

RapidFire 365 High-throughput Mass Spectrometry System

Quick Start Guide

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

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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.

What's New in RapidFire Integrator 5.0

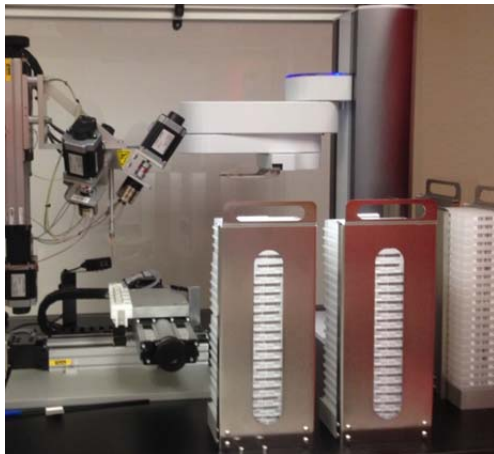


Figure 1. BenchBot sample handler and input stacks.

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

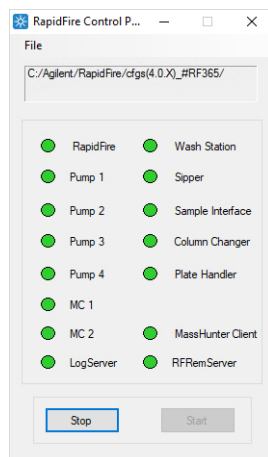
Steps	Details
1 Prepare solvents	Pull out the solvent drawer and make sure you have enough solvent. 
2 Check waste capacity	Check that the waste flasks have enough room to accommodate the waste that will be generated from the runs that are planned.
3 Start the vacuum system	Open up the vacuum valve or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

Getting Started

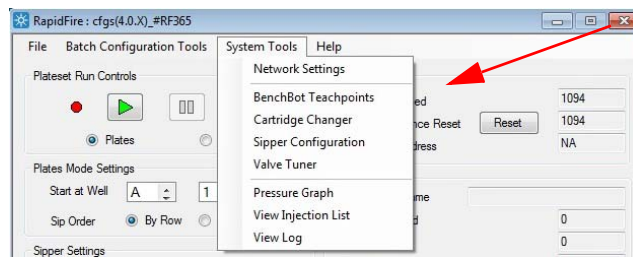
System Preparation

System Preparation

Steps	Details
4 Start the software	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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.
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Getting Started

System Preparation

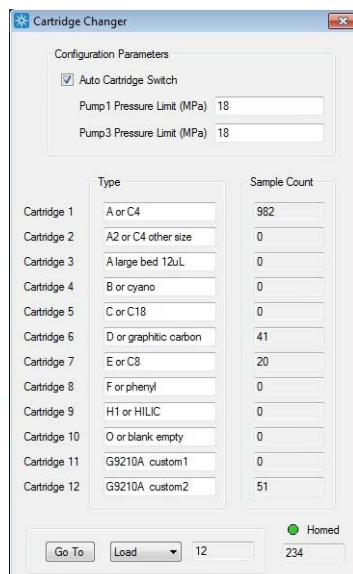
System Preparation

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

- Install an empty example plate in either the 96- or 384-well format.
- Click **System Tools > Sipper Configuration** to open the Sipper Configuration wizard,

Refer to the *User Guide* for details.



