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TIANGEN BIOTECH (BEIJING) CO., LTD

Version No.: OS190801

TGet Electronic Pipette
User's Manual

Cat. No.	Product Name
OSE-EP	TGet Electronic Pipette

Content

Precautions

○ Please read the instructions carefully and use the product in strict accordance with the instructions.

○ Use within the chemical corrosion resistance limit of the product.

○ Do not pipette highly flammable liquid.

○ If the temperature of the sample and pipette tips are different from that of the pipette, there may be deviation in the results of the pipette, so the temperature of the three should be maintained the same.

○ Do not use this product in the area of gas with explosion risk.

○ Do not use or disassemble the product with brute force.

○ If the instrument fails to operate normally, stop the operation immediately and refer to the fault analysis section.

○ The operating temperature shall be kept between 15°C and 40°C, and the relative humidity shall be below 80%.

○ Please properly place the pipettes, chargers and other objects to avoid accidental falling and damage.

(3) Disinfection

The tip ejector of the TGet Electronic Pipette is made of corrosion-resistant and high temperature resistant materials, which can be sterilized under high temperature and high pressure. After cleaning the removed tip ejector, disinfect it at 121°C, 1 bar for 20 min. After sterilization, cool at room temperature for at least 2 hours before using. The instrument is made of anti-aging material, which can be sterilized under ultraviolet without dismantling.

2. Replace the battery

When the battery power is insufficient or the battery is lost, so that the pipette can not work, please connect the charging cable in time to charge or replace a fully charged new battery. When replacing the battery, please pay attention to the positive and negative directions of the battery. After replacing the battery, please turn on the machine and check whether the pipette can work properly.

Tip: after replacing the battery, the main interface and system parameters will be restored to the default settings.

3. Storage

Daily storage: after use, please hang the pipette vertically on the pipette rack. Do not place the pipette horizontally or upside down when there is liquid in the tip of the pipette, , so as to avoid liquid backflow corroding the piston.

When the pipette is not used for a long time, please take out the battery, and then store the cleaned and sterilized pipette in dry, clean place under room temperature. Avoid placing in the environment with large temperature change, high humidity and large amount of dust.

Product Description

TGet Electronic pipette can automatically pipette liquid based on the principle of air piston replacement. It can reduce the risk of manual pipetting error, and is capable of performing the functions which manual pipette can't achieve, such as multiple dispensation and measurement of liquid with unknown volume, making it an ideal pipette in the laboratory.

It is easy to operate, with the ergonomic design and a flexible knob to quickly set the pipetting parameters. The 1.44-inch color screen clearly displays all kinds of liquid pipetting information. Various pipetting combination modes can be quickly changed by the simplified menu and the adjusting knob.

Product Specification

Cat. No.	Range (µl)	Maximum adjustable range (µl)	Plunger bottom color	Increment (µl)	Volume (µl)	Accuracy ±µl	Accuracy ≤%	Precision ±µl	Precision ≤%
OSE-EP-01	0.5-20	20.5	Green	0.1	2	0.24	12	0.12	6
					10	0.8	8	0.4	4
					20	0.8	4	0.4	2
OSE-EP-02	5-200	220	Blue	0.5	20	0.8	4	0.4	2
					100	2	2	1	1
					200	3	1.5	2	1
OSE-EP-03	50-1000	1050	Purple	1	100	2	2	1	1
					500	5	1	2.5	0.5
					1000	10	1	5	0.5
OSE-EP-04	100-5000	5100	Red	10	500	5	1	2.5	0.5
					2500	12.5	0.5	5	0.2
					5000	30	0.6	10	0.2

Packing List

Name	Quantity
Electronic Pipette	1
Charger	1
USB charging cable	1
Lithium battery	1
Grease	1
User's Guide	1
QC report	1
Certificate	1
Warranty card	1

Quality Assurance

The warranty period of TGet Electronic Pipette is 24 months. If the instrument is damaged due to the improper use and operation of the user, or is repaired or modified under unqualified conditions without authorization, it will not be covered by the warranty. For the repair of the instrument beyond the warranty period, TIANGEN will charge for the repair accordingly.

