HAMILTON

Microlab Prep

Operator's Manual



6602850-01 Rev. J en-US

Hamilton Company
4970 Energy Way
Reno, Nevada 89502
USA

Table of Contents

1 General Information 8

1.1 Product Information 8

1.1.1 Intended Use 8

1.1.2 Product Identification 8

1.1.3 Warranty 8

1.2 Manual Information 9

1.2.1 About This Manual 9

1.2.2 Warnings and Notes 10

1.2.3 Version History 10

2 Safety 12

2.1 Product Safety 12

2.1.1 Safety Symbols 12

2.1.1.1 Symbol Definition 12

2.1.1.2 Safety Symbols on the Instrument 13

2.1.2 Product-Related Hazards 13

2.1.2.1 UV Light Hazards 13

2.1.2.2 Magnetic Field Hazards 14

2.2 Safety Measures 14

2.2.1 General Precautions 14

2.2.2 Safety Measures During Installation 14

2.2.3 Safety Measures During Operation 15

2.2.4 Pinch Points 15

2.2.5 Electrical 16

2.2.6 Computer 17

2.2.7 Safety Measures During Repair and Shipment 17

3 Product Overview 19

3.1 Pipetting Features 19

3.1.1 Air Displacement Pipetting 19

3.1.2 Tip Pick Up 19

3.1.3 Tip-On Recognition 20

3.1.4 Tip Size Recognition 20

3.1.5 Capacitive Liquid Level Detection 21

3.1.6 Clot Detection 21

3.2 Base Instrument Features 21

3.2.1 Pipetting Arm 22

3.2.2 Deck 22

3.2.3 Touchscreen 22
3.2.4 Camera 22
3.2.5 Waste 23
3.3 Configuration Options 25
3.3.1 Independent Channels 25
3.3.1.1 Standard Channels 25
3.3.1.2 Fluid Motion Channel 26
3.3.1.3 Standard Pipetting Head 27
3.3.1.4 X1 Pipetting Head 29
3.3.2 8 Multi-Probe Head 29
3.3.3 CO-RE Paddles and Dual CO-RE Gripper 31
3.4 Racks 32
3.4.1 Framed Tip Rack 32
3.4.2 Tube Rack 32
3.4.3 Reagent Reservoir Racks 33
3.5 Disposable CO-RE II Tips 34
3.5.1 Nestable Tips 34
3.5.2 Framed Tips 35
3.6 Accessories 36
3.6.1 Hamilton Heater Shaker 36
3.6.2 Hamilton Heater Cooler 36
3.6.3 cLLD Adapter Plates 37
3.6.4 Barcode Reader 37
3.6.5 Magnet Plates 37
3.6.6 Prep CAP HEPA/UV 37
4 Installation 41
4.1 Site Considerations 41
4.2 Setup 41
5 Operation 44
5.1 Software Overview 44
5.2 Powering On the Instrument 45
5.3 Running a Protocol 45
5.4 After a Run 48
5.5 Prep CAP HEPA/UV 48
5.5.1 Operation of UV Light 48
5.5.2 HEPA Filtration System 49
5.6 Powering Off the Instrument 50
6 Maintenance 52
6.1 Intervals 52

6.2 Materials Required 52
6.2.1 Daily and Weekly Maintenance 52
6.2.2 Yearly Maintenance 52
6.2.3 Stop Disc and O-Ring Replacement 53
6.2.4 Pipetting Head Replacement 54
6.2.5 Volume Verification 54
6.2.6 Decontamination 54
6.3 Accessing Maintenance 55
6.4 Routine Maintenance Procedures 56
6.4.1 Daily Maintenance 56
6.4.2 Weekly Maintenance 59
6.4.3 Yearly Maintenance 60
6.4.4 CO-RE I Stop Disc and O-Ring Replacement 63
6.4.5 CO-RE II and X1 Pipetting Head O-Ring Replacement 64
6.4.6 CO-RE II Stop Disc Replacement 65
6.4.7 Data Maintenance 67
6.4.8 Database Backup 67
6.5 Volume Verification 67
6.6 Decontamination 68
6.7 Prep CAP HEPA/UV Decontamination 68
6.8 Prep CAP HEPA/UV Maintenance 69
6.8.1 Pre-Filter Replacement 69
6.8.2 Main Filter Replacement 69
6.8.3 UV Module Replacement 70
7 Troubleshooting 76
7.1 Overview 76
7.2 Exchanging the Standard Pipetting Head 76
7.3 Exchanging the X1 Head 80
7.4 Fuse Replacement 82
7.5 Prep CAP HEPA/UV 83
7.6 Finding the Software Version 84
7.7 Taking Screenshots 85
8 Disposal 87
8.1 General Product Disposal 87
8.1.1 Americas/Pacific Rim 87
8.1.2 European 87
9 Parts and Accessories 90
9.1 Disposable Tips 90

9.2 Reagent Reservoirs 90
9.3 Waste 90
9.4 Teaching Needles 90
9.5 Thermal Devices 90
9.6 Deck 90
9.7 Accessories 91
9.8 Service Parts 91
9.9 Prep CAP HEPA/UV Service Parts 92
9.10 Maintenance Fluids 92
10 Technical Specifications 94
10.1 Instrument Specifications (Microlab Prep) 94
10.2 Instrument Specifications (Microlab Prep with Prep CAP) 95
10.3 Pipetting Specifications 96
10.4 Barcode Reader Specifications 96
10.4.1 Supported Symbologies 97
10.4.2 Barcode Specifications 97
10.5 HHC Heating and Cooling Specifications 98
11 Appendix 100
11.1 Type Plate 100
11.2 Regulatory 101
11.2.1 Declaration of Conformity 102
11.3 Getting Technical Assistance 103
11.3.1 Support in the Americas and Pacific Rim 103
11.3.2 Support in Europe, Asia, and Africa 103
11.4 Glossary, Abbreviations 103

Chapter 1

General Information

1.1 Product Information

1.2 Manual Information

1 General Information

1.1 Product Information

1.1.1 Intended Use

The Microlab® Prep™ is a low-cost, entry-level pipetting instrument for general laboratory use. It can be equipped with two independent standard channels, two or four Fluid Motion channels, or two independent standard channels with an 8 Multi-Probe Head standard channel. The Prep is intended for liquid transfers, hit-picking, serial dilution, reagent dispensing, and PCR prep applications. The instrument is intended for indoor use only.

The Prep can be integrated with the Hamilton Heater Shaker (HHS) or Hamilton Heater Cooler (HHC). The instrument is small enough to fit inside select fume hoods, but placing the Prep inside a hood may affect laminar airflow. Hamilton issues no guarantee of the resulting hood performance; this is the responsibility of the laboratory.

The Prep is designed to be serviced without the help of Hamilton-trained Field Service Engineers. Users can perform routine preventative maintenance and parts replacement in addition to daily and weekly maintenance. The software comes with visuals to aid users in servicing the Prep.

For additional resources and support, go to the Microlab Prep Help Center.

1.1.2 Product Identification

The product identification label is located on the back of the Microlab® Prep™. Refer to 11.1 ▸ page 100 for more information.

1.1.3 Warranty

Hamilton Company guarantees this product to be free of defects in material and workmanship for a period of 12 months from the date of delivery. Hamilton Company's liability on the sale of all products shall be limited to repair, replacement, or refund of the price of any defective product. Improper packaging and/or securing the package for return void this warranty. This warranty is extended to the buyer of record on the original purchase order to Hamilton Company.

Hamilton Company or an authorized Hamilton representative will repair or replace, at Hamilton's discretion, free of charge, any part or parts that, under proper and normal use, prove to be defective during the warranty period. Abuse, unauthorized replacement of parts, modifications, or adjustments made by anyone other than Hamilton Company or an assigned representative void this warranty.

This warranty is void for the following:

- Failure to operate the product in accordance with the Operator's Manual.
- Failure to regularly and correctly maintain the product.
- Unauthorized maintenance, repair, or modification by a non-Hamilton-authorized representative or user.

- Failure to use original Hamilton products or spare parts.
- Altering the product or any parts thereof without written authorization from Hamilton Company.

Note:
Hamilton Company reserves the right to refuse to accept the return of any instrument or valve that was used with radioactive, microbiological, or any other material or substance that may be deemed hazardous to employees of Hamilton Company.

1.2 Manual Information

1.2.1 About This Manual

This manual describes the components and functionality of the Microlab® Prep™ automated liquid handler and guides users to correctly and safely program and run protocols on the instrument.

Refer to 11.4 ▸ page 103 for abbreviation definitions.

All efforts have been made to ensure the accuracy of the contents of this document. Hamilton Company assumes no responsibility for any errors in these instructions or their consequences. If any errors are found, contact Hamilton Company.

Copyright © 2026 Hamilton Company. All rights reserved.

Reproduction of any part of these instructions in any form whatsoever without the express written consent of Hamilton Company is forbidden. The contents of these instructions are subject to change without notice.

For the latest revisions of the Microlab® Prep™ manuals and software, go to the Microlab Prep Help Center.

The following product names and any registered and unregistered trademarks that might be mentioned in these instructions are used for identification purposes only and remain the exclusive property of their respective owners. For simplicity, the symbols for registered trademarks (®) and unregistered trademarks (™) are not repeated later within these instructions.

Hamilton Company Trademarks

- CO-RE®
- MICROLAB®
- Prep™

For a complete list, go to https://www.hamiltoncompany.com/about-us/trademarks.

Microsoft Corporation Trademarks

- Microsoft®
- Windows®

For more information, go to https://www.microsoft.com/en-us/legal/intellectualproperty/trademarks

The Microlab® Prep™ is referred to as the Prep for the remainder of this manual.

1.2.2 Warnings and Notes

Note
Information of particular interest or importance to better understand the related topic or system behavior.

NOTICE:
Indicates the possibility of damaging the instrument or compromising the results of a method, protocol, or assay.

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

1.2.3 Version History

Version	Revision	Release Date	Description
02	A	05/2019	Initial release
00	B	01/2021	Format updated
01	C	10/2022	CO-RE information updated
00	D	12/2023	HHC section was added
01	E	05/2024	Dimensions updated
00	F	06/2024	Prep CAP UV/HEPA information added
02	G	08/2024	Regulatory conformance table updated
00	H	11/2025	About section updated, Shutdown section added, Parts and Accessories updated, Regulatory Conformance table updated
02	J	10/2026	Added Fluid Motion Technology information

Chapter 2

Safety

2.1 Product Safety

2.2 Safety Measures

2 Safety

2.1 Product Safety

2.1.1 Safety Symbols

2.1.1.1 Symbol Definition

	The exclamation mark indicates a general warning, specified by the supplementary information.
	The Electrical Hazard symbol indicates the presence of electrical components that can be harmful to the operator if handled incorrectly.
	The Mechanical Hazard symbol indicates the presence of moving mechanical parts that can be harmful to the operator if handled incorrectly.
	The Laser symbol indicates the presence of a laser beam that can be harmful to the operator if handled incorrectly.
	The Hazardous Material symbol indicates the presence of materials that are toxic or otherwise harmful to the operator if handled incorrectly.
	The Biohazard symbol indicates the presence of biological samples that can be harmful to the operator if handled incorrectly.
	The UV Light symbol indicates the presence of artificial UV light that can be harmful to the operator if handled incorrectly.
	The Magnet symbol indicates the presence of a strong magnetic field. Interaction with metallic objects may produce pinch hazards.

2.1.1.2 Safety Symbols on the Instrument

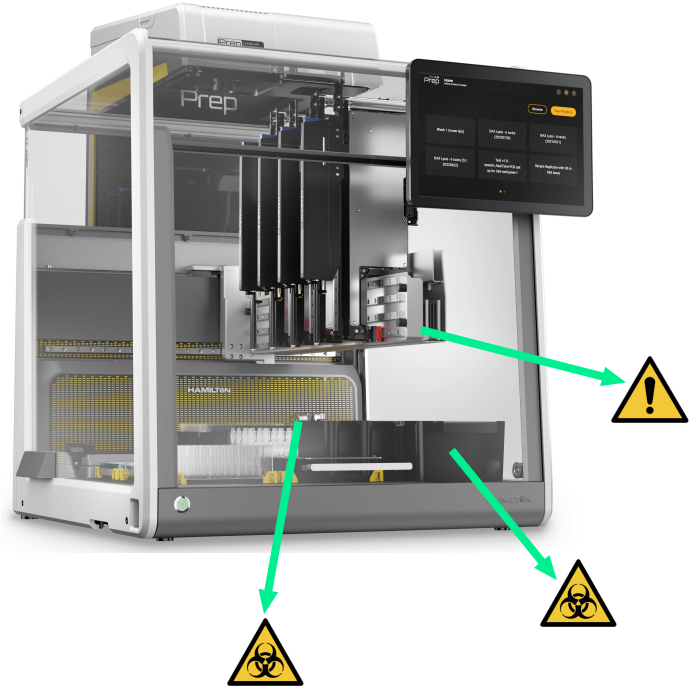


Figure 2-1: *Safety symbols on the Prep*



General Warning



Biohazard Warning

Use Good Laboratory Practices (GLP) as the Prep may be contaminated.

2.1.2 Product-Related Hazards

2.1.2.1 UV Light Hazards

When the UV lamp is in operation, the instrument's lighting system pulses purple and the arm moves slowly. This is a warning that hazardous UV radiation is present inside the instrument.

If the door is open and the purple visible lights remain on, close the door immediately and unplug the instrument to remove power.



⚠ CAUTION: UV Light Exposure

UV light hazard. Avoid direct exposure to eyes or skin.

Never disable any safety measure. Always operate the UV light with the door closed.

When the UV light is on, remain at least 15 cm (6 in) away from the instrument.

Avoid standing in front of openings or gaps while the UV light is running, as UV radiation may escape.

Wear ANSI Z87.1 - U6 rated eye protection, gloves, and protective clothing.



Note:

UV decontamination can only be completed on surfaces that have direct or reflective exposure to the UV light. Decontamination by UV light is not possible on surfaces that are covered or in shadow; use other means to decontaminate these surfaces.

2.1.2.2 Magnetic Field Hazards



⚠ CAUTION: Strong Magnetic Field

Anyone with medical implants must remain at least 30 cm (12 in) away from the instrument.

2.2 Safety Measures

2.2.1 General Precautions

When using the Microlab Prep, observe Good Laboratory Practices (GLP) and wear suitable protective clothing, safety glasses, and protective gloves.

2.2.2 Safety Measures During Installation

***NOTICE:* Uninterrupted Power Supply**

For reasons of data security and integrity, use an uninterrupted power supply (UPS) to prevent power loss or data loss/corruption.



⚠ WARNING:

Always wear proper PPE and safety attire.



⚠ CAUTION: Heavy Load

Two or more people are required to move the instrument, which weighs 40.6 kg (89.5 lbs). Always remove labware, empty the waste container, and secure the pipetting arm before moving the instrument.

2.2.3 Safety Measures During Operation

When using the Microlab Prep, observe Good Laboratory Practices (GLP) and wear suitable protective clothing, safety glasses, and protective gloves.



⚠ WARNING:
Always wear proper PPE and safety attire.



⚠ CAUTION: Heavy Load
Two or more people are required to move the instrument, which weighs 40.6 kg (89.5 lbs). Always remove labware, empty the waste container, and secure the pipetting arm before moving the instrument.

NOTICE: **Manipulation of Data**
Any manipulation of the data or application files can result in either incorrect test results or system failure.



Note:
Users must validate all protocols.



⚠ CAUTION: Contaminated Parts
If working with biohazardous samples, observe and carry out the maintenance procedures, paying particular attention to cleaning and decontamination. Wear gloves when handling the pipetting arm, carriers, containers, and tips. Avoid touching tips discarded into the waste bin. Decontaminate any surfaces on which liquid is spilled.

2.2.4 Pinch Points



⚠ WARNING:
Keep hands clear of the pinch point areas to avoid injury.

Pinch points are indicated by yellow warning symbols on the device. The potential pinch points on the Microlab Prep include:

- The area around the loading door



Figure 2-2: *Prep pinch points*

2.2.5 Electrical

! ***NOTICE:*** **Uninterrupted Power Supply**
For reasons of data security and integrity, use an uninterrupted power supply (UPS) to prevent power loss or data loss/corruption.

⚠ **WARNING:**
Only Hamilton-trained Field Service Engineers should install or remove any electrical component, device, or accessory (excluding labware) that provides no user-facing replacement instructions.

⚠ **CAUTION:** **Electrostatic Discharge**
Avoid electrostatic discharge (ESD) when servicing electronics on the Prep. Remain grounded when making repairs.

⚠ **CAUTION:**
Use extreme caution when working with any power supply. Make sure the instrument has been disconnected from power for at least five minutes before attempting any repair on the power supply.

2.2.6 Computer

⚠ WARNING:
Use only Hamilton software to control the Prep.

The Prep has a built-in Windows PC that runs software specifically designed to interact with the Prep. Avoid tampering with the internal PC. For instructions on PC replacement, refer to Integrated PC.

2.2.7 Safety Measures During Repair and Shipment

⚠ CAUTION: Biological Hazards
Be aware of the danger of infection where instruments are used to sample biohazardous materials. In such cases, the instrument or parts are said to be contaminated. Perform repairs only after cleaning and decontaminating the instrument or part.

Verify that full ESD precautions are taken and use the recommended equipment for preventing damage caused by ESD.

Chapter 3

Product Overview

3.1 Pipetting Features
3.2 Base Instrument Features
3.3 Configuration Options
3.4 Racks
3.5 Disposable CO-RE II Tips
3.6 Accessories

3 Product Overview

3.1 Pipetting Features

3.1.1 Air Displacement Pipetting

The Prep uses air displacement pipetting heads to perform pipetting operations. The pipetting heads work similarly to hand-held pipettes. A disposable tip is attached to the pipetting head, and the liquid is aspirated into and dispensed from that disposable tip. No system liquid is used in the instrument. A plunger inside the pipetting head enables the movement of the liquid. The liquid in the tip never contacts the pipetting head.



Figure 3-1: *Air displacement pipetting principle*

3.1.2 Tip Pick Up

Tips are picked up using Hamilton's patented CO-RE technology. CO-RE technology enables low force, but high precision tip attachment, and gentle tip ejection. CO-RE technology enables the use of multiple disposable tip sizes along with various tools during the same run. Fluid Motion channels use CO-RE II technology.

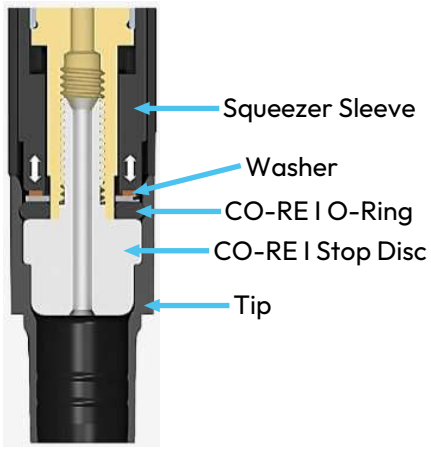


Figure 3-2: *CO-RE I technology components*

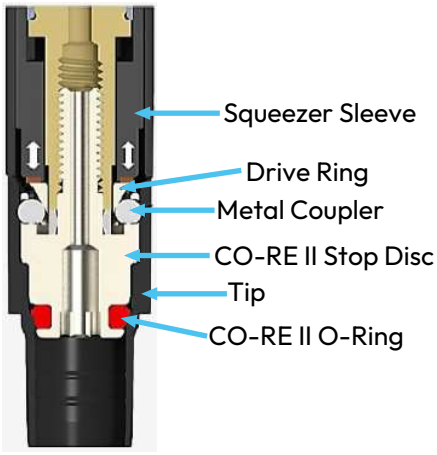


Figure 3-3: *CO-RE II technology components*

3.1.3 Tip-On Recognition

The Prep detects when a tip is attached to the channels. When a tip is picked up, the tip eject sleeve is pushed upward, triggering a sensor. To eject tips, the tip eject sleeve moves downward, and the sensor indicates the tip has been released. This security feature prevents accidental aspiration of liquid without a tip attached to the pipetting head.