Getting Started

System Preparation

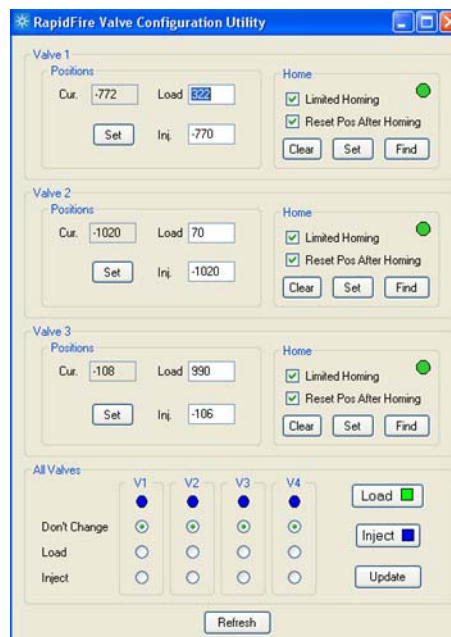
System Preparation

Steps

Details

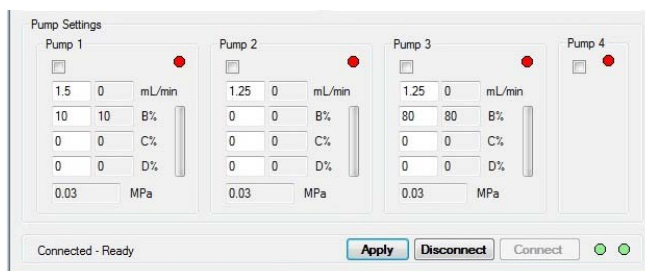
7 Check the valves

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.

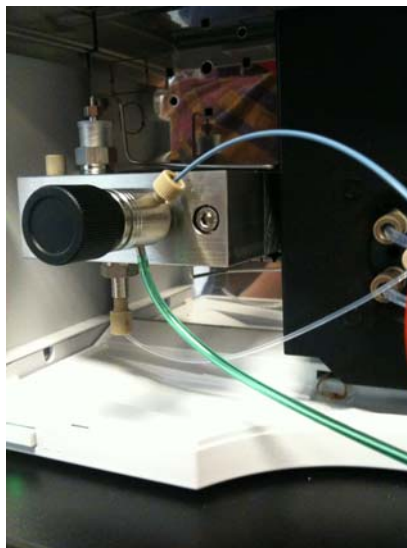


Getting Started

System Preparation

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 .
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Sipper Settings

Wash Needle Between Sips

Sip Height (mm)

Blank Injections Between Wells

Vac Pressure (kPa)

11 Prepare the Agilent MassHunter Data Acquisition program.	<ol style="list-style-type: none">Click the RapidFire Communicator on the desktop.Start the Data Acquisition program.Turn on the detector. <p>For Q-TOF only</p> <ol style="list-style-type: none">Calibrate the TOF.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.

The screenshot shows a software control panel with two main sections: 'Plate Info' and 'Miscellaneous Settings'.
Plate Info:
- Current Plate Name: [Empty text field]
- Plates Completed: [0]
- Input Stack: [NA]
- Output Stack: [NA]
- Current Column Position: [Unknown]
- Plate Configuration: [StandardPlate_96] (dropdown menu)
Miscellaneous Settings:
- Use Plate Handler:
- Use Barcode Scanner:
- Mass Spec Standby After Run:
- Plates Between Flushes: [1] [4]
- Missed Sip Tolerance: [5] [10]

3 Prepare the MassHunter Data Acquisition program.	<ul style="list-style-type: none">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.
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Getting Started

Run RapidFire in Plates Mode

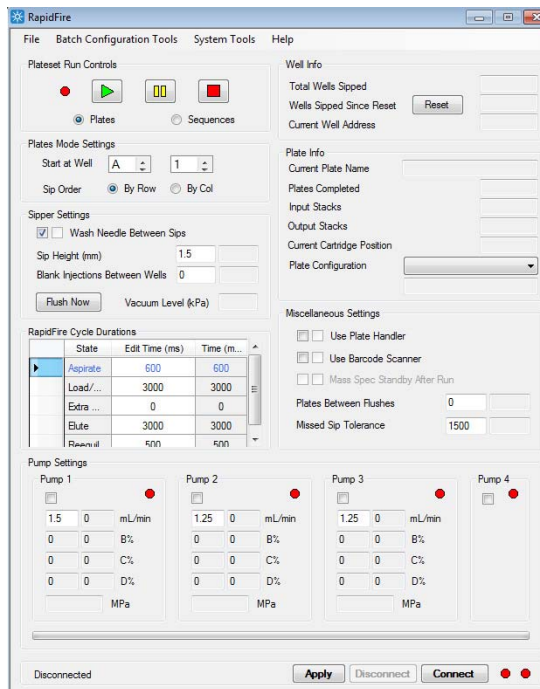
System Preparation

Steps

- 4 Set RapidFire run parameters.

Details

Set parameters in the RapidFire dialog box for your analysis. Make sure to select the **Plates** option. Save the RapidFire method.



