

Rainin Vero

Confidence in Every Pipetting Step



METTLER TOLEDO

Table of Contents

1. Safety and Regulatory Information	5
1.1 Important Safety Information	5
1.2 Intended Use	7
1.3 Compatible and Incompatible Liquids	8
2. Introducing Vero	9
2.1 Display	11
2.2 Navigation	11
2.3 Joystick Controls	12
2.4 Soft Key Functions	13
2.5 Ergonomic Triggers	14
2.6 Box Contents	15
3. Getting Started	16
3.1 Charging Vero	17
3.2 Setup	19
3.3 Basic Operation – Using Basic Mode	21
3.4 Setting the Volume	22
3.5 Setting Aspiration/Dispense Rate	23
3.6 Aspiration	25
3.7 Dispensing	26
3.8 Tip Ejection	27
3.9 Sleep Timeout	27
3.10 Power Shutdown	28
4. Modes	29
4.1 Basic Mode	30
4.2 Advanced Mode	31
4.3 Multi-Dispense Mode	32
4.4 Manual Mode	33
4.5 Reverse Mode	35

Table of Contents

5. Options and Settings	36
5.1 Single Volume Settings	38
5.2 Fixed Volume	40
5.3 Volume Sequencing	45
5.4 Cycle Counter	46
5.5 Mix	47
5.6 Presets	48
6. Sound and Display Settings	49
6.1 Sound Volume	49
6.2 Display Setting	49
6.3 Time and Date Settings	51
6.4 Language	52
6.5 Factory Default Settings Reset	52
6.6 Sound Alerts	53
6.7 GLP Alarms	54
7. Presets and Preset Lists	55
7.1 Preset Lists	56
7.2 Creating and Managing Preset Lists	57
7.3 Creating and Saving a Preset	58
7.4 Naming Presets	59
7.5 Loading and Managing a Preset	60
7.6 Editing an Existing Preset	61
7.7 Locking the Pipette	62
8. Specifications	63
9. Connectivity	64
9.1 Update Firmware via USB	64
9.2 Radio Frequency Device (NFC)	65

Table of Contents

10. Accessories	66
11. Ordering Information	67
12. Care and Maintenance	68
12.1 Care Tips	68
12.2 Cleaning	69
12.3 Autoclaving	72
13. Service and Calibration	73
13.1 Replacement Parts	73
13.2 Replacing the Battery	74
14. Troubleshooting	75
15.1 Acids and Corrosives	76
15.2 Warning Messages	76
15.3 Lookup Codes	76
15. Warranty Information	77
16. Disposal	78
16.1 RoHS Regulation # 2011/65/EU	78
16.2 China RoHS Substance Disclosure	78

1. Safety and Regulatory Information

The following safety information is critically important for the safe handling and use of the Rainin Vero. Please read these operating instructions carefully before unpacking, charging or operating Vero. Keep these instructions for future reference.

1.1 Important Safety Information

1. Read all safety notices before using, charging, or servicing Vero. Use Vero only in accordance with these instructions.
2. Vero should only be used in laboratory or production environments by trained personnel. Use only Rainin-approved tips and accessories.
3. Do not use Vero for in vivo applications (in or on the human body). Avoid exposing the electronics to liquids.
4. Vero is not waterproof and neither the entire pipette nor its battery is autoclavable.
5. Vero should only be charged using the supplied USB-C wall power supply or optional Vero charging stand (sold separately). Using non-approved chargers can damage electronics and will void the warranty.



Safety Notice: Using this product in a manner other than as described in this manual may impair its safety protections.

1.1.1 EC Declaration of Conformity

Manufacturer's Name: Mettler-Toledo Rainin, LLC.

Manufacturer's Address: 7500 Edgewater Drive, Oakland, CA, 94621 USA

Declares that the following product:

- Product Name: Rainin Vero Electronic Pipette

Conforms to the following EC directives (incl. all applicable amendments):

- 2014/35/EU Low Voltage (LVD)
- 2014/30/EU Electromagnetic Compatibility (EMC)
- 2023/1542 EU Battery Regulation
- 2011/65/EU Reduction of Hazardous Substances (RoHS)

Supplementary Information:

- Safety: EN 61010-1:2010/A1:2019
- EN 62133-2 2017+a1 2021

2023/2854 EU Data Act:

All data that is designed to be retrievable can be downloaded or requested from Rainin Technical Support.

Emissions Testing: EN 61326-1:2021

Testing performed to: Class A Limits (commercial/industrial environment)

Immunity Testing:

- EN 61326-1:2021
- EN 61000-4-2 Electrostatic Discharge
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 Electrical Fast Transients
- EN 61000-4-5 Surge: Power Ports
- EN 61000-4-6 Conducted Immunity
- EN 61000-4-11 Voltage Dips and Interrupt

1.2 Intended Use

Vero is an electronic air-displacement pipette intended for precise pipetting of aqueous and aqueous-based solutions in laboratory settings. It is designed for research, quality control, and production applications.

For liquid compatibility beyond standard biological buffers and aqueous solutions, consult Rainin Technical Support.

Depending on the model, Vero works with either Rainin LTS™ LiteTouch System™ or universal-fit tips to dispense liquids across a volume range of 0.5 µL – 20 mL.

1.2.1 Operating Conditions

Vero is designed to deliver exceptional performance across a wide range of environmental conditions. While the systematic and random error specifications are typically achieved under the controlled conditions outlined in ISO 8655-6:2022, Vero is robust and can be used in a wide range of laboratory settings.

- Altitude: 0 – 2,000 meters
- Operating ambient temperature range: 5°C – 46°C
- Relative humidity: 10 – 80% RH (non-condensing)
- Electrical input rating: 5.0 V, 3.0 A

For optimal performance Rainin recommends an operating environment of 15°C to 30°C and relative humidity between 45% to 80%. Note, however, that in most laboratory settings, exceeding these parameters somewhat will not significantly impact performance.

1.2.2 Battery

Vero must be charged before use. A full charge requires one hour. The time a full charge lasts depends on the liquid volumes and viscosities pipetted. The battery is designed to deliver approximately 2,800 cycles on a single charge. See Section 3.1 for charging options.

Recharge only with the Limited Power Source (LPS-type) Wall Power Supply shipped with Vero (part number 31051598) or the optional Vero charging stand (part number 31103649). Severe damage to internal electronics will result from improper charging and the use of a non-LPS power supply can be hazardous.

The Vero battery (part number 31132056) is a user-serviceable part and should be replaced every two years. For more information, contact a qualified METTLER TOLEDO or Rainin service professional, or your Rainin sales representative.

1.3 Compatible and Incompatible Liquids

Vero is compatible with aqueous solutions, biological buffers, diluents, and cell culture media.

Vero should not be used with strong acids or bases above 1 M, organic solvents (e.g., acetone, acetonitrile) at high concentrations or solutions containing abrasive particulates. If you plan to pipette non-aqueous or corrosive liquids, contact Rainin Technical Support for guidance.

2. Introducing Vero

This manual describes the Rainin Vero electronic air-displacement pipette and explains how to set up, operate, and maintain it to achieve accurate, repeatable results.

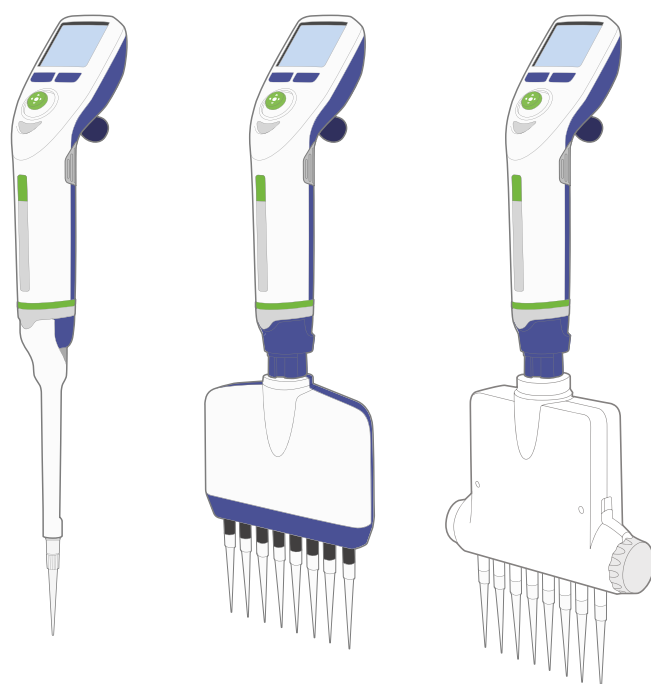
Vero comes loaded with features and conveniences that include:

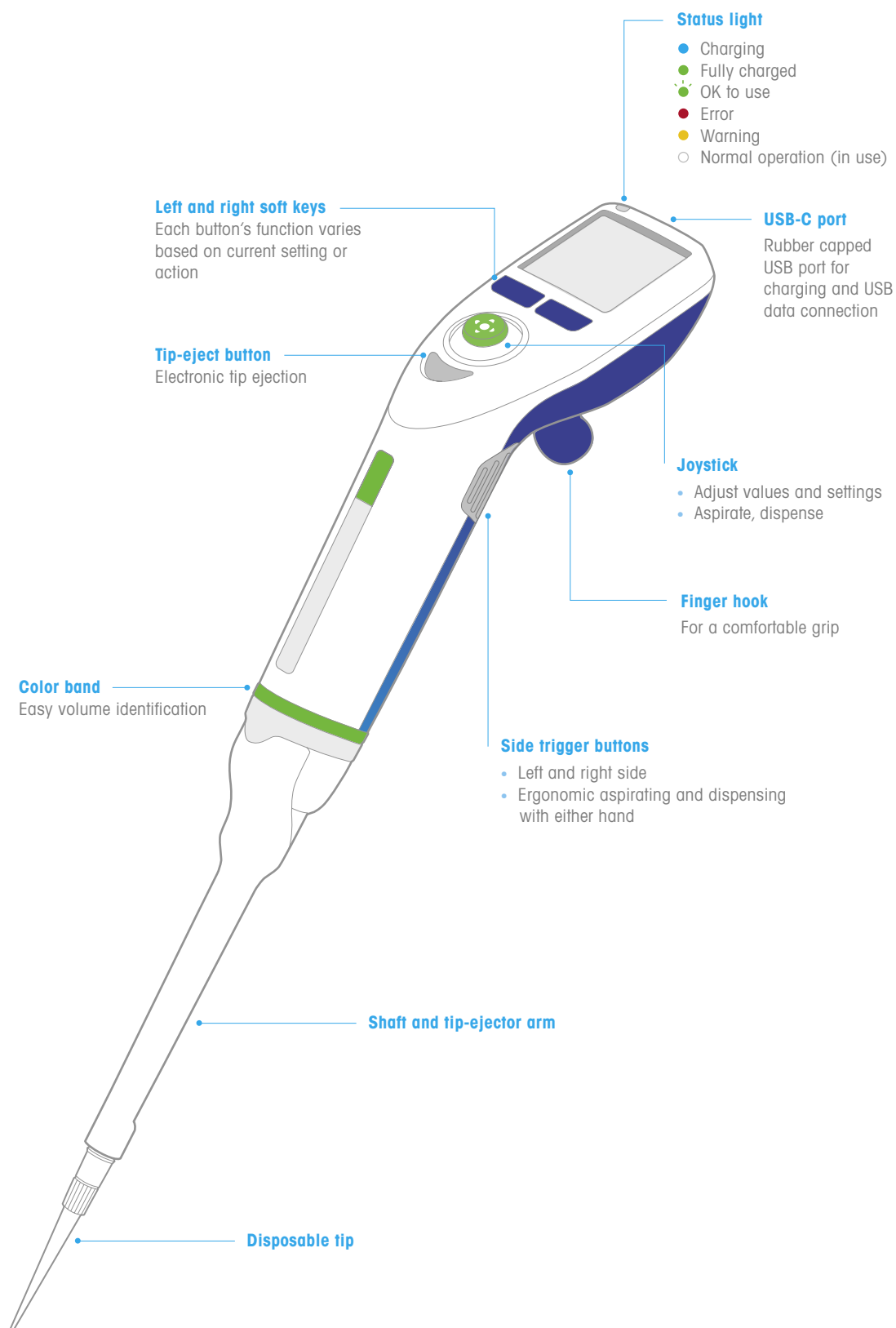
- Lightweight and compact for all day comfort
- Enhanced systematic and random error specifications
- Ergonomic trigger buttons located on the grip for easy and quick aspiration and dispensing
- Electronic tip ejection to avoid thumb strain
- A graphical user interface that employs a highly-intuitive tile layout
- Exceptionally fast volume setting to speed up your workflows

Vero is available in single channel, eight- and 12-channel multichannel, and six- and eight-channel Adjustable Spacer models. All user settings and service settings are stored on nonvolatile memory and are protected even if the pipette is reset or in the unlikely case of battery failure.