3.1.4 Tip Size Recognition

Hamilton tips feature unique geometries that the Prep's machine vision technology detects so the instrument can determine different tip sizes.

This prevents the accidental pick-up of 300 µL tips, for example, when 1000 µL tips are expected. The Prep also uses the camera and software to help identify and manage other types of labware on the deck (refer to 3.2.4 ▸ page 22 for details).

The Prep camera can detect the different tip sizes supported. It can also distinguish filtered tips from non-filtered tips, but Hamilton recommends verifying the tip type before running a protocol as this technology is not 100 percent accurate.

The Prep channels use a technology to detect tip size, but it is unable to distinguish 50 µL tips from 300 µL tips. Hamilton recommends verifying the tip type before running a protocol.

3.1.5 Capacitive Liquid Level Detection

The capacitive sensors on the Prep's channels detect the liquid surface. Capacitive Liquid Level Detection (cLLD) is used to detect the liquid level of conductive fluids when pipetting with conductive tips.

The minimum detectable volume for cLLD depends on the application, and it can vary by such factors as labware geometry, liquid type, and proximity to the cLLD base plate on the deck. As general guidance, the minimum recommended volume is approximately 50 µL in a 96-well PCR plate, 75 µL in a 96-well, flat-bottom microplate, and 200 µL in a 16 mm x 100 mm tube.

For liquids unable to be reliably detected with cLLD, Hamilton recommends using the **Above container bottom** setting to set the pipetting height and disable cLLD. Selecting a height **Below liquid level** automatically enables cLLD.

Note:
cLLD is incompatible with clear (non-conductive) tips.

Note:
Test liquid level detection when working with foamy liquids. Foam may affect the accuracy of liquid level detection.

Note:
Liquid level detection in PCR plates may be improved when using cLLD adapters (refer to 3.6.3 ▸ page 37).

⚠ CAUTION: Liquid Displacement
To prevent liquid displacement causing wells to overflow and potential cross-contamination, avoid pipetting at a height where the pipette tip is inserted deep into a nearly full well. Always monitor liquid levels and adjust the pipetting height to maintain a safe tip depth.

3.1.6 Clot Detection

Aspiration is monitored using a pressure sensor in the pipetting head. The pressure is checked against values in the system to detect the aspiration of tip clots.

Clot detection can be enabled or disabled for any pipetting step in a protocol.

3.2 Base Instrument Features

This section describes the components that are common to all Prep instruments.

The instrument's power switch is located on the front of the Prep, below and to the left of the door handle. Ports for connecting a USB external drive or a barcode reader are located on the left side of the instrument.

3.2.1 Pipetting Arm

The Prep features pipetting options for two independent standard channels, two or four Fluid Motion channels, or two independent standard channels with an 8 Multi-Probe Head standard channel.

Refer to 3.3.1 ▸ page 25 and 3.3.2 ▸ page 29 for details on the channels and 8 Multi-Probe Head. The arm moves left and right over the deck of the Prep to access labware for pipetting and plate transport.

3.2.2 Deck

The deck of the Prep has eight sites for holding ANSI/SLAS footprint labware. Most microplates are placed directly on the deck, but some labware requires Hamilton adapters (e.g., tubes and reagent reservoirs). The base plate for each site can be removed for labware that extends below its edges (e.g., tube pedestals and 1000 µL tips).

Locations on the deck are numbered Site 1 – Site 8, starting from the rear-left corner of the deck and counting toward the front. The HHS or HHC are integrated on Site 1, if required. Instructions for installing an HHS or HHC on the Prep are included with its installation kit.

3.2.3 Touchscreen

The Prep includes a touchscreen mounted on the enclosure. Use the touchscreen to create, manage, and run protocols.

Tilt the touchscreen upward or downward to adjust its angle.

Refer to 5.1 ▸ page 44 for an overview of the Prep's software.

3.2.4 Camera

The Prep is equipped with a camera positioned above the deck to scan labware. This feature assists with building deck layouts and verifying labware before starting a protocol run.

Refer to 5.3 ▸ page 45 for details on using the camera during a run.

Before adding steps to a protocol, create a deck layout with all necessary labware. Labware placement is essential for setting up a protocol. It determines the required equipment and its location, which enables accurate pipetting. The camera can help create the deck layout, but some labware may need to be specified manually due to their similar appearance. For example, some tips are difficult for the Prep to automatically detect.



Figure 3-4: *Specifying scanned labware*

Labware can also be added without scanning. If the deck scan is skipped or there are open sites left after the scan, manually select the site on the touchscreen to display a list of labware.

3.2.5 Waste

The waste block is located to the right of the deck. A waste bin, a teaching needle, a liquid waste bottle, and CO-RE Paddles or Dual CO-RE Gripper (DCG; specific to Microlab Prep with Fluid Motion Technology) are mounted on the waste block.

The waste bin is located to the right of the waste block. The waste bin holds up to two racks worth of ejected 1000 µL tips. When the Prep is idle, the waste bin can be removed and emptied. Install a waste bag on the wire rack inside the waste bin, verifying that there is no interference of the edge of the bag with the tip eject bar.

A teaching needle is located on the waste block. The teaching needle is used for maintenance and calibration activities.

Liquid waste is dispensed to a tub on the waste block. The liquid waste tub drains to a removable 250 mL bottle in the waste bin, which is emptied per laboratory protocols with the waste bin after each run.

The waste block has park position brackets for the CO-RE Paddles or a DCG. Refer to 3.3.3 ▸ page 31 for information about CO-RE Paddles and DCG. Both the park position brackets and the CO-RE Paddles have magnets that hold them in place.



Figure 3-5: *CO-RE II Paddles park position brackets*

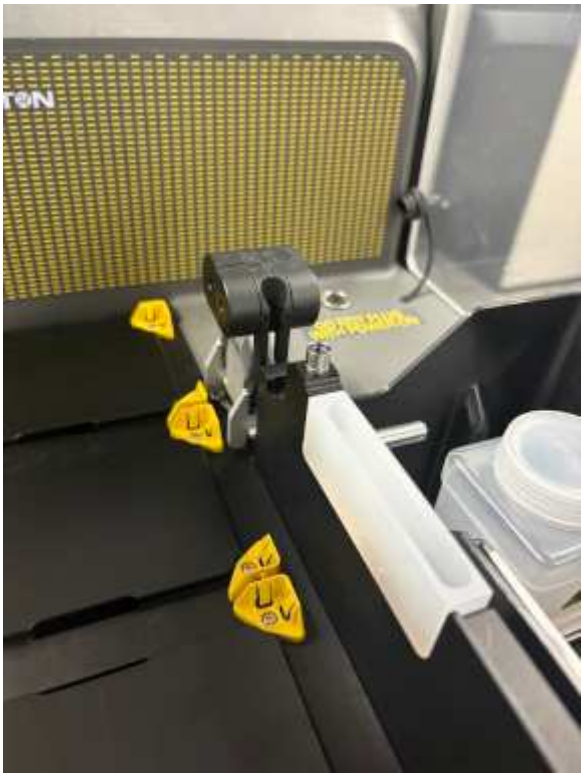


Figure 3-6: *Dual CO-RE Gripper park position brackets*

3.3 Configuration Options

3.3.1 Independent Channels

The Prep can be equipped with two independent standard channels, or two or four Fluid Motion channels. Each channel incorporates a pipetting head with a maximum volume of 1 mL (1000 µL), depending on the tip type used.

The channels have independent spacing, meaning there is no fixed maximum spacing between channels. The channels can access any two labware containers in the same column with greater than 9 mm spacing simultaneously. For instruments with four Fluid Motion channels, all four channels can reach 9 mm spacing on microplates, or four labware containers in the same column with 9 mm or greater spacing simultaneously.

The channels support the use of 50 µL, 300 µL, and 1000 µL filtered and non-filtered disposable CO-RE tips.

3.3.1.1 Standard Channels

A standard channel carries the pipetting head, which performs all pipetting steps and moves in the Y- and Z-directions. The front and rear independent channels are built differently to accommodate their 9 mm spacing.

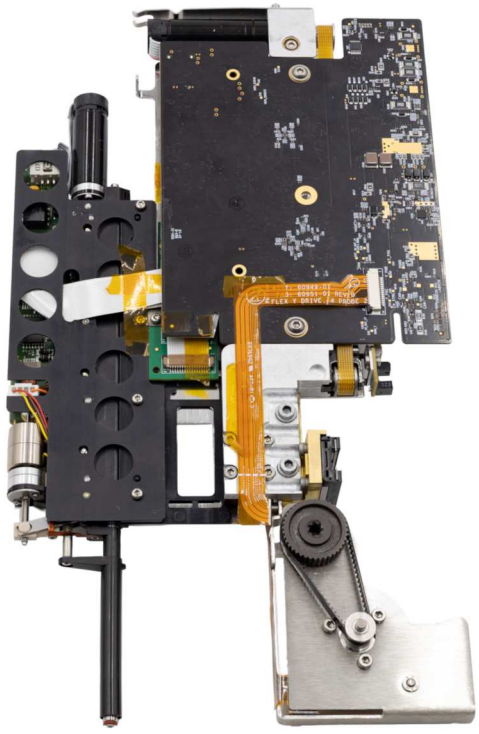


Figure 3-7: *Front standard channel (B) with pipetting head*



Figure 3-8: *Rear standard channel (A) with pipetting head*

3.3.1.2 Fluid Motion Channel

The Fluid Motion channel is equipped with Fluid Motion Technology. The Fluid Motion channel carries the 1000 µL X1 pipetting head to perform all pipetting steps and moves in the Y- and Z-directions. The channel body consists of the Y-linear motor, Z-drive and the main board, which controls all functionality.



Figure 3-9: *Fluid Motion channel with X1 pipetting head*

3.3.1.3 Standard Pipetting Head

The standard pipetting head performs all pipetting steps. It includes a pipetting drive for plunger movement, a tip-coupling mechanism for tip pickup, a capacitance sensor for liquid level detection, a pressure sensor for clot detection, and a tip-presence sensor.

Microlab Prep pipetting heads are designed for easy replacement if they break or lose accuracy. The front and rear standard channels require different pipetting heads to maintain 9 mm spacing. Verify which head must be replaced before ordering a new pipetting head.

Refer to 6.4.4 ▸ page 63 for instructions on replacing a pipetting head.



Figure 3-10: *Front standard pipetting head (B)*



Figure 3-11: *Rear standard pipetting head (A)*

3.3.1.4 X1 Pipetting Head

1000 µL pipetting heads used with Fluid Motion channels are referred to as X1 pipetting heads. The X1 pipetting head performs all pipetting steps. The heads are designed to be easily replaceable if a pipetting head breaks or loses accuracy. Fluid Motion channels use the same X1 pipetting head and are interchangeable on all independent Fluid Motion channels.

Refer to 6.4.5 ▸ page 64 for instructions on replacing an X1 pipetting head.



Figure 3-12: *X1 pipetting head*

3.3.2 8 Multi-Probe Head

The Prep can also be equipped with an 8 Multi-Probe Head Channel. CO-RE technology guarantees fast and accurate pick-up and release of disposable tips.

The 8 Multi-Probe Head consists of eight 1 mL channels with a 9 mm raster, combined into a single multi-probe head. The eight channels work simultaneously to pipette the same volume. cLLD is available on only Channel 1 and Channel 8.

The 8 Multi-Probe Head supports the use of 50 µL, 300 µL, and 1000 µL filtered and non-filtered disposable CO-RE tips. It is designed to be replaceable if it breaks or loses accuracy. Refer to 6.4.4 ▸ page 63 for instructions on replacing the 8 Multi-Probe Head.



Figure 3-13: *8 Multi-Probe Head*

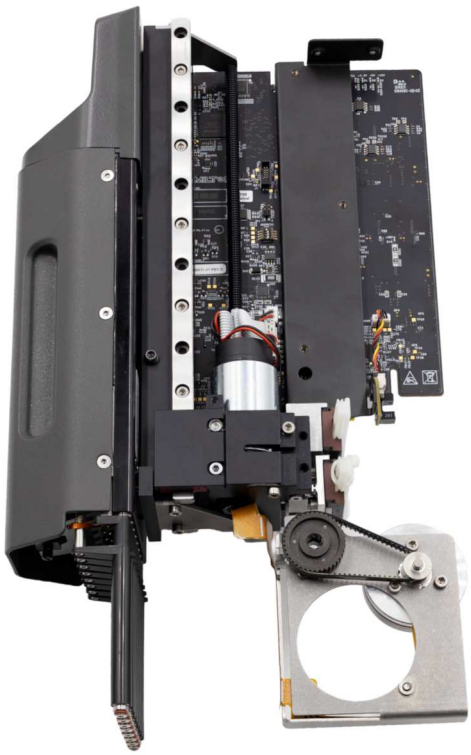


Figure 3-14: *8 Multi-Probe Head channel with 8 Multi-Probe Head*

3.3.3 CO-RE Paddles and Dual CO-RE Gripper

> **⚠ CAUTION: Sharp Gripper Points**
> The portions of CO-RE Paddles and DCG that contact the labware are sharp by design. When handling these devices, use extreme caution and avoid touching the sharp gripper points.

The Prep's independent channels can be equipped with CO-RE Paddles or a Dual CO-RE Gripper (DCG) for transporting labware on the deck. During a transport step, the two channels pick up the CO-RE Paddles or the DCG and use them to move labware to and from accessories on the deck. After transport, the channels return the CO-RE Paddles or the DCG to their brackets, freeing the pipetting heads to pick up tips and execute pipetting steps.

Plate transport with the CO-RE Paddles and the DCG is only allowed between the deck's sites. Plate rotation is not possible with the CO-RE Paddles and the DCG.

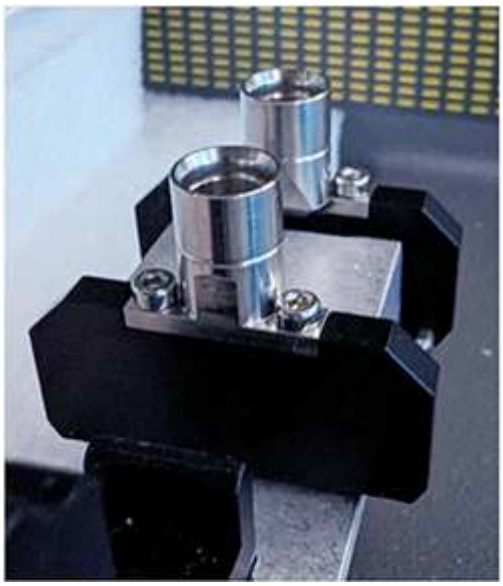


Figure 3-15: *CO-RE II Paddles*



Figure 3-16: *DCG*

3.4 Racks

3.4.1 Framed Tip Rack

Framed tips must be loaded on a Framed Tip Rack (FTR). If 1000 µL tips are used, remove the base plate below the pedestal before loading the tips.



Figure 3-17: *Framed Tip Rack*

3.4.2 Tube Rack

Tube racks hold up to 24 sample tubes. The large tube rack is loaded by removing the base plate on a site.

Large and small tube racks are available, depending on the type of tube used.

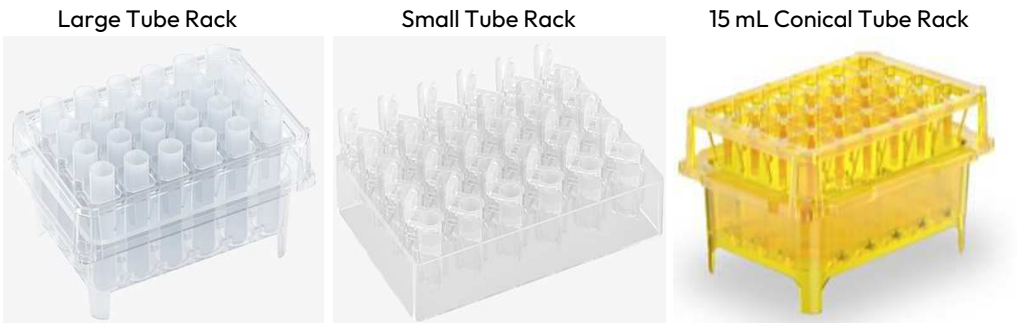


Figure 3-18: *Tube racks*

3.4.3 Reagent Reservoir Racks

Reagent reservoir racks hold up to five 60 mL reagent reservoirs. The reservoirs are made in a clean room environment (ISO 14644-1, class 8) and are pyrogen-, RNAse- and DNAse-free. They are self-standing and come with lids for reagent storage. Compatible reagent reservoirs are part numbers 56694-02 and 56694-03. Remove the center rib from these reservoirs, as shown in Figure 3-19 ▸ page 33, before using the Prep. Using pliers and some force may be needed to remove the rib. Failure to do so may result in instrument damage.



Figure 3-19: *Reagent reservoir with rib*

Note:
The reagent reservoir rack can only be placed on the front two sites to avoid obstruction of other labware.



Figure 3-20: *Reagent reservoir rack*

3.5 Disposable CO-RE II Tips

Disposable CO-RE II tips come in many sizes, with or without a filter, in conductive black or non-conductive clear, and stacked or unstacked. All tips are produced under clean room conditions (ISO 14644-1, class 8) and are pyrogen-, RNAse-, and DNAse-free. Disposable tips for the instrument are only available for purchase through Hamilton Company.



Figure 3-21: *Disposable tips*

The 50 µL and 300 µL unfiltered tips are available in nested and framed formats. Larger tips, or tips that are filtered, are only available in frames.

Note:
Use only Hamilton tips on the Prep. Using other disposable tips can result in inaccurate pipetting and cross-contamination.

3.5.1 Nestable Tips

Nestable tips are loaded directly onto deck sites. Nested tips come in a package of five stacks of four racks per stack.

Note:
Never stack tips on the deck.

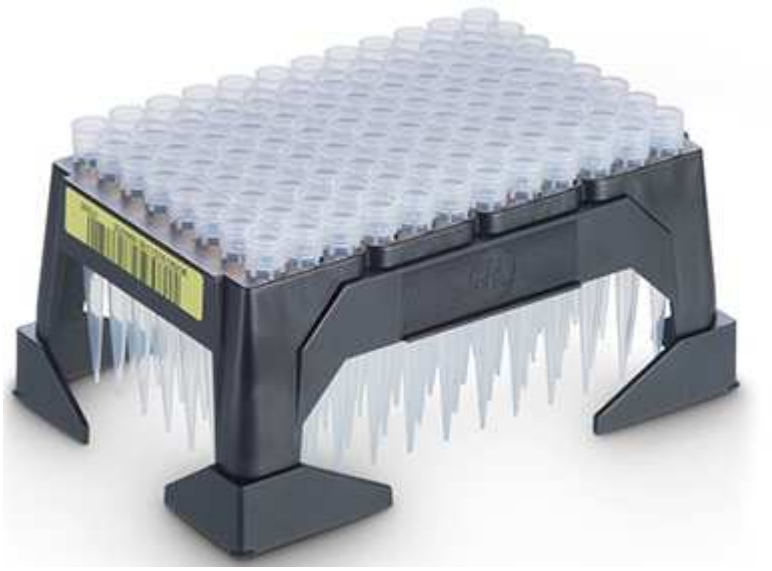


Figure 3-22: *Nestable tips*

3.5.2 Framed Tips

Framed tips are loaded with a framed tip pedestal on the deck. All tip types come in frame format, but 1000 µL tips and filtered tips are only available in frames.