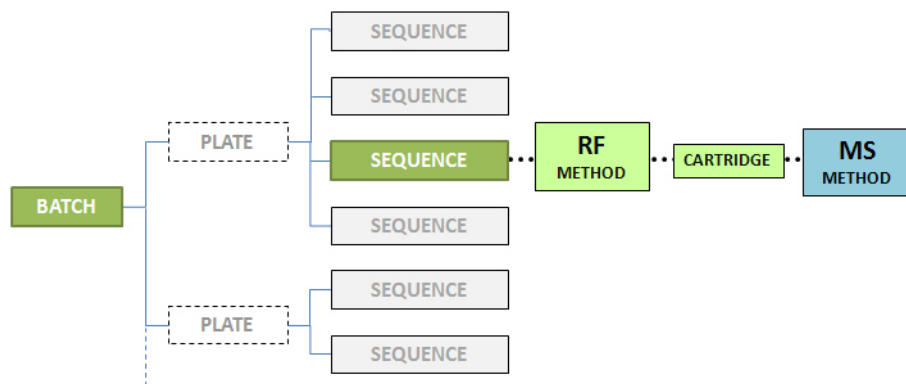
- 5 Start the run in Plates mode.



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.

Plate Info

Current Plate Name

Plates Completed

Input Stack

Output Stack

Current Column Position

Plate Configuration

Miscellaneous Settings

Use Plate Handler

Use Barcode Scanner

Mass Spec Standby After Run

Plates Between Flushes

Missed Sip Tolerance

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.
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Getting Started

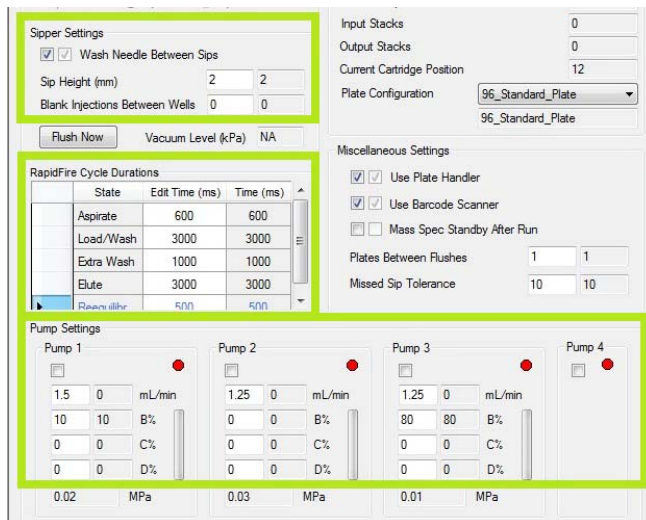
Run RapidFire in Sequence Mode

Steps

- 4 Set RapidFire run parameters.

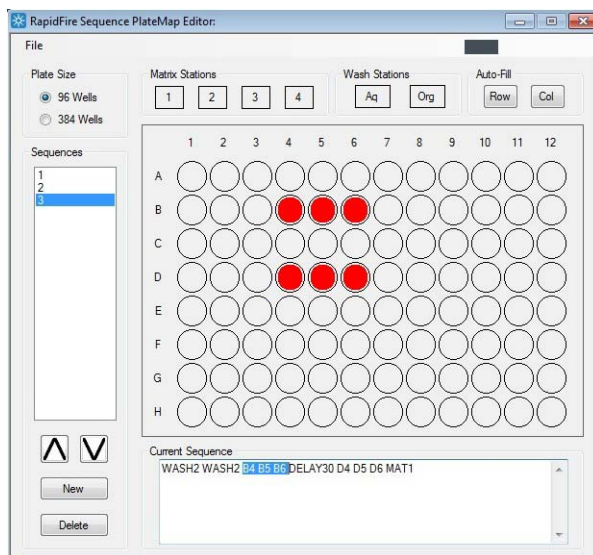
Details

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.

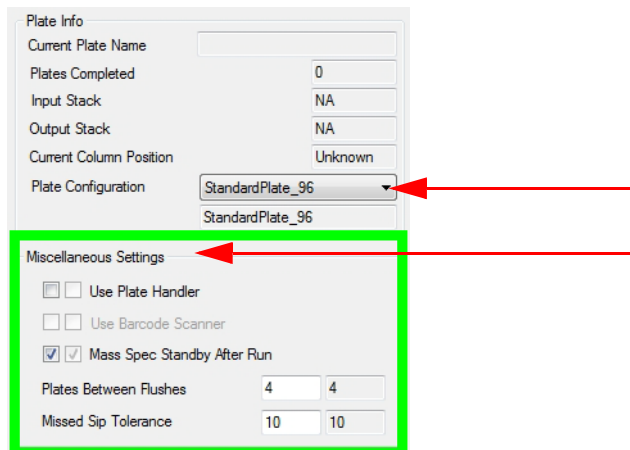
Click **Batch Configuration Tools > Plate Map Editor**. Create or edit a sequence for a plate map, then save the sequence.



