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Vanquish Charger

Operating Manual

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1 Using this Manual

This chapter provides information about this manual, the conventions used throughout the manual, and the reference documentation that is available in addition to this manual.

1.1 About this Manual

This manual describes the functional features and operating principle of your Vanquish™ Charger and provides instructions for installation, set up, start up, shut down, operation, maintenance and troubleshooting.

The layout of this manual is designed to provide quick reference to the sections of interest to the user. To obtain a full understanding of your Charger, read this manual thoroughly.

This manual also contains safety messages, precautionary statements, and special notices that can prevent personal injury, damage to the Charger, or loss of data when followed properly.

Note the following:

- The Charger configuration may vary; therefore, not all descriptions necessarily apply to your particular Charger.
- If some detail applies to only one model or variant, the model or variant is identified by name.
- Illustrations in this manual are provided for basic understanding. They can vary from the actual model of the Charger or component. However, this does not influence the descriptions. No claims can be derived from the illustrations in this manual.

1.2 Conventions

This section describes the conventions that are used throughout this manual.

1.2.1 Safety Messages

The safety messages and precautionary statements in this manual appear as follows:

- Safety messages or precautionary statements that apply to the entire manual and all procedures in this manual are grouped in the Safety chapter.
- Safety messages or precautionary statements that apply to an entire section or to multiple procedures in a section appear at the beginning of the section to which they apply.
- Safety messages that apply to only a particular section or procedure appear in the section or procedure to which they apply. They appear different from the main flow of text.

Safety messages are often preceded by an alert symbol and/or alert word. The alert word appears in uppercase letters and in bold type.

Make sure that you understand and follow all safety messages presented in this manual.

1.2.2 Special Notices and Informational Notes

Special notices and informational notes in this manual appear different from the main flow of text. They appear in boxes and a note label identifies them. The label text appears in uppercase letters and in bold type.

NOTICE Highlights information necessary to prevent damage to the Charger or invalid test results.

TIP Highlights information of general interest or helpful information that can make a task easier or optimize the performance of the Charger.

1.2.3 Typographical Conventions

These typographical conventions apply to the descriptions in this manual:

Data Input and Output

- The following appears in **bold** type:
 - ◆ Input that you enter by the keyboard or that you select with the mouse
 - ◆ Buttons that you click on the screen
 - ◆ Commands that you enter by the keyboard
 - ◆ Names of, for example, dialog boxes, properties, and parameters
- For brevity, long expressions and paths appear in the condensed form, for example: Click **Start > All Programs > Chromeleon 7 > Services Manager > Start Instrument Controller**.

References and Messages

- References to additional documentation appear *italicized*.
- Messages that appear on the screen are identified by quotation marks.

Viewpoint

If not otherwise stated, the expressions *left* and *right* in this manual always refer to the viewpoint of a person that is facing the Charger from the front.

Particularly Important Words

Particularly important words in the main flow of text appear italicized.

Electronic Manual Version (PDF)

The electronic version (PDF) of the manual contains numerous links that you can click to go to other locations within the manual. These include:

- Table of contents entries
- Index entries
- Cross-references (in blue text), for example, to sections and figures

1.3 Reference Documentation

In addition to this operating manual, other documentation is available for reference.

Hardware Documentation

Additional hardware documentation includes the following:

- *Operating manuals* for the other modules of the Vanquish system
A printed version of the manual is shipped with the device.
- *Vanquish System Operating Manual*
A printed version of the manual is shipped with the Vanquish system base and solvent rack.
- *Instrument Installation Qualification Operating Manual*

TIP Electronic versions of these manuals are available as PDF (Portable Document Format) files. To open and read the PDF files, Adobe® Reader® or Adobe® Acrobat® is required.

Software Documentation

Additional software documentation includes the following:

- *Chromeleon™ 7 Help and documents*
The *Chromeleon 7 Help* provides extensive information and comprehensive reference material for all aspects of the software. For basic information about device installation and configuration, refer to the *Installation Guide*; for specific information about a certain device, refer to the *Instrument Configuration Manager Help*. In Chromeleon 7, devices are called modules.

For information about the main elements of the user interface and step-by-step guidance through the most important workflows, refer to the *Quick Start Guide*.

For a concise overview of the most important workflows, refer to the *Reference Card*.

- *Chromeleon™ 6.8 Help*

The *Chromeleon 6.8 Help* provides extensive information for all aspects of the software, including device installation and configuration.

TIP The *Chromeleon* Help and documents are included in the software shipment.

Third-Party Documentation

Refer also to the user documentation provided by the manufacturers of third-party components and materials, for example, Material Safety Data Sheets (MSDSs).

2 Safety

This chapter provides general and specific safety information and informs about the intended use of the Charger.

2.1 Safety Symbols and Signal Words

2.1.1 Safety Symbols and Signal Words in This Manual

This manual contains safety messages to prevent injury of the persons using the Charger. The safety symbols and signal words in this manual include the following:



Always be aware of the safety information. Do not proceed until you have fully understood the information and consider the consequences of what you are doing.



CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



WARNING Indicates a hazardous situation that, if not avoided, could result in serious injury.

2.1.2 Observing this Manual

Observe the following:

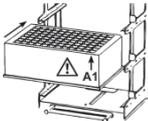
- Before installing or operating the Charger, read this manual carefully to be familiar with the Charger and this manual. The manual contains important information with regard to user safety as well as use and care of the Charger.
- Always keep the manual near the Charger for quick reference.
- Save this manual and pass it on to any subsequent user.



Read, understand, and comply with all safety messages and precautionary statements presented in this manual.

2.1.3 Safety Symbols on the Charger

The table lists the safety symbols that appear on the Charger or on labels affixed to the Charger. Follow the safety notices in this manual to prevent the risk of operator injury or damage to the Charger.

Symbol	Description
	Indicates a potential hazard. Refer to this manual to avoid the risk of personal injury and/or to prevent damage to the device.
I O	Power supply is on Power supply is off
	Indicates that the high LED output (according to IEC 62471:2006) produced by the barcode reader in the device may be harmful to the eyes. Do not use light-focusing instruments for viewing the light output.
	Indicates that liquid reservoirs or any other items must not be placed on top of the Charger.
	Indicates that sample racks and well plates must be placed with position A1 in the front right corner.

2.1.4 Rating Plate/Type Label

The rating plate/type label is present behind the Charger front door, on the left-hand side. The rating plate indicates the serial number, part number, line rating, and the manufacturer's address.

An additional label on the left-hand side of the Charger near the electrical connections indicates the fuse and line rating.

2.2 Intended Use

The Charger is intended to be part of the Vanquish system. The intended use of the Vanquish system is to analyze a mixture of compounds in sample solutions. The Charger is for use by qualified personnel and in laboratory environment only.

The Charger and Vanquish system are intended for laboratory research use only. They are not intended for use in diagnostic procedures.

Laboratory Practice

Thermo Fisher Scientific recommends that the laboratory in which the Vanquish system is used follow best practices for LC analyses. This includes among others:

- Using appropriate standards
- Regularly running calibration prior to reporting results
- Establishing shelf life limits and following them for all consumables used with the system
- Running the system according to the laboratory's verified and validated 'lab developed test' protocol

2.3 Safety Precautions

2.3.1 General Safety Information

All users must observe the general safety information presented in this section and all specific safety messages and precautionary statements elsewhere in this manual during all phases of installation, operation, troubleshooting, maintenance, shutdown, and transport of the Charger.



If the Charger is used in a manner not specified by Thermo Fisher Scientific, the protection provided by the Charger could be impaired. Observe the following:

- Operate the Charger only within its technical specifications.
- Use only the replacement parts and additional components, options, and peripherals specifically authorized and qualified for the Charger by Thermo Fisher Scientific.
- Thermo Fisher Scientific cannot be held liable for any damage, material or otherwise, resulting from inappropriate or improper use of the Charger. If there is any question regarding appropriate usage, contact Thermo Fisher Scientific before proceeding.

Safety Standard

This device is a Safety Class I instrument (provided with terminal for protective grounding). The device has been manufactured and tested according to international safety standards.

2.3.2 Qualification of the Personnel

Observe the information below on the proper qualification of the personnel installing and/or operating the Charger.



Installation by Service Engineer only

Service personnel certified by Thermo Fisher Scientific must perform the installation (for brevity, referred to as Thermo Fisher Scientific service engineer).

