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Vanquish

Manual Injection Valve

Installation Guide

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1 About this Manual

This manual describes the installation of the manual injection valve. The manual injection valve is an optional accessory available for the Vanquish™ Core system.

This manual is intended as a supplementary document to the *Vanquish System Operating Manual*. Refer to the *Operating Manual* for general safety information on the device, and the conventions used throughout this manual regarding safety messages, notices and typography.

2 Safety Guidelines for Usage

To ensure safe valve operation, observe the following guidelines.

- Always wear appropriate protective equipment and follow good laboratory practice.
- Use only the syringes provided by Thermo Fisher Scientific for the valve.
- After the injection of sample into the valve, remove the syringe from the valve.

Use of high pH solutions

The standard rotor seal is sensitive to alkaline attack when exposed to solutions having a pH of 10 or more. Order the rotor seal for pH values of 10 or more when using alkaline solutions.

3 Overview

The Vanquish manual injection valve enables manual injection of samples into the flow path of the Vanquish system by using a syringe. The valve can be used to substitute a basic feature of the autosampler in a system configuration with a pump, column compartment and an optical detector.

Hardware setup

The manual injection valve is mounted to the Vanquish solvent rack. In this configuration, the system stack is setup as shown in the figure. The column compartment is optional.

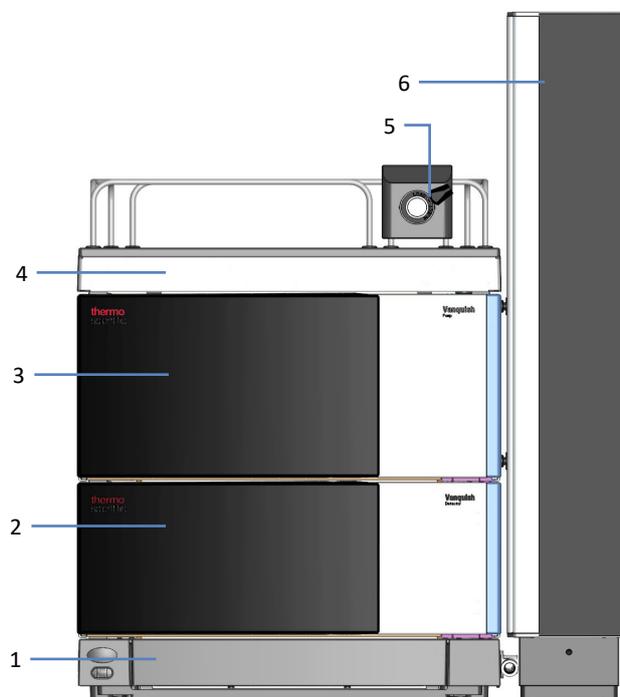


Figure 1: System setup with manual injection valve

No.	Description
1	System base
2	Detector
3	Pump
4	Solvent rack
5	Valve mount with manual injection valve
6	Column compartment (optional)

4 Installation

4.1 Scope of Delivery

The kit contains the following parts:

- Manual injection valve with Vanquish mount, including 2 mounting screws
- Parts kit for valve
- Viper adapter (2 pieces)
- Capillary, Viper, stainless steel, ID 1.8 mm x L 450 mm, to connect the valve to the pump
- Capillary, PEEK, ID 0.5 mm x 1 m for waste line
- RheFlex™ PEEK fitting 1/16"
- Silicone tubing for waste line
- Fitting plug
- Cable groove cover
- Installation guide

4.2 Installing the Valve to the Solvent Rack

Follow the installation instructions in this document step-by-step to ensure safe installation and operation.

Parts required

Manual injection valve mount

Preparations

Set up the system stack as shown in [Overview](#) (► [page 6](#)). For details on how to stack Vanquish system modules, refer to the *Vanquish System Operating Manual*. Do not yet attach the column compartment to the system stack.

