

Rainin QuickFlow

Ergonomic Aspiration System



METTLER TOLEDO

Rainin QuickFlow

Convenient, Trouble-free Operation

- **Continuous and Non-continuous Flow**
- **Optical Liquid Level Sensor**
- **Multiple Adapters**
- **Easy Cleaning**

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1 Box Contents

Shipping box

- a. Base unit
- b. 4-liter collecting bottle
- c. Bottle cap with quick connector heads
- d. Bottle cap with closed top
- e. Bottle carrying plate
- f. Airflow inlet tube (blue)
- g. Quick connector plug (orange) for vacuum tube
- Note: The vacuum tube (clear) is part of the handle kit, see next page
- h. Power supply
- i. Power adapters (4)
- j. Quick Reference Guide
- k. Handle kit / inner box (see next page for details)

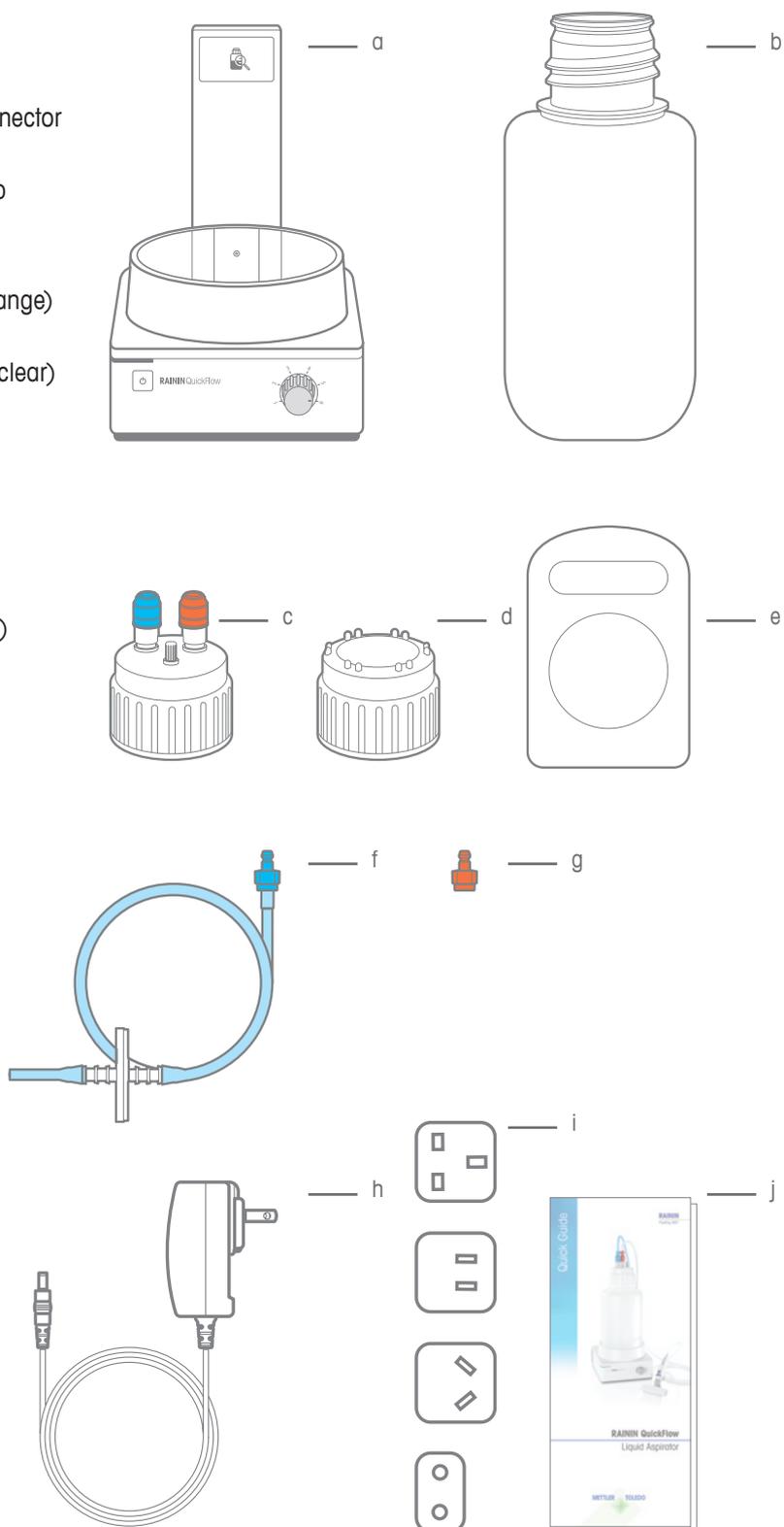


Figure 1: QuickFlow shipping box components

Inner box (handle kit)

- a. Handle
- b. Single-tip adapter
- c. Multi-tip adapter
- d. Pasteur pipette adapter (glass/plastic)
- e. Vacuum tube (clear)
- f. Handle hang up (for safe handle storage)
- g. Extra o-rings
- h. Quick Reference Guide