General Operation

The Charger is designed to be operated only by trained and qualified personnel in a laboratory environment.

All users must know the hazards presented by the Charger and the substances they are using. All users should observe the related Material Safety Data Sheets (MSDSs).

Instruction of the Operating Personnel

For any operation of this device, the operator must prepare clear and concise written instructions in the language of the operating and cleaning personnel based on this operating manual, applicable safety data sheets, plant hygiene guidelines, and technical regulations.

2.3.3 Personal Protective Equipment

Wear personal protective equipment and follow good laboratory practice to protect you from hazardous substances. The appropriate equipment depends on the hazard. For advice on the hazards and the equipment required for the substances you are using, refer to the material handling and safety data sheet provided by the vendor.



An eyewash facility and a sink should be available nearby. If any substance contacts your skin or eyes, wash the affected area and seek medical attention.

Protective Clothing

To protect you from chemical splashes, harmful liquids, or other contamination, put on appropriate protective clothing, such as a lab coat.

Protective Eyewear

To prevent liquids from striking your eyes, put on appropriate protective eyewear, such as safety glasses with side shields. If there is a risk of splashing liquids, put on goggles.

Gloves

To protect you from harmful liquids and avoid personal injury during maintenance or service, put on appropriate protective gloves.

2.3.4 Electric Safety Precautions



WARNING— Electric Shock or Damage to the Device

High voltages are present inside the device that could cause an electric shock or damage to the device.

- Do not make any changes to the electrical or grounding connections.
- If you suspect any kind of electrical damage, disconnect the power cord and contact Thermo Fisher Scientific Technical Support for assistance.
- Do not open the housing or remove protective panels unless specifically instructed to do so in this manual.
- Do not place liquid reservoirs directly upon the device. Liquid might leak into the device and get into contact with electronic components causing a short circuit. Instead, place liquid reservoirs in the solvent rack that is available for the Vanquish system.

2.3.5 General Residual Hazards

Pay attention to the following general residual hazards when working with the Charger:



WARNING—Hazardous Substances

Solvents, mobile phases, samples, and reagents might contain toxic, carcinogenic, mutagenic, infectious, or otherwise harmful substances. The handling of these substances can pose health and safety risks.

- Be sure that you know the properties of all substances that you are using. Avoid exposure to harmful substances. If you have any doubt about a substance, handle the substance as if it is potentially harmful.
- Wear personal protective equipment as required by the hazard and follow good laboratory practice.
- Reduce the volume of substances to the minimum volume required for sample analysis.
- Do not operate the Charger in a potentially flammable environment.
- Avoid accumulation of harmful substances. Make sure that the installation site is well ventilated.
- Dispose of hazardous waste in an environmentally safe manner that is consistent with local regulations. Follow a regulated, approved waste disposal program.



WARNING—Biohazard

Human-sourced material, for example microorganisms, cell cultures, tissues, body fluids, and other biological agents can transmit infectious diseases. To avoid infections with these agents:

- Assume that all biological substances are at least potentially infectious.
- Wear personal protective equipment as required by the hazard and follow good laboratory practice.
- Dispose of bio-hazardous waste in an environmentally safe manner that is consistent with local regulations. Follow a regulated, approved waste disposal program.

**WARNING—Hazardous Gases**

Mobiles phases and samples might contain volatile or flammable solvents. The handling of these substances can pose health and safety risks.

- Avoid accumulation of these substances. Make sure that the installation site is well ventilated.
- Avoid open flames and sparks. Do not operate the Charger in the presence of flammable gases or fumes.

**WARNING—Flammable and Hazardous Vapors**

Flammable or hazardous vapors can escape from improperly sealed sample containers with flammable or volatile samples, and can accumulate inside the device. This can pose health and safety risks and lead to wrong results.

Observe the following safety guidelines with flammable and volatile samples:

- Use only vials or well plates that are made gas-tight by means of caps, sealing mats, or sealing tapes. Refer to the latest list of closures approved by Thermo Fisher Scientific.
- Inspect vials for cracks or defects before use. Do not use cracked or damaged vials.

**WARNING—Explosion Hazard**

The air gap in the door seal of the Charger is an engineered safety feature designed to provide adequate air exchange inside the Charger. Do not block or modify this port for any reason. Blocking this port may result in the build-up of vapors inside the unit that can result in an explosion hazard.

2.3.6 In Case of Emergency

**WARNING—Safety Hazard**

In case of emergency, disconnect the Charger from the power line.

2.4 Compliance Information

Thermo Fisher Scientific performs complete testing and evaluation of its products to ensure full compliance with applicable domestic and international regulations. When the device is delivered to you, it meets all pertinent electromagnetic compatibility (EMC) and safety standards as described in this manual. For details, see [section 11, page 81](#).

Changes that you make to the device may void compliance with one or more of these EMC and safety standards. Changes to the device include replacing a part or adding components, options, or peripherals not specifically authorized and qualified for the product by Thermo Fisher Scientific. To ensure continued compliance with EMC and safety standards, replacement parts and additional components, options, and peripherals must be ordered from Thermo Fisher Scientific or one of its authorized representatives.

The device has been shipped from the manufacturing site in a safe condition.

3 Charger Overview

This chapter introduces you to the Charger and the main components.

3.1 Charger Features

The Charger stores sample racks and well plates during an analysis, and transfers them to the Vanquish autosampler. It includes the following features:

- A shelf to store sample racks and well plates. Different shelves are available for sample racks and well plates of variable heights.
- A mover to transport sample racks and well plates from their position in the shelf to the autosampler carousel and vice versa.
- A temperature control and airflow system to ensure that the temperature within the compartment remains at a set temperature, such that samples can be stored at suitable thermal conditions.
- A barcode reader to identify barcode-labeled Vanquish sample racks and well plates in the shelf as well as empty shelf positions.
- A sensor to detect if a sample rack or well plate is present on the shovel to prevent the double loading of the shelf, for example, after a power reset.
- An active evaporation system to collect condensation. In case of excessive temperature fluctuations (while cooling and at compartment temperatures below ambient temperature), moisture may condense on the compartment surfaces. To prevent the samples from being humidified, a condensate collector tray traps the condensate and the moisture evaporates from the tray.
- The Charger is designed to be controlled by the Chromeleon Chromatography Data Management System.

3.2 Operating Principle

The mover is the transport system of the Charger. The mover shovel transports sample racks and well plates from the shelf to the free position in the yellow (Y) segment in the autosampler carousel through a transfer opening in the right Charger side panel. In the same way, the mover shovel transports the sample racks and well plates from the autosampler segment Y back into their target position in the shelf.

The picture illustrates how the mover operates:

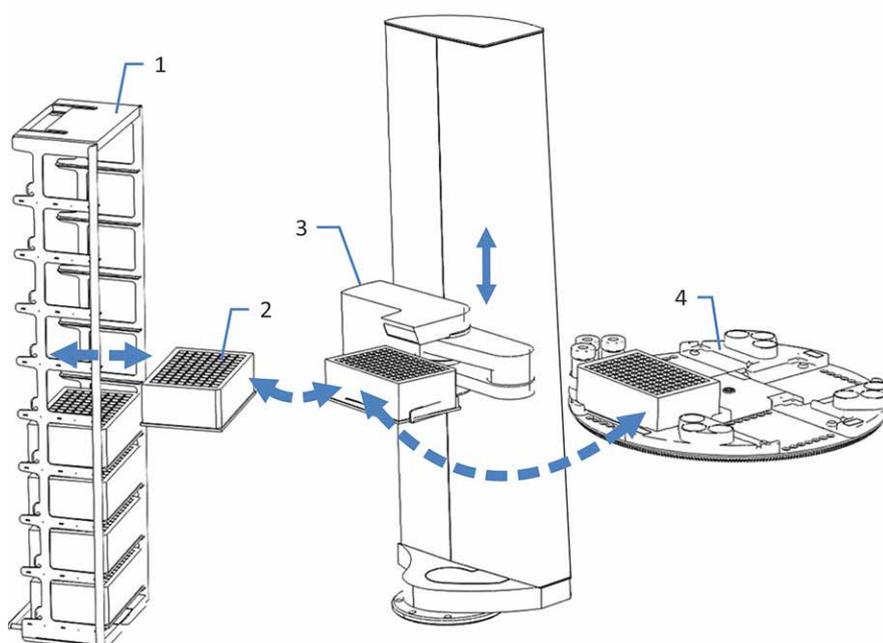


Figure 1: Operating principle

No.	Description
1	Shelf with sample racks and/or well plates (here: deep well plates)
2	Deep well plate being transported
3	Mover
4	Autosampler carousel – the yellow segment (Y) is used for sample racks and well plates delivered from the Charger

