Agilent does not support the placement of the 1200 LC or the 6000 series LC/MS on a corporate LAN environment.

Electrical Requirements

The customer must provide appropriate electrical power and power outlets for all of the components in the 6000 series LC/MS system.

Power considerations include:

- voltage ranges of major components
- power configurations
- power requirements
- power plugs and cords

Voltage Range

The 6000 series LC/MS includes a wide-range power supply that can operate without reconfiguration on a wide range of single-phase alternating current (AC) electrical power.

Refer to the *Site Preparation Checklist* for details about voltage and power requirements.

Foreline pump specifications:

You must make a note in the purchase order when:

- The standard voltage at the installation site is different from the standard voltage from the country in which the order originates.
- The electrical power at the installation site is different from the standard electrical power in that country.

Power Requirements

Power requirements for the LC/MS instrument and related equipment are listed in the *Site Preparation Checklist* for your instrument series. Future additions can require extra power capacity.

Power considerations include:

- Each product listed requires a dedicated circuit. The LC/MS instrument, LC, and data system must each have a separate circuit breaker.
- Power must meet the stability specifications listed in the *Site Preparation Checklist*. Use a line monitor to check power stability. If your line power is unstable, install a line conditioner.
- Excessive fluctuations in the voltage of the power supply can create a shock hazard and can damage the instrument. This equipment must be installed in a Category II environment as defined in IEC 60664.
- All Agilent-supplied sources draw their power from the LC/MS instrument and do not require separate line voltage.

Power Configurations

Electrical power for the 6000 series LC/MS can be delivered in either single-phase or 208-Wye configuration. See the Power Configuration table in the *Site Preparation Checklist* for your instrument.

Correct grounding for the 208-Wye configuration must be verified by an electrician and line-to-ground must be balanced (that is, voltage must measure the same) for both power lines to the instrument. *The neutral wire cannot be used for safety grounding.*

The ground wire must carry zero current except for ground-fault current or static electric discharge. The entire system must share an isolated, noise-free electrical ground that is connected to the main earth ground for the facility.

Power configuration considerations include:

- The power source to which you connect the LC/MS instrument must be equipped with a protective earth contact (ground).
- Do not interrupt the protective earth contact inside or outside the LC/MS instrument or disconnect the protective earth terminal (ground).

Power plugs and cords

The 6000 series LC/MS is supplied with a power cord set appropriate for the country from which the order originates.

Power plug considerations:

- The length of all 6000 series LC/MS power cords is approximately 2.5 m (8 ft). See "Power Cords" on page 39 illustrations of the power cords available.
- Data system components also include power cords set appropriate for the country where the order was placed. Power cord lengths for the data system components and accessories are approximately 2.3 m (7.5 ft).
- Make sure that the power cords that you receive with the 6000 series LC/MS are appropriate for your country and site before they are used.
- Do not use extension cords with the LC/MS instrument. Extension cords cannot provide enough power and can be a safety hazard.
- Power cords must be easily disconnected for maintenance of the 6000 series LC/MS system.

Other electrical considerations

Additional electrical considerations include:

- Electromagnetic interference (EMI), such as is generated by NMRs, radio transmitters, and microwave links, can interfere with system performance.
- Protect the system from static electricity by observing humidity and temperature requirements. Minimize the presence of non-conductive products such as carpets and vinyl floor tiles.
- Install emergency-off push buttons that can disconnect power to the ventilation system and all electric equipment in the room except overhead lighting.
- Provide separate convenience outlets for building maintenance and other appliances. Convenience outlets must be on the main circuits separate from the 6000 series LC/MS system. Convenience outlets must share the normal building distribution ground, not the 6000 series LC/MS system ground.
- In some geographical areas, installation of lightning protection for personnel and equipment is recommended.

Gas Requirements

Nitrogen Gas

The 6000 series LC/MS systems requires a very large quantity of high-purity nitrogen for drying gas, nebulizing gas, and Agilent Jet Stream source sheath gas (if applicable), and to pressurize the calibrant delivery system.