Getting Started

Run RapidFire in Sequence Mode

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.



The screenshot shows a software interface for configuring a batch. It is divided into two main sections: 'Plate Info' and 'Miscellaneous Settings'. The 'Plate Info' section includes fields for 'Current Plate Name', 'Plates Completed' (set to 0), 'Input Stack' (set to NA), 'Output Stack' (set to NA), and 'Current Column Position' (set to Unknown). A 'Plate Configuration' dropdown menu is set to 'StandardPlate_96', with a red arrow pointing to it. The 'Miscellaneous Settings' section is highlighted with a green border and includes checkboxes for 'Use Plate Handler' (unchecked), 'Use Barcode Scanner' (unchecked), and 'Mass Spec Standby After Run' (checked). Below these are input fields for 'Plates Between Flushes' (set to 4) and 'Missed Sip Tolerance' (set to 10). Red arrows also point to the 'Miscellaneous Settings' section header.

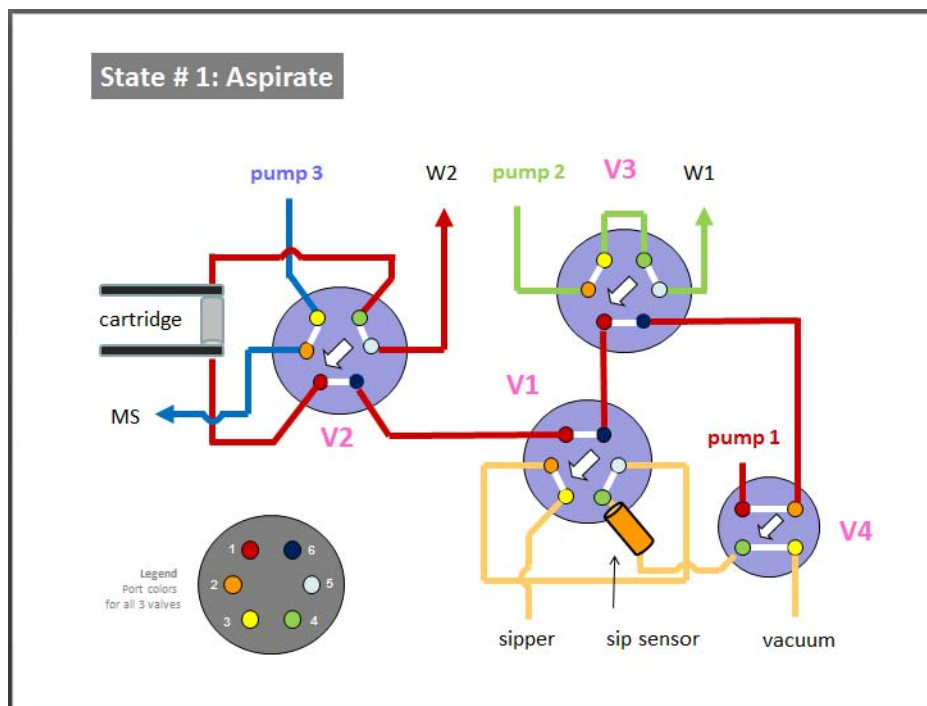
8 Start the run.	 Load the RapidFire batch. Click Play .
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RapidFire Integrator Flow Path

