RapidFire 365 High-throughput Mass Spectrometry System

Quick Start Guide

For Research Use Only. Not for use in diagnostic procedures.

What is the RapidFire 365 High-throughput Mass Spectrometry System?

The RapidFire 365 High-throughput Mass Spectrometry System helps to eliminate bottlenecks in your drug discovery workflow and enhance the screening process of sample analyses. By feeding samples directly to the mass spectrometer, RapidFire technology enables the acceleration of drug discovery pipeline decisions.

The high-throughput mass spectrometry system consists of a proprietary sample purification and injection system that interfaces directly with the mass spectrometer. The RapidFire-MS system can simultaneously analyze multiple analytes in complex mixtures presented by biological samples and remove contaminants such as salts, buffers, detergents, proteins, microsomes, and subcellular material.

The RapidFire system facilitates the analysis of one 384-well plate in about 50 minutes or as many as ten 384-well plates (3840 individual samples) in a single instrument shift (8 hours). When you run an experiment continuously over a weekend, the system can run 63 plates (24192 individual samples). The throughput of the RapidFire system for label-free biologically-relevant data approaches that of optical technologies.

The system is equipped with one BenchBot sample handler and four plate stacks. The plate stacks enable the system to process 63 microplates in one batch. Three plate stacks serve as the input stacks, and each can accommodate 21 microplates. One plate stack is left empty to serve as the output stack. When all of the plates from one input stack is moved to the output stack, the original input stack becomes the output stack. In addition, the bar code scanner is capable of reading bar code labels on any side of the sample plates.
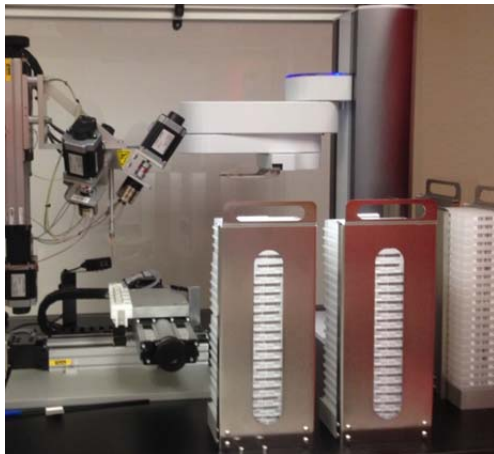
Figure 1. BenchBot sample handler and input stacks.

What's New in RapidFire Integrator 5.0

- Added support for:
    - MassHunter Data Acquisition for Ultivo LC/TQ C.01.00
    - MassHunter Data Acquisition for TOF/Q-TOF LC/MS B.09.00
    - MassHunter Data Acquisition for Triple Quad LC/MS B.09.00

What's New in RapidFire Integrator 4.3

- Added Support for Windows 10 (in addition to Windows 7)
- Support for these Agilent MassHunter Data Acquisition revisions:
    - MassHunter Data Acquisition for TOF/Q-TOF LC/MS B.08.00
    - MassHunter Data Acquisition for Triple Quadrupole LC/MS B.08.02
- Added support for RoHS-compliant G9531A RapidFire 365 High-throughput Mass Spectrometry system
- Sciex LC/MS instruments no longer supported

Where to find more information

User Guides

You can access these guides from the RapidFire Resource App which you can start from the RapidFire Resources icon.

User Guide   This guide contains information to prepare, maintain, and run the RapidFire system.

Data Analysis Guide   Use this guide to learn how to use RapidFire Integrator to prepare and analyze data.

Safety Guide   This guide contains safety instructions for operating the RapidFire system.

Web Site

Go to **www.agilent.com** for more information about RapidFire.

Getting Started

Refer to the *User Guide* for detailed instructions.

System Preparation

System Preparation

Steps	Details
1 Prepare solvents	Pull out the solvent drawer and make sure you have enough solvent.
2 Check waste capacity	Check that the waste flasks have enough room to accommodate the waste that will be generated from the runs that are planned.
3 Start the vacuum system	Open up the vacuum valve or switch on your stand-alone vacuum pump.

System Preparation

Steps	Details
4 Start the software	**1** Double-click the **RapidFire Control Panel** desktop icon. **2** Click **File > Choose CFGs**. **3** Select the configuration folder under **C:\Agilent\ RapidFire**. **4** Click **Start** in the Control Panel dialog box.
5 Verify network settings	**1** Double-click the **RapidFire UI** desktop icon. **2** Click **System Tools > Network Settings**. **3** Verify that the IP addresses for the RapidFire Integrator computer and the mass spectrometer computer are correct. **4** Click **Connect** in the main window.