Nitrogen gas considerations include:

- Nitrogen is the only acceptable drying gas and nebulizing gas. Use of air, oxygen, or other gases, when combined with volatile solvents and high voltages in the spray chamber, can result in an explosion. Use of air, oxygen, or other gases also causes deterioration of parts in the 6000 series LC/MS and negatively impacts instrument operation and sensitivity.
- Liquid chromatographs other than the Agilent 1100/1200 Series LC can require compressed gases for the LC autosampler and for sparging the LC solvents. If you are installing a liquid chromatograph from a vendor other than Agilent, see the site preparation and installation material supplied with that LC.
- *Compressed or liquefied gases can be dangerous. Please contact your gas supplier for handling and safety information for the gases you use.*

Drying Gas Requirements

The nitrogen gas used for drying must be free of contaminants. The recommended nitrogen sources for drying are:

- nitrogen generator
- liquid nitrogen Dewar
- bulk cryogenic nitrogen system

The requirements for these nitrogen sources are:

- 95% purity or better, with oxygen and trace argon as remaining gas
- hydrocarbon-free (<0.1 ppm)
- gas pressure of 5.5 to 6.8 bar (80 to 100 psi)

High-pressure bottled nitrogen is not supported due to the high usage of nitrogen.

Refer to the *Site Preparation Checklist* for details on required flow rate for each model.

One or more high-capacity gas conditioner is supplied with the 6000 series LC/MS. Its primary function is to remove hydrocarbon contamination from the nitrogen before it reaches the LC/MS system. This conditioner has 1/4-inch Swagelok fittings.

Nitrogen Gas Generator Requirements

If you choose to use a nitrogen gas generator, make sure that the nitrogen gas generator meets the specifications listed in "Drying Gas Requirements" on page 22.

Agilent offers several models of nitrogen gas generator, with or without an internal air compressor. See "Nitrogen Gas Generator Specifications" on page 41 for more details.

NOTE If you purchase a nitrogen gas generator, make sure you complete and return the warranty form as directed by the supplier, or the warranty can be voided by the supplier.

Nitrogen gas generators that require a source of compressed air

These products do not include an air compressor:

- Nitrogen Gas Generator (Agilent p/n 5183-2003)
- LC/MS Nitrogen Generator with O_2 Analyzer (Agilent p/n 5183-2004)

  The oxygen analyzer is especially helpful in negative ion APCI operation where small concentrations of oxygen can improve performance for some analyses.

They can supply enough nitrogen gas for a single *without* an Agilent Jet Stream source.

Installation is not included with the purchase of these generators. Detailed installation, operation, and maintenance instructions are included with each generator. If you do not want to install the nitrogen gas generator, you can purchase additional Agilent Customer Engineer time. If the nitrogen generator is purchased after the 6000 series LC/MS is installed, additional travel charge is required.

To use these nitrogen gas generators, you must supply a source of clean, dry, hydrocarbon-free air. You must have or install a house compressed air system or an oil-free air compressor.

Make sure that the air source meets these specifications:

- flow rate of up to 60 liters/minute
- pressure of at least 760 kPa (110 psi)

Nitrogen gas generators with an internal air compressor

These products include an air compressor:

- PEAK Nitrogen Generator System (Agilent p/n G1953A)
- Parker Nitrogen Generator (Agilent p/n G1954A)

They can supply enough nitrogen gas for:

- one or two LC/MS instrument *without* an Agilent Jet Stream source
- one LC/MS instrument *with* an Agilent Jet Stream source

Installation is included with these nitrogen gas generator systems.

Nitrogen regulators, tubing, and fittings

You must supply appropriate regulators for your sources of nitrogen gas. The regulators must be able to supply gas in the specified pressure ranges. The regulator for the drying gas must have one outlet with 1/4-inch Swagelok fittings.