Instructions Before Use

1. Battery

(1) Precautions:

① It is strongly recommended to fully charge the battery before using this product.

② Please use the charger and battery combination provided by the original factory. It might cause damage to the pipette if other batteries and charging accessories are used, and the damage caused by this is not covered by the warranty.

③ Please charge the pipette indoors.

④ Do not put the battery together with metal and objects with metal surface to prevent short circuit of the battery.

⑤ Dispose the waste battery according to the local laws and regulations. Please classify it with the daily garbage.

⑥ Do not put the battery into the fire to prevent explosion.

⑦ If the pipette is not used for a long time, please take out the battery.

(2) Battery Specification:

Lithium battery: nominal voltage 3.7 V

Rated capacity: 800 mAH, charging limit voltage 4.2 V

Charging time: only 2 hours with the matching charger

(3) Charger specification:

Input: AC 100-240 V, 50/60 Hz, Max 0.15 A

Output: USB 5 V, 1 A

Charging: before the charger is connected to the power socket, please confirm whether the power socket is consistent with the input voltage of the charger. Then connect the charging line to the charger, connect the charging line to the charging socket on the top of the pipette, and connect the charger plug to the AC socket.

(4) Notes:

① When the power is turned on, the green and white flashing of the battery icon indicates that the battery is charging; the green indicates that the battery is full, and the red indicates that the battery is low. When the power is off, the screen is off and no icon is displayed.

② The battery has slight heating during charging, which is a normal phenomenon.

③ Please unplug the power supply after the battery is full as soon as possible .

④ It is recommended to replace the battery once every 2 years.

Cleaning steps:

① Rotate the tip ejector clockwise and remove it; wipe the tip ejector and the tip cone with a wet cloth stained with 70% ethanol, then rinsed with double-distilled water, and leave to dry.

② Turn the connecting nut at the bottom clockwise and take it off. A piston and O-ring can be seen inside. Generally, O-ring piston do not need to be cleaned. If there are solid particles, please wipe them off with clean dry cotton cloth.

③ Apply a thin layer of grease to the piston and O-ring.

④ Assemble the pipette according to the reverse steps of dismantling.

Liquid type	Anti pollution methods	Cleaning and maintenance methods
Waters and buffers		Remove the tip ejector of the pipette and wash the contaminated parts with double-distilled water, dry below 60 °C or air dry naturally and then apply a small amount of grease to the plug.
Inorganic acid or alkali	Use the pipette tips with filter	Remove the tip ejector of the pipette after pipetting, and keep in ventilation place. Wash the contaminated parts with double-distilled water, dry below 60 °C or air dry naturally and then apply a small amount of grease to the plug.
Infectious liquid	Use the pipette tips with filter	Remove the tip ejector of the pipette, and soak it in the routine disinfectant for 30 min, then wash with double-distilled water, and autoclave the contaminated parts at 121 °C, 1 bar for 20 min.
Cell culture	Use the pipette tips with filter	
Organic solvents	Pipette quickly	Remove the tip ejector of the pipette after pipetting, and keep in ventilation place. Wash the contaminated parts with double-distilled water, dry below 60 °C or air dry naturally and then apply a small amount of grease to the plug.
Radioactive solution	Use the pipette tips with filter	Remove the tip ejector of the pipette after pipetting, immerse the contaminated parts in the compound solution or special cleaning solution for 30 minutes, and then wash with double-distilled water, dry below 60 °C or air dry naturally and then apply a small amount of grease to the plug.
Nucleic acid or protein solution	Use the pipette tips with filter	For nucleic acid: Boil in aminoacetic acid or hydrochloric acid buffer (pH 2.0) for 10 min, then wash with double-distilled water, dry below 60 °C or air dry naturally and then apply a small amount of grease to the plug. For protein: Remove the tip ejector of the pipette and rinse with detergent, then wash with double-distilled water, dry below 60 °C or air dry naturally.

