Varian LC Systems for LC/MS Mass Spectrometers Systems
Pre-installation Instructions

Checklist

NOTE: Do not unpack the boxes.

Check off each box after satisfying each requirement as described in the instructions. All requirements must be met before requesting installation.

NOTE: If the site is not ready for installation when the Varian Representative arrives, Varian, Inc. reserves the right to invoice for the Representative's time.

Requirements	☑
Installation site is in compliance with all relevant safety regulations.	☐
User Representative will be available during the installation and Varian certification period.	☐
Entrance to the installation site is at least 92 cm (36 in.) wide.	☐
Bench space is sufficient for all modules.	☐
Bench can support system weight.	☐
Bench does not vibrate.	☐
Temperature maintained between 16 and 30 °C.	☐
Relative humidity maintained between 20 and 80%.	☐
Installation site is free of excessive particulate matter.	☐
Specified electrical supply and power outlets are installed.	☐
Materials and solvents of specified grade are on site.	☐
Shipping cartons were inspected for damage. If there was any damage, the damaged shipping carton procedure was completed.	☐

Requesting Installation

After preparing your site, contact the Customer Service office in your region to schedule installation.

Contents

Introduction

The Pre-installation Instructions guide you through each requirement of the checklist. Follow these instructions to ensure that the installation requires no more than the usual three days. Have the completed checklist available when you call to schedule the installation. After the Varian Representative completes the installation, you can analyze your samples.

NOTE: You may be required to also meet the Pre-installation Instructions of other components of your system, such as the mass spectrometer.

After meeting all of these requirements, contact the Customer Service office in your region to schedule the installation.

The LC/MS operates reliably under carefully controlled environmental conditions. You must provide suitable power sources, operating environment, materials, and solvents. Failures may occur if you use or maintain the system outside of the power and operating environment ranges and limits described in these instructions. The Varian Warranty and Service contract specifically excludes the repair of failures due to such causes.

CAUTION

All phases of preparing the installation site must conform to local safety, electrical, and building codes. These codes take precedence over any recommendations in these instructions. The customer is responsible for compliance.

Safety

Safety is the most important consideration for instrument use. Determine if the installation site complies with all relevant safety regulations.

☑ **Check off the checklist box:** ***Installation site is in compliance with all relevant safety regulations.***

Before the Installation

User Representative

Schedule the installation when the User Representative will be available. One of the important duties of the Varian Representative is to familiarize the User Representative with the basic functions of the LC/MS.

☑ **Check off the checklist box: *User Representative will be available during the installation and Varian certification period*.**

Entrance

Before arranging for delivery of the LC/MS, determine that there is sufficient clearance to move the shipping container to the installation site. The shipping boxes are 72 cm (28 in.) wide by 92 cm (36 in.) long. If you move the instrument using the pallet, you need at least 92 cm (36 in.) clearance. Additional room is needed to maneuver the shipping containers around corners and through doors.

☑ **Check off the checklist box: *Entrance to the installation site is at least 92 cm (36 in.).***

CAUTION **The MS, foreline pump, and LC are heavy. To prevent personal injury, use appropriate moving and lifting techniques.**

Bench Space and Load

Use the following information to help plan the layout of your LC/MS. The Pre-installation Instructions for the MS has more information about the mass spectrometer and computer. The Varian Representative will unpack the boxes and put the modules on the bench.

The tables following the figures provide information about bench space and load. The bench must be strong enough to support the weight of all modules, wide enough for all modules, and at least 84 cm (33 in.) deep for the MS.

NOTE: The following are examples of possible instrument configurations. Your configuration may be different.

212-LC and ProStar 410 Autosampler with the 500-MS

Figure 1 Typical Layout of the 500-MS with the 212-LC pumps

Figure 1 shows an example of the 500-MS LC/MS with the 212-LC pumps and the ProStar 410 AutoSampler. The autosampler belongs on the side of the 212-LC pumps, not on top.

NOTE: Do not stack an autosampler on top of the 212-LC pumps.

Table 1 lists the dimensions of the LC modules in figure 1. Table 2 lists the weights of the LC modules for the ProStar410 without the cooling option and Table 3 has that information for the ProStar 410 with the cooling options.

Table 1 Bench Space with ProStar 410

Width	212-LC	ProStar 410	Total
cm	26	30	56 cm
in.	10.5	11.8	22.3 in.

Table 2 Bench Load: ProStar 410 without Cooling Option

Weight	212-LC	ProStar 410	Total
kg	14.5	19	33.5 kg
lb	32	42	74 lb

Table 3 Bench Load: ProStar 410 with Cooling Option.