Gas generators have built-in regulators so they do not require an external regulator. A Dewar of liquid nitrogen typically requires a single-stage regulator (see the Dewar manufacturer's literature for specifics).

Nitrogen from a house supply requires a single-stage regulator if the supply is at a pressure higher than the specified range. Bottled, compressed nitrogen typically requires a dual-stage regulator. See the Agilent Chemical Analysis Columns and Supplies Catalog (5988-4970EN) for dual-stage regulators available from Agilent Technologies.

For the 6400 and 6500 Series LC/MS instruments, the regulator for the collision cell gas must have one outlet with 1/8-inch Swagelok fittings.

The 6000 series LC/MS is supplied with 300 cm of heavy-wall 1/4-inch PTFE tubing to connect the nitrogen supply to the LC/MS instrument. If the nitrogen supply is located farther from the LC/MS system, you need to supply additional heavy-wall 1/4-inch PTFE tubing. You can substitute 1/4-inch medical-grade polypropylene tubing for the PTFE tubing.

You must supply fittings, ferrules, and connectors of a Swagelok design for the 1/4-inch tubing to connect to the regulator or nitrogen supply fitting.

Collision Cell Reagent Gas (6400 and 6500 Series LC/MS only)

The collision cell gas must be a higher purity than the gas used as drying gas. You can use high-pressure bottled nitrogen as the collision cell reagent gas. The minimum requirements are:

- 99.999% purity or better
- hydrocarbon-free (<0.1 ppm)
- gas pressure of 1 to 2 bar (15 to 30 psi)

The typical flow is up to 0.001 liters/minute (0.06 liter/hour).

A high-capacity gas conditioner for collision cell reagent gas is supplied with the 6000 series LC/MS. Its primary function is to remove hydrocarbon contamination from the nitrogen before it reaches the LC/MS system. This conditioner has 1/8-inch Swagelok fittings.

The supplied conditioner is to be used with nitrogen only.

For 6500 Series LC/MS, you can use argon gas instead of nitrogen, but nitrogen is required for installation performance verification. If you use argon, make sure you purchase an appropriate gas conditioner for argon.

Agilent does not support the use of a separate regulator to split the drying gas flow, due to the uncertainty in the purity of the drying gas source.

HPLC-Chip Cube Gas (6200, 6400, and 6500 Series LC/MS only)

The HPLC-Chip Cube gas must be a higher purity than the gas used as drying gas. You can use high-pressure bottled air or an air compressor. The air source must be able to deliver air at a constant pressure. The minimum requirements are:

- 99.99% purity or better
- hydrocarbon-free (<0.1 ppm)
- gas pressure of 5.5 to 6.8 bar (80 to 100 psi). The inlet gas pressure for air must equal the pressure used for the nitrogen gas supply pressure.

Refer to the *Site Preparation Checklist* for typical flow rates for your instrument.

The use of air compressors for air generation and nitrogen generation is not supported.

Do not use an air compressor to generate nitrogen and air for the Background Reduction Kit. Doing so results in unstable spray conditions and loss of signal.

Drift Tube Gas Requirements (Ion Mobility Q-TOF only)

The drift tube gas must be of a higher purity than the gas used as drying gas. You can use high-pressure bottled nitrogen as the drift tube gas. The minimum requirements are:

- 99.999% purity or better
- hydrocarbon-free (<0.1 ppm)
- gas pressure of 5.5 to 6.8 bar (80 to 100 psi)

The typical flow is up to 1.0 liters/minute (60 liters/hour).

A high-capacity gas conditioner for drift tube gas is supplied with the 6000 series LC/MS. Its primary function is to remove hydrocarbon contamination from the nitrogen before it reaches the LC/MS system. This conditioner has 1/8-inch Swagelok fittings.

Agilent does not support the use of a separate regulator to split the drying gas flow, due to the uncertainty in the purity of the drying gas source.