Problem	Reason	Solution
Noise during operation	Insufficient piston lubrication	Grease the piston evenly
	Foreign body on piston	Clean and grease the piston
	Loose of O-ring	Install O-ring correctly
Weak aspiration or unable to aspirate	Battery loss	Replace the battery
	Low battery	Charge the battery
Inaccurate dispensation of special liquid	Improper calibration, high viscosity liquid needs to be re-calibrated	Recalibrate with special liquid
	The liquid is volatile or has density obviously different from water	Pre-soak the tip or recalibrate
Tip falling off or difficult to mount	Mismatch of the tip and pipette (poor tip quality)	Use a suitable tip
	Tip damaged	Replace the tip with a new one

2. Leakage test

The leakage of pipette will directly affect the result of sampling and lead to the error of experimental results. Therefore, regular leakage test shall be conducted for the device.

Methods: after aspiring the liquid, suspend the pipette in the air and keep it vertically for 30 s, observe whether the liquid level drops and whether the liquid drips out from the tip. If so, it means that there is leakage in the pipette. Please refer to the chapter "Fault Analysis and Clearance " for solutions.

Note: for volatile liquid (such as most organic solvents), it may be the problem of saturated vapor pressure. You can first pipette up and down the liquid several times, then pipette the liquid again.

Maintenance and Service

1. Cleaning and disinfection

In order to ensure the accuracy and precision of the pipette, regular maintenance should be carried out according to the usage condition. Especially after pipetting corrosive solvent, the pipette should be cleaned. Through simple cleaning and maintenance, the service life of the pipette can be extended properly.

Note: please take out the battery before cleaning or disinfecting.

(1) External cleaning

Methods: according to the usage, wipe the surface of the pipette with a wet cotton cloth stained with 70% ethanol to remove the external dirt, then wipe it with double-distilled water and dry it. Before starting work every day, check whether there is dust or dirt on the surface of the pipette, especially the tip connection mouth area.

(2) Internal cleaning

2. Battery Installation

3. Mounting and ejection of the pipette tips

(1) Mounting of pipette tips:

Please select a matching tip before mounting. Insert the pipette vertically into the pipette tip, rotate left and right for half a circle, and tighten it. It is not recommended to mount the tip by striking it, for long-term operation will make the parts of the pipette loose so as to damage the pipette.

(2) Moistening the tip:

Before the formal pipetting, please first aspirate and dispense the liquid for 2-3 times to make the tip fully wet and reduce the pipetting error.

(3) Ejection of the tip:

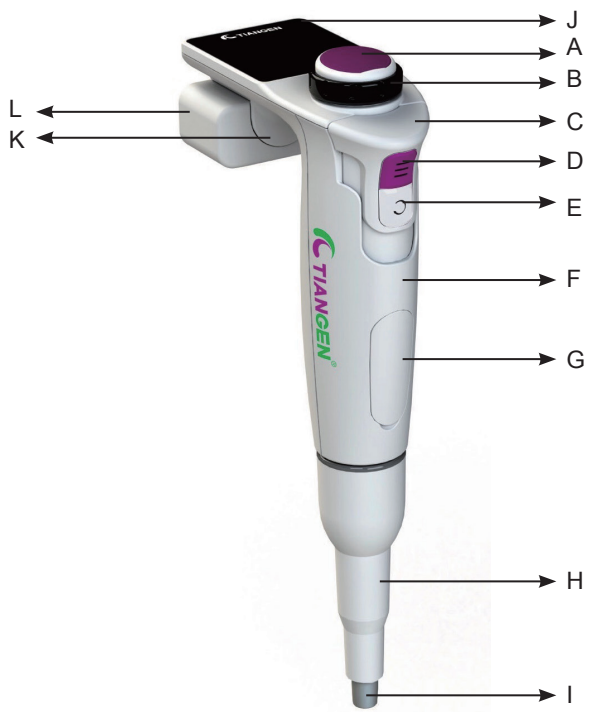
Press the tip ejector button to dispose the tip into a waste container (see the schematic diagram of the instrument).

(4) Precautions:

① Do not pipette any liquid before the pipette is installed with a pipette tip.

② It is recommended to use tips with filter.