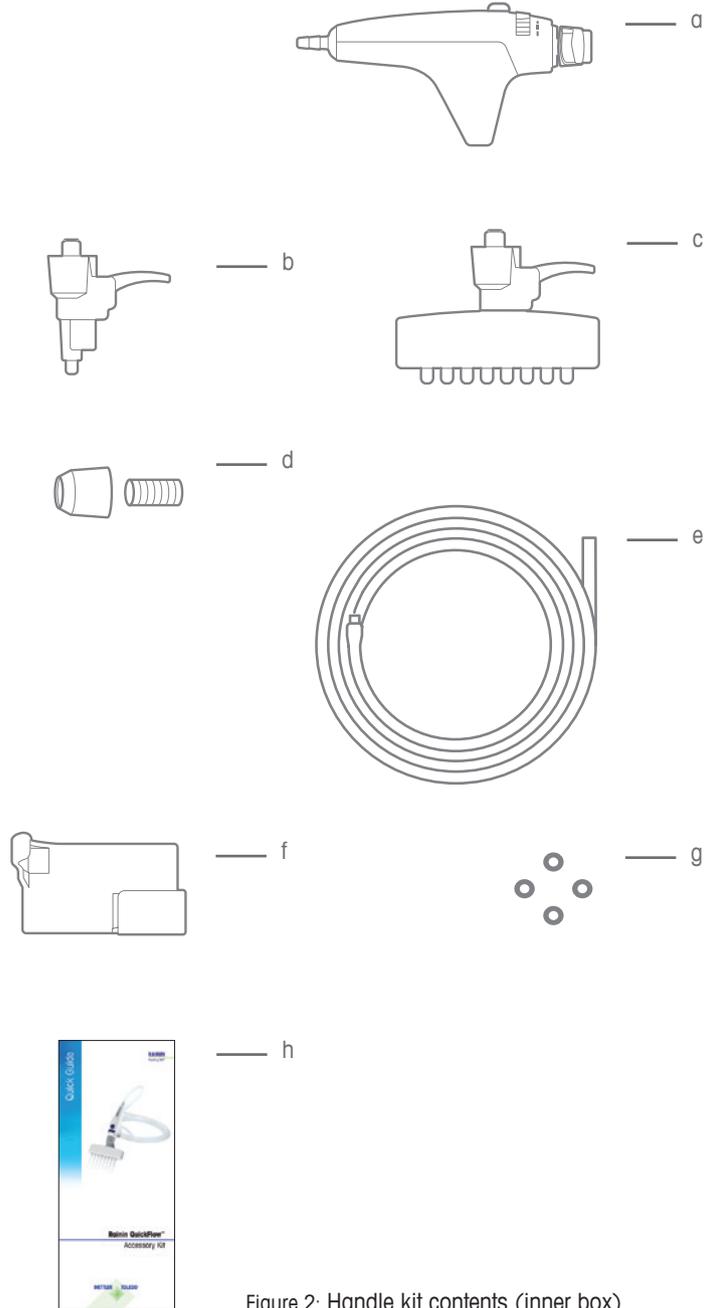


Figure 2: Handle kit contents (inner box)

2 Safety

Read all Safety warnings before setting up or servicing your Rainin QuickFlow. Always operate QuickFlow in accordance with this User Manual. For your convenience and future reference, this manual is available online to download at www.mt.com/quickflow-manual.

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument including malfunction, as well as unreliable results.

Safety terms used in this manual

WARNING – a hazardous situation with medium to high risk, possibly resulting in severe personal injuries (or death) if not avoided, as well as damage to the instrument or laboratory.

CAUTION – a hazardous situation with lower risk, possibly resulting in damage to the instrument and laboratory, data loss, and/or minor or medium personal injuries if not avoided.

ATTENTION or **NOTE** (no symbol) – useful or important information about the product

Safety symbols used in this manual



General Hazard



Electrical Hazard



Hand Injury



Explosion Hazard

2.1 Electrical safety

WARNINGS   

To reduce the risk of electric shock:

- Only use the supplied power cord at the rated line voltage when connecting QuickFlow to electrical power. Do not modify the power cord in any way or plug it in to an ungrounded power outlet. For detailed information on the power supply, see page 19 (Specifications).

- Do not open the instrument. No user-serviceable parts are inside. Refer to qualified service personnel if help is required. NOTE: Place QuickFlow in an area where it can be easily disconnected from power outlet in a case of emergency.

Use this product only as described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

NOTE: Keep the power adapter away from instrument to avoid electric shock caused by overflowing.

2.2 General safety

WARNINGS



When lifting a full collecting bottle off the QuickFlow base unit, grasp the carrying plate from both sides and use proper lifting procedures. A filled collecting bottle weighs approximately 5 kg (11 lbs.)

At all times, keep face and body away from the aspiration tips and pipettes when using QuickFlow.

CAUTIONS



Always use safe laboratory practices. Wear personal protective equipment (PPE) when using QuickFlow.

Never move QuickFlow when the collecting bottle is full. Always empty the collecting bottle before moving the instrument.

Using QuickFlow with strong acids, bases or other aggressive liquids may damage seals, nozzles, or other parts. Clean up any contamination or accidental splashes immediately.

3 Introduction

The Rainin QuickFlow is a benchtop liquid aspirator system made by METTLER TOLEDO. It is designed for the safe and efficient removal of cell culture media and other commonly used buffers in life sciences research labs.

Adapters snap to an ergonomic handle for precision aspiration control.

Aspiration may be continuous (always on) or touch-actuated via a button on the handle.

A liquid-level sensor integrated into the base unit alerts users when the collecting bottle is full. This stops the pump to prevent overflow.

QuickFlow is intended for laboratory research purposes only. If used for other purposes, METTLER TOLEDO is not liable for any resulting damage.

Please read this User Manual carefully, especially regarding safety, setup and basic operation, before using QuickFlow in real lab conditions. It is the responsibility of the User to read the instructions and to work in accordance with the standard operating procedures and general safety guidelines defined by your workplace.

3.1 Device and liquid compatibility

Liquid-touching components of QuickFlow are made from materials including PVDF (polyvinylidene difluoride), polypropylene and silicone rubber.

Lower concentration (up to 30%) chemicals including

- Bleach
- Acetone
- DMSO
- Trichlorethylene
- Chloroform
- Phenol

and other liquids may be aspirated safely.