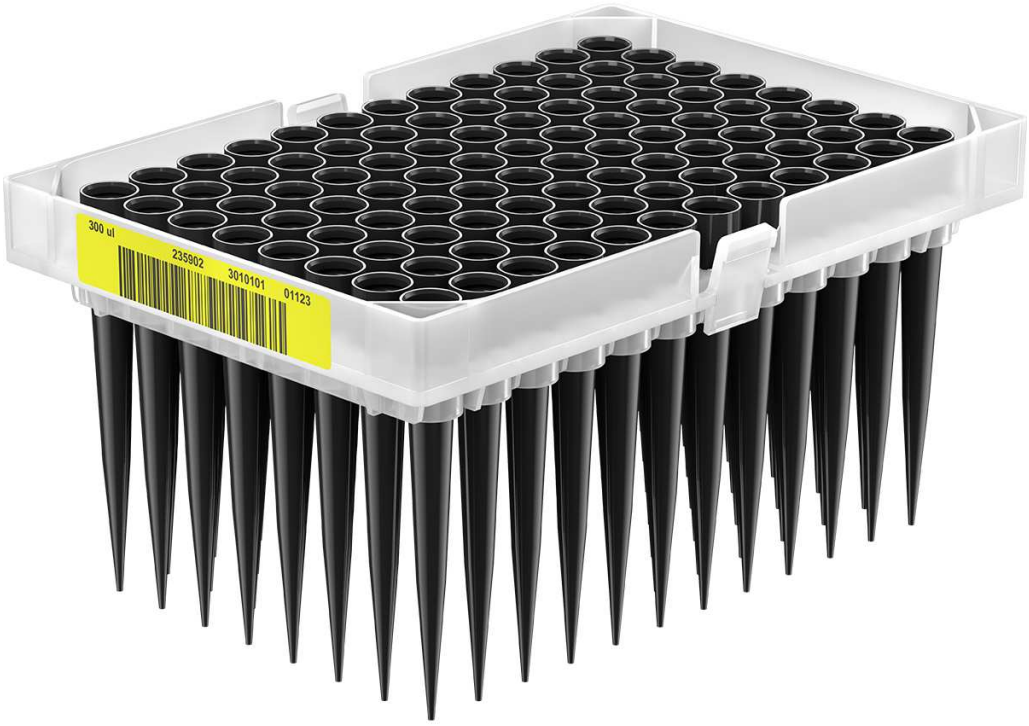


Figure 3-23: *Framed tips*

3.6 Accessories

3.6.1 Hamilton Heater Shaker

The Prep can be equipped with a Hamilton Heater Shaker (HHS). The HHS can heat to 105 °C and has a circular orbit of either 2 or 3 mm.

The HHS installs on Site 1 at the rear-left corner of the deck. A Heat/Shake step must be used to heat or shake a plate during a protocol. A Prep must have independent channels to integrate an HHS, as they are used with the CO-RE Paddles or DCG to transport labware to and from the HHS.

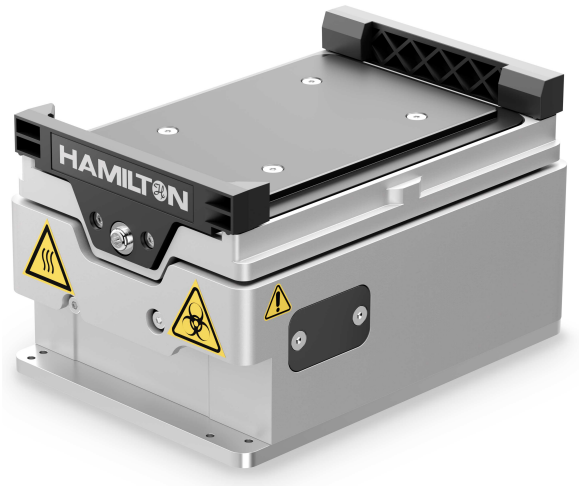


Figure 3-24: *HHS 2G*

3.6.2 Hamilton Heater Cooler

The Prep can be equipped with a Hamilton Heater Cooler (HHC). The HHC can cool to 0 °C and heat to 110 °C, depending on the adapter used and environmental conditions. Go to the Microlab Prep Help Center for supported adapters.

The HHC installs on Site 1 at the rear-left corner of the deck. A Heat/Cool step must be used to heat or cool a plate during a protocol. The HHC can also be controlled outside a protocol from the Prep **Home** page for pre-cooling or heating of the device.

> **Note**
> Transporting to and from the HHC using the CO-RE paddles is not supported.



Figure 3-25: HHC

3.6.3 cLLD Adapter Plates

cLLD Adapter plates are used with certain PCR plate formats to improve cLLD functionality at low volumes. Part numbers for available adapters are listed in 9.5 ▸ page 90.

3.6.4 Barcode Reader

A handheld USB barcode reader can be used with the Prep for sample tracking. The barcode reader is also used to read labware barcodes during a **Read Barcodes** step in a protocol.

3.6.5 Magnet Plates

The Prep supports the use of a variety of magnet plates for magnetic bead-based applications. A Prep must have independent channels to integrate a magnet plate, as they are used with the CO-RE Paddles or DCG to transport labware to and from magnet plates on the deck.

Go to the Microlab Prep Help Center for a list of supported labware, including magnet plates and cLLD adapter plates.

3.6.6 Prep CAP HEPA/UV

The Prep Clean Air Protection (CAP) system combines UV decontamination and HEPA filtration to provide air filtration and UV decontamination for the Prep. It provides 99.99 percent HEPA-filtered air and UV LED sterilization to protect samples from contamination.

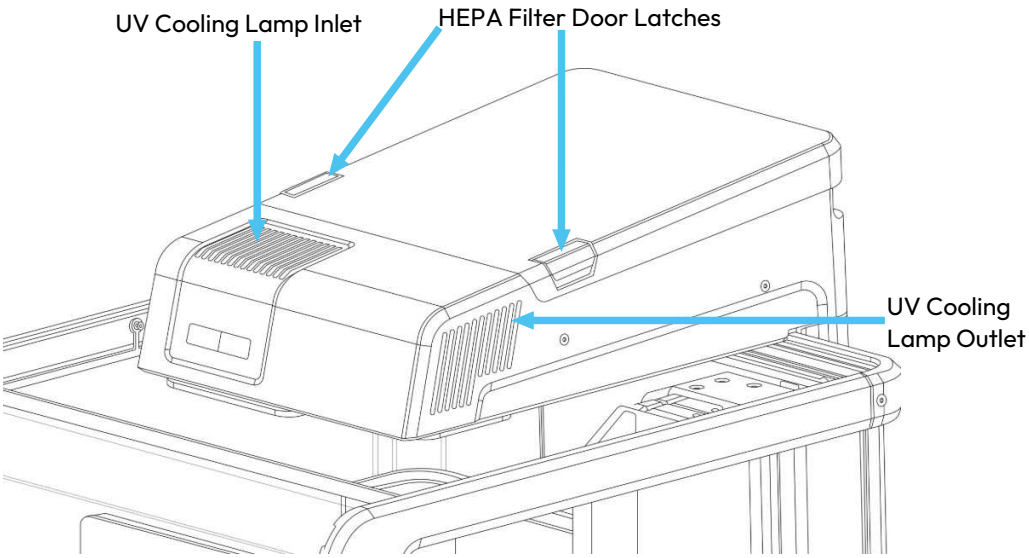


Figure 3-26: *Prep CAP top view*

Note:
When the UV lamp is on, warm air escapes from the cooling outlet.

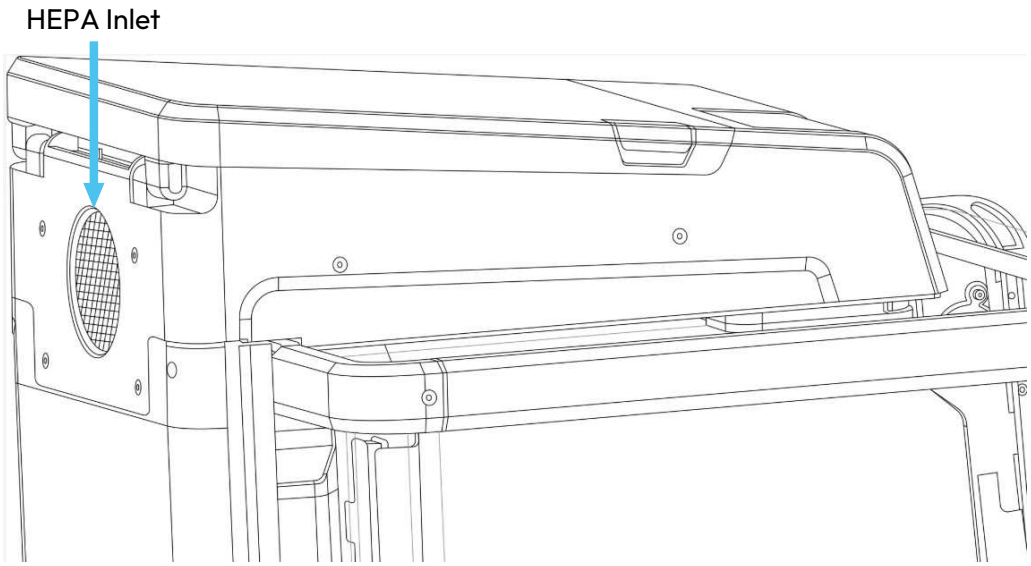


Figure 3-27: *HEPA fan inlet*

Note:
Never place the rear of the instrument within two inches of a wall.

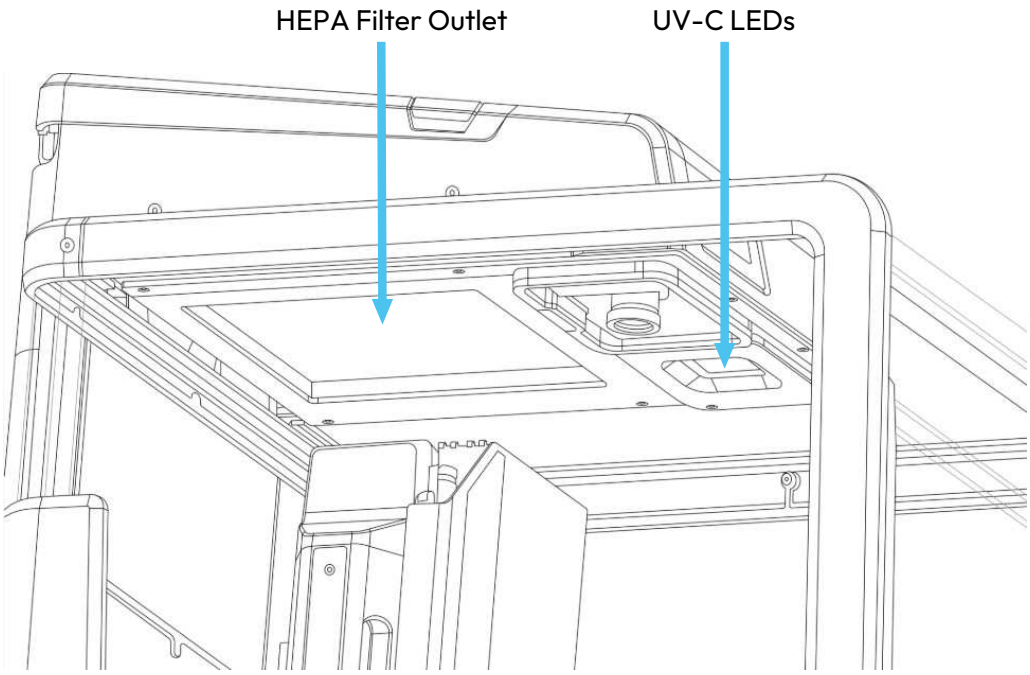


Figure 3-28: *HEPA filter and UV location*

Note:
Avoid touching the UV-C LEDs or HEPA Filter because touching them could cause damage.

Chapter 4

Installation

4.1 Site Considerations

4.2 Setup

4 Installation

4.1 Site Considerations

The Prep must be on a stable surface that can accommodate the instrument's weight and dimensions and strain from the movement of the pipetting arm, without bowing or swaying. Refer to 10.1 ▸ page 94 for the full specifications; contact Hamilton support for specific questions.

⚠ CAUTION: Heavy Load
Two or more people are required to move the instrument, which weighs 40.6 kg (89.5 lbs). Always remove labware, empty the waste container, and secure the pipetting arm before moving the instrument.

Note:
If the pipetting arm is not secured, it may slide during transportation.

Protect the Prep from direct sunlight, excessive vibrations, and fluctuating temperatures or humidity. This is especially critical for low-volume (<10 µL) applications that require highly accurate pipetting.

Provide sufficient space for PC peripherals (e.g., keyboard, mouse). Storage for documentation, tips, pedestals, and maintenance materials should also be considered. For optimum serviceability, position the Prep on an island location in the laboratory.

Provide power outlets for the Prep. Refer to 10.1 ▸ page 94 for the power input requirements.

Note:
Always prevent main power voltage supply fluctuations from exceeding 10 percent of the nominal supply voltage.

Examine the packaging for any signs of damage. If the crate or instrument has been damaged, refer to 11.3 ▸ page 103.

Verify the contents of the package with the packing checklist. Each instrument comes with an accessory box with any ordered pedestals, as well as a set of tools packaged inside of the Prep. Refer to 11.3 ▸ page 103 if any items are missing.

4.2 Setup

Instructions for installing the Prep are linked on the instrument packaging. The linked installation packet also includes ordering information for tips and other consumables. If the info card is lost or misplaced, refer to 11.3 ▸ page 103, or go to the Microlab Prep Help Center.

Before using the Prep, some basic settings need to be configured. The first time the Prep is powered on, a startup wizard is displayed.
To configure the associated settings for Prep setup:

1. Select **[Next]** on the **Welcome** page to begin setup.

2. Select the laboratory's time zone and enter the date and time.
    - This information is included in run reports and used to track when protocols were last run or edited.
3. Enter the admin username, password, and password recovery questions. Select the numbered buttons to navigate between recovery questions.
    - Additional users can be added later, and user management can be disabled if not required.
4. Wait for the Prep to import the labware catalog.
5. Select labware from the library as favorites or select **[Skip]** to choose favorites later.
    - Select the favorite toggle to the right of the desired labware to mark it as a favorite.
    - If the desired labware is not present, contact Hamilton.
    - Use the **File Manager** to add or remove favorites at any time.
6. Wait for the Prep to calibrate.
7. Follow the on-screen instructions to complete the calibration process.
8. Select **[Finish]** to complete setup.

→ The Prep is now ready to use.
→ Tips may be unloaded if not already removed.

Chapter 5

Operation

5.1 Software Overview
5.2 Powering On the Instrument
5.3 Running a Protocol
5.4 After a Run
5.5 Prep CAP HEPA/UV
5.6 Powering Off the Instrument

5 Operation

5.1 Software Overview

The Prep features intuitive, user-friendly software that is accessed through the instrument's touchscreen. Protocols, settings, and maintenance are all accessed through this software.

Select a protocol on the touchscreen to open it for editing, simulating, or running. Up to 18 favorite protocols are displayed on the home page; select **[Browse]** to view a list of all protocols. New protocols are automatically added to favorites until all 18 spaces are filled. Favorites are managed in the **"Settings > File Manager"**. If no protocols exist, a prompt for a new protocol is displayed.

Use the utility bar at the top of the page to access settings and related activities.

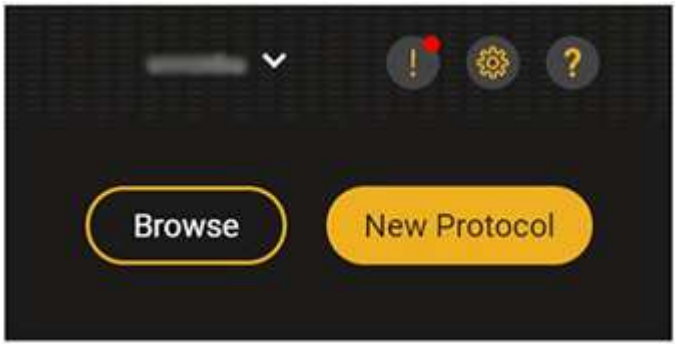


Figure 5-1: *Home page buttons and utility bar*

When User Management is enabled, select the **[User Profile]** icon to display the current user name.

Use the drop-down to choose from the following:

- Change existing password (Also available on the **User Settings** page.)
- Password recovery.
- Log out

Select the **[Alert]** button to access shortcuts to Prep maintenance routines. Refer to 6.4.1 ▸ page 56 and 6.4.2 ▸ page 59 for instructions on daily and weekly maintenance, and 6.4.3 ▸ page 60 and 6.4.4 ▸ page 63 for details on preventative maintenance.

> **Note:**
> When maintenance is required, running any associated protocols is prohibited.

Use the **[Settings]** icon to access maintenance, tutorials, file management, software, and instrument settings.

Most pages have contextual help available. Use the **[Help]** icon in the utility bar to view information specific to the current page. Use the **[Table of Contents]** button at the top of a help page to access other help pages.

5.2 Powering On the Instrument

To power on the Prep, press and hold the power button on the front of the instrument until the button illuminates.



Figure 5-2: *Power button location*

5.3 Running a Protocol

To run a protocol:

1. Power on the Prep. Log in if user management is enabled.
2. Open the door if needed.
    - To open the door, pull the door handle upward until it stops in place.
3. Verify that the waste bin is empty before initiating a run.
4. Confirm global lighting settings if using light-sensitive reagents.
5. If an HHC is installed and pre-heating/cooling is required, set the HHC to the desired temperature from the **Home** page.
6. Select the desired protocol.

→ The overview page displays.

7. Go to the **Labware** tab to view the number and type of labware required to run the protocol.
8. Select **[Run]** to begin setup. Protocols can also be simulated from this page.
9. If the protocol has a **How Many Samples** step:
    - Select the wells or tubes to use for the highlighted labware and select **[Next]**.
    - Any steps that use the highlighted labware are restricted to the selected containers.
10. If the protocol has a **Read Barcodes** step:
    - Scan or enter each expected barcode, then select **[Next]**.
    - The barcodes are used for sample tracking only.

- If the Prep has a handheld barcode reader connected by USB, use it to scan the barcodes. Otherwise, enter the barcode(s) manually using the virtual keyboard.

11. If prompted, select **[Browse]** to select a worklist with the required data for any Hit Picking steps, then select **[Next]**. Verify the requirements for the worklist before selecting a file.
12. Load the labware and consumables specified on-screen, then select **[Scan]**.
    - Load labware, tips, samples, and reagents onto their designated site, including any cLLD adapters as needed.
    - Use pedestals as necessary for tips, tubes, and reagent reservoirs.
    - Verify that there are enough tips to run the protocol.
13. To add labware (e.g., tube pedestals, 1000 µL tips in a framed tip pedestal, and half-skirted PCR plates) remove the site's base plate first.
    - Hold the front edge of the plate down and lift on the back edge to remove the base plate.



Figure 5-3: *Removing a base plate*

⚠ CAUTION: Biological Hazard
Always pay special attention to the tip type(s) called for in the protocol. If a tip that is smaller than the defined tip size is used to aspirate liquid, that liquid can be aspirated into the pipette head, causing damage and increasing the risk of biohazard contamination.

Note:
Never overfill reagent reservoirs, tubes, or other liquid containers.

Note:
Never load anything that sits higher than 78 mm above the deck.

14. Verify that all labware and partial tip racks match the layout, then select **[Confirm]**.

- Labware-like tips may need to be specified before proceeding.

> **Note:**
> When loading labware, pay close attention to the identity and status of the detected labware and the labware specified in the protocol.

15. Monitor the progress of the run on the page.
    - The estimated time remaining is shown on the run timer.
    - On the deck layout, containers that are aspirated from flash purple, and containers that are dispensed to flash blue.
    - Labware that is heated or shaken flash and a second timer for that step is displayed.
16. While simulating, the speed can be changed in the **Step View** using the slider below the run timer. The speed is set to real-time (1x) by default, but can be changed to 2x, 5x, 10x, or 0.5x the default speed.
17. Open the **Plate View** to display a detail of selected labware.

