# MultiWash+ Microplate Washer

## User Guide

**MOLECULAR DEVICES**

# Contents

# Safety Information

Information about the safe use of the instrument from Molecular Devices® includes an understanding of the user-attention statements in this guide, the safety labels on the instrument, precautions to follow before you operate the instrument, and precautions to follow while you operate the instrument.

Make sure that everyone involved with the operation of the instrument has:

- Received instruction in general safety practices for laboratories.
- Received instruction in specific safety practices for the instrument.
- Read and understood all Safety Data Sheets (SDS) for all materials being used.

Read and observe all warnings, cautions, and instructions. The most important key to safety is to operate the instrument with care.

⚠️ **WARNING! If the instrument is used in a manner not specified by Molecular Devices, the protection provided by the equipment might be impaired.**

## Warnings, Cautions, Notes, and Tips

All warning symbols are framed within a yellow triangle. An exclamation mark is used for most warnings. Other symbols can warn of other types of hazards such as biohazard, electrical, or laser safety warnings as are described in the text of the warning. Follow the related safety information.

The following user attention statements might be displayed in the text of Molecular Devices user documentation. Each statement implies the amount of observation or recommended procedure.

⚠️ **WARNING! A warning indicates a situation or operation that could cause personal injury if precautions are not followed.**

⚠️ **CAUTION!** A caution indicates a situation or operation that could cause damage to the instrument or loss of data if correct procedures are not followed.

📓 **Note:** A note calls attention to significant information.

✳️ **Tip:** A tip provides useful information or a shortcut, but is not essential to the completion of a procedure.

## Symbols on the Instrument

Each safety label found on the instrument contains an alert symbol that indicates the type of potential safety hazard.

| Symbol | Indication |
|---|---|
|  | Consult the product documentation. |
|  | Potential biohazard. |
|  | Power switch indicates power on. |
|  | Power switch indicates power off. |
|  | Indicates the location of the Protective Ground Terminal. |
|  | Required in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union. It indicates that you must not discard this electrical or electronic product or its components in domestic household waste or in the municipal waste collection system.<br>For products under the requirement of the WEEE directive, contact your dealer or local Molecular Devices office for the procedures to facilitate the proper collection, treatment, recovery, recycling, and safe disposal of the device. |

 - California proposition 65 requires businesses to provide warnings to Californians about significant exposures to chemicals that cause cancer, birth defects, or other reproductive harm.

## Service Trained Users

Most procedures required to operate and troubleshoot the instrument can be done by a user who reads the instructions in this user guide and is familiar with the system. However, all installation procedures and some complex service and troubleshooting procedures require the expertise of a service trained user. When Molecular Devices installs the instrument, part of the setup procedure is to provide training for the people in your company who are to be your company's service trained users. Contact Molecular Devices to arrange additional training.

Whenever the following warning message appears, a service trained user must do the procedure to ensure user safety and to prevent instrument damage. Example:

⚠️ **WARNING! The following procedures must be completed by a service trained user. Do not attempt the following procedures if you have not received proper training by Molecular Devices personnel.**

## Electrical Safety

To prevent electrical injuries and property damage, inspect all electrical equipment before use and report all electrical deficiencies. Contact Molecular Devices technical support for equipment service that requires the removal of covers or panels.

To prevent electrical shock, use the supplied power cord and connect to a properly grounded wall outlet.

To ensure sufficient ventilation and provide access to disconnect power from the instrument, maintain a 20 cm to 30 cm (7.9 in. to 11.8 in.) gap between the rear of the instrument and the wall.

Power off the instrument when not in use.

## Chemical and Biological Safety

Normal operation of the instrument can involve the use of materials that are toxic, flammable, or otherwise biologically harmful. When you use such materials, observe the following precautions:

- Handle infectious samples based on good laboratory procedures and methods to prevent the spread of disease.
- Observe all cautionary information printed on the original containers of solutions before their use.
- Dispose of all waste solutions based on the waste disposal procedures of your facility.
- Operate the instrument in accordance with the instructions outlined in this guide, and take all the required precautions when using pathological, toxic, or radioactive materials.

- Splashing of liquids can occur. Take applicable safety precautions, such as using safety glasses and wearing protective clothing, when working with potentially hazardous liquids.
- Observe the applicable cautionary procedures as defined by your safety officer when using hazardous materials, flammable solvents, toxic, pathological, or radioactive materials in or near a powered-up instrument.

**WARNING! Never use the instrument in an environment where potentially damaging liquids or gases are present.**

## Moving Parts Safety

The instrument contains moving parts that can cause injury. Under normal conditions, the instrument is designed to protect you from these moving parts.

**WARNING! If the instrument is used in a manner not specified by Molecular Devices, the protection provided by the equipment might be impaired.**

To prevent injury:

- Never try to exchange labware, reagents, or tools while the instrument is operating.
- Never try to physically restrict the moving components of the instrument.
- Keep the instrument work area clear to prevent obstruction of the movement.
- Always keep the cover closed when the instrument is in use.

**Note:** Observe all warnings and cautions listed for all external devices attached to or in use during the operation of the instrument. See the applicable user guide for the operating and safety procedures of that device.

# Chapter 1: Unpacking and Setting Up the Instrument

**1**

Before unpacking and setting up the MultiWash+ Microplate Washer, prepare a dry, flat, vibration-free work area that has sufficient space for the instrument, the fluidics bottles and tubing, and the power cable.

The instrument is 21.00 cm (8.27 in.) wide, 21.00 cm (8.27 in.) high, and 46.00 cm (18.11 in.) deep. To provide access to disconnect power from the instrument, maintain a 20 cm to 30 cm (7.9 in. to 11.8 in.) gap between the rear of the instrument and the wall.

Keep the instrument away from direct sunlight.

Unpacking and setting up the instrument includes the following procedures:

- Unpacking the instrument and saving the original packaging. See Unpacking the Washer on page 11.
- Installing the manifold and connecting the fluidics tubing. See Installing the Manifold on page 15.
- Connecting the fluidics tubing to the waste, rinse, and wash bottles. See Connecting the Fluid Bottles on page 17.
- Installing the microplate carrier on the instrument deck. See Installing the Microplate Carrier on page 18.
- Connecting the power cord and powering on the instrument. See Connecting Power to the Instrument on page 19.

## Contents of the Package

The package contains the instrument and the accessories that are required for installing the instrument as follows:

- MultiWash+ Microplate Washer Quick-Start Guide
- MultiWash+ Microplate Washer
- Power cord
- 2.5 L waste bottle
- 2.0 L rinse bottle
- 2.0 L wash bottles (3)
- Microplate carrier
- 8-channel manifold
- Fluidics tubing
- Cleaning tools for manifold needles
- Spare fuses (2)



**Figure 1-1: Instrument and Accessories**

## Unpacking the Washer

The packaging is specifically designed to protect the MultiWash+ Microplate Washer during transportation.

**Note:** Keep the shipping box and all packaging materials for future transport needs. Do not use tools that can damage the packaging or the instrument.

To unpack the washer:

1. Check the box for visible damage that occurred during transportation. In case of damage, immediately report it to your Molecular Devices representative and keep the damaged packaging.
2. With the box facing up as indicated on the packaging, use a box cutter to carefully cut open the top of the box.
3. Remove the power cable.
4. Remove the waste, wash, and rinse bottles.



**Figure 1-2: Waste, Wash, and Rinse Bottles**

5. Remove the accessories boxes.



**Figure 1-3: Accessories Boxes**

6. Remove the cardboard dividers from each end of the box



**Figure 1-4: Cardboard Dividers**

7. Carefully lift the instrument out of the box.

8. Remove the foam and cardboard packing materials from the instrument.



**Figure 1-5: Instrument Packing Materials**

9. Remove the plastic wrapper from the instrument.

10. Gently place the instrument on a dry, flat, vibration-free area of the workbench.

    The instrument is 21.00 cm (8.27 in.) wide, 21.00 cm (8.27 in.) high, and 46.00 cm (18.11 in.) deep. To provide access to disconnect power from the instrument, maintain a 20 cm to 30 cm (7.9 in. to 11.8 in.) gap between the rear of the instrument and the wall. Keep the instrument away from direct sunlight.

11. Visually inspect the instrument for loose, bent, or broken parts. If damage is found, immediately report it to your Molecular Devices representative.

12. Compare the serial number on the rear of the instrument with the instrument serial number on the shipping document and the packing list.

13. Make sure that all the instrument accessories are present and match the shipping document and the packing list.

14. Remove the adhesive tape from the clear cover and then open the cover.
15. Remove all packing material, foam, and adhesive tape from the instrument deck.



**Figure 1-6: Remove and keep all packing materials**

16. Remove the metal microplate carrier lock that is attached to the instrument deck with adhesive tape and held in place by the magnet below the surface of the instrument.
17. Keep the shipping box and all packaging materials for future transport needs.

⚠️ **CAUTION!** Before the instrument is installed and powered on, let the instrument stand for at least 2 hours to reduce the possibility of condensation that can damage the instrument or cause a malfunction.

## Installing the Manifold

There are three manifolds available for the MultiWash+ Microplate Washer.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.

The instrument comes with the standard 8-channel manifold. The standard manifold and the fluidics tubing for connecting the manifold to the instrument are packed in separate accessories boxes.

To install the manifold:

1. Open the clear cover.
2. Connect the red quick-fit connector on the aspiration tubing to the red connector on the top of the instrument.
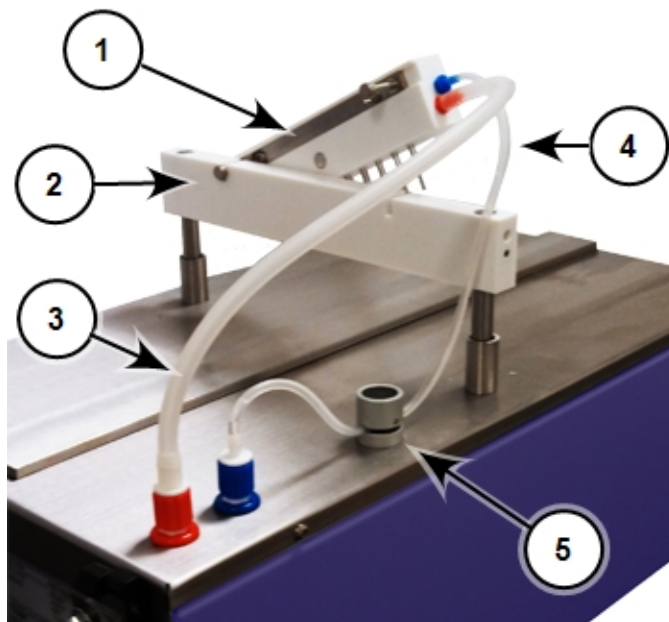


**Figure 1-7: Manifold and Fluidics Tubing**

| Item | Description |
| --- | --- |
| 1 | Manifold |
| 2 | Manifold holder |
| 3 | Aspiration tubing (red) |
| 4 | Dispense tubing (blue) |
| 5 | Pinch valve |

3. Slide the other end of the aspiration tubing onto the red connector on the manifold.

4. Connect the blue quick-fit connector on the dispense tubing to the blue connector on the top of the instrument.

5. Press down on the black top of the pinch valve and then slip the dispense tubing into the slot.



**Figure 1-8: Dispense Tubing in Pinch Valve**

6. Make sure that the tubing is fully inserted into the slot and then release the pinch valve.

7. Slide the other end of the dispense tubing onto the blue connector on the manifold.

> **Note:** Make sure that there is enough slack in the dispense tubing on both sides of the pinch valve to allow for vertical movement of the manifold and to allow fluid to flow freely through the tubing.

8. Place the manifold on the horizontal manifold holder with the needles pointing down and the mounting pins pointing to the rear of the instrument.
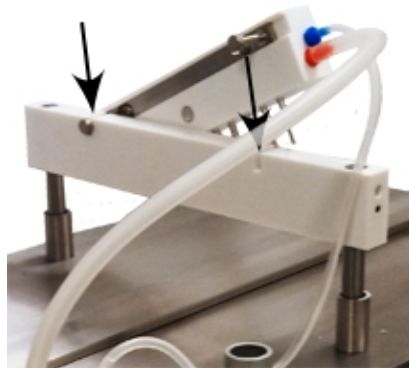


**Figure 1-9: Placing the Manifold on the Manifold Holder**

9. Set the mounting pins into the slots on the top of the manifold holder.

10. Close the clear cover.

After you start the instrument, make sure that the correct manifold is selected in the set up options. See .

## Connecting the Fluid Bottles

The waste, rinse, and wash bottles connect to the color-coded fittings on the rear of the MultiWash+ Microplate Washer.
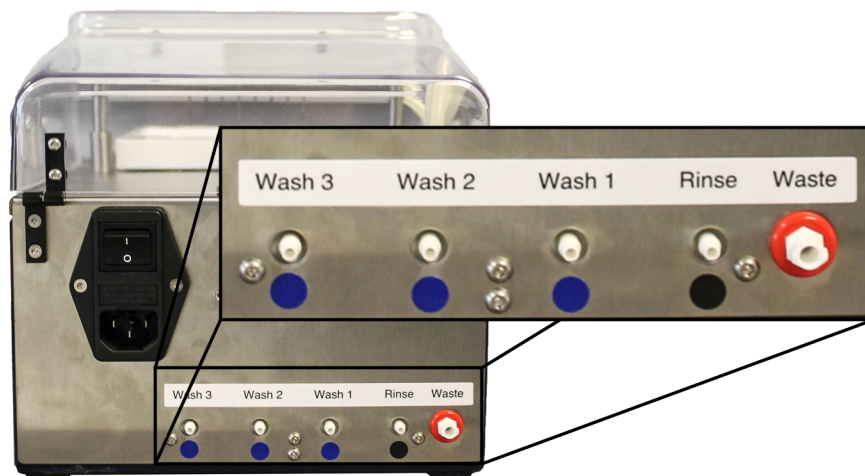


**Figure 1-10: Fittings for Fluid Bottle Connections**

- The 2.5 liter waste bottle connects to the fitting framed in red.
- The 2 liter rinse bottle connects to the fitting with the black label below it.
- The 2 liter wash bottles connect to the fittings with the blue labels below them.

  You can connect up to three wash bottles to the instrument.

The bottles and fittings are labeled for their intended use. For example, the 2 liter rinse bottle is labeled **Rinse**, and the corresponding fitting on the rear of the instrument is also labeled **Rinse**.

To install the fluid bottles:

1. Locate the waste tubing with the red marking.
2. Connect the waste tubing to the **Waste** fitting framed in red on the rear of the instrument.
3. Connect the other end of the waste tubing to the fitting on top of the 2.5 liter waste bottle.
4. Locate the rinse tubing with the black marking.
5. Connect the rinse tubing to the **Rinse** fitting with the black label below it on the rear of the instrument.
6. Connect the other end of the rinse tubing to the fitting on top of the 2 liter rinse bottle.

7. Locate a wash tubing with the blue marking.

8. Connect the wash tubing to the **Wash 1** fitting with a blue label below it on the rear of the instrument.

9. Connect the other end of the wash tubing to the fitting on top of a 2 liter wash bottle.

10. Connect up to two more wash bottles if needed.

> **Note:** Before starting a procedure, make sure that the applicable wash and rinse bottles contain adequate liquid, and that the waste bottle is empty.

## Installing the Microplate Carrier

The removable microplate carrier has a very strong magnet permanently mounted to its base. When the microplate carrier is removed from the instrument, keep the carrier away from magnet-sensitive items or devices.

Before installing the microplate carrier for the first time, remove all packing materials and adhesive tape from the microplate carrier, and make sure that the metal microplate carrier lock has been removed from the instrument deck.

To install the microplate carrier, carefully slide the microplate carrier onto the instrument so that the slot on the bottom of the carrier fits on the rail on the top of the instrument and the front of the carrier is near the front of the instrument deck. The magnet below the instrument deck holds the carrier in the home position.



**Figure 1-11: Installed Microplate Carrier**

## Connecting Power to the Instrument

The power port and power switch are located on the rear of the instrument.
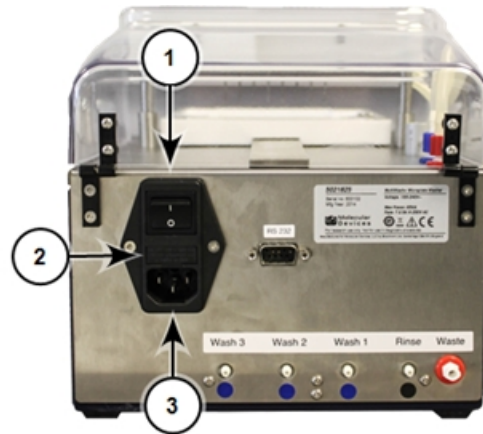


**Figure 1-12: Power Switch, Fuses, and Power Port**

| Item | Description |
|------|-------------|
| 1 | Power switch |
| 2 | Fuse carrier |
| 3 | Power port |

To connect power to the instrument:

1. Make sure that the power switch on the rear of the instrument is in the off position.
2. Plug the provided power cord into the power port.
3. Plug the other end of the power cord into a properly grounded electrical wall outlet.
4. Make sure that the instrument is in position for operation on the work bench.

⚠️ **CAUTION!** Before turning on the power to the instrument, make sure that the metal microplate carrier lock has been removed from the instrument deck and that the microplate carrier is installed.

5. Turn on the power to the instrument.

When the instrument is ready for use, the indicator light on the front of the instrument illuminates, and the LCD screen displays the **Run Procedure** menu.

