

Vanquish MD

HPLC system for in vitro diagnostic use

Preinstallation Guide

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IVD in vitro diagnostic medical device.



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Preface

Before taking delivery of the Thermo Scientific™ Vanquish™ MD High Performance Liquid Chromatography (HPLC) system, use this guide to set up your lab.

CAUTION Operating an instrument or maintaining it outside the power and operating environment specifications described in this guide might cause failures of many types. The repair of such failures is specifically excluded from the Thermo Fisher Scientific standard warranty and service contract coverage.

- [Requesting Instrument Installation](#)
- [Special Notices, Symbols, and Cautions](#)
- [Contacting Us](#)

Requesting Instrument Installation








Note Refer to the Preinstallation Guide of the mass spectrometer, if you are integrating your Vanquish MD HPLC System with a Thermo Scientific mass spectrometer.





Do not open the shipping containers—the service engineer unpacks, inspects, and installs the system.

For additional information, request specific preinstallation support directly through your local sales or service office for Thermo Fisher Scientific products.




Special Notices, Symbols, and Cautions

Make sure you understand the special notices, symbols, and caution labels in this guide. Most of the special notices and cautions appear in boxes; those pertaining to safety also have corresponding symbols. Some symbols are also marked on the instrument itself and can appear in color or in black and white.

Notice, symbol, or label	Meaning
	Caution: Review the operator manual for the instructions to safely operate the instrument.
	Chemical hazard: Wear gloves and personal protective equipment, as instructed, when handling toxic, carcinogenic, mutagenic, corrosive, or irritant chemicals. Observe Good Laboratory Practices (GLP) when handling chemicals. Only work with volatile chemicals under a fume or exhaust hood
	Heavy object: Never lift or move the instrument by yourself; you can suffer personal injury or damage the instrument. Use suitable lifting equipment as needed.
	Risk of electric shock: Before you service the instrument, shut it down and disconnect it from line power. While operating the instrument, keep the covers on. This instrument uses voltages that can cause electric shock and personal injury.
	Risk of eye injury: Before you service the instrument, shut it down and disconnect it from line power. While operating the instrument, keep the covers on. This instrument uses voltages that can cause electric shock and personal injury.
	Trip obstacle: Watch where you step to avoid tripping over cords, hoses, or other objects on the floor.
CAUTION	Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or might contain information that is critical for optimal performance of the product.
IMPORTANT	Useful information for efficiently operating the system.
Note	Highlights information of general interest.
Tip	Highlights helpful information that can make a task easier.
	For in vitro diagnostic use.

Notice, symbol, or label	Meaning
	Manufacturer
	CE Marking of Conformity
	European Authorized Representative
	Consult the instructions for use.

Contacting Us

Contact	Email	Telephone	QR Code
U.S. Technical Support	us.techsupport.analyze@thermofisher.com	(U.S.) 1 (800) 532-4752	
U.S. Customer Service and Sales	us.customer-support.analyze@thermofisher.com	(U.S.) 1 (800) 532-4752	
Global Support	<ul style="list-style-type: none"> ❖ To find global contact information or customize your request <ol style="list-style-type: none"> 1. Go to thermofisher.com. 2. Click Contact Us, select the country, and then select the type of support you need. 3. At the prompt, type the product name. 4. Use the phone number or complete the online form. ❖ To find product support, knowledge bases, and resources <p>Go to thermofisher.com/us/en/home/technical-resources.</p> ❖ To find product information <p>Go to thermofisher.com/us/en/home/brands/thermo-scientific.</p> 		

Preface

Revision History

Revision	Reason for Change	Date
A	First release of document	February 2020

Revision History

Introduction

Before the Vanquish MD HPLC System field service engineer installs the Thermo Scientific Vanquish MD HPLC System, you must provide a suitable location, a carefully controlled operating environment, a source of power of acceptable quality, correct solvent supplies, and proper waste and exhaust systems.

CAUTION Operating an instrument or maintaining it outside the power and operating environment specifications described in this guide might cause failures of many types. The repair of such failures is specifically excluded from the Thermo Fisher Scientific standard warranty and service contract coverage.

For preinstallation support and additional information, contact your local Thermo Fisher Scientific office.

1 Introduction

Laboratory Requirements

For a successful installation, confirm that your laboratory meets these requirements.