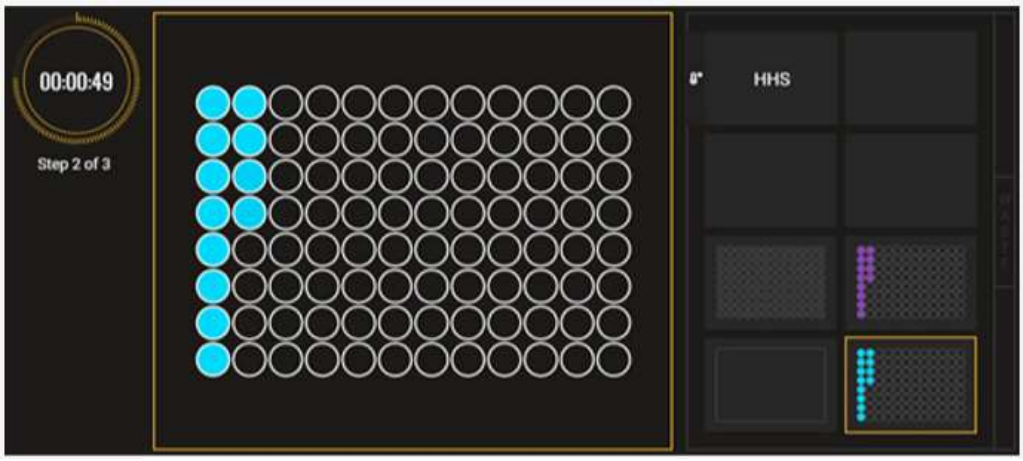


Figure 5-4: *Run page* ***Plate View***

18. Select **[Pause]** to pause the run.
    - The Prep finishes the last command it received and then comes to a stop.
    - The door may be opened and closed while the run is paused.
    - Select **[Resume]** to continue the run after the door is closed.
19. To abort a run, select **[Stop]**, then select **[Abort]** in the confirmation dialog to confirm.

→ The Prep finishes the last command it received, comes to a stop, and the protocol is aborted.

> **Note:**
> Aborted protocols can only be restarted from the beginning step. If a protocol is aborted with tips, the CO-RE Paddles or DCG attached to the channels or the 8 Multi-Probe Head are ejected the next time the pipetting arm is initialized.

20. If tips or reagents require a refill, a dialog displays listing what is required to continue the run. Replenish the specified consumables and select **[Finished]**.

5.4 After a Run

A dialog box displays when a run is completed (see Figure 5-5 ▸ page 48). Select **[View Report]** to view the run report for the protocol. Use the **Run History** page to view reports.

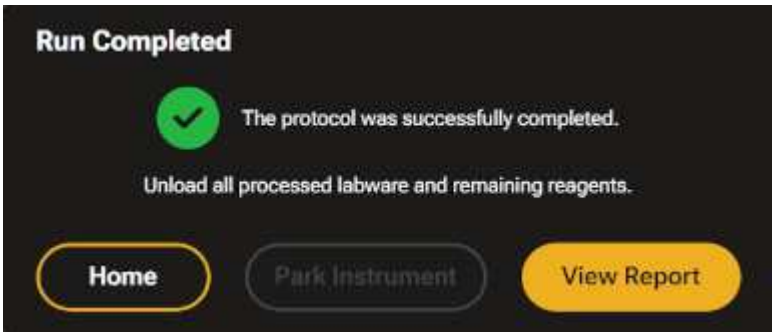


Figure 5-5: *Finishing a run*

Note:
Empty the waste bin when full, but only after a run is complete or when the instrument is paused.

⚠ WARNING: Biological Hazard
Waste may contain biohazardous or chemically contaminated material.

After the run is completed:

- Remove any empty or processed labware.
- Remove or refill reagents.
- Immediately clean any spills. Refer to 6.6 ▸ page 68 for the recommended decontamination procedure.
- Empty the waste bin and liquid waste bottle.
- Select the next protocol to run, if required.

5.5 Prep CAP HEPA/UV

5.5.1 Operation of UV Light

Perform ultraviolet germicidal decontamination after successfully running the Daily Maintenance or Weekly Maintenance routine for the instrument.

Note:
During the decontamination process, remain at least 15 cm (6 in) away from the instrument.

Note:
UV decontamination can only be completed on surfaces that have direct or reflective exposure to the UV light. Decontamination by UV light is not possible on surfaces that are covered or in shadow; use other means to decontaminate these surfaces.

To perform UV decontamination:

1. Go to the **Maintenance Items** menu and run the UV decontamination routine.
→ The decontamination process runs for 15 minutes.
2. The instrument UI provides instructions for completing the UV decontamination.
3. During the UV decontamination:
    - The indicator lights in the Prep pulse purple.



⚠ CAUTION: UV Radiation Present in Instrument
When the UV lamp is in operation, the instrument's lighting system pulses purple and the arm moves slowly. This is a warning that hazardous UV radiation is present inside the instrument.



⚠ CAUTION: Door Open During UV Decontamination
If the door is open and the purple visible lights remain on, close the door immediately and unplug the instrument to remove power.

    - The remaining duration time is displayed on the computer monitor.
    - The instrument monitors the door.
    - The X-arm and channels sweep across the instrument to ensure as much of the interior is decontaminated as possible.
4. After the operation is complete, the UV light and the purple indicator lights turn off.

Note:
To stop the decontamination process at any time, select **[Abort]** on the UV light window. This completes a controlled shut down of the decontamination process.

Note:
Never stop the UV decontamination process by opening the instrument door. Wait for the purple lights to turn off before opening the door.

Note:
If the door of the Prep is opened, the decontamination process stops immediately and does not restart upon closing the door. Decontamination is restarted through the **Maintenance** menu.

5.5.2 HEPA Filtration System

Use the **[HEPA fan]** icon in the utility bar or a step in the protocol to start the HEPA filtration system.
HEPA Filtration steps:

- To start the fan from the utility bar, select the **[HEPA fan]** icon.



Figure 5-6: *HEPA fan icon*

- To start the HEPA from a protocol step, insert a **HEPA** step into the protocol and modify settings as needed.
- Select the **[HEPA fan]** icon to stop the fan.

5.6 Powering Off the Instrument

To power off the Prep, press and hold the power button on the front of the instrument until the button stops blinking and is no longer illuminated.



Figure 5-7: *Power button illumination*

Chapter 6

Maintenance

6.1 Intervals
6.2 Materials Required
6.3 Accessing Maintenance
6.4 Routine Maintenance Procedures
6.5 Volume Verification
6.6 Decontamination
6.7 Prep CAP HEPA/UV Decontamination
6.8 Prep CAP HEPA/UV Maintenance

6 Maintenance

6.1 Intervals

Periodic Maintenance is required to ensure safe and reliable operation of the instrument. Maintenance must be performed by the user to keep the instrument clean and to maintain proper functionality.

Hamilton recommends that the appropriate maintenance be performed at the following intervals:

- **Daily:** cleaning and inspection recommended every 24 hours
- **Weekly:** deck cleaning recommended every seven days
- **Yearly:** cleaning and lubrication of the Prep's mechanisms recommended every year
- **CO-RE I:** Replace stop discs and O-rings every 20,000 tip eject cycles (approximately every six months)
- **CO-RE II and Fluid Motion channels:** Replace O-rings every 40,000 tip eject cycles (approximately every 12 months)



Note:
Observe and follow the maintenance procedures provided. Failure to do so may impact the reliability or functionality of the Prep.

6.2 Materials Required

6.2.1 Daily and Weekly Maintenance

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

6.2.2 Yearly Maintenance

Purchased from Hamilton:

- Silicone oil (P/N 6603044-01)
- SKF grease (P/N 6614299-01; for instruments with Fluid Motion Technology)

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water
- Lint-free cotton swabs

6.2.3 Stop Disc and O-Ring Replacement

CO-RE I

Purchased from Hamilton:

- Set of stop discs (2-pack for channels, P/N 6603039-01; 8-pack for 8 MPH, P/N 6603039-02)
- Stop disc glue (included with stop discs)
- Tips
- CO-RE I stop disc removal tool (P/N 6603034-01)

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

CO-RE II and Fluid Motion channels (O-ring replacement only)

Purchased from Hamilton:

- Set of O-rings
  - 2-pack (for channels; P/N 6607080-01)
  - 4-pack (for channels; P/N 6607080-03)
  - 8-pack (for 8 MPH; P/N 6605752-08)
  - 10-pack (for 2 channels + 8 MPH; P/N 6607080-02)
  - 100-pack (P/N 6605752-100)
- Tips

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

CO-RE II Stop Disc replacement

Fluid Motion channel stop discs cannot be replaced.

Purchased from Hamilton:

- Set of stop discs (2-pack for channels, P/N 97660-02; 8-pack for 8 Multi-Probe Head, P/N 97660-08)
- Tips
- CO-RE II stop disc removal tool (P/N 6607023-01)

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

6.2.4 Pipetting Head Replacement

Standard pipetting heads

Purchased from Hamilton:

- Replacement front/rear pipetting head or multi-probe head
- Tips

Included with Prep:

- 2 mm hex wrench (if replacing front/rear pipetting head)
- 3 mm hex wrench (if replacing multi-probe head)

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)

X1 pipetting heads

Purchased from Hamilton:

- Replacement Head
- Tips

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)

6.2.5 Volume Verification

Purchased from Hamilton:

- Volume verification kit (P/N 6604125-01, P/N 6604125-02)
- Two Prep Framed Tip Rack (FTR) Pedestals (PN 6600553-01)
- Blister of 1000 µL tips
- Blister of 50 µL tips
- Four microplates
- Three reagent reservoirs
- Volume verification solutions
- Volume verification spreadsheets
- Channel verification spreadsheet
- 8 MPH verification spreadsheet

Supplied by lab:

- Absorbance reader with 405 nm and 620 – 650 nm filters
- Balance with 1 mg resolution and accuracy

6.2.6 Decontamination

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Microcide SQ (USA) or Deconex (EUR)

Note:
Microcide SQ (USA) and Deconex (EUR) are cleaners and broad-spectrum disinfectants for use on Hamilton instruments. They are colorless, low foaming liquids. The concentrate comes with a spray bottle. Dilute the concentrate with deionized water according to the instructions on the bottle.

⚠ CAUTION: Avoid Bleach
Avoid using cleaning or disinfecting solutions that contain hypochlorite, such as bleach, on the Microlab Prep.

***NOTICE:* Avoid Acetone-Based Solutions**
Avoid using an acetone-based solution to clean the enclosure. It can cause micro-fractures.

6.3 Accessing Maintenance

When maintenance is due on the Prep, the required routine is accessed through the **[Alert]** button if maintenance alerts are enabled in the maintenance setting. Protocols may be prevented from running until the required maintenance is completed, depending on the maintenance setting.

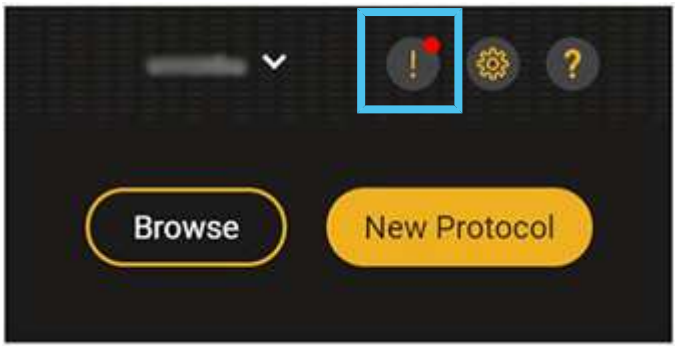


Figure 6-1: *Alert button*

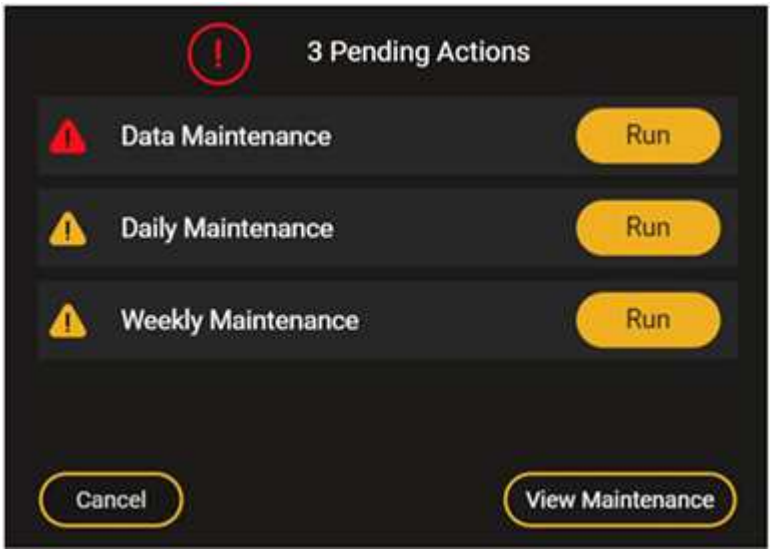


Figure 6-2: *Starting maintenance through the alert button*

Maintenance is accessible at any time on the **Maintenance Routines** page. Select the **[Gear]** icon to access settings, then go to **"Maintenance > Maintenance Routines"**. All maintenance procedures are listed with the last date they were completed and when they must be performed next.

Select the required routine and select **[Run]**. Each routine has a set of dialogs with instructions for the required tasks.

6.4 Routine Maintenance Procedures

6.4.1 Daily Maintenance

Daily maintenance requires performing the following tasks:

- Inspect tip eject sleeves and O-rings.
- Inspect deck and calibration post.
- Inspect the waste block and liquid waste.
- Inspect the thermal device (if installed).
- Empty waste bin and liquid waste.
- Clean tip eject sleeves and O-rings.

To perform daily maintenance:

1. Wear the appropriate PPE in the laboratory area.
2. Run the daily maintenance protocol. Refer to 6.3 ▸ page 55 for instructions on locating and running maintenance protocols.
3. Inspect the tip eject sleeves and O-rings.
    - Verify that the tip eject sleeves can move up and down freely, and that the stop discs are undamaged and aligned with the tip eject sleeves.
    - If a stop disc is damaged, refer to 6.4.4 ▸ page 63 for instructions on how to replace it.

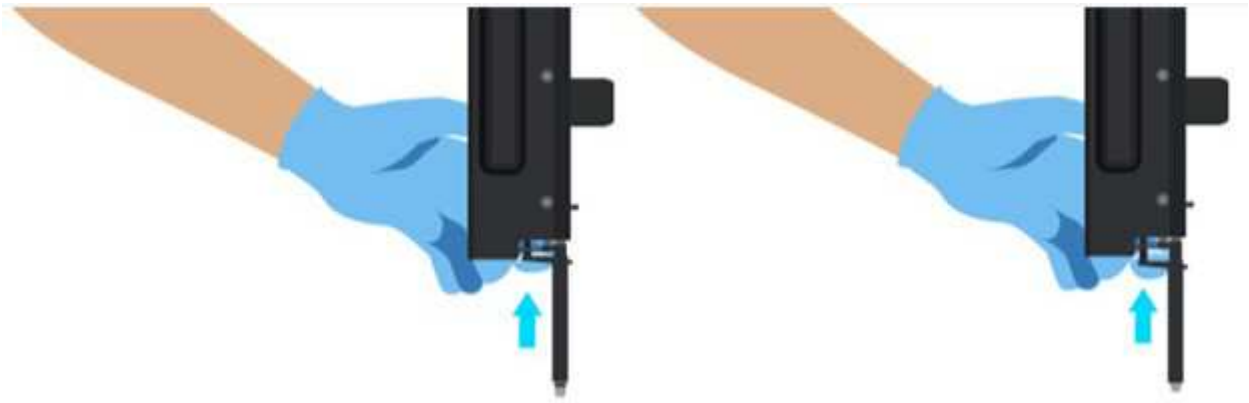


Figure 6-3: *Checking the tip eject sleeve*

4. Inspect the deck and verify that the following components are secure and undamaged:
   - Corner brackets



Figure 6-4: *Corner locator brackets*

   - Calibration post



Figure 6-5: *On-deck calibration post*

   - Waste block



Figure 6-6: *Liquid waste block*

- Liquid waste bottle
- Thermal device (if no devices are installed, check the cover for the connector)

5. Empty the waste bin and liquid waste bottle.
   - Clean the waste bin and liquid waste bottle according to laboratory procedures.
6. Spray a clean, lint-free towel with deionized water and wipe down the tip eject sleeves.
7. Spray a clean, lint-free towel with deionized water and wipe down the stop discs. Lift the tip eject sleeve to expose the stop discs and O-rings.

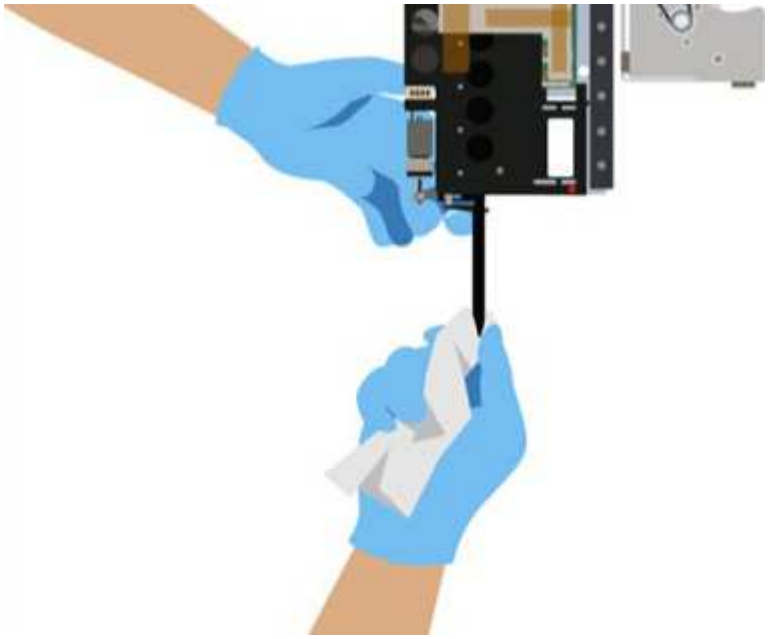


Figure 6-7: *Cleaning stop discs and O-rings (standard pipetting head)*

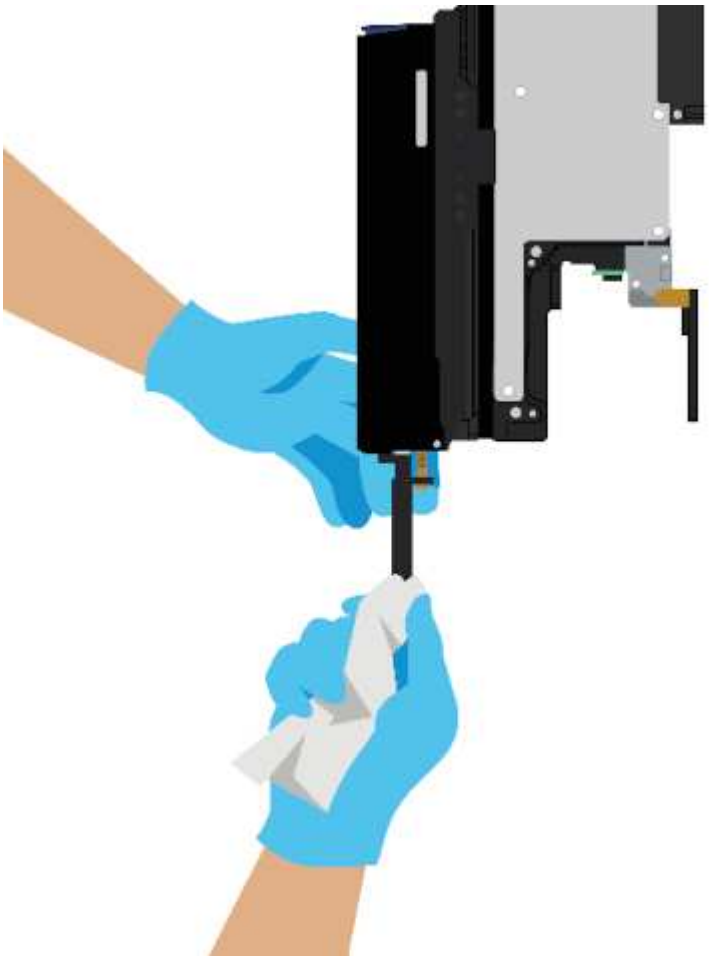


Figure 6-8: *Cleaning stop discs and O-rings (X1 pipetting head)*

8. Clear the deck and close the door when prompted.
    - The pipetting tools each pick up the teaching needle and perform tightness and cLLD checks, after which maintenance is completed.
    - The camera performs a calibration.

6.4.2 Weekly Maintenance

Weekly maintenance consists solely of cleaning the deck and any devices. Daily maintenance should be run along with weekly maintenance when required.