4 Setup

4.1 Prepare a workspace

An ideal workspace is a clean, dry area of bench that is protected from vibration and drafts and is near an electrical power source. It should be out of direct sunlight.

QuickFlow requires a working horizontal bench space about 40 cm (18 inch) wide and 40 cm (18 inch) deep. It weighs about 6 kg (13.2 lbs) and is about 51 cm (20 inch) high.

Electrical power: QuickFlow comes with a set of four power adapters to enable operation in any region.

NOTE: Avoid connecting QuickFlow to a power source used by any device with large current fluctuations, such as a refrigerator that cycles on and off.

4.2 Check shipping box

QuickFlow is shipped from the manufacturer in one large shipping box. Check the box for signs of damage. If there is damage to the shipping box or contents, please contact your METTLER TOLEDO Customer Service or Sales representative.

4.3 Unpack QuickFlow

Open the shipping box. This reveals the first layer of QuickFlow components.

Take out the Quick Reference Guide, handle kit box and the cap with connectors.

Remove the top layer of foam.

Take out the QuickFlow base unit, tubing, power adapters and power supply.

Take out the empty collecting bottle with the bland (flat) cap on.

Keep the shipping box. It will be useful if you ever need to transport QuickFlow or return it for authorized service.

If any items are missing, please contact your METTLER TOLEDO Customer Service or Sales representative.

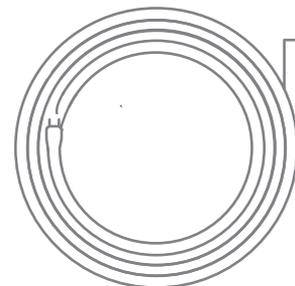
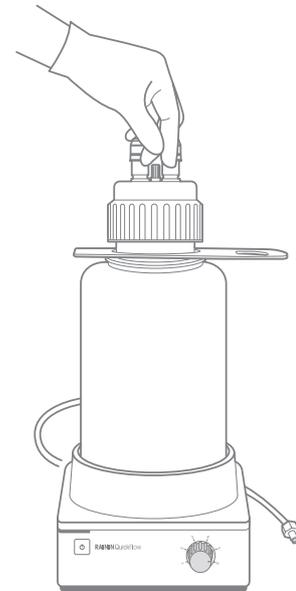
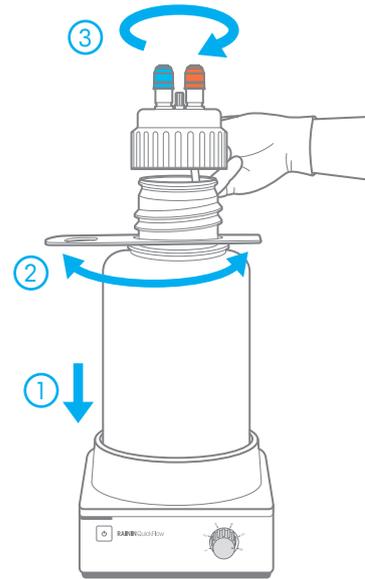
4.4 Assemble QuickFlow

1. Place the open bottle on the base unit. Take the flat metal carrying plate, align the large center hole over the open top of the collecting bottle, and rotate the plate clockwise until it rests on the shoulder of the bottle.

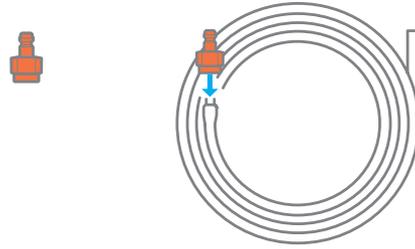
2. Place the cap with quick connector heads (orange and blue) on top of the collecting bottle and rotate the cap clockwise until the bottle is tightly closed.

3. Close the gray pressure-release valve on top of the cap between the blue and orange connector heads by turning it clockwise until it stops. Loosening it counter-clockwise opens the pressure-release valve.

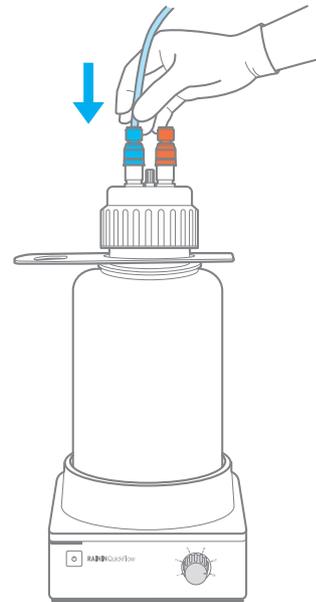
4. Unpack the handle and adapter kit to take the clear vacuum tubing out.



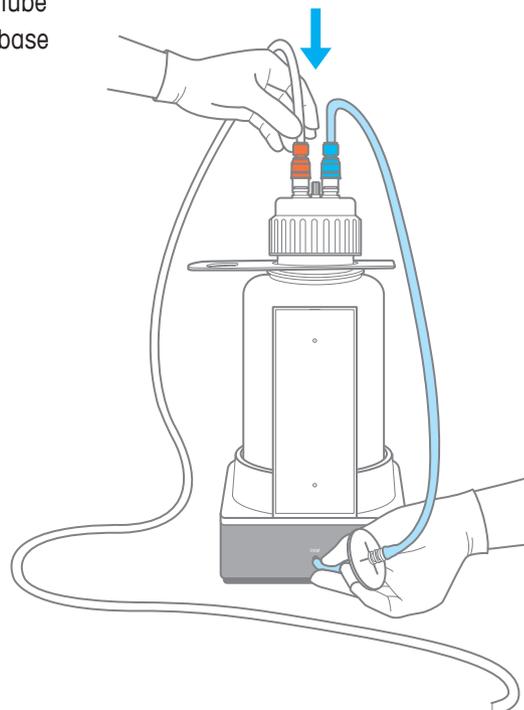
5. Attach the orange connector plug to one end of the clear vacuum tubing.