Vero pipettes contain a radio-frequency identification (NFC) tag.

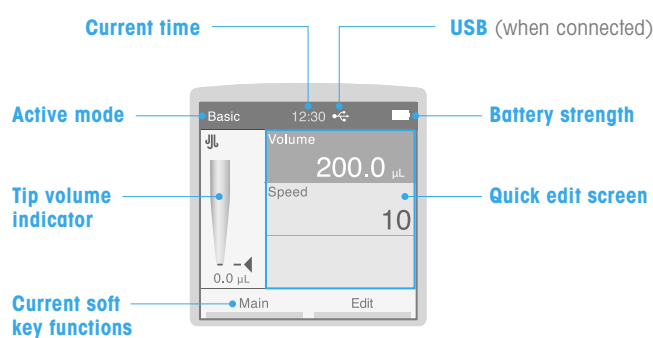
Read this manual in its entirety before using the pipette. It contains critical component, user interface and pipette controls that will help you obtain accurate, reproducible results and ensure long-lasting operation.





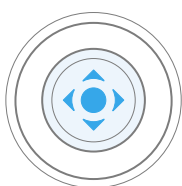
2.1 Display

Vero's user interface is a high-contrast electronic color display. Screen navigation, pipette operation, settings and option selections are performed using the soft keys, trigger buttons, tip eject button, and joystick.



2.2 Navigation

Navigate using the soft keys and joystick control. This manual uses left, right, up, and down arrows, and a circle icon to indicate their respective joystick actions.

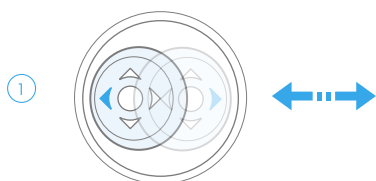


When you see this icon...	...do this on Vero
>	Joystick right
<	Joystick left
^	Joystick up
v	Joystick down
○	Center press on the joystick

2.3 Joystick Controls

Navigation and volume setting is done via the joystick.

Practice display navigation to familiarize yourself with the joystick's ease of use and control sensitivity.



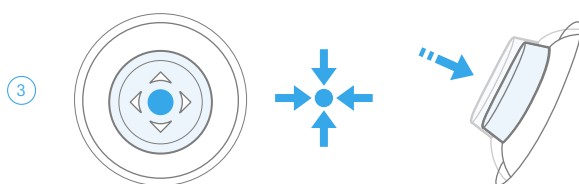
Joystick left or right

- Navigate between settings and screens
- Make coarse setting value adjustments



Joystick up or down

- Aspirate and dispense
- Navigate between settings and options
- Make fine setting value adjustments



Center press the joystick button

- Aspirate and dispense
- Access menu items
- Edit settings or options
- Select and save an option, preset, or protocol

2.4 Soft Key Functions

The function of each soft key located below the display is contextual and changes based on the mode or setting screen. Functions are shown in the display above each soft key. Occasionally, there is a function shown for the left soft key but not for the right key.



Left soft key options actions

- **Main:** Display the Main Menu
- **Prev:** Return to the previously used mode; allows toggling between modes
- **Done:** Exit the screen after viewing or editing is complete
- **Purge:** Empty tip and reset operation
- **Back:** Return to the previous screen



Right soft key actions

- **Cancel:** Exit the current action without saving changes
- **Exit:** Return to the previous screen
- **Presets:** Load a preset
- **Select:** Select a preset or protocol
- **Edit:** Edit a preset or protocol
- **Load:** Load a preset or protocol
- **Save:** Launches on-screen keyboard. This option allows you to save the current settings as a preset with a custom name.

2.5 Ergonomic Triggers

Vero's ergonomic, side-mounted trigger buttons for aspiration and dispense reduce hand fatigue. They enable users to control aspiration and dispense with their right or left forefinger as an alternative to pressing the joystick with their thumb.

Enable or disable the left and/or right triggers

- ①



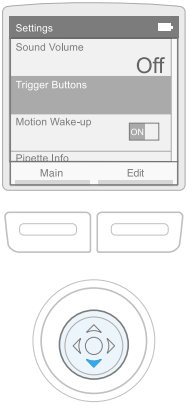
Navigate to the main menu.
- ②



Navigate to **Settings**.
- ③



Press  to select **Settings**.
- ④



Navigate to **Trigger Buttons**.
- ⑤



Press  or  to select **Trigger Buttons**.
- ⑥

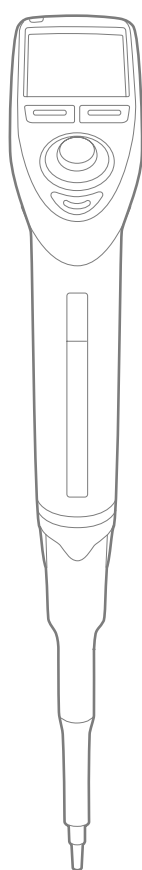


Press  or  to toggle the left or right trigger button.

2.6 Box Contents

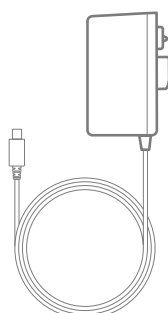
- Electronic pipette model as ordered
- Vero Quick Reference Guide
- Universal wall power supply with USB-C charging cable
- Certificate of Conformance

If any item is missing, contact your Rainin product distributor.
For contact information, visit www.mt.com/contact.



Vero

Plugs



Wall Power Supply



Quick Reference Guide



Certificate of Conformance

3. Getting Started

Optimal pipetting results and reliable data are the result of quality instruments and consumables in the hands of users who are trained in good pipetting technique and practices.

Vero Usage Do's and Don'ts

Do	Do Not
Only use Rainin tips	Leave liquid in the tip
Store Vero upright. Hang on stand, rail, or Rainin Hang-Up™	Autoclave the entire pipette (see section 12.3)
Pre-wet tip prior to aspirating	Re-use tips
Use a consistent immersion depth	Use corrosive chemicals to clean
Pipette vertically or within 20 degrees of vertical	Use non-Rainin approved replacement parts (doing so voids the warranty and performance specifications)
Use a filter when pipetting large volumes.	Invert or lay the pipette flat with liquid in the tip

For more information about good pipetting techniques, pipetting training and to order free pipetting technique lab posters, visit the Good Pipetting Practices page on the METTLER TOLEDO web site.

► www.mt.com/GPP

3.1 Charging Vero

Charge the pipette for at least 15 minutes before using it for the first time. Use the wall power supply included with the pipette, the optional charge stand, or a computer with a cable that has a USB-C connector.

The battery charge indicator in the top right corner of the display increases as the unit charges. After 15 minutes, the pipette will have enough charge for at least a few hours of pipetting. A full charge is achieved after approximately 60 minutes.

When charging is complete the battery charge indicator is solid green, indicating a fully charged battery. As the battery depletes with use, the indicator will decrease accordingly.

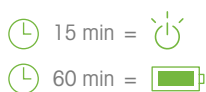
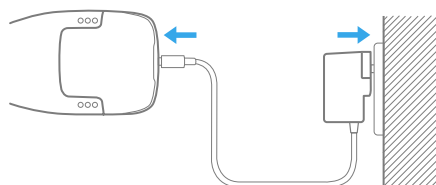
Note: Only use Rainin-approved power supplies. Non-approved chargers can damage the electronics and void the warranty.

3.1.1 Charging Vero Via Wall Power Supply

To charge Vero with the universal wall power supply:

1. Connect the wall power supply to a power outlet using one of the adapters supplied.
2. Connect the other end of the cord to the USB-C port located on the top of the pipette.

Note: The pipette is operable while connected to the wall power supply cord.



3.1.2 Charging Vero Via Computer

You will need a USB cable with at least one USB-C connector to charge Vero with a computer.

1. Connect the cable's USB connector to a computer USB port.
2. Connect the other end of the cable to the USB-C outlet located on the top of the pipette.

Note:

- The status light turns blue while charging, then green when fully charged.
- Charging Vero with a computer takes approximately two to three times longer than with the wall power supply or charging stand.
- Rainin does not recommend operating Vero while it is connected to a computer for charging.

3.1.3 Charging Vero Via Optional Charging Stand

If you have the Vero charging stand (sold separately):

1. Place the pipette upright onto the stand so the two gold contacts on the back mate with the two pins on the stand.
2. Ensure the pipette is fully seated—an status light will turn blue to confirm that it charging.
3. Allow approximately one hour for a full charge.

Tips:

- The stand keeps your workbench clear and can hold and charge up to three Vero pipettes simultaneously.
- Rainin recommends storing Vero on the charging stand when not in use. The stand provides a safe storage place and assures the pipette will always be fully charged.

3.2 Setup

Vero makes it easy to create, save, and switch between protocols, streamlining repetitive tasks and reducing the risk of mistakes. The carefully designed interface eliminates accidental setting changes or pipetting actions.

3.2.1 Powering the Pipette On

Press and hold the left soft key to turn the pipette on. The start-up screen will briefly appear during initialization, after which the main menu is displayed.

3.2.2 Tip Selection and Mounting

Rainin pipettes and tips are designed to work together as a pipetting system. Vero pipettes are calibrated with Rainin tips and performance to published specifications is only guaranteed when Rainin tips are used.

To mount a tip, using light force, press Vero's shaft into the end of the tip. Rainin LTS tips are designed to seal properly on the shaft with minimal force. With universal-fit tips, avoid using more force than is required.

Tip Immersion Depth

The recommended depth for tip insertion into your sample is shown in the table below.

Nominal Volume	Volume Range	Immersion Depth
10 µL	0.5–10 µL	1–2 mm
20 µL	2–20 µL	2–3 mm
50 µL	5–50 µL	2–3 mm
100 µL	10–100 µL	2–3 mm
200 µL	20–200 µL	3–6 mm
300 µL	20–300 µL	3–6 mm
1000 µL	100–1000 µL	3–6 mm
1200 µL	100–1200 µL	3–6 mm
2000 µL	200–2000 µL	3–6 mm
5000 µL	500–5000 µL	6–10 mm
10 mL	1–10 mL	6–10 mm
20 mL	2–20 mL	6–10 mm

Tip immersion depth is critical. When recommended depths are exceeded, the volume measured may be inaccurate and possibly out of specification. The tip angle is also important. Ensure that the pipette is always used in a position within 20 degrees of vertical.

3.3 Basic Operation – Using Basic Mode

Rainin recommends learning basic pipetting operations – including selecting and editing settings – in Basic Mode prior to using advanced operational modes. Users should also practice aspirating and dispensing with water before working with valuable samples.



In the main menu, use the joystick to highlight **Basic**.

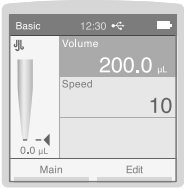
Push  to enter **Basic mode**.

Soft key functions in Basic mode:

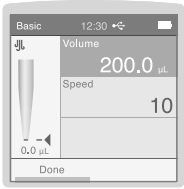
- **Purge** empties the tip and resets the pipette operation to aspirate.
- **Main** displays the main menu.
- **Edit** displays the Edit screen where you can change parameters such as volume, aspiration/dispense speed, and set the pipette to its maximum volume.
- **Done** confirms the new settings and returns to the pipetting screen.
- **Cancel** exits the current action without saving any changes.
- **Save** launches a keyboard on the screen. This option allows you to save the current settings as a preset with a custom name.