To perform weekly maintenance:

1. Wear the appropriate PPE in the laboratory area.
2. Run the daily maintenance protocol. Refer to 6.3 ▸ page 55 for instructions on locating and running maintenance protocols.
3. Spray a clean, lint-free towel with deionized water and wipe down the following components:
    - Deck area
    - Waste block
    - Calibration post

Note:
Never spray the Prep directly with water.

6.4.3 Yearly Maintenance

Once a year, the Prep must be cleaned and lubricated to maintain best performance. The following procedure describes the steps for cleaning and lubrication in detail. Refer to 6.3 ▸ page 55 for information on accessing maintenance routines.

To perform yearly maintenance:

1. Wear the appropriate PPE in the laboratory area.
2. Run the yearly maintenance protocol. Refer to 6.3 ▸ page 55 for instructions on locating and running maintenance protocols.
3. Clear any labware from the deck and close the door.

→ The Prep moves either the front channel or the 8 Multi-Probe Head into position for cleaning.

Note:
If there are no independent channels, skip to step 9 ▸ page 62.
If there are independent channels, continue to step 4 ▸ page 60.
If there are Fluid Motion channels, skip to step 11 ▸ page 62.

4. Open the door and wrap a clean, dry cloth around the front channel's lead screw, then pull gently on each end to clean the lead screw (not applicable for Fluid Motion channels).

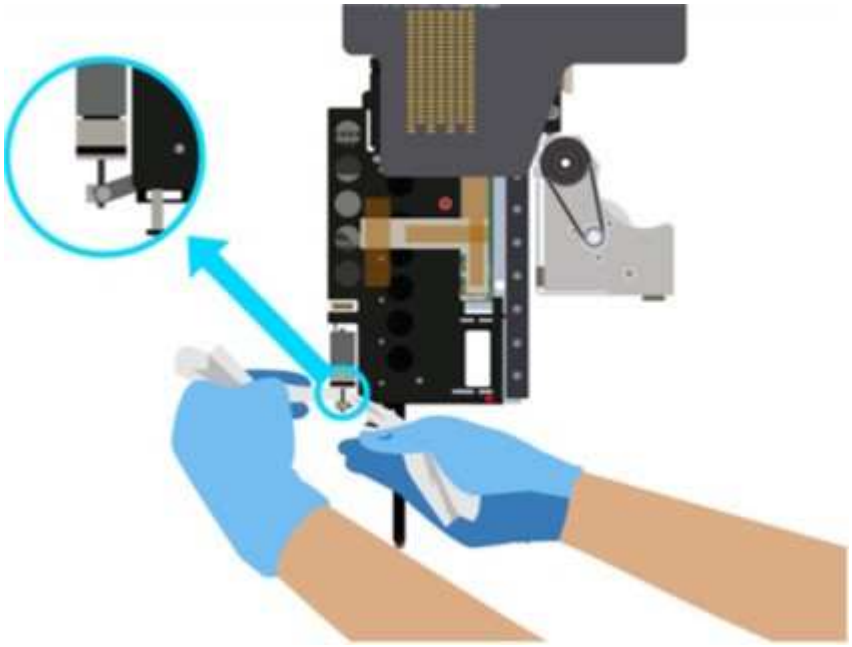


Figure 6-9: *Cleaning the front channel's lead screw*

5. Apply a small amount of silicone oil to the front channel's lead screw using a clean, lint-free cotton swab (not applicable for Fluid Motion channels).

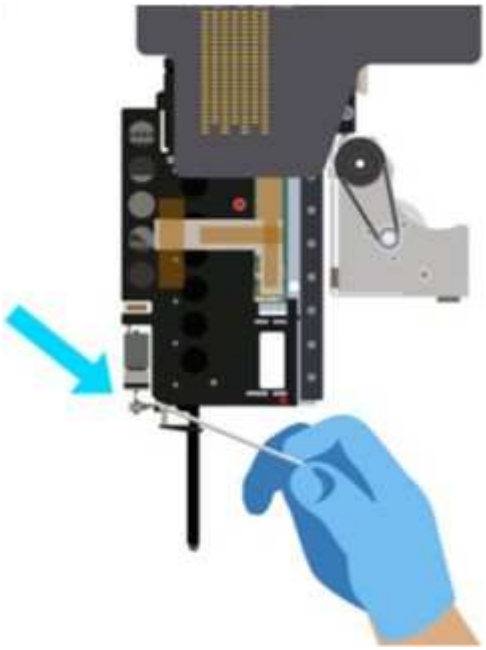


Figure 6-10: *Oiling the front channel's lead screw*

Note:
Use only a few drops of oil when lubricating the Prep's lead screws to prevent contamination.

6. Close the door when finished with the front channel.
7. The Prep positions the rear channel for cleaning.
8. Repeat step **4** ▸ page 60 – step **6** ▸ page 61 for the rear channel (not applicable for Fluid Motion channels).

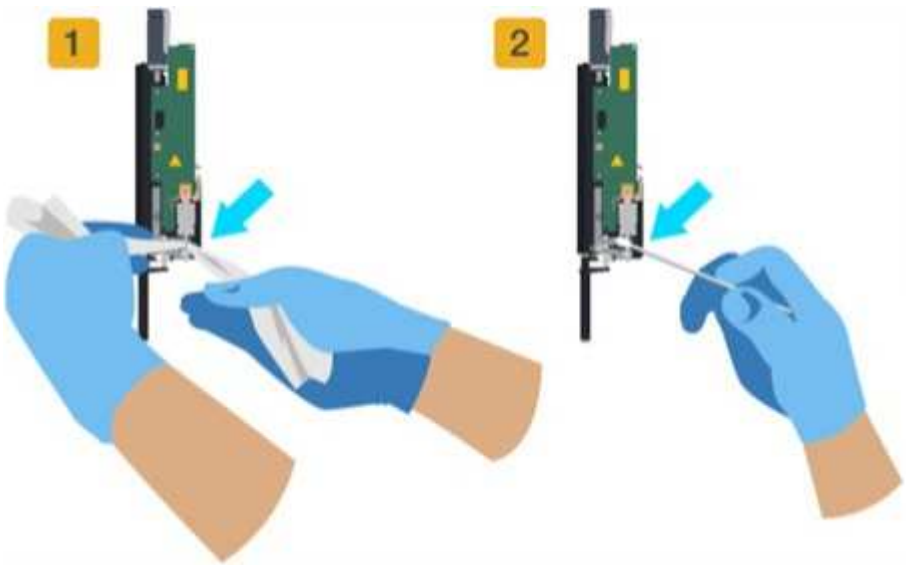


Figure 6-11: *Cleaning and lubricating the rear channel*

Note:
The lead screw is located to the right of the tip eject sleeve.

Note:
If there is no 8 Multi-Probe Head, skip to step 11 ▸ page 62.

If there is an 8 Multi-Probe Head, continue to step 9 ▸ page 62.

9. Wipe down the 8 Multi-Probe Head's lead screw with a clean, dry cloth.

Note:
The lead screw can be difficult to access if the Prep has individual channels; wipe down as much of the lead screw as possible.

10. Apply a small amount of silicone oil to the 8 Multi-Probe Head's lead screw with a clean, lint-free cotton swab.

Note:
Use only a few drops of oil when lubricating the Prep's lead screws to prevent contamination.

11. Close the door.
12. The Prep moves the channels and/or 8 Multi-Probe Head out of the way for the next step.
13. Open the door and wipe down the following parts with a clean, dry cloth:
    - The pipetting arm's lead screw (not applicable for Fluid Motion channels)
    - All pipetting arm rails

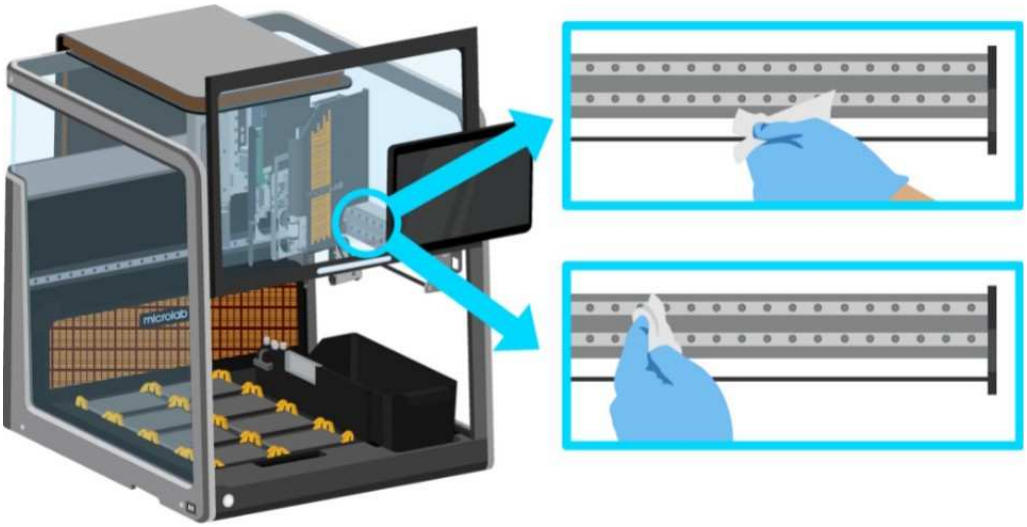


Figure 6-12: *Cleaning the pipetting arm's lead screw and rails*

    - The two rails along the rear of the Prep

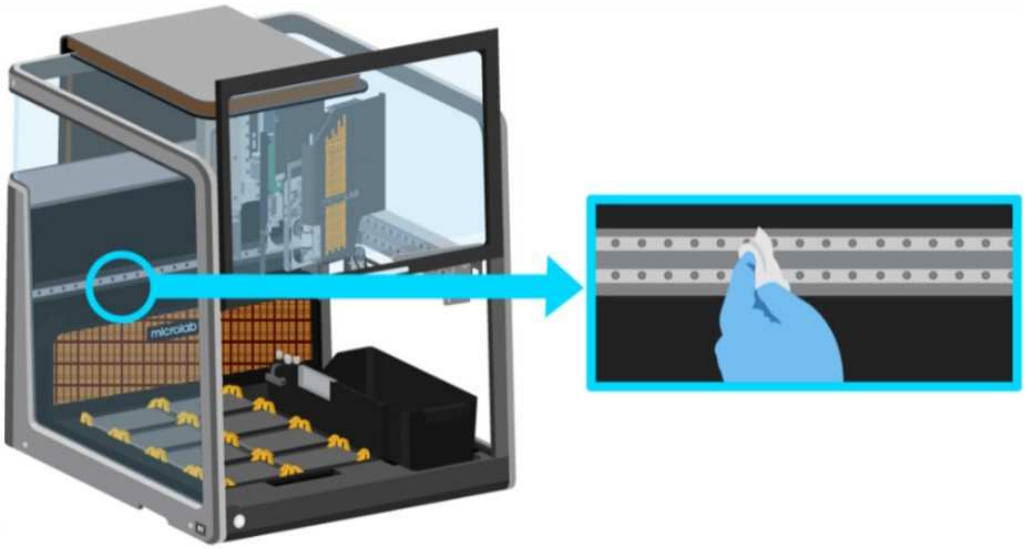


Figure 6-13: *Cleaning the rails along the rear of the Prep*

14. Do one of the following:
    - For Fluid Motion channels, go to step **15** ▸ page 63.
    - For standard channels, skip to step **16** ▸ page 63.
15. Apply a thin film of SKF grease to the Fluid Motion channel's X and Y rails.
16. Apply a small amount of silicone oil to the front, middle, and back of the standard channel's pipetting arm's lead screw using a clean, lint-free cotton swab.

> **Note:**
> Use only a few drops of oil when lubricating the Prep's lead screws to prevent contamination.

> **Note:**
> Avoid applying oil to any parts other than the specified lead screws.

17. Close the door and select **[Finish]**.

→ The Prep moves the channels and pipetting arm to spread the oil.

6.4.4 CO-RE I Stop Disc and O-Ring Replacement

A Prep with CO-RE I technology requires new stop discs and O-rings after 20,000 tip eject cycles, which occurs approximately every six months depending on the Prep's tip usage.

The following procedure describes the steps for stop disc and O-ring replacement in detail. Refer to **6.3** ▸ page 55 for information on accessing preventative maintenance routines.

To replace the CO-RE I stop disc and O-ring:

1. Wear the appropriate PPE in the laboratory area.
2. Run the appropriate **Replace stop discs and O-rings** protocol. Refer to **6.3** ▸ page 55 for instructions on locating and running maintenance protocols.
3. Clear any labware on the deck and close the door.

→ The Prep moves the pipetting arm and tools into position.

4. Open the door again when prompted.
5. Use the stop disc removal tool to unscrew the old stop disc, old O-ring, and washer from the pipetting head or multi-probe head.
6. Apply glue to two to three threads of the new stop disc. The new stop disc requires a small amount of glue on its threads to hold it in place.

> **Note:**
> Avoid getting glue on the washer, the O-ring, or inside the stop disc. Replace any stop discs that have glue on them.

7. Pull the new stop disc out of its rubber strip. Twist the stop disc to help remove it, if needed.
8. Verify that the O-ring and washer are properly attached to the new stop disc.
   - The O-ring should rest between the top of the stop disc and the washer.
   - Verify that there is no glue on the washer or O-ring before proceeding.



Figure 6-14: *Checking the stop disc assembly*

9. Screw the new stop disc onto the pipetting head or multi-probe head by hand. The washer may need to be adjusted slightly to fit it properly in place.
10. Wipe down the new stop disc with a clean, lint-free towel sprayed with deionized water.
11. Repeat step 4 ▸ page 64 through step 9 ▸ page 64 as necessary.
    - All eight stop discs on the multi-probe head must be replaced at the same time.
    - The pipetting heads for the channels only have one stop disc each, but they should all be replaced at the same time for consistent performance.
12. Close the door when prompted.

→ The Prep starts the calibration procedure for the new stop discs and O-rings.

13. Follow the on-screen instructions to complete the calibration.

6.4.5 CO-RE II and X1 Pipetting Head O-Ring Replacement

A Prep with CO-RE II technology requires new O-rings after 40,000 tip eject cycles, which occurs approximately every 12 months depending on the Prep's tip usage.

To replace the CO-RE II and X1 pipetting head O-rings:

1. Wear the appropriate PPE in the laboratory area.
2. Turn on the Prep and sign in, if required.
3. Select the **[Gear]** icon to access settings.

4. Run the appropriate **Replace stop discs and O-rings** protocol. Refer to 6.3 ▸ page 55 for instructions on locating and running maintenance protocols.
5. Clear any labware on the deck, then close the door.

→ The Prep moves the pipetting arm and tools into position.

6. Open the door again when prompted.
7. Select **O-rings to be replaced**, then select **[Next]**.
8. Follow the on-screen instructions to replace O-rings using the included pick tool.
9. Wipe down the new stop disc with a clean, lint-free towel sprayed with deionized water.
10. Repeat step 4 ▸ page 65 to step 9 ▸ page 65 as necessary.
    - All eight O-rings on the multi-probe head must be replaced at the same time.
    - The pipetting heads for the channels only have one O-ring each, but they should all be replaced at the same time for consistent performance.
11. Close the door when prompted.

→ The Prep starts the calibration procedure for the new O-rings.

12. Follow the on-screen instructions to complete the calibration.
13. Open the door when prompted and place tips on Site 7.
    - A Prep with independent-only channels requires two tips in positions A1 and B1.
    - Other setups require a full column of tips in Column 1.
14. Select which tips to load, then select **[Next]**.
15. Close the door and wait until calibration is finished. Remove the tips once calibration is finished.

6.4.6 CO-RE II Stop Disc Replacement

Note:
CO-RE II stop discs do not require replacement as part of normal preventative maintenance. Instructions are included in this manual in case the need arises.

Note:
CO-RE II stop discs on Fluid Motion channels cannot be replaced.

To replace CO-RE II stop discs:

1. Wear the appropriate PPE in the laboratory area.
2. Run the appropriate **Replace stop discs and O-rings** protocol. Refer to 6.3 ▸ page 55 for instructions on locating and running maintenance protocols.
3. Clear any labware on the deck and close the door.

→ The Prep moves the pipetting arm and tools into position.

4. Open the door again when prompted.
5. Use the 12 cNm torque driver and 2 mm hex bit to unscrew the old stop disc, old O-ring, and drive ring from the pipetting head or multi-probe head.

6. Remove the rubber sleeve from the top of the CO-RE II stop disc.



Figure 6-15: *CO-RE II stop disc*

7. Verify that the drive ring is properly attached to the new stop disc. The drive ring should sit on top of the stop disc.

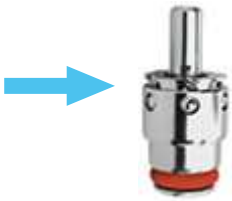


Figure 6-16: *Checking the stop disc assembly*

8. Screw the new stop disc onto the pipetting head or multi-probe head using the 12 cNm torque driver and 2 mm hex bit. The drive ring may need to be adjusted slightly to fit properly in place.

> **Note:**
> Never use any other tools to tighten the new stop disc; doing so may damage the pipetting head.

9. Wipe down the new stop disc with a clean, lint-free towel sprayed with deionized water.
10. Repeat step 5 ▸ page 65 to step 9 ▸ page 66 as necessary.
    - All eight stop discs on the multi-probe head must be replaced at the same time.
    - The pipetting heads for the channels only have one stop disc each, but they should all be replaced at the same time for consistent performance.
    - Verify that all stop discs on the 8 MPH are flush.



Figure 6-17: *8 MPH stop disc alignment*

11. Close the door when prompted.

→ The Prep starts the calibration procedure for the new stop discs and O-rings.

12. Follow the on-screen instructions to complete the calibration.

6.4.7 Data Maintenance

Traces and other data stored on the Prep must be regularly archived or deleted. Data maintenance is *required* when the amount of data stored reaches a certain size. Data maintenance is *recommended*, depending on the level of maintenance warnings in the Prep's settings. Go to the **Maintenance** page help for details.

6.4.8 Database Backup

Regularly back up the Prep's database in the event of a software issue. These backups can be viewed, managed, or restored in the Prep's settings. Go to the **Maintenance** page help for details.

6.5 Volume Verification

The Prep features built-in protocols to verify liquid handling performance. The channels and 8 Multi-Probe Head channel each have two protocols: one for high-volume verification, and one for low-volume verification. The protocols pipette reagents to a plate, which is measured in an off-deck absorbance reader and balance. The measurements are used with spreadsheets supplied by Hamilton to verify the Prep's pipetting accuracy and precision.

Verification kits are available for purchase through Hamilton. One kit includes two framed tip pedestals, and the other kit includes only the consumables. Each kit comes with consumables to run both low- and high-volume verification protocols for the channels and 8 Multi-Probe Head channel.

6.6 Decontamination

Note:
Instruments, defective parts, and disposables must meet disinfectant and decontamination regulations prior to disposal.

These instructions include recommendations and materials required for cleaning and decontamination. Be aware of any materials that may be incompatible with parts of the device.

Users are responsible for following the recommended decontamination procedure in the event of a hazardous material spill on or inside the equipment.

The following is the recommended decontamination procedure:

1. Spray a lint-free towel with Microcide SQ (USA) or Deconex (EUR).
2. Wipe down the following components:
    - The enclosure (inner and outer faces)
    - The deck and base plates
    - The pipetting channels (not the pipetting heads)
    - The waste block, including the waste bin, liquid waste tub, and liquid waste bottle

Note:
Avoid spraying cleaning agents directly on the Microlab Prep.

⚠ CAUTION: Avoid Bleach
Avoid using cleaning or disinfecting solutions that contain hypochlorite, such as bleach, on the Microlab Prep.

NOTICE: **Avoid Acetone-Based Solutions**
Avoid using an acetone-based solution to clean the enclosure. It can cause micro-fractures.

6.7 Prep CAP HEPA/UV Decontamination

If the Prep has a Prep CAP HEPA/UV accessory, the following is the recommended decontamination procedure:

1. Spray a lint-free towel with Microcide SQ (USA) or Deconex (EUR).
2. Wipe down the following components:
    - The outer enclosure and latches
    - The inner surfaces of the Prep CAP, when the HEPA filter is changed

NOTICE: **Damage to UV-C LED Array**
Never wipe or touch the UV-C LED array with any cleaning agent or tool. Damage may result.