6. Attach the blue connector-plug end of the blue tube to the blue connector head by pushing it in firmly. Attach the orange connector-plug end of the clear tube to the orange connector head by pushing it in firmly.



7. Firmly push the filter-end of the blue airflow tube onto the port labelled "Inlet" on the rear of the base unit. The filter picture points to the correct port.



4.5 Assemble the handle

1. Decide what length of the clear tubing you desire between QuickFlow and the handle (working end). Suggested length is not less than 1 meter.

At a desired length(s), cut perpendicularly across the tube with scissors.

2. Press the open end of the clear tube firmly and fully over the ridged extrusion on the tube-connecting end of the handle.

3. (Optional) Splitter – A splitter with additional QuickFlow handle, tube and adapters is sold separately.

QuickFlow supports a maximum of 2 operating channels at the same time. The splitter can be used to connect an extra tube.

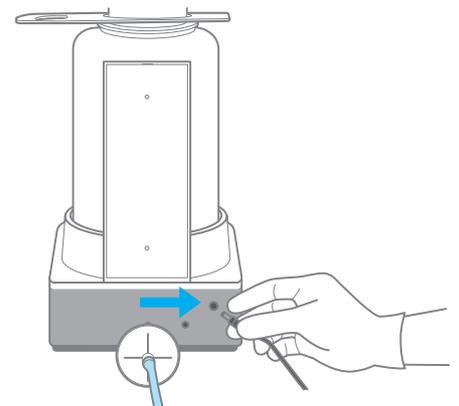
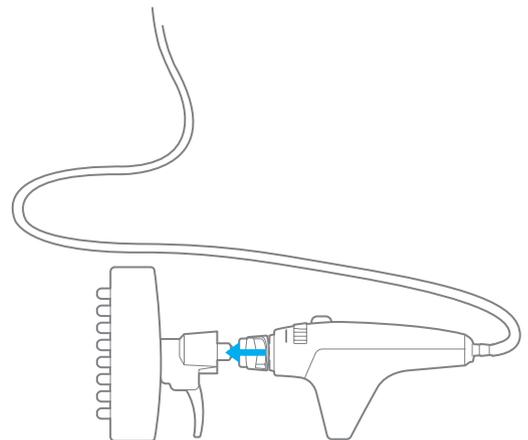
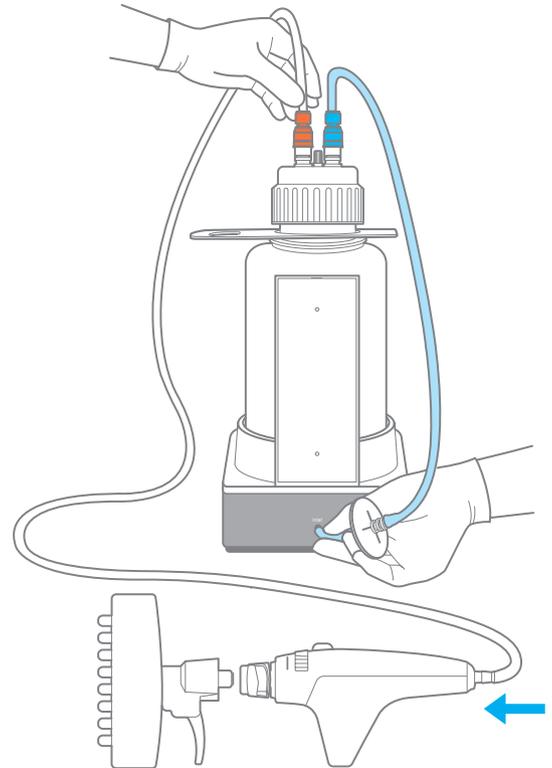
4. QuickFlow includes three different handle adapters (see Figure 2 on page 4) :

- Single-tip
- Multi-tip (8-channel)
- Glass/plastic Pasteur pipette

The Pasteur adapter fits most extended glass or plastic pipette tubes. This adapter and pipette combination allows more liquid to be aspirated with higher flow capacity, and deep vessels can be reached.

Snap an adapter to the handle by gently pressing and rotating it into position.

5. Insert power cord into the back of the base unit at the port marked "Power." Connect the other end to a power outlet.

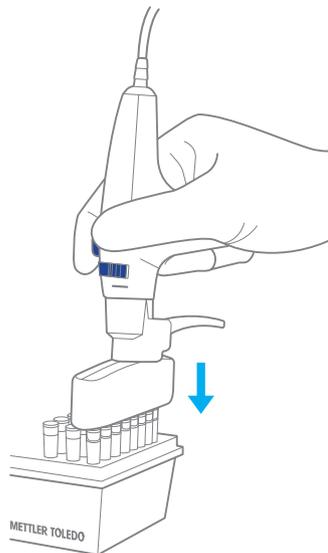
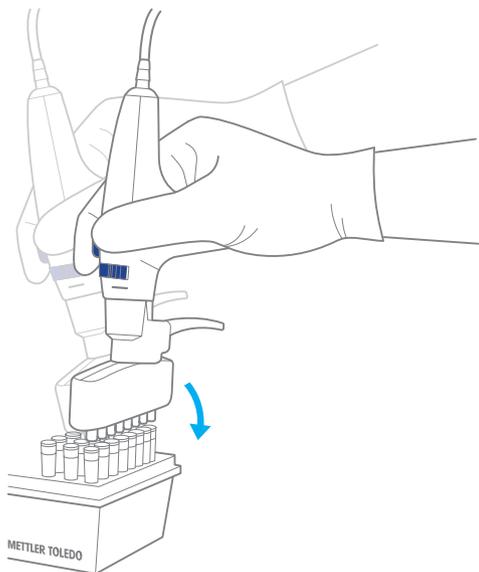


6. Load Rainin UNV 250 μ L tips or a glass (Pasteur) pipette onto appropriate adapter

NOTE: QuickFlow is designed for use with Rainin universal (UNV) tips. See page 20 for tip ordering information.

