Agilent Technologies

Agilent 6400 Series Triple Quad LC/MS
Site Preparation Checklist

Thank you for purchasing an Agilent system. To get you started and to assure a successful and timely installation of your Agilent software, please refer to this specification or set of requirements.

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, consumables, space and utility requirements for your equipment at your site.

Make sure you also read the 6000 Series LC/MS Site Preparation Guide (p/n G1960-90069) for additional details.

For additional information, please visit our web site at www.agilent.com.

This document can be used for these products:
- G6420A QQQ LC/MS System
- K6420A QQQ LC/MS System
- G6430A QQQ LC/MS System
- K6430A QQQ LC/MS System
- G6460A QQQ LC/MS System
- G6460A QQQ LC/MS System
- G6460C QQQ LC/MS System Option 100
- K6460C QQQ LC/MS System
- G6460C QQQ LC/MS System Option 100
- K6460C QQQ LC/MS System Option 100
- G6490A QQQ LC/MS System
- K6490A QQQ LC/MS System
- G6495A QQQ LC/MS System

Customer Responsibilities

Make sure your site meets the following prior specifications before the installation date. For details, see specific sections within this checklist and also the *Site Preparation Guide*.

- ❑ The necessary laboratory or bench space is available
- ❑ The environmental conditions for the lab as well as laboratory gases and plumbing
- ❑ The power requirements related to the product (e.g., number & location of electrical outlets)
- ❑ The required operating supplies necessary for the product and installation
- ❑ Please consult Other Requirements section below for other product-specific information.
- ❑ For more details, please consult the product-specific Site Preparation Manual (G2581-90020).

If Agilent is delivering installation and familiarization services, users of the instrument must 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 as a **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.

Dimensions and Weight

Special Notes:

1 At least 30 cm (1 ft) to the left (inlet end) and right of the instrument must be added to these dimensions to provide adequate instrument access and ventilation.

2 The supporting surface must be relatively vibration free and capable of supporting the combined weight of the Triple Quad system

3 Size and weight of the LC system depends on the number and type of modules included. Most Agilent 1100/1200 Series LC modules are approximately 35 cm (14 in) wide and 45 cm (18 in) deep. Do not stack the LC modules on top of the LC/MS instrument.

4 Size and weight of the data system depends on the components included. Reserve at least 100 cm (39 in) of bench space for the data system. A typical data system weight is 23 kg (50 lb).

5 The LC/MS instrument requires a source of nitrogen gas. Typically, this is either a 160-liter Dewar flask of liquid nitrogen or a nitrogen generator. Be sure to plan for the space that your nitrogen source requires.

All dimensions are approximate.

Description	Height		Width		Depth		Weight	
	cm	inches	cm	inches	cm	inches	kg	lb
6410/6420[1]	47	18.5	111	43.5	66	26	107.5	236.5
6430[1]	47	18.5	111	43.5	66	26	115	255
6460A[2]	48	18.8	111	43.5	66	26	115	255
6460C[2]	48	18.8	111	42.5	72.4	28.5	115	255
6490/6495[2]	47	18.5	84	33	76	30	115	255
MS40+ Foreline pump	22.8	9.0	29.7	11.7	41.8	16.5	33.0	72.7
E2M28 Foreline pump	28	11	18	7.1	58.3	23.0	40.0	88.2
XDS35i Scroll pump	39	15.3	29	11.4	47.6	18.7	48.0	106
G1948B ESI source[3]	17	6.8	18	7.1	9.5	3.7	1.7	3.8
G1947B APCI source[3]	23	9.2	18	7.1	13.0	5.1	1.7	3.8
G1971B APPI source	23	9.2	18	7.1	13.0	5.1	1.7	3.8
G1978B multimode source[3]	17	6.8	18	7.1	13.0	5.1	2.29	5.05
Agilent Jet Stream source[3]	23	9.2	18	7.1	11.5	4.5	1.7	3.75
G4240A HPLC-Chip Cube	36	14.1	35	13.7	30	11.7	14	31

1 The dimensions for this model represent the maximum cabinet dimensions with a G1948B ESI source installed. Add a minimum of 30 cm (1 ft.) to the left (source end) and right of the instrument to provide adequate instrument access and ventilation. The cover (included in the weight above) weighs 12 kg (26.5 lbs.).

2 The dimensions for this model represent the maximum cabinet dimensions with an Agilent Jet Stream source installed. Add at least 30 cm (1 ft.) to the left (inlet end) and right of the instrument to provide adequate instrument access and ventilation. The covers (included in the weight above) weigh 12 kg (26.5 lbs.).

