

NOTICE: Varian, Inc. was acquired by Agilent Technologies in May 2010. This document is provided as a courtesy but is no longer kept current and thus will contain historical references to Varian. For more information, go to www.agilent.com/chem.



Varian, Inc.
2700 Mitchell Drive
Walnut Creek, CA 94598-1675 USA

Varian LC Systems

Pre-installation Instructions

The Varian LC Systems consist of HPLC Solvent Delivery Modules, Detectors, and AutoSamplers which can be configured to create complete, stackable Analytical, Semiprep, or Preparative HPLC systems. ProStar/PrepStar LC modules can also be purchased individually to add to any existing Varian (or other manufacturer's) system. However, the 212-LC Chromatography Pump is packaged only with either the 1200L or 500-MS LC/MS System.

If your system is to be installed by a qualified Varian Customer Service or Sales Representative, it is preferred that the boxes remain unopened until your Varian Representative arrives on site.

The information provided here will help you identify and prepare a suitable installation site for your LC System. The Varian LC Systems have been designed to operate reliably under carefully controlled environmental conditions. It is your responsibility to provide a suitable location, power source, and operating environment. Operating or maintaining a system in operational conditions outside of the power and operating environment limits described below could cause failures of many types. The repair of such failures is specifically excluded from the Warranty and Service contract conditions.



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

Contents

Space and Weight Requirements	2
Power Requirements	3
Operating Environment	5
Gas Requirements	6
Network Requirements	6
Inspection.....	6
Unpacking and Installation.....	7
Spare Parts	8
Preventive Maintenance	8

Space and Weight Requirements

Allow sufficient bench space to permit installation of printers, workstations, and other peripheral LC equipment. Table 1 lists the physical dimensions and weights of each module, and the peripheral instruments that may be installed near it. Allow at least two inches of space at the sides, and six inches at the rear of the LC system to permit free air circulation. Power cord, signal output, and I/O connectors are located at the rear of the instrument. Power switches are located on the front panel on most modules, but are generally on the rear panel for autosamplers.

Table 1 Physical Dimensions of LC System Components

	Height		Width		Depth		Weight	
	in.	cm	in.	cm	in.	cm	lb.	kg
Solvent Delivery Modules								
ProStar 210/218 *	7.75	19.7	11.5	29.2	18.3	46.4	48.0	22.0
ProStar 220/230/240	11.5	29.2	11.5	29.2	20.0	51.0	53.0	24.0
PrepStar SD-1	10.5	27.0	16.0	41.0	22.0	56.0	75.0	34.0
PrepStar SD-2	7.6	19.7	11.5	29.2	20.3	57.5	60.0	27.0
212-LC	13.0	33.0	10.3	26.0	14.0	36.0	32.0	14.5
Detectors								
ProStar 325 UV-Vis	8.3	21.2	11.7	29.6	18.7	47.5	34.0	15.5
ProStar 330 Photodiode Array	9.3	23.5	11.5	29.2	20.0	50.0	35.0	16.0
ProStar 335 Photodiode Array	8.3	21.2	11.7	29.6	18.7	47.5	34.0	15.5
ProStar 340 UV-Vis	6.3	16.0	9.8	25.0	13.3	33.5	20.0	9.0
ProStar 350/352 RI	5.5	14.0	10.3	26.0	19.0	48.0	35.0	16.0
ProStar 363 Fluorescence	12.0	30.5	11.5	29.2	18.5	47.0	42.0	19.0
ProStar 364 Fluorescence	11.0	28.0	24.0	60.0	24.0	61.0	68.0	31.0
Star 9080 EC **	14.3	36.5	8.6	22.0	18.6	48.0	34.2	15.5
AutoSamplers/Fraction Collectors								
ProStar 400	11.1	28.2	11.8	30.0	17.3	44.0	34.0	15.4
<i>with cooling option</i>							41.0	19.0
ProStar 410	13.4	34.0	11.8	30.0	19.7	50.0	42.0	19.0
<i>with cooling option</i>							46.0	21.0
ProStar 420	17.3	44.0	11.0	28.0	21.3	54.0	48.0	22.0
<i>with cooling option</i>							66.0	26.0
ProStar 430	17.3	44.0	11.0	28.0	15.7	40.0	46.0	21.0
<i>with cooling option</i>							58.0	26.0
ProStar 701 XY Fraction Collector	15.0	38.0	11.4	29.0	24.0	61.0	23.0	10.4
ProStar 704 Fraction Collector	13.0	33.0	10.9	28.0	12.3	31.0	10.4	4.7
Peripheral Components								
ProStar 500 Column Valve Module	20.0	50.8	5.4	13.7	15.0	38.1	30.0	13.6
ProStar 510 Column Thermostat	20.5	52.0	6.8	17.0	13.0	33.0	35.2	16.0
ProStar 520 Column Oven	18.0	46.0	13.0	32.0	22.0	56.0	47.0	21.0
PrepStar 530 Fluidics Module	7.6	19.7	11.5	29.2	18.5	47.0	32.0	15.0
Ancillary equipment (Mobile phase reservoirs, column mount assy, dynamic mixer, manual injector, etc.) (<i>approximate values</i>)	18.0	46.0	12.0	31.0	18.0	46.0	—	—
Printer (<i>approximate values</i>)	6.0	15.0	18.0	46.0	18.0	46.0	12.0	5.4
Star Chromatography Workstation (computer with monitor, <i>approximate values</i>)	17.0	43.0	17.0	43.0	21.0	53.0	35.0	16.0