3.4 Setting the Volume

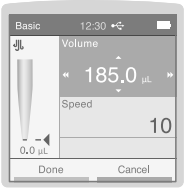
- ①



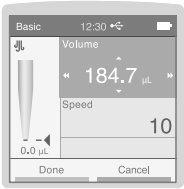

In Basic mode, press **>** or select **Edit** to edit the volume. Volume is highlighted on the display.
- ②



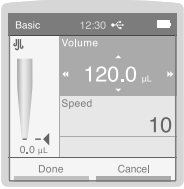

Press **>** again or **○** to edit the volume.
- ③



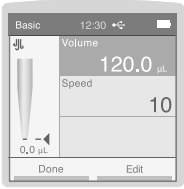

Use **<** or **>** for coarse volume adjustment.
- ④




Use **^** or **v** for fine volume adjustment.
- ⑤




Push and hold the joystick in any direction to quickly scroll through values.
- ⑥




Select **Done** or **○** to save the volume setting or select **Cancel** to exit without saving changes and return to the previous screen.

3.5 Setting Aspiration/Dispense Rate

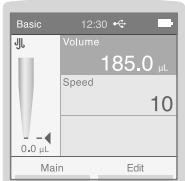
When setting the aspiration and dispense speed, in Basic and Manual modes the rate is the same for both aspiration and dispense. In all other modes users can set different rates for aspiration, dispense and, when turned on, mixing.

By default, rates are adjusted using a relative scale from 1 (slow) to 10 (fast). Alternatively, users can choose to work in absolute units by enabling Flow Rate in the Admin Settings menu. When Flow Rate is enabled, the Speed field allows users to enter values in microliters per second ($\mu\text{L/s}$) rather than the 1–10 relative scale.

Higher speed settings are best for aqueous samples and lower speed settings are best for viscous, foaming, delicate or shear-sensitive samples. The maximum speed settings for large-volume Vero models in Basic mode are limited to prevent “fountaining” (air intake) during aspiration.

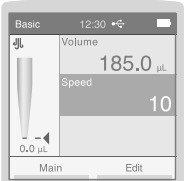
Adjust the volume

①



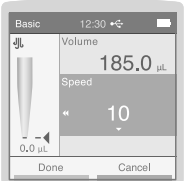

After selecting the mode, press **Edit** or **>**, then **<** or **>** to highlight the desired field (shown here in Basic mode).

②



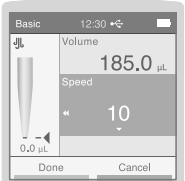

Press **✓** to highlight **Speed**.
Note: In Basic mode, the speed/rate of flow are the same for both aspirate and dispense.

③

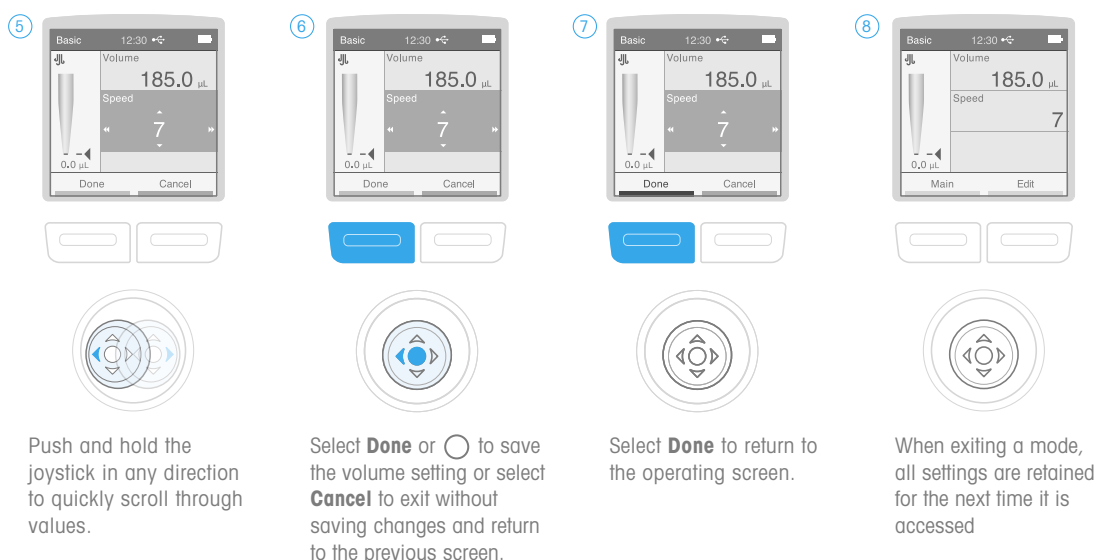



Use **<** or **>** for coarse volume adjustment.

④




Use **▲** or **▼** for fine volume adjustment.



Relative Speeds 1-10 as Flow Rate (µL/Second)

Vero Model	1	2	3	4	5	6	7	8	9	10
LTS V-10	2.4	2.9	3.5	4.2	5.3	7.0	9.2	11.9	15.5	20.0
LTS V-20	4.9	5.8	6.9	8.4	10.7	14.1	18.4	23.9	31.0	40.0
LTS V-100	24.5	29.0	34.5	42.2	53.3	70.3	92.0	119.3	155.0	200.0
LTS V-200	49.0	58.0	69.0	84.5	106.5	140.5	184.0	238.5	310.0	400.0
LTS V-300	73.5	87.0	103.5	126.7	159.8	210.8	276.0	357.8	465.0	600.0
LTS V-1000	245.0	290.0	345.0	422.5	532.5	702.5	920.0	1192.5	1550.0	2000.0
LTS V-2000	490.0	580.0	690.0	845.0	1065.0	1405.0	1840.0	2385.0	3100.0	4000.0
LTS V-5ML	675.0	850.0	1025.0	1224.9	1449.9	1725.1	2112.5	2662.6	3512.5	4600.0
LTS V-10ML	1350.0	1700.0	2050.0	2449.9	2899.9	3450.1	4224.9	5325.1	7025.1	9200.0
LTS V-20ML	1250.0	1950.0	2699.9	3400.0	1.0	4899.7	5799.7	6900.2	8449.8	10650.2
UNV SV-10	2.4	2.9	3.5	4.2	5.3	7.0	9.2	11.9	15.5	20.0
UNV SV-20	4.9	5.8	6.9	8.4	10.7	14.1	18.4	23.9	31.0	40.0
UNV SV-100	24.5	29.0	34.5	42.2	53.3	70.3	92.0	119.3	155.0	200.0
UNV SV-200	49.0	58.0	69.0	84.5	106.5	140.5	184.0	238.5	310.0	400.0
UNV SV-300	73.5	87.0	103.5	126.7	159.8	210.8	276.0	357.8	465.0	600.0
UNV SV-1000	245.0	290.0	345.0	422.5	532.5	702.5	920.0	1192.5	1550.0	2000.0
UNV SV-2000	490.0	580.0	690.0	845.0	1065.0	1405.0	1840.0	2385.0	3100.0	4000.0
UNV SV-5ML	675.0	850.0	1025.0	1224.9	1449.9	1725.1	2112.5	2662.6	3512.5	4600.0
UNV SV-10ML	1350.0	1700.0	2050.0	2449.9	2899.9	3450.1	4224.9	5325.1	7025.1	9200.0
Multi LTS V8-10	2.4	2.9	3.5	4.2	5.3	7.0	9.2	11.9	15.5	20.0
Multi LTS V8-20	4.9	5.8	6.9	8.4	10.7	14.1	18.4	23.9	31.0	40.0
Multi LTS V8-50	12.2	14.5	17.3	21.1	26.6	35.1	46.0	23.9	77.5	100.0
Multi LTS V8-200	49.0	58.0	69.0	84.5	106.5	140.5	184.0	59.6	310.0	400.0
Multi LTS V8-300	73.5	87.0	103.5	126.7	159.8	210.8	276.0	357.8	465.0	600.0
Multi LTS V8-1200	162.0	204.0	246.0	294.0	348.0	414.0	507.0	639.0	843.0	
Multi LTS V12-10	2.4	2.9	3.5	4.2	5.3	7.0	9.2	11.9	15.5	20.0
Multi LTS V12-20	4.9	5.8	6.9	8.4	10.7	14.1	18.4	23.9	31.0	40.0

3.6 Aspiration

With the exception of Manual mode, aspiration and dispense is automatic and the user does not need to maintain pressure on a the joystick or trigger for the operation to complete. For controlling aspiration and dispense in Manual mode, see [Section 4.4.1](#).



1. Attach a new Rainin tip by pressing the shaft into the tip with just enough force to make a secure seal.
2. Hold the pipette vertically or no more than 20 degrees of vertical.
3. Place the tip into the sample at the recommended immersion depth (see "Tip Immersion Depth" in [Section 3.2.2](#)).
4. Press $\bigcirc$, ∇ , or the left or right trigger button to aspirate the sample.

Note: Vero automatically aspirates, so it is not necessary to hold the joystick in place. The tip volume indicator on the left side of the display illustrates the progress of the aspiration and the current settings are shown in the quick edit screen.

5. Pause for approximately one second to ensure that the full volume of sample is drawn into the tip.
6. Withdraw the tip from the sample.
7. If any liquid remains on the outside of the tip, touch it off to the side of the source reservoir carefully, taking care not to touch the tip orifice.

3.7 Dispensing



1. Press $\bigcirc$, ∇ , or the left or right trigger button to dispense the sample.

Note: It is not necessary to hold the joystick in place; Vero automatically dispenses. The tip volume indicator on the left side of the display illustrates the progress of the dispense and volume reading adjusts accordingly.

2. For volumes 2–300 μL , pause for one second to ensure that the full volume of the sample is dispensed. For volumes of 1000 μL or greater, wait one to two seconds.
3. Withdraw the tip, slowly sliding it along the vessel wall.
4. If needed, press $\bigcirc$, ∇ , for tip blowout. When pipetting viscous solutions, pause prior to blowout.

Note: Although Vero automatically performs blowout, you can also repeat blowout manually.

5. If desired, you can also delay the piston return time by holding down the joystick during dispense.
6. After dispensing, touch the tip against the side wall of the receiving vessel. See Rainin Good Pipetting Practices for more information.

3.8 Tip Ejection

1. Lightly press the electronic tip ejector button below the joystick to discard the tip.

Note: The motorized tip eject system cleanly ejects tips with minimal thumb force.

2. Use a new tip for each sample to prevent residual carry-over.

3.9 Sleep Timeout

Vero is equipped with sleep and display timeout features to conserve battery life. Either feature can be adjusted from the Settings menu.

Sleep Timeout

- This feature turns the display off and puts the unit into a low-power state after a user-specified period of inactivity. Sleep timeout reduces power consumption by 98%. Vero automatically sleeps after a set period or when setting the pipette down.
- Pressing either soft key awakens Vero from a sleep timeout. The pipette initializes momentarily before returning the display to the last screen accessed.

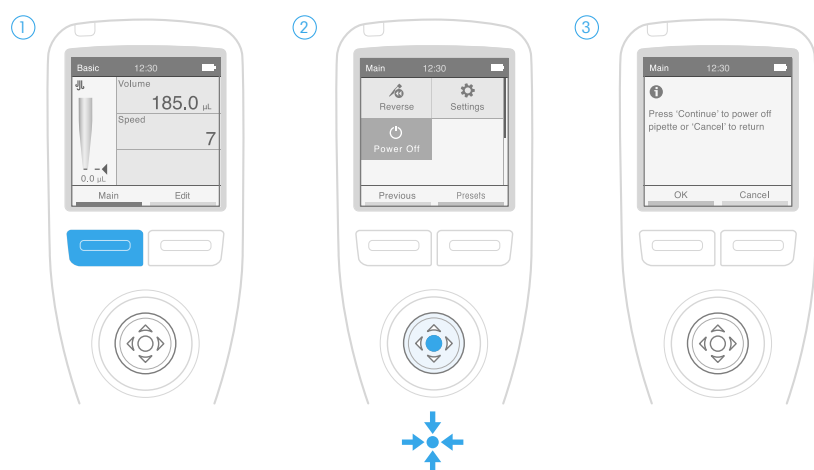
Display Timeout

- Display timeout dims the display after a user-specified period of inactivity. To wake Vero from a display timeout, press any button or soft key, or move the joystick in any direction.

Note: Pressing the soft key or joystick to exit a display timeout returns Vero to ready mode without initiating the associated soft key function or joystick command.

3.10 Power Shutdown

Vero automatically shuts down after 18 hours of non-use. To shut Vero down manually:



Return to the main menu.

Joystick to **Power Off** and press .

Select **OK** to power off or **Cancel** to return to the main menu.