- Multi-tip (8-channel) adapter

As with a multichannel pipette, press the QuickFlow adapter nozzles into a row of 8 tips with sufficient force to make a good seal.

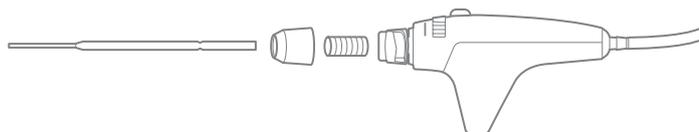


- Single-tip adapter

Press the adapter into pipette tip with sufficient force to make a good seal

- Pasteur pipette adapter

Insert the glass or plastic pipette tube into the open end of the adapter.



5 Operation

Operating Conditions

Keep the machine in the laboratory on the work bench or on another flat surface such as a table or the floor.

QuickFlow's operating temperature range is 0 °C to 40 °C.

Optimal operation is below 2000 m elevation.

5.1 Continuous or Non-continuous aspiration

Continuous aspiration

Continuous (always-on) aspiration offers more relaxed operation by bypassing the on/off button on the handle.

To select Continuous aspiration mode, move the sliding switch at the front of the handle to the left. A solid line indicates Continuous operation.

Turn aspiration on or off at the base by pushing the Power button.

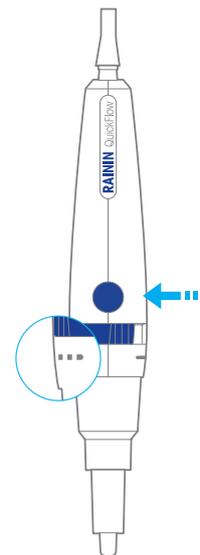
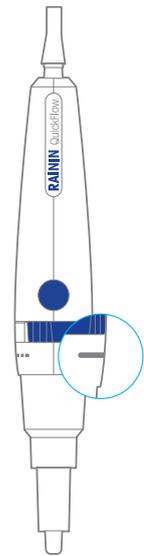
Non-continuous aspiration

If your aspiration task requires pinpoint on/off control, you can activate and deactivate the vacuum action by pressing the button on the handle. This is Non-continuous aspiration.

To select Non-Continuous aspiration, move the sliding switch at the front of the handle to the right, where a dotted line indicates Non-Continuous operation.

Turn on QuickFlow by pushing the Power button on the front of the base unit.

Then, press the button on top of the handle to aspirate. Release the button to halt aspiration.

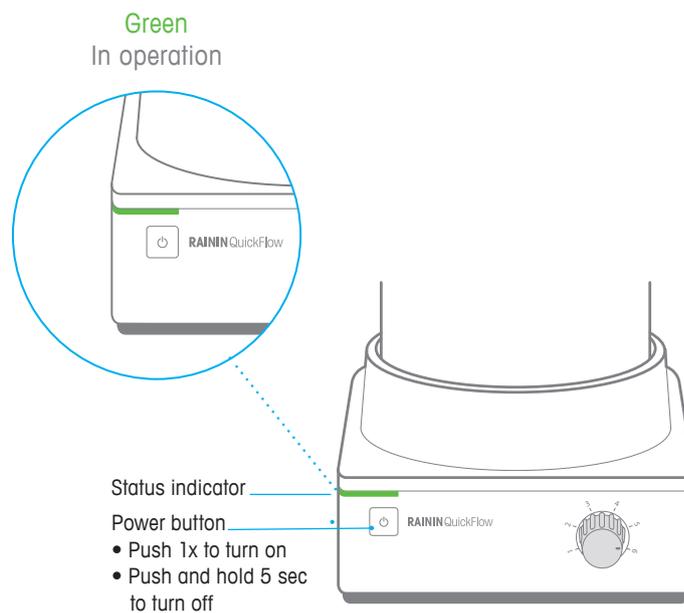


5.2 Power up and turn off QuickFlow

WARNING

To reduce the risk of electric shock, use only the supplied power cord at the rated line voltage when connecting the QuickFlow to your electrical power supply. Do not modify the power cord in any way or plug it into an ungrounded power outlet.

1. Make sure the QuickFlow power indicator light is off/dark.
2. Press the power button for one second to power up the machine.
The indicator light turns green. A slightly audible working pump sound is normal.

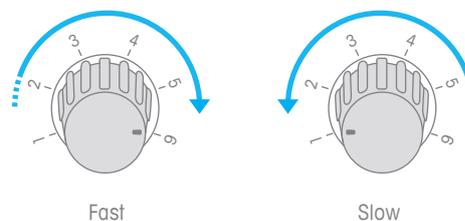


5.3 Adjust Vacuum Speed

On the QuickFlow base unit, the speed knob rotates from 1 (slow) to 6 (more rapid). Maximum speed is 17 mL/s.

Clockwise rotation speeds up aspiration, and counter-clockwise slows it down.

NOTE: QuickFlow may stop temporarily to reset system air pressure.



A high vacuum pressure within the collecting bottle may interfere with speed control. If this happens, either:

- Rotate the gray pressure-release valve on top of the cap counter-clockwise to equalize pressure within the bottle, or
- Use the handle to momentarily aspirate air.