3 This source attaches to the left side of the LC/MS instrument. Add this depth to the width of the LC/MS instrument and subtract the depth of the source that is replaced. The height dimension for this source includes the height of the nebulizer.

6410

6420, 6430, and 6460

6490 and 6495

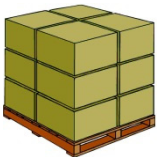
Recommended Configurations

Agilent recommends 2 standard stacking configurations for your new system. Please use these notes and the following images as examples for the LC stack and LC/MS instrument bench configurations.

1. Do not stack the entire LC stack or CTC Autosampler on top of the LC/MS instrument. This configuration is not supported. Vibrations from these modules can cause a loss of resolution in the LC/MS instrument.
2. A single-stack LC configuration is permissible if:
   - the height of the stack does not result in a safety problem
   - the LC system does not include a G1330B thermostat module
3. A multiple stack LC configuration must be used if:
   - the stack of LC modules is too high, resulting in a safety problem
   - the system includes a thermostatted sampler
4. The thermostatted version of all samplers includes the G1330B thermostat module. The thermostat module must be placed directly under the sampler to be thermostatted. Position the thermostat module at the bottom of the stack, directly on the laboratory bench. Any stack that contains a G1330B thermostat module needs at least 25 cm (10 inches) of space on either side to guarantee proper ventilation.

Single stack 1200 Series Infinity LC system

Double-stack 1200 Series Infinity LC system



Storage

Special Notes:

1 Refer to the *Site Preparation Guide* for information on proper storage. Shipping containers are large and heavy. This table lists the approximate size and weight of the largest **shipping container** of your LC/MS system.

Shipping Container	Height		Width		Depth		Weight	
	cm	in	cm	in	cm	in	kg	lb
6410, 6420, 6430, and 6460 base unit	122	48	81	32	78	31	45	100
6490 and 6495 base unit	157	62	102	40	86	34	41	90

2 Make sure that the storage area meets these environmental specifications:

- temperature between -20°C and 50°C (-4°F and 122°F)
- relative humidity between 20% to 80%
- non-condensing and non-corrosive environment

Power Consumption

Special Notes:

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

2 Depending on the instrument type, one or two dedicated AC power outlet is required for all 6400 Series LC/MS systems. The 6400 Series LC/MS system should be located with 2.5 meters (8 feet) of this outlet. In addition, the computer system and printer require additional outlets. Please refer to the *Site Preparation Guide* for additional details.

3 Additional outlets are required for all Agilent 1260/1290 HPLC modules. Please refer to the Site Preparation Checklist and Manuals for the 1260/1290 HPLC modules for more detailed information.

4 The 6460C, 6490 and 6495 require two outlets.

5 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.

6 The foreline pump is supplied for the standard voltage in the country where the order originates. The Agilent G1978B Multimode source and the Agilent G1948B APCI source draw their power from the Triple Quad instrument and do not require separate line voltage.

7 The high sensitivity 6460 LC/MS requires tighter tolerances that should be within +10% and -5% nominal line voltage.

Product	Line Voltage & Frequency	Maximum Power Consumption	Supply Circuit Rating	No. of Outlets
6410A LC/MS	AC 200-240V 50/60 Hz	2500 VA	15 A	1
6410A LC/MS 6420A LC/MS 6430A LC/MS 6460A LC/MS	AC 200-240V 50/60 Hz	2700 VA	15 A	1
6460C LC/MS 6490A LC/MS 6495A LC/MS	AC 200-240V 50/60 Hz	2850 VA	15 A	2
1200 Series LC	AC 100-120V or 220-240V 50/60 Hz	800-1200 VA	15 A	4 to 6
6400 Series Triple Quad LC/MS Data System	AC 100-120V or 220-240V, 50/60 Hz	1000 VA	15 A	4 to 6

Power Configuration

Electrical power for the LC/MS instrument can be delivered in either single-phase or 208-Wye configuration. Correct grounding for the 208-Wye configuration must be verified by an electrician. The line-to-ground for each phase must be balanced. The neutral wire cannot be used for safety grounding.