Power off the instrument when not in use.
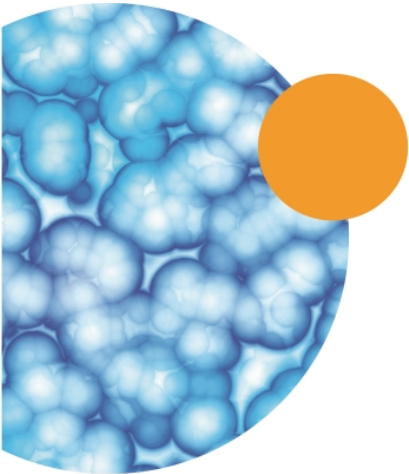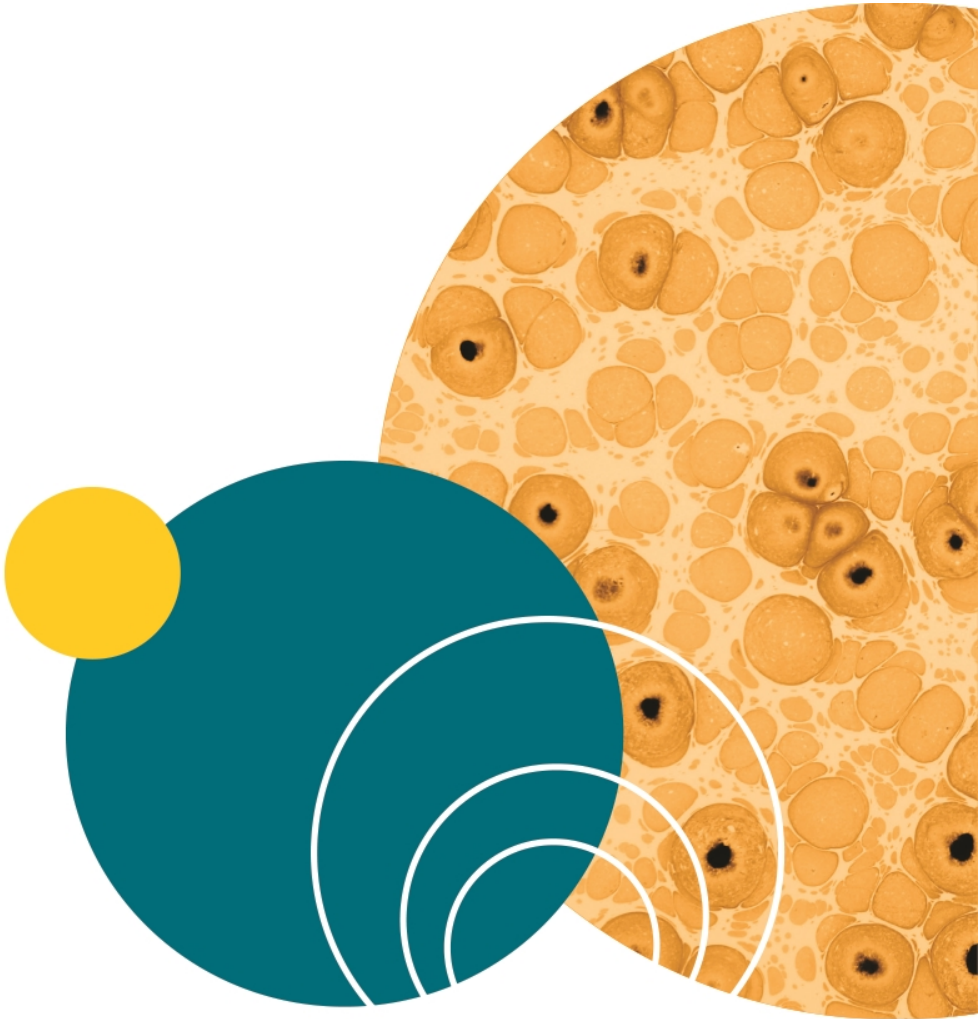
# Chapter 2: Using the Instrument

**2**

The MultiWash+ Microplate Washer is a fully automated and programmable microplate washer for standard ANSI/SLAS footprint 96-well and 384-well microplates with flat-bottom or round-bottom wells.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.

Up to three separate wash liquids plus a rinse liquid can be selected for the dispense cycles through the on-board software. Aspirated liquid is routed to a separate waste bottle.

You can control all instrument operations using the 5 keys and the 2-line LCD display on the front of the instrument. Using the on-board software, you can save up to 50 user-defined procedures. Each procedure can run 1 to 8 cycles selected from a list of up to 20 user-defined cycles.

You can save up to 20 user-defined microplate types to use with your procedures. The movement of the microplate and manifold can be optimized for the specific dimensions of each microplate type. You can set the dispense volume and speed, and the aspirate power and time. There are three shake speeds available. Other programmable features include crosswise aspiration and bottom detection for flat-bottom microplates.

This chapter includes the following sections:

## Using the Instrument Control Panel

After you turn on the power to the instrument, the indicator light on the front of the instrument illuminates, and the LCD screen displays the **Run Procedure** menu.



**Figure 2-1: Instrument Control Panel**

You can control all instrument operations using the 5 keys and the 2-line LCD display on the front of the instrument.

The first line of the display is the command, such as **Run Procedure**, **Prime/Rinse**, or **Plate Format**.

The second line of the display contains the functions for the command.

The four buttons below the display correspond with the functions in the second line of the display.

- The two ⬆ buttons correspond to the functions displayed directly above them in the second line of the display. The functionality assigned to these buttons changes depending on the needs of the command in the first line of the display. For example, from a top-level menu, press these buttons to scroll through the other top-level menus.

- The ⊕ and ⊖ buttons let you scroll through the options displayed above them in the second line of the display. For example, for the **Run Procedure** command, press these buttons to scroll through the list of defined procedures.
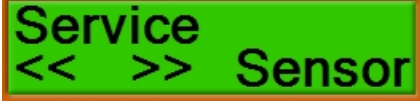
To confirm the displayed selection, press ⬭ENTER .

The user guide describes the functionality of the control panel buttons for each available command.

## Software Overview

The top-level menus can be accessed by pressing the [icon] buttons on the control panel.

**Table 2-1: Top-Level Menus**

| Menu | Description |
|------|-------------|
| **Run Procedure** << >> PROC | From **Run Procedure**, select a previously defined wash or rinse procedure from the list. See Running a Procedure on page 25. |
| **Prime/Rinse** << >> Manua | From **Prime/Rinse**, define and run a manual, automatic, or periodic prime or rinse cycle. See Priming or Rinsing the Fluidics System on page 31. |
| **Define** << >> <new> | From **Define Procedure**, define and save procedures using defined cycles and defined microplate types. See Defining a Procedure on page 51. |
| **Define Cycle** << >> <new> | From **Define Cycle**, define and save wash or rinse cycles to be used in procedure definitions. See Defining a Wash or Rinse Cycle on page 65. |
| **Define Plate** << >> <new> | From **Define Plate**, define and save microplate types to be used in procedure definitions. See Defining a Microplate Type on page 77. |
| **Setup** << >> | From **Setup**, customize the instrument set up for your requirements. See Selecting Instrument Set Up Options on page 113. |
| **Service** << >> Sensor | The **Service** menu is intended to be used by Molecular Devices trained personnel only. See Obtaining Support on page 142. |

## Setting Up the Software

Before running procedures with the MultiWash+ Microplate Washer, select the instrument set up options, define the microplate types, define the wash or rinse cycles, and then define the procedures.

Do the software set up procedures in the following order:

1. Selecting Instrument Set Up Options, see page 113
2. Defining a Microplate Type, see page 77
3. Defining a Wash or Rinse Cycle, see page 65
4. Defining a Procedure, see page 51

## Loading a Microplate

A microplate can be loaded into the microplate carrier in either portrait or landscape orientation, depending on the installed manifold.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.

The instrument comes with the standard 8-channel manifold.
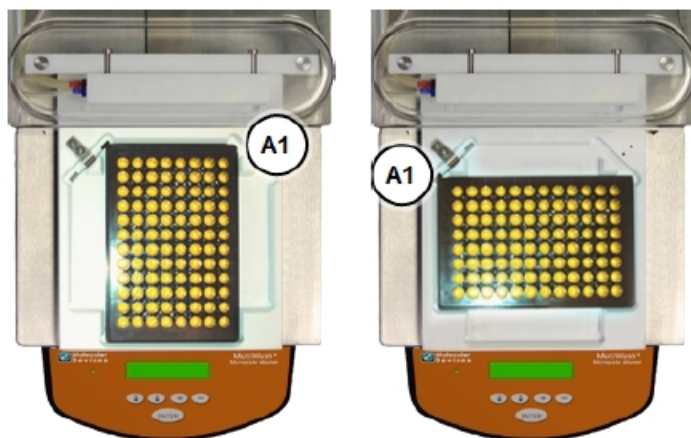


**Figure 2-2: A 96-Well Microplate in Portrait and Landscape Orientation**

- In portrait orientation, load the microplate with well A1 in the upper-right corner.
- In landscape orientation, load the microplate with well A1 in the upper-left corner.

# Chapter 3: Running a Procedure

**3**

Before running procedures with the MultiWash+ Microplate Washer, select the instrument set up options, define the microplate types, define the wash or rinse cycles, and then define the procedures.

- To select the instrument set up options, see Selecting Instrument Set Up Options on page 113.
- To define the microplate types, see Defining a Microplate Type on page 77.
- To define the wash or rinse cycles, see Defining a Wash or Rinse Cycle on page 65.
- To define the procedures, see Defining a Procedure on page 51.

After you have one or more procedures defined, scroll the LCD display to **Run Procedure**. From **Run Procedure**, select a previously defined wash or rinse procedure from the list.



**Figure 3-1: The Run Procedure menu option**

**Table 3-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| (button) On the left | Press this button to scroll to **Service**. The **Service** menu is intended to be used by Molecular Devices trained personnel only. |
| (button) On the right | Press this button to scroll to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| + | Press this button to scroll forward through the list of defined procedures. |
| − | Press this button to scroll backward through the list of defined procedures. |
| ENTER | Press this button to run the selected procedure. See Running the Selected Procedure on page 26. |

## Running the Selected Procedure

After you have selected the procedure to run, the software displays a series of optional prompts to make sure that the instrument is ready for the procedure.

> **Note:** Before starting a procedure, make sure that the applicable wash and rinse bottles contain adequate liquid, and that the waste bottle is empty.

The software displays the optional prompts in the following order:

1. Confirm the Level of the Wash Bottle, see page 27
2. Confirm the Level of the Waste Bottle, see page 28
3. Confirm That the Microplate is Loaded, see page 29
4. Define the Number of Strips to Process, see page 30

If no options have been enabled, then the selected procedure starts to run. See Monitoring the Procedure on page 30.

## Confirm the Level of the Wash Bottle

If the **Liquid Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the applicable wash bottles have sufficient liquid for the selected procedure.

⚠️ **CAUTION!** Running a procedure without sufficient liquid in the wash bottles can damage the instrument.

To enable the **Liquid Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 3-2: The Wash Liquid OK prompt**

**Table 3-2: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | If the wash bottle does not contain enough liquid, press this button to return to **Run Procedure**. See Running a Procedure on page 25. |
| On the right | If the wash bottle contains enough liquid, press this button to go to the next step. If no other options have been enabled, then the selected procedure starts to run. See Monitoring the Procedure on page 30. |
| + | The button has no function for this option. |
| — | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Confirm the Level of the Waste Bottle

If the **Waste Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the waste bottle has sufficient room for aspirated liquid during the selected procedure.

⚠️ **CAUTION!** Running a procedure without sufficient room in the waste bottle can damage the instrument.

To enable the **Waste Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 3-3: The Waste Empty prompt**

**Table 3-3: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆ On the left | If the waste bottle is not empty, press this button to return to **Run Procedure**. See Running a Procedure on page 25. |
| ⬆ On the right | If the waste bottle is empty, press this button to go to the next step. If no other options have been enabled, then the selected procedure starts to run. See Monitoring the Procedure on page 30. |
| + | The button has no function for this option. |
| — | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Confirm That the Microplate is Loaded

If the **Plate Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the microplate has been loaded into the microplate carriage. See Loading a Microplate on page 24.

⚠️ **CAUTION!** Running a procedure without a microplate loaded in the microplate carrier can cause spillage of the wash fluid. This can cause damage to the instrument and to the lab environment, depending on the type of liquid used.

To enable the **Plate Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.

**Plate Inserted?**
**No   Yes**

**Figure 3-4: The Plate Inserted prompt**

**Table 3-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | If the microplate has not been loaded into the microplate carriage, press this button to return to **Run Procedure**. See Running a Procedure on page 25. |
| ▲ On the right | If the microplate has been loaded into the microplate carriage, press this button to go to the next step. If no other options have been enabled, then the selected procedure starts to run. See Monitoring the Procedure on page 30. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Define the Number of Strips to Process

If the **Ask Strip Nr** option is enabled for the selected procedure, then the software displays a prompt for you to define the number of strips to process. The strips are processed starting from row A. This can be useful to process a partial microplate or only a few strips in the procedure.

To enable the **Ask Strip Nr** option in a procedure, see Defining a Procedure on page 51.



**Figure 3-5: The Number of Strips prompt**

**Table 3-5: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Run Procedure**. See Running a Procedure on page 25. |
| On the right | The button has no function for this option. |
| + | Press this button to reduce the number of strips to process. |
| − | Press this button to increase the number of strips to process. |
| ENTER | Press this button to confirm the number of strips to process and then start to run the selected procedure. See Monitoring the Procedure on page 30. |

## Monitoring the Procedure

As the selected procedure runs on the instrument, the software displays the name of each cycle as it is being run.

To stop the procedure, press the  button on the left.

# Chapter 4: Priming or Rinsing the Fluidics System

To prime or rinse the fluidics system, scroll the LCD display to **Prime/Rinse**. From **Prime/Rinse**, define and run a manual, automatic, or periodic prime or rinse process.

- A **Manual** prime or rinse lets you manually control the length of time for the prime or rinse process. See Running a Manual Prime or Rinse Process on page 32.
- An **Auto** prime or rinse lets you define the prime or rinse process that then runs automatically. See Running an Automatic Prime or Rinse Process on page 37.
- A **Periodic** prime or rinse lets you define the prime or rinse process that can then be run repeatedly at a specified interval of time. See Running a Periodic Prime or Rinse Process on page 43.



**Figure 4-1: The Prime/Rinse menu option**

**Table 4-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to scroll to **Run Procedure**. See Running a Procedure on page 25. |
| On the right | Press this button to scroll to **Define Procedure**. See Defining a Procedure on page 51. |
| + | Press this button to scroll forward through the list of prime or rinse processes: **Manual**, **Auto**, or **Periodic**. |
| − | Press this button to scroll backward through the list of prime or rinse processes: **Manual**, **Periodic**, or **Auto**. |
| ENTER | Press this button to select the type of prime or rinse process. See Running a Manual Prime or Rinse Process on page 32, Running an Automatic Prime or Rinse Process on page 37, or Running a Periodic Prime or Rinse Process on page 43. |

## Running a Manual Prime or Rinse Process

A **Manual** prime or rinse lets you manually control the length of time for the prime or rinse process.



**Figure 4-2: The Manual Prime/Rinse option**

Press the ⊕ or ⊖ buttons to scroll through the options until **Manual** is displayed, and then press **ENTER** .

The software displays a series of prompts to prepare the instrument for the process.

> **Note:** Before starting a prime or rinse process, make sure that the applicable wash or rinse bottle contains adequate liquid, and that the waste bottle is empty. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

The software displays the prompts in the following order:

1. Select the Bottle for the Prime or Rinse Process, see page 33
2. Confirm the Level of the Wash or Rinse Bottle, see page 34
3. Confirm the Level of the Waste Bottle, see page 35

After the instrument is prepared, the manual prime or rinse process can be run. See Controlling the Manual Prime or Rinse Process on page 36.

## Select the Bottle for the Prime or Rinse Process

Before you can run the manual prime or rinse process, you must select the bottle to use.

The labels above the fittings where the bottles connect to the rear of the instrument match the names of the bottles in the software.
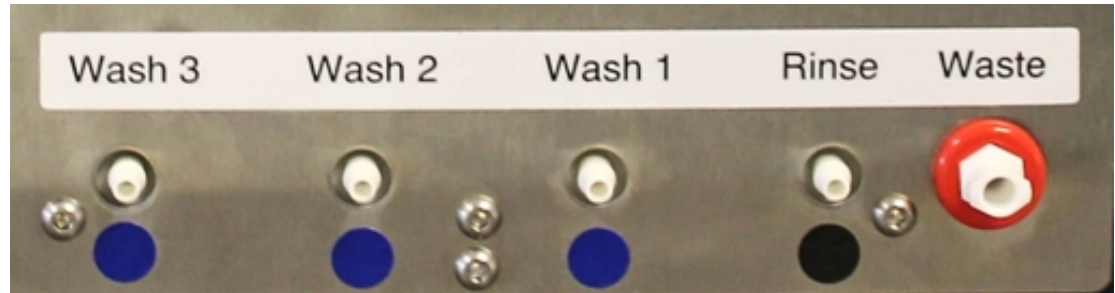


**Figure 4-3: Fittings for Fluid Bottle Connections**



**Figure 4-4: The Liquid prompt**

**Table 4-2: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ On the right | The button has no function for this option. |
| + | Press this button to scroll forward through the list of wash and rinse bottles. |
| — | Press this button to scroll backward through the list of wash and rinse bottles. |
| ENTER | Press this button to confirm the bottle selection and go to the next step. The software displays a series of optional prompts to make sure that the instrument is ready for the procedure. If no options have been enabled, then the manual prime or rinse process can be started. See Controlling the Manual Prime or Rinse Process on page 36. |

## Confirm the Level of the Wash or Rinse Bottle

If the **Liquid Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the applicable wash or rinse bottle has sufficient liquid for the process.

⚠️ **CAUTION!** Running a prime or rinse process without sufficient liquid in the wash or rinse bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Liquid Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 4-5: The Wash Liquid OK prompt**

**Table 4-3: Actions of Control Panel Buttons**

| Button | Action |
| --- | --- |
| ⏫ On the left | If the wash or rinse bottle does not contain enough liquid, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ⏫ On the right | If the wash or rinse bottle contains enough liquid, press this button to go to the next step. If no other options have been enabled, then the manual prime or rinse process can be started. See Controlling the Manual Prime or Rinse Process on page 36. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Confirm the Level of the Waste Bottle

If the **Waste Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the waste bottle has sufficient room for aspirated liquid during the prime or rinse process.

> ⚠️ **CAUTION!** Running a prime or rinse process without sufficient room in the waste bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Waste Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 4-6: The Waste Empty prompt**

**Table 4-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⏏ On the left | If the waste bottle is not empty, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ⏏ On the right | If the waste bottle is empty, press this button to go start the manual prime or rinse process. See Controlling the Manual Prime or Rinse Process on page 36. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Controlling the Manual Prime or Rinse Process

After the instrument is prepared, the manual prime or rinse process can be run.



**Figure 4-7: The Manual Prime/Rinse option**

**Table 4-5: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ (On the left) | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ (On the right) | Press and hold this button down for as long as you want the prime or rinse process to run. To stop the process, release the button. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Running an Automatic Prime or Rinse Process

An **Auto** prime or rinse lets you define the prime or rinse process that then runs automatically.



**Figure 4-8: The Auto Prime/Rinse option**

Press the ⊕ or ⊖ buttons to scroll through the options until **Auto** is displayed, and then press ENTER .

The software displays a series of prompts to prepare the instrument for the process.