* 210 SDM weight includes pump heads and large pressure module. Add 4.0 lbs. (1.81 kg) for 218 Pump.

** Star 9080 EC Detector weight includes injector.

Power Requirements

A separate circuit, free of equipment with intermittent start/stop cycles and heavy starting current demands, is required for each LC system.

Note: Single-phase power only. (120V, 101V)

A measured GROUND to NEUTRAL potential of greater than 3 volts ac or dc indicates grounding problems that may need correction before connecting an instrument module to the power source. Any power source suspected of having noise problems should be evaluated with a recording-type power line monitor prior to being used for operating instruments.



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

Note: The PrepStar SD-2 is only available in a 220V version. You must have a transformer to use it with 110V power.

Power cords for North America and other 120V, 60 Hz, applications are terminated in a 3-prong plug that requires a matching 120 Vac receptacle as shown in Figure 1. Replacement or substitution of the power plug requires strict compliance with all applicable electrical codes, regulations, and power cord color coding.

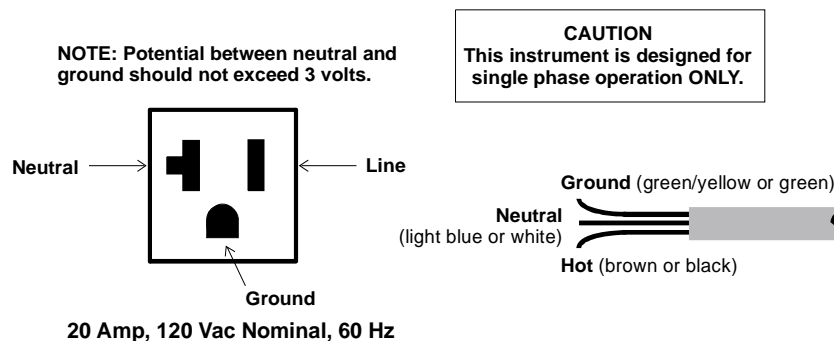


Figure 1 Power Cord Receptacle Polarity (120 Vac)

For use in 220V, 50 Hz, countries, the instrument is supplied with an IEC 320 style socket. The power cord can be changed to suit local power requirements, but must be replaced with a CE compliant equivalent.

Receptacle located on rear of Instrument.

10 Amp, 230 Vac Nominal, 50 Hz

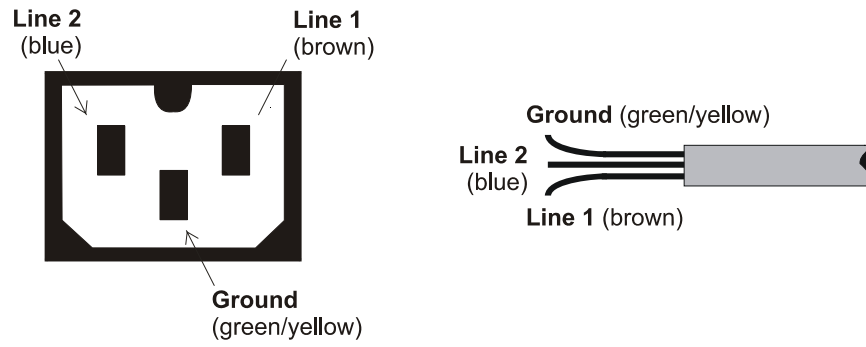


Figure 2 Power Cord and Receptacle Polarity (230 Vac)

NOTE: Potential between neutral and ground should not exceed 3 volts.

CAUTION
This instrument is designed for single phase operation ONLY.