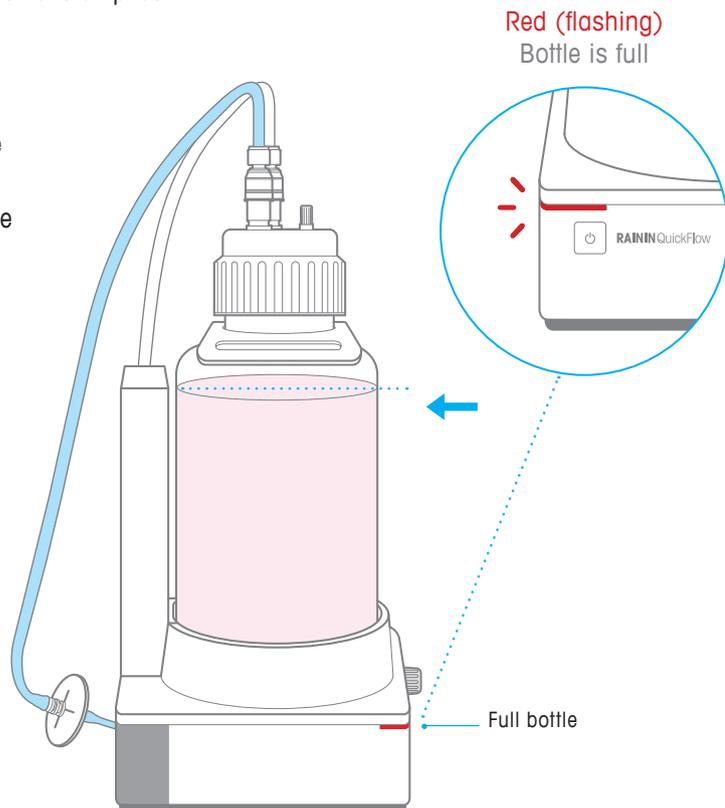
5.4 Full bottle: Level sensor and liquid level alert

When the collecting bottle is full, the level sensor turns off the pump and alerts the user to empty the bottle.

The pump is disabled until the bottle is emptied.

WARNING:

When working with liquids at higher than ambient temperature or with liquids that tend to foam, the maximum liquid level may be reduced.



5.5 Eject tips or remove Pasteur pipette

NOTE: Tips or Pasteur pipettes (glass/plastic) cannot be removed when vacuum flow is on.

If using Continuous aspiration mode, either turn off QuickFlow or switch to Non-Continuous mode.

The ergonomic trigger design make it easy to discard tips. Pull trigger using whichever finger is most comfortable.

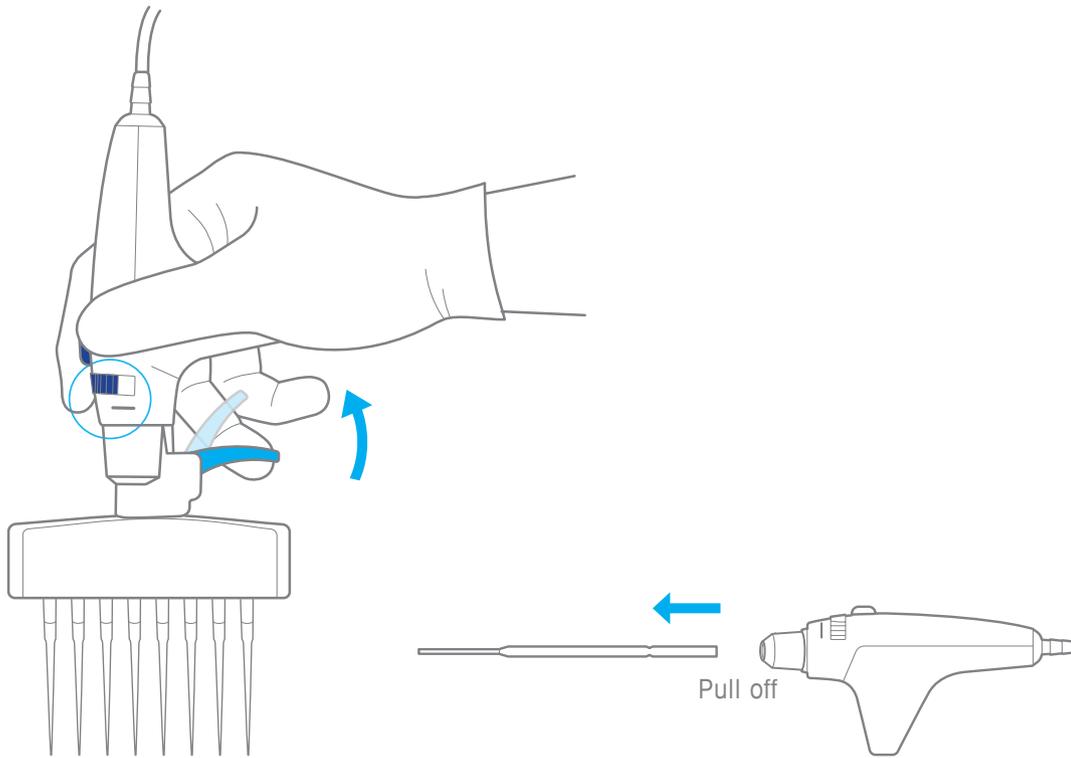


Figure 3: Ejecting Tips or removing the Pasteur pipette

6 Cleaning and Maintenance

To keep QuickFlow performing optimally, aspirate water or a low-concentration ethanol or bleach solution as the last step of any aspiration cycle. Empty and clean the bottle daily, or as needed.

6.1 Emptying the bottle

1. Turn off QuickFlow by pressing the Power button on the front of the base unit for five (5) full seconds.
2. Turn the gray pressure-release valve on top of the bottle cap counter-clockwise to equalize pressure in the bottle.
3. At the top of the collecting bottle, the blue and orange quick connectors join the tubes to the bottle. When a connecting collar is pulled down, spring forces will lightly "pop" a tube from a connector. To prevent liquid splashing or spilling from the tube, hold the connector-end of the tube in one hand while pulling down the connecting collar with the other hand. Repeat to disconnect both tubes.
4. Using the metal handle beneath the cap of the bottle, lift the bottle to transport to the liquid disposal location.
5. Unscrew cap to empty the bottle. Always follow your lab's policy for a safe liquid media disposal.