Instrument Diagram



A: Plunger key (Enter/Start key)	G: Handwrite label slot
B: Adjusting knob	H: Tip ejector
C: Tip ejector button	I: Tip cone (stainless steel)
D: Toggle key	J: LCD screen (tempered glass surface)
E: Speed adjustment key	K: Hand support
F: Hand grip	L: Rechargeable battery

Fault Analysis and Clearance

1. Troubleshooting

Problem	Reason	Solution
Piston anomaly	Piston installed too tight	Refit the piston
	Insufficient piston lubrication	Grease the piston
	Piston surface grease solidification	Clean the old grease and put on new grease
	There are foreign body or damage on piston surface	Clean or replace piston
	There are impurities and particles within the piston, O-ring and tip ejector	Clean and lubricate O-rings and the tip ejector
	Damage of the O-ring	Replace O-ring
Inaccurate pipette volume or leakage	Improper installation of the tip	Re-mount the tip
	Mismatch of the pipette and tip (poor tip quality)	Clean the tip cone and replace a proper tip
	There are impurity particles between the tip coneand tip	
	Damage of the tip	Replace the tip with a new one
	Too fast pipetting	Adjust the pipette speed to low
	The tip leaves the liquid level too fast	When pipetting viscous and bulky liquid, stay for a few seconds before moving away from the liquid level
	There are foreign body or damage on piston surface	Clean or replace piston
	There are impurities and particles within the piston, O-ring and tip connecting mouth	Clean and lubricate O-rings and tip connecting mouth
	Insufficient lubrication of O-ring and piston	Apply grease evenly
	Damage of the O-ring	Replace O-ring
	Incorrect operation	Please follow the instructions
Residual liquid in the tip	The mode with replenishing liquid is selected	Press the plunger key to blow off theresidual liquid
	Mismatch of the tip and pipette (poor tip quality)	Use a suitable tip
	Improper mounting of the tip	Re-mount the tip
	High adsorption of the tip	Replace to a low adsorption tip
	Excessive viscosity of liquid	Select reverse transfer mode, pre-soak the tip, and slow down the pipetting speed

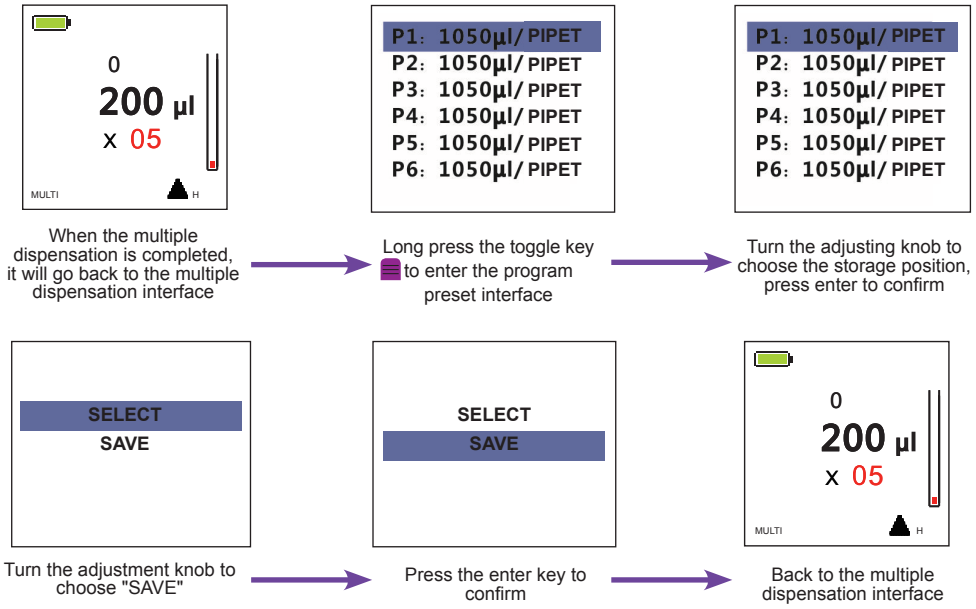
8. Program preset

Users can set up 6 pipette programs according to their needs, which can be edited, saved and invoked.