3.3 Interior Components

The functional components of the Charger are located directly behind the front door:

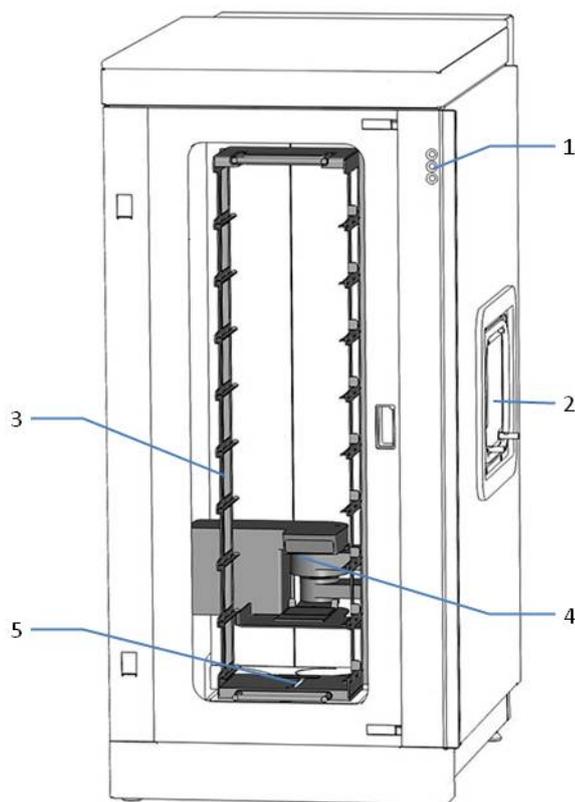


Figure 2: Interior view (door not shown)

No.	Description
1	LED status indicators
2	Transfer opening to autosampler
3	Shelf
4	Mover
5	Shelf locking rail

3.3.1 LED Status Indicators

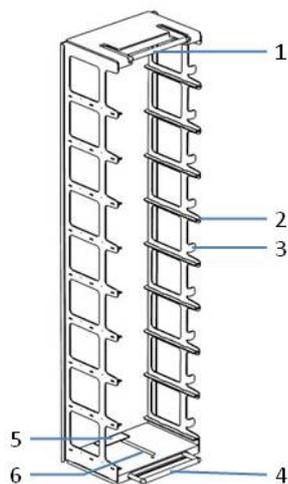
The status indicator LEDs (Light Emitting Diodes) on the front side of the Charger provide general information about the device status. For details, refer to [section 6.3.1 Status Indicators, page 45](#).

3.3.2 Shelf

Sample racks and well plates are placed in a shelf that is mounted on the base plate. The shelf is equipped with several guide rails (levels) to accommodate the sample racks and well plates. Each level is labeled with a number.

Shelves are available for sample racks and well plates of different heights. The vertical distance between two guide rails, the so-called pitch, indicates the clear distance of the sample racks or well plate bottoms in millimeters. When selecting shelves, bear in mind that the selected pitch must exceed the height of the sample container (including cover) by at least 5 mm.

The shelf is not included in shipment and must be ordered separately. For a list of available shelves, refer to [section 10 Accessories, Consumables and Replacement Parts, page 77](#).



No.	Description
1	Top handle
2	Guide rail
3	Level number
4	Bottom handle
5	Shelf ID label
6	Recess for shelf locking rail

Figure 3: Shelf

3.3.3 Mover

The mover is the transport system of the Charger. For details on how the mover operates, refer to [section 3.2 Operating Principle, page 27](#).

The mover is equipped with a barcode reader to identify sample racks and well plates in the shelf as well as empty positions.

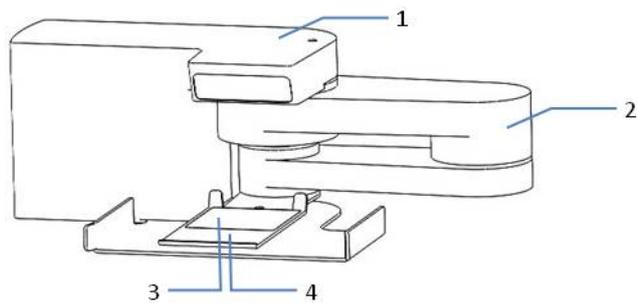


Figure 4: Mover

No.	Description
1	Barcode reader
2	Swivel arm
3	Shovel ID label
4	Shovel

3.4 Device Connections

Charger Connectors

The following connectors are provided on the rear upper corner of the left side panel for power line connection and for USB connection:

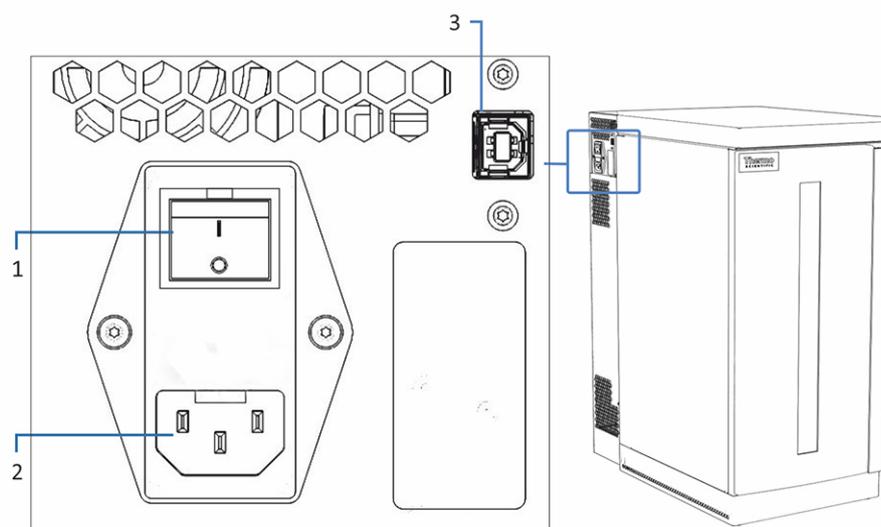


Figure 5: Side view showing device connectors

No.	Description
1	Main power switch (on/off control) with fuse holder
2	Power-inlet connector
3	USB (Universal Serial Bus) port ("B" type connector) Allows connection to other modules in the Vanquish system or the computer on which the data management system, such as Chromeleon, is installed.

TIP Thermo Fisher Scientific recommends using the USB ports only as described above. If the USB ports are used for any other purpose, Thermo Fisher Scientific cannot ensure proper functionality.

3.5 Operation

The Charger is designed to be operated from a computer configured with the Chromeleon Chromatography Data Management System. The Chromeleon software provides complete instrument control, data acquisition, and data management.

For a basic description of instrument control and automated sample analysis with Chromeleon, refer to the *Vanquish System Operating Manual*. Details on control and operation of the Charger are available in the *Chromeleon Help*.

TIP The Charger can be operated also with other data systems, such as Xcalibur™. In this case, installation of additional software is required in addition to the data system software. For details, contact the Thermo Fisher Scientific sales organization.

To control the Charger, a Vanquish autosampler must be installed and configured in Chromeleon. All functions for controlling the Charger are part of the autosampler control interface.

4 Unpacking and Transport

This chapter provides information for unpacking and moving the Charger and informs you about the scope of delivery.

4.1 Unpacking and Moving

Damaged Packaging, Defective on Arrival

Inspect the shipping container for signs of external damage and, after unpacking, inspect the Charger for any signs of mechanical damage that might have occurred during shipment.

If you suspect that the Charger may have been damaged during shipment, immediately notify the incoming carrier and Thermo Fisher Scientific about the damage. Shipping insurance will compensate for the damage only if reported immediately.

Unpacking the Charger



CAUTION—Heavy Load, Bulky Device

The Charger is too heavy or bulky for one person alone to handle safely. To avoid personal injury or damage to the Charger, observe the following guidelines:

- Physical handling of the Charger, including lifting or moving, requires a team effort of two persons.
- To lift or move the Charger, grasp the Charger by the sides. Do not move or lift the Charger by the front door. This will damage the door or the Charger.