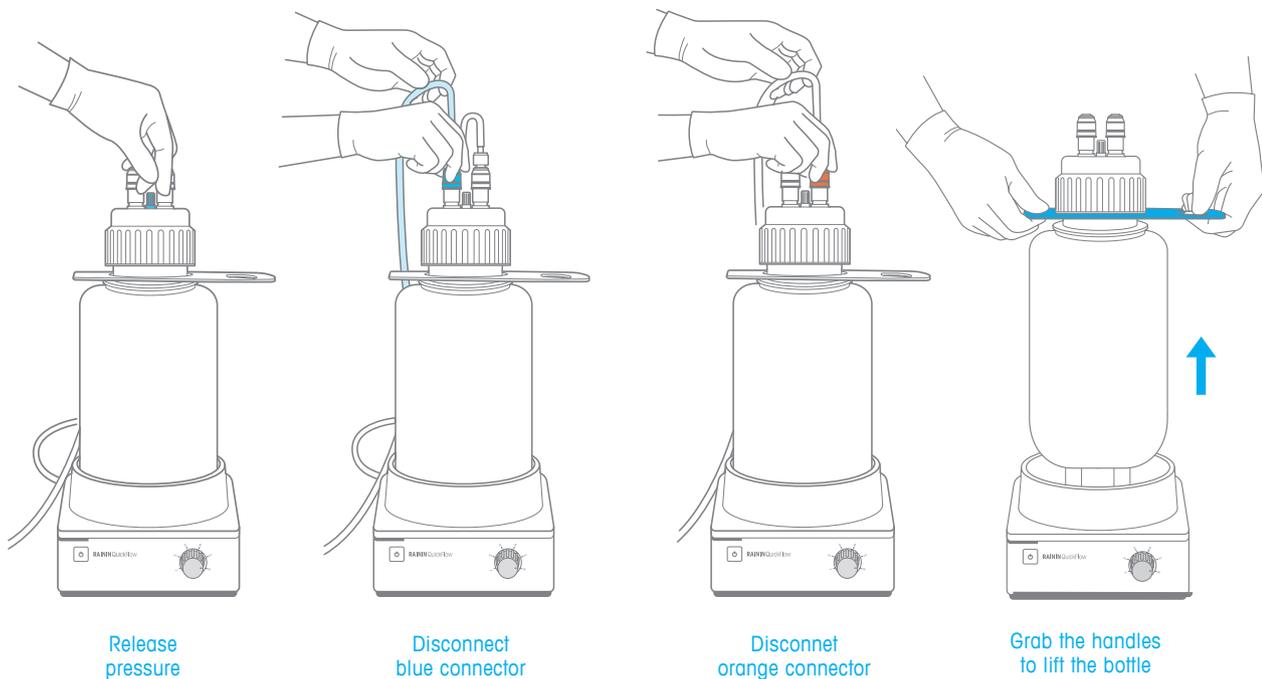


Figure 4: Emptying the bottle

6.2 Cleaning the handle, adapter, bottle and cap

The QuickFlow handle, adapters, cap and collecting bottle are easily cleaned in mild soapy water. These parts may be more thoroughly decontaminated using cleaning agents best matched to the aspirated liquid, such as alcohol (70%) or bleach (10%) solutions.

NOTE: Extra o-rings for adapters are provided with QuickFlow for replacement as needed.

6.3 Cleaning the clear vacuum tube

1. Place the empty bottle onto the QuickFlow base unit and screw on the cap with connectors.
2. Connect both tubes to the cap.
3. Select a cleaning agent based on the substance to be removed from the tube: for example, 10% bleach solution (proteinaceous liquids) or 70% alcohol (aqueous liquids), and pour the cleaning agent into a reservoir.
4. Aspirate the cleaning agent for 20 seconds to clean the tube. Ensure proper ventilation and wear personal protective equipment whenever solvents are in use.
5. Disconnect tubes and empty the collecting bottle and rinse with water.

6. Place the empty bottle back on the QuickFlow base unit, screw on the cap, connect the tubes, and aspirate distilled water for 20 seconds to rinse the handle and tube.

7. Disconnect tubes and empty the collecting bottle.

6.4 Autoclaving

The QuickFlow handle, tubes, adapters, cap and collecting bottle may be autoclaved at 121 °C, 1 Bar, for 15-20 minutes.

NOTE: Cap and collecting bottle must be separated before autoclaving.

IMPORTANT: To autoclave the handle, move the switch to Non-Continuous mode (dotted line) to keep it at optimum performance.

Do not autoclave the entire machine or any other parts of the machine.

7 Spare parts and accessories

Check with your local sales rep for a full list of QuickFlow spare parts and accessories.

7.1 Filter (blue vacuum inlet tube)

If liquid splashes into the vacuum inlet tube, the filter will protect the machine.

If the filter is blocked, disassemble and spin-dry it for reuse. If a filter is destroyed, disassemble it and replace with a new one.

Pay attention to filter direction when reassembling. The side with indicator "IN" connects toward the bottle.

7.2 Handle hang-up

When QuickFlow is not being used, you can secure the handle on a nearby flat vertical surface using the handle hang-up.

Remove the adhesive backing and attach the hang-up to a nearby surface. Then, insert the QuickFlow handle as shown.