Configuration	Measurement	Nominal Voltage
Single phase	Line to neutral	AC 200V, 220V, 230V, or 240V[1]
	Line to ground	AC 200V, 220V, 230V, or 240V
	Ground to neutral	< 0.5 V rms
208-Wye	Line to Line (phase A to phase B)	AC 208V, 220V
	Line to ground (phase A to ground)	AC 120V, 127V ±5%
	Line to ground (phase B to ground)	AC 120V, 127V ±5%

1 Varies with country. Single phase, 60 Hz operation is not supported for nominal voltage above 220 VAC.

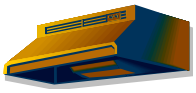
Environmental Conditions

Special Notes:

1 Environmental control systems must maintain these temperatures < +/-3°C from calibration temperature) and humidity ranges.

2 The 6410, 6420, 6430, and 6460 Triple Quad LC/MS dissipates up to 1,100 Watts 3,700 BTU/hr). Approximately 600 Watts 2,047 BTU/hr) are removed with the source exhaust. The LC and data system also contribute significantly to the cooling load. The exact amounts will depend on their configurations. In comparison, the 6490 and 6495 Triple Quad LC/MS dissipates up to 1318 Watts 4,500 BTU/hr). Approximately 600 Watts 2,047 BTU/hr) are removed with the source exhaust

Environmental Conditions
Equipment class: Class 1 Laboratory Equipment
Pollution: Degree 2
Installation: Category II
Environment: Indoor Use
Altitude: Not to exceed 3,300 m up to 35°C, not to exceed 3,700 m up to 30°C
Electrical Supply: • 200 to 210 Vac, 50/60 Hz configuration for U.S. & Japan) • 220 to 240 Vac, 50/60 Hz configuration for Europe)
Mains supply voltage: Fluctuations not to exceed 10% of nominal supply voltage
Operating Temperature: 15 to 35°C 59 to 95°F)
Humidity: < 85% RH at 35°C



Exhaust Venting Requirements

Agilent will not install a 6400 Series LC/MS unless an adequate exhaust system is present and functioning.

Special Notes:

The 6400 Series Triple Quadrupole LC/MS System foreline pump exhaust and spray chamber exhaust must be vented outside of the laboratory environment. Exhaust vent system should not be part of an environmental control system that recirculates air inside of a building.

1. Exhaust must be vented according to local Environmental Health and Safety regulations.
2. Exhaust gases contain traces of solvent, sample and hydrocarbon pump fluid.
3. Venting Rate is commensurate with Nitrogen comsumption rate.
4. Two independent, negative pressure vents must be available with one for each of the exhaust sources: foreline pump(s) and i. If only 1 vent is available, the exhaust line(s) from the foreline pump(s) must extend beyond the exhaust line from the spray chamber.
5. If a negative pressure vent is not available, the length of the tubing from the foreline pump(s) and the drain bottle to the vent should each not exceed 460 cm (15 ft).
6. Exhaust tubing is 1/2" interior diameter (I.D.). A 6-meter (20-foot) length is included for venting the foreline pump exhaust and spray chamber exhaust. This length is sufficient for two 3-meter (10-foot) lengths

Model	Combined Exhaust Flow
G6410A G6410B G6420A G6430A G6460A#100 G6460C#100	≤20 liters/minute (≤1080 liters/hour)
6460A 6460C	≤30 liters/minute (≤1800 liters/hour)
6490A 6495A	≤50 liters/minute (≤3000 liters/hour)

Refer to the *Site Preparation Guide* for additional exhaust vent requirements.

Nitrogen Gas Supply Requirements

Drying Gas Requirements

1. Use only nitrogen for the drying, sheath 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 can also deteriorate parts in the 6400 Series Triple Quad LC/MS and negatively impact instrument operation and sensitivity.
2. Maintain the minimum flow as indicated to prevent the entry of air into the instrument.
3. If you choose to use a nitrogen gas generator, make sure that the nitrogen gas generator meets the specifications listed in the *Site Preparation Guide*. Agilent offers several models of gas generator, with or without an internal air compressor. See the *Site Preparation Guide* for details.
4. High-pressure bottled nitrogen is not supported for use as drying gas.