Weight	212-LC	ProStar 410	Total
kg	14.5	21	35.5 kg
lb	32	46	78 lb

The following provides bench space and load information for a 212-LC with a ProStar430.

Table 4has the bench space information. Table 5 lists the weights of the LC modules for the ProStar410 without the cooling option and Table 6 has that information for the ProStar430 with the cooling options.

Table 4 Bench Space with ProStar 430

Width	212-LC	ProStar 430	Total
cm	26	28	54 cm
in.	10.5	11	21.5 in.

Table 5 Bench Load: ProStar 430 without Cooling Option

Weight	212-LC	ProStar 430	Total
kg	14.5	21	35.5 kg
lb	32	46	78 lb

Table 6 Bench Load: ProStar 430 with Cooling Option

Weight	212-LC	ProStar 430	Total
kg	14.5	26	40.5 kg
lb	32	58	90 lb

216-LC and 320-MS

Figure 2 shows an example of the 320-MS with 216-LC.

Figure 2 Typical Layout of the 320-MS with the 216-LC

Table 7 lists the dimensions and weights of the 216-LC system. The Pre-installation Instructions for the LC/MS has the information for the MS and computer.

Table 7 Bench Space and Bench Load

Bench Width	216-LC	Bench Load	216-LC
cm	35	kg	32
in.	14	lb	71

☑ **Check off the checklist box:** ***Bench space sufficient for all modules.***

☑ **Check off the checklist box:** ***Bench can support system weight.***

Vibration

Ensure that the installation site benches are free from vibrations, especially those caused by equipment in adjoining locations. Because the foreline pump vibrates during operation, it belongs on the floor not on the bench.

☑ **Check off the checklist box:** ***Bench does not vibrate.***

Temperature

The optimal operating temperature is between 16 and 30 °C (61-86 °F).

NOTE: As installation site temperature increases, system reliability decreases due to heat generated by electronic components during operation. This heat must dissipate to the surrounding air for reliable operation.

The airflow around the system must be adequate. The air-conditioning system must maintain a constant temperature (within the operational limits) around the system. Do not place the system near air ducts, windows, or heating and cooling systems. The average steady-state heat load for the MS alone is 6,000 Btu, with a possible short-term heat dissipation of 15,000 Btu during Startup.

☑ **Check off the checklist box*****: Temperature maintained between 16 and 30 °C.***

Humidity

The relative humidity of the operating environment must be between 20 and 80%, with no condensation. Operating the LC/MS at a very low humidity may result in the accumulation and discharge of static electricity, which shortens the life of electronic components. Operating the system at high humidity may create condensation and result in short circuits.

Varian recommends using a combination temperature and humidity monitor in your installation site.

☑ **Check off the checklist box:** ***Relative humidity maintained between 20 and 80%.***

Particulate Matter

Your installation site must not have excessive dust, smoke, or other particulate matter. Particulate matter may block airflow vents causing the electronics to overheat.

☑ **Check off the checklist box: *Installation site is free of excessive particulate matter.***

Power Requirements

See the Pre-installation Instructions for the LC/MS for more information.

212-LC

Power Input: 85 – 264V ac; 47 – 63 Hz; 60 Watts 100VA

216-LC

115V ac; +15/-20%; 50/60 Hz; 250VA
230V ac; +15/-20%; 50/60 Hz; 250VA

(For UPS, assume 250W)

For 115V ac: one 5.0 AT-fuse (5 x 20 mm, IEC 127)
For 230V ac: one 2.5 AT-fuse

All fuses supplied with the 216-LC instrument are UL-listed and CSA-certified. The 216-LC must be used with appliances and power sources that have the proper protective grounding.

Use a separate dedicated power source for HPLC modules and additional instruments and equipment. Never plug the mass spectrometer and the chromatograph into the same power source or the power source may overload. Never use the free outlet on any of the power sources for equipment that draws more than 2A.

Materials and Solvents

See the Pre-installation Instructions for the MS for other materials and solvents.

- 212-LC, supply the solvents on Table 8**.**
- 216-LC system, supply the solvents on Table 9.