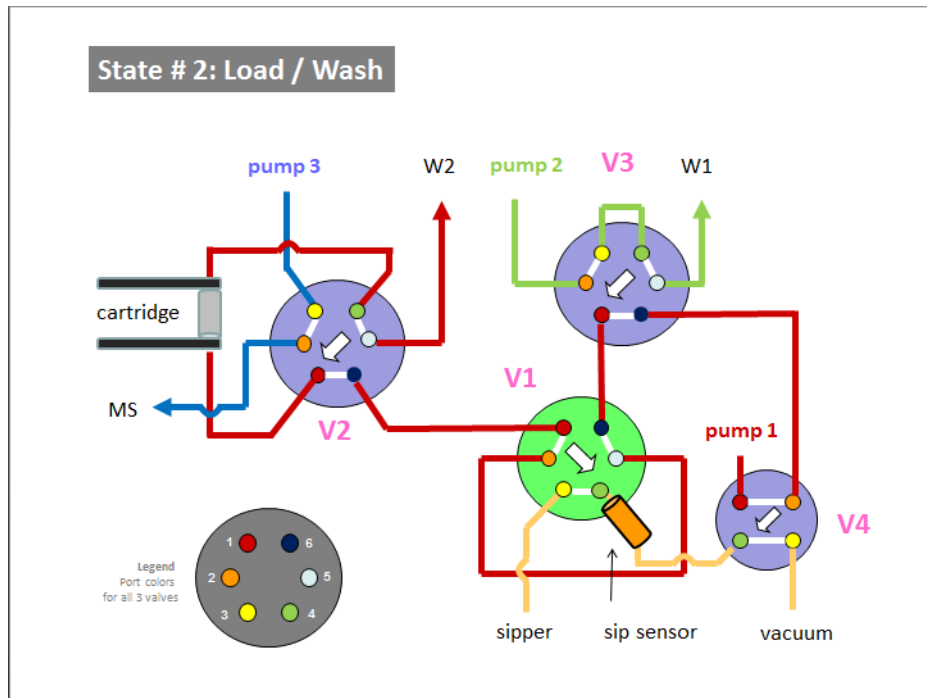
State #1: Aspirate

RapidFire Integrator Flow Path

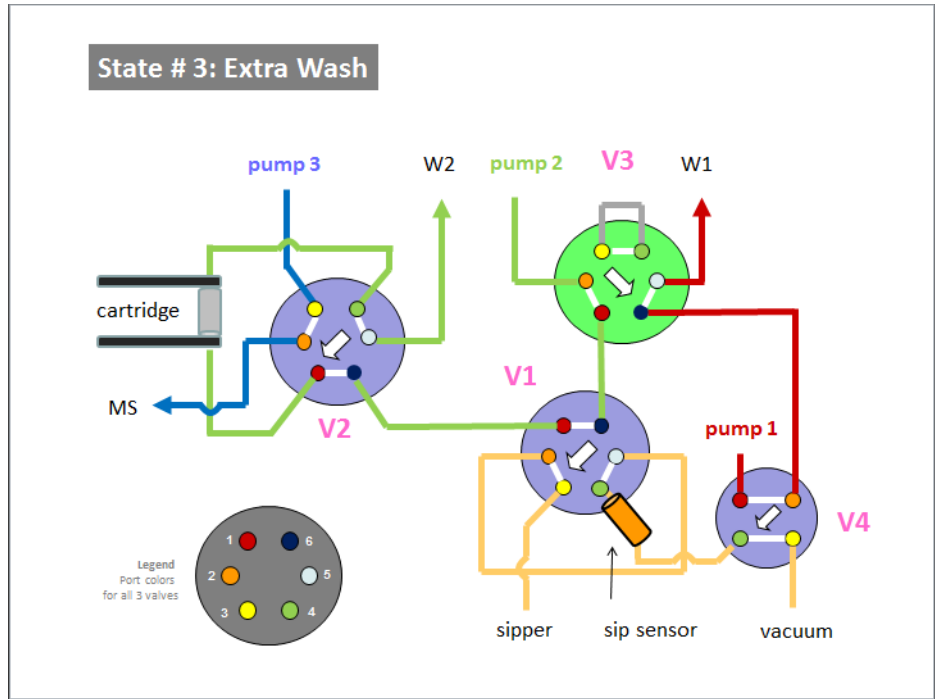
State #1: Aspirate



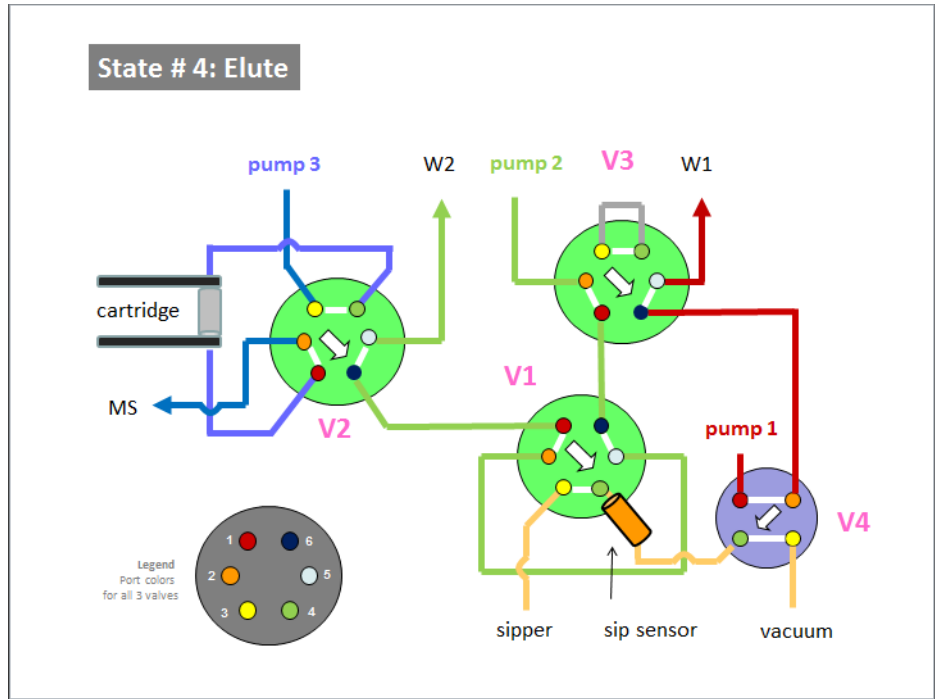
State #2: Wash/Load