> **Note:** Before starting a prime or rinse process, make sure that the applicable wash or rinse bottle contains adequate liquid, and that the waste bottle is empty. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

The software displays the prompts in the following order:

1. Select the Bottle for the Prime or Rinse Process, see page 38
2. Confirm the Level of the Wash or Rinse Bottle, see page 39
3. Confirm the Level of the Waste Bottle, see page 40
4. Defining the Liquid Volume for the Prime or Rinse Process, see page 41

After the instrument is prepared, the automatic prime or rinse process can be run. See Starting the Automatic Prime or Rinse Process on page 42.

## Select the Bottle for the Prime or Rinse Process

Before you can run the automatic prime or rinse process, you must select the bottle to use.

The labels above the fittings where the bottles connect to the rear of the instrument match the names of the bottles in the software.



**Figure 4-9: Fittings for Fluid Bottle Connections**
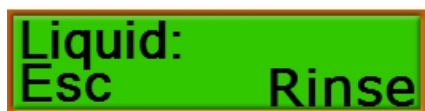


**Figure 4-10: The Liquid prompt**

**Table 4-6: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | The button has no function for this option. |
| + | Press this button to scroll forward through the list of wash and rinse bottles. |
| − | Press this button to scroll backward through the list of wash and rinse bottles. |
| ENTER | Press this button to confirm the bottle selection and go to the next step. The software displays a series of optional prompts to make sure that the instrument is ready for the procedure. If no options have been enabled, then you can define the volume of liquid to use for the automatic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 41. |

## Confirm the Level of the Wash or Rinse Bottle

If the **Liquid Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the applicable wash or rinse bottle has sufficient liquid for the process.

⚠️ **CAUTION!** Running a prime or rinse process without sufficient liquid in the wash or rinse bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Liquid Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 4-11: The Wash Liquid OK prompt**

**Table 4-7: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | If the wash or rinse bottle does not contain enough liquid, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ On the right | If the wash or rinse bottle contains enough liquid, press this button to go to the next step. If no other options have been enabled, then you can define the volume of liquid to use for the automatic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 41. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Confirm the Level of the Waste Bottle

If the **Waste Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the waste bottle has sufficient room for aspirated liquid during the prime or rinse process.

⚠️ **CAUTION!** Running a prime or rinse process without sufficient room in the waste bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Waste Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.

**Waste Empty?**
**No   Yes**

**Figure 4-12: The Waste Empty prompt**

**Table 4-8: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | If the waste bottle is not empty, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ On the right | If the waste bottle is empty, press this button to define the volume of liquid to use for the automatic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 41. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Defining the Liquid Volume for the Prime or Rinse Process

Define the volume of liquid to dispense during the automatic prime or rinse process.



**Figure 4-13: The Volume prompt**

**Table 4-9: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | The button has no function for this option. |
| + | Press this button to increase the dispense volume by 1 mL, up to a maximum of 200 mL. |
| − | Press this button to decrease the dispense volume by 1 mL, down to a minimum of 1 mL. |
| ENTER | Press this button to confirm the dispense volume and start the automatic prime or rinse process. See Starting the Automatic Prime or Rinse Process on page 42. |

## Starting the Automatic Prime or Rinse Process

After the instrument is prepared, the automatic prime or rinse process can be run.



**Figure 4-14: The Start Prime/Rinse prompt**

**Table 4-10: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | The button has no function for this option. |
| + | The button has no function for this option. |
| — | The button has no function for this option. |
| ENTER | Press this button to run the automatic prime or rinse process. |



**Figure 4-15: The Prime/Rinse In Process prompt**

To stop the prime or rinse process, press the button on the left.

## Running a Periodic Prime or Rinse Process

A **Periodic** prime or rinse lets you define the prime or rinse process that can then be run repeatedly at a specified interval of time.



**Figure 4-16: The Periodic Prime/Rinse option**

Press the ➕ or ➖ buttons to scroll through the options until **Periodic** is displayed, and then press ENTER .

The software displays a series of prompts to prepare the instrument for the process.

> **Note:** Before starting a prime or rinse process, make sure that the applicable wash or rinse bottle contains adequate liquid, and that the waste bottle is empty. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

The software displays the prompts in the following order:

1. Select the Bottle for the Prime or Rinse Process, see page 44
2. Confirm the Level of the Wash or Rinse Bottle, see page 45
3. Confirm the Level of the Waste Bottle, see page 46
4. Defining the Liquid Volume for the Prime or Rinse Process, see page 47
5. Defining the Interval Between Each Prime or Rinse Process, see page 48

After the instrument is prepared, the periodic prime or rinse process can be run. See Starting the Periodic Prime or Rinse Process on page 49.

The defined prime or rinse process repeats after the defined interval of time until the process is stopped.

## Select the Bottle for the Prime or Rinse Process

Before you can run the periodic prime or rinse process, you must select the bottle to use.

The labels above the fittings where the bottles connect to the rear of the instrument match the names of the bottles in the software.
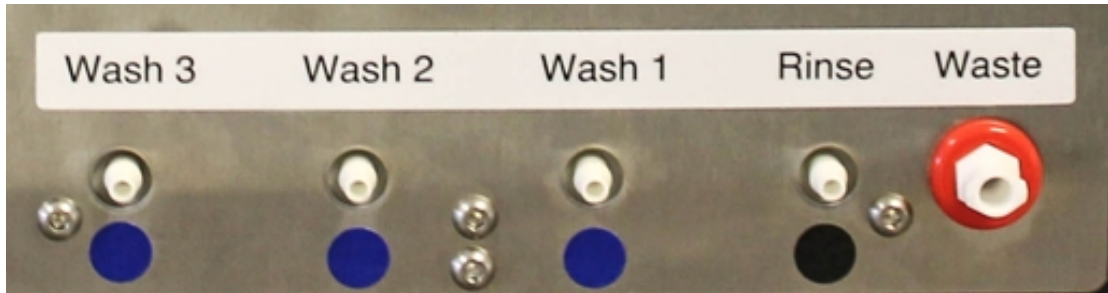


**Figure 4-17: Fittings for Fluid Bottle Connections**
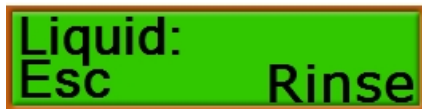


**Figure 4-18: The Liquid prompt**

**Table 4-11: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | The button has no function for this option. |
| + | Press this button to scroll forward through the list of wash and rinse bottles. |
| − | Press this button to scroll backward through the list of wash and rinse bottles. |
| ENTER | Press this button to confirm the bottle selection and go to the next step. The software displays a series of optional prompts to make sure that the instrument is ready for the procedure. If no options have been enabled, then you can define the volume of liquid to use for the periodic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 47. |

## Confirm the Level of the Wash or Rinse Bottle

If the **Liquid Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the applicable wash or rinse bottle has sufficient liquid for the process.

⚠️ **CAUTION!** Running a prime or rinse process without sufficient liquid in the wash or rinse bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Liquid Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 4-19: The Wash Liquid OK prompt**

**Table 4-12: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ <br> On the left | If the wash or rinse bottle does not contain enough liquid, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ <br> On the right | If the wash or rinse bottle contains enough liquid, press this button to go to the next step. If no other options have been enabled, then you can define the volume of liquid to use for the automatic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 47. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Confirm the Level of the Waste Bottle

If the **Waste Warning** option is enabled in the **Setup** menu, then the software displays a prompt to make sure that the waste bottle has sufficient room for aspirated liquid during the prime or rinse process.

> ⚠️ **CAUTION!** Running a prime or rinse process without sufficient room in the waste bottle can damage the instrument. The minimum volume required for a Prime/Rinse function is 7.5mL+1.5mL (total of 9mL), where 7.5mL is the volume of liquid in the tube (from Rinse bottle to Dispense head of manifold) and 1.5mL is the volume dispensed during the Prime/Rinse cycle. We suggest using a little more than 7.5mL + 1.5mL to have enough backup pressure to push liquid through the tube and dispense the required volume (1.5mL).

To enable the **Waste Warning** option in the **Setup** menu, see Selecting Instrument Set Up Options on page 113.



**Figure 4-20: The Waste Empty prompt**

**Table 4-13: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | If the waste bottle is not empty, press this button to return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲ On the right | If the waste bottle is empty, press this button to define the volume of liquid to use for the automatic prime or rinse process. See Defining the Liquid Volume for the Prime or Rinse Process on page 47. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | The button has no function for this option. |

## Defining the Liquid Volume for the Prime or Rinse Process

Define the volume of liquid to dispense during the periodic prime or rinse process.



**Figure 4-21: The Volume prompt**

**Table 4-14: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | The button has no function for this option. |
| + | Press this button to increase the dispense volume by 1 mL, up to a maximum of 200 mL. |
| − | Press this button to decrease the dispense volume by 1 mL, down to a minimum of 1 mL. |
| ENTER | Press this button to confirm the dispense volume and then define the time between each periodic prime or rinse process. See Defining the Interval Between Each Prime or Rinse Process on page 48. |

## Defining the Interval Between Each Prime or Rinse Process

Define the number of minutes to wait before running each periodic prime or rinse process. The defined prime or rinse process repeats after the defined interval of time until the process is stopped.



**Figure 4-22: The Rinse Interval prompt**

**Table 4-15: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| (button) On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| (button) On the right | The button has no function for this option. |
| + | Press this button to increase the interval by 1 minute, up to a maximum of 200 minutes. |
| − | Press this button to decrease the interval by 1 minute, down to a minimum of 1 minute. |
| ENTER | Press this button to confirm the interval and start the periodic prime or rinse process. See Starting the Periodic Prime or Rinse Process on page 49. |

## Starting the Periodic Prime or Rinse Process

After the instrument is prepared, the periodic prime or rinse process can be run.



**Figure 4-23: The Start Prime/Rinse prompt**

**Table 4-16: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲● On the left | Press this button to end the process and return to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| ▲● On the right | The button has no function for this option. |
| + | The button has no function for this option. |
| — | The button has no function for this option. |
| ENTER | Press this button to run the periodic prime or rinse process. |



**Figure 4-24: The Periodic Rinse prompt**

The defined prime or rinse process repeats after the defined interval of time until the process is stopped.

To stop the prime or rinse process, press the ▲● button on the left.
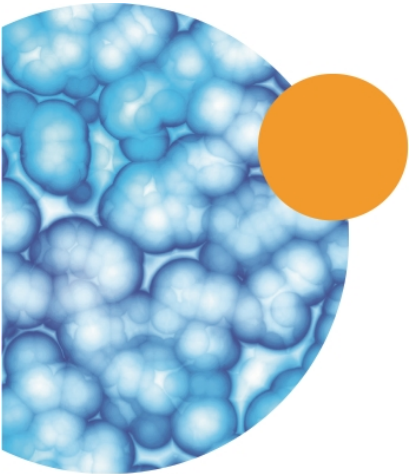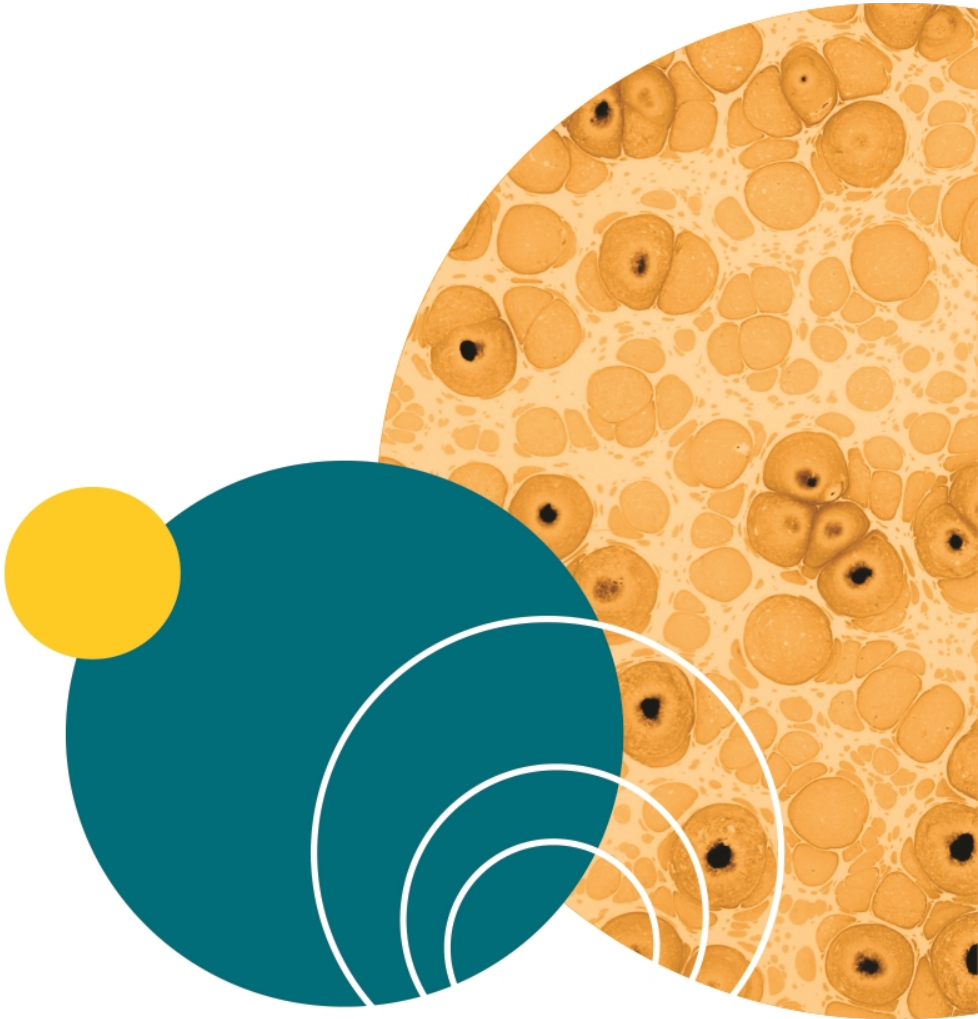
# Chapter 5: Defining a Procedure

Before running procedures with the MultiWash+ Microplate Washer, select the instrument set up options, define the microplate types, define the wash or rinse cycles, and then define the procedures.

- To select the instrument set up options, see Selecting Instrument Set Up Options on page 113.
- To define the microplate types, see Defining a Microplate Type on page 77.
- To define the wash or rinse cycles, see Defining a Wash or Rinse Cycle on page 65.

To edit or define a procedure, scroll the LCD display to **Define Procedure**. From **Define Procedure**, define and save procedures using defined cycles and defined microplate types.

✳ **Tip:** If you have a previously defined procedure, you can create a similar new procedure by editing an existing procedure and giving it a new name.



**Figure 5-1: The Define Procedure menu option**

**Table 5-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to scroll to **Prime/Rinse**. See Priming or Rinsing the Fluidics System on page 31. |
| On the right | Press this button to scroll to **Define Cycle**. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to scroll forward through the list of previously defined procedures. If you want to edit a previously defined procedure, scroll until the name is displayed. If you want to define a new procedure, scroll until **<new>** is displayed. |
| − | Press this button to scroll backward through the list of previously defined procedures. If you want to edit a previously defined procedure, scroll until the name is displayed. If you want to define a new procedure, scroll until **<new>** is displayed. |
| ENTER | Press this button to start defining the procedure. See Defining the Procedure on page 52. |

## Defining the Procedure

The defined procedure can have up to eight previously defined cycles and one previously defined microplate type. If you have not defined the cycles and microplate type to use with this procedure, you must do so before you can continue with the procedure definition.

- To define the wash or rinse cycles, see Defining a Wash or Rinse Cycle on page 65.
- To define the microplate type, see Defining a Microplate Type on page 77.

The software displays the prompts for the procedure definition in the following order:

1. Confirm or Change the Name of the Procedure, see page 53
2. Select the Bottle for the Procedure, see page 55
3. Select the Cycles for the Procedure, see page 56
4. Select the Duration of the Final Aspiration for the Procedure, see page 58
5. Select the Speed of the Final Aspiration for the Procedure, see page 59
6. Select the Processing Mode for the Procedure, see page 60
7. Select the Microplate Type for the Procedure, see page 61
8. Enable the Number of Strips Prompt for the Procedure, see page 62
9. Delay the Final Aspiration for Strips in the Procedure, see page 63

## Confirm or Change the Name of the Procedure

A name is displayed for the procedure. You can either confirm the displayed name or give the procedure a new name.



**Figure 5-2: The Name prompt**

**Table 5-2: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| On the right | Press this button to edit the name of the procedure. See Edit the Name of the Procedure on page 54. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | Press this button to confirm the name as it is displayed and then define the wash or rinse bottle to use for the procedure. See Select the Bottle for the Procedure on page 55. |

**Edit the Name of the Procedure**

You can give a short, descriptive name to the procedure, with up to eight alphanumeric characters.



**Figure 5-3: The Name edit prompt**

**Table 5-3: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| On the right | Press this button to select the character displayed on the far right side of the line. |
| + | Press this button to scroll forward through the available characters: A to Z and 0 to 9 |
| − | Press this button to scroll backward through the available characters: 9 to 0 and Z to A |
| ENTER | Press this button to confirm the name as it is displayed and then define the wash or rinse bottle to use for the procedure. See Select the Bottle for the Procedure on page 55. |

## Select the Bottle for the Procedure

The procedure uses the wash or rinse bottle defined in this step.

The labels above the fittings where the bottles connect to the rear of the instrument match the names of the bottles in the software.



**Figure 5-4: Fittings for Fluid Bottle Connections**



**Figure 5-5: The Liquid prompt**

**Table 5-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Confirm or Change the Name of the Procedure on page 53. |
| On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to scroll forward through the list of wash and rinse bottles. |
| — | Press this button to scroll backward through the list of wash and rinse bottles. |
| ENTER | Press this button to confirm the bottle selection and then select a previously defined cycle to use with the procedure. See Select the Cycles for the Procedure on page 56. |

## Select the Cycles for the Procedure

The procedure definition must have at least one cycle selected, and can have up to eight cycles. If you have not defined the cycles to use with this procedure, you must do so before you can continue with the procedure definition. See .



**Figure 5-6: The Cycle1 prompt**

**Table 5-5: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ <br> On the left | Press this button to return to the previous step. See . |
| ▲ <br> On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See . |
| + | Press this button to scroll forward through the list of previously defined cycles. |
| − | Press this button to scroll backward through the list of previously defined cycles. |
| ENTER | Press this button to confirm the cycle selection and then select the next cycle to use with the procedure. See . |

## Add More Cycles to the Procedure

The procedure definition can have up to eight cycles. When you have finished adding cycles, select - - - as the name of the next cycle to stop adding cycles to the procedure definition.