(1) Save preset program

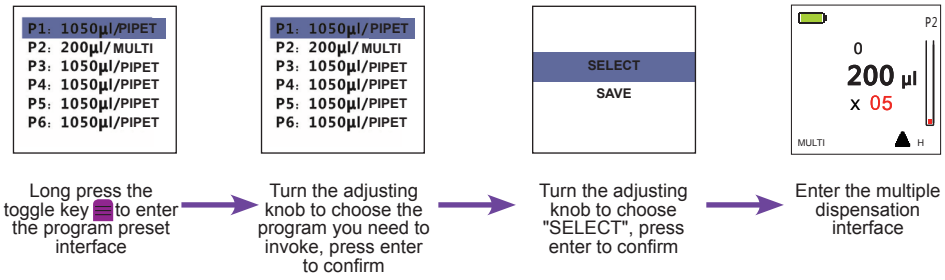
For example, set the dispensation to 5 times, 200 μl each time.

The specific steps are as follows:



(2) Invoke the preset program

When the program is saved, you can invoke the program by the following steps:



M: Charging socket N: Power switch

O: Battery indicator P: Pipette volume

Q: Navigation bar

R: Speed indicator S: Pipette status

Plunger key (Enter/Start key):

It is responsible for liquid aspiration and dispensation on the pipette main interface. It is the confirmation key in case of confirmation needs. In standby mode, it can wake up the system.

Adjusting knob:

Turn clockwise to increase the volume and counter clockwise to decrease the volume. In the automatic aspiration mode, after aspirating the liquid, turn the adjustment knob to enter the quick dispensation mode.

Toggle key:

It can be freely switched in automatic, manual and multiple aspiration mode, and the multiple dispensation mode. In the manual and multiple aspiration mode, press the toggle key to stop aspirating and switch to dispensation mode.

Speed key:

In the state of pipetting, it is responsible for changing the pipetting speed. It has high, medium and low gears. In the fast and multiple dispensation mode, long press the speed key to change to direct dispensation.

Battery indicator:

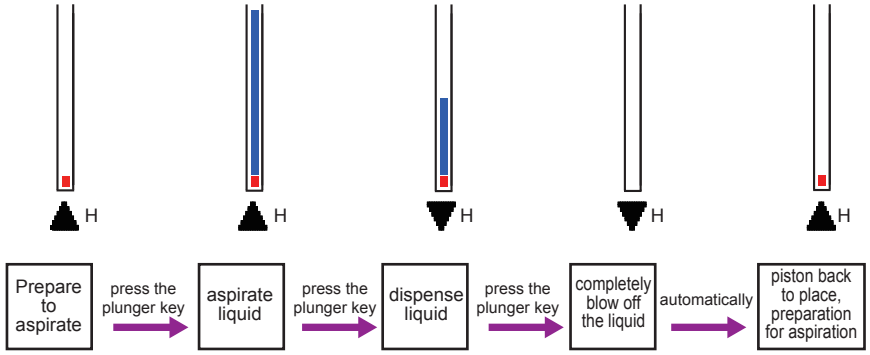
Green stands for full power state; red stands for low power state which indicates the battery needs to be charged in time.

Pipette status:

▲ Is liquid aspiration state

▼ Is the liquid dispensation state

Navigation bar of liquid volume (take high-speed aspiration and dispensation as an example)



Turn the adjusting knob to set the aspiration volume as 110 μl, press the plunger key to aspirate; turn the adjusting knob to set the first dispense volume as 100 μl, press the plunger key to dispense 100 μl, and then press the plunger key to dispense the remaining 10 μl to complete the pipetting.