- [Environmental Requirements](#)
- [System Waste and Exhaust Requirements](#)

Environmental Requirements

Table 1. Environmental requirements

Parameter	Requirement
Relative humidity	5–80%, noncondensing
Temperature	<ul style="list-style-type: none"> • Operating range: 5–35 °C (41–95 °F) • Ambient temperature fluctuations: Less than 5 °C or 41 °F over a one-hour period
Heat output (power)	<ul style="list-style-type: none"> • Pump: 35 W (119 BTU/h) • Split Sampler: 100 W (341 BTU/h) • Column Compartment: 120 W (409 BTU/h)
Electrostatic Discharge	<ul style="list-style-type: none"> • Use a static-dissipating floor covering in the lab. • Use laboratory chairs covered with natural fibers or other static-dissipating material. • Wear a laboratory coat and clothing made from natural fibers or other static-dissipating material. • Keep Styrofoam™ cups or packing material away from the instrument.
Particulate Matter	Ensure that the air in your lab is free from excessive dust, smoke, or other particulate matter in excess of 5 microns. Not to exceed 3 500 000 particles per cubic meter (100 000 particles per cubic foot)
Vibration	Choose a lab location that is vibration-free.

System Waste and Exhaust Requirements

The waste and exhaust arrangements for your Vanquish MD HPLC System can affect the proper performance of the system. Solvent wastes must be collected and disposed properly.



CAUTION You are responsible to provide the proper waste and ventilation systems required to operate your system. Do not allow flammable or toxic solvents to accumulate. Follow a regulated, approved waste disposal program. Never dispose of flammable or toxic solvents through the municipal sewage system. You are responsible to ensure that your laboratory is vented adequately to prevent the buildup of solvent fumes.

Table 2. Vanquish MD modules and maximum flow rates

Modules	Maximum flow rates
Binary Pump	Flow: up to 8 mL/min Also: rear seal wash solution waste
Split Sampler	Needle wash and condensation wash
All modules	Drain liquid in case of leaks or spills

CAUTION Thermo Fisher Scientific recommends that you place the waste container in a secondary containment vessel large enough to hold 110% of the volume of the waste container.

Installation Requirements

You must prepare your site before your Thermo Fisher Scientific service engineer can install the Vanquish MD HPLC System. Review the space and load requirements and ensure that the laboratory workbench is large enough and strong enough to support the LC system.

- [Shipping Containers](#)
- [Power Cables](#)
- [Power Outlets](#)
- [Connecting to Power Sockets](#)
- [Workbenches and Clearance Distances](#)
- [Vanquish MD HPLC Layout](#)
- [Solvent Requirements and Recommendations](#)

Shipping Containers

Table 3 lists the dimensions and weights of the shipping containers for the components of the Vanquish MD HPLC system. Ensure that the width of all doorways and hallways is a minimum of 97 cm (38 in.). Transport the container with the HPLC to the lab and do not open it until the service engineer is on site. The system is provided with all necessary solvent reservoirs, power cables, and communication cables. The Field Service Engineer will unpack the containers during the installation.



CAUTION Heavy object: Never lift or move the shipping containers by yourself; you can suffer personal injury or damage the instrument. Ask for assistance when you move the containers.

3 Installation Requirements

Power Cables

Table 3. Shipping Containers

Component	Height		Width		Depth		Weight	
	cm	in.	cm	in.	cm	in.	kg	lbs
System Base	38	15	52	21	72	28	20	44
Binary Pump	36	14	59	23	79	31	36	79
Column Compartment	30	12	52	21	72	28	12	26
Split Sampler	45	18	59	23	79	31	35	77

Note The Vanquish MD HPLC System Base contains base, solvent rack, reservoirs, and the Ship Kit. The Ship Kit contains solvent lines, system capillaries, Vanquish MD Software, and USB cables

Power Cables

Each of the three power-supply cables for the modules of the Vanquish MD HPLC System are 2 m (6 ft.) long.

Table 4. Plug type, voltage rating, and current rating for US and Canada

Destination	Plug type	Voltage rating	Current rating
US and Canada	NEMA 5-15P	125 V AC	10 A



CAUTION Only use the power cord provided for the device. Do not use multiple sockets or extension cords. Using defective multiple sockets or extension cords may cause personal injury or damage to the device.

Power Outlets

All Vanquish modules are equipped with auto-ranging power modules and can operate within the range of 100 V to 240 V, 50/60 Hz, and evaluated for minimum and maximum voltage tolerances of +10% and -10% (per safety standard IEC/UL/CSA 61010-1).