To unpack the Charger, follow these steps:

1. Place the shipping container on the floor. Remove the top cover.
2. Remove the accessories.
3. Remove the upper foam spacers from the Charger and remove the side walls of the shipping card box toward the top.
4. Remove the polyethylene packaging.
5. Slowly and carefully, lift the Charger out of the shipping container. Never lift the Charger only by the foam spacers or the front door.
6. Place the Charger on a stable surface.

A Thermo Fisher Scientific service engineer must take over at this point for further steps and installation.

TIP Save the shipping container and all packing material. These items will be needed if the Charger is shipped or moved to a new location.

Moving the Charger after Unpacking

If you have to move the Charger after it has been set up and installed in the Vanquish system, prepare the Charger for transport and move it to the new location. Follow the instructions in [section 7.5 Transporting or Shipping the Charger](#), page 62.

4.2 Scope of Delivery

The following items are included in the delivery:

- Vanquish Charger
- Installation Kit including adapter frame for attaching the Charger to the Vanquish autosampler
- USB cable (with ferrite bead)
- Power cord
- Printed operating manual
- Printed installation manual

For reordering information, see [section 10 Accessories, Consumables and Replacement Parts, page 77](#).

5 Installation

This chapter specifies the requirements for the installation site.

5.1 Safety Guidelines for Installation

Pay attention to the following safety guidelines:



Installation by Service Engineer only

Service personnel certified by Thermo Fisher Scientific must perform the installation (for brevity, referred to as Thermo Fisher Scientific service engineer).

Observe all warning messages and precautionary statements presented in [section 2.3 Safety Precautions](#) (see [page 19](#)).



CAUTION—Heavy Load, Bulky Device

The Charger is too heavy or bulky for one person alone to handle safely. To avoid personal injury or damage to the Charger, observe the following guidelines:

- Physical handling of the Charger, including lifting or moving, requires a team effort of two persons.
- To lift or move the Charger, grasp the Charger by the sides. Do not move or lift the Charger by the front door. This will damage the door or the Charger.

5.2 Site Requirements

The operating environment is important to ensure optimal performance of the Charger. This section provides important requirements for the installation site. Note the following:

- Operate the Charger only under appropriate laboratory conditions.
- The Charger is intended to be part of the Vanquish system. Observe the site requirements for the Vanquish system as stated in the *Vanquish System Operating Manual*.
- For specifications, see the *Specifications* section in this operating manual and the *Operating Manuals* for the other modules in the Vanquish system.

Power Considerations

The power supply of the device has wide-ranging capability, accepting any line voltage in the range specified for the device.



CAUTION—Electric Shock or Damage to the Device

- Connecting the device to a line voltage higher or lower than specified could result in personal injury or damage to the device. Therefore, connect the device to the specified line voltage only.
- Never connect the device to a power socket that is shared with other equipment (for example, multiple sockets).
- Do not use extensions cords.
- After the power to the device is turned off, the device is still energized as long as the power cord is connected. Repair work on the device while the device is connected to power could lead to personal injury. Therefore, always unplug the power cord before starting repair work inside the device. If you were instructed to remove any covers or panels, do not connect the power cord to the device while the cover or panels are removed.

Power Cord

The power cords are designed to match the wall socket requirements of the country in which they are used. The end of the power cords that plugs into the power socket on the device is identical for all power cords. The end of the power cords that plugs into the wall socket is different.



WARNING—Electric Shock or Damage to the Device

- Never use a power cord other than the power cords provided by Thermo Fisher Scientific for the device.
- Only use a power cord that is designed for the country in which you use the device.
- Do not use extensions cords.
- Never plug the power cord to a power socket that is shared with other equipment (for example, multiple sockets).
- Operate the device only from a power outlet that has a protective ground connection.
- In case of emergency, it must be possible to reach the power cord easily at any time to disconnect the device from the power line.



WARNING—Electric Shock or Damage to a Product

Misuse of the power cords could cause personal injury or damage the instrument. Use the power cords provided by Thermo Fisher Scientific only for the purpose for which they are intended. Do not use them for any other purpose, for example, for connecting other instruments.

Condensation

NOTICE Condensation in the device can damage the electronics. Therefore, when using, shipping, or storing the device, avoid or minimize conditions that can lead to a build-up of condensation in the device. For example, avoid significant or fast changes in environmental conditions. If you suspect that condensation is present, allow the device to warm up to room temperature. This may take several hours. Wait until the condensation is gone completely before connecting the Charger to the power line.

6 Operation

This chapter describes the elements for Charger control, provides information on routine operation and on shutdown.

6.1 Introduction to this Chapter

The information in this chapter assumes that the initial setup of the Charger has already been completed. If this is not the case, contact Thermo Fisher Scientific Technical Support for assistance.

For a basic description of instrument control and automated sample analysis with Chromeleon, refer to the *Vanquish System Operating Manual*. Details on control and operation of the Charger are available in the *Chromeleon Help*.

6.2 Safety Guidelines for Operation

When operating the Charger, pay attention to the following safety guidelines:



Observe all warning messages and precautionary statements presented in [section 2.3 Safety Precautions](#) (see [page 19](#)).



CAUTION—Moving Parts

Parts inside the Charger are moving when the device is operating and can cause minor injury. Do not open the door during the phases when parts inside the Charger are moving. During these phases, the **Mover Status** LED on the Charger is blinking green.



CAUTION—High Luminosity of Barcode Reader

The high luminosity produced by the LED inside the barcode reader can cause serious eye injury. Do not use light-focusing instruments for viewing the light output.



WARNING—Flammable and Hazardous Vapors from Spills

Flammable or hazardous vapors from sample spills can accumulate inside the device. This can pose health and safety risks.

- Follow the guidelines for preventing spills below.
- If a spill occurs inside the Charger, turn the Charger power off. Clean up the spill and leave the Charger door open. Allow sufficient time for the spill to dry and any vapors to disperse before putting the Charger back into use.

To prevent spills, follow these guidelines:

- Ensure that well plates and sample racks are properly positioned inside the shelf.
- Ensure that the shelf is properly mounted on the shelf locking rail.

- Do not open the door and remove the shelf during the phases when parts inside the Charger are moving. During these phases, the **Mover Status** LED on the Charger is blinking green.
- Do not place liquid reservoirs or any other items on top of the Charger.

6.3 Control Elements

The Charger is designed to be operated from a computer running with the chromatography software.

In addition, status indicator LEDs on the front panel of the Charger provide a quick visual check of the operational status of the device.

6.3.1 Status Indicators

The status indicator LEDs at the front side of the Charger provide information about the device status.

LED	Status	Description
Power LED	Off Green	Indicates the overall power status of the Charger. The LED is green when device power is on and unlit when power is off.
Mover Status LED	Off Green blinking Green Red	Indicates the status of the Charger mover: The LED is unlit when the mover motor power is off. Green blinking: the mover is performing a command from the software, a start-up routine, or an inventory scan and is therefore not ready Green: mover motor power is on and the mover is ready to move; it is safe to open the door during this time Red: the mover is in error state
Connect/Equil LED	Off Yellow Green blinking Green	Indicates the connect status and equilibration status of the Charger. The LED is unlit when the Charger is not connected to the software. Yellow: the Charger is connected to the software, temperature control is turned off Green blinking: the Charger is connected to the software and equilibrating (target temperature has not been reached) Green: the Charger is connected to the software, and the target temperature has been reached.

6.3.2 Power Switch

The power switch on the left side of the Charger is the main switch for on/off control. Turn the power off when instructed to do so in this manual; for example, before performing a maintenance procedure. The Charger *cannot* be turned on or off with the power button on the Vanquish system base.

TIP The Charger door is equipped with a mechanism that opens the door automatically when the Charger is turned off. The door cannot be closed while power is off.

6.4 Preparing the Charger for Operation

This section gives information on any additional steps that are required to prepare the Charger for operation and sample analysis.

Before Starting Sample Analysis

- Set the target temperature and wait until the temperature has been reached (see [section 6.4.1, page 47](#)).
- Load the sample racks or well plates (see [section 6.4.2, page 48](#)).
- Verify that the Charger door is closed.
- Select a rack type in Chromeleon, if applicable (see [section 6.4.3, page 52](#)).
- Make sure that the chromatography system is properly equilibrated. For more information, refer to the *Vanquish System Operating Manual*.