Do not use a nitrogen gas generator to supply drift tube gas.

Laboratory Supply Requirements

Operating supplies

Refer to the Site Preparation Checklist for a list of supplies required for the routine operation of the 6000 series LC/MS.

Agilent recommends the use of the highest grade solvents and chemicals with the 6000 series LC/MS. Lower purity grades will result in higher background levels.

Cleaning Solvents

Cleaning tasks for the 6000 series LC/MS require the following HPLC-grade or better solvents:

- isopropyl alcohol
- methanol
- water

Proper storage, handling, and disposal of these chemicals is required for personal and environmental safety.

Contact your chemical supplier for solvent handling and safety information. Chemical solvents are to be considered hazardous and must be handled with care.

Tools

Make sure to have these commonly used tools available for maintenance of the 6000 series LC/MS system.

Table 5 Screwdrivers

Description	Part Number
large flat-blade screwdriver	8730-0002
pocket flat-blade screwdriver	8730-0008[1]
0.89-mm hex key	8710-1225[1]
6-mm T-handle hex key	8710-2549[1]
120° 6-mm hex key (for 6200, 6400, and 6500 Series LC/MS)	G2571-20121
10-mm hex key (for MS40+ oil plug access)	8710-2612[1]
90° 6-mm hex key (for 6200, 6400, and 6500 Series LC/MS)	8710-1839[1]
T6 Torx screwdriver	8710-2548[1]
T10 Torx screwdriver	8710-1623[1]
T20 Torx screwdriver	8710-1615[1]
T25 Torx screwdriver	8710-1817[1]

1 Included with the 6000 series LC/MS

Table 6 Wrenches

Description	Part Number
3-mm open-end wrench	8710-2699
1/4-inch × 5/16-inch open-end wrench	8710-0510[1]
1/2-inch × 7/16-inch open-end wrench	8710-0806[1]
1/2-inch × 9/16-inch open-end wrench	8710-0877[1]

1 Included with the 6000 series LC/MS

Table 7 Other common tools

Description	Part Number
Nebulizer Adjustment Kit	G1960-67470[1]
plastic-tubing cutter	8710-1930[1]
needle-nose pliers	8710-0004
safety glasses	9300-1159[1]

1 Included with the 6000 series LC/MS

Data System Supplies

Make sure you have:

- paper to print the results of the testing done during installation and later to reports of your analyses
- appropriate media such as floppy disks, tape cartridges, USB flash drive, or writable CD-ROM/DVD-ROM to make backup copies of your data files

3
Delivery and Installation

This chapter describes what the customer is expected to do at the time of delivery and installation.

Delivery

When the 6000 series LC/MS system is delivered, the customer is expected to:

- remove the shipping containers from the truck
- store the containers until installation
- contact the Agilent service representative to arrange an installation date

The shipping containers are large and heavy. The dimensions for the largest containers are listed in the *Site Preparation Checklist*.

Delivery considerations:

- The shipping containers require a loading dock and a fork lift or similar lifting device. *If no loading dock and/or suitable lifting device is available, the containers cannot be removed from the delivery truck.*
- If you make prior arrangements with Agilent, the system can be delivered in a lift-gate truck. This removes the need for a loading dock, but a lifting device is still required to move the containers.
- The shipping containers must be kept upright at all times to prevent damage to the instrument.
- All doorways, hallways, floors, and elevators must be able to accommodate the largest, heaviest container. For container dimensions, refer to the *Site Preparation Checklist* for your instrument.

Inspection

Do not open any of the shipping containers unless an Agilent representative is present. Doing so voids the receiving warranty on the instrument.

Inspection process:

- When the shipping containers are unloaded, inspect the containers for any obvious *external* damage.
- If any of the containers appear damaged, note on the carrier's bill of lading the presence of "`Apparent damage - subject to inspection and test`". Arrange for both the carrier's claims representative and your Agilent service representative to be present when the containers are unpacked.

Storage

You are expected to store the containers until installation.