US and Canada installations:

For systems installed in regions with 120 V AC service only, the basic power requirements for the Vanquish HPLC System with computer, monitor, and printer consist of the following:

- Nominal voltage of 120 V AC
- Frequency of 50/60 Hz
- Two fourplex outlets (single-phase power) with a minimum power rating of 10 A (120 V AC)
- Earth ground hard-wired to the main panel



CAUTION The Vanquish MD HPLC System must have a common ground. The interconnected power outlets for the Vanquish MD HPLC System must have a common point to one ground connector.

Connecting the modules of the Vanquish MD HPLC System to external grounds at different potentials can create a ground loop that causes noise and interference.

Improper grounding of the Vanquish MD HPLC System creates an electrical safety hazard



CAUTION Do not connect a mass spectrometer and a Vanquish MD HPLC System to the same electrical power socket circuit.

IMPORTANT Additional power outlets might be required for test and cleaning equipment, such as an ultrasonic bath. Thermo Fisher Scientific recommends that you provide several additional power outlets to the workbench space.

Connecting to Power Sockets

Table 5 shows the maximum current required by each module of the Vanquish MD HPLC System.

Table 5. Current Draw by Module from a 120 V AC fourplex outlet

Module	Module outlet 120 V AC
Binary Pump	2.1A
Column Compartment	3A
Split Sampler	4.6A

Refer to Table 6 as an example of the number of outlets that your laboratory might require for your Vanquish MD HPLC System and to provide additional outlets.

Table 6. Number of outlets

Item	Outlets
System Base / Solvent Rack	0
Binary Pump	1
Column Compartment	1
Split Sampler	1
Additional outlets	3
Total outlets	6

Workbenches and Clearance Distances

You must provide a workbench for the Vanquish MD HPLC system. The workbench must have a load capacity of at least *twice* the combined weight of all expected devices, including filled eluent bottles, and sufficient space to operate the system.

Table 7 lists the minimum bench-top areas, space requirements, and the weights of the components of the Vanquish MD HPLC System

Table 7. Approximate space and load requirements for the system modules

Equipment	Height (<i>h</i>) cm (in.)	Width (<i>w</i>) cm (in.)	Depth (<i>d</i>) cm (in.)	Weight kg (lb)
Vanquish MD HPLC ^a	81 (31.9)	54 (21.2)	62 (24.4)	68 (150)

^a These values exclude the solvent bottles and tubing.

Follow these clearance guidelines for the workbenches:

- Place the Vanquish MD HPLC, MS, and data system workbenches close to each other to prevent strain on the interconnecting Ethernet communications cables.

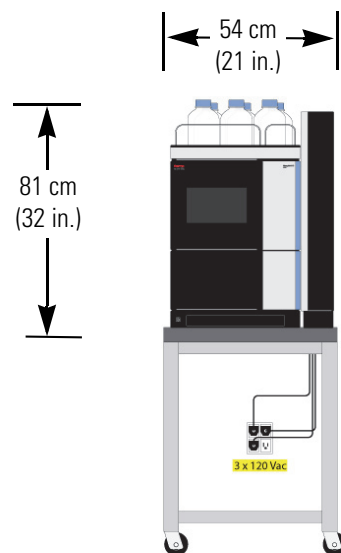
Note Safety and EMC regulations require the use of Category 5e shielded Ethernet communications cables, maximum 3 m (10 ft) long.

- For the LC system, allow for a minimum vertical clearance of 92 cm (36 in.) between the top of the system and any shelves above it.
- Allow at least 15 cm (6 in.) of space between the back of the system and any wall or obstruction. This room is needed to unplug power cables.

The main power switch and the main power receptacle are located on the rear right side panel of charger module, detector, autosampler, pump, and on the rear side of the column compartment. Make sure that free and unrestricted access to the main power switch is ensured and that the power cord of the device can be easily reached and disconnected from the power line at all times.

Vanquish MD HPLC Layout

Figure 1. Vanquish MD HPLC Layout



Solvent Requirements and Recommendations

Before the installation make sure that your lab has the recommended solvents and solutions. Installation and maintenance of the LC requires LC/MS-grade solvents and additives only

- [Mobile Phase Requirements](#)
- [LC Additive Restrictions](#)
- [Required and Recommended Solvents](#)

Mobile Phase Requirements

Note Do not filter solvents. Filtering solvents can introduce contamination.