6.8 Prep CAP HEPA/UV Maintenance

Pre-filter and main filter replacement are available in the software under **Maintenance Routines** and provide step-by-step procedures for replacing each of the filter types.

6.8.1 Pre-Filter Replacement

The pre-filters must be changed every 520 hours of operation.

To change the pre-filter:

1. Run the **Replace HEPA Pre-Filter** protocol. Refer to 6.3 ▸ page 55 for information on accessing and running maintenance protocols.
2. Lift the latch tabs to unlock the filter cover.

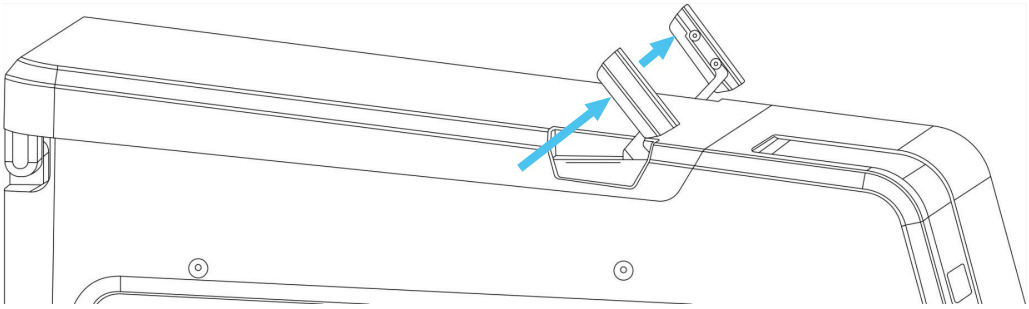


Figure 6-18: *Latch tabs*

3. Pull the pre-filter upwards and out of the machine.

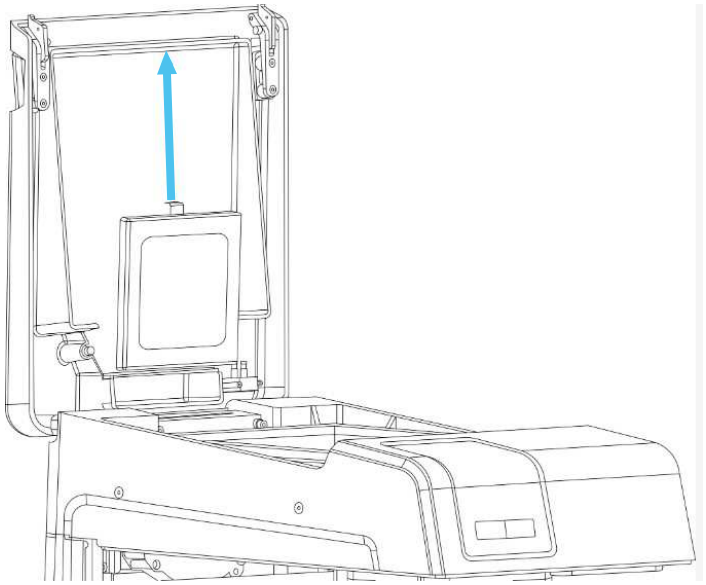


Figure 6-19: *Remove pre-filter*

4. Insert the new pre-filter into the slot.
5. Close the lid and lock the tabs.

6.8.2 Main Filter Replacement

The main HEPA filter must be changed when the pressure sensor reports "filter at end of life".

To change the main HEPA filter:

1. Run the **Replace Main HEPA Filter** protocol. Refer to 6.3 ▸ page 55 for information on accessing and running maintenance protocols.
2. Lift the latch tabs to unlock the filter cover.

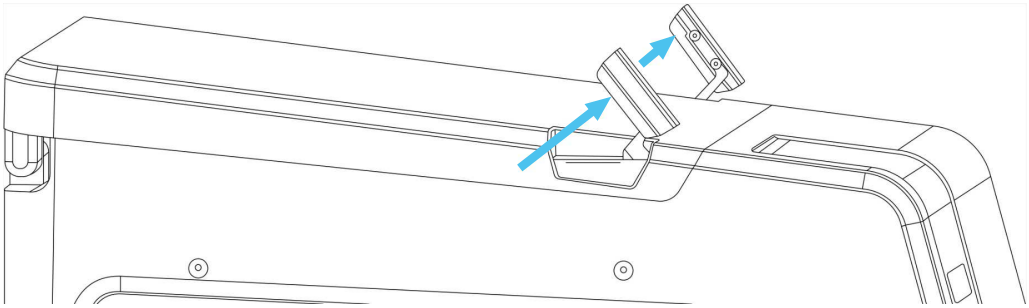


Figure 6-20: *Latch tabs*

3. Pull the main HEPA filter upwards and out of the machine.

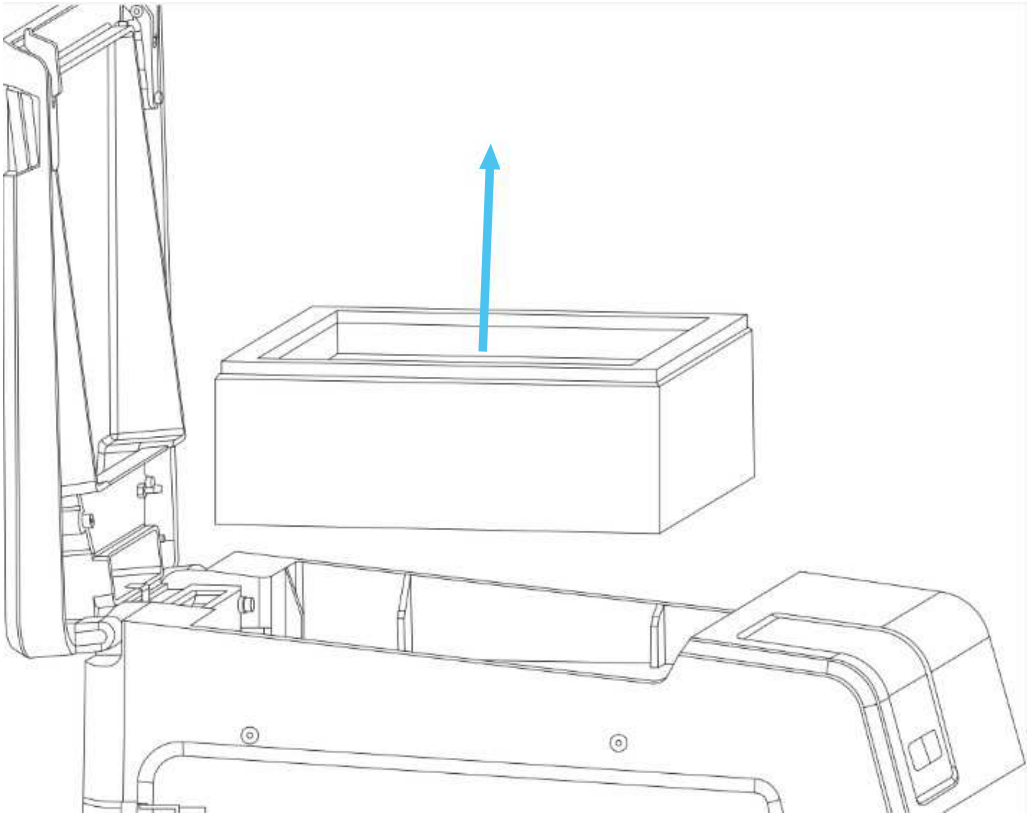


Figure 6-21: *Remove HEPA filter*

4. Insert the new HEPA filter into the slot.
5. Close the lid and lock the tabs.
6. Follow the on-screen instructions to complete the calibration process.

6.8.3 UV Module Replacement

To replace the UV module:

1. Remove the four screws holding the UV module.

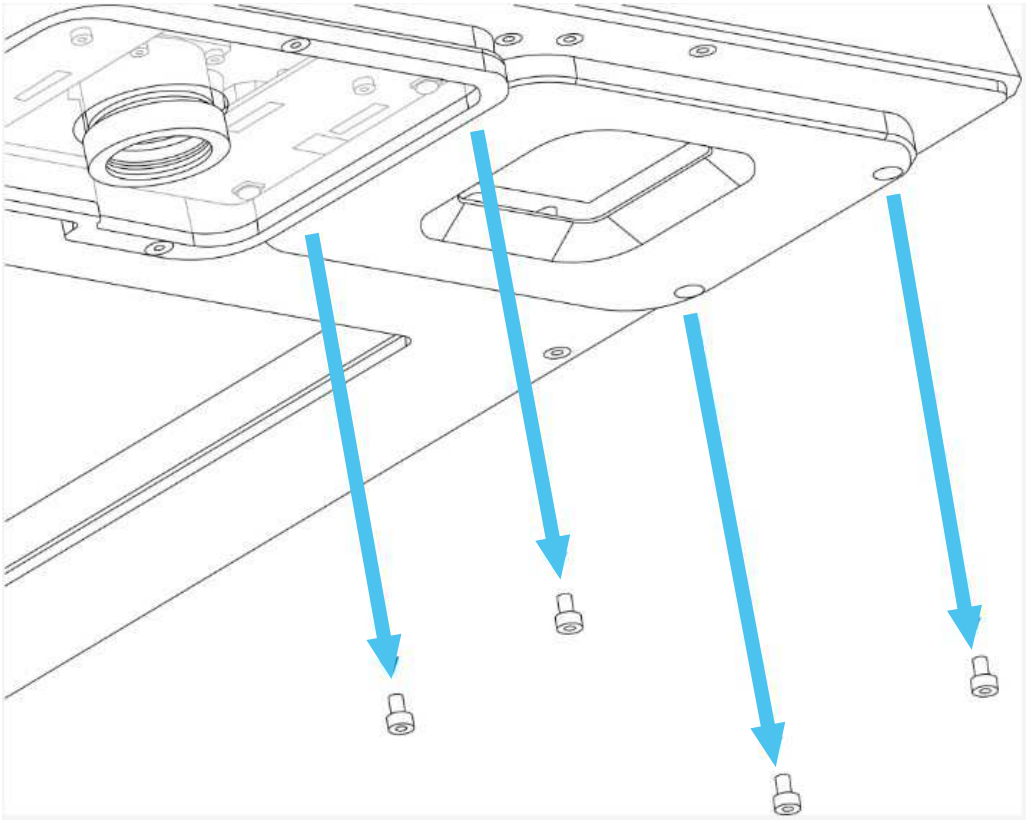


Figure 6-22: *Screw locations*

Note:
The module does not fall out when removing the screws.

2. Slide the UV module forward and downwards.

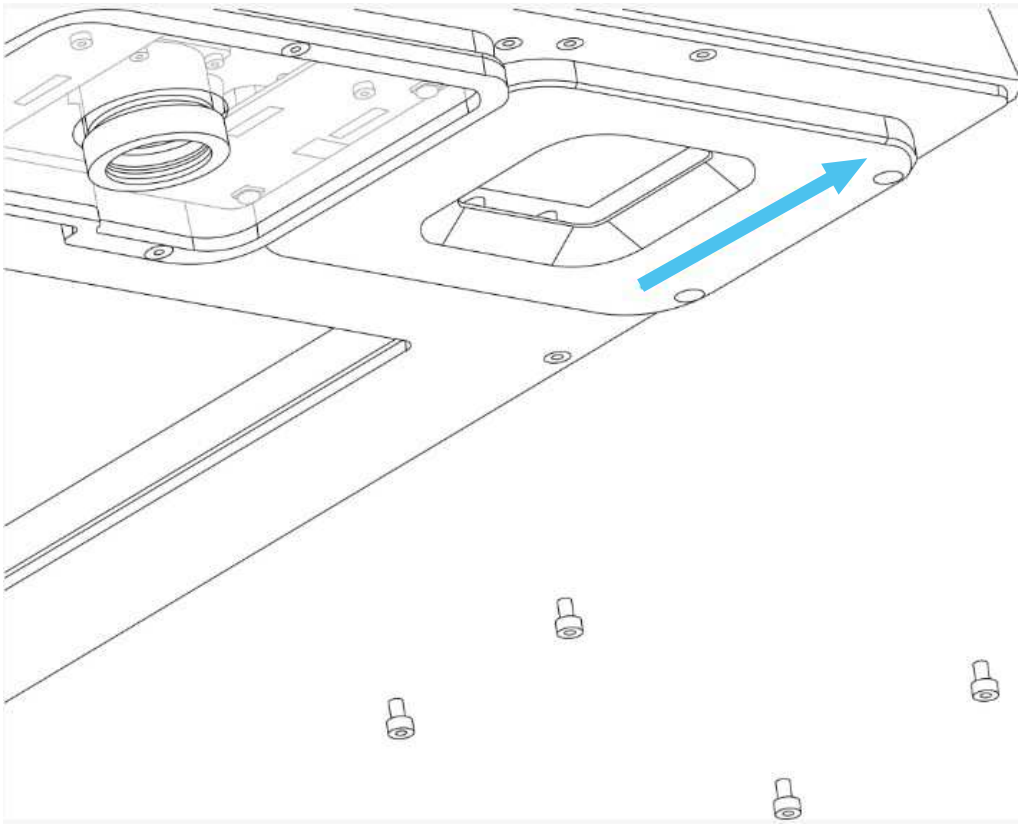


Figure 6-23: *Slide UV module*

3. Remove the UV module.

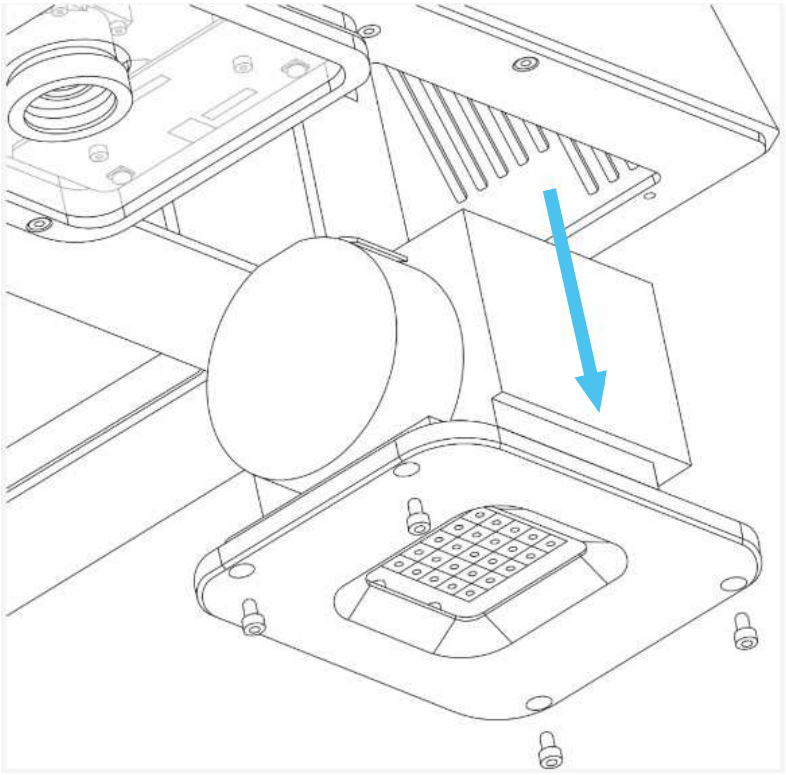


Figure 6-24: *Remove UV module*

4. Unplug the two cables attaching the module to the CAP.
5. Plug the cables into the new module.
6. Slide the module to the rear of the instrument.

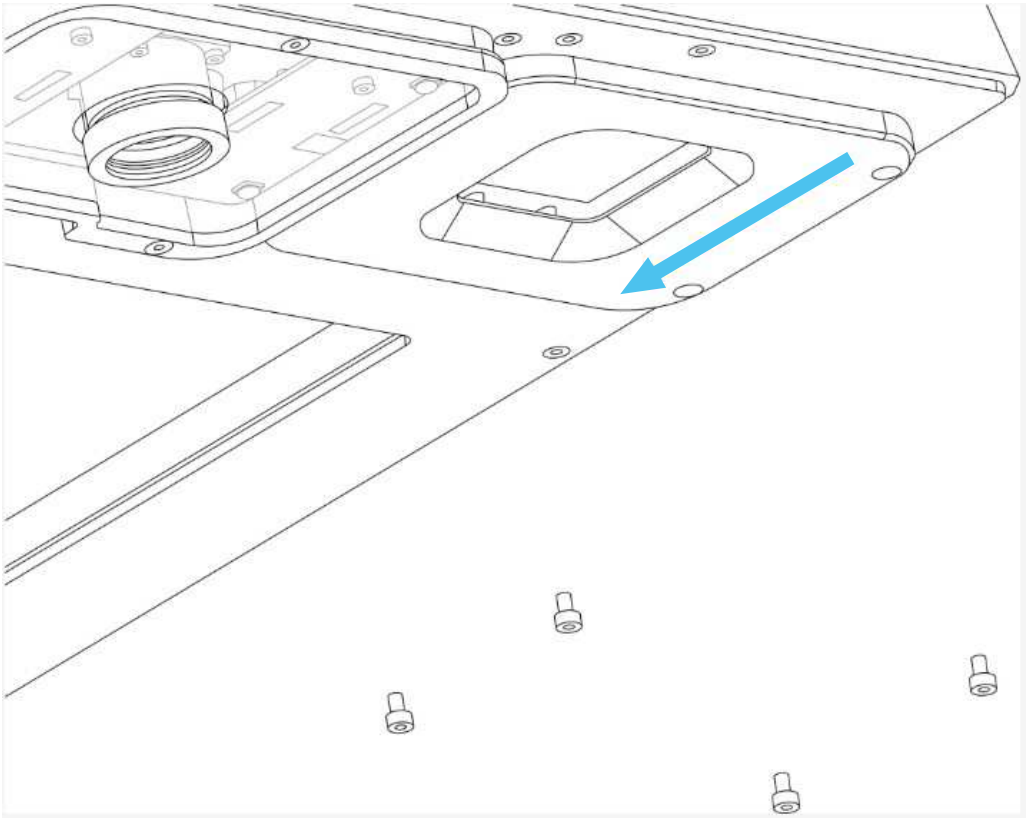


Figure 6-25: *Replace UV module*

7. Reinstall the four screws.

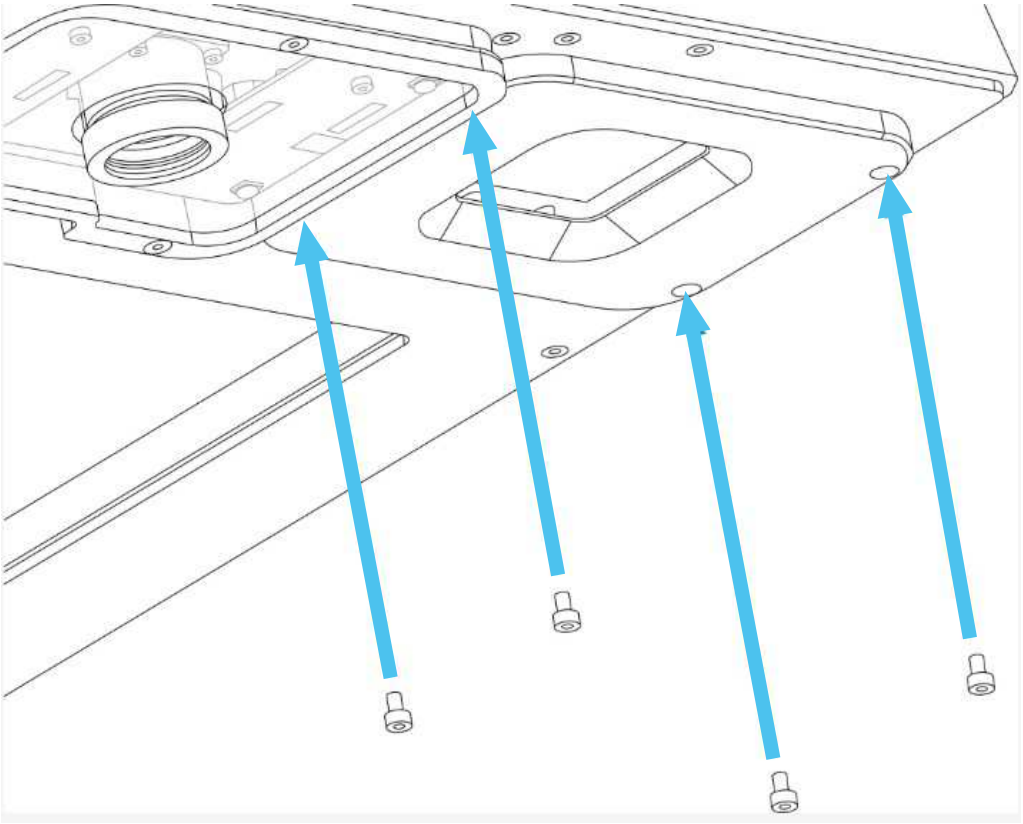


Figure 6-26: *Reinstall screws*

Chapter 7

Troubleshooting

7.1 Overview
7.2 Exchanging the Standard Pipetting Head
7.3 Exchanging the X1 Head
7.4 Fuse Replacement
7.5 Prep CAP HEPA/UV
7.6 Finding the Software Version
7.7 Taking Screenshots

7 Troubleshooting

7.1 Overview

If the Prep encounters persistent errors, articles addressing common issues are provided in the Hamilton Knowledge Center. The Knowledge Center also provides tutorials and other information on how to best use the Prep.