6.4.1 Temperature Control in the Charger Compartment

Define the following parameters if you want to use temperature control inside the Charger compartment to maintain the samples as required. The same setting is used to control the Charger compartment temperature and autosampler compartment temperature.

- The target temperature (**Temperature.Nominal**) for the Charger compartment. Setting a nominal temperature automatically turns on temperature control (**TempCtrl = On**).
- The maximum allowed deviation (**ReadyTempDelta**) between the target temperature and the actual temperature of the Charger. If the temperature deviates from the target temperature by more than the maximum allowed deviation, the Charger is not ready to operate.

You can deactivate this feature by setting the allowed deviation to **0**.

Keep the door closed until the target temperature has been reached.

Note that in case of excessive ambient conditions (while cooling and at set temperatures below ambient), condensation might appear temporarily on the outside of the Charger door.

6.4.2 Loading Sample Racks or Well Plates



WARNING—Flammable and Hazardous Vapors

Flammable or hazardous vapors can escape from improperly sealed sample containers with flammable or volatile samples, and can accumulate inside the device. This can pose health and safety risks and lead to wrong results.

Observe the following safety guidelines with flammable and volatile samples:

- Use only vials or well plates that are made gas-tight by means of caps, sealing mats, or sealing tapes. Refer to the latest list of closures approved by Thermo Fisher Scientific.
- Inspect vials for cracks or defects before use. Do not use cracked or damaged vials.

Opening the Front Door

When operating the Charger, you will need to open the front door, for example, to place or remove the shelf or load or unload sample racks and well plates. Note the following:

- Before you open the door, check the **Mover Status** LED on the front panel. Avoid opening the door when the **Mover Status** LED is blinking green. This indicates that the mover is currently executing an operation.
- When you open the door while the mover is executing an operation, the mover will finish the current movement and will then stop.
- It is not possible to issue any commands from Chromeleon while the door is open. Also, an open door may delay the processing of a queue.

To open the front door, slightly pull on the door.

If you must move the mover manually after you have opened the door, gently push the mover into a safe position. Do not use any great force when moving the mover by hand.

Placing the Shelf inside the Compartment

TIP You can either place the shelf inside the Charger first, and then load the sample racks or well plates, or you can first load the sample racks or well plates in the shelf, and then place the shelf inside the Charger.

1. Hold the shelf by the top and bottom handles and slide it on the shelf locking rail on the base plate (see Figure 6). A recess for the shelf locking rail is provided on the bottom side of the shelf.
2. Verify that the shelf has properly clicked into place on the shelf locking rail.

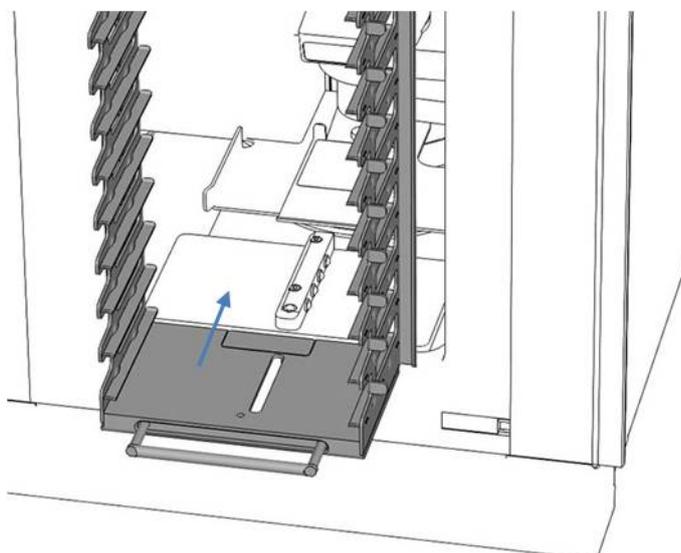


Figure 6: Placing the shelf

The Charger will automatically detect the shelf type after the door has been closed, and Chromeleon displays the number of available levels.

Placing Sample Racks or Well Plates in the Shelf

A barcode reader allows rack type identification of Vanquish sample racks and well plates with a barcode for rack type identification as shown in Figure 7.

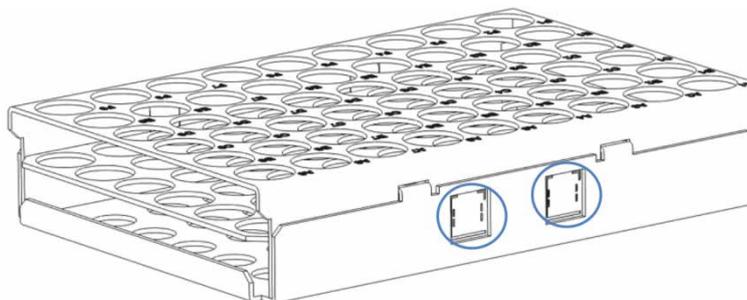


Figure 7: Sample rack with barcodes for rack type identification



CAUTION—Positioning of Sample Racks or Well Plates without Barcode

Sample racks and well plates without a special Vanquish barcode may easily be placed the wrong way around, but Chromeleon cannot detect the incorrect orientation. This may result in a safety hazard.

- Preferably, use Vanquish sample racks and well plates with a barcode for rack type identification, as this allows the software to check the correct orientation. Refer to the current list of sample racks and well plates approved by Thermo Fisher Scientific.
- When you place sample racks and well plates without such barcodes, double-check the correct positioning as described in this section.

The shelf is equipped with several guide rails (levels) to accommodate the sample racks and well plates. Each level is labeled with a number. This level number is used for defining the sample positions in Chromeleon.

1. If you use sample racks, place the vials in the sample rack.
2. Place each sample rack or well plate on a free shelf level so that position A1 is at the front right-hand corner as shown in the figure.

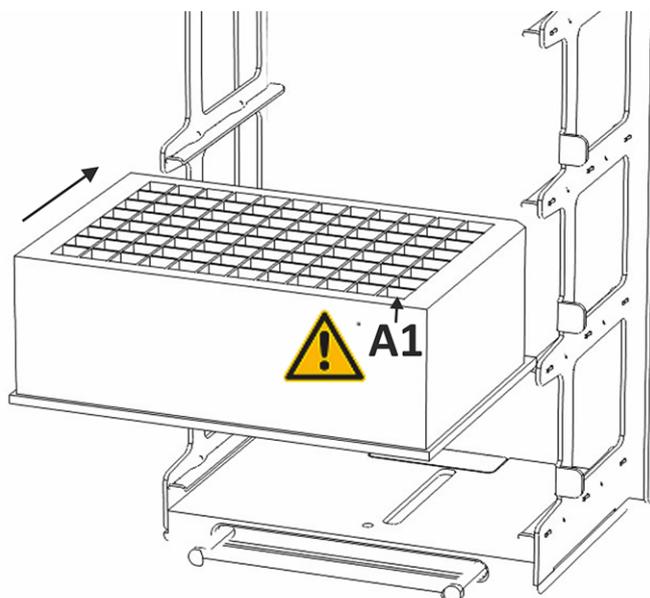


Figure 8: Placing the sample racks or well plates

3. Verify that well plates and sample racks are properly positioned on the guide rails of the shelf. The edge of the sample rack or well plate must not extend beyond the stops at the front and rear of the guide rail.

TIP Check the Chromeleon 7 ePanel or Chromeleon 6.80 panel for the Charger for sample rack and well plate information. This may be helpful, for example, to find out which shelf levels are free to place a new sample rack or well plate.

Closing the Front Door

After you have closed the door, the Charger will perform a startup routine and inventory scan. The mover moves down to the bottom of the shelf and flashes its barcode reader. Once the inventory scan has completed, the **Mover Status** LED on the front panel turns from blinking green to green.

Notes on Loading the Carousel of the Autosampler

NOTICE The Charger delivers sample racks and well plates to segment Y. Observe the following to avoid operating problems and damages:

- Always leave segment Y (yellow) of the autosampler carousel empty.
- Do not manually remove any sample racks or well plates from segment Y during normal operation.