Ensure the following:

- Use dedicated glassware that you clean and store in the lab between uses.
- Clean solvent bottles before refilling them.
- Do not use plastic materials for preparing or storing solvents.
- Do not use Parafilm™ to seal mobile phase solution bottles.

LC Additive Restrictions

Note If your workflow requires the use of any of these reagents, contact Thermo Fisher Scientific Technical Support for advice.

If you are using an MS with the HPLC system then limit the type of reagents you use:

- Because it reacts with the PEEK™ material, do not use tetrahydrofuran (THF).
- Because these might cause corrosion of the API source, do not use the following:
 - Alkali-metal bases, such as sodium hydroxide (NaOH)
 - Inorganic acids, such as hydrogen chloride (HCl), phosphoric acid (H₃PO₄), or sulfuric acid (H₂SO₄)
- Because these reagents can suppress ionization, do not use the following:
 - Detergent solutions
 - Involatile buffer solutions, such as borate, citrate, or phosphate
 - Surfactants or other surface-active agents, such as polyethylene glycol (PEG), sodium dodecyl sulfate (SDS), or Triton™ X-100
 - Trifluoroacetic acid (TFA) at concentrations (volume/volume %) greater than 0.1

Required and Recommended Solvents

Table 8 lists the components of the Thermo Scientific™ UHPLC-MS Reagents Installation Kit which you need to purchase for the service engineer to use during installation.

Table 8. Required Solvent Kit

Solvent	Grade	Quantity	Part number
Thermo Scientific™ UHPLC-MS Reagents Installation Kit			UHPLCMSKIT
Water	UHPLC-MS grade	2 each Borosilicate 1 L bottles	W8-1
Methanol	UHPLC-MS grade	2 each Borosilicate 1 L bottles	A458-1
Acetonitrile	UHPLC-MS grade	1 each Borosilicate 1 L bottles	A956-1
ChromaCare™ LC-MS Instrument Flush Solution composed of 25% acetonitrile, 25% methanol, 25%, water, and 25% 2-propanol (IPA)	LC-MS grade	1 each Borosilicate 1 L bottles	T11110-1000

3 Installation Requirements

Solvent Requirements and Recommendations

Table 9 lists recommended additives. Refer to the Fisher web (<https://www.fishersci.com/us/en/home.html>) to see a variety of LC/MS- and UHPLC/MS-grade solvents and consumables that are compatible with you system.

Table 9. Recommended Additives

Additive	Grade	Quantity	Part number
Acetic acid (modifier)	Optima LC/MS	Ampule, 1 mL	A113-1AMP
Ammonium acetate (modifier)	Optima LC/MS	Amber glass, 50 g	A114-50
Ammonium formate (modifier)	Optima LC/MS	Amber glass, 50 g	A115-50
Formic acid (modifier)	Optima LC/MS	Ampule, 10 × 1 mL	A117-10X1AMP



CAUTION Avoid exposure to potentially harmful materials.

Read the MSDS or SDS for each chemical you use. Store and handle all chemicals in accordance with standard safety procedures. Always wear protective gloves and safety glasses when you use solvents or corrosives. Also, contain waste streams, use fume hoods to prepare chemicals, and dispose of all laboratory reagents according to the directions in the MSDS or SDS.

By law, producers and suppliers of chemical compounds are required to provide their customers with the most current health and safety information in the form of Material Safety Data Sheets (MSDSs) or Safety Data Sheets (SDSs). The MSDSs and SDSs must be freely available to lab personnel to examine at any time. These data sheets describe the chemicals and summarize information on the hazard and toxicity of specific chemical compounds. They also provide information on the proper handling of compounds, first aid for accidental exposure, and procedures to remedy spills or leaks.

Instrument Shipments

Electronic equipment carriers that specialize in the handling and transport of delicate machinery ship the Vanquish MD HPLC to your site. When the instrument arrives, move it to a protected indoor location. If you have questions about moving your instrument, contact your local office for Thermo Scientific San Jose products (see “[Contacting Us](#)” on [page vii](#)).

- [Receiving Shipping Packages and Reporting Damage](#)
- [Filing a Damage Claim Against the Carrier](#)

Receiving Shipping Packages and Reporting Damage

When the shipment packages arrive, visually inspect them for any damage.

❖ To visually inspect for damage

1. Carefully inspect for obvious damage or evidence of rough handling.
2. If the instrument shipping container, ShockWatch, or other indicators show visible evidence of damage or mishandling, do NOT open the container.
3. Follow the next procedure, and then call your Thermo Fisher Scientific sales representative for further instructions.