4. Modes

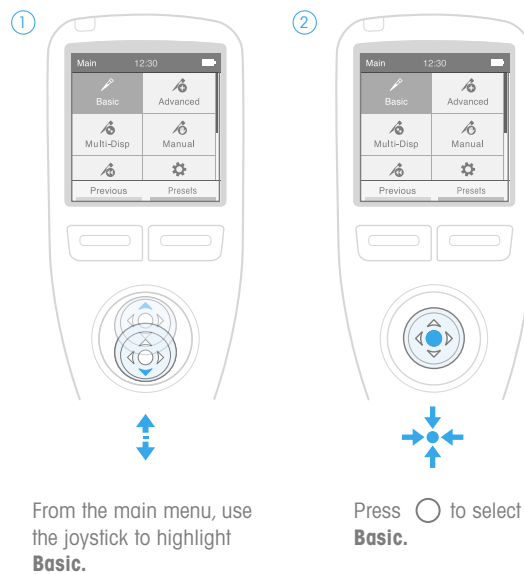
The following operational modes offer a wide range of pipetting capabilities:

 Basic	Basic pipetting operation. Selection of a single volume and one aspirate/dispense speed.
 Advanced	Access Vero's advanced pipetting options, such as Mix and separate speeds for aspiration and dispense.
 Multi-Disp	Multi-aliquot dispensing with user-defined automatic dispense intervals.
 Manual	Simulates manual pipette operation by enabling the joystick to emulate plunger action.
 Reverse	Aspirate both the selected volume and pipette blowout volume. Reverse mode is recommended when working with dense or volatile liquids.

4.1 Basic Mode

Basic mode meets basic laboratory pipetting needs by allowing users to aspirate and dispense a single volume at the same speed.

Access Basic mode

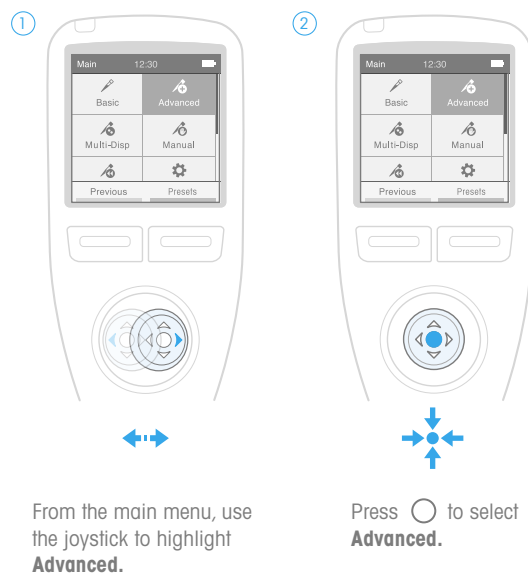


- **Settings:** Single volume, single speed
- **Blowout:** Manually repeatable

4.2 Advanced Mode

Select Advanced mode to access Vero's advanced pipetting options.

Access Advanced mode

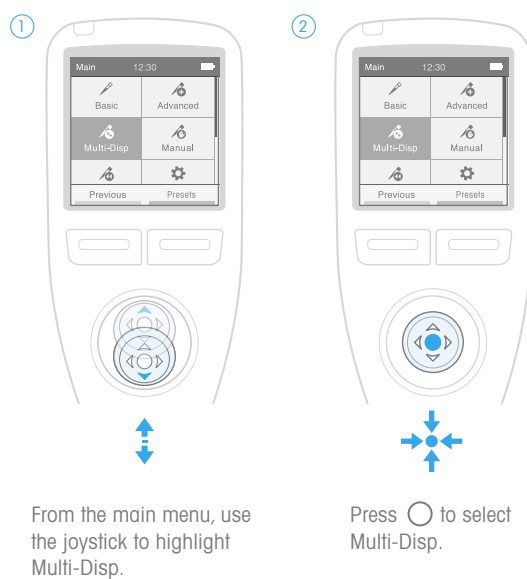


- **Settings:** Single and fixed volume, volume sequencing, speed setting, mix, cycle count, and presets.
- **Blowout:** Automatic and manual.

4.3 Multi-Dispense Mode

Multi-Dispense mode enables multi-aliquot dispensing with user-defined automatic dispense intervals.

Access Multi-Dispense mode



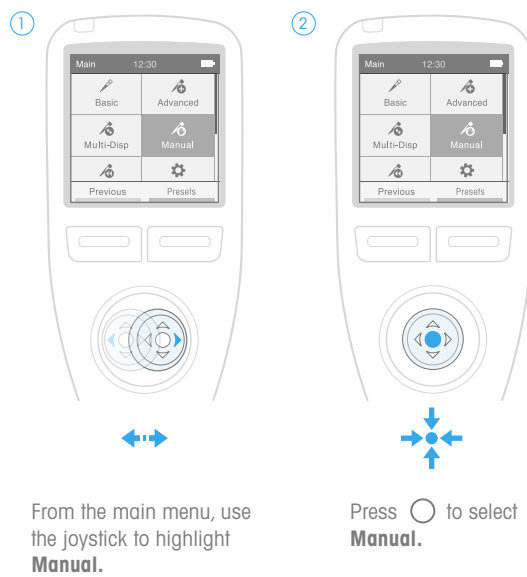
Note: In Multi-Dispense and Reverse modes, to ensure accurate accurate delivery of all samples, Vero aspirates an extra volume of liquid (residual liquid) that remains in the tip after all aliquots have been dispensed.

- **Settings:** Single and fixed volume (with number of aliquots and aliquot volume), volume sequencing, multi speed, and presets.
- **Blowout:** Joystick blowout optional (can be turned off).

4.4 Manual Mode

Manual mode simulates manual pipette operation by enabling the joystick to emulate a physical plunger, allowing users to finely control the rate of aspiration and dispense of measured volumes.

Access Manual mode



- **Settings:** Single and fixed volume, single speed
- **Blowout:** Manual

4.4.1 Aspirating/Dispensing in Manual Mode

In Manual mode the joystick emulates the plunger action of a manual pipette, so aspirating and dispensing works differently than in all other modes.

- Press **and hold** $\wedge$ to aspirate.
- Press **and hold** $\vee$ to dispense.

It is not necessary to aspirate the entire volume shown in the quick edit screen (however, aspiration will stop when the set volume is reached). Once the desired amount of liquid has been aspirated, the user can switch to dispensing.

The amount of sample aspirated or dispensed is controlled directly through the joystick:

- As the joystick is moved towards its maximum position, the volume will aspirate/dispense at a faster rate. To aspirate/dispense smaller volumes at slower rates, move the joystick slowly until the desired rate is achieved.
- The operation will pause when the joystick is released. When pressure is reapplied, operation will continue from the same point.
- **Step Up** and **Step Down** aspirates/dispenses the pipette's minimum allowable increment each time the soft key is pressed. Pressing the **Step Up/Step Down** button continuously repeats incremental aspiration/dispense until it is released.

When dispense is complete, press $\vee$ for manual blowout (if needed).

4.4.2 Measuring an Unknown Volume

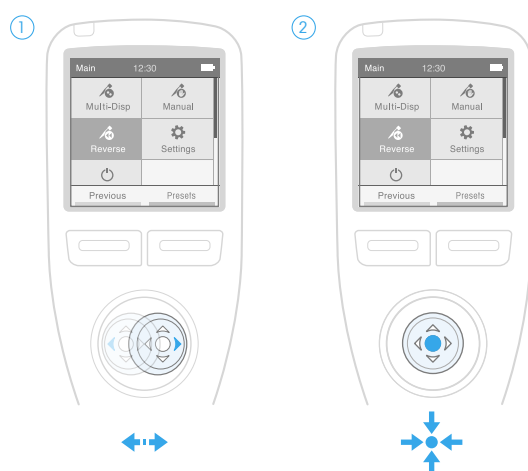
Press and hold $\wedge$ to aspirate the unknown volume of sample into the tip. If necessary, release the joystick and use the **Step Up** soft key to aspirate the desired volume.

The volume of sample in the tip is displayed in the lower left of the operating screen and represents the measured volume.

4.5 Reverse Mode

Reverse pipetting is an established technique that enables users to aspirate the selected volume along with the pipette blowout volume and is recommended for dense or volatile liquids.

Access Reverse mode



From the main menu, use the joystick to highlight **Reverse**.

Press  to select **Reverse**.

- **Settings:** Single and fixed volume, volume sequencing, multi-speed, and mode presets.
- **Blowout:** Manual

Note: In Reverse Mode, when Blowout is ON, pressing  or  to manually blowout is required before the next aspiration. When Blowout is OFF, a manual blowout is not required between aspirations.

5. Options and Settings

Vero's most common options and settings for each mode are shown in the table below. A detailed description of these and other mode-specific options follows.

Mode	Options								
	Fixed Volume	Volume Sequence	Single Speed	Multi-Speed	Mix	Blowout Control	Cycle Counter	Auto-Pace	Presets
Basic			✓						✓
Advanced	✓	✓		✓	✓	✓	✓		✓
Multi-Dispense	✓	✓		✓		✓		✓	✓
Manual	✓		✓*				✓		✓
Reverse	✓	✓		✓		✓	✓		✓

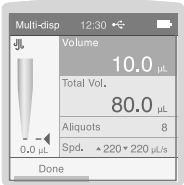
* Speed in Manual mode is variable.

Selecting settings

The pipette settings available in each operational mode are displayed in boxes along the right side of the operating screen. Volume and speed settings are common to all operating modes. Cycle count, mix settings, and mode Presets are displayed if the corresponding option is available and has been turned on.

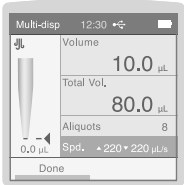
In general, settings can be selected and changed as follows:

①



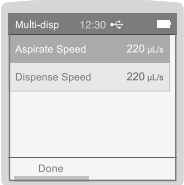

Press **>** to access the quick edit window or **Edit** to access the settings screen.

②




Press **^** or **v** to navigate between and highlight a setting.

③




Press **○** or **>** to edit.

④



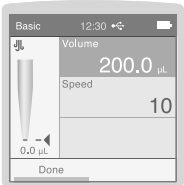

Press **<** or **>** for coarse value adjustment and **^** or **v** for fine. Hold the joystick in place to quickly scroll through values.

Note: Some option-specific settings may require additional steps. When a user exits an operational mode, all settings are retained when the mode is accessed again. Some settings are only accessible through the Settings screen rather than the quick edit window.

5.1 Single Volume Settings

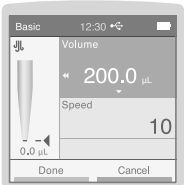
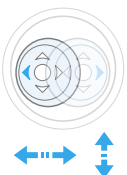
Single volume is the default volume setting for all operational modes, and the only volume setting available in Basic and Manual mode. When this setting is active, the volume is displayed in the quick edit screen is the same for aspirate and dispense.

①



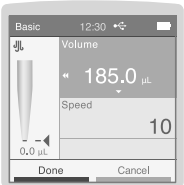

Press  or  to edit.

②

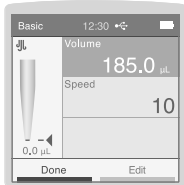
Press  or  for coarse adjustment and  or  for fine.

③




Press **Done** or  to save. Press **Cancel** to exit without saving changes.

④




Press **Done** to exit Settings screen and return to operating screen.

5.1.1 Single Volume Settings in Multi-Dispense

In Multi-Dispense mode, users can set Vero to dispense multiple aliquots of the same volume from a single aspiration.

Highlight Aliquots in the quick edit screen to set the number of aliquots and Volume to set the volume of each aliquot.

To adjust the values of either box press:

-  to edit
-  or  for coarse adjustment
-  or  for fine adjustment

Then:

- **Done** or  to save the setting
- **Cancel** to exit without saving the changes

Note that the aspiration volume automatically changes based on the number and volume of aliquots set. Vero will not allow the number of aliquots at a set volume exceed the maximum volume of the pipette (e.g., if the volume per aliquot is set to 20 μL on a 100 μL pipette, Vero will limit the number of aliquots to 5).

If your desired value cannot be selected, change the volume of each aliquot (Volume) to a lower value. The Total Volume setting will automatically adjust based on the new volume per aliquot setting.

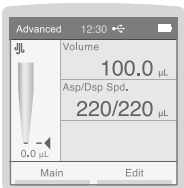
5.2 Fixed Volume

Fixing Vero's volume can be useful for routine work in labs where standard volumes are in frequent use. The Fixed Volume option is available in Advanced, Multi-Dispense, Manual, and Reverse modes.