System Preparation

Steps	Details
5 Home the cartridge changer and replace the cartridge	Click **System Tools > Cartridge Changer**. Refer to the *User Guide* for more details.
6 Home the stages	**a** Install an empty example plate in either the 96- or 384-well format. **b** Click **System Tools > Sipper Configuration** to open the Sipper Configuration wizard, Refer to the *User Guide* for details.
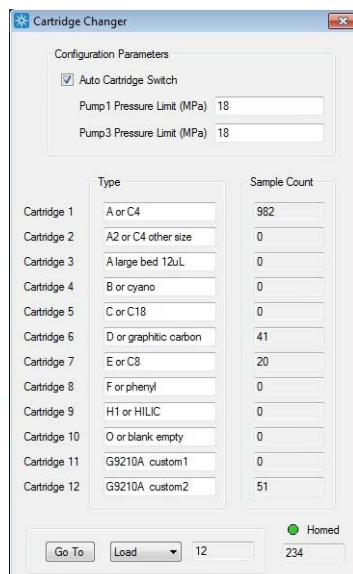
System Preparation

Steps	Details
7 Check the valves	Click **System Tools > Valve Tuner** to open the Valve Configuration Utility dialog box. Refer to the *User Guide* for details.
8 Prepare the peristaltic pump	Check that Pump 4 is active. Make sure the pump rotates clockwise.
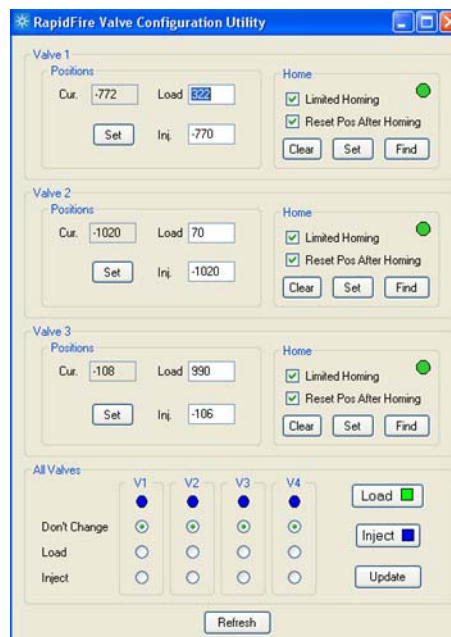
System Preparation

Steps	Details
9 Prepare the quaternary pumps	Prime the quaternary pump. Refer to the User Guide for details.
10 Flush the sipper tube	Under **Sipper Settings**, click **Flush Now**.
11 Prepare the Agilent MassHunter Data Acquisition program.	**a** Click the **RapidFire Communicator** on the desktop. **b** Start the Data Acquisition program. **c** Turn on the detector. **For Q-TOF only** **d** Calibrate the TOF. **e** Create or edit a method with Q-TOF tab settings that are appropriate for your analysis. Save the method
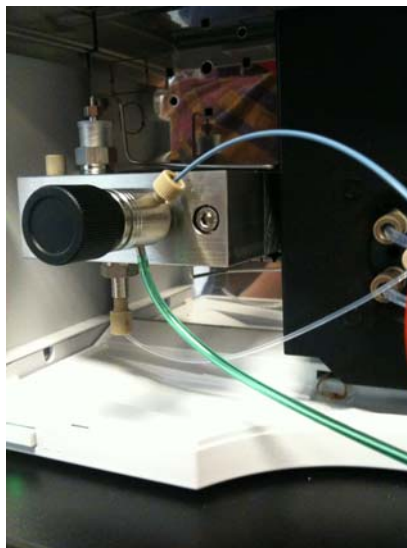
Run RapidFire in Plates Mode

System Preparation

Steps	Details
1 Prepare plates.	Thaw sample plates and spin on a centrifuge at 3000 rpm for at least 5 minutes.
2 Load plates.	Manually load the plates or use the BenchBot plate handler.

3 Prepare the MassHunter Data Acquisition program.	**a** For Triple Quad LC/MS, open or create a method and set parameters on the QQQ tabs for your analysis.
	b Set up a Manual Run. Set Injection Volume to As Instrument.Run the sample.