Follow these steps

1. Remove the two mounting screws and washers from the valve mount with your fingers (no tools required).

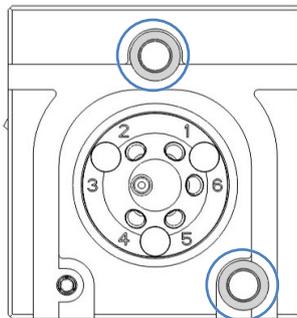


Figure 2: Mounting screws

2. Install the mount to the right side of the solvent rack front railing as shown in the figure. Firmly push the mount onto the railing.

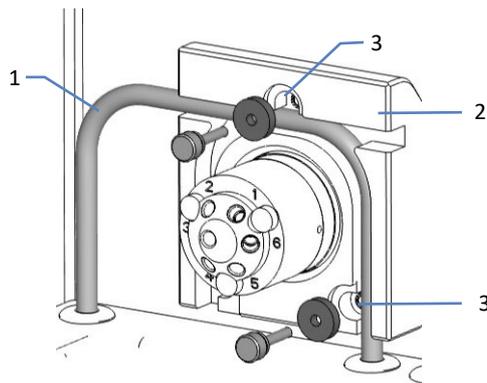


Figure 3: Installing the valve mount (rear view)

No.	Description
1	Solvent rack front railing
2	Valve mount
3	Mounting screw positions

3. Fix the two mounting screws and washers with your fingers.

4.3 Connecting the Valve Cable

Preparation

Turn off the pump and disconnect the power cord from its source.

Parts required

Cable cover from kit

Connecting the cable

1. Connect the cable that is attached to the valve to one of the digital I/O ports (**Dig I/O**) on the pump.

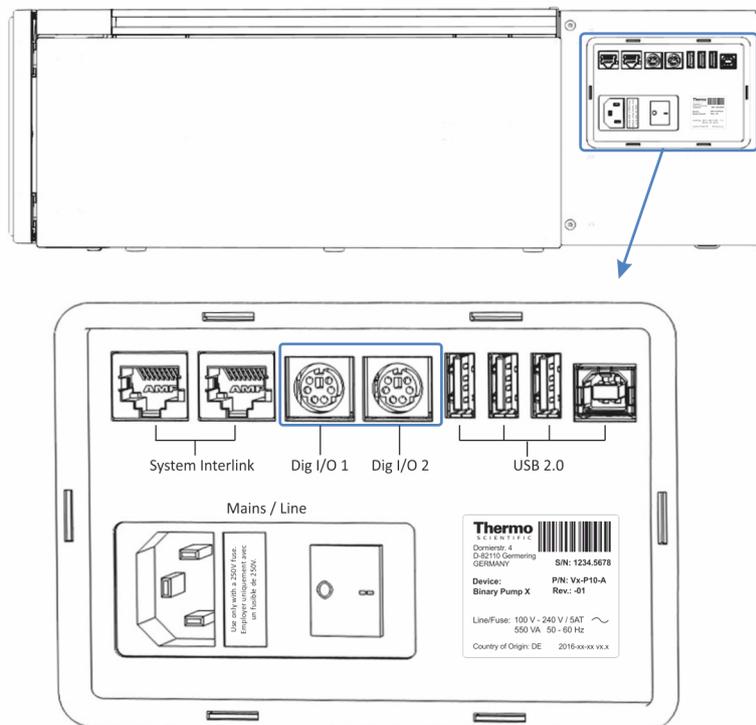


Figure 4: Digital I/O connectors on the pump

2. Guide the cable depending on your system setup (see below).

Guiding the cable if system does not include a column compartment

1. Guide the cable through the cable groove of the pump.



Figure 5: Guiding the cable through the cable groove

2. Fix the cable cover to the cable groove.

TIP You may need to shorten the cable cover. Cut the cover to the required length by using scissors.

Guiding the cable if system includes column compartment

If your system includes a column compartment, it is not possible to use the cable groove of the pump to guide the cable. After you have installed the column compartment, you can push the cable into the gap between the pump and the column compartment.

4.4 Setting Up the Valve Connections

Parts required

Fittings and capillary from the kit

Viper adapters from the kit

¼" wrench

Overview

The figure shows the ports and their numbers on the manual injection valve. The port numbers are referenced in the description below.