With the Fixed Volume option on, users can select from up to 14 pre-defined volumes by highlighting Fixed Volume in the quick edit screen and pressing $\bigcirc$ to open the fixed volume table. Press $\wedge$ or $\vee$ to toggle through the values and $\bigcirc$ to select the desired volume setting.

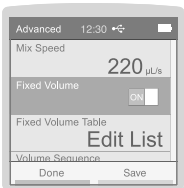
Turn Fixed Volume on or off

①



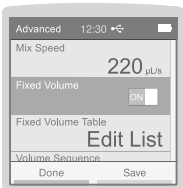

Select a mode that has the Fixed Volume option, then press **Edit**.

②



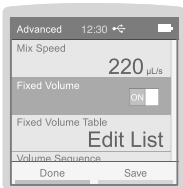

Press $\vee$ to scroll down the list of available options and settings to Fixed Volume.

③



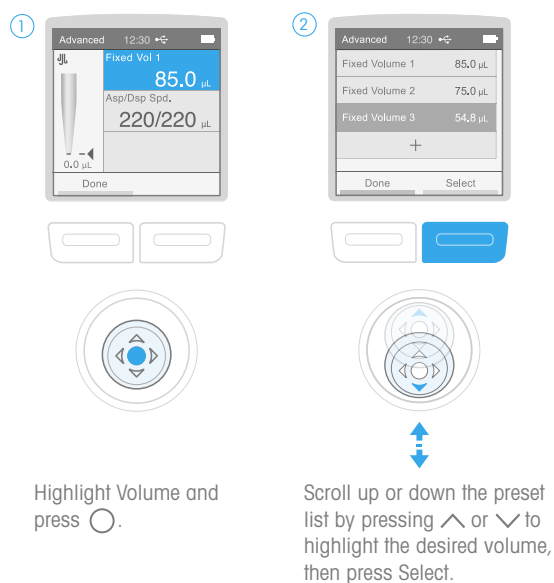

Press $\bigcirc$ or $\>$ to toggle Fixed Volume on or off (the switch turns green when the option is on).

④

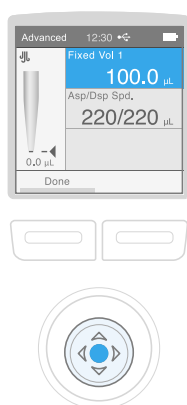



Press **Done** to return to the mode screen.

Select a Fixed Volume preset

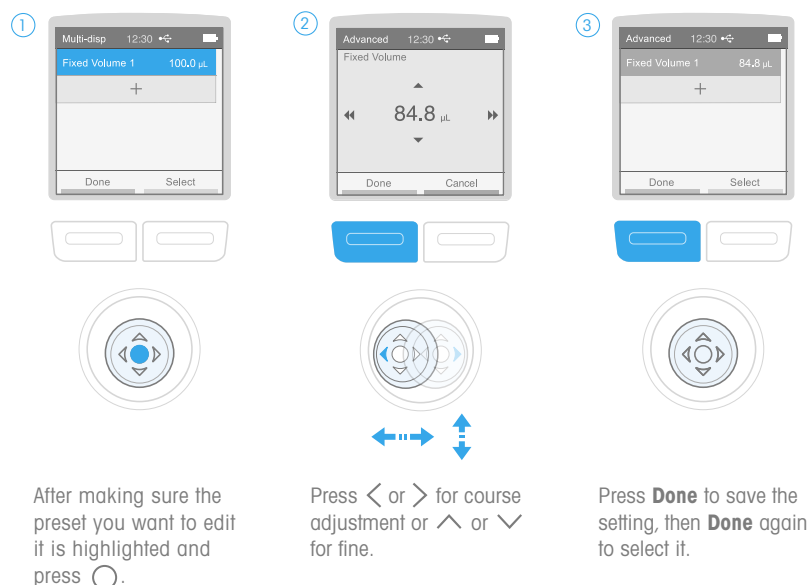


Edit Fixed Volume presets



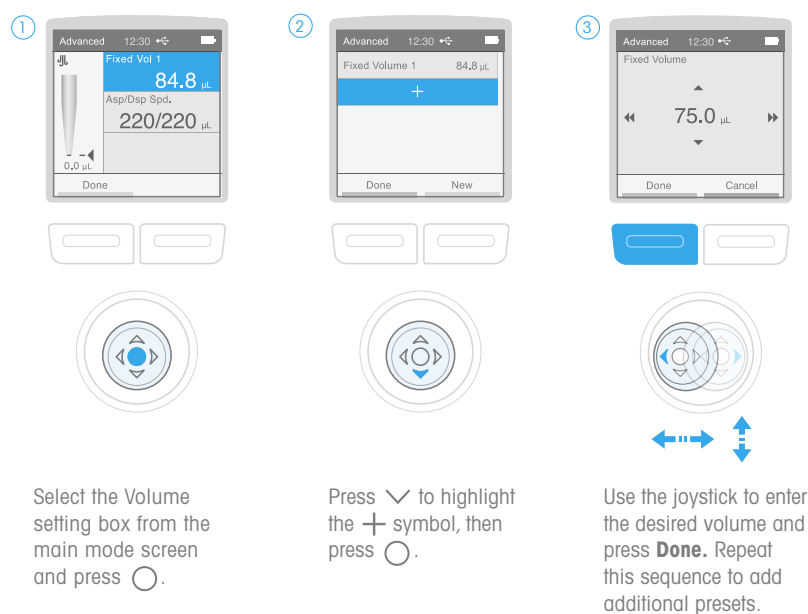
From the main mode menu, select Volume in the quick edit screen ("Fixed Volume" when option is on) and press .

To adjust the value of "Fixed Volume 1" or any Fixed Volume preset:



Add Fixed Volume presets

Users can preset up to 14 custom values for Fixed Volume.



Move or delete a Fixed Volume preset



From the main mode screen select **Edit**.

Press $\wedge$ or $\vee$ to highlight Edit List and press $\bigcirc$.

Select the desired preset and press **Edit**.

Press $\wedge$ or $\vee$ to highlight Move or Delete, then press **Select**.

If moving a preset, on the next screen you will press $\wedge$ or $\vee$ to place the preset in the desired order.

Press **Done** to return to the mode screen.

5.2.1 Fixed Volume Settings in Multi-Dispense

When Fixed Volume is on in Multi-Dispense mode, "Fixed Aliquot Vol" is displayed in the quick edit screen. The Fixed Volume option must be on for this setting to be shown or to view the volume table. The volume currently selected will be highlighted in the table.

Select a preset volume

1. Press $\triangleright$ to highlight volume in the quick edit box, then press $\bigcirc$ or $\triangleright$ to access the volume table.
2. Press $\wedge$ or $\vee$ to highlight a volume.
3. Press **Select** to set and exit the volume table.

Edit a preset volume

1. Highlight the volume to be edited and press $\bigcirc$ or $\triangleright$ to enter edit mode.
2. Press $\triangleleft$ or $\triangleright$ for coarse adjustment and $\wedge$ or $\vee$ for fine.
3. Press **Done** or to save.
4. Repeat as needed for other volumes.
5. Press **Cancel** to exit without saving changes or press **Done** to exit the table.

Note: If no other selection is made before exiting the table, the Volume Setting will be set to the last volume edited.

5.3 Volume Sequencing

Volume Sequencing is useful for protocols that require multiple samples at various volumes. When the option is turned on, “Vol X of X” is displayed in the quick edit screen and up to 16 pre-set volumes can be selected for use in series from the volume table.

For example, “Vol 2 of 4” indicates the volume shown is the second of four volumes in the series selected in the table. The volume value and number advance as each cycle completes.

Note: When the series volume exceeds the pipette’s maximum volume, it will be split into multiple aspirations. For example, if two aspirations are required, Vol 1 of 2 is shown at the initial aspiration and will change to Vol 2 when the next volume must be aspirated.

To set up and manage volume-sequencing presets, see [Section 7, Presets and Preset Lists](#).

Turn Volume Sequencing on



Select a mode that has the Volume Sequencing option, then press **Edit**.

Scroll down the list of available options and settings to Volume Sequencing and press **ON** or **>** to toggle Volume Sequencing on or off (the switch turns green when the option is on). Press **Done** or to save the setting and return to the operating screen.

Press **Done** to return to the mode screen.

Note: Volume Sequencing and Fixed Volume cannot be used simultaneously. If Fixed Volume is on when a user turns on Volume Sequencing, Fixed Volume will automatically turn off. When both options are off, Vero defaults to single-volume operation.

Add, edit, select and delete Volume Sequence presets

The steps for setting Volume Sequence presets are practically identical to those for Fixed Volume presets. See [Section 5.2](#) for details.

5.4 Cycle Counter

A cycle is complete aspiration and dispense followed by blowout. The Cycle Counter displays the operational mode's current cycle count, which updates after each cycle completes. Cycle count can be set to any value between 0 and 99,999. This setting is shown only when the Cycle Counter option is on.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press **Reset** to zero counter. Press $\triangleleft$ or $\triangleright$ for coarse adjustment and $\wedge$ or $\vee$ for fine.
3. Press **Done** or $\bigcirc$ to save or **Cancel** to exit without saving changes.
4. Press **Done** to exit the Settings screen and return to the operating screen.

5.5 Mix

Mix allows users to perform in-tip mixing after dispense. A mix volume, up to 99 automated mix cycles or manual mixing can be selected. This setting is shown only when the Mix option is on. Minimum and maximum volumes depend on the size of the Vero pipette. When automatic mix cycles are used, the set volume and number of mix cycles (Mix Cyc X) are shown in the settings box. The cycle number will update as each mix cycle completes and stop when the set number of cycles is reached. When manual mixing is used, the set volume and Mix Manual are shown in the settings box. Press **or** to view mix settings and **or** to highlight setting.

Change volume

1. Press **or** to edit.
2. Press **<** or **>** for coarse adjustment and **^** or **v** for fine.
3. Press **Done** or **or** to save, or press **Cancel** to exit without saving changes.
4. Press **Done** to exit.

Change cycles

1. Press **or** to edit.
2. For manual operation, press **<** or repeat-press **v** until "Manual" is displayed. Otherwise, press **<** or **>** for coarse adjustment and **^** or **v** for fine (limit is 99 cycles).
3. Press **Done** or **or** to save, or press **Cancel** to exit without saving changes.
4. Press **Done** to exit.

When finished setting volume and cycles, press **Done** to return to the operating screen.

5.6 Presets

Users can select a Preset file if one or more has been saved. The display shows how many presets are available and which one is currently loaded (if any). Activating this setting box allows users to scroll through and select any available presets with the joystick. For more information, see [Section 7, Presets and Preset Lists](#).

6. Sound and Display Settings

Vero's Settings menu gives users control over a wide range of date, time, display, sound, alarm and language features.

6.1 Sound Volume

From the Settings menu, scroll down to Sound Volume to adjust the volume level for audible activity alerts. Volume levels between 1 and 10, or Off can be selected.

1. Press $\bigcirc$ or $>$ to edit.
2. Press $<$ or $>$ for coarse adjustment of Off, 5 or 10 and $\wedge$ or $\vee$ for fine adjustment in single digits. Press $\vee$ or $<$ at 1 for Off. Volume level is shown on the display.
3. Press **Done** or $\bigcirc$ to save.

6.2 Display Setting

Users can customize Vero's display to control brightness and optimize battery life.

6.2.1 Display Brightness

Adjust the display brightness by selecting values between 1 and 10, with 1 being the dimmest and 10 the brightest.

1. Press $\bigcirc$ or $>$ to edit.
2. Press $<$ or $>$ for coarse adjustment and $\wedge$ or $\vee$ for fine. The screen's brightness will automatically adjust as the setting is changed.
3. Press **Done** or $\bigcirc$ to save.

6.2.2 Display Timeout

Display Timeout dims the display after a period of inactivity to conserve battery life. Select time intervals between 5 and 120 seconds, or Never.

Note: To wake Vero from a Display Timeout, press either soft key or move the joystick in any direction.

1. Press $\bigcirc$ or $\rangle$ to edit.
2. Press $\langle$ or $\rangle$ for coarse adjustment and $\wedge$ or $\vee$ for fine.
3. Press **Done** or $\bigcirc$ to save.

6.2.3 Sleep Timeout

Sleep Timeout powers the display off after a period of inactivity to conserve battery life. Select time intervals between 1 and 60 minutes.