System Preparation

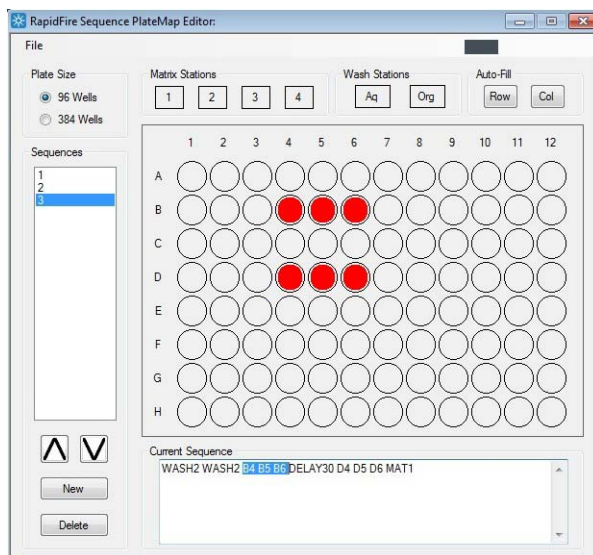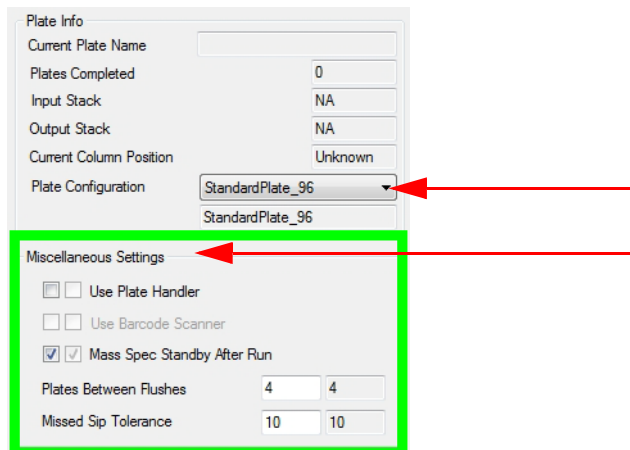| Steps	Details
4 Set RapidFire run parameters.	Set parameters in the RapidFire dialog box for your analysis. Make sure to select the **Plates** option. Save the RapidFire method.
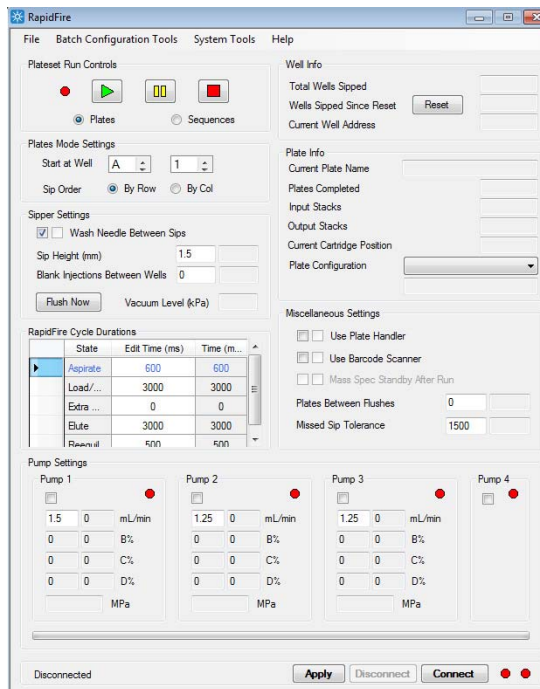
5 Start the run in Plates mode.	Click **Play**

Run RapidFire in Sequence Mode

The following diagram illustrates the terminology used to define a batch of plates in Sequences mode.

Steps		Details
1 Prepare plates.		Thaw sample plates and spin on a centrifuge at 3000 rpm for at least 5 minutes.
2 Load plates.		Manually load the plates or use the BenchBot plate handler.

3 Prepare the MassHunter Data Acquisition program.	**a**	Make sure the MassHunter Data Acquisition program is prepared as described in **"System Preparation"** on page 5.