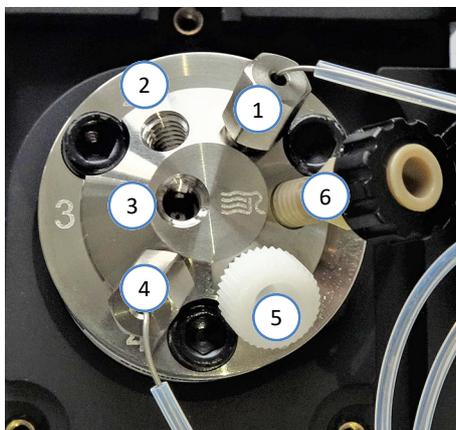


Figure 6: Valve flow connections

No.	Description
1	Sample loop (pre-installed)
2	From pump
3	To column
4	Sample loop (pre-installed)
5	Fitting plug
6	To waste

Preparations

Install the Viper adapters to the valve. The adapter is not fingertight, a ¼" wrench is required:

- Install one Viper adapter to port no. 2.
- Install another Viper adapter to port no. 3.

TIP Active pre-column heaters are not supported with the manual injection valve.

Follow these steps

1. Connect the waste line (PEEK fitting and PEEK capillary with silicone tubing) to port no. 6. Route the waste line through the tubing guides of the system to the system base and into a waste container. For details, refer to the *Vanquish System Operating Manual*.
2. Install the fitting plug to port no. 5.
3. Connect the 450 mm stainless steel Viper capillary from the kit to the Viper adapter on port no. 2. Connect the other end of the capillary to the pump outlet.
4. Connect either of the following to port no. 3:
 - ◆ If your system includes a column compartment: Connect the long end of the passive pre-heater from the Vanquish Core system capillary kit to the Viper adapter. The pre-heater must be mounted in one of the top pre-heater positions in the column slot.
 - ◆ If your system does *not* include a column compartment: Connect the 0.18 mm x 350 mm stainless steel Viper capillary from the Vanquish Core system capillary kit to the Viper adapter.
5. Leave the column disconnected from the valve during initial flushing. Flush the needle port in the INJECT position with 1 mL mobile phase.
6. Connect the column:
 - ◆ If your system includes a column compartment: Connect the column to the passive pre-heater installed on port no. 3. For details, refer to the *Operating Manual for the Column Compartment*.
 - ◆ If your system does *not* include a column compartment: Connect the column to the Viper capillary installed on port no. 3.
7. Connect the other end of the column to the detector as appropriate. A Viper capillary is included in the Vanquish Core system capillary kit.

4.5 Attaching the Column Compartment

The column compartment is installed to the right side of the system.

Parts required

All parts required for the installation of a column compartment are included in the standard installation kit shipped with the column compartment.

Preparations

Install a mounting bar in the rail on the pump housing. For details, refer the *Operating Manual for the column compartment*.

Follow these steps

1. Remove the 2 top position holding knobs on the column compartment.

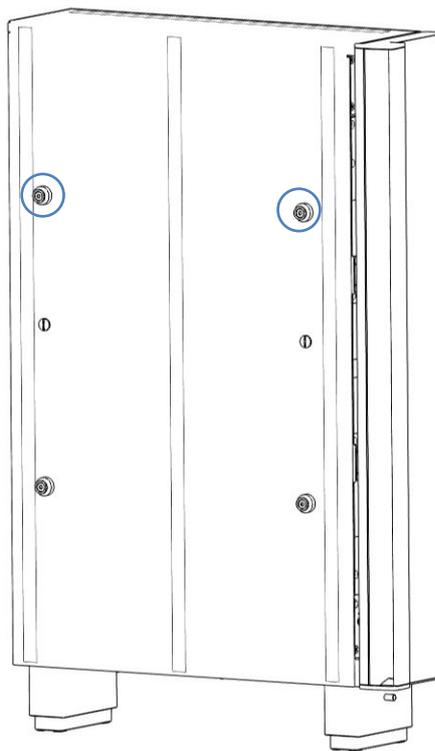


Figure 7: Top position holding knobs

2. Remove the two plugs from the center position and install the holding knobs in the center position.
3. Plug up the top position screw holes with the plugs.
4. Grasp the column compartment by its sides and slightly lift up to insert the holding knobs in the grooves on the mounting bar.