Note: When charging, the pipette will not enter a sleep timeout if a cycle is incomplete (e.g., when a sample has been aspirated but not yet dispensed). To wake the pipette from a Sleep Timeout, press either soft key. If a cycle is incomplete and Vero is not charging, it will wait an additional 15 minutes before entering a sleep timeout. The interrupted cycle is recoverable for up to 18 hours when not charging.

1. Press $\bigcirc$ or $\rangle$ to edit.
2. Press $\langle$ or $\rangle$ for coarse adjustment and $\wedge$ or $\vee$ for fine.
3. Press **Done** or $\bigcirc$ to save.

6.3 Time and Date Settings

Vero's time and date settings are located under Admin in the Settings menu. Users can choose between 12- and 24-hour time display formats (or None) and three date formats.

Note: Even if the time display format is set for 12 hour, Vero uses the 24-hour format for setting the time.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press $\wedge$ or $\vee$ to change the value.
3. Press **Done** or $\bigcirc$ to save.

The date is displayed in format selected in Date Format Setting.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press $\wedge$ or $\vee$ to select the desired date format.
3. Press **Done** or $\bigcirc$ to save.

6.3.1 Time Display

This is the format of the on-screen time display. Select 24- or 12-hour formats or None to turn the time display off.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press $\wedge$ or $\vee$ to select display format.
3. Press **Done** or $\bigcirc$ to save. The format of the time display in all screens will update immediately.

6.3.2 Date Format

Users can choose among three date formats: MM/DD/YYYY, DD/MM/YYYY or YYYY/MM/DD.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press $\wedge$ or $\vee$ to select format.
3. Press **Done** or $\bigcirc$ to save. The Date Setting will update automatically.

6.4 Language

Users can select one of the following languages: English, Japanese, Chinese, French, Spanish, or German.

1. Press $\bigcirc$ or $\triangleright$ to edit.
2. Press $\wedge$ or $\vee$ to select language.
3. Press **Done** or $\bigcirc$ to save. The text displayed in all screens will update.

6.5 Factory Default Settings Reset

This feature resets the pipette to its factory default settings. All temporary settings, including the Admin passcode, are removed or reset, and the language reverts to English. Because they are saved to the file system, all user presets are preserved.

1. Access the factory reset features by clicking on Settings from the main screen, then Admin, then Service and scroll down to Factory Defaults.
2. Press $\bigcirc$ or **Edit** to access the Factory Reset option.
3. Press OK to reset the pipette or **Cancel** to return to the previous screen.

6.6 Sound Alerts

Vero has a wide range of sounds that provide users with audible feedback.

- Aspiration complete: High-tone ding
- Dispense complete: Mid-tone ding
- Blowout complete: Low-tone ding
- Reset activated: Two high-tone beeps
- Reset complete (piston in home position): Low-tone ding
- Soft key function accessed: Short click
- Menu navigation: Swoosh
- Menu item selected: Short click
- Setting or option selection: Short click
- Setting value or option edit: Short click
- Setting error (min/max setting has been reached): Buzz
- Cancel: Swoosh
- Low battery warning: Two high-tone beeps
- Service alarm: Two high-tone beeps

Mode-specific sound alerts

- Multi-Dispense mode: A second low-tone ding will sound after the last aliquot is dispensed.
- Manual mode: Aspirate and dispense complete alerts will sound only when the value set in the Volume setting is fully aspirated or dispensed.

6.7 GLP Alarms

GLP Alarms help ensure that pipettes are used within defined calibration limits, supporting compliance with Good Manufacturing Practices (GMP), Good Laboratory Practices (GLP), and internal Standard Operating Procedures (SOPs).

When enabled, GLP Alarms allow users to define how the pipette behaves as it approaches or exceeds its calibration due date. This helps maintain consistency across users and prevents use of out-of-calibration instruments.

With GLP Alarms enabled, you can

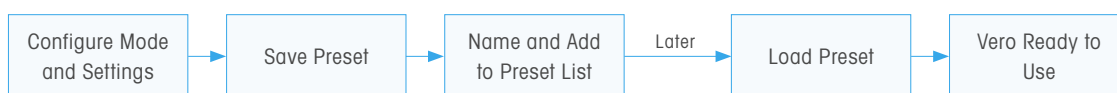
- Set the pipette's next calibration date
- Define a warning period (in days) before the calibration due date
- Enable automatic pipette disablement once the calibration date is exceeded

To turn GLP Alarms on or off, go to Settings > Admin, then scroll to GLP Alarms.

7. Presets and Preset Lists

Many pipetting tasks require the same set of parameters to be used repeatedly, such as specific volumes, aspiration and dispense speeds, mixing cycles, or blow-out settings.

Presets allow users to save a complete pipette configuration and recall it instantly when needed. Instead of manually adjusting settings each time a protocol is performed, users can load a saved preset and begin work immediately.



Using presets helps

- Save time by eliminating repeated setup
- Improve consistency between runs
- Support reproducibility across users and experiments
- Standardize workflows in shared laboratories or production environments

In addition, administrators can configure the pipette so that only approved presets are available during operation. In this locked configuration, users can run protocols but cannot modify settings, helping ensure adherence to validated methods.

If a protocol is performed more than once, saving it as a preset ensures the pipette is configured instantly and consistently each time.

Vero can store many presets and organize them into Preset Lists, allowing related protocols to be grouped together. Vero supports up to:

- 10 characters per preset name
- 99 presets per list
- 20 preset lists

At any time, from any screen, press **both soft keys simultaneously** to open the **Presets** menu.

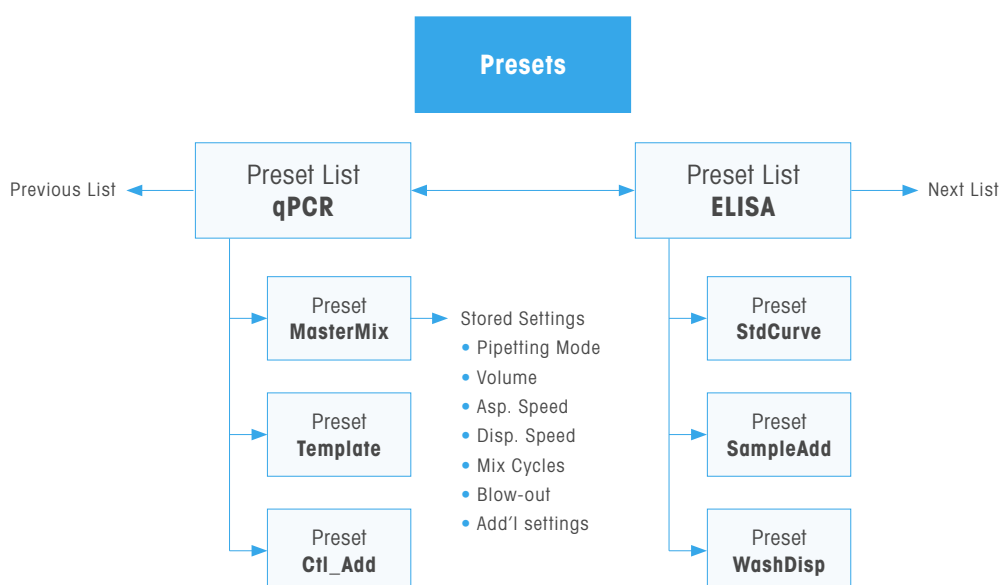
7.1 Preset Lists

A Preset List is a collection of related presets similar to a folder that contains individual preset files. Preset lists help organize protocols by workflow or experiment type.

Examples

List Name	Example Presets
qPCR	MasterMix, Template, Ctrl_Add
ELISA	StdCurve, SampleAdd, WashDisp
PCR Prep	PrimerMix, BufferAdd, Enzyme
QC Test	LotTest, StdRef, CtrlChk

Organizing presets by lists makes it easier to locate the correct protocol when operating the pipette.



7.2 Creating and Managing Preset Lists

Vero accommodates up to 20 preset lists with names up to 10 characters in length.

If no preset lists exist, users will be prompted to create one when entering the Presets menu. Alternatively, when navigating preset lists, scroll to the far right to select **New List**.

Create a preset list

1. Press **Presets** (or press both soft keys).
2. Press $\wedge$ to highlight the preset list field (top line), if needed.
3. Press **Edit**, then select New List.
4. Enter a name using the keyboard.
5. Press **Save**.

Rename, delete, or copy a preset list

1. Press **Presets**.
2. Highlight the preset list field.
3. Press **Edit**.
4. Use $\wedge$ or $\vee$ to select an action, then press $\bigcirc$.
5. Follow the onscreen instructions



Presets list edit menu

7.3 Creating and Saving a Preset

A preset stores the entire pipetting configuration, including the selected pipetting mode and all associated settings.

Save a preset

1. From the home screen, select the desired pipetting mode.
2. Configure settings (volume, speed, mixing, etc.).
3. Press **Edit**, then select **Save**.
4. Enter a preset name.
5. Press **Done**
6. Use < or > to select the destination Preset List.
7. Press **Done** to complete the save.

Once saved, the preset can be recalled at any time to instantly restore all settings.

7.4 Naming Presets

Preset names are limited to 10 characters. Using a consistent naming convention makes presets easier to identify—especially in shared environments or when many protocols are stored.

A simple and effective format is **Task + Volume + Modifier**.

Where

Component	Meaning	Example
Task	What the preset is doing	MIX, ADD, WASH, STD
Vol	Volume in μL	20, 100, 200
Mod	Optional detail	FAST, SLOW, PCR

Example preset lists

Preset List	Preset Name	Meaning
qPCR	MM_20uL	Dispense qPCR master mix
	TMP_5uL	Add DNA/RNA template
	CTRL_5uL	Add control samples
	NTC_5uL	Add no-template control
	MIX_10x	Mix reaction wells
ELISA	STD_100uL	Dispense standard curve
	SMP_100uL	Add samples to wells
	CTRL_100	Add assay controls
	WASH_MD	Multi-dispense wash buffer
	SUB_50uL	Add substrate reagent
PCR Prep	BUF_50uL	Add PCR buffer
	PRM_10uL	Add primer mix
	ENZ_2uL	Add polymerase enzyme
	DNA_5uL	Add DNA sample
QC Test	LOT_100	Lot validation sample
	REF_50uL	Reference standard
	CTRL_25	QC control addition

7.5 Loading and Managing a Preset

Loading a preset restores all saved pipetting settings.

Save a preset

1. Press **Presets** (or press both soft keys).
2. Use < or > to navigate preset lists.
3. Use ^ or v to highlight a preset.
4. Press ○ to load.

Rename, delete, or copy a preset list

1. Press **Presets**.
2. Highlight the desired preset.
3. Press **Edit**.
4. Use ^ or v to select an option, then press ○.

7.6 Editing an Existing Preset

If a protocol changes, existing presets can be modified.

1. From the main screen, press **Presets** and highlight the preset to edit (note the exact name if the new setting will replace the old).
2. Press **○** to load the preset.
3. Adjust settings as needed (volume, aliquots, speed, etc.).
4. Press **Save** and, using the keyboard, enter the exact present name.
5. Press **Done**, then **Done** again.
6. Press **Okay** to accept the new preset and delete the old.



After pressing **Done**, users will be asked to **Okay** replacing the old file with the new.

7.7 Locking the Pipette

Administrators can lock the pipette to restrict operation to approved presets.

When Lock Mode is enabled:

- Users can operate the pipette only using presets
- Access can be limited to selected preset lists
- Modifications to pipetting modes and settings are prevented

This ensures consistent execution of validated protocols, particularly in regulated or production environments.

Lock the pipette

1. Select Settings
2. Select Admin
3. Select Lock Pipette
4. Toggle Lock Mode ON
5. Select Preset List Permissions to define which preset lists are available

8. Specifications

Use these manufacturer's specifications as guidelines when establishing your own performance specification.