Steps	Details
4 Set RapidFire run parameters.	Set parameters in the RapidFire dialog box for your analysis. Make sure to select the **Plates** option. Save the RapidFire method.
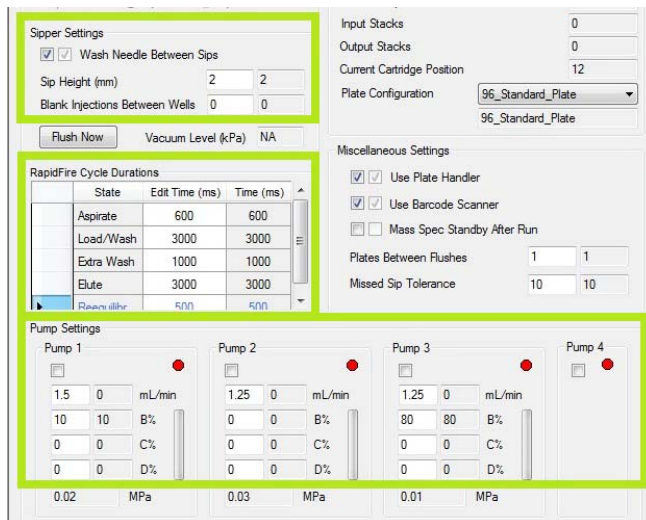
5 Edit the plate map.	Click **Batch Configuration Tools > Plate Map Editor**. Create or edit a sequence for a plate map, then save the sequence.

Steps	Details
6 Edit the batch	Click **Batch Configuration Tools > Batch Editor**. Create or edit the batch. For each sequence in the batch, assign a RapidFire method to run. Save the RapidFire batch.
7 Set run parameters.	Select the correct plate configuration. Verify other parameters for your analysis.
8 Start the run.	Load the RapidFire batch. Click **Play**.