**Figure 5-7: The Cycle2 prompt**

**Table 5-6: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ <br> On the left | Press this button to return to the previous step. See Select the Cycles for the Procedure on page 56. |
| ▲ <br> On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to scroll forward through the list of previously defined cycles. When you have finished adding cycles, select - - - to stop adding cycles to the procedure definition. |
| − | Press this button to scroll backward through the list of previously defined cycles. When you have finished adding cycles, select - - - to stop adding cycles to the procedure definition. |
| ENTER | Press this button to confirm the cycle selection and then select the next cycle to use with the procedure. If you selected - - - , then you can define the duration of the final aspiration. See Select the Duration of the Final Aspiration for the Procedure on page 58 |

## Select the Duration of the Final Aspiration for the Procedure

Define the duration time for the final aspiration of the procedure from 0.1 second to 10.0 seconds. The aspiration duration is the amount of time that the aspiration needle on the manifold stays inside a well during aspiration.



**Figure 5-8: The Final Aspiration Time prompt**

**Table 5-7: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲● On the left | Press this button to return to the previous step. See Select the Cycles for the Procedure on page 56. |
| ▲● On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to add time to the duration in 0.1 second intervals to a maximum of 10.0 seconds. |
| — | Press this button to subtract time from the duration in 0.1 second intervals to a minimum of 0.1 second. |
| ENTER | Press this button to confirm the duration and then define the speed of the final aspiration for the procedure. See Select the Speed of the Final Aspiration for the Procedure on page 59. |

## Select the Speed of the Final Aspiration for the Procedure

Define the speed, or power, of the final aspiration of the procedure.



**Figure 5-9: The Final Aspiration Speed prompt**

**Table 5-8: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to return to the previous step. See Select the Duration of the Final Aspiration for the Procedure on page 58. |
| ▲ On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to scroll forward through the aspiration speeds: **Low**, **Medium**, or **High** |
| − | Press this button to scroll backward through the aspiration speeds: **High**, **Medium**, or **Low** |
| ENTER | Press this button to confirm the speed and then select the processing mode to use for the procedure. See Select the Processing Mode for the Procedure on page 60. |

## Select the Processing Mode for the Procedure

Define the processing mode for the procedure as either **Plate** or **Strip**.



**Figure 5-10: The Processing Mode prompt**

**Table 5-9: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆ On the left | Press this button to return to the previous step. See Select the Speed of the Final Aspiration for the Procedure on page 59. |
| ⬆ On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to display either **Plate** or **Strip**. |
| − | Press this button to display either **Plate** or **Strip**. |
| ENTER | Press this button to select the displayed mode and then select a previously defined microplate type to use with the procedure. See Select the Microplate Type for the Procedure on page 61. |

## Select the Microplate Type for the Procedure

Select a previously defined microplate type for the procedure. If you have not defined the microplate type to use with this procedure, you must do so before you can continue with the procedure definition. See Defining a Microplate Type on page 77.



**Figure 5-11: The Plate prompt**

**Table 5-10: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Select the Processing Mode for the Procedure on page 60. |
| On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to scroll forward through the list of previously defined microplate types. |
| − | Press this button to scroll backward through the list of previously defined microplate types. |
| ENTER | Press this button to confirm the microplate type and then select whether to ask for the number of strips in the procedure set up. See Enable the Number of Strips Prompt for the Procedure on page 62. |

## Enable the Number of Strips Prompt for the Procedure

Enable or disable the prompt to define the number of strips to process during the procedure. This can be useful to process a partial microplate or only a few strips in the procedure.



**Figure 5-12: The Ask Strip Number prompt**

**Table 5-11: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| (button, up) On the left | Press this button to return to the previous step. See Select the Microplate Type for the Procedure on page 61. |
| (button, up) On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to display either **Yes** to enable the prompt or **No** to disable the prompt. |
| — | Press this button to display either **Yes** to enable the prompt or **No** to disable the prompt. |
| ENTER | Press this button to accept the selection. If you selected **Plate** as the processing mode, then the parameters for the procedure definition are saved. If you selected **Strip** as the processing mode, then you can select to delay the final aspiration. See Delay the Final Aspiration for Strips in the Procedure on page 63. |

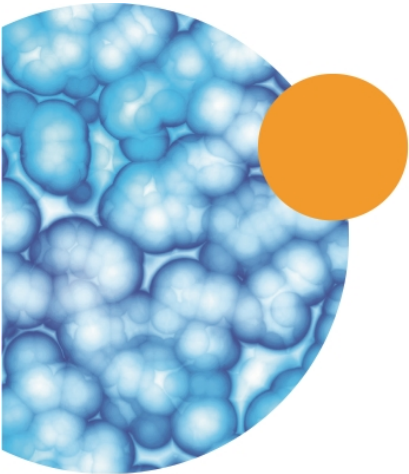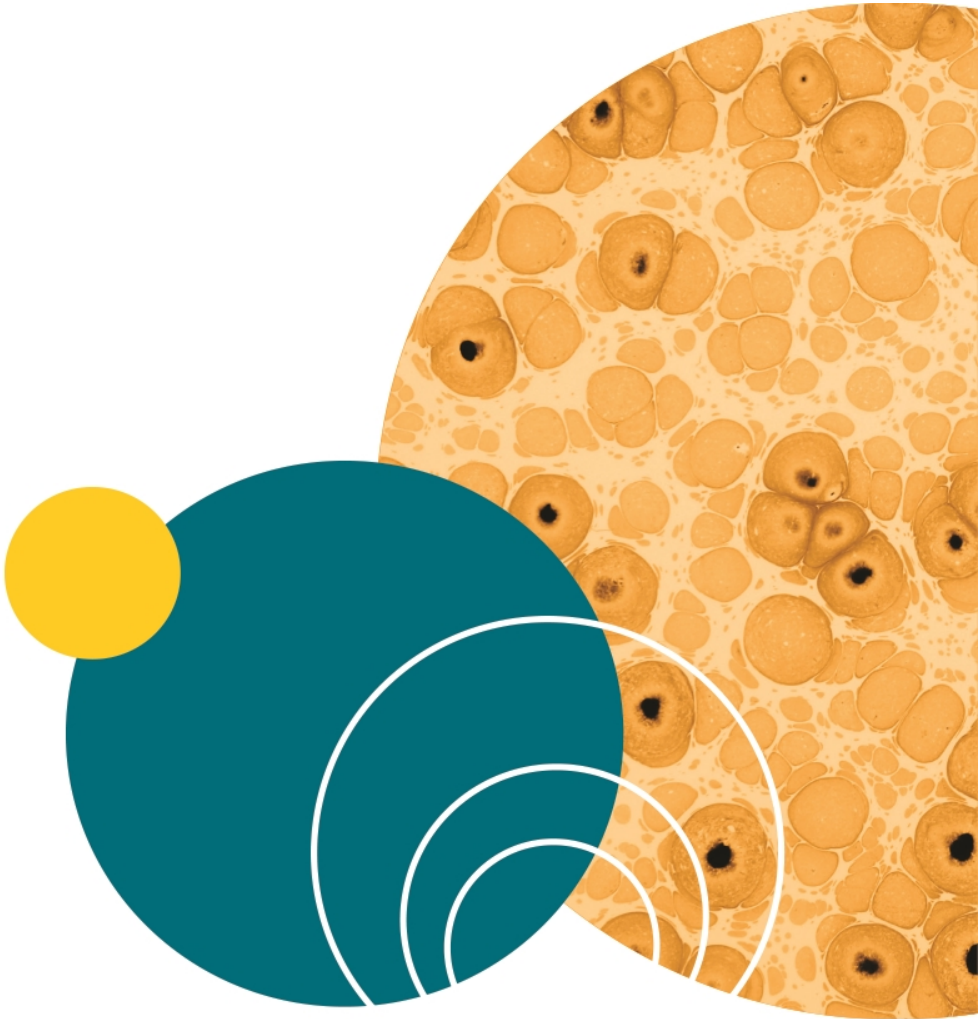## Delay the Final Aspiration for Strips in the Procedure

For **Strip** processing mode only, you can select to delay the final aspiration until after the last cycle for the last strip is complete and the soak time has expired.



**Figure 5-13: The Delay Final Aspiration prompt**

**Table 5-12: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to return to the previous step. See Enable the Number of Strips Prompt for the Procedure on page 62. |
| ▲ On the right | Press this button to end the process and return to **Define Procedure** without saving any changes. See Defining a Procedure on page 51. |
| + | Press this button to display either **Yes** or **No**. Select **Yes** to delay the final aspiration until after the last cycle for the last strip is complete and the soak time has expired. |
| − | Press this button to display either **Yes** or **No**. Select **Yes** to delay the final aspiration until after the last cycle for the last strip is complete and the soak time has expired. |
| ENTER | Press this button to accept the selection. The parameters for the procedure definition are saved. |

# Chapter 6: Defining a Wash or Rinse Cycle

Before running procedures with the MultiWash+ Microplate Washer, select the instrument set up options, define the microplate types, define the wash or rinse cycles, and then define the procedures.

- To select the instrument set up options, see Selecting Instrument Set Up Options on page 113.
- To define the microplate types, see Defining a Microplate Type on page 77.
- To define the procedures, see Defining a Procedure on page 51.

To edit or define a cycle, scroll the LCD display to **Define Cycle**. From **Define Cycle**, define and save wash or rinse cycles to be used in procedure definitions.

✳ **Tip:** If you have a previously defined cycle, you can create a similar new cycle by editing an existing cycle and giving it a new name.



**Figure 6-1: The Define Cycle menu option**

**Table 6-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to scroll to **Define Procedure**. See Defining a Procedure on page 51. |
| ▲ On the right | Press this button to scroll to **Define Plate**. See Defining a Microplate Type on page 77. |
| + | Press this button to scroll forward through the list of previously defined cycles. If you want to edit a previously defined cycle, scroll until the name is displayed. If you want to define a new cycle, scroll until **<new>** is displayed. |
| − | Press this button to scroll backward through the list of previously defined cycles. If you want to edit a previously defined cycle, scroll until the name is displayed. If you want to define a new cycle, scroll until **<new>** is displayed. |
| ENTER | Press this button to start defining the cycle. See Defining the Cycle on page 66. |

## Defining the Cycle

One or more defined cycles are required before a procedure can be defined.

The software displays the prompts for the cycle definition in the following order:

1. Confirm or Change the Name of the Cycle, see page 67
2. Select the Duration of the Aspiration for the Cycle, see page 69
3. Select the Speed of the Aspiration for the Cycle, see page 70
4. Define the Dispense Volume for the Cycle, see page 71
5. Select the Dispense Speed for the Cycle, see page 72
6. Select the Wash Mode for the Cycle, see page 73
7. Define the Microplate Shake Time for the Cycle, see page 74
8. Select the Microplate Shake Intensity for the Cycle, see page 75
9. Define the Minimum Soak Time for the Cycle, see page 76

## Confirm or Change the Name of the Cycle

A name is displayed for the cycle. You can either confirm the displayed name or give the cycle a new name.



**Figure 6-2: The Name prompt**

**Table 6-2: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| On the right | Press this button to edit the name of the cycle. See Edit the Name of the Cycle on page 68. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | Press this button to confirm the name as it is displayed and then define the aspiration duration for the cycle. See Select the Duration of the Aspiration for the Cycle on page 69. |

**Edit the Name of the Cycle**

You can give a short, descriptive name to the cycle, with up to eight alphanumeric characters.



**Figure 6-3: The Name edit prompt**

**Table 6-3: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| On the right | Press this button to select the character displayed on the far right side of the line. |
| + | Press this button to scroll forward through the available characters: A to Z and 0 to 9 |
| — | Press this button to scroll backward through the available characters: 9 to 0 and Z to A |
| ENTER | Press this button to confirm the name as it is displayed and then define the aspiration duration for the cycle. See Select the Duration of the Aspiration for the Cycle on page 69. |

## Select the Duration of the Aspiration for the Cycle

Define the duration time for the aspiration in the cycle from 0 seconds to 10.0 seconds. The aspiration duration is the amount of time that the aspiration needle on the manifold stays inside a well during aspiration.



**Figure 6-4: The Aspiration Time prompt**

**Table 6-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Confirm or Change the Name of the Cycle on page 67. |
| On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to add time to the duration in 1 second intervals to a maximum of 10 seconds. |
| − | Press this button to subtract time from the duration in 1 second intervals to a minimum of 0 seconds. |
| ENTER | Press this button to confirm the duration and then define the speed of the aspiration for the cycle. See Select the Speed of the Aspiration for the Cycle on page 70. |

## Select the Speed of the Aspiration for the Cycle

Define the speed, or power, of the aspiration in the cycle.



**Figure 6-5: The Aspiration Power prompt**

**Table 6-5: Actions of Control Panel Buttons**

| Button | Action |
| --- | --- |
| ⏏<br>On the left | Press this button to return to the previous step. See Select the Duration of the Aspiration for the Cycle on page 69. |
| ⏏<br>On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to scroll forward through the aspiration speeds: **Low**, **Medium**, or **High** |
| — | Press this button to scroll backward through the aspiration speeds: **High**, **Medium**, or **Low** |
| ENTER | Press this button to confirm the speed and then define the dispense volume for the cycle. See Define the Dispense Volume for the Cycle on page 71. |

## Define the Dispense Volume for the Cycle

Define the dispense volume in the cycle from 0 µL to 2000 µL.



**Figure 6-6: The Dispense Volume prompt**

**Table 6-6: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Select the Speed of the Aspiration for the Cycle on page 70. |
| On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to add volume in 50 µL increments to a maximum of 2000 µL. |
| − | Press this button to subtract volume in 50 µL increments to a minimum of 0 µL. |
| ENTER | Press this button to confirm the volume and then define the speed of the dispense for the cycle. See Select the Dispense Speed for the Cycle on page 72. |

## Select the Dispense Speed for the Cycle

Define the speed, or power, of the dispense in the cycle.



**Figure 6-7: The Dispense Power prompt**

**Table 6-7: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to return to the previous step. See Define the Dispense Volume for the Cycle on page 71. |
| ▲ On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to scroll forward through the dispense speeds: **Low**, **Medium**, or **High** |
| — | Press this button to scroll backward through the dispense speeds: **High**, **Medium**, or **Low** |
| ENTER | Press this button to confirm the speed and then define the wash mode for the cycle. See Select the Wash Mode for the Cycle on page 73. |

## Select the Wash Mode for the Cycle

Select either the **Bottom** or **Overflow** wash mode for the cycle.

- The **Bottom** wash mode places the needles on the manifold in the well to the position defined for the microplate type. During the wash cycle, only the bottom of the well is washed.

- The **Overflow** wash mode places the needles on the manifold above the well to the position defined for the microplate type. During the wash cycle, the entire well is washed. The wash solution is aspirated only after it reaches the aspiration needles on the manifold.

  When using the **Overflow** wash mode, Molecular Devices recommends that you use a dispense volume that is slightly more than the well volume.

For information on defining the **Bottom** and **Overflow** positions for a microplate, see Defining a Microplate Type on page 77.



**Figure 6-8: The Wash Mode prompt**

**Table 6-8: Actions of Control Panel Buttons**

| Button | Action |
|--------|--------|
| ▲ <br> On the left | Press this button to return to the previous step. See Select the Dispense Speed for the Cycle on page 72. |
| ▲ <br> On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to display either **Bottom** or **Overflow** wash mode. |
| − | Press this button to display either **Bottom** or **Overflow** wash mode. |
| ENTER | Press this button to confirm the selection and then define the microplate shake time for the cycle. See Define the Microplate Shake Time for the Cycle on page 74. |

## Define the Microplate Shake Time for the Cycle

Define the duration of time to shake the microplate from 0 seconds to 10 seconds.



**Figure 6-9: The Shaking Time prompt**

**Table 6-9: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆ On the left | Press this button to return to the previous step. See Select the Wash Mode for the Cycle on page 73. |
| ⬆ On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to add time to the shake duration in 1 second intervals to a maximum of 10 seconds. |
| − | Press this button to subtract time from the shake duration in 1 second intervals to a minimum of 0 seconds. |
| ENTER | Press this button to confirm the shake duration and then define the intensity of the shaking for the cycle. See Select the Microplate Shake Intensity for the Cycle on page 75. |

## Select the Microplate Shake Intensity for the Cycle

Define the intensity for shaking the microplate in the cycle.



**Figure 6-10: The Shaking Intensity prompt**

**Table 6-10: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to return to the previous step. See Define the Microplate Shake Time for the Cycle on page 74. |
| ▲ On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to scroll forward through the shake speeds: **Low**, **Medium**, or **High** |
| − | Press this button to scroll backward through the shake speeds: **High**, **Medium**, or **Low** |
| ENTER | Press this button to confirm the shake intensity and then define the minimum soak time for the cycle. See Define the Minimum Soak Time for the Cycle on page 76. |

## Define the Minimum Soak Time for the Cycle

Define the minimum duration of time to soak the wells, between dispense and aspirate, from 0 seconds to 1000 seconds.



**Figure 6-11: The Minimum Soak Time prompt**

**Table 6-11: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Select the Microplate Shake Intensity for the Cycle on page 75. |
| On the right | Press this button to end the process and return to **Define Cycle** without saving any changes. See Defining a Wash or Rinse Cycle on page 65. |
| + | Press this button to add time to the minimum soak duration in 10 second intervals to a maximum of 1000 seconds. |
| — | Press this button to subtract time from the shake duration in 10 second intervals to a minimum of 0 seconds. |
| ENTER | Press this button to confirm the minimum soak duration. The parameters for the cycle definition are saved. |

# Chapter 7: Defining a Microplate Type

Before running procedures with the MultiWash+ Microplate Washer, select the instrument set up options, define the microplate types, define the wash or rinse cycles, and then define the procedures.

- To select the instrument set up options, see Selecting Instrument Set Up Options on page 113.
- To define the wash or rinse cycles, see Defining a Wash or Rinse Cycle on page 65.
- To define the procedures, see Defining a Procedure on page 51.

To define the microplate types, scroll the LCD display to **Define Plate**. From **Define Plate**, define and save microplate types to be used in procedure definitions.

✳ **Tip:** If you have a previously defined microplate type, you can create a similar new microplate type by editing an existing microplate type and giving it a new name.