Model	Source	Purity	Gas Pressure	Flow
G6410A G6410B G6420A G6430A G6460A#100 G6460C#100	Dewar	99.5% pure[1] or better and hydrocarbon free[2]	5.5 to 6.8 bar (80 to 100 psi)[3]	≤18 liters/minute (≤1080 liters/hour) >3 liters/minute
	Nitrogen generator or liquid nitrogen	95.0% pure[1] or better and hydrocarbon free[2]		
6460A 6460C	Dewar	99.5% pure[1] or better and hydrocarbon free[2]	5.5 to 6.8 bar (80 to 100 psi)[3]	≤30 liters/minute (≤1080 liters/hour) >3 liters/minute
	Nitrogen generator or liquid nitrogen	95.0% pure[1] or better and hydrocarbon free[2]		
6490A 6495A	Dewar	99.5% pure[1] or better and hydrocarbon free[2]	5.5 to 6.8 bar (80 to 100 psi)[3]	≤50 liters/minute (3000 liters/hour) >9 liters/minute
	Nitrogen generator or liquid nitrogen	95.0% pure[1] or better and hydrocarbon free[2]		

1 With the remaining gas being oxygen.
2 Less than 0.1 parts per million of hydrocarbons, with the remaining gas being oxygen and trace argon.
3 Gas Pressure is at the instrument inlet and not at the supply side.

Collision Cell Gas Requirements

The collision cell gas must be a higher purity than the gas used as drying gas.

Model	Source	Purity	Gas Pressure	Flow
All 6400 Series LC/MS	High-pressure bottled nitrogen	99.999% pure or better and hydrocarbon free[1]	1 to 2 bar (15 to 30 psi)	≤0.001 liter/minute (≤0.06 liter/hour)

1 Less than 0.1 parts per million of hydrocarbons, with the remaining gas being oxygen and trace argon.

HPLC-Chip Cube Gas

1. The HPLC-Chip Cube gas must be a higher purity than the gas used as drying gas.
2. Air source must be able to deliver air at a constant pressure.
3. Inlet gas pressure for air must be equal to or slightly higher than the pressure used for the Main Nitrogen Gas supply
4. 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.

Model	Source	Purity	Gas Pressure	Flow
6410 6420 6430 6460	High-pressure bottled nitrogen or air compressor	99.999% pure or better and hydrocarbon free[1]	5.5 to 6.8 bar (60 to 100 psi)	≤4 liters/minute (≤240 liters/hour)
6490 6495				≤10 liters/minute (≤600 liters/hour)

1 Less than 0.1 parts per million of hydrocarbons, with the remaining gas being oxygen and trace argon.

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 at least one outlet with a ¼-inch Swagelok fitting.
- The regulator for the collision cell must have at least one outlet with a 1/8-inch Swagelock fitting.

Refer to the *Site Preparation Guide* for further details.

Laboratory Supplies

Refer to the *Site Preparation Guide* for details on other supplies for routine operation and tools that are needed for installation and routine operation.

Description	Part Number	Recommended Quantity
Agilent 6000 Series LC/MS Site Preparation Guide	G1960-90069	1
Tuning Calibrant – Dependent on LC/MS model and Source		
Electrospray (ESI) Calibrant	G2421A	1
APCI/APPI Calibrant	G2432A	1
ESI-Low Calibrant	G1969-85000	1
APCI-Low Calibrant	G1969-85010	1
Performance Standard – Electrospray/APCI Positive Ion	G2423A	1
Performance Standard – ES Negative Ion (Acid Red 4)	G2424A	1
Performance Standard – ES Negative Ion (Chloramphenicol)	5190-0591	1
Performance Standard – APCI Negative Ion	G2525A	1
Performance Standard – Multimode LC Demo Sample	G1978-85000	1
Performance Standard – Electrospray LC Demo Sample	59987-20033	1
Acetic Acid – Reagent Grade		
Ammonium Formate	G1946-85021	1
Formic Acid – Reagent Grade	G2453-85060	2
HPLC Flushing Solvent (500 mL)	G1969-85026	1
Methanol, High Purity (1 L)	8500-1867	3
Acetonitrile, High Purity (1 L)	G2453-85050	2
Pipette, 1 mL	9301-1423	3
Volumetric Flask, 50 mL	9301-1424	1
Volumetric Flask, 100 mL	9301-1433	2
Vials, 2 mL Screw Top, Wide Opening, Amber (100/pk)	5182-0716	1
Vial Caps, Blue, PTFE/red silicone septa (100/pk)	5182-0717	1
Water, High Purity (4 L)	8500-2236	1

Important Customer Web Links

- ❑ For additional information about our solutions, please visit our web site at http://www.agilent.com
- ❑ Need to get information on your product?
  Literature Library - http://www.agilent.com/chem/library
- ❑ Need to know more?
  Customer Education – http://www.agilent.com/chem/education
- ❑ Need technical support, FAQs? – http://www.agilent.com/chem/techsupp
- ❑ Need supplies? – http://www.agilent.com/chem/supplies

Document part number: G2571-90018