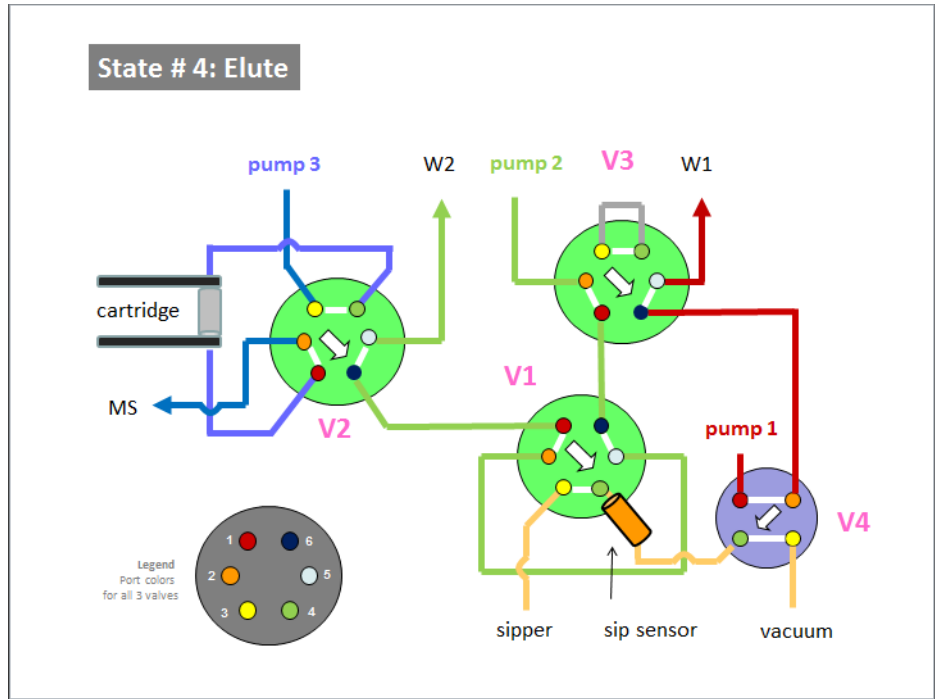# RapidFire Integrator Flow Path
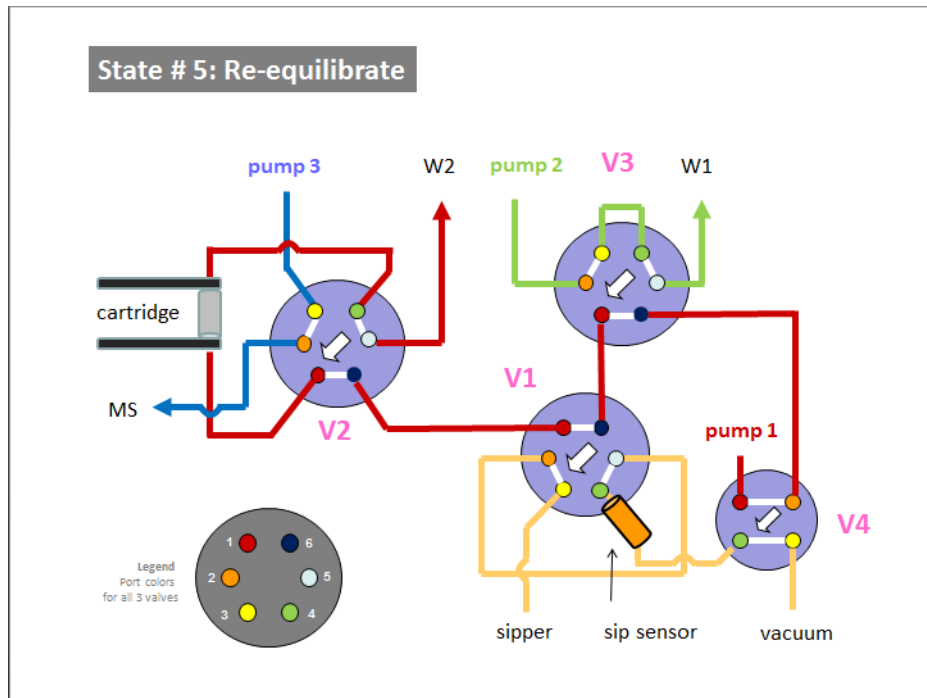
State #1: Aspirate
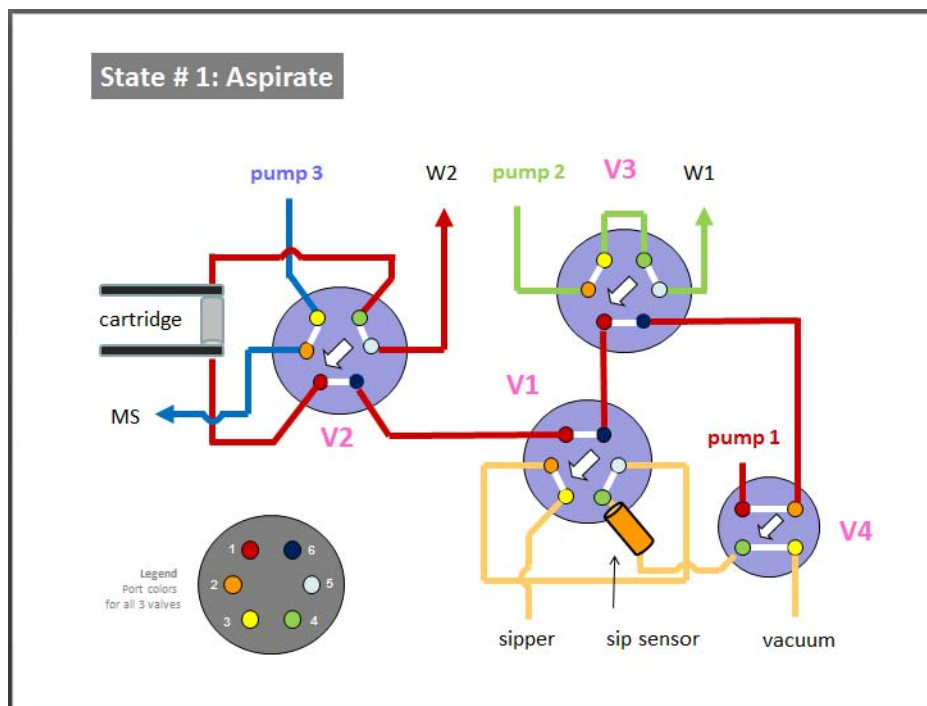
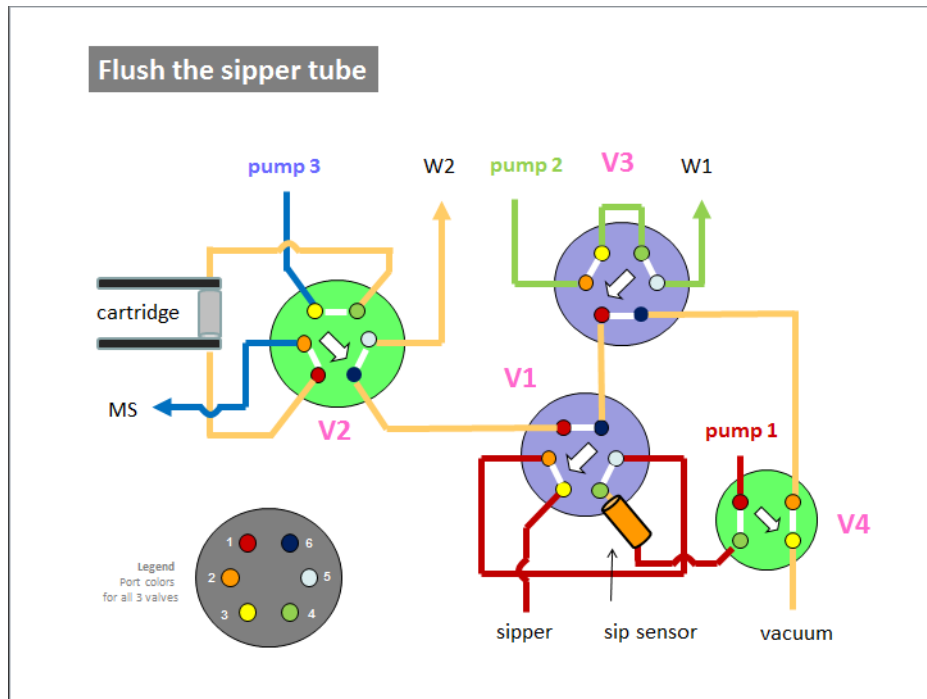# State #2: Wash/Load