6.4.3 Selecting the Rack Type

The Charger automatically detects the container type for Vanquish sample racks and well plates with a barcode for rack type identification, and the software calculates the correct autosampler needle position. You do not have to select a rack type. However, you must select a rack type for sample racks and well plates without such a barcode.

For details how to select the rack type, refer to the *Chromeleon Help*.

6.5 Important Settings for Operation

The parameters described in this section should be considered for routine operation of the Charger. You can access these parameters from the Chromeleon user interface. For more information, refer to *Chromeleon Help and documents*.

Setting	Description
Temperature Control On/Off	Activate and deactivate temperature control inside the compartment.
Nominal Temperature	The target temperature for the autosampler and Charger compartments. Setting a nominal temperature automatically turns on temperature control.
Ready Temperature Delta	The maximum allowed deviation between the nominal temperature and the actual temperature. If the temperature deviates from the nominal temperature by more than the maximum allowed deviation, the Charger is not ready to operate. If set to None , Chromeleon does not check whether the nominal temperature deviates from the actual temperature.
Reset Temperature History	Resets the temperature history. The temperature history logs minimum and maximum temperatures of the Charger compartment since the last reset.
Rack Type CHXX	Indicates the type of the sample rack or well plate that is located at level # 1 (RackType_CH01) to level # 20 (RackType_CH20), as recognized during rack identification. If the indicated rack type is Unknown , select the correct rack type from the list. If no sample rack or well plate is installed in the respective level, the rack type is displayed as Empty .
Sample Position	The sample position identifies the position from which the autosampler needle draws the sample. It consists of the Charger level number and the position on the sample rack or well plate (for example, CH01:E8).
Light Mode	Determines the behavior of the compartment light. In automatic mode, the light is dimmed when the door is closed, and on when the door is open. You can select whether to always have the light dimmed, on, or off.
Reset	Resets the internal Charger and autosampler control information. This may be required, for example, if a rack had to be removed manually from segment Y.

6.6 Shutting Down the Charger

If the Charger will not be operated for a short or longer period of time, follow the instructions on shutting down the Charger in the following section.

Shut down the Charger if the autosampler is shut down, too. If the autosampler is operating, leave the Charger turned on to ensure that temperature control remains effective.

Shutting Down the Charger

To shut down the Charger, follow the instructions below.

1. Remove the shelf and any samples from the Charger compartment.
2. Turn off the Charger.
3. *(If you plan to interrupt operation for a longer period)* Disconnect the power cord.
4. Clean the inside of the Charger compartment if necessary (see [section 7.3.2 Cleaning the Charger, page 59](#)).
5. Leave the Charger door open.
6. If you want to move the Charger to a new location or if you need to ship the Charger, follow the instructions in [section 7.5 Transporting or Shipping the Charger, page 62](#).

TIP The Charger door is equipped with a mechanism that opens the door automatically when the Charger is turned off. The door cannot be closed while power is off.

Restarting the Charger

To restart the Charger, follow these steps:

1. Reconnect the power cord if necessary and turn on the Charger.
2. Prepare the Charger for operation (see [section 6.4 Preparing the Charger for Operation, page 47](#)).

7 Maintenance

This chapter describes the routine maintenance procedures that the user may perform.

7.1 Introduction to Maintenance

This chapter describes the routine maintenance procedures that the user may perform.



Additional maintenance or service procedures must be performed only by service personnel certified by Thermo Fisher Scientific (for brevity, referred to as Thermo Fisher Scientific service personnel).

7.2 Safety Guidelines for Maintenance

When performing maintenance procedures, pay attention to the following safety guidelines:



Observe all warning messages and precautionary statements presented in [section 2.3 Safety Precautions, page 19](#).



WARNING—High Voltage

High voltages are present inside the Charger that could cause an electric shock. Do not open the housing or remove protective panels unless specifically instructed to do so in this manual.

7.3 Routine and Preventive Maintenance

Optimum Charger performance, maximum uptime of the Charger, and accurate results can be obtained only if the Charger is in good condition and properly maintained.

7.3.1 Maintenance Plan

Perform the maintenance procedures in the table on a regular basis. The frequency given in the table is a suggestion. The optimum frequency for maintenance depends on several factors, such as the types and amounts of samples and solvents used with the Charger.

Frequency	What you should do...
Daily	Inspect vials and well plates inside the Charger for cracks or defects. Clean up spills if necessary.
Regularly	Clean the Charger (see section 7.3.2 Cleaning the Charger, page 59).
	Check that all warning labels are still present on the Charger and clearly legible. If they are not, contact Thermo Fisher Scientific for replacement.
	Check that the ID labels on the shovel and shelves are still present and clearly legible. If they are not, contact Thermo Fisher Scientific for replacement.
Annually	Have Thermo Fisher Scientific service personnel perform preventive maintenance once a year.

7.3.2 Cleaning the Charger

Before you start the cleaning procedure, remove the shelf and any samples from the Charger compartment and turn off the Charger.

To keep the Charger surfaces clean, wipe the surfaces with a dry, soft, lint-free cloth or paper. If necessary, slightly dampen the cloth with a solution of lukewarm water and conventional dishwashing detergent, or a special laboratory cleaning detergent. Afterward, wipe the cleaned surfaces with clear water to ensure that all cleaning detergent residues have been removed. Wipe the surfaces dry using a soft, lint-free cloth.

NOTICE Observe the following:

- Some Charger components are made of plastic. Solvents may dissolve plastics. Powerful acids or lyes may cause embrittlement of the plastics. For cleaning the plastic components and surfaces, do not use hydrocarbon-containing solvents, cleaning agents with an alcohol content of more than 10 %, or powerful acids and lyes.
 - All outer surfaces of the system are resistant to weak acids, alkali, and organic solvents. Nevertheless, wipe up all liquids spilled onto the system immediately. If surfaces are exposed for longer periods, these liquids can cause damage.
 - Prevent cleaning detergent from entering the flow path.
 - Never use sharp tools or brushes for cleaning any surfaces.
 - Do not use excessively wetted cloth or paper for cleaning. Prevent any liquids from entering the functional components of the Charger. Liquids might cause a short circuit when getting in contact with the electronic components.
-

7.4 Updating the Charger Firmware

When

Updating the Charger firmware might be required, for example, when a new firmware version is released that adds functionality or solves problems of an older version.

Items required

Firmware version/Chromeleon Service Release as appropriate

TIP When a new firmware version is released, the new version will be included in the next available Chromeleon Service Release. The new firmware will *not* be transferred automatically to the device when you install the Chromeleon Service Release.

Preparations

- Read the release notes provided with the firmware and/or Chromeleon Service release
- Verify the following:
 - ◆ The **Charger** check box on the **General** page of the Vanquish Autosampler configuration is selected.
 - ◆ The autosampler is connected in Chromeleon.
 - ◆ All operations on the instrument (Chromeleon 7) or timebase (Chromeleon 6.8) that includes the autosampler (with Charger) have been stopped. The instrument or timebase is idle.
- Verify that the mover is idle (**Charger Status = Idle**, the **Mover Status** LED is *not* blinking green).

Follow these steps

1. Start the Chromeleon 7 Instrument Configuration Manager or the Chromeleon 6.8 Server Configuration program.
2. Perform a firmware update from the **General** tab page in the configuration dialog box for the Charger. For details, refer to the Chromeleon Help.

NOTICE A firmware downgrade or incomplete firmware update may result in loss of functionality or malfunctioning of the Charger.

- Do not interrupt communication between Chromeleon and the Charger at any time during the procedure.
- At the beginning of the update process, a message appears showing the firmware version currently installed in the Charger and the version that will be transferred from Chromeleon. If the firmware installed in the Charger is a newer version than the version in Chromeleon, cancel the download.

The firmware update for the Charger usually takes longer than a firmware update for the other Vanquish modules, usually up to a few minutes.

- Monitor the Audit Trail of the Chromeleon Instrument Configuration Manager (or Server Configuration program) to find out if the firmware update was successful or failed.
- If the firmware update failed, turn the device off and on again and repeat the firmware update.
- If the firmware update fails repeatedly, contact Thermo Fisher Scientific Technical Support for assistance.

7.5 Transporting or Shipping the Charger

If you want to transport the Charger to a new location or if you need to ship the Charger, first prepare the Charger for transport and then move or ship the Charger as required. Follow the instructions in this section.