4. Unequal liquid dispensation

Aspirate the liquid once and dispense several times, and the volume of each dispensation is not equal. For example: if the first dispensation is required to be 100 μl, and the second one is required to be 200 μl, the third one is 300 μl and the fourth one is 400 μl, just aspirate 1050 μl and dispense one by one, with 50 μl as the replenishment volume. The specific steps are as follows:

Turn the adjusting knob to set the total amount of liquid aspiration to 1050 μl, press the plunger key to aspirate liquid, and turn the adjusting knob to set the first liquid dispensation volume to 100 μl, press the plunger key to dispense 100 μl; turn the adjusting knob to set the second liquid dispensation volume as 200 μl, and press the plunger key to dispense 200 μl; turn the adjustment knob to set the third liquid dispensation volume as 300 μl, press the plunger key to dispense 300 μl; turn the adjustment knob to set the fourth dispensation volume as 400 μl, press the plunger key to dispense 400 μl. Then press the plunger key again to empty the tip, and complete the liquid pipetting.

5. Dispense the liquid equally after manual aspiration

It can be used to control the liquid aspiration flexibly and divide the liquid equally for unknown volume liquid, such as the stratified liquid in a centrifugal tube. The specific steps are as follows:

In the manual aspiration mode, press the plunger key to aspirate. After aspiration, press the toggle key to switch to the dispensation state. Turn the adjustment knob to set the single liquid dispensation volume. Press the plunger key to dispense the liquid. Repeat the dispensing until all the liquid is fully dispensed.

6. Unequal liquid aspiration

Unequal aspiration is an operation in the multiple aspiration mode. The system defaults the multiple aspiration to equal aspiration. If unequal volume liquid needs to be aspirated, please change the aspiration volume while aspirating. For example, to aspirate 100 μl of sample A, 150 μl of sample B, 200 μl of sample C and 250 μl of sample D, the specific steps are as follows:

Under the multiple aspiration mode, turn the adjusting knob to 100 μl, press the plunger key to aspirate sample A, and turn the adjusting knob to 150 μl, press the plunger key to aspirate sample B, repeat the above operations to aspirate sample C and sample D, and press the toggle key to switch to dispensation state, press the plunger key to empty the tip and complete the pipetting.

7. Gel loading pipette

This pipetting mode is carried out under the automatic liquid aspiration mode, the operation method is the same as the automatic liquid aspiration, and the liquid aspiration and dispensation speed should be set to low. The specific steps are as follows:

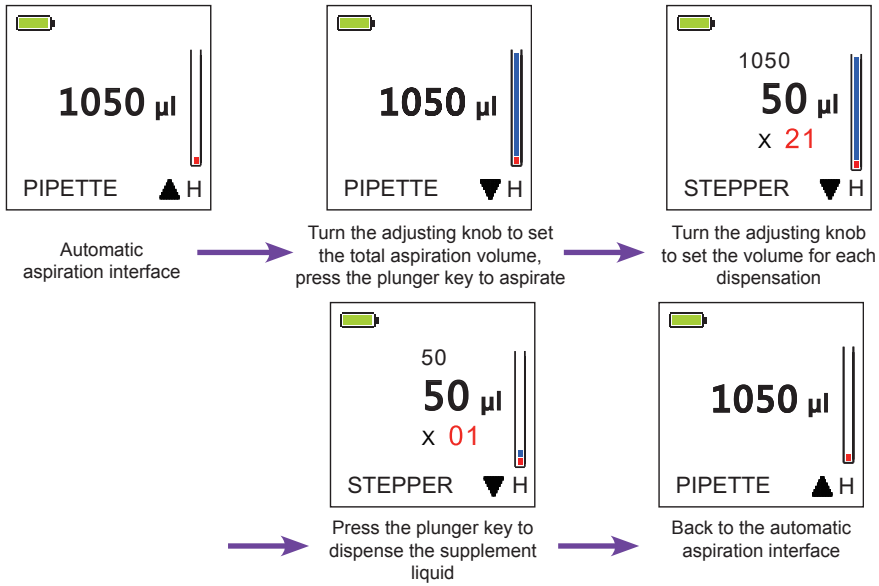
Under the automatic aspiration mode, turn the adjusting knob to set the aspiration volume, press the speed to adjust the aspiration speed to a low level, press the plunger key to aspirate the liquid. Press the speed key to adjust the dispensation speed to a low level, press the plunger key to dispense the liquid and complete the pipetting.