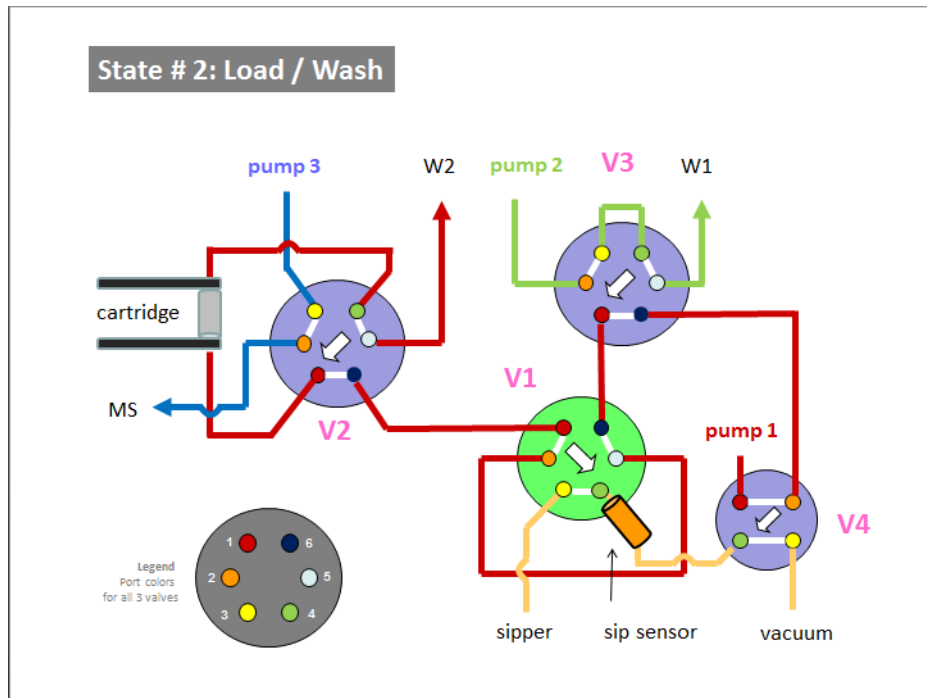
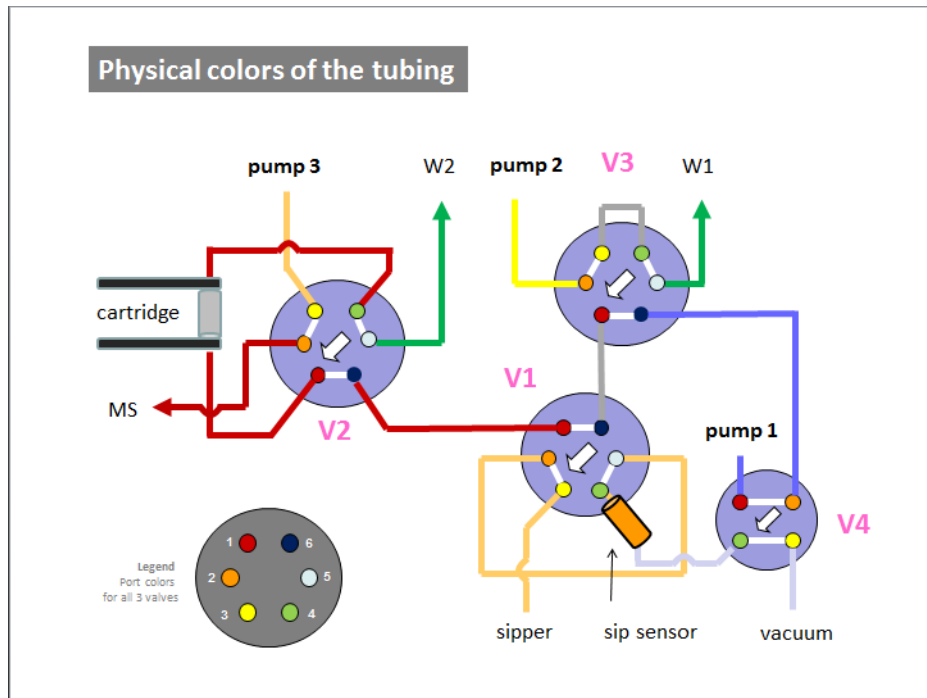# State #3: Extra Wash
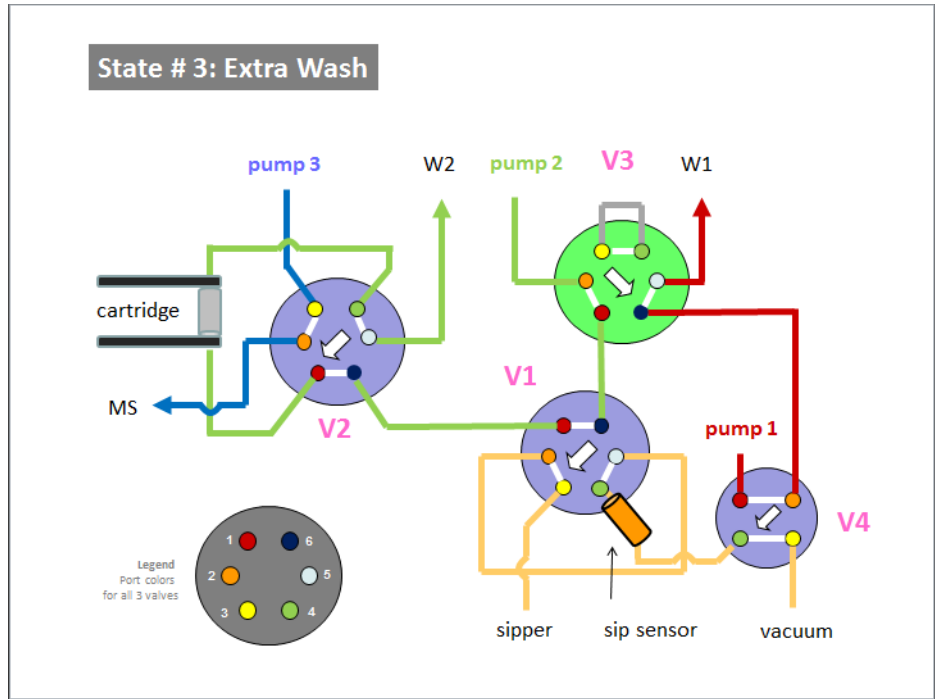
State #4: Elute
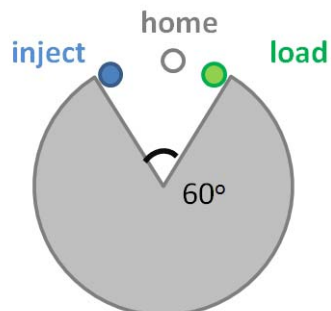
State #5: Re-equilibrate

Flush the sipper tube

Physical colors of the tubing

Valve positions

In This Book

This guide gives you a quick overview of the RapidFire 365 High-throughput Mass Spectrometry System.

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