Observe the following safety guidelines:



Installation by Service Engineer only

Service personnel certified by Thermo Fisher Scientific must perform the installation (for brevity, referred to as Thermo Fisher Scientific service engineer).

If it is required to re-attach the Charger to the Vanquish autosampler after transport, contact Thermo Fisher Scientific Technical Support for assistance.

Observe all warning messages and precautionary statements presented in [section 2.3 Safety Precautions](#) (see [page 19](#)).



CAUTION—Heavy Load, Bulky Device

The Charger is too heavy or bulky for one person alone to handle safely. To avoid personal injury or damage to the Charger, observe the following guidelines:

- Physical handling of the Charger, including lifting or moving, requires a team effort of two persons.
- To lift or move the Charger, grasp the Charger by the sides. Do not move or lift the Charger by the front door. This will damage the door or the Charger.

Preparing the Charger for Transport

To prepare the Charger for transport, follow these steps:

1. Shut down the Charger as described in [section 6.6, page 54](#). In particular, verify that the shelf and any samples were removed from the Charger compartment before you continue.
2. Disconnect the power cord.

3. Disconnect the USB cable.
4. Open the front door so that you can access the transfer opening to the autosampler on the right-hand side. Remove the four screws next to the transfer opening that fix the Charger to the autosampler shown in [Figure 9](#).

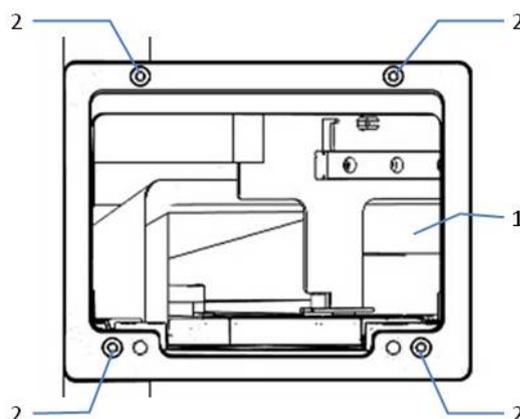


Figure 9: Screws attaching the Charger to the autosampler

No.	Description
1	Transfer opening
2	Screws fixing the Charger to the autosampler

5. Follow the steps below to protect the mover during shipment using the original shipping lock screws and foam parts that were removed during initial installation:
 - a) Place foam part 1 ([see Figure 10](#)) below the mover arm and lower the mover arm to the lowest position, such that the shovel and mover arm rest in the cavities of the foam part.

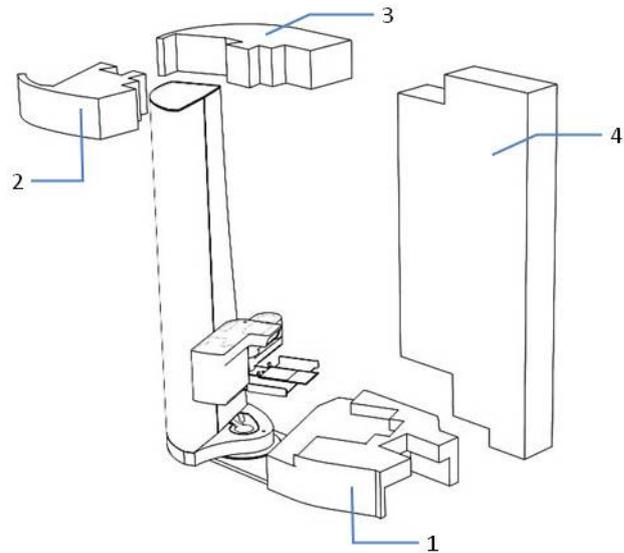


Figure 10: Installing the foam parts

- b) Mount the two shipping lock screws that secure the mover during transport as shown in Figure 11.

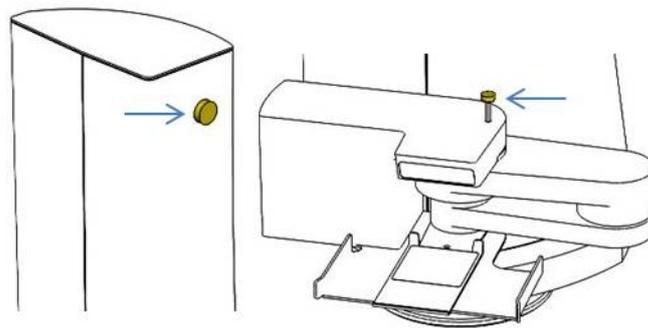


Figure 11: Shipping lock screws securing the mover

- c) Install foam parts 2, 3, and 4 as shown in Figure 10.

6. Remove the Charger from the Vanquish system.

NOTICE Always fix the shipping lock screws before moving or shipping the Charger. Transporting the Charger without fixing the shipping lock screws will damage the device.

Transporting the Charger

The Charger must be transported in upright position under the following conditions:

- The shelf and all sample racks or well plates have been removed from the compartment.
- The mover shovel has been lowered to the lowest position, and the mover is secured with the shipping lock screws and foam parts.
- The front door is secured for transport.

Shipping the Charger

To ship the Charger, follow these steps:

1. Follow the unpacking instructions in this manual in the reverse order.
Use only the original packing material and shipping container. If the original shipping container is not available, appropriate containers and packing material can be ordered from the Thermo Fisher Scientific sales organization.
2. If you need to return the Charger to Thermo Fisher Scientific for depot repair, contact your local Thermo Fisher Scientific support organization for the appropriate procedure.



CAUTION—Possible Contamination

Hazardous substances may have contaminated the device during operation and may cause personal injury to service personnel.

- Decontaminate all parts of the device that you want to return for repair.
- Fill in and sign the Decontamination Certificate, which is part of the Service Return Form. Sign the certificate to confirm that the device has been properly decontaminated and that it is free of hazardous substances.
- Thermo Fisher Scientific refuses to accept devices for repair if the Decontamination Certificate is missing.

8 Troubleshooting

This chapter is a guide to troubleshooting issues that may arise during operation of the Charger.

8.1 General Information about Troubleshooting

The following features help you to identify and eliminate the source for problems that may arise during operation of the Charger.

TIP For information about operating problems that might occur during the operation of a Vanquish system, refer to the *Vanquish System Operating Manual*.

If you are unable to resolve a problem following the instructions given here or if you experience problems that are not covered in this section, contact Thermo Fisher Scientific Technical Support for assistance. See the contact information at the beginning of this manual.

To facilitate device identification have the serial number and technical name available when communicating with Thermo Fisher Scientific.

Status Indicators

The status indicator LEDs on the front side of the Charger provide quick visual feedback on the operational status of the device.

If the firmware detects a problem, the **Mover Status** LED on the front side is red and the problem is reported to Chromeleon. The related message is displayed in the Audit Trail. For possible causes and recommended remedial actions, see [section 8.2 Messages, page 70](#).

The **Connect/Equil** LED on the front side is unlit when the Charger is not connected. If the LED is unlit during operation, this may indicate a problem with the connection to the computer. In this case, check the USB cable and connection to the computer.

Chromeleon Audit Trail

Chromeleon logs information about all events related to instrument operation for the current day in an Audit Trail. The Audit Trail is named with the current date, using the format `yyyymmdd`. For example, the Audit Trail for May 15, 2013, is named `20130515`.

- *Chromeleon 7*: The Instrument Audit Trails can be found on the ePanel Set (Audit ePanel). In addition, Audit Trails for each instrument are available in the Chromeleon 7 Console Data view, in the folder of the instrument.
- *Chromeleon 6.8*: The Daily Audit Trails can be found on the panel tabset (Sequence Control panel). In addition, Daily Audit Trails are available in the Browser, in the folder of the timebase.

Messages in the Chromeleon Audit Trail are preceded by an icon. The icon identifies the seriousness of the problem. The table shows the icons and explains the severity level. You can change the severity level for a problem as appropriate.

Icon	Severity	Description
	Warning	<ul style="list-style-type: none"> • The queue (Chromeleon 7) or batch (Chromeleon 6.8) can be started. • The current run is not interrupted. Nevertheless, Thermo Fisher Scientific recommends taking appropriate remedial action to resolve the problem.
	Error	The software attempts to correct the problem. An error does not interrupt the current analysis. However, if the error occurs during the Ready Check, the analysis will not be started.
	Abort	<ul style="list-style-type: none"> • The queue (Chromeleon 7) or batch (Chromeleon 6.8) cannot be started. • A running queue or batch is stopped immediately.