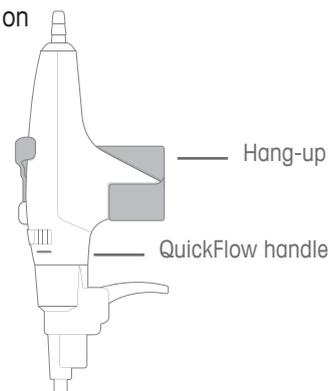


Figure 5: Mounted hang-up with handle resting inside it

8 Specifications

	Description
Max. aspiration speed	17 mL/s (with aspiration pipette)
Vacuum range	-20KPa – -70KPa
Power adapter input	100 – 240 VAC, 50/60Hz
Device power input	24V DC / 0.625A
Dimensions (H*W*D)	460 x 200 x 400 mm
Weight	4.016 kg (base unit, bottle and accessories)
Shipping weight	5.6 kg (includes packaging)
Max. liquid volume	4L
Tube diameter	4 mm (inner), 8 mm (outer)
Tube length	2 m
Operating range (°C)	0 to 40 °C, Max. 85% RH (non-condensing)
Storage range (°C)	-30 to 60 °C, Max. 95% RH (non-condensing)
Power supply	Model: PSA 15R-240P
(Manufacturer information)	Manufacturer: PHIHONG Manufacturer address: Keji Road Yinhu Industrial Park, Qingxi Town Dongguan City, Guangdong Province, China

9 Troubleshooting

Before performing any troubleshooting, remember to turn off the QuickFlow completely and remove the power adapter from the instrument.

Problem	Probable cause	Remedy
Device doesn't run	Power switch is off	Press the switch and turn on the device.
	Power not connected	Plug the power adapter and turn on.
	Defective main PC Board*	See disclaimer below.
Pump keeps running	Air leakage	Ensure the cap is tightly closed. Ensure the handle is on non-continuous mode (with switch moved toward dotted line). Ensure the pressure-release valve is closed. Ensure the connecting tubes are airtight at all connection points.
	Defective pump*	See disclaimer below.
	Defective main PC Board*	See disclaimer below.
Slow aspiration	Aspiration speed is set to minimum	Rotate the speed control knob clockwise to set faster speed.
	Blocked tubes	Check the tubes and clean. Replace if needed.
	Blocked filter	Empty the bottle and replace the filter.
	Air leakage	Ensure the cap is tightly closed. Ensure the pressure-release valve is closed. Check the tube connectors and ensure they are tight.
	Defective pump*	See disclaimer below.
False full bottle alerts	Inside wall of the bottle is dirty	Clean the bottle with a cleaning agent such as soapy water, 70% alcohol or a 10% bleach solution.
	Electromagnetic interference disturbs the level sensor	Identify and remove source of electromagnetic interference.
	Viscous or bubbly liquid	Move bottle as far forward as possible on the base unit.
	Liquid splashes on the inside bottle wall	Check whether the tube inside the cap is bending; keep the tube straight.
	Defective sensor*	See disclaimer below.
Power malfunction	N/A	Immediately turn off the instrument, unplug the power adapter from the instrument and contact Technical Support or your local METTLER TOLEDO Service Organization.
		NEVER open the instrument cover and attempt to troubleshoot this power problem. For more information, see Section 2.1 on page 5.

* If any of these occur, please immediately turn off the instrument, unplug the power adapter and contact Technical Support or your local METTLER TOLEDO Service Organization. See page 22 for contact information.

10 Incompatible chemicals and agents

QuickFlow should not be used to aspirate full strength corrosive chemicals.

11 Ordering information

Part Number	Description
30519826	Aspirator, QuickFlow 4L
30519824	QuickFlow Handle Kit – Standard
30519825	QuickFlow Handle Kit – w/ Splitter
QuickFlow Accessories	
30524505	Bottle kit, QuickFlow 4L
30524507	Accessory: Handle Hang-up
30520489	2 µm Filter – w/ Tubing
Rainin Universal Tips for QuickFlow	
30389191	250 µL Universal (UNV) Tips in RT-racks
30389193	250 µL Universal (UNV) Tips in RT-racks – Sterilized
17014976	250 µL Universal (UNV) Tips in TerraRack™ – Sterilized

12 Warranty

Limited Warranty and Limitation of Liability

Seller warrants the merchandise to conform to specifications. Under no circumstances shall Seller be responsible for alleged nonconformities with respect to any merchandise which has been used for purposes or in any manner for which it was not intended, or any merchandise which has been customized or modified without Seller's prior written consent, or damaged or misused. As Buyer's exclusive remedy in the event of breach of warranty, Seller shall repair or replace, as its option, any nonconforming merchandise or parts thereof for a period of one (1) year after delivery. All claims must be made in writing to the Seller. Any claims not made within the period specified above shall be deemed waived and released.

The provisions of the foregoing warranties are in lieu of any other warranty, whether express or implied, written or oral (including any warranty of merchantability, fitness for a particular purpose, title or non-infringement). Seller's liability arising out of the manufacture, sale or supplying of a product or its use or its disposition, whether based upon warranty, contract, tort or otherwise, shall not for any reasons exceed the aggregate purchase price paid by buyer for such product. In no event shall seller be liable to buyer or any other person or entity for special, incidental, consequential or exemplary damages (including but not limited to damages for loss of profits, loss of data or loss of use) arising out of the manufacture, sale, supply, use, marketing, resale or operation of the merchandise, even if seller has been advised of the possibility of such damages or losses.

Contact information

China: Phone: 4008 878 989

Email: mtservice@mt.com

North America/ Technical Support: Phone: 800 662 7027

E-mail: tech.support@rainin.com

RoW: www.mt.com/contacts

FCC Statement

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. CAN ICES-3(B)/NMB-3(B)

See Section 5 - Specifications for information on electrical power rating and power cord selection.

www.mt.com/rainin

For more information

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