**Define Plate**
**<<    >>    <new>**

**Figure 7-1: The Define Plate menu option**

**Table 7-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲<br>On the left | Press this button to scroll to **Define Cycle**. See Defining the Cycle on page 66. |
| ▲<br>On the right | Press this button to scroll to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to scroll forward through the list of previously defined microplate types. If you want to edit a previously defined microplate type, scroll until the name is displayed. If you want to define a new microplate type, scroll until **<new>** is displayed. |
| − | Press this button to scroll backward through the list of previously defined microplate types. If you want to edit a previously defined microplate type, scroll until the name is displayed. If you want to define a new microplate type, scroll until **<new>** is displayed. |
| ENTER | Press this button to start defining the microplate type. See Defining Microplate Types on page 78. |

## Defining Microplate Types

Molecular Devices recommends that you load the plate in the plate carrier before creating or editing a plate type definition.

Different options are available for round-bottom and flat-bottom microplates.

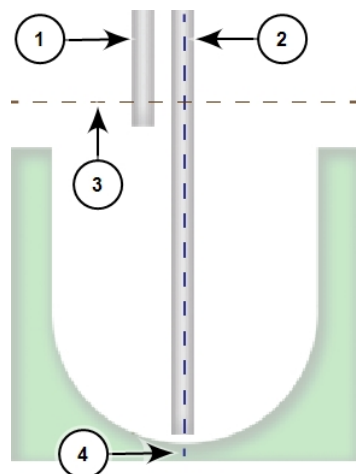For round-bottom microplates, define the center of the well for aspiration.



**Table 7-2: Round-Bottom Microplate**

| Item | Description |
|------|-------------|
| 1 | Dispense needle |
| 2 | Aspiration needle |
| 3 | Vertical "zero" point for setting the vertical position of the manifold. |
| 4 | Horizontal "zero" point for setting the horizontal position of the microplate. |

To define a round-bottom microplate type, see Defining a Round-Bottom Microplate Type on page 80.

For flat-bottom microplates, you can define the outside edges of the well for crosswise aspiration.
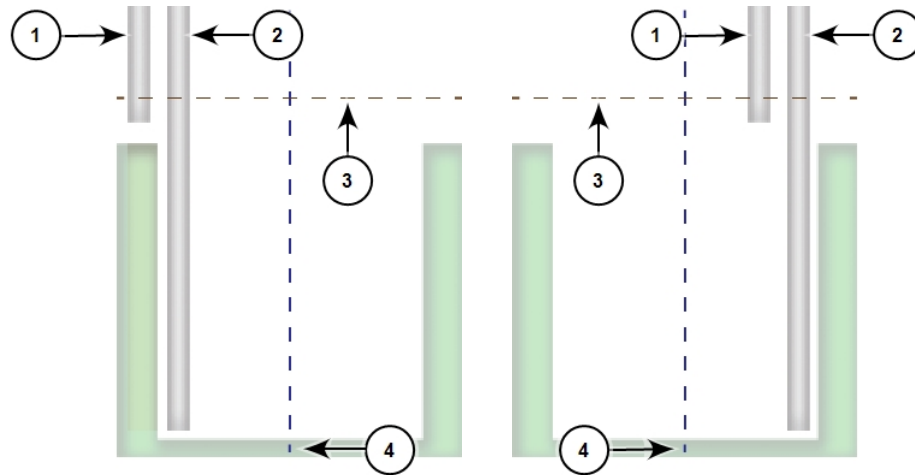


**Table 7-3: Flat-Bottom Microplate**

| Item | Description |
|------|-------------|
| 1 | Dispense needle |
| 2 | Aspiration needle |
| 3 | Vertical "zero" point for setting the vertical position of the manifold. |
| 4 | Horizontal "zero" point for setting the horizontal position of the microplate. |

**Note:** Crosswise aspiration is available only for flat-bottom microplates.

To define a flat-bottom microplate type, see Defining a Flat-Bottom Microplate Type on page 95.

## Defining a Round-Bottom Microplate Type

Different options are available for round-bottom and flat-bottom microplates. To define a flat-bottom microplate type, see Defining a Flat-Bottom Microplate Type on page 95.



**Figure 7-2: The Define Plate menu option**

Press the ⊕ or ⊖ buttons to scroll through the list of previously defined microplate types.

- If you want to edit a previously defined microplate type, scroll until the name is displayed.
- If you want to define a new microplate type, scroll until **<new>** is displayed.

Press ENTER to start defining the microplate type.

The software displays the prompts for defining the microplate type in the following order:

1. Confirm or Change the Name of the Microplate Type, see page 81
2. Select the Format of the Microplate Type, see page 83
3. Select the Well Shape of the Microplate Type, see page 84
4. Define the Center of the Well for Aspiration, see page 85
5. Define the Height for Aspiration, see page 87
6. Define the Dispense Position, see page 89
7. Define the Bottom Dispense Height, see page 91
8. Define the Overflow Dispense Height, see page 93

> **Note:** Molecular Devices recommends that you load the plate in the plate carrier before creating or editing a plate type definition.

## Confirm or Change the Name of the Microplate Type

A name is displayed for the microplate type. You can either confirm the displayed name or give the microplate type a new name.



**Figure 7-3: The Name prompt**

**Table 7-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to edit the name of the cycle. See Edit the Name of the Microplate Type on page 82. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | Press this button to confirm the name as it is displayed and then define the microplate format. See Select the Format of the Microplate Type on page 83. |

**Edit the Name of the Microplate Type**

You can give a short, descriptive name to the microplate type, with up to eight alphanumeric characters.



**Figure 7-4: The Name edit prompt**

**Table 7-5: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| ▲ On the right | Press this button to select the character displayed on the far right side of the line. |
| + | Press this button to scroll forward through the available characters: A to Z and 0 to 9 |
| − | Press this button to scroll backward through the available characters: 9 to 0 and Z to A |
| ENTER | Press this button to confirm the name as it is displayed and then define the microplate format. See Select the Format of the Microplate Type on page 83. |

## Select the Format of the Microplate Type

You can select the **8-strip**, **12-strip**, or **16-strip** format for the microplate type. The strip formats correspond to the number of channels in the manifold.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.



**Figure 7-5: The Plate Format prompt**

**Table 7-6: Actions of Control Panel Buttons**

| Button | Action |
| --- | --- |
| ▲ On the left | Press this button to return to the previous step. See Confirm or Change the Name of the Microplate Type on page 81. |
| ▲ On the right | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| + | Press this button to scroll forward through the microplate formats: **8-strip**, **12-strip**, or **16-strip** |
| − | Press this button to scroll backward through the microplate formats: **16-strip**, **12-strip**, or **8-strip** |
| ENTER | Press this button to confirm the format and then define the well shape for the microplate type. See Select the Well Shape of the Microplate Type on page 84. |

## Select the Well Shape of the Microplate Type

Different options are available for round-bottom and flat-bottom microplates. To define a flat-bottom microplate type, see Defining a Flat-Bottom Microplate Type on page 95.



**Figure 7-6: The Well Shape prompt**

**Table 7-7: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬓ On the left | Press this button to return to the previous step. See Select the Format of the Microplate Type on page 83. |
| ⬓ On the right | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| + | Press this button to display either **Flat** or **Round**. To define a round-bottom microplate type, select **Round**. |
| − | Press this button to display either **Flat** or **Round**. To define a round-bottom microplate type, select **Round**. |
| ENTER | Press this button to confirm the well shape and then define the center of the well for aspiration for the microplate type. See Define the Center of the Well for Aspiration on page 85. |

# Define the Center of the Well for Aspiration

This option is available only for round-bottom microplates. Molecular Devices recommends positioning the aspiration needle in the center of the well for round-bottom microplates.
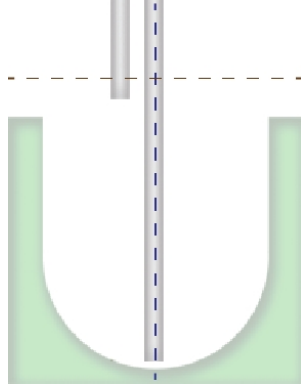


**Figure 7-7: The center of a round-bottom microplate**

You can define the center by editing the offset value, or by using the "teach-in" method.



**Figure 7-8: The Center Position prompt**

**Table 7-8: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved center position and switch to "teach-in" mode. See Teach-In the Center of the Well for Aspiration on page 86. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the aspiration height. See Define the Height for Aspiration on page 87. |

### Teach-In the Center of the Well for Aspiration

Use the "teach-in" method to define the center of the well for aspiration.



**Figure 7-9: The Center Position "teach-in" prompt**

**Table 7-9: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| On the right | Press this button to move the microplate to the currently saved center position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| — | Press this button to decrease the offset value by 0.1 mm to a minimum of –5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the aspiration height. See Define the Height for Aspiration on page 87. |

# Define the Height for Aspiration

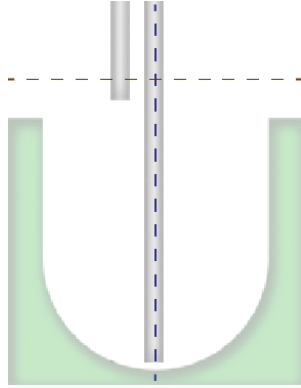Define the height of the manifold during aspiration for the microplate type.



**Figure 7-10: Aspiration height**

You can define the aspiration height by editing the offset value, or by using the "teach-in" method.



**Figure 7-11: The Aspiration Height prompt**

**Table 7-10: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved aspiration position and switch to "teach-in" mode. See Teach-In the Height for Aspiration on page 88. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense position. See Define the Dispense Position on page 89. |

**Teach-In the Height for Aspiration**

Use the "teach-in" method to define the height for aspiration.



**Figure 7-12: The Aspiration Height "teach-in" prompt**

**Table 7-11: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well. With ↑ displayed on the left, press this button to move the manifold up. |
| On the right | Press this button to move the microplate to the currently saved aspiration position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense position. See Define the Dispense Position on page 89. |

## Define the Dispense Position

The dispense position defines the horizontal position of the microplate below the manifold needles.

For washing, the dispense needle is placed above the microplate well. The aspiration needle aspirates overflow to prevent spillage into adjacent wells.
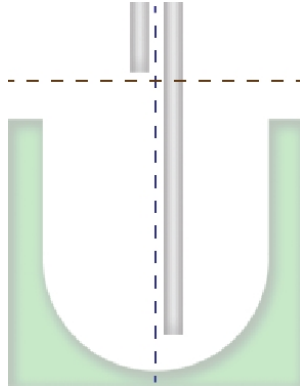


**Figure 7-13: Dispense position**

You can define the dispense position by editing the offset value, or by using the "teach-in" method.



**Figure 7-14: The Dispense Position prompt**

**Table 7-12: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved dispense position and switch to "teach-in" mode. See Teach-In the Dispense Position on page 90. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense height for a **Bottom** wash. See Define the Bottom Dispense Height on page 91. |

**Teach-In the Dispense Position**

Use the "teach-in" method to define the dispense position.



**Figure 7-15: The Dispense Position "teach-in" prompt**

**Table 7-13: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⏶ On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| ⏶ On the right | Press this button to move the microplate to the currently saved dispense position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| — | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense height for a **Bottom** wash. See Define the Bottom Dispense Height on page 91. |

## Define the Bottom Dispense Height

The bottom dispense height defines the height of the manifold during a dispense for a **Bottom** wash. The dispense height must be higher or equal to the height for aspiration.
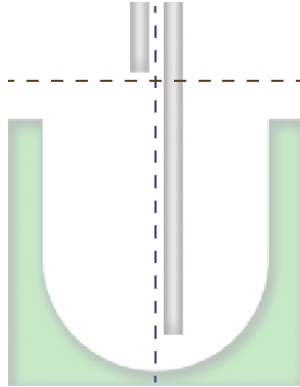


**Figure 7-16: Bottom dispense height**

You can define the bottom dispense height by editing the offset value, or by using the "teach-in" method.



**Figure 7-17: The Bottom Dispense Height prompt**

**Table 7-14: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved bottom dispense position and switch to "teach-in" mode. See Teach-In the Bottom Dispense Height on page 92. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the overflow dispense height. See Define the Overflow Dispense Height on page 93. |

**Teach-In the Bottom Dispense Height**

Use the "teach-in" method to define the dispense height for a **Bottom** wash.
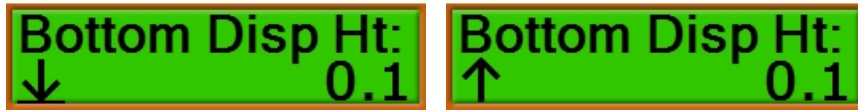


**Figure 7-18: The Bottom Dispense Height "teach-in" prompt**

**Table 7-15: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well. <br> With ↑ displayed on the left, press this button to move the manifold up. |
| On the right | Press this button to move the microplate to the currently saved bottom dispense position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the overflow dispense height. See Define the Overflow Dispense Height on page 93. |

## Define the Overflow Dispense Height

The overflow dispense height defines the height of the manifold during a dispense for an **Overflow** wash. The dispense height must be higher or equal to the height for aspiration.

When using the **Overflow** wash mode, Molecular Devices recommends that you use a dispense volume that is slightly more than the well volume.
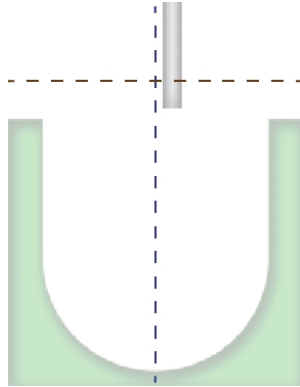


**Figure 7-19: Overflow dispense height**

You can define the overflow dispense height by editing the offset value, or by using the "teach-in" method.



**Figure 7-20: The Overflow Dispense Height prompt**

**Table 7-16: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved overflow dispense position and switch to "teach-in" mode. See Teach-In the Overflow Dispense Height on page 94. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then save the parameters for the microplate type definition. |

**Teach-In the Overflow Dispense Height**

Use the "teach-in" method to define the dispense height for an **Overflow** wash.



**Figure 7-21: The Overflow Dispense Height "teach-in" prompt**

**Table 7-17: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⏫ On the left | With ⬇ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well. With ⬆ displayed on the left, press this button to move the manifold up. |
| ⏫ On the right | Press this button to move the microplate to the currently saved overflow dispense position. |
| ＋ | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| － | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then save the parameters for the microplate type definition. |

## Defining a Flat-Bottom Microplate Type

Different options are available for round-bottom and flat-bottom microplates. To define a round-bottom microplate type, see Defining a Round-Bottom Microplate Type on page 80.



**Figure 7-22: The Define Plate menu option**

Press the ⊕ or ⊖ buttons to scroll through the list of previously defined microplate types.

- If you want to edit a previously defined microplate type, scroll until the name is displayed.
- If you want to define a new microplate type, scroll until **<new>** is displayed.

Press ENTER to start defining the microplate type.

The software displays the prompts for defining the microplate type in the following order:

1. Confirm or Change the Name of the Microplate Type, see page 96
2. Select the Format of the Microplate Type, see page 98
3. Select the Well Shape of the Microplate Type, see page 99
4. Select Whether to Use Crosswise Aspiration, see page 100
5. Define the Side for Aspiration, see page 101
6. Define the Second Side for Crosswise Aspiration, see page 103
7. Define the Height for Aspiration, see page 105
8. Define the Dispense Position, see page 107
9. Define the Bottom Dispense Height, see page 109
10. Define the Overflow Dispense Height, see page 111

> **Note:** Molecular Devices recommends that you load the plate in the plate carrier before creating or editing a plate type definition.

## Confirm or Change the Name of the Microplate Type

A name is displayed for the microplate type. You can either confirm the displayed name or give the microplate type a new name.



**Figure 7-23: The Name prompt**

**Table 7-18: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| (up/down button) On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| (up/down button) On the right | Press this button to edit the name of the cycle. See Edit the Name of the Microplate Type on page 97. |
| + | The button has no function for this option. |
| − | The button has no function for this option. |
| ENTER | Press this button to confirm the name as it is displayed and then define the microplate format. See Select the Format of the Microplate Type on page 98. |

## Edit the Name of the Microplate Type

You can give a short, descriptive name to the microplate type, with up to eight alphanumeric characters.



**Figure 7-24: The Name edit prompt**

**Table 7-19: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| (up arrow) On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| (up arrow) On the right | Press this button to select the character displayed on the far right side of the line. |
| + | Press this button to scroll forward through the available characters: A to Z and 0 to 9 |
| − | Press this button to scroll backward through the available characters: 9 to 0 and Z to A |
| ENTER | Press this button to confirm the name as it is displayed and then define the microplate format. See Select the Format of the Microplate Type on page 98. |

## Select the Format of the Microplate Type

You can select the **8-strip**, **12-strip**, or **16-strip** format for the microplate type. The strip formats correspond to the number of channels in the manifold.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.



**Figure 7-25: The Plate Format prompt**

**Table 7-20: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | Press this button to return to the previous step. See Confirm or Change the Name of the Microplate Type on page 96. |
| ▲ On the right | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| + | Press this button to scroll forward through the microplate formats: **8-strip**, **12-strip**, or **16-strip** |
| − | Press this button to scroll backward through the microplate formats: **16-strip**, **12-strip**, or **8-strip** |
| ENTER | Press this button to confirm the format and then define the well shape for the microplate type. See Select the Well Shape of the Microplate Type on page 99. |

## Select the Well Shape of the Microplate Type

Different options are available for round-bottom and flat-bottom microplates. To define a round-bottom microplate type, see Defining a Round-Bottom Microplate Type on page 80.



**Figure 7-26: The Well Shape prompt**

**Table 7-21: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Select the Format of the Microplate Type on page 98. |
| On the right | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| + | Press this button to display either **Flat** or **Round**. To define a flat-bottom microplate type, select **Flat**. |
| − | Press this button to display either **Flat** or **Round**. To define a flat-bottom microplate type, select **Flat**. |
| ENTER | Press this button to confirm the well shape and then define the whether to use crosswise aspiration for the microplate type. See Select Whether to Use Crosswise Aspiration on page 100. |

## Select Whether to Use Crosswise Aspiration

In crosswise aspiration, the aspiration needle is moved close to one side of the well for the first aspiration step. After the defined aspiration time, the needle moves to the opposite side of the well for the second aspiration step.
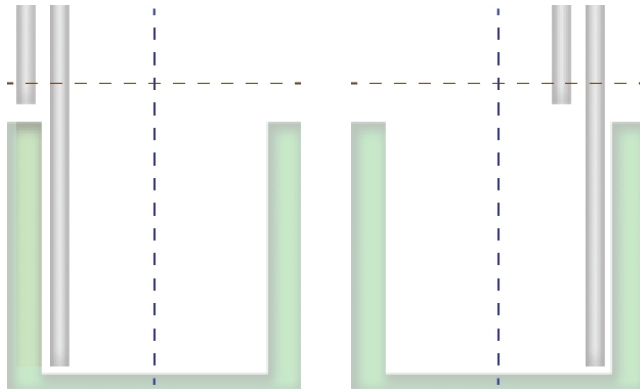


**Figure 7-27: Crosswise Aspiration**

Molecular Devices recommends using crosswise aspiration for flat-bottom microplates. Crosswise aspiration is available only for flat-bottom microplates.