For possible causes and recommended remedial actions, see [section 8.2 Messages, page 70](#).

8.2 Messages

The table lists the most frequently observed messages for the Charger and provides troubleshooting assistance. If you are unable to resolve the problem following the instructions, contact Technical Support for assistance.

TIP If a message appears in the Audit Trail that is not listed in the table, write down the code and wording of the message. If you are unable to resolve the problem, contact Thermo Fisher Scientific Technical Support for assistance.

TIP You may have to move the mover manually after you have opened the door to remedy a situation. Do not use any great force when moving the mover by hand.

Message	Description and Remedial Action
A collision occurred during movement.	<p>The mover hit something or got caught on something during movement. This can happen if a sample rack or well plates is incorrectly placed on the shelf or autosampler segment, or if something has fallen into the Charger.</p> <p>Open the Charger door and remove the shelf to identify the cause. Check that all sample racks and well plates are placed correctly in the shelf (see page 50). If a sample rack or well plate or other object has fallen into the compartment, remove it. Check the compartment for spills and clean it if necessary. Check if anything is potentially blocking segment Y in the autosampler.</p> <p>If there is no obvious reason, the autosampler could be out of position. In this case, contact Thermo Fisher Scientific Technical Support.</p>
<p>An error occurred while trying to load a rack from a shelf position. or</p> <p>An error occurred while trying to load a rack from the sampler's carousel. or</p> <p>An error occurred while trying to place a rack in a shelf position. or</p> <p>An error occurred while trying to move a rack onto the sampler's carousel.</p>	<p>Check to see if anything is potentially blocking the Charger or autosampler. If there is a sample rack or well plate on the shovel, remove it manually before closing the door.</p>

Message	Description and Remedial Action
A rack was placed at shelf position {0:d} but this position is reserved for a rack that is currently in the sampler unit for injection. Remove that rack immediately from the charger or an error will occur as soon as the rack in the sampler is moved back to the shelf.	Remove the sample rack or well plate immediately from the Charger. Otherwise, an error will occur as soon as the sample rack in the autosampler is moved back to the shelf.
Cannot get rack. There is already a rack on the shovel.	The Charger received a command to pick a sample rack or well plate up, but already has a sample rack or well plate in its shovel. Open the Charger door and remove the shelf to identify the cause. If there is a sample rack or well plate on the shovel, place it back on the shelf or remove it.
Cannot place rack. No rack on shovel.	The Charger is trying to put a sample rack or well plate down and cannot detect the sample rack or well plate on the shovel. Open the Charger door and remove the shelf to identify the cause. If a sample rack or well plate got caught while the Charger tried to pick it up, place the sample rack or well plate back on the shelf.
Cannot read current rack list because the door is open. Rack list will be updated as soon as the door has been closed and the inventory scan has finished successfully.	Verify that the door is closed properly.
Charger communication error.	Check the USB connection from the Charger to the computer. If the Charger uses a USB hub on another system module, check that the module that provides the hub is turned on. Disconnect and reconnect the device in Chromeleon and execute the ClearError command. If the error persists, turn the device off, wait for 5 seconds and turn it on again.
Current list of racks cannot be read. The device reports that a rack is still placed on the shovel. Remove that rack first before trying a new inventory scan.	Open the Charger door and remove the shelf to find out about the cause. If there is a sample rack or well plate on the shovel, place it back in the shelf or remove it. Close the door and wait for the inventory scan to finish.
Current list of racks cannot be read. Try another inventory scan by opening and closing the door. Check if the racks are placed properly and that no rack is located on the shovel.	Open the Charger door and check the racks. Close the Charger door and wait for the inventory scan to finish.
Error: The rack/plate on shelf position CHXX is placed the wrong way around and cannot be used for injection. Please place rack/plate with position A1 in the right front corner.	Place each sample rack or well plate so that position A1 is at the front right-hand corner, see also Figure 6, page 49 .
Inventory scan has failed. Please check if the racks are placed properly.	Open the Charger door and check the racks. Close the Charger door and wait for the inventory scan to finish.

Message	Description and Remedial Action
The inventory scan could not be finished because the door is open.	Close the Charger door.
Unexpected module behavior. Code 6XXX	The Charger has encountered an unexpected error. Note code number and turn the device off, wait for 5 seconds and turn it on again. If the error persists, contact Thermo Fisher Scientific Technical Support.

9 Specifications

This chapter provides the physical and performance specifications of the
Charger.

9.1 Performance Specifications

The Charger performance is specified as follows:

Type	Specification
Temperature range	4-40 °C (settable), cooling target ≥ 22 K below ambient
Temperature accuracy	-2 °C / +4 °C
Spatial temperature deviation	± 2 °C
Plate capacity	9 deep well plates, maximum height 45 mm or 9 sample racks, maximum height 45 mm including vials or 20 well plates, maximum height 20 mm
Sample capacity	Up to 7,680 samples in twenty 384 well plates
Cycle time for handling system	< 1 min (shuttling a sample rack or well plate from or to autosampler)
PC connection	USB 2.0 interface
Control	Chromeleon 7, Chromeleon 6.8 The Charger can be operated also with other data systems. For details, contact the Thermo Fisher Scientific sales organization.
Safety features	Sample rack/well plate detection sensor on shovel, Barcode reader to detect rack type and shelf ID Automatic stop when door is opened (interlock door switch) Automatic opening of door after power failure 3 LEDs for status monitoring
Good Laboratory Practice (GLP) features	All system parameters are logged in the Chromeleon Audit Trail.

9.2 Physical Specifications

The physical conditions of the Charger are specified as follows:

Type	Specification
Range of use	Indoor use only
Ambient temperature	Operation: 5 °C to 35 °C Storage: 1 °C to 60 °C Transport: -20 °C to 60 °C
Ambient humidity	Operation: 20% to 80% relative humidity, non-condensing Storage: 5% to 80% relative humidity, non-condensing Transport: 20% to 80% relative humidity, non-condensing
Altitude	Up to 2000 m
Mains supply voltage fluctuations	Up to ± 10% of the nominal voltage
Pollution degree	2
Power requirements	Wide range, 100 - 240 V AC, 50/60 Hz ~ 350 W
Overvoltage category	II
Emission sound pressure level	≤ 60 dB(A) in 1 m distance
Dimensions (height x width x depth)	750 mm x 339 mm x 620 mm
Weight	Approx. 35 kg

10 Accessories, Consumables and Replacement Parts

This chapter provides information for reordering accessories, consumables,
and replacement parts.

10.1 General Information

The Charger must be operated only with the replacement parts and additional components, options, and peripherals specifically authorized and qualified by Thermo Fisher Scientific.

Accessories, consumables, and replacement parts are always maintained at the latest technical standard. Therefore, part numbers are subject to change. If not otherwise stated, updated parts will be compatible with the parts they replace.

10.2 Ordering Information

For ordering information of sample racks and well plates for the Charger, refer to the information that is included in the Vanquish autosampler ship kit.

Shelves

Description	Part No.
Shelf for 9 deep well plates and/or sample racks pitch 57.5 mm, max. height of deep well plates: 45 mm	6900.1020
Shelf for 20 well plates pitch 25.5 mm, max. height of well plates: 20 mm	6900.1010

Power cords

Description	Part No.
Power cord, Australia, China	6000.1060
Power cord, Denmark	6000.1070
Power cord, EU	6000.1000
Power cord, India, SA	6000.1090
Power cord, Italy	6000.1040
Power cord, Japan	6000.1050
Power cord, UK	6000.1020
Power cord, USA	6000.1001
Power cord, Switzerland	6000.1030

Other Parts

Description	Part No.
USB cable (with ferrite bead)	6900.1021

11 Compliance Information

This chapter provides additional compliance information.

11.1 Declaration of Conformity

CE Declaration of Conformity

The device has satisfied the requirements for the CE mark and is compliant with the applicable requirements.

11.2 WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:



Figure 12: WEEE symbol

Thermo Fisher Scientific has contracted with one or more recycling or disposal companies in each European Union (EU) Member State, and these companies should dispose of or recycle this product. For further information, contact Thermo Fisher Scientific.

11.3 FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the U.S. FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his expense.

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