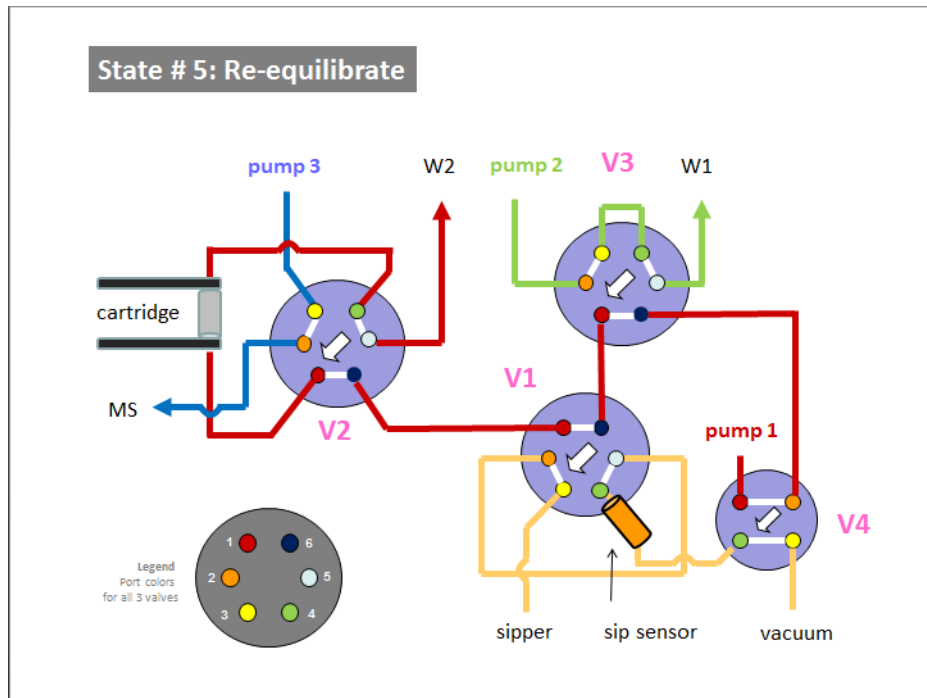
State #3: Extra Wash



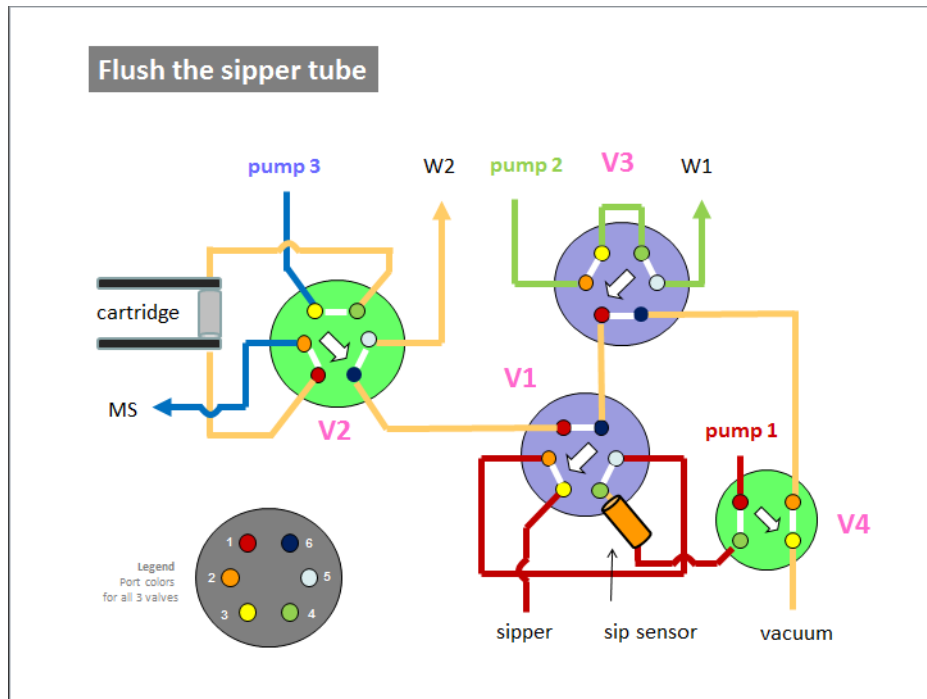
State #4: Elute



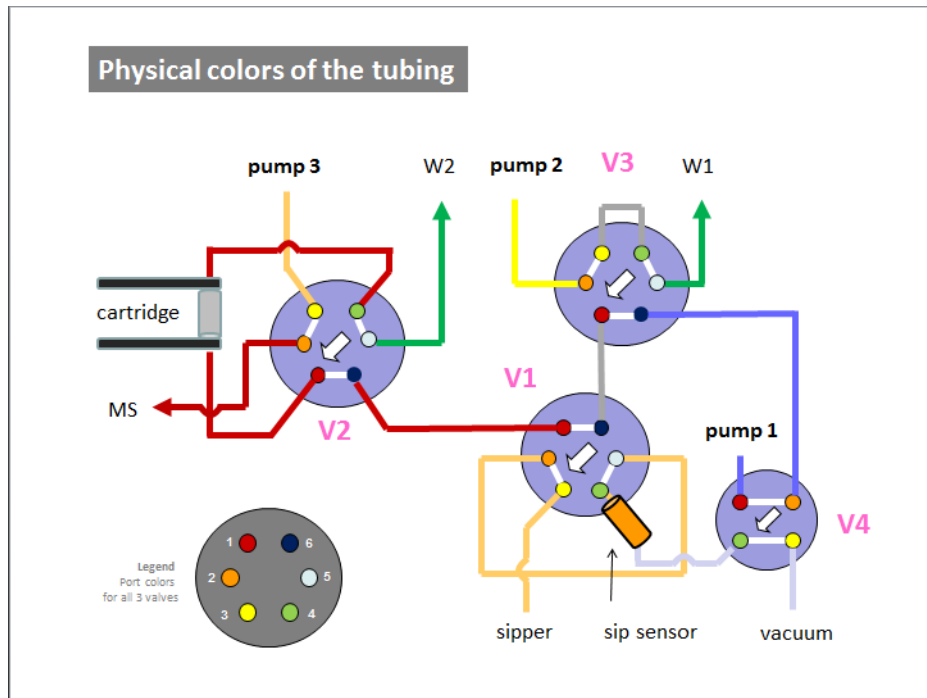
State #5: Re-equilibrate



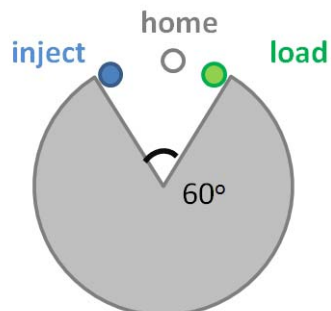
Flush the sipper tube



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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www.agilent.com

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