**Figure 7-28: The Crosswise Aspiration prompt**

**Table 7-22: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to the previous step. See Select the Well Shape of the Microplate Type on page 99. |
| On the right | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| + | Press this button to display either **Yes** or **No**. To enable crosswise aspiration, select **Yes**. |
| — | Press this button to display either **Yes** or **No**. To enable crosswise aspiration, select **Yes**. |
| ENTER | Press this button to confirm the selection and then define the side of the well for aspiration, or the first side for crosswise aspiration. See Define the Side for Aspiration on page 101. |

## Define the Side for Aspiration

This option defines the position of a flat-bottom microplate for aspiration. If crosswise aspiration is enabled, then this option defines the position for the first step of a crosswise aspiration. Molecular Devices recommends that you place the aspiration needle close to the edge the well in a flat-bottom microplate.
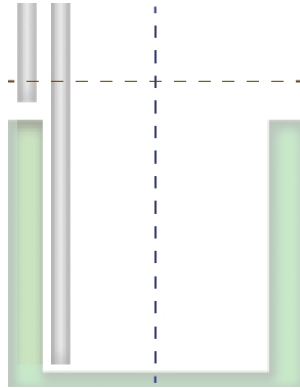


**Figure 7-29: Aspiration position**

You can define the side for aspiration by editing the offset value, or by using the "teach-in" method.



**Figure 7-30: The Side Position Front prompt**

**Table 7-23: Actions of Control Panel Buttons**

| Button | Action |
| --- | --- |
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved aspiration position and switch to "teach-in" mode. See Teach-In the Side for Aspiration on page 102. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value. If crosswise aspiration is enabled, then you can define the second side for aspiration. See Define the Second Side for Crosswise Aspiration on page 103. If crosswise aspiration is disabled, then you can define the aspiration height. See Define the Height for Aspiration on page 105. |

## Teach-In the Side for Aspiration

Use the "teach-in" method to define the side of the well for aspiration, or the first side of the well for crosswise aspiration.
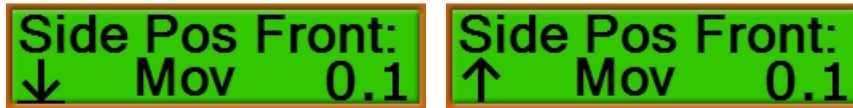


**Figure 7-31: The Side Position Front "teach-in" prompt**

**Table 7-24: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well. With ↑ displayed on the left, press this button to move the manifold up. |
| ▲ On the right | Press this button to move the microplate to the currently saved aspiration position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value. If crosswise aspiration is enabled, then you can define the second side for aspiration. See Define the Second Side for Crosswise Aspiration on page 103. If crosswise aspiration is disabled, then you can define the aspiration height. See Define the Height for Aspiration on page 105. |

## Define the Second Side for Crosswise Aspiration

This option is available only for flat-bottom microplates with crosswise aspiration enabled. This option defines the position of the microplate for the second step of a crosswise aspiration. Molecular Devices recommends that you place the aspiration needle close to the edge that is opposite from the first aspiration position.
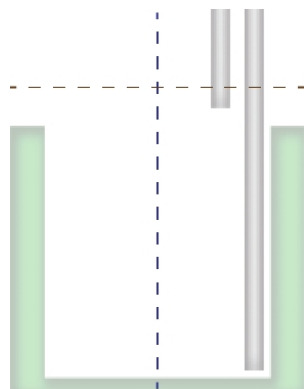


**Figure 7-32: The second side for crosswise aspiration**

You can define the second side for crosswise aspiration by editing the offset value, or by using the "teach-in" method.



**Figure 7-33: The Side Position Rear prompt**

**Table 7-25: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved second side position and switch to "teach-in" mode. See Teach-In the Second Side for Crosswise Aspiration on page 104. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the aspiration height. See Define the Height for Aspiration on page 105. |

### Teach-In the Second Side for Crosswise Aspiration

Use the "teach-in" method to define the second side of the well for crosswise aspiration.



**Figure 7-34: The Side Position Rear "teach-in" prompt**

**Table 7-26: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆ On the left | With ⬇ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well. With ⬆ displayed on the left, press this button to move the manifold up. |
| ⬆ On the right | Press this button to move the microplate to the currently saved second side position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the aspiration height. See Define the Height for Aspiration on page 105. |

## Define the Height for Aspiration

Define the height of the manifold during aspiration for the microplate type.



**Figure 7-35: Aspiration height**

You can define the aspiration height by editing the offset value, or by using the "teach-in" method.



**Figure 7-36: The Aspiration Height prompt**

**Table 7-27: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved aspiration position and switch to "teach-in" mode. See Teach-In the Center of the Well for Aspiration on page 86. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense position. See Define the Dispense Position on page 89. |

**Teach-In the Height for Aspiration**

Use the "teach-in" method to define the height for aspiration.



**Figure 7-37: The Aspiration Height "teach-in" prompt**

**Table 7-28: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| ▲ On the right | Press this button to move the microplate to the currently saved aspiration position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense position. See Define the Dispense Position on page 107. |

## Define the Dispense Position

The dispense position defines the horizontal position of the microplate below the manifold needles.

For washing, the dispense needle is placed above the microplate well. The aspiration needle aspirates overflow to prevent spillage into adjacent wells.
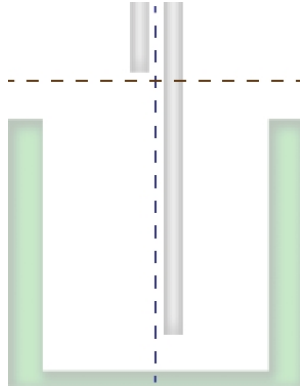


**Figure 7-38: Dispense position**

You can define the dispense position by editing the offset value, or by using the "teach-in" method.



**Figure 7-39: The Dispense Position prompt**

**Table 7-29: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved dispense position and switch to "teach-in" mode. See Teach-In the Dispense Position on page 108. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense height for a **Bottom** wash. See Define the Bottom Dispense Height on page 109. |

### Teach-In the Dispense Position

Use the "teach-in" method to define the dispense position.



**Figure 7-40: The Dispense Position "teach-in" prompt**

**Table 7-30: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ▲ On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| ▲ On the right | Press this button to move the microplate to the currently saved dispense position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 5.0 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of −5.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the dispense height for a **Bottom** wash. See Define the Bottom Dispense Height on page 109. |

## Define the Bottom Dispense Height

The bottom dispense height defines the height of the manifold during a dispense for a **Bottom** wash. The dispense height must be higher or equal to the height for aspiration.
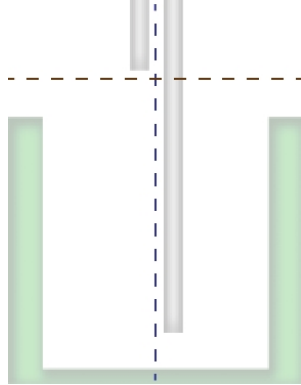


**Figure 7-41: Bottom dispense height**

You can define the bottom dispense height by editing the offset value, or by using the "teach-in" method.



**Figure 7-42: The Bottom Dispense Height prompt**

**Table 7-31: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved bottom dispense position and switch to "teach-in" mode. See Teach-In the Bottom Dispense Height on page 110. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the overflow dispense height. See Define the Overflow Dispense Height on page 111. |

**Teach-In the Bottom Dispense Height**

Use the "teach-in" method to define the dispense height for a **Bottom** wash.
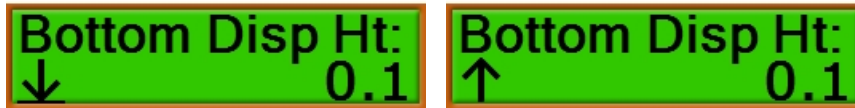


**Figure 7-43: The Bottom Dispense Height "teach-in" prompt**

**Table 7-32: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| On the right | Press this button to move the microplate to the currently saved bottom dispense position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then define the overflow dispense height. See Define the Overflow Dispense Height on page 111. |

## Define the Overflow Dispense Height

The overflow dispense height defines the height of the manifold during a dispense for an **Overflow** wash. The dispense height must be higher or equal to the height for aspiration.

When using the **Overflow** wash mode, Molecular Devices recommends that you use a dispense volume that is slightly more than the well volume.
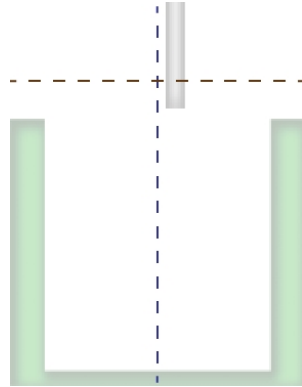


**Figure 7-44: Overflow dispense height**

You can define the overflow dispense height by editing the offset value, or by using the "teach-in" method.



**Figure 7-45: The Overflow Dispense Height prompt**

**Table 7-33: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to end the process and return to **Define Plate** without saving any changes. See Defining a Microplate Type on page 77. |
| On the right | Press this button to move the microplate to the currently saved overflow dispense position and switch to "teach-in" mode. See Teach-In the Overflow Dispense Height on page 112. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then save the parameters for the microplate type definition. |

**Teach-In the Overflow Dispense Height**

Use the "teach-in" method to define the dispense height for an **Overflow** wash.

**Ovflow Disp Ht:**
↓                0.1

**Ovflow Disp Ht:**
↑                0.1

**Figure 7-46: The Overflow Dispense Height "teach-in" prompt**

**Table 7-34: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⏏ On the left | With ↓ displayed on the left, press this button to detect and move the aspiration needle to the bottom of the well.<br>With ↑ displayed on the left, press this button to move the manifold up. |
| ⏏ On the right | Press this button to move the microplate to the currently saved overflow dispense position. |
| + | Press this button to increase the offset value by 0.1 mm to a maximum of 18.8 mm. |
| − | Press this button to decrease the offset value by 0.1 mm to a minimum of 0.0 mm. |
| ENTER | Press this button to accept the displayed offset value and then save the parameters for the microplate type definition. |

# Chapter 8: Selecting Instrument Set Up Options

To define the instrument set up options, scroll the LCD display to **Setup**. From **Setup**, customize the instrument set up for your requirements.



**Figure 8-1: The Setup menu option**

**Table 8-1: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to scroll to **Define Plate**. See Defining a Microplate Type on page 77. |
| On the right | Press this button to scroll to **Service**. The **Service** menu is intended to be used by Molecular Devices trained personnel only. |
| + | The button has no function for this option. |
| — | The button has no function for this option. |
| ENTER | Press this button to start defining the set up options with the language selection. See Selecting the Language for the Display on page 114. |

## Selecting the Language for the Display

You can choose to display the text on the LCD display in English or German.



**Figure 8-2: The Language option**

**Table 8-2: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| On the right | The button has no function for this option. |
| + | Press this button to display either **English** or **German**. |
| − | Press this button to display either **English** or **German**. |
| ENTER | Press this button to select the language and then define the installed manifold. See Selecting the Installed Manifold on page 115. |

## Selecting the Installed Manifold

This option is very important to let the software know the size of the manifold that is installed on the instrument. A procedure will not run if a different manifold is defined here than the size defined for the procedure.

There are three manifolds available for the MultiWash+ Microplate Washer.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.



**Figure 8-3: The Manifold option**

**Table 8-3: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆ On the left | Press this button to return to **Language**. See Selecting the Language for the Display on page 114. |
| ⬆ On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to scroll forward through the list of available manifolds: **8Needle**, **12Needle**, or **16Needle** |
| – | Press this button to scroll backward through the list of available manifolds: **16Needle**, **12Needle**, or **8Needle** |
| ENTER | Press this button to select the manifold and then define the number of wash bottles connected to the instrument. See Selecting the Number of Installed Wash Bottles on page 116. |

## Selecting the Number of Installed Wash Bottles

Up to three wash bottles can be connected to the instrument.



**Figure 8-4: The Wash Liquids option**

**Table 8-4: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Manifold**. See Selecting the Installed Manifold on page 115. |
| On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to scroll forward through the number of wash bottles: **1**, **2**, or **3** |
| — | Press this button to scroll forward through the number of wash bottles: **3**, **2**, or **1** |
| ENTER | Press this button to select the number of wash bottles and then scroll through the detection options. See Scrolling Through the Detection Options on page 117. |

## Scrolling Through the Detection Options

Liquid-level detection is not available for the instrument. To prevent messages, make sure that **Off** is selected for each of the following options.

**Figure 8-5: The Waste Full Detection option**

Press **ENTER** to go to the **Rinse Empty Detection** option.

**Figure 8-6: The Rinse Empty Detection option**

Press **ENTER** to go to the **Wash1 Empty Detection** option.

**Figure 8-7: The Wash1 Empty Detection option**

Press **ENTER** to go to the **Wash2 Empty Detection** option.

**Figure 8-8: The Wash2 Empty Detection option**

Press **ENTER** to go to the **Wash2 Empty Detection** option.

**Figure 8-9: The Wash3 Empty Detection option**

Press **ENTER** to set the liquid level warning message. See Selecting the Display of the Liquid Level Warning on page 118.

## Selecting the Display of the Liquid Level Warning

Before starting a wash procedure or rinse process, the software can display a message for the operator to make sure that the required wash or rinse bottles contain enough liquid for the procedure or process.



**Figure 8-10: The Liquid Warning option**

**Table 8-5: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Wash3 Empty Detection**. See Scrolling Through the Detection Options on page 117. |
| On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to display either **On** or **Off**. |
| − | Press this button to display either **On** or **Off**. |
| ENTER | Press this button to confirm the selection and then set the waste warning message. See Selecting the Display of the Waste Level Warning on page 119. |

## Selecting the Display of the Waste Level Warning

Before starting a wash procedure or rinse process, the software can display a message for the operator to make sure that the waste bottle is empty.



**Figure 8-11: The Waste Warning option**

**Table 8-6: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Liquid Warning**. See Selecting the Display of the Liquid Level Warning on page 118. |
| On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to display either **On** or **Off**. |
| − | Press this button to display either **On** or **Off**. |
| ENTER | Press this button to confirm the selection and then set the microplate warning message. See Selecting the Display of the Microplate Warning on page 120. |

## Selecting the Display of the Microplate Warning

Before starting a wash procedure or rinse process, the software can display a message for the operator to make sure that a microplate is loaded in the microplate carrier.



**Figure 8-12: The Plate Warning option**

**Table 8-7: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Waste Warning**. See Selecting the Display of the Waste Level Warning on page 119. |
| On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to display either **On** or **Off**. |
| − | Press this button to display either **On** or **Off**. |
| ENTER | Press this button to confirm the selection and then set the key click option. See Selecting the Key Click Option on page 121. |

## Selecting the Key Click Option

You can turn the audible key click on or off.



**Figure 8-13: The Key Click option**

**Table 8-8: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| ⬆<br>On the left | Press this button to return to **Plate Warning**. See Selecting the Display of the Microplate Warning on page 120. |
| ⬆<br>On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to display either **On** or **Off**. |
| − | Press this button to display either **On** or **Off**. |
| ENTER | Press this button to confirm the selection and then set the emergency stop option. See Selecting the Emergency Stop Option on page 122. |

## Selecting the Emergency Stop Option

If a microplate or microplate strip is installed incorrectly, the process in progress stops immediately if the aspirate needle touches the bottom of the well.



**Figure 8-14: The Emergency Stop option**

**Table 8-9: Actions of Control Panel Buttons**

| Button | Action |
|---|---|
| On the left | Press this button to return to **Key Click**. See Selecting the Key Click Option on page 121. |
| On the right | Press this button to return to **Setup**. See Selecting Instrument Set Up Options on page 113. |
| + | Press this button to display either **On** or **Off**. |
| − | Press this button to display either **On** or **Off**. |
| ENTER | Press this button to confirm the selection and then return to **Setup**. See Selecting Instrument Set Up Options on page 113. |

# Chapter 9: Maintenance and Troubleshooting

Perform only the maintenance tasks described in this guide. Contact a Molecular Devices service engineer to inspect and perform a preventive maintenance service on the instrument each year. See Obtaining Support on page 142.

Before operating the instrument or performing maintenance operations, make sure you are familiar with the safety information in this guide. See Safety Information on page 5.

The following topics describe maintenance procedures and troubleshooting that can be done by users to ensure optimal operation of the instrument.

- Preventive Maintenance, see page 123
- Clean the Instrument, see page 124
- Maintaining the Fluidics System and Manifold, see page 126
- Replacing Fuses, see page 130
- Packing the Instrument for Storage or Service, see page 132
- Status Messages and Error Messages, see page 141

> ⚠️ **CAUTION!** Maintenance procedures other than those specified in this guide must be performed by Molecular Devices. When service is required, contact Molecular Devices technical support.

## Preventive Maintenance

To ensure optimal operation of the instrument, perform the following preventive maintenance procedures as needed:

- Wipe off visible dust from exterior surfaces with a lint-free cloth to avoid dust build-up on the instrument.
- Wipe up all spills immediately.
- Follow applicable decontamination procedures as instructed by your laboratory safety officer.
- Respond as required to all error messages displayed by the software.
- Power off the instrument when not in use.

# Clean the Instrument

Observe the following general tips when cleaning the instrument:

**WARNING! BIOHAZARD.** Always wear gloves when operating the instrument and during cleaning procedures that could involve contact with either hazardous or biohazardous materials or fluids.

**CAUTION!** Do not use abrasive cleaners. Do not spray cleaner directly onto the instrument or into any openings. Do not let water or other fluids drip inside the instrument.