Refer to the *Site Preparation Checklist* for shipping container sizes and storage conditions.

Other storage consideration:

- If your site does not have adequate storage space, the containers can be stored at your expense in a bonded warehouse.
- Allow space for data system and accessory containers.
- Be prepared to store the shipping containers for reuse in case the system needs to be shipped from one location to another.

Unpacking

Do not open any shipping containers until an Agilent representative is present. Warranty claims for missing items will not be honored unless an Agilent representative is present to verify the contents of each container as it is unpacked.

If the shipping containers come from cold storage, to prevent exposure of the instrument to condensing humidity, bring the containers to room temperature before they are opened.

All shipping containers become your property and are not to be returned to Agilent.

Installation

The installation site must be completely prepared as described in this guide, or installation can be delayed. Such delays can cause loss of instrument use during the warranty period. Agilent reserves the right charge for additional time required to complete the installation.

Other installation considerations:

- The base unit of the 6000 series LC/MS is too heavy for one person to lift. Make sure that at least two people (for 6100 Series LC/MS) or four people (for 6200, 6400 and 6500 Series LC/MS) are available to lift the LC/MS instrument onto the laboratory bench.
- Make sure that the primary user of the 6000 series LC/MS is present during installation to receive familiarization instruction from the Agilent service representative.
- If you purchased a nitrogen gas generator that does not include an air compressor, make sure that you have a source of hydrocarbon-free air before you install the nitrogen gas generator.

Verification

Verification considerations:

- Agilent will test the 6000 series LC/MS system against standards as documented for the system that you purchased.
- *Agilent will not test your system against your standards or samples.*
- Agilent will not set up your laboratory procedures as part of installation. To get assistance with laboratory procedures, contact Agilent to purchase consulting time by an Application Engineer.
- To see the sensitivity specifications for your 6000 series LC/MS, go to http://www.chem.agilent.com.
- For 6400 Series LC/MS systems, if testing to the Marketing Bid Specification is required, you must separately purchase the G6061A, G6062A, or G6063A Performance Specification Service prior to installation. Contact Agilent to determine the correct Performance Specification Service for your system.

Recycling

To recycle the 6000 series LC/MS, contact Agilent.

4 Reference

This chapter contains reference information for your 6000 series LC/MS system.

Spare parts and consumables

Keep these spare parts and consumables on hand to minimize system downtime.

For a list of commonly-used tools for maintenance of the 6000 series LC/MS, see "Tools" on page 28.

Consumables

Table 8 Calibrant Solutions

Description	Part Number
ESI Calibrant Solution	G2421A
ESI-L Calibrant Solution	G1969-85000
MMI-L Calibrant Solution	G1969-85020
APCI-L Calibrant Solution	G1969-85010
APCI/APPI Calibrant Solution	G2432A

Table 9 Performance standards

Description	Part Number
ES/APCI positive ion performance standard (Reserpine)	G2423A
ES/APCI negative ion performance standard (Acid Red 4)	G2424A
ES negative ion performance standard (Chloramphenicol)	5190-0591

Table 10 Gas filters

Description	Part Number
Nitrogen drying gas conditioner (universal trap purifier)	RMSN-4
Nitrogen gas conditioner for Collision Cell Gas	RMSN-2
Maintenance kit for pre-filter cartridges for 5183-2003 or 5183-2004 nitrogen gas generators	5183-2014

Table 11 General Supplies

Description	Part Number
abrasive mesh (micro-grit paper)	8660-0827
clean, lint-free cloths	05980-60051
cotton swabs	5080-5400