Technical Data

Single Channel

Model	Volume	Increment	Systematic Error		Random Error	
	(μL)	(μL)	%	μL ($\pm$)	%	μL ($\leq$)
V-10	1	0.01	2.4	0.024	1.2	0.012
	5		1.2	0.060	0.60	0.030
	10		0.90	0.090	0.40	0.040
V-20	2	0.02	4.5	0.090	1.5	0.030
	10		1.1	0.11	0.50	0.050
	20		0.80	0.16	0.30	0.060
V-100	10	0.1	2.0	0.20	1.0	0.10
	50		0.70	0.35	0.23	0.115
	100		0.50	0.50	0.15	0.15
V-200	20	0.2	2.3	0.46	0.70	0.14
	100		0.80	0.80	0.25	0.25
	200		0.60	1.2	0.15	0.30
V-300	30	0.2	1.8	0.54	0.60	0.18
	150		0.60	0.90	0.20	0.30
	300		0.60	1.8	0.15	0.45
V-1000	100	1	2.0	2.0	0.50	0.50
	500		0.60	3.0	0.20	1.0
	1000		0.45	4.5	0.15	1.5
V-2000	200	2	2.7	5.4	0.60	1.2
	1000		0.80	8.0	0.20	2.0
	2000		0.60	12	0.18	3.6

Multichannel

Model	Volume	Increment	Systematic Error		Random Error	
	(μL)	(μL)	%	μL ($\pm$)	%	μL ($\leq$)
V8-10 V12-10	1	0.01	3.9	0.039	3.0	0.030
	5		1.4	0.070	0.80	0.040
	10		0.90	0.090	0.50	0.050
V8-20 V12-20	2	0.02	5.0	0.10	3.0	0.060
	10		1.4	0.14	1.0	0.10
	20		0.90	0.18	0.30	0.060
V8-50 V12-50	5	0.5	3.4	0.17	1.4	0.070
	25		1.1	0.275	0.40	0.10
	50		0.70	0.35	0.30	0.15
V8-200 V12-200	20	0.2	1.9	0.38	1.0	0.20
	100		0.70	0.70	0.25	0.25
	200		0.60	1.2	0.20	0.40
V8-300 V12-300	30	0.2	1.9	0.57	1.0	0.30
	150		0.80	1.2	0.25	0.375
	300		0.60	1.8	0.20	0.60
V8-1200 V12-1200	100	1	1.9	1.9	0.60	0.60
	120		1.9	2.28	0.60	0.72
	600		0.70	4.2	0.20	1.2
	1200		0.60	7.2	0.15	1.8

9. Connectivity

Vero connects to other devices and applications via USB and NFC.

The USB-C port on top of Vero (protected with a black rubber cap) connects to the wall power supply to charge the device. A USB-C to USB cord (not included with Vero) can be used to connect to a computer or laptop for device firmware updates. (See below.)

For more information, contact a qualified Rainin Service professional or your Rainin sales representative.

9.1 Update Firmware via USB

To update the firmware for Vero:

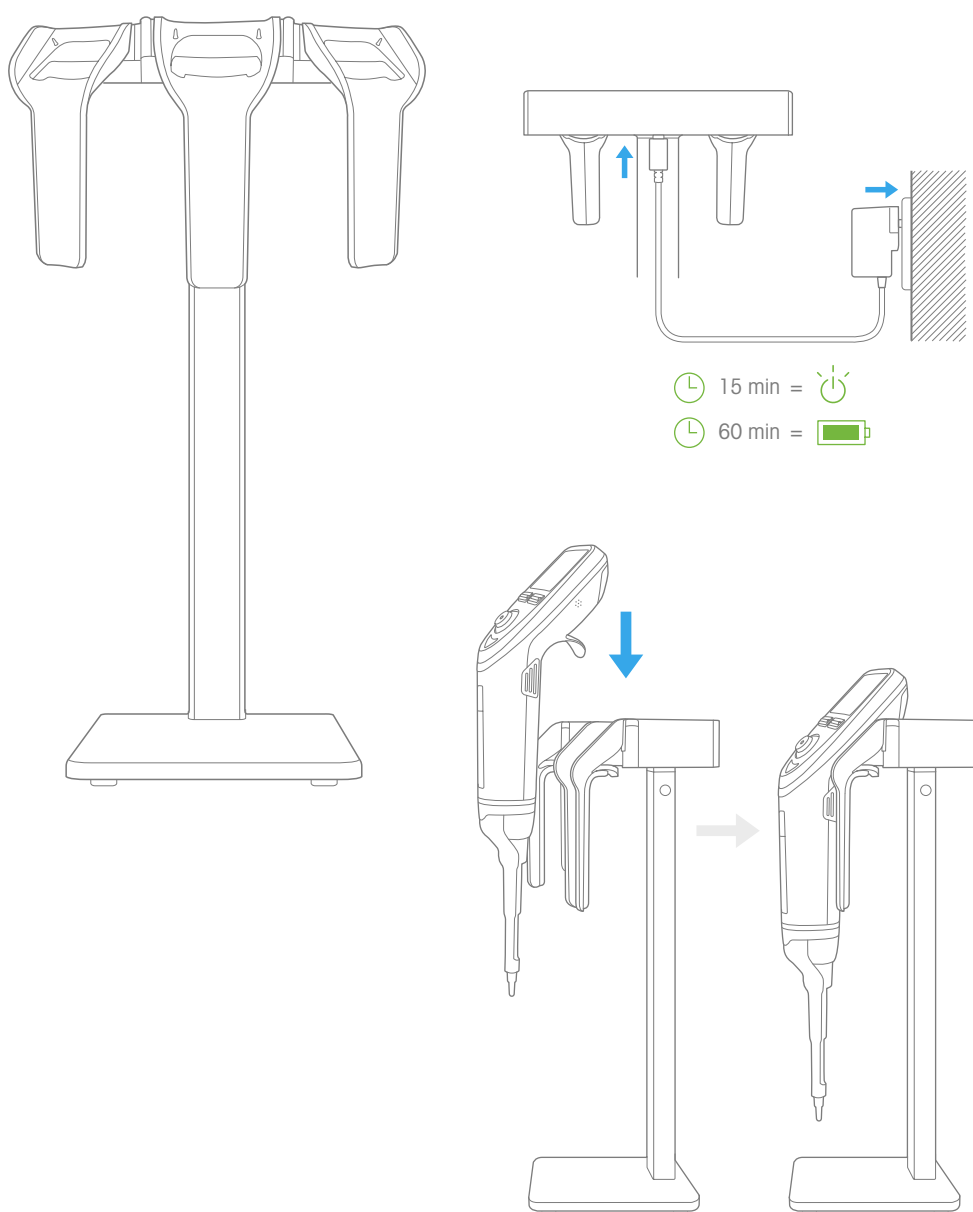
1. Download the .zip file with latest Vero firmware update and note the new version number (you'll use this at the end to check that the update was successful).
2. Open the .zip file, click Extract All and select a destination for the extracted "Vero_App.bin" file. Click Extract.
3. Using a cable with at least one USB-C connector, plug Vero to your PC using the USB-C port on the top of the pipette.
4. On the pipette go to Settings > Admin and enable Remote File Access – the pipette will now act like a USB thumb drive
5. On your laptop find the new drive and copy the file Vero_App.bin into the UPDATE folder located on the pipette.
6. On the pipette, press **Exit** to return to the Settings/Admin screen.
7. Press  to highlight Service, then press . Click **OK** to install the update.
8. The update will take a minute and the pipette will restart. Do not use the pipette until it restarts
9. To check the firmware version, in Settings, use the joystick to navigate to and highlight Service Info and press . The version is listed on the Firmware Version line.

9.2 Radio Frequency Device (NFC)

All Vero models have a passive NFC (Near Field Communication) tag near the finger-hook that contains unique information about the pipette including model type, serial number, NFC UID, and service calibration information.

10. Accessories

In addition to the wall power supply that came packaged with your Rainin Vero electronic pipette (part number 31051598), the optional Vero Charging Stand (part number 31103649) provides a safe place to store and charge up to three Rainin Veros simultaneously.



11. Ordering Information

	MT-Order No.	Description	Volume Range
Single Channel Models 	30983887	V-10	0.5-10 µL
	30983908	V-20	2-20 µL
	30983909	V-100	10-100 µL
	30983910	V-200	20-200 µL
	30983911	V-300	20-300 µL
	30983913	V-1000	100-1000 µL
	30983914	V-2000	200-2000 µL
	30983915	V-5000	500-5000 µL
	30983916	V-10ML	1-10 mL
	30983917	V-20ML	2-20 mL
Single Channel Models 	31044457	SV-10	0.5-10 µL
	31044518	SV-20	2-20 µL
	31044519	SV-100	10-100 µL
	31044520	SV-200	20-200 µL
	31044521	SV-300	20-300 µL
	31044522	SV-1000	100-1000 µL
	31044523	SV-2000	200-2000 µL
	31044524	SV-5000	500-5000 µL
	31044525	SV-10ML	1-10 mL
Multichannel Models 	8-Channel		
	31034227	V8-10	0.5-10 µL
	31034228	V8-20	2-20 µL
	31034229	V8-50	5-50 µL
	31034230	V8-200	20-200 µL
	31034231	V8-300	20-300 µL
	31034232	V8-1200	100-1000 µL
	12-Channel		
	31034233	V12-10	0.5-10 µL
	31034234	V12-20	2-20 µL
	31034235	V12-50	5-50 µL
	31034236	V12-200	20-300 µL
	31034237	V12-300	20-300 µL
	31034238	V12-1200	100-1200 µL
Accessories	31103649	Charging stand for Vero (holds three pipettes)	
	31051598	USB-C power adapter for Vero	
Vero Battery	31132056	Battery Vero Lithium Ion	

12. Care and Maintenance

When not in use, store the pipette in a clean safe place. Vero is a precision instrument and should be treated with the level of care appropriate for laboratory instrumentation.

Rainin recommends storing Vero on the Vero charging stand.

12.1 Care Tips

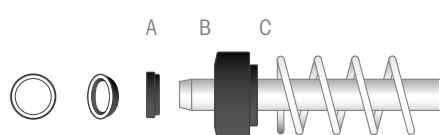
The most important factor in taking proper care of Vero is to keep the mechanisms dry and clean. The following simple rules should be strictly observed:

1. Never allow liquid to enter the shaft where it can contact the piston or seal.
2. Never allow liquid to enter the electronics, including the display, soft keys, and joystick.
3. Never pick up liquid without a tip attached.
4. Never invert the pipette or lay it on its side with liquid in the tip. Always hold Vero upright and store upright if possible. Use the optional Vero charging stand.
5. Never use aggressive solvents to clean Vero. Instead, use a lint-free wipe dampened with water and, only if necessary, a mild diluted detergent. Be sure to keep the display, soft keys, and joystick dry.
6. Never attempt to recharge Vero with a device other than the Vero-WPS Wall Power Supply, the Vero stand, or the Vero-USB cable. Using non-Rainin-approved charging equipment can severely damage Vero's internal electronics.

12.2 Cleaning

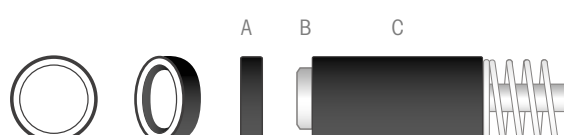
Sample contamination of the shaft, seals or piston can result in rough, sticky plunger movement. Deposits on the piston can eventually cause the seal to tear, leading to inaccurate results. A best practice for pipette maintenance is to regularly clean the pipette liquid end with the following procedure:

1. Remove tip ejector arm.
2. To remove the shaft:
 - 2 – 1000 μL : unscrew the shaft coupling nut and remove the shaft.
 - 2000 μL : unscrew the shaft.
 - > 2000 μL : unscrew the lower part of the shaft.
3. When removing the piston assembly, note the order and placement of the seal, retainers, springs, and O-rings. Vero seals vary by model:
 - 2 – 20 μL seals are symmetrical and can be used in either orientation.
 - 100 – 2000 μL seals are asymmetrical and must be inserted in the correct orientation (figures A and B, below).
4. Seals on 1000 – 2000 μL models can remain inside the shaft when the piston assembly is removed and is normal for this design. If desired, remove the seals by inserting the large end of a tip into the shaft (figures C) and hooking the seal over it.