- Always turn the power switch off and disconnect the power cord from the main power source before using liquids to clean the instrument.
- Wipe up all spills immediately.
- Periodically clean the outside surfaces of the instrument using a cloth or sponge that has been lightly dampened with water.
- If required, clean the surfaces using a mild soap solution diluted with water and then wipe with a damp cloth or sponge to remove all residue.
- Other recommended cleaning solutions include a 70% ethanol solution, a 2% SDS (sodium-dodecylsulphate) solution, or a 4% glutaraldehyde solution.
- Clean the area around the microplate carrier with a dry lint-free cloth. The microplate carrier can be removed from the instrument to clean the carrier and the surrounding area.
- After all metal surfaces are dry, wipe the surfaces using a cloth or sponge that has been lightly dampened with paraffin oil.
- To keep the fluidics system clean, run a daily rinse cycle. See Priming or Rinsing the Fluidics System on page 31.
- Do not leave buffer in the tubing for extended periods of time. Some buffer solutions can crystallize on contact with air, blocking the tubing, fittings, and manifold needles.
- Clean the manifold needles using the provided manifold cleaning tools. See Cleaning the Manifold Needles on page 129.
- If a bleach solution has been used, wipe the instrument using a lint-free cloth that has been lightly dampened with water to remove the bleach residue.

## Disinfection

When you need to disinfect or decontaminate the instrument, use the policies and procedures defined by your laboratory.

Molecular Devices recommends that you disinfect the fluidics system after the washer has not been used for more than a day or when changing the manifold. If the instrument is used regularly, disinfect it at least once each week.

Always turn the power switch off and disconnect the power cord from the main power source before using liquids to clean the instrument.

Use an appropriate disinfectant solution.

* Recommended cleaning solutions include a 70% ethanol solution, a 2% SDS (sodium-dodecylsulphate) solution, or a 4% glutaraldehyde solution.
* Do not use bleach solutions. A thorough rinse still leaves traces of bleach in the fluidics system that can corrupt the reagents in wash procedures.

Wipe the outside surfaces and the microplate carrier using a cloth or sponge that has been lightly dampened with the disinfectant solution.

* To remove the disinfectant residue, wipe the outside surfaces and the microplate carrier using a cloth or sponge that has been lightly dampened with a 50% alcohol solution, and then wipe again using a cloth or sponge that has been lightly dampened with water.
* After all metal surfaces are dry, wipe the surfaces using a cloth or sponge that has been lightly dampened with paraffin oil.

Disinfect the fluidics system by repeatedly dispensing and aspirating the disinfectant solution.

* To leave some solution in the fluidics system, turn off the power to the instrument during the final aspiration.
* Do not leave disinfectant solution in the fluidics system for more than 30 minutes.
* To flush disinfectant from the tubing, run a manual or automatic rinse cycle using 200 mL or more of distilled water.

⚠ **WARNING! BIOHAZARD. Always wear gloves when operating the instrument and during cleaning procedures that could involve contact with either hazardous or biohazardous materials or fluids.**

## Maintaining the Fluidics System and Manifold

The fluidics system includes the bottles, tubing, manifold, and internal pumps. To keep the fluidics system clean, run a daily rinse cycle.

Do not leave buffer in the tubing for extended periods of time. Some buffers solutions can crystallize on contact with air, blocking the tubing and fittings.

For information about disinfecting the fluidics system, see Disinfection on page 125.

You can do the following maintenance procedures for the fluidics system:

- Replacing the Manifold, see page 126
- Cleaning the Manifold Needles, see page 129
- Replacing the Fluidics Tubing, see page 129

Perform only the maintenance tasks described in this guide. Contact a Molecular Devices service engineer to inspect and perform a preventive maintenance service on the instrument each year. See Obtaining Support on page 142.

### Replacing the Manifold

There are three manifolds available for the MultiWash+ Microplate Washer.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.

The instrument comes with the standard 8-channel manifold. The fluidics tubing for connecting the manifold to the instrument is included with the standard manifold.

To replace the manifold:

1. Open the clear cover.

2. Remove the dispense tube from the blue connector on the manifold.

3. Make sure that the dispense tube remains in the pinch valve on the top of the instrument
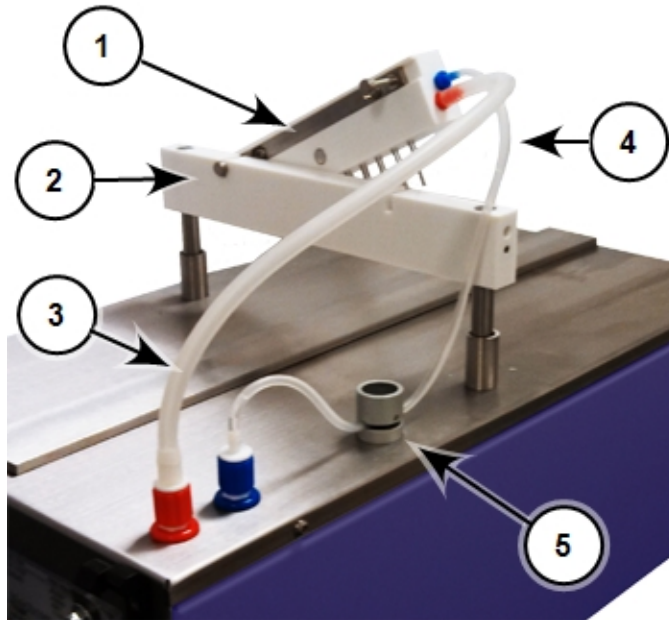


**Figure 9-1: Manifold and Hydraulic Tubing**

| Item | Description |
|---|---|
| 1 | Manifold |
| 2 | Manifold holder |
| 3 | Aspiration tubing |
| 4 | Dispense tubing |
| 5 | Pinch valve |

4. Remove the aspiration tube from the red connector on the manifold.

5. Lift the manifold off the horizontal manifold holder and set the manifold aside.

6. Place the new manifold on the horizontal manifold holder with the needles pointing down and the mounting pins pointing to the rear of the instrument.
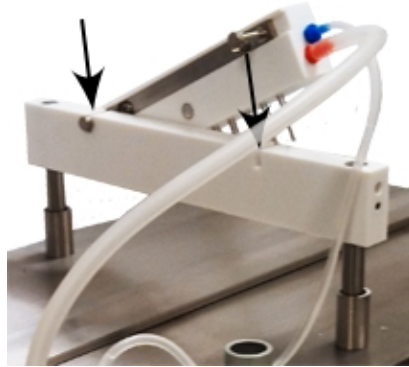


**Figure 9-2: Placing the Manifold on the Manifold Holder**

7. Set the mounting pins into the slots on the top of the manifold holder.
8. Slide the aspiration tube onto the red connector on the manifold.
9. Slide the dispense tube onto the blue connector on the manifold.

> **Note:** Make sure that there is enough slack in the dispense tubing on both sides of the pinch valve to allow for vertical movement of the manifold and to allow fluid to flow freely through the tubing.

10. Close the clear cover.

After you start the instrument, make sure that the correct manifold is selected in the set up options. See .

## Cleaning the Manifold Needles

Some buffers solutions can crystallize on contact with air, blocking the tubing, fittings, and manifold needles. Clean the manifold needles using the provided manifold needle cleaning tools.
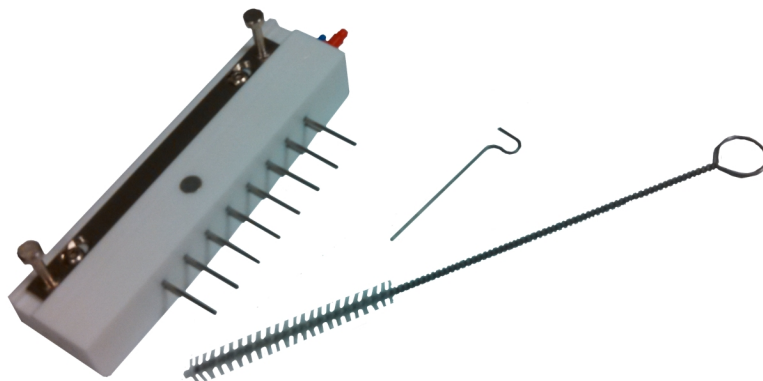


**Figure 9-3: Manifold Needle Cleaning Tools**

Rub the brush on the outside areas of the needles and manifold to remove build up, deposits, or staining.

Slide the pin into the manifold needles to clear blockages.
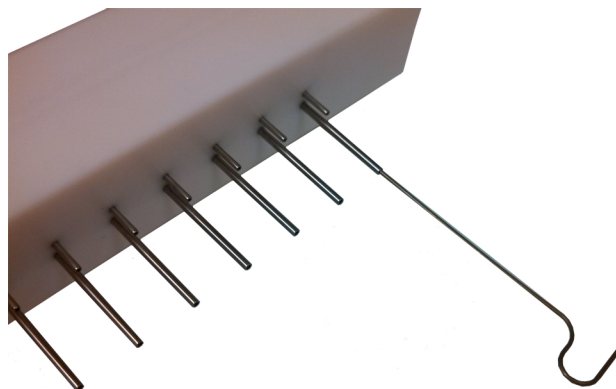


**Figure 9-4: Cleaning the Manifold Needles**

## Replacing the Fluidics Tubing

Fluidics tubing connect the bottles to the rear of the instrument and the manifold to the top of the instrument.

Periodically inspect the fluidics tubing for cracks or leaks. Replace the tubing as needed.

- For information about connecting the fluidics tubing to the bottles and the rear of the instrument, see Connecting the Fluid Bottles on page 17.
- For information on connecting the fluidics tubing to the manifold and the top of the instrument, see Installing the Manifold on page 15.

## Replacing Fuses

If the instrument does not seem to be getting power after switching it on, check to see whether the supplied power cord is securely plugged into a functioning power outlet and to the power port on the rear of the instrument.

If the power failed while the instrument was on, check that the power cord is not loose or disconnected and that power to the power outlet is functioning properly.

If these checks fail to remedy the loss of power, replace the fuses. You can obtain replacement fuses from Molecular Devices. For fuse specifications, see Physical Specifications on page 145.

⚠️ **CAUTION!** Do not touch or loosen screws or parts other than those specifically designated in the instructions. Doing so could cause misalignment and possibly void the warranty.

The fuses are located in the fuse carrier on the rear of the instrument.
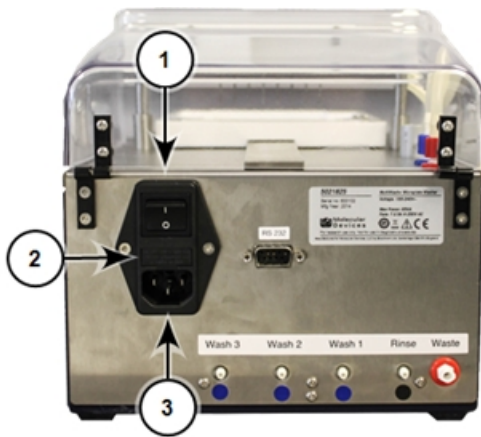


**Figure 9-5: Power Switch, Fuses, and Power Port**

| Item | Description |
|------|-------------|
| 1 | Power switch |
| 2 | Fuse carrier |
| 3 | Power port |

To replace the fuses:

> ⚠️ **WARNING! HIGH VOLTAGE** **Power off the instrument and disconnect the power cord before you do maintenance procedures that require removal of a panel or cover or disassembly of an interior instrument component.**

1. Switch the power switch on the rear of the instrument to the off position.
2. Unplug the power cord from the power port.
3. Place a small slot-head screwdriver below the fuse carrier and gently pry the fuse carrier from the instrument.
4. Gently pull the old fuses from the carrier by hand.



**Figure 9-6: Fuse Carrier**

5. Gently place new fuses into the carrier by hand.
6. Return the fuse carrier to the slot above the power port with the tabs on the carrier pointing down.
7. Press the fuse carrier into the instrument until the carrier snaps into place.
8. Plug the power cord into the power port.
9. Turn on power to the instrument.

> 📓 **Note:** If the instrument still does not power on after changing the fuses, contact Molecular Devices technical support. See Obtaining Support on page 142.

# Packing the Instrument for Storage or Service

To minimize the possibility of damage during storage or shipment, the instrument should be repacked only in the original packaging materials.

Before repacking the instrument, follow the applicable decontamination and cleaning procedures. See Clean the Instrument on page 124.

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⚠️ **CAUTION!** When transporting the instrument, warranty claims are void if improper packing results in damage to the instrument.

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Store the instrument in a dry, dust-free, environmentally controlled area.

Packing the instrument includes the following procedures:

- Disconnecting Power From the Instrument, see page 133
- Removing the Microplate Carrier, see page 134
- Disconnecting the Fluid Bottles, see page 135
- Removing the Manifold and Fluidics Tubing, see page 136
- Packing the Instrument in its Original Container, see page 138

## Disconnecting Power From the Instrument

The power port and power switch are located on the rear of the instrument.
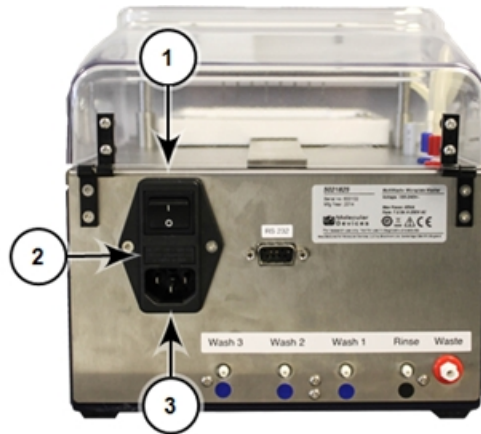


**Figure 9-7: Power Switch, Fuses, and Power Port**

| Item | Description |
|---|---|
| 1 | Power switch |
| 2 | Fuse carrier |
| 3 | Power port |

To disconnect power from the instrument:

1. Make sure that the power switch on the rear of the instrument is in the off position.
2. Unplug the power cord from the electrical wall outlet.
3. Unplug the power cord from the power port on the rear of the instrument.
4. Set the power cord aside.

## Removing the Microplate Carrier

The removable microplate carrier has a very strong magnet permanently mounted to its base. When the microplate carrier is removed from the instrument, keep the carrier away from magnet-sensitive items or devices.



**Figure 9-8: Installed Microplate Carrier**

To remove the microplate carrier, carefully slide it off the front of the instrument. Set the microplate carrier aside.

## Disconnecting the Fluid Bottles

The waste, rinse, and wash bottles connect to the color-coded fittings on the rear of the MultiWash+ Microplate Washer.
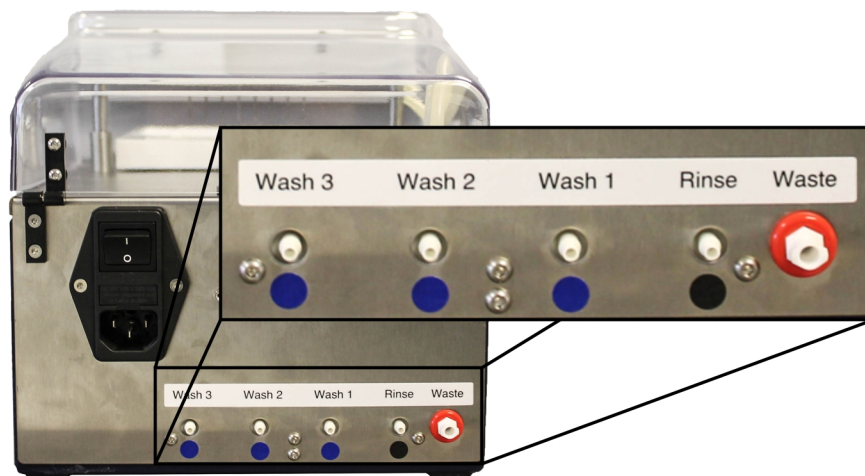


**Figure 9-9: Fittings for Fluid Bottle Connections**

Before removing the bottles from the instrument, follow the applicable decontamination and cleaning procedures. See Clean the Instrument on page 124.

To remove the fluid bottles:

1. Disconnect the wash tubing from the wash fittings with the blue labels below them on the rear of the instrument.
2. Disconnect the other end of the wash tubing from the fittings on top of the 2 liter wash bottles.
3. Disconnect the rinse tubing from the rinse fitting with the black label below it on the rear of the instrument.
4. Disconnect the other end of the rinse tubing from the fitting on top of the 2 liter rinse bottle.
5. Disconnect the waste tubing from the waste fitting framed in red on the rear of the instrument.
6. Disconnect the other end of the waste tubing from the fitting on top of the 2.5 liter waste bottle.
7. Drain all bottles and tubing into appropriate receptacles.
8. Set the bottles and tubing aside.

## Removing the Manifold and Fluidics Tubing

There are three manifolds available for the MultiWash+ Microplate Washer.

- The standard 8-channel manifold works with 96-well plates in portrait orientation.
- The optional 12-channel manifold works with 96-well plates in landscape orientation.
- The optional 16-channel manifold works with 384-well plates in portrait orientation.

The instrument comes with the standard 8-channel manifold. The fluidics tubing for connecting the manifold to the instrument is packed with the standard manifold. Other manifolds are packed separately.

To remove the manifold and fluidics tubing:

1. Open the clear cover.
2. Remove the dispense tubing from the blue connector on the manifold.
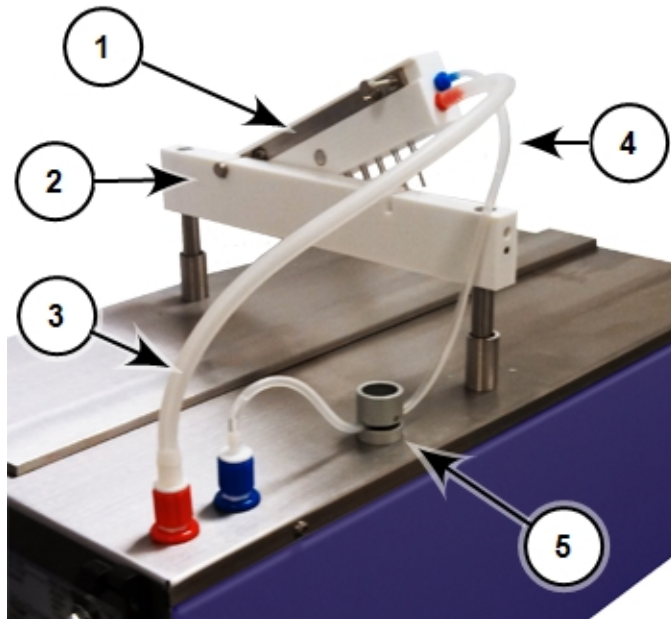


**Figure 9-10: Manifold and Hydraulic Tubing**

| Item | Description |
|------|-------------|
| 1 | Manifold |
| 2 | Manifold holder |
| 3 | Aspiration tubing |
| 4 | Dispense tubing |
| 5 | Pinch valve |

3. Press down on the black top of the pinch valve and then slide the dispense tubing out of the slot.
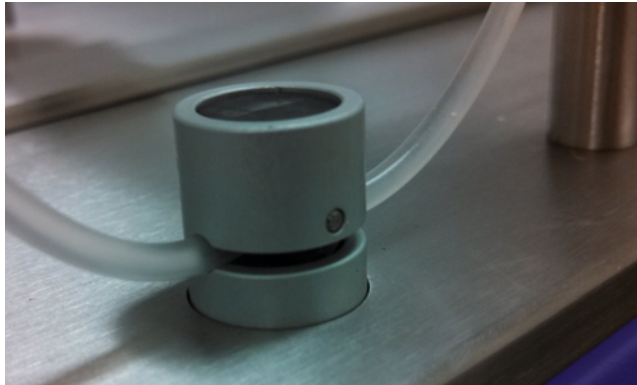


**Figure 9-11: Dispense Tubing in Pinch Valve**

4. Disconnect the blue quick-fit connector on the dispense tubing from the blue connector on the top of the instrument.

5. Drain the dispense tubing into an appropriate receptacle, and then set the dispense tubing aside.

6. Remove the aspiration tubing from the red connector on the manifold.

7. Disconnect the red quick-fit connector on the aspiration tubing from the red connector on the top of the instrument.

8. Drain the aspiration tubing into an appropriate receptacle, and then set the aspiration tubing aside.

9. Lift the manifold off the horizontal manifold holder

10. Drain the manifold into an appropriate receptacle, and then set the manifold aside.

11. Close the clear cover.

## Packing the Instrument in its Original Container

To minimize the possibility of damage during storage or shipment, the instrument should be repacked only in the original packaging materials. If you do not have the original packing materials, contact Molecular Devices.