If the available articles do not solve the problem, open a ticket for Hamilton Support via the Knowledge Center to get additional help. Have the following information ready when opening a ticket:

- Name
- Software version (refer to 7.6 ▸ page 84 for details)
- Email
- Company
- Serial number
- A description of the problem

7.2 Exchanging the Standard Pipetting Head



⚠ CAUTION: Biohazard
Always treat the pipetting head as a biohazard contaminant.

The standard pipetting head can be replaced if it loses accuracy or functionality. Verify it is the correct head before replacing it.
To remove and replace the pipetting head:

1. Wear the appropriate PPE in the laboratory area.
2. Power off and disconnect the Prep from power for at least five minutes.
3. Open the door and clear any labware from the deck.
4. Verify that the correct replacement pipetting head or multi-probe head is ordered.



⚠ WARNING:
Avoid installing a front pipetting head on the rear channel, or vice versa. Hardware errors and potential instrument damage may occur if the wrong pipetting head is installed.

5. Carefully move the pipetting arm to the right side of the Prep.
6. Carefully pull the desired pipetting head near the front of the pipetting arm.
7. Grip the channel at its base, where it attaches to the rails on the arm. Avoid touching any electronics or gripping the pipetting head by the black tip eject sleeve.
8. Verify that the pipetting head is clear of the waste block.
9. Gently pull the pipetting head or multi-probe head all the way down.
10. When replacing the front or rear channel's pipetting head:

- Use the 2 mm wrench included with the Prep to remove the two red screws, as shown in Figure 7-1 ▸ page 77. The screws are located in the same place in both the front and rear pipetting heads.

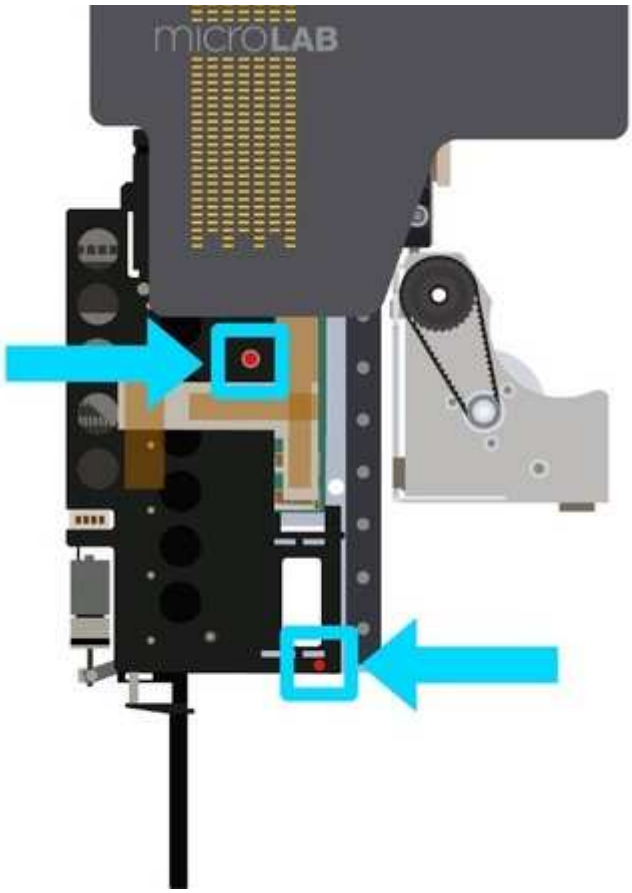


Figure 7-1: *Pipetting head screws*

- Examine the back of the channel before proceeding to see how the slots and tabs fit on a correctly installed pipetting head.

⚠ **WARNING:**
A pipetting head may seem to fit without each of the four tabs lining up properly, but it can cause errors later.

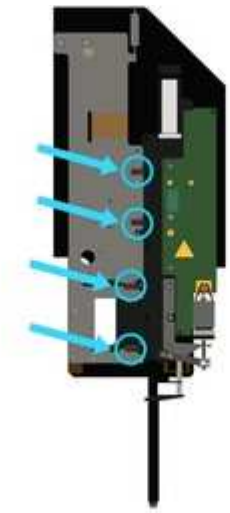


Figure 7-2: *Checking the fit of a pipetting head's slots and tabs*

- Push the pipetting head removal tool through the hole, as shown in Figure 7-3 ▸ page 78. The pipetting head ejects slightly and can be removed by pulling it to the left, away from the pipetting arm.

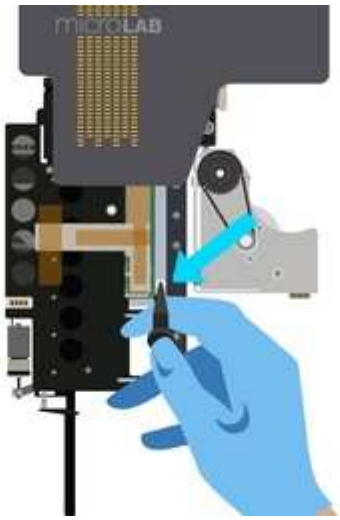


Figure 7-3: *Ejecting a pipetting head*

- Attach the new pipetting head:
  - Match the four plastic slots on the pipetting head to the metal tabs on the channel.
  - Slide the pipetting head onto the channel until it clicks in place.
- Secure the new pipetting head using the same two red screws. The new pipetting head includes replacement screws if needed.

> ⚠ **WARNING:**
> Avoid installing a front pipetting head on the rear channel, or vice versa. Hardware errors and potential instrument damage may occur if the wrong pipetting head is installed.

11. When replacing the multi-probe head:

- Use a 3 mm hex wrench to loosen the screw, as shown in Figure 7-4 ▸ page 79 by a half-turn.

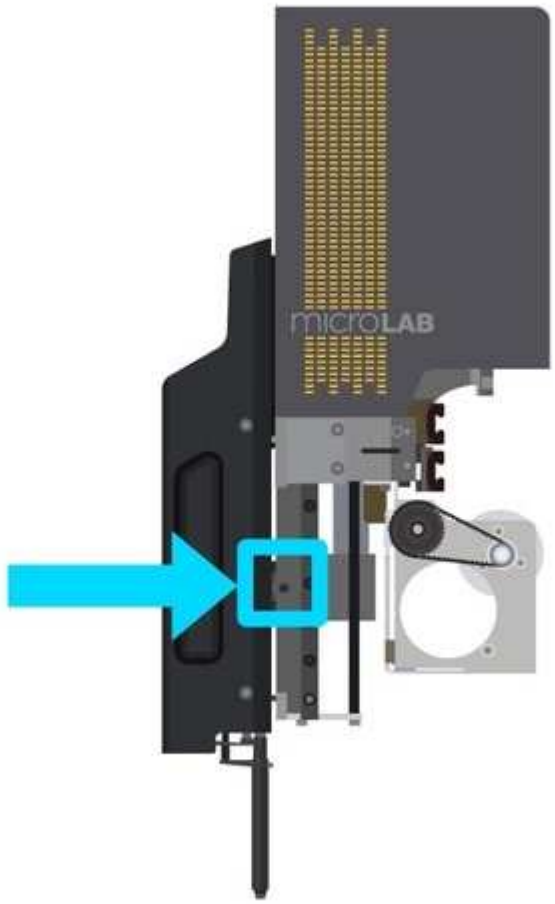


Figure 7-4: *8 Multi-Probe Head replacement screw*

- Grab the old multi-probe head by the grip and pull left until it detaches from the channel.
- Attach the new multi-probe head:
  - Match the black prong on the new multi-probe head to the hole on the channel and slide the multi-probe head onto the channel until it clicks in place.
- Secure the new pipetting head by tightening the screw, as shown in Figure 7-4 ▸ page 79.
- Visually check the alignment of the new multi-probe head.
  - Push the 8 MPH to the rear of the pipetting arm to visually check the alignment of the new multi-probe head, using the rear edge of the Prep as a reference. All eight channels should be level.

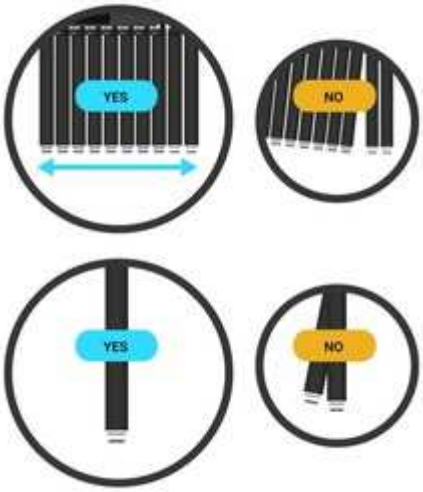


Figure 7-5: Checking the alignment of a new multi-probe head

12. Move the channel with the new pipetting head or 8 MPH to the same position near the front of the pipetting arm. This helps ensure that the pipetting head does not snag the flat flex cables inside the channel.
13. Close the door.
14. Reconnect the Prep's power cable and power it on. Sign in if required.
15. Open the **Maintenance Routines** page. Select the **[Settings]** icon in the utility bar on the instrument **Home** page, open the **Maintenance** tab, then select **Maintenance Routines**.
16. Select the **Replace a pipetting head** routine, then select **Run**.
17. When prompted, select the multi-probe head (on-screen) to start calibrating the new pipetting head or multi-probe head.
18. Follow the on-screen instructions to complete the X1 head replacement process (in the subsequent steps of this procedure) and start calibration.

7.3 Exchanging the X1 Head

⚠ CAUTION: Biohazard
Always treat the pipetting head as a biohazard contaminant.

***NOTICE:* Sensitive Components**
Avoid using excessive force when working on the pipetting head.

To remove and replace the X1 head:

1. Wear the appropriate PPE in the laboratory area.
2. Open the **Maintenance Routines** page. Select the **[Settings]** icon in the utility bar on the instrument **Home** page, open the **Maintenance** tab, then select **Maintenance Routines**.
3. Select the **Replace a pipetting head** routine, then select **Run**.
4. When prompted, select the pipetting head to replace.

5. Follow the on-screen instructions to complete the X1 head replacement process (in the subsequent steps of this procedure) and start calibration.
6. Press and hold the pipetting head release button (1).
7. Tilt the pipetting head to the left. (2)
8. Lift the pipetting head upward to remove it from the locating pin (3).

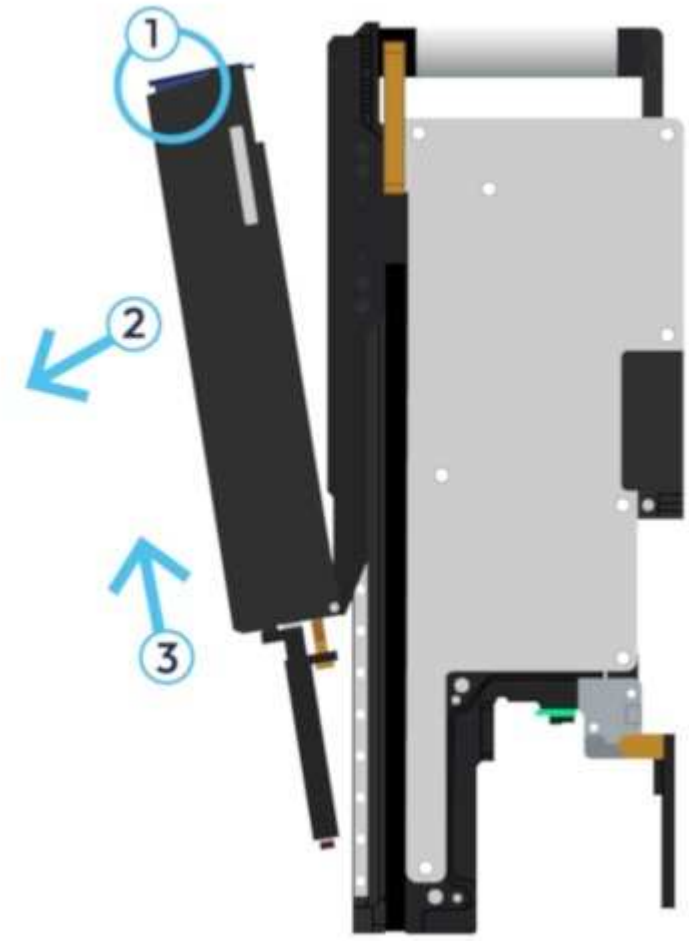


Figure 7-6: *Removing the X1 head*

9. Position the bottom of the pipetting head onto the locating pin (4).
10. Tilt the pipetting head to the right while pressing the release button until the pipetting head is fully seated. (5)
11. Release the button and confirm the pipetting head is securely locked. (6)

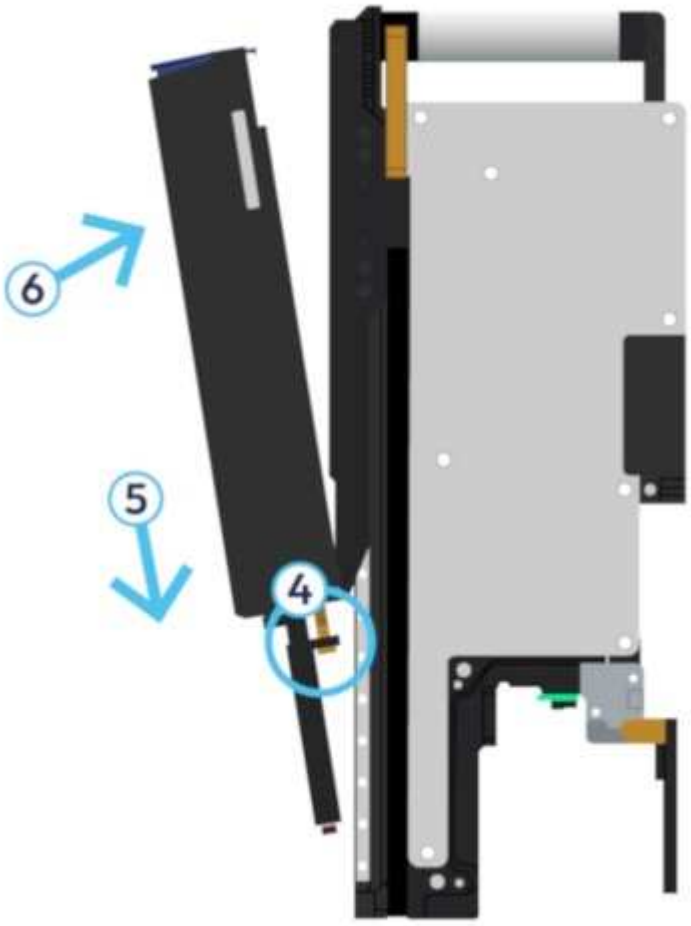


Figure 7-7: *Installing the X1 head*

7.4 Fuse Replacement

If the fuses require replacement, verify that the fuses are replaced with the same type and current rating. Refer to 10.1 ▸ page 94 for type and rating.
To replace the fuses:

1. Turn off the instrument and unplug the power cord from the socket on the side of the Prep.
2. Remove the fuse holder with a screwdriver.

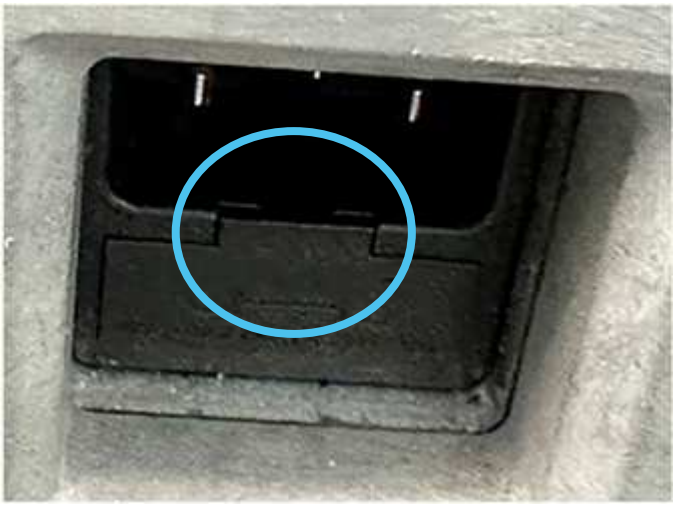


Figure 7-8: *Fuse holder tab*

3. Remove the old fuses from the fuse holder.



Figure 7-9: *Remove fuse*

4. Install new fuses in the fuse holder.
5. Replace the fuse holder with a screwdriver.

7.5 Prep CAP HEPA/UV

In the event of a fault with the CAP accessory, a help message displays on the Prep touchscreen. If the message fails to resolve the fault, refer to the table below.

Symptom	Possible Cause	Corrective Action
Fan does not start.	Filter door is not latched.	Check door latches for the ability to completely close.
	Filter door is not closed.	Verify that the filter door is closed completely and there is nothing blocking it from completely closing.
	Filter is not installed.	Verify that a HEPA filter is installed.
Fan speed varies frequently.	HEPA Filter is torn or perforated.	Replace HEPA filter.
Fan starts, but stops unexpectedly.	Pre-Filter is clogged.	Replace pre-filter.
	HEPA Filter is clogged.	Replace HEPA filter.
	HEPA Filter is torn or perforated.	Replace HEPA filter.
UV lamps do not turn on.	Prep door is not closed.	Verify that the Prep door is closed and there is nothing blocking it from completely closing.
	Filter door is not latched.	Check door latches for the ability to completely close.
	Filter door is not closed.	Verify that the filter door is closed completely and there is nothing blocking it from completely closing.
	Filter is not installed.	Verify that a HEPA filter is installed.
UV lamps turn on, but turn off unexpectedly.	Prep door is blocked or contaminated.	Verify that the Prep door can close completely and that there are no objects holding it open to any degree.

7.6 Finding the Software Version

To find the software version, go to the **Version** tab of the **Software Configuration** settings. The version information is also available on startup from the login page if the help button is selected.

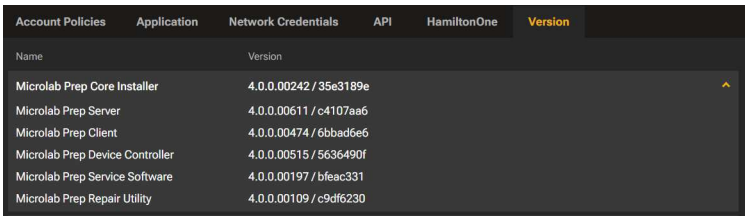


Figure 7-10: *Software version on startup*

7.7 Taking Screenshots

If an error appears on the screen:

1. Verify that a USB keyboard is connected to the USB port on the Prep.
2. Use the **[Ctrl + Shift + S]** keyboard shortcut to take a screenshot.
3. From the Prep Home page, select the **[Settings]** icon in the utility bar, then select **File Manager** in the **Software** tab.
4. On the **File Manager** page, select the **Screenshots** tab to view, export, or delete screenshots.