Table 8 Solvents for ESI or APCI

Quantity	Solvent
2 each 4-liter bottles	LC-MS grade water, new and unopened
2 each 1-liter bottles	LC-MS grade acetonitrile, new and unopened
2 each 1-liter bottles	LC-MS grade methanol, new and unopened

Table 9 Solvents for nESI

Quantity	Solvent
1 each 2.5-liter bottle	Water with 0.1% formic acid LC-MS CHROMASOLV®, total impurities 0.093-0.107 % (v/v) formic acid from Sigma Aldrich Part Number 34673 or equivalent
1 each 2.5-liter bottle	Acetonitrile with 0.1% formic acid LC-MS CHROMASOLV®, ≥99.5% (GC) from Sigma Aldrich Part Number 34668 or equivalent

You may need additional tubing to complete the installation of your system. Most of the tubing is included in the accessory kits of the LC modules. Additional tubing (PEEK® or stainless steel) may be required for installation of special valves or modules. For most analytical HPLC systems, use 1/16 in. tubing with an ID of 0.005 in. Use 0.005 in. ID or smaller tubing downstream of the sample injector and autosampler to prevent peak broadening. Keep the tubing as short as possible to prevent peak broadening and to minimize run time.

☑ **Check the checklist box:** ***Materials and solvents of specified grade are on site.***

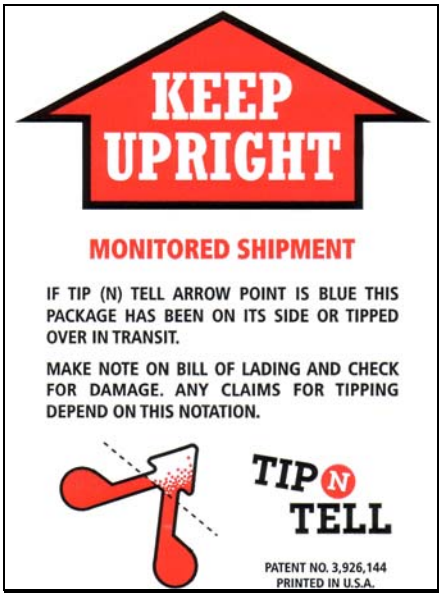
When the LC/MS Arrives

Inspecting the Shipping Cartons

After the LC arrives, carefully inspect the exterior of the shipping cartons for evidence of any damage that might have occurred during shipment. Inspect the cartons for the following:

- Water stains.
- Cuts, punctures, or deep indentations.
- Crushed corners or excessively abraded edges.
- Blue beads in the Tip (N) Tell arrow point.

Two Tip (N) Tell indicators and labels are affixed to the exterior of the shipping boxes. Read and follow the instructions on the label. If the Tip (N) Tell arrow point is blue, the box was on its side or tipped in transit and instrument damage may have occurred.



If no external damage is apparent, sign the receiving documents, "*Received but not inspected*" to indicate that the boxes were not opened.

If you receive obviously damaged materials without noting the damage on the receiving documents, Varian will not accept the liability

Do not open any boxes. The Varian Representative opens them during installation. Move the shipping containers to a warm, dry, and secure area near the installation site.

If a shipping carton shows evidence of damage, do the following procedure:

1. Report the conditions to the carrier when you receive the shipment.
2. Note the damage on all copies of the shipping documents.
3. Write a brief description of the damage.
4. Ask driver to sign next to your comments to signify agreement with the observations.
5. Contact the appropriate Varian office to report the damage.

Systems are shipped either **FOB Varian** or **FOB Destination**. The manner of shipment determines who is responsible for filing a claim against the carrier if the system was damaged in transit. Most systems are shipped **FOB Varian**, so any damages incurred in shipment are the responsibility of the purchaser and the carrier. Contact the Varian office for assistance with filing claims and billing repairs. If the system ships **FOB Destination**, contact the Varian office, and that office files a claim against the carrier.

☑ **Check the checklist box:** ***Shipping cartons inspected for damage. The damaged shipping carton procedure was completed for any observed damage.***

Unpacking and Installing

The Varian Representative will review the Pre-installation Checklist with you to ensure that you satisfy all of the site requirements. The Varian Representative will unpack and install the instrument and demonstrate the fundamental operation and maintenance procedures. The User Representative must be present during the installation.

The Varian Representative will demonstrate that your system meets the performance specifications, which are on the data sheet, and any additional criteria explicitly written into your sales contract.

Plan to analyze your samples only after the installation is complete and you accept the conditions of delivery. The process requires at least three days.

Spare Parts

Refer to the respective MS hardware manual for a list of spare parts.

Preventive Maintenance

You are responsible for performing routine and preventive maintenance of the LC, autosampler, MS, and data system. If using a nitrogen generator, you must do the required preventive maintenance that ensures that the nitrogen supply is clean and dry. Any instrument problems resulting from a contaminated gas supply are billable and not included in the Varian Warranty.

Perform regular preventive maintenance to increase the life of the system, to maximize system uptime, and to optimize system performance. Refer to the appropriate manual or Quick Reference Guide for more information. Your Varian Representative will describe and demonstrate these procedures during the installation.

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