A. Seal (note open edge faces outward)
B. Seal retainer
C. Piston assembly

Figure A. Seal orientation, 100, 200 and 300 μL



A. Seal (note open edge faces outward)
B. Seal retainer
C. Piston assembly

Figure B. Seal orientation, 1000 and 2000 μL

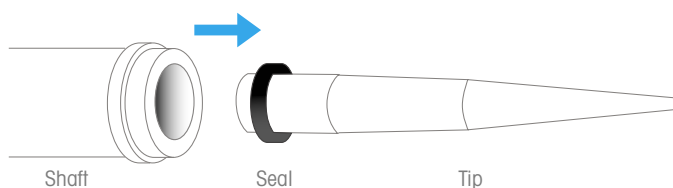


Figure C. Using the large end of a tip to remove 1000 or 2000 μL XLS+ seal from the shaft

5. To inspect and clean seals on 100 – 300 µL models, gently remove them from their retainers by pushing them out from the back side, preferably with a dull object like a pipette tip.
6. Inspect the seals, retainers, O-rings, shaft, and piston for contamination. Clean with a lint-free cloth and either distilled water or isopropyl alcohol. Apply grease (part number 6200-524, 17014531) sparingly by gently rubbing the seal or O-ring between your thumb and index finger, ideally using a clean powder-free examination glove. Apply a small amount of grease on the piston as well. Reassemble in the correct order and orientation.
7. If piston corrosion or staining is evident, take the pipette out of service and have a METTLER TOLEDO or Rainin service representative assist with replacement of the piston.
8. The shaft, tip ejector and handle can also be cleaned using a cloth dampened with distilled water, 10% bleach solution, isopropyl alcohol, or any commercially available instrument decontamination solution. Be sure to rinse off the cleaning agent with distilled water.

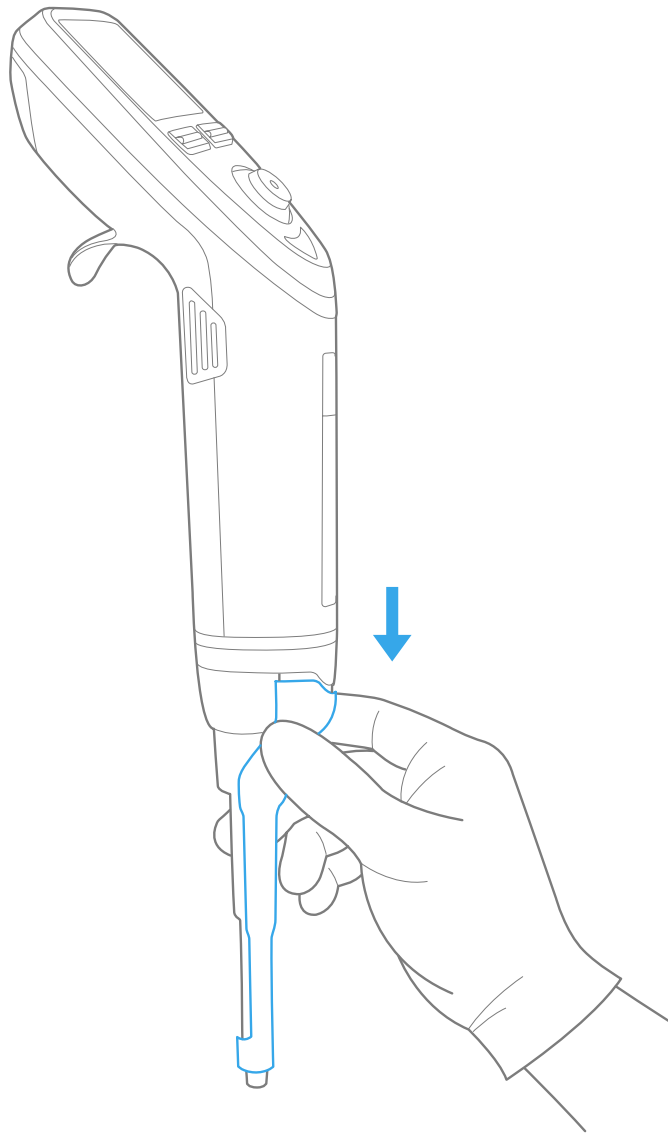
Vero can be exposed to UV light for surface treatment to help deactivate microorganisms. Place the pipette in a biosafety cabinet equipped with a 254 nm UV lamp, positioning the pipette approximately 60 cm (24 in) from the lamp. Follow the cabinet manufacturer's recommendations for exposure time.

12.2.1 Tip Ejector Arm Removal

Vero's metal and plastic tip ejector arms are easy to remove.

Metal tip ejector: press in the quick-release tabs on the ejector arm and pull the arm down and away from the body of the pipette.

Plastic tip ejector: Firmly grasp the tip ejector arm and pull down.



12.3 Autoclaving

Autoclaving Vero's shaft and tip ejector arm can be performed at 121°C, at 1 Bar, for 15-20 minutes, with the following restrictions:

Model	Autoclavable Parts
Single Channels	Tip ejector, shaft, spring, seal and seal retainer.
Multichannels	None

The entire liquid end of Vero single channel pipettes may be removed and placed into the autoclave without disassembling individual parts. The liquid end includes the following: Shaft, tip ejector, seal, and seal retainer.

13. Service and Calibration

We recommend METTLER TOLEDO and Rainin service for calibration and preventive maintenance. ISO certificates can be requested from your local sales representative.

For technical support questions, contact your local Rainin representative. For contact information visit: www.mt.com/contact

Only use genuine Rainin replacement parts, such as seals, O-rings, and shafts. It is **not** necessary to recalibrate the pipette after changing the seal, O-ring, or shaft. Pipette recalibration is only necessary when the piston is replaced and recalibration must be performed by a METTLER TOLEDO or Rainin service technician.

Note that the warranty is void if the pipette has been damaged due to physical or chemical abuse, or if it has been repaired or recalibrated by a service provider not authorized by Rainin. Visit www.mt.com/contact to locate your local METTLER TOLEDO or Rainin service center.

13.1 Replacement Parts

For replacement parts, see Section 11, Ordering Information, or contact either your local Rainin representative or Rainin Technical Support.

For contact information, visit: www.mt.com/contact

13.1.1 Filter

Vero 5000 μ L, 10 mL, and 20 mL models have a filter in the end of the shaft to prevent liquid from contaminating the piston. Using a filter is recommended when pipetting large volumes and should be replaced if it gets wet. Filters are not autoclavable.

The 5000 μ L and 10 mL pipettes use the same filter:

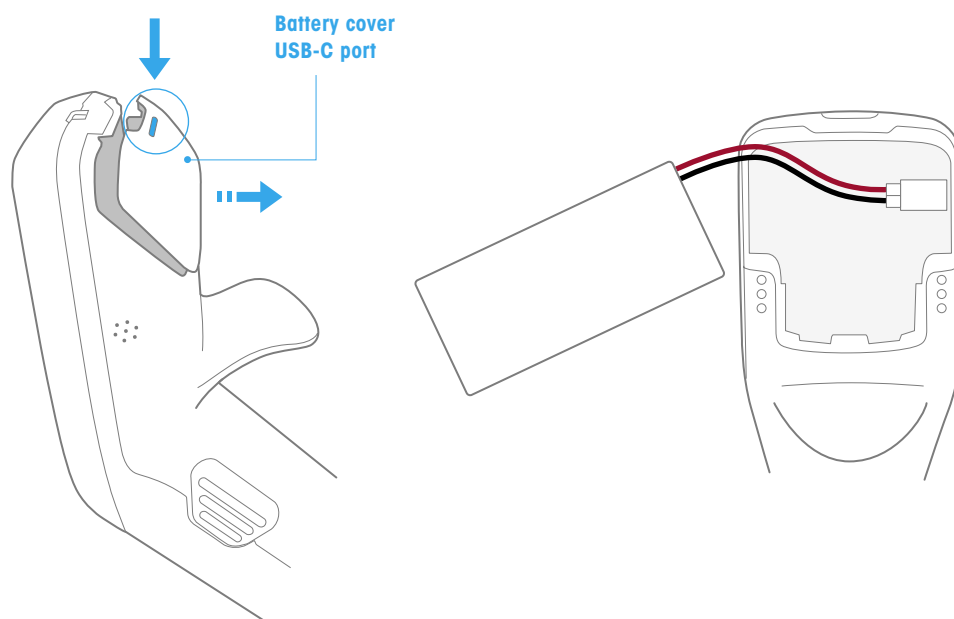
- 5000 μ L: small diameter into the shaft.
- 10 mL: large diameter into the shaft.
- Filter part numbers are 17001944 (pack of 100) and 17001945 (pack of 1000).

Part numbers for the cylinder-shaped 20 mL model are 17001951 (pack of 100), 17001952 (pack of 500).

13.2 Replacing the Battery

To replace the battery, locate the battery housing on the back of the pipette near the USB port. Apply force to the blue battery cover indent at the top pressing down and sliding outwards simultaneously. Remove the cover and take the battery out, making sure to disconnect the red and black cables that are attached to the pipette's circuit board. Connect the new battery's cables to the pipette making sure to insert the flat side of the battery into the center of the pipette and replace the battery cover.

Note: It is important that the battery only be replaced with a Rainin battery.



14. Troubleshooting

Pipette line	Possible Cause	Suggested Remedy
Leaks, inaccuracy	Loose shaft	Tighten coupling nut by hand
	Worn seal for pipette volumes $\leq 2000 \mu\text{L}$	Replace seal
	Worn O-ring or insufficient grease seal for pipette volumes 5000 μL , 10mL, 20 mL	Replace O-ring and apply small amount of grease
	Cracked or split shaft	Replace shaft. Check to ensure piston is not bent. If bent, call METTLER TOLEDO or Rainin service for a new piston. www.mt.com/contact
Rough, jerky, or sticky plunger movement	Contamination inside mechanism	Remove tip ejector arm, remove shaft, and check piston and seal clean as described in Care and Maintenance section. If piston is permanently corroded or stained, call METTLER TOLEDO or Rainin service for a new piston. www.mt.com/contact
	Insufficient grease	Apply grease sparingly to seal or O-ring.

When removing the shaft from the pipette body, make sure the spring, seal and O-ring do not detach from the piston, especially on smaller models. Be careful not to bend the piston on smaller models. Pipette recalibration is only required when the piston is replaced.

14.1 Acids and Corrosives

Extensive contact with corrosive fumes may result in premature seal wear and damage to the piston. Exposing the internal components to corrosive aerosols and fumes can be reduced by using Rainin tips with aerosol barrier filters. After using concentrated acids or corrosive solutions, disassemble Vero and inspect and clean the piston assembly, shaft, and seal/O-ring with distilled water. Use extreme care on the 10 μ L models to avoid damaging the small diameter piston or losing small items such as seals. Dry all components thoroughly and reassemble.

14.2 Warning Messages

Vero is self monitoring and will alert users to important issues such as battery levels, USB connection, charge stand connection, factory reset, real time clock status and more. Any changes to these variables that could affect your operation of the pipette will be reported as a Warning message and the status light will turn red. Some warnings require action, such as recharging the unit or resetting the clock, while others are informational only ("Memory Clear" after factory reset). To exit any warning message, press the left soft key (CONT). If a warning message is displayed during the Vero power up sequence that cannot be reset, note the error number and contact your local Rainin service center or sales representative.

► www.mt.com/contact

14.3 Lookup Codes

Vero is a sophisticated instrument composed of a complex mix of electronic hardware and software components. The pipette uses four-digit codes to provide users with information about a function the pipette is currently performing or operational issue that may affect its performance.

If you receive a lookup code and want to know more about the event that prompted it, visit www.mt.com/vero-lookup to enter the code and receive a detailed explanation.

► mt.com/vero-lookup

15. Warranty Information

The Rainin warranty is a conditional warranty that covers defects in parts or workmanship, as well as ensures proper performance of the pipette as shipped by the factory. It does not cover damage such as that caused by dropping, splash up of chemicals or if the pipette has been repaired or recalibrated by any service facility not authorized by Rainin. This warranty is effective for one year following purchase or service in our lab.

16. Disposal



In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, according to their specific requirements. Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

16.1 RoHS Regulation # 2011/65/EU



Rainin and METTLER TOLEDO fulfil requirements under RoHS Regulation # 2011/65/EU.

E4 XLS products and accessories comply with the above-mentioned RoHS Regulation.

16.2 China RoHS Substance Disclosure



Complies with SJ/T11364-2014.

For more information, go to: <http://www.mt.com/China-RoHS>.

www.mt.com/rainin

For more information

[DE] Für mehr Informationen
[ES] Para más información
[FR] Pour plus d'informations
[JP] 詳細については
[KO] 자세한 내용은
[PT] Para maiores informações
[ZHS] 更多信息
[ZHT] 更多資訊

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