⚠️ **CAUTION!** When transporting the instrument, warranty claims are void if improper packing results in damage to the instrument.

Make sure that the instrument is clean and dry before packing.

To pack the instrument.

1. Pack the microplate carrier, manifold, and fluidics tubing in their original boxes.



**Figure 9-12: Packing the Accessories Boxes**

2. Open the clear cover.
3. Place the metal microplate carrier lock to the left of the rail on the top of the instrument.
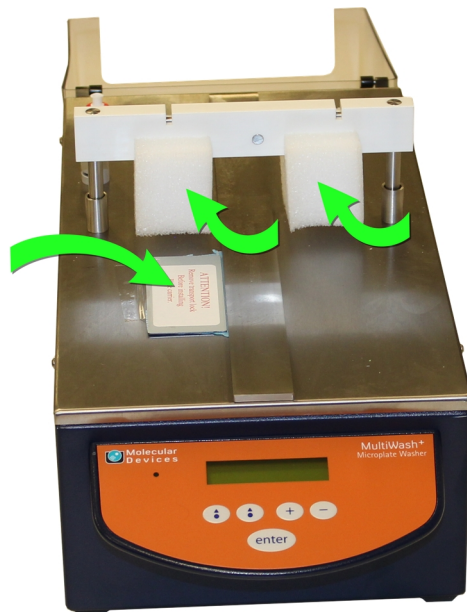


**Figure 9-13: Installing the Microplate Carrier Lock and the Foam Blocks**

The metal microplate carrier lock is held in place by the magnet below the surface of the instrument.

4. Use adhesive tape to secure the metal microplate carrier lock into position.

5. Place the slotted foam blocks under the manifold holder to secure it in position for shipping.

6. Close the clear cover.

7. Wrap the instrument in plastic.

8. Place the cardboard packing sheet on top of the clear cover with the foam resting against the rear of the cover, and then secure it with adhesive tape.



**Figure 9-14: Packing the Instrument**

9. Place the fitted packing foam on the sides of the instrument.

10. Carefully place the instrument in the center of the shipping container.

11. Place the cardboard dividers in the shipping container.



**Figure 9-15: Inserting Cardboard Dividers**

12. Place the accessories boxes in their designated areas.



**Figure 9-16: Inserting Accessories Boxes**

13. Place the waste, wash, and rinse bottles in their designated areas.



**Figure 9-17: Inserting Wash, Rinse, and Waste Bottles**

14. Insert the power cable.
15. Close and seal the shipping container.

## Status Messages and Error Messages

The following status and error messages can be displayed by the instrument. To close a status or error message, press any button on the instrument control panel.

If an error condition persists, contact Molecular Devices. See Obtaining Support on page 142.

**Table 9-1: Top-Level Menus**

| Menu | Description |
|------|-------------|
| **Duplicate name** <br> **Press any key** | When the **Duplicate name** message is displayed, the name you entered for the procedure, cycle, or microplate type has been used. The names of procedures, cycles, and microplate types must be unique. |
| **MF-trans error** <br> **Press any key** | When the **MF-trans error** message is displayed, the vertical movement of the manifold holder failed. Make sure that no obstructions are in the path of the manifold. |
| **No cycle** <br> **Press any key** | When the **No cycle defined** message is displayed, the selected procedure does not have a cycle defined. You must define the cycle before you can define and run the procedure. See Defining a Wash or Rinse Cycle on page 65. |
| **No plate defined** <br> **Press any key** | When the **No plate defined** message is displayed, the selected procedure does not have a microplate type defined. You must define the microplate type before you can define and run the procedure. See Defining a Microplate Type on page 77. |
| **Platetrans error** <br> **Press any key** | When the **Platetrans error** message is displayed, the horizontal movement of the microplate carrier failed. Make sure that no obstructions are in the path of the microplate carrier and that the surface of the instrument is clean. |
| **Stop pressed** <br> **Press any key** | When the **Stop pressed** message is displayed, the process was stopped by the operator. This message confirms the operator action. |
| **Wrong manifold** <br> **Press any key** | When the **Wrong manifold** message is displayed, the manifold selected for the procedure does not match the manifold selected in the instrument set up options. See Selecting the Installed Manifold on page 115. |

## Obtaining Support

Molecular Devices is a leading worldwide manufacturer and distributor of analytical instrumentation, software, and reagents. We are committed to the quality of our products and to fully supporting our customers with the highest level of technical service.

Our Support website, www.moleculardevices.com/service-support, has a link to the Knowledge Base, which contains technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance after consulting the Knowledge Base, you can submit a request to Molecular Devices Technical Support.

You can contact your local representative or Molecular Devices Technical Support at 800-635-5577 (North America only) or +1 408-747-1700. In Europe, call +44 (0) 118 944 8000.

To find regional support contact information, visit www.moleculardevices.com/contact.

Please have your instrument serial number or Work Order number, and your software version number available when you call.

**WARNING! BIOHAZARD. It is your responsibility to decontaminate components of the instrument before you return parts to Molecular Devices for repair. Molecular Devices does not accept items that have not been decontaminated where it is applicable to do so. If parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.**

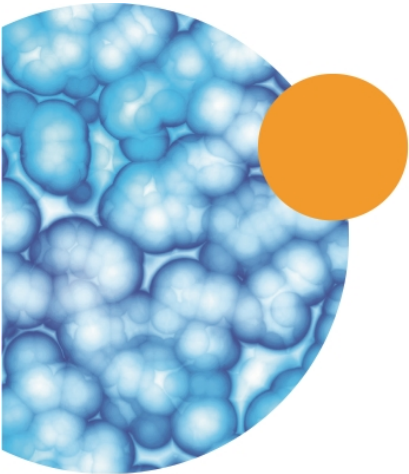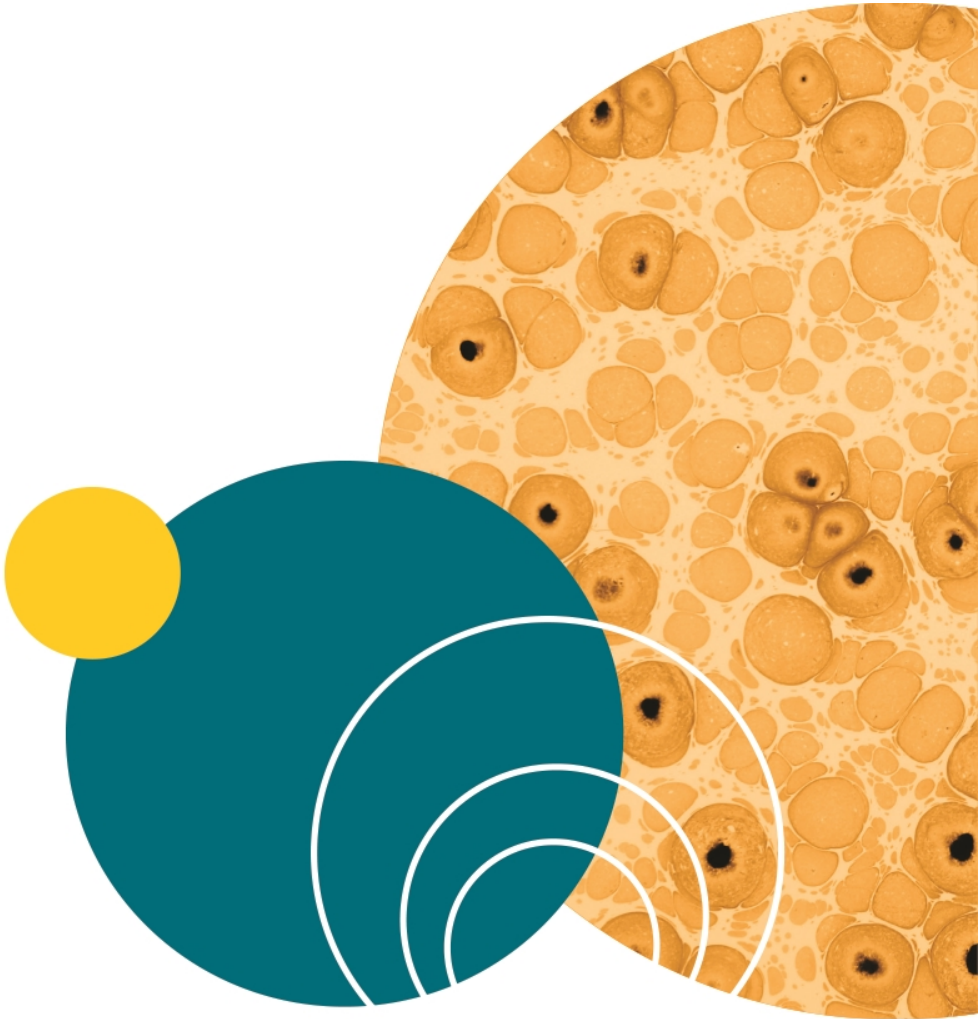# Appendix A: Parts and Accessories

**A**

This appendix provides a list of available spare parts, consumable parts, and accessories for the MultiWash+ Microplate Washer.

**Table A-1: Parts and Accessories**

| Part Number | Description |
|---|---|
| 5032337 | 8-channel manifold |
| 5032336 | 12-channel manifold |
| 5032338 | 16-channel manifold |
| 5032339 | Washer maintenance kit |
| 5032340 | External tubing kit |
| 5032341 | 2-liter wash bottle |
| 5032342 | 2-liter rinse bottle |

To order parts and accessories, contact your Molecular Devices representative.
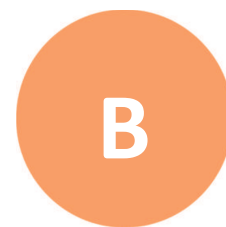
# Appendix B: Instrument Specifications

**B**

This appendix provides specifications for the MultiWash+ Microplate Washer.

## Physical Specifications

The following table lists the physical specifications of the MultiWash+ Microplate Washer.

**Table B-1: Physical Specifications of the Instrument**

| Item | Description |
|---|---|
| Environment | Indoor use only |
| Power requirements, power adapter | 115V~/230V~ 50/60 Hz autosensing, 2.5 amps, maximum power 65 VA |
| Dimensions | 21.00 cm W x 21.00 cm H x 46.00 cm D <br> (8.27 in. W x 8.27 in. H x 18.11 in. D) |
| Weight | 6.20 kg (13.67 lbs) |
| Power disconnect clearance (rear) | 20 cm to 30 cm (7.9 in. to 11.8 in.) between the rear of the instrument and the wall |
| Ambient operating temperature | 15°C to 40°C (59°F to 104°F) |
| Ambient storage temperature | −20°C to 50°C (−4°F to 122°F) |
| Humidity restrictions | 15% to 85%, non-condensing |
| Altitude restrictions | Up to 2000 m (6562 ft) |
| Sound pressure level (maximum) | 65 dB |
| Installation category | II |
| Pollution degree | 2 |
| Fuses | T 2.5 A H 250 VAC (TH250VAC), 5 x 20 mm, slow-blow, <br> IEC Standard (2 fuses) |
| User interface | 2 line x 16 character LCD display <br> 5 button keyboard |
| Microplate shaking | 3 speeds |
| Data connection | One (1) RS-232 port |

## Measurement Specifications

The following table lists the measurement specifications of the MultiWash+ Microplate Washer.

**Table B-2: Measurement Specifications of the Instrument**

| Item | Description |
|------|-------------|
| Dispense volume | The wash liquid volume is adjustable from 50 µl to 2000 µl in 50 µl increments |
| Dispensing accuracy | ±5% at 300 µl across the microplate |
| Residual volume | ±1 µl per well |

# Appendix C: System Dimensions

In the following drawings, the dimensions are shown in centimeters and inches.
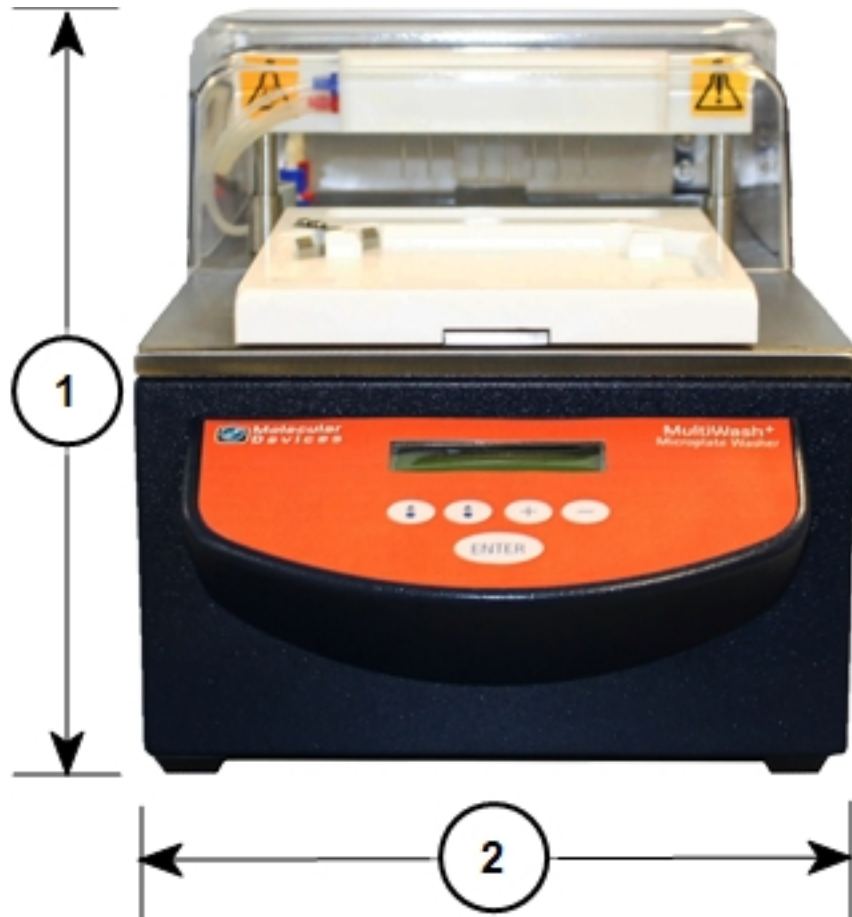


**Figure C-1: Front View of the Instrument with Dimensions**

| Item | Description |
|------|-------------|
| 1 | Width: 21.00 cm (8.27 in.) |
| 2 | Height: 21.00 cm (8.27 in.) |
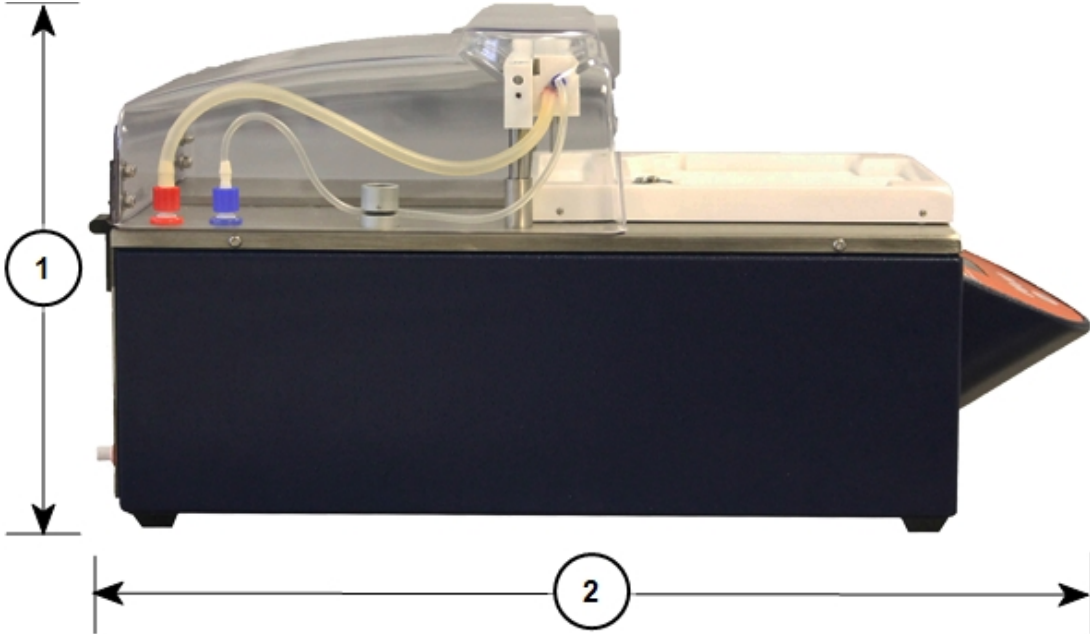
**Figure C-2: Side View of the Instrument with Dimensions**

| Item | Description |
|------|-------------|
| 1 | Depth: 46.00 cm (18.11 in.) |
| 2 | Height: 21.00 cm (8.27 in.) |

# Index

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Phone:    +1-800-635-5577
Web:      moleculardevices.com
Email:    info@moldev.com

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