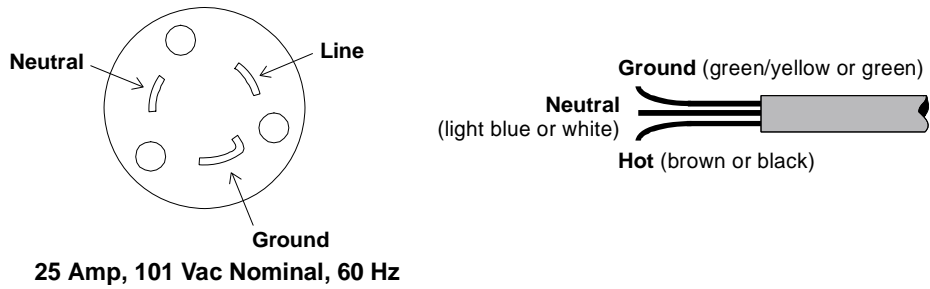


Figure 3 Power Cord and Receptacle Polarity (101 Vac)

Power Consumption

Table 2 LC Module Power Consumption

ProStar 210 SDM	270 VA	ProStar 400 AutoSampler	200 VA
PrepStar 218 SDM	550 VA	ProStar 410 AutoSampler	150 VA
ProStar 220/230/240 SDM	270 VA	ProStar 420 AutoSampler	200 VA
PrepStar SD-1 SDM	350 VA	ProStar 430 AutoSampler	250 VA
PrepStar SD-2 SDM (220V only)	720 VA	ProStar 500 Column Valve Module	250 VA
212-LC Chromatography Pump	100 VA	ProStar 510 Column Thermostat	400 VA
ProStar 325 UV-Vis Detector	130 VA	ProStar 520 Column Oven	1100 VA
ProStar 330 PDA Detector	200 VA	PrepStar 530 Fluidics Module	110 VA
ProStar 335 PDA Detector	130 VA	ProStar 701 XY Fraction Collector	65 VA
ProStar 340 UV-Vis Detector	100 VA	ProStar 704 Fraction Collector	22 VA
ProStar 345 UV-Vis Detector	200 VA		
ProStar 352 RI Detector	70 VA		
ProStar 363 Fluorescence Detector	360 VA	Star 9080 Digital Electrochemical Amperometric Detector	150 VA
ProStar 364 Fluorescence Detector	180 VA		

Operating Environment

Keeping with safe laboratory practices, the HPLC system should not be exposed to corrosive chemicals or gases. It should not be exposed to excessive dust/particulate accumulation. For optimum performance, HPLC systems should not be exposed to the direct venting of air conditioners, heaters, furnaces, or fans.

Temperature/Humidity

Humidity: 5% to 95% RH

Temperature: 10° to 40°C operating; -20° to 65°C non-operating

Particulate Matter

Take the necessary precautions to minimize particulates in the laboratory environment. A layer of dust on the electronic components could act as an insulating blanket, and reduce heat transfer to the surrounding air.

Vibration

Ensure that laboratory benches are free from vibrations, e.g., those caused by equipment in adjoining locations.

Gas Requirements

Unless your system is equipped with a pneumatically controlled injector valve, a helium-sparging unit, or a PrepStar 530 Fluidics module, there are no gas requirements for the ProStar or PrepStar LC system or a 212-LC System. For gas requirements on these other devices, consult the Operation Manual or other documentation received with the particular device.

Proper Handling of Gas Cylinders

Always observe safe laboratory practice in the transportation, storage, and usage of gas cylinders under high pressure.

- Never move a cylinder with a regulator installed. Make sure safety cap is in place over valve when transporting cylinder.
- Always chain or strap cylinders in the laboratory and in storage.
- Always use cylinder condition labels to show whether tank is FULL, IN USE, or EMPTY.
- Always leave at least 100 psig residual gas in a depleted cylinder. Always store in empty tank storage area with tank valve closed. Empty cylinders should be clearly marked as such and dated.
- Do not expose cylinders to temperatures above 125°F (50°C).



DO NOT USE UNCLEARED TUBING. Use of plastic tubing or improperly cleaned tubing or impure gases may result in severe contamination and may void the warranty.

Network Requirements

You may need to provide a standard 10BaseT cable to connect the instrument to the network, as most instruments include a cross-over 10BaseT cable supporting only a direct connection to the data system.

You or your network administrator must provide any hardware, adapters, cables, and configuration and setup work required to convert from the company network wiring type to 10BaseT wiring. This hardware must comply with the IEEE 802.3 standard.

Inspection

Before unpacking, carefully inspect the exterior of the shipping cartons for evidence of any damage occurring during shipment. Inspect for:

- Water stains
- Cuts, punctures, or deep indentations
- Crushed corners or excessively abraded edges

If any of the above conditions are evident on any of the shipping cartons, report the conditions to the carrier at time of receipt.