Other Operation Instructions

The pipette adopts an open and user-friendly operating system. By the combination of four basic pipette modes, a variety of pipette combinations can be matched. Here are some commonly used pipette combinations.

1. Quick dispensation

This combination of pipette mode is on the basis of automatic aspiration, which is to dispense equal volume liquid separately. The specific operation is as follows (take 50-1000 μl pipette as an example, if the liquid needs to be dispense into 20 aliquots with 50 μl each time, 1050 μl will be automatically aspirated, of which 50 μl is used as replenishment. Set the dispensation volume of each time as 50 μl and dispense in 21 times):



Hint:

The system will not automatically reserve replenishment liquid during quick liquid dispensation. Users can set the volume of replenishment liquid according to the actual total aspiration volume, which is about 5% - 10% of the total volume of liquid aspiration.

2. Mix

In the automatic aspiration mode, when dispensing, long press the plunger key, and the liquid will be automatically aspirated and dispensed for 5 times, so that the liquid inside the tip and the liquid outside the tip are fully mixed.

3. Reverse aspiration

For viscous or volatile liquid, when aspiring liquid, more supplementary liquid should be aspirated, and the target liquid amount will be first dispensed before the residual liquid. To pipette 100 μl of liquid, aspirate 110 μl, dispense 100 μl first and dispense 10 μl for the second time. The specific steps are as follows:

Tip: the electronic pipette has an automatic reset function. After blowing off the liquid, lift the pipette above the liquid level to prevent the liquid from being aspirated back in the process of automatic reset of the piston.

Basic Operating Instructions

1. Start

Power on: turn the power switch to the left to the ON position.

Shutdown: turn the power switch to the right to OFF.

Standby: if the pipette is not operated for 2 minutes, it will be automatically standby. Press the Enter key to resume use.

2. Mode switching

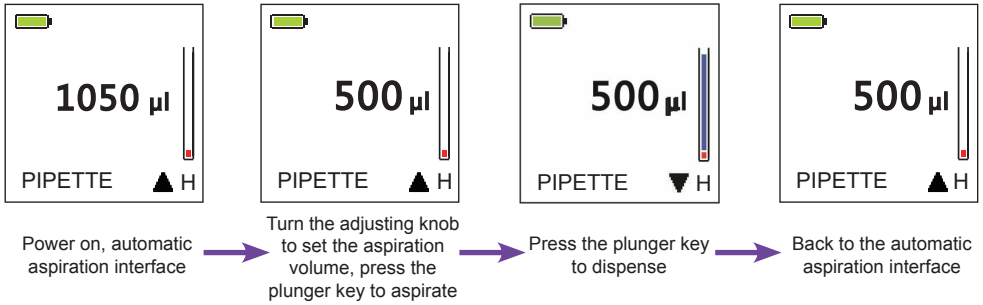
This pipette has four basic pipette modes: automatic liquid aspiration (PIPETTE), manual liquid aspiration (MANUAL), multiple liquid aspiration (ASPIRATE), and multiple liquid dispensation (MULTI). Press the toggle key to switch freely among the four basic pipette modes.

Automatic liquid aspiration interface | Manual liquid aspiration interface | Multiple liquid aspiration interface | Multiple liquid dispensation interface

3. Basic pipette operation

(1) Automatic aspiration

The volume set for automatic aspiration is equal to the actual volume, which is commonly used for general pipette operation. It has the function of automatic purging and can effectively avoid liquid residue. The specific operation is as follows (take 50-1000 μl pipette as an example):



Note:

① During the aspiration process, the tip should not touch the bottom of the container to avoid affecting the accuracy of the tip.

② After the aspiration of liquid, pause for a little while, and then move the tip away from the liquid level: for liquid below 1000 μl, stay for 1 s; for liquid above 1000 μl, stay for 3 s.

③ When pipetting the liquid with viscosity or density greater than water, it is recommended to pre-soak the tip with the same liquid for 3-5 times before formal aspiration.

④ When using the pipette with smaller range, the tip shall be immersed 3 mm below the liquid level; for pipette with larger range, the tip shall be immersed 5 mm below the liquid level.