Spare parts

Table 12 6000 series LC/MS Spare Parts

Description	Part Number	Used for...
0.6-mm ID glass dielectric capillary	59987-20040	
0.5-mm dielectric capillary	G1946-80009	
0.6-mm fast polarity switching capillary	G1960-80060	
hexabore resistive capillary	G1964-80659	6490, 6495
hexabore resistive capillary	G1964-80661	6550
canted coil spring	1460-2571	
high-throughput capillary cap	G1946-20301	59987-20040 capillary
narrow-bore capillary cap	G1960-20310	G1960-80060 capillary
hexabore capillary cap	G1964-20310	hexabore resistive capillary
1/4-inch ID front capillary seal	0905-1475	
Agilent Jet Stream heater replacement kit	G1958-68000	
corona needle	G1947-20029	
corona needle (package of 3)	G2429A	
corona needle holder	G1947-60103	
low gain CEM replacement horn	G1960-80103	6100 Series LC/MS
high gain electron multiplier	G2571-80103	6400 Series LC/MS
Inland 45 foreline pump oil, (1 liter)	6040-0834	E1M8, E2M28

Table 12 6000 series LC/MS Spare Parts (continued)

Description	Part Number	Used for...
Inland 45 foreline pump oil (1 gallon)	6040-0798	E1M8, E2M28
SW60 foreline pump oil (1 liter)	6040-1361	MS40+
8 Amp fuse	2110-0969	
12.5 Amp fuse	2110-1398	

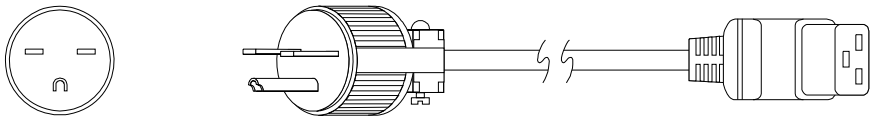
Table 13 Nebulizer Spare Parts

Description	Part Number
APCI Nebulizer Needle Kit G2428A	G2428A
API-ES Nebulizer Needle Kit (for ESI and Multimode)	G2427A
Nebulizer (needle SS316 replacement) kit (for Agilent Jet Stream)	G1958-60137

Power Cords

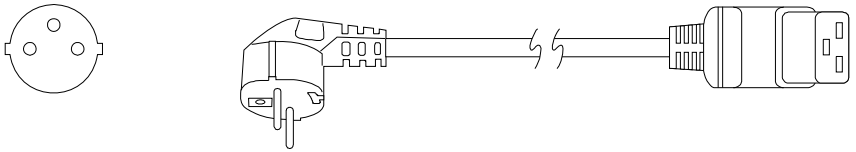
The power cords (IEC C19) available for the 6000 series LC/MS are shown here. See "Electrical Requirements" on page 18 for information.

US and Canada (p/n 8120-8623)

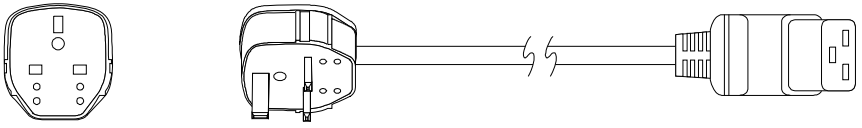


An alternative power cord (G1946-60066) with a NEMA L6-30P connector is available at extra cost. This alternative is useful if a twist-lock plug is preferred.

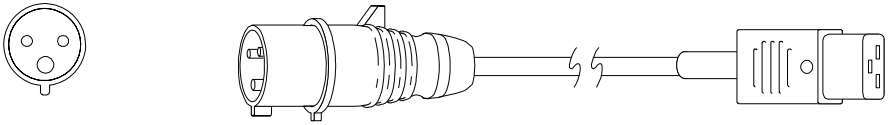
Europe, CEE 7/7 (p/n 8120-8621)



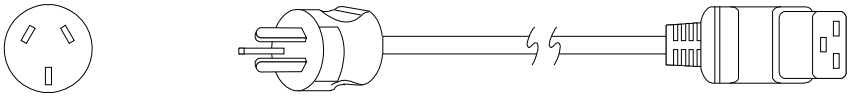
UK/Hong Kong/ Malaysia/Singapore, BS 1363 (p/n 8120-8620)