Systems are shipped either **FOB Varian** or **FOB Destination**. The manner of shipment determines who has responsibility for filing a claim against the carrier if the system is damaged in transit. Most systems are shipped **FOB Varian**, and in this instance any damages incurred in shipment are the responsibility of the purchaser and the carrier. Contact Varian Service for assistance with claims filing and billing for repairs if necessary. If the system is shipped **FOB Destination**, contact Varian Order Processing who will file a claim against the carrier. Note, however, that Varian will not accept liability for damage if you receive obviously damaged materials but do not make note of the damage on the receiving documents.

If none of the conditions listed above are evident after inspecting the shipping carton, place the shipping container on the floor near the installation site. Before proceeding, you should make sure that the site to be used for installation has the required power and meets the space requirements described in these instructions.



WARNING

Some of the HPLC modules may weigh in excess of 40 pounds. Use proper lifting techniques to avoid possible personal injury or damage to the instrument.

Unpacking and Installation

If your system is to be installed by a qualified Varian Customer Service or Sales Representative, it is preferred that the boxes remain unopened until your Varian Representative arrives onsite.

Before proceeding, make sure that the site to be used for installation has the required power and meets the space requirements described in these instructions.

Should you experience difficulties during installation, Varian Customer Support personnel will be available to assist you by telephone. This assistance is provided with the purchase of LC Systems.

Mobile Phase Solvents, Columns and Other Installation Requirements

Installation by a Varian Field Service or Sales Representative will normally include a basic test of the systems functionality. To run a chromatogram will require the installation of an analytical or “test” column, a test sample, and specific mobile phases.

Mobile phase solvents required for installation are methanol, de-ionized water, and isopropyl alcohol. All solvents should be pure HPLC-grade, and degassing apparatus should be available, if required.

An **analytical reverse-phase C18 column** is also required to run a test sample. Varian has a number of columns available to fill this need. An example would be a Microsorb (or Microsorb-MV) C18 (ODS) column. Column descriptions, specifications, and recommendations can be found in the Varian Parts and Supplies Catalog, available on request from any Varian office.

In addition to the above, **interconnect tubing** will be required to complete installation of your system. Most of this tubing is included in the accessory kits of specific LC instrument modules. Additional tubing (PEEK® or Stainless Steel) may be required for installation of special valving, or installation of modules to existing HPLC systems.

For most *analytical* HPLC systems (flow rates up to 10 mL/min), 1/16" tubing with an internal diameter (ID) of 0.010 to 0.020" can be used throughout. However, 0.010" ID or *smaller* should always be used downstream of the sample injector or autosampler to prevent peak broadening. In addition, tubing lengths should always be kept to a minimum.

Semiprep and *Preparative* systems have other requirements/limitations with regard to interconnect tubing. Typically, a system using flow rates up to 200 mL/min will require 1/16" tubing with an internal diameter as high as 0.040". On these systems, tubing ID used after the injector/autosampler should be ~0.010" smaller than tubing used in the rest of the system. On Prep systems, 1/8" tubing (0.062" or 0.080" ID) is typically used throughout. Always consult the instrument module Operation Manual for specific recommendations.

Table 3 Stainless Steel and PEEK Tubing

	OD, in.	ID, in.	Length	Part Number
Stainless Steel	1/16	0.007	20 cm (5 ea)	AL97036
	1/16	0.010	20 cm (5 ea)	AL97061
	1/16	0.020	30 cm (5 ea)	AL97091
	1/16	0.030	30 cm (5 ea)	AL97111
	1/16	0.040	30 cm (5 ea)	R0-003830-65
	1/8	0.080	1 meter	R0-0000U8-00
PEEK	1/16	0.005	5 ft	UC1535
	1/16	0.007	5 ft	UC1536
	1/16	0.010	5 ft	UC1531
	1/16	0.020	5 ft	UC1532
	1/16	0.030	5 ft	UC1533
	1/16	0.040	5 ft	UC1538
	1/8	0.062	5 ft	UC1534
	1/8	0.080	5 ft	UC1544

Note: 316 Stainless Steel, PEEK®, and titanium tubing is available in many other lengths and internal diameters. Consult the Varian Consumables Catalog for more information.

Spare Parts

Refer the appropriate Operation Manual for a list of spare parts for normal operation.

Preventive Maintenance

Please note that it is essential that you perform regular preventive maintenance on your LC System. By performing this maintenance, you will increase the life of the system, increase system uptime, and enjoy optimum system performance. Please refer to the Maintenance section of the appropriate Operation Manual for details.