4.6 Configuring the Manual Injection Valve in Chromeleon

The steps below refer to Chromeleon™ 7.2, but are similar for other Chromeleon versions.

Prerequisites

- The Vanquish system is set up in Chromeleon.
- The Instrument Controller is running.

Follow these steps

1. Open the Chromeleon Instrument Configuration Manager.
2. In the **Properties** for the Vanquish pump, do the following:
 - ◆ on the **Limits** page, set the maximum pressure to 40 MPa.
 - ◆ on the **Inputs** page, select the **Pump_Input_1** check box (or **Pump_Input_2**, depending on where the cable is connected).

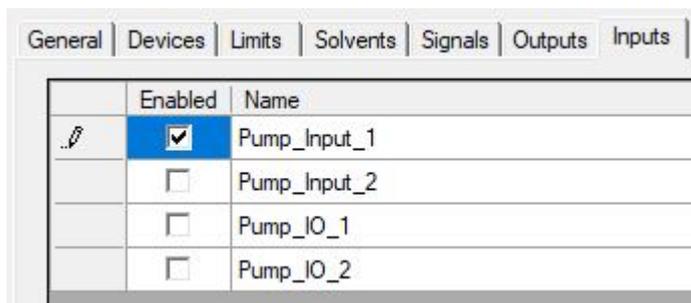


Figure 8: Pump Inputs Page

3. Right-click the Vanquish instrument, and click **Add Module**.
4. On the **Manufacturers** list, select **Generic**, and on the **Modules** list, select **Remote Inject**.
5. On the **General** tab, select **Pump_Input_1** from the **Inject Port** list (or **Pump_Input_2**, depending on where the cable is connected).

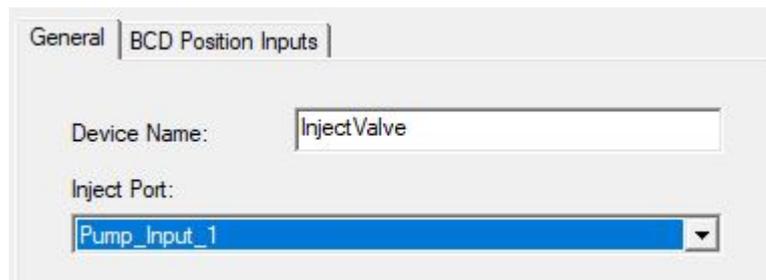


Figure 9: Remote Inject General Page

The manual injection valve is now available in Chromeleon and appears in the Chromeleon Commands window under **InjectValve**.

TIP When you start a sequence in Chromeleon, the LED bars on your instruments turn to blue if preconditions are met. The Audit Trail indicates that the instrument is "Waiting for inject". The run begins with the click of the handle to the INJECT position.

5 Specifications

This chapter provides the physical specifications of the valve.

Type	Specification
Biocompatibility	No
Maximum operating pressure	48 MPa (483 bar)
Flow passage diameters	0.33 mm (0.0013") and 0.3 mm (0.012")
Materials in the flow path	Stainless steel, inert polymer
pH range	1-10 with standard rotor seal

6 Replacement Parts

The device must be operated only with the replacement parts specifically authorized and qualified by Thermo Fisher Scientific.

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.

Description	Part No.
Capillary from valve to column, stainless steel, Viper, ID 0.18 mm x L 350 mm	6040.2375
Capillary from valve to pump, stainless steel, Viper, ID 0.18 mm x L 450 mm	6040.2365
PEEK capillary 0.5 mm x 1 m (waste)	2251.6002
Pre-heater, for connection from valve to column, stainless steel, Viper, ID 0.18 mm	6732.0170
Rotor seal, standard	6025.0022
Rotor seal, for pH values of 10 or more	6035.8125
Sample loop, 20 µL	6263.1251
Silicone tubing 3 m (waste)	6007.9100
Stator	6025.0023
Syringe, 100 µL	6035.0665
Viper adapter, 2 pieces	6261.5065
Wrench	6000.0051

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