❖ To record damages on the receiving documents

1. Read the information in [Filing a Damage Claim Against the Carrier](#) to determine which parties might be responsible for filing a claim against the carrier.
2. On all copies of the receiving documents, note any apparent external damage and briefly describe the extent of the damage.

4 Instrument Shipments

Filing a Damage Claim Against the Carrier

3. Have the driver sign or initial next to your comments to signify agreement with your observations.
4. Report the list of damages to your Thermo Fisher Scientific representative.

CAUTION Freight insurance requires that you note obvious damage on the receiving documents. Thermo Fisher Scientific does not accept liability for damage if materials are received with obvious damage AND the damage is not recorded on the receiving documents.

Filing a Damage Claim Against the Carrier

If the instrument is damaged in transit, the shipment method determines the party who assumes the risk of damage and files a claim against the carrier—Thermo Fisher Scientific or the purchaser. To determine the shipment method for instruments shipped from the San Jose, CA site, check the sales agreement or the sales quote.

Table 10 lists the party who files the damage claim against the carrier for instruments damaged in transit based on the shipment method.

Table 10. Shipment methods for delivery from the San Jose, CA site to domestic and international destinations

Destination	Shipment method	Party responsible for filing a damage claim
Domestic (United States)	Destination or Origin—Thermo Fisher Scientific pays the carrier.	Thermo Fisher Scientific
	Origin—The purchaser pays the carrier.	Purchaser
International	Carriage Paid To (CPT) named destination ^a	Purchaser
	Carriage and Insurance Paid (CIP) to named destination ^b	Thermo Fisher Scientific

^a Unless specified differently, Thermo Fisher Scientific uses this shipment method for international shipments.

^b Under special circumstances, Thermo Fisher Scientific uses this shipment method for international shipments.

Instrument Demonstration

When the field service engineer (FSE) installs the Vanquish MD HPLC system, the FSE demonstrates the instrument. During the installation, the FSE demonstrates the basics of the instrument operation and routine maintenance. To receive maximum benefit from this on-site opportunity, plan for the system operators to be available during the entire process.

IMPORTANT You are responsible to provide the solvents that are required for the Vanquish MD HPLC demonstration.

IMPORTANT Do not use the new system for sample analysis until the installation is complete and you have signed the Acceptance Form.

5 Instrument Demonstration

Line Power Management

The quality of line power (AC mains power system) delivered to the Vanquish MD HPLC can affect its performance and longevity. You are responsible for correcting any line power problems. Contact Thermo Fisher Scientific for assistance in monitoring the line voltage in your lab and in selecting a line conditioner.



CAUTION To support compliance and safety requirements, all devices connected between the power source and the HPLC must be suitably rated and certified by recognized organizations for your country or territory (for example, UL, CSA, SEMKO, VDE, or TÜV).

CAUTION Such devices include the power supply cords, electrical outlets, circuit breakers, uninterruptible power supplies (UPSs), and so on.

- [Power Monitoring Devices](#)
- [Quality of Power](#)

Power Monitoring Devices

Several devices are available to monitor the quality of the line power. These devices provide a continuous record of line performance by analyzing and printing out data for the three most common voltage disturbances. Monitor the power line 24 hours a day for seven consecutive days. If inspection of the printout indicates disturbances, stop the test and take corrective action. Monitor the power again as previously described.

A power line disturbance analyzer detects and records most types of line power problems. The Dranetz™ system¹ is an example of a suitable analyzer. In some countries, you can rent power line analyzers from electrical equipment suppliers.

¹ Thermo Fisher Scientific does not endorse any power monitoring company, nor does it endorse products other than its own. Companies and products listed in this guide are given as examples only.

Quality of Power

Before the service engineer arrives to install your system, the line voltage must be stable and within the recommended specifications. The line voltage must be free of fluctuations due to slow changes in the average sags, surges, transients, or voltage. Establishing the quality of power supplied to the HPLC system is very important for these reasons:

- Constant high-line voltage, impulses, or surges in voltage can cause overheating and component failures.
- Constant low-line voltage or sags in voltage can cause the equipment to function erratically or not at all.
- Transients—even a few microseconds in duration—can cause electronic devices to degrade or fail catastrophically, shortening the lifetime of the equipment.

Addresses

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European Authorized Representative



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