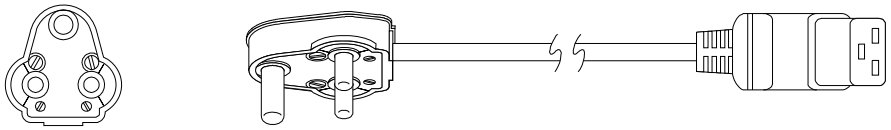
Switzerland/Denmark, IEC 309 (p/n 8120-8622)



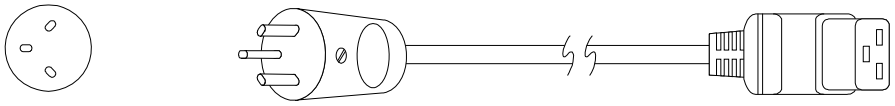
Australia (p/n 8120-8619) China (p/n 8121-0070)



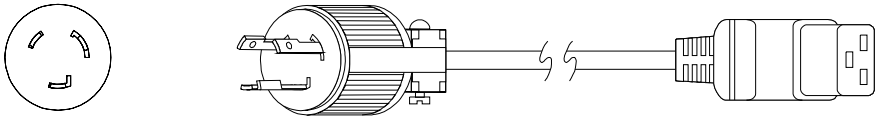
India/South Africa, BS 546 (p/n 8121-0710)



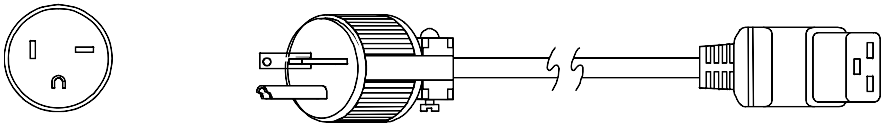
Israel, SI 32 (p/n 8121-0161)



Japan, NEMA L6-20P (p/n 8120-6903)



Taiwan/South America, NEMA 6-20P (p/n 8120-6360)



Korea (p/n 8121-1222) Figure not available.

Thailand, (p/n 8121-1301) Figure not available.

Nitrogen Gas Generator Specifications

See "Nitrogen Gas Generator Requirements" on page 22 for more information about the gas generator that the purchased 6000 series LC/MS requires.

Agilent offers several nitrogen gas generators that are well suited for use with the 6000 series LC/MS. In these generators, clean, compressed air is passed through hollow-fiber membranes that separates the air into a concentrated nitrogen output stream and an oxygen-enriched permeate stream. The nitrogen is supplied to LC/MS instrument while the oxygen is vented from the generator.

Some generators require a source of clean, dry air. Others include their own internal air compressor.

Do not use the nitrogen gas generator with the collision cell gas supply. If a nitrogen gas generator is being used for drying gas supply, use a separate high purity line for collision cell gas.

Nitrogen gas generators without air compressor

These nitrogen gas generator require a source of clean, dry air:

- Nitrogen Gas Generator (Agilent p/n 5183-2003)
- LC/MS Nitrogen Generator with O_2 Analyzer (Agilent p/n 5183-2004)

Refer to Table 14 to order these nitrogen gas generators.

Table 14 Nitrogen gas generator ordering information

Single-instrument generators	Part Number
Nitrogen Gas Generator *or*	5183-2003
LC/MS Nitrogen Generator with O_2 Analyzer	5183-2004
fitting set for single-instrument generator installation:	
1/4-inch male NPT to 1/4-inch Swagelok, brass (2/package)	5180-4145
maintenance pre-filter cartridge kit	5183-2014

Each generator requires up to 60 liters/minute of clean, oil-free air at a pressure of at least 760 kPa (110 psi). These generators includes two pre-filters for removing particulates and excess water vapor from the air.