Chapter 8

Disposal

8.1 General Product Disposal

8 Disposal

8.1 General Product Disposal

To dispose of the product, contact your local service organization. Contact a local Hamilton representative for further recommendations specific to your location.

Note:

Negative environmental impacts may be associated with the treatment of waste. Avoid treating electrical equipment as unsorted municipal waste. Collect electrical and electronic equipment waste.

⚠ CAUTION: Decontaminate Before Disposal

Depending on the applications, parts of the instrument may have been in contact with biohazardous, poisonous, or even radioactive material.

Verify that this material is treated in accordance with the applicable safety standards and regulations.

Always decontaminate the parts before disposal.

8.1.1 Americas/Pacific Rim

After the life cycle of the instrument has ended, the customer is responsible for proper disposal of electronic devices per local regulations.

8.1.2 European

WEEE Declaration

Recycling of Hamilton instruments is in accordance with EC directive WEEE (Europe only).

The European Community requires from manufacturers to organize the disposal and Waste of Electrical and Electronic Equipment (WEEE). For this reason, Hamilton Bonaduz AG took part in an initiative to organize the disposal of its products through a European disposal network called RENE. RENE is the largest recycling network for the disposal of electronic equipment in Europe. The mission of RENE is a Europe-wide, WEEE-compliant, high-quality recycling for electrical and electronic equipment through a dense network with both innovative and SMB-sized partner companies. As a consequence, Hamilton Bonaduz AG gets a turn-key solution that includes all processes from treatment of incoming orders over collection, logistics and recycling down to reporting and the according management of material flows.

Hamilton offers a WEEE process in collaboration with Toolpoint and RENE AG:

- Request for the collection of the Hamilton instrument via Toolpoint home page (www.toolpoint.ch).
- Completion of the decontamination confirmation form
- Preparation for transport: Packing
- Activation of the recycling order

- Archiving of the decontamination confirmation
- Disposal of instrument

Party	Responsibilities
Ordering Party	Decontamination Preparation for transport Cost of decontamination and shipment (on request, Hamilton offers to take care of that part of these costs).
RENE	Transport Disposal
Toolpoint	Registration Invoice the disposal to Hamilton
Hamilton	Responsible for adhering to WEEE compliance

Recycling process

1. Request the disposal of the instrument. Go to www.toolpoint.ch for the order registration form.
2. Complete the decontamination form. Once the form has been completed, the request for disposal is automatically activated and transferred to Toolpoint. Order confirmation is sent to the registered contact person.
3. Decontaminate the instrument. The ordering party is responsible for decontamination. It is mandatory to sign the decontamination form and send an electronic copy to Toolpoint. Toolpoint forwards the documentation to RENE, which is responsible for instrument disposal.
4. Pack and prepare the instrument for shipping. Instruments weighing greater than 30 kg are secured to a euro pallet. Instruments less than 30 kg are packed in a cardboard or plastic box. A signed copy of the decontamination form is placed on the outer part of the shipping box or container.

Chapter 9

Parts and Accessories

9.1 Disposable Tips
9.2 Reagent Reservoirs
9.3 Waste
9.4 Teaching Needles
9.5 Thermal Devices
9.6 Deck
9.7 Accessories
9.8 Service Parts
9.9 Prep CAP HEPA/UV Service Parts
9.10 Maintenance Fluids

9 Parts and Accessories

9.1 Disposable Tips

Go to the Hamilton Company website for more information on disposable tips.

9.2 Reagent Reservoirs

Part Number	Description
56694-02	60 mL Reagent Reservoirs - Black with Lid, 28 per case
56694-03	60 mL Reagent Reservoirs - Black with Lid, 20 per bulk bag

9.3 Waste

Part Number	Description
6600248-01	Waste bin
6603149-01	Waste bag wire stand
6603183-01	Biohazard waste bags, 50/roll
6603183-02	Waste bags, 50/roll
6600264-01	Liquid waste bottle

9.4 Teaching Needles

Part Number	Description
182176	Teaching needle

9.5 Thermal Devices

Part Number	Description
6601900-02	Hamilton Heater Cooler
6601877-01	Flat HHC adapter
67391-01	96-well PCR HHC adapter
67392-01	384-well PCR HHC adapter
6609979-01	24-tube PCR HHC adapter
6601885-01	Hamilton Heater Shaker 2G 3 mm orbit
6601885-02	Hamilton Heater Shaker 2G 2 mm orbit

9.6 Deck

Part Number	Description
660215-01	8-position deck

Part Number	Description
660215-02	7-position deck
92080-03	Yellow deck corner

9.7 Accessories

Part Number	Description
186105	CO-RE Paddle
6612800-01	Dual CO-RE Gripper
6600553-01	Framed tip rack
6600555-01	Tube rack Holds up to 24 full-size tubes. Tubes can be 10.5 – 16.0 mm in diameter and 75 – 125 mm in height.
6605054-01	15 mL Conical tube rack Holds up to 24 15 mL conical style tubes or self-standing tubes, such as VTM tubes. Tubes can be 14 – 16 mm in diameter and 75 – 125 mm in height for conical bottom falcon-style tubes and 75 – 105 mm in height for self-standing tubes.
6600409-01	Small tube rack Holds up to 24 microtubes. Microtubes can be 9.5 – 11.5 mm in diameter and 30 – 50 mm in height.
6607478-01	cLLD Adapter 384-Well PCR Plates Adapter to improve cLLD performance for 384-well, full-skirt PCR plates.
6607479-01	cLLD Adapter 96-Well, Half-Skirt PCR Plates Adapter to improve cLLD performance for 96-well, half-skirt PCR plate.
6607610-01	cLLD Adapter 96-Well, Full-Skirt PCR Plates Adapter to improve cLLD performance for 96-well, full-skirt PCR plates.
6600700-01	Reagent reservoir rack Holds up to five 60 mL reagent reservoirs.
6603432-01	Handheld barcode reader
6603189-01	Prep fume hood integration kit
6604845-01	Lid Pedestal

9.8 Service Parts

Part Number	Description
6600317-01S	CO-RE I single channel head, A, rear

Part Number	Description
6600318-01S	CO-RE I single channel head, B, front
6600317-02S	CO-RE II single channel head, A, rear
6600318-02S	CO-RE II single channel head, B, front
6606804-11	X1 pipetting head
6600140-01S	CO-RE I 8 multi-probe head
6600140-02S	CO-RE II 8 multi-probe head
6603039-01	CO-RE I Preventative Maintenance kit, two stop discs
6603039-02	CO-RE I Preventative Maintenance kit, eight stop discs
6603034-01	CO-RE I stop disc removal tool
97660-02	CO-RE II stop disc, 2-pack
97660-08	CO-RE II stop disc, 8-pack
6607023-01	CO-RE II stop disc removal tools (standard channels only)
6607080-01	CO-RE II Preventative Maintenance kit, two O-rings
6607080-03	CO-RE II Preventative Maintenance kit, four O-rings
6607080-02	CO-RE II Preventative Maintenance kit, 10 O-rings
6604125-01	Prep verification kit, with framed tip pedestals
6604125-02	Prep verification kit, no framed tip pedestals
6608001-01	Prep enclosure

9.9 Prep CAP HEPA/UV Service Parts

Part Number	Description
6610166-01	Pre-filter
6609093-01	HEPA filter
6610325-01	Replacement UV module

9.10 Maintenance Fluids

Part Number	Description
3995-01	Microcide SQ Kit, consisting of an 8 oz bottle of Microcide SQ plus an empty spray bottle
3995-02	Microcide SQ Kit, consisting of a 32 oz bottle of Microcide SQ plus an empty spray bottle
3896-01	Microcide SQ, 8 oz bottle
3896-02	Microcide SQ, 32 oz bottle
6603044-01	Silicone oil
6614299-01	SKF grease

Chapter 10

Technical Specifications

10.1 Instrument Specifications (Microlab Prep)
10.2 Instrument Specifications (Microlab Prep with Prep CAP)
10.3 Pipetting Specifications
10.4 Barcode Reader Specifications
10.5 HHC Heating and Cooling Specifications

10 Technical Specifications

10.1 Instrument Specifications (Microlab Prep)

Physical Dimensions

Parameter	Specification
Width with touchscreen	572 mm (22.5 in)
Width without touchscreen	531 mm (20.9 in)
Depth with touchscreen	636 mm (25.0 in)
Depth without touchscreen	617 mm (24.3 in)
Height	604 mm (23.8 in)
Height (door open)	809 mm (31.9 in)
Weight	**Weight** 40.6 kg (89.5 lbs) **Weight, packaged** 66.9 kg (147.5 lbs)

Power

Parameter	Specification
Input Power (Primary), Universal Supply	100 – 240 ±10 percent VAC, 50 – 60 Hz 3.0A
Fuse Rating	T4A L 250V 4.0A
Output Power (Secondary)	300 W at 48 V

Operation

Parameter	Specification
Deck Capacity	Up to 8 positions
Plate Transport Mass	Maximum 300 g filled deep well plate
Communication	USB, Ethernet
Calibrated Positional Accuracy	0.5 mm
Positional Repeatability	0.125 mm
Operating Temperature	15 – 35 °C (59 – 95°F)
Relative Humidity	15 – 85 percent non-condensing
Designed Life	Seven years
Altitude	0 – 2000 m (0 – 6562 ft) above sea level

Storage

Parameter	Specification
Storage Temperature	-20 – 70 °C (-4 – 158°F)
Relative Humidity	10 – 90 percent non-condensing
CSA Certification Installation Category	II
Pollution Degree	2 Indoor Operation and Use Only. Per Section **CAN/CSA-C22.2 NO. 61010-1-12 3.6.8 POLLUTION DEGREE 2:** "Only non-conductive POLLUTION occurs, except that occasionally a temporary conductivity caused by condensation is expected."

10.2 Instrument Specifications (Microlab Prep with Prep CAP)

Physical Dimensions

Parameter	Specification
Width	572 mm (22.5 in)
Depth with touchscreen	636 mm (25.0 in)
Height	716 mm (28.2 in)
Height (door open)	813 mm (32 in)
Weight	**Weight (with filters)** 44.9 kg (99.0 lbs) **Weight (with filters), packaged** 73.5 kg (162.0 lbs)

Noise

Parameter	Specification
Emitted Noise	<75 dB

UV Specifications

Parameter	Specification
Wavelength	270 nm
UV Intensity	30 µW/cm2
Bulb Life	10,000 hours, which includes a 30 percent intensity decay over the life of the bulb.

HEPA Filter Specifications

Parameter	Specification
HEPA Filter	99.99 percent at 0.3 µm

10.3 Pipetting Specifications

The design specifications in the following section are valid under the following conditions, obtained for measurements at Hamilton:

- Test method: Gravimetric testing at Hamilton.
- Test size: ≥10 single pipettings per channel with disposable CO-RE II tips (pick-up and dispense, tip used only once) per channel and specified volume
- Test mode: Volumes ≥20 µL as jet dispense, <20 µL as (liquid) surface dispense
- Acceptance criteria: Measured values are within specifications if less than the values appearing in the following tables.
- Balance: Mettler Toledo WSX
- Test temperature: 20 ±2 °C
- Relative humidity: 50 ±5 percent
- Test fluid deionized water with 0.1 percent NaCl, 0.01 percent Tween
- Test liquid temperature to within ±0.5 °C of room temperature

There is no guarantee that the specifications for trueness and precision are met with any liquid or environment other than the ones specified.

Tip Size (µL)	Pipetting Volume (µL)	Accuracy |R| (percent)	Precision CV (percent)
50	1	5.0	5.0
50	5	2.5	2.0
50	50	2.0	1.0
300	30	2.0	1.5
300	300	1.0	1.0
1000	100	2.0	1.0
1000	1000	1.0	1.0

For pipetting of less than 10 µL, Hamilton recommends 50 µL volume disposable tips to achieve the highest pipetting precision.

10.4 Barcode Reader Specifications

Physical Dimensions

Parameter	Specification
Width	6.2 cm (2.4 in)
Depth	18 cm (7.1 in)

Parameter	Specification
Height	6 cm (2.4 in)
Weight	122 g (4.3 oz)

Electrical

Parameter	Specification
Input Voltage	5 ±10 percent VDC at 100 mA
Interface	USB

Environmental

Parameter	Specification
Operating Temperature	0 – 50 °C (32 – 122°F)
Storage Temperature	-40 – 70 °C (-40 – 158°F)
Relative Humidity	5 – 95 percent non-condensing

Scan Performance

Parameter	Specification
Scan Speed	100 scan/s
Scan Type	Bi-directional

10.4.1 Supported Symbologies

The following barcode symbologies can be detected by the system:

- UPC-A
- UPC-E
- Code 128-B
- EAN-13
- EAN-8
- Code 39 (no checksum)
- Interleaved 2 of 5 (no checksum)
- Codabar

10.4.2 Barcode Specifications

Table 10-1: Barcode Specifications

Specification	Description
Length of string	Maximum 32 characters excluding start, stop and check characters, depending on the code length (see label dimensions).

Specification	Description	
Code Density, Tolerance	Minimum module width (x-dimension) including a print tolerance: ≥0.1651 mm (0.0065 in) Maximum module width (x-dimension) including a print tolerance: ≤0.508 mm (0.02 in) Best reading performance with X dimension ≥0.254 mm (0.01 in)	
Check character	Codabar	None
	Code 39	None
	Code 128	One character
Quiet Zone	≥0 times the x-dimension, but at least 3 mm	
Print contrast	Minimum contrast between bars and spaces (PCS): ≥80 percent (at 632.8 nm)	
Print quality	The barcode print must be of a high quality. Offset, typographic, intaglio, and flexographic printing are suitable. Mechanical dot matrix and thermo matrix printing are not suitable. The surface may be treated, sealed, or plastic-coated.	

10.5 HHC Heating and Cooling Specifications

Start Temperature (°C)	End Temperature (°C)	Delta (°C)	Average HHC Ramp Time Inside Prep* (Minutes)
70	25	-45	4.5
25	15	-10	2.3
25	10	-15	4.1
25	0	-25	12.8
25	50	25	1.1
25	60	35	1.5
25	70	45	2.0
Internal Prep Temperature During Testing (°C)			26

* -- Test conditions are at the exposed aluminum heating/cooling plate. Addition of labware, the thermal mass contained in that labware, and the ambient temperature of the lab, increase or decrease these times depending on the application details.

Chapter 11

Appendix

11.1 Type Plate
11.2 Regulatory
11.3 Getting Technical Assistance
11.4 Glossary, Abbreviations

11 Appendix

11.1 Type Plate

The product identification label (type plate) is located on the back of the Prep, in the lower right-hand corner when facing the back of the instrument.



Figure 11-1: Type plate location



Figure 11-2: Type plate

11.2 Regulatory

CE	EC Declaration of Conformity The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives and allows the sale of product in the EU. It is a mandatory conformity marking for certain products sold within the European Economic Area (EEA).
C US	North American Product Certification The CSA C/US mark signifies that the product is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian standards.
	WEEE (Waste of Electrical and Electronic Equipment) This directive represents the recycling, sorting, and handling of the product. The symbol for separated collecting of electrical and electronic equipment shows a crossed-out bin on wheels.

FCC Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The following list of regulatory requirements is maintained for the Prep. The labeling displays the associated marks as listed.

Table 11-1: Regulatory Standards

Entity	Directive/Standard	Description	Safety	EMC	Environmental
UL CSA IEC	61010-1 C22.2 NO. 61010-1-12 61010-1	Safety Requirements for Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	X	-	-
UL CSA IEC	61010-2-010 C22.2 No. 61010-2-010 61010-2-010	Safety Requirements for Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-010: Particular requirements for laboratory equipment for the heating of materials	X	-	-
UL CSA IEC	61010-2-081 C22.2 No. 61010-2-081 61010-2-081	Safety Requirements for Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes	X	-	-
IEC	62471	Photobiological Safety of Lamps	X	-	-
European Union	Directive 2014/35/EU	Low Voltage Directive (LVD)	X	-	-
European Union	Directive 2014/30/EU	EMC Directive (EMCD)	-	X	-
FCC	47 CFR Part 15 Subpart B Class A	Radio Frequency Devices, Unintentional Radiators	-	X	-
Canada	ICES-001 Class A	Industrial, Scientific and Medical (ISM) Equipment	-	X	-
European Union	Directive 2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)	-	-	X
European Union	Directive 2011/65/EU Directive 2015/863/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS2)	-	-	X

Refer to the Declaration of Conformity for specific versions of the standards.

11.2.1 Declaration of Conformity

The Declaration of Conformity is part of the delivery of the Microlab Prep. It verifies that the instrument meets all required directive standards.

11.3 Getting Technical Assistance

For additional assistance with Hamilton instruments, modules, or devices, contact an authorized Hamilton Company distributor or Hamilton Company directly. Regional contact information is provided in 11.3.1 ▸ page 103 and 11.3.2 ▸ page 103.

Provide the following information when requesting technical assistance:

- Model number
- Serial number
- Configuration
- Description of the problem
- Laboratory Contact Information

If possible, provide the following additional information:

- What was happening at the time of the error
- What has been tried so far to solve the problem
- Version of software
- Screenshots of any errors
- Photos that could more readily illustrate the problem
- Trace files, log files
- A copy of the protocol

11.3.1 Support in the Americas and Pacific Rim

Hamilton Company

4970 Energy Way, Reno, Nevada 89502, USA

To receive assistance with the Prep, submit a ticket by completing the relevant information: https://www.hamiltoncompany.com/contact

11.3.2 Support in Europe, Asia, and Africa

Hamilton AG

CH-7402, P.O. Box 26

Bonaduz, Switzerland

Telephone: +41 81 660 60 60

Fax: +41 81 660 60 70

E-Mail: itechsupport@hamilton.ch

11.4 Glossary, Abbreviations

ANSI/SLAS	Micro Plate Standards
BREP	Bonaduz (BZ) Repair facility. Manages the replacement and exchange of parts and assemblies.

CAP	Clean Air Protection
cLLD	Capacitive Liquid Level Detection
CO-RE	Compression-induced O-Ring Expansion
DCG	Dual CO-RE Gripper
DNA	Deoxyribonucleic Acid
ESD	Electrostatic Discharge
EU	European Union
FCC	Federal Communications Commission
GLP	Good Laboratory Practice
HEPA	High-Efficiency Particulate Air
HHC	Hamilton Heater Cooler
HHS	Hamilton Heater Shaker
IEC	International Electrotechnical Commission
LED	Light Emitting Diode
MPH	Multi-Probe Head
NTR	Nestable Tip Rack
PCB	Printed Circuit Board
PCR	Polymerase Chain Reaction
PPE	Personal Protective Equipment
RGA	Return Goods Authorization
RMA	Return Material Authorization
RNA	Ribonucleic Acid
UV	Ultraviolet
ZIF	Zero Insertion Force. A type of connector designed to join delicate, flat cables (e.g., ribbon cables) or fragile computer chips to a circuit board without applying physical pressure.
µL	Microliter
mL	Milliliter
nm	Nanometer
mm	Millimeter
cm	Centimeter
in	Inch
g	Gram
kg	Kilogram
oz	Ounce
lb	Pound
°C	Degrees Celsius
°F	Degrees Fahrenheit



Years of Experience
75+

Locations Worldwide
22+

Employees Internationally
3,000+

To find a representative
in your area, please visit:
www.hamiltoncompany.com/contact

Web: www.hamiltoncompany.com
USA: 800-648-5950
Europe: +40-356-635-055

Hamilton Americas & Pacific Rim
Hamilton Company Inc.
4970 Energy Way
Reno, Nevada 89502 USA
Tel: +1-775-858-3000
Fax: +1-775-856-7259

Hamilton Europe, Asia & Africa
Hamilton AG
Via Crusch 8
CH-7402 Bonaduz
Switzerland
Tel: +40-356-635-055

Throughout this document, protected product names may be used without being specifically marked as such.
All rights reserved. All other trademarks are the sole property of their respective owners.
©2026 Hamilton Company. All rights reserved. All trademarks are owned and/or registered by Hamilton Company in the U.S. and/or other countries.