Table 15 Specifications for single-instrument nitrogen gas generators

Specification	Value
Nitrogen purity	95.0% - 98%*
Minimum/maximum air input pressure	415/1000 kPa (60/145 psi)
Max air consumption	60 l/min at 760 kPa (110 psi)
Dimensions (height × width × depth)	127 cm × 40 cm × 40 cm (50 in × 16 in × 16 in)
Shipping weight	34 kg (75 lbs)
Electrical power (5183-2003)	none
Electrical power (5183-2004)	100-120 or 220-240 Vac, 50/60 Hz

* Varies with the input pressure and output flow required. Purity of 97% can be achieved at the maximum nitrogen output required for 6410 Triple Quad LC/MS operation.

Nitrogen gas generators with internal air compressors

These Agilent products include a built-in air compressor:

- PEAK Nitrogen Generator System (Agilent p/n G1953A)
- Parker Nitrogen Generator (Agilent p/n G1954A)

These model selectively remove oxygen, moisture and other gases to leave clean, dry, phthalate-free Nitrogen. Internal air compressors make these unit independent from in- house air supplies, and fitted casters allow the user to easily position the units in the lab.

These gas generators can supply sufficient nitrogen for a single or dual 6410, 6420, 6430, or a single 6460 or 6490 Triple Quad LC/MS, depending on the option selected.

Installation is included with the purchase of the G1953A or G1954A generators.

Table 16 Single-instrument gas generator with air compressor

	G1954A option 001 (Peak Scientific NM32LA)	G1953A option 002 (Peak Scientific Genius 3010)
Nitrogen purity	>95.0%	>95.0%
Maximum flow	32 l/min (1.13 cfm)	64 L/min (2.26 cfm)
Maximum pressure	6.90 bar (100 psi)	6.90 bar (100 psi)
Dimensions (height × width × depth)	60 cm × 75 cm × 71.2 cm (23.6 in × 29.5 in × 28 in)	130.3 cm × 60 cm × 85 cm (51.29 in × 23.6 in × 33.5 in)
Weight	95 kg (209 lbs)	189 kg (417 lbs)
Shipping weight	150 kg (330 lbs)	265.5 kg (585 lbs)
Noise Level	54 db(A)	54 db(A)
Electrical power	220-240 Vac*, 50/60 Hz	220-240 Vac*, 50/60 Hz

* 230 VAC ±10% is recommended. Manufacturer will provide boost transformer (p/n 0950-5405) for locations below this threshold. Performance is not affected at lower voltages.

Table 17 Dual-instrument gas generator with air compressor

	G1953A option 003 (Peak Scientific Genius 3020)	G1954A (Parker NitroFlow Lab)
Number of nitrogen outlets	2	
Nitrogen purity	>95.0%	> 95.0%
Maximum flow	32 L/min (1.13 cfm)	32 L/min (1.13 cfm)
Maximum pressure	6.90 bar (100 psi)	8 bar (116 psi)
Dimensions (height × width × depth)	130.3 cm × 60 cm × 85 cm (51.29 in × 23.6 in × 33.5 in)	70 cm × 90 cm × 31 cm (27.6 in × 35.4 in × 12.2 in)
Weight	189 kg (417 lb)	92.5 kg (204 lbs)
Shipping weight	265.5 kg (585 lb)	
Noise Level	54 db(A)	< 58 dB(A)
Electrical power	220-240 Vac*, 50/60 Hz	120VAC/60Hz (20 A), 230VAC/50Hz†

* 230 VAC ±10% is recommended. Manufacturer will provide boost transformer (p/n 0950-5405) for locations below this threshold. Performance is not affected at lower voltages.

† Main supply voltage fluctuations not to exceed ±10% of nominal voltage.

After installation of this nitrogen gas generator with internal compressor, the Manufacturer must be contacted directly for support and service within the 1-year bundled service and warranty period.

Contact Agilent for the most up to date availability on nitrogen gas generators.

www.agilent.com

In This Book

The guide is a supplement to the Site Preparation Checklist for your specific instrument.

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