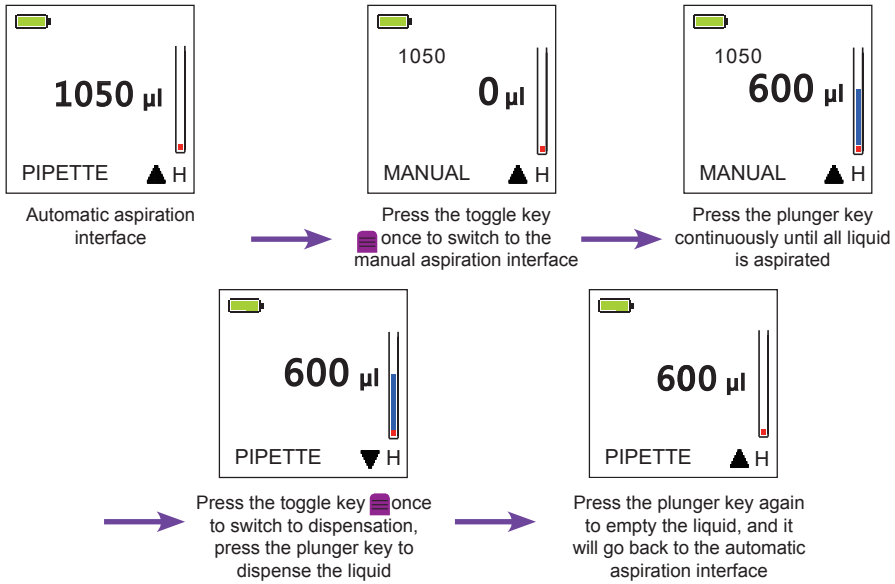
(2) Manual aspiration

In this mode, aspiration and dispensation operation is completed manually. There are two situations:

① If the target volume is known, the specific operation is as follows (take 50-1000 μl pipette as an example):

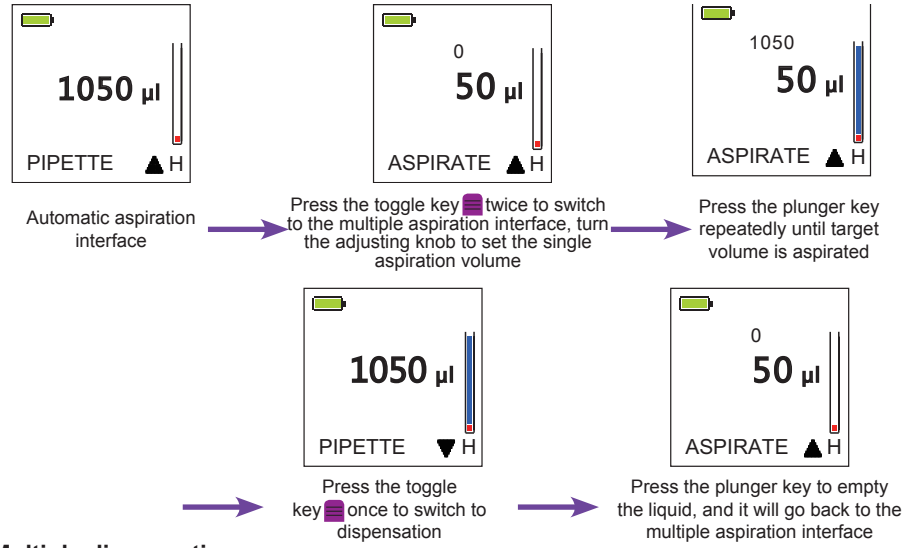
Under the automatic aspiration interface, press the toggle key once to switch to the manual aspiration interface, and turn the adjustment knob to set the liquid aspiration volume. Long-press the plunger key to aspirate the liquid to the target volume, then long press the plunger key to dispense the liquid, press the plunger key again to empty the liquid, and it will go back to the manual aspiration interface.

② For unknown target volume (such as supernatant), the specific operation is as follows (take 50-1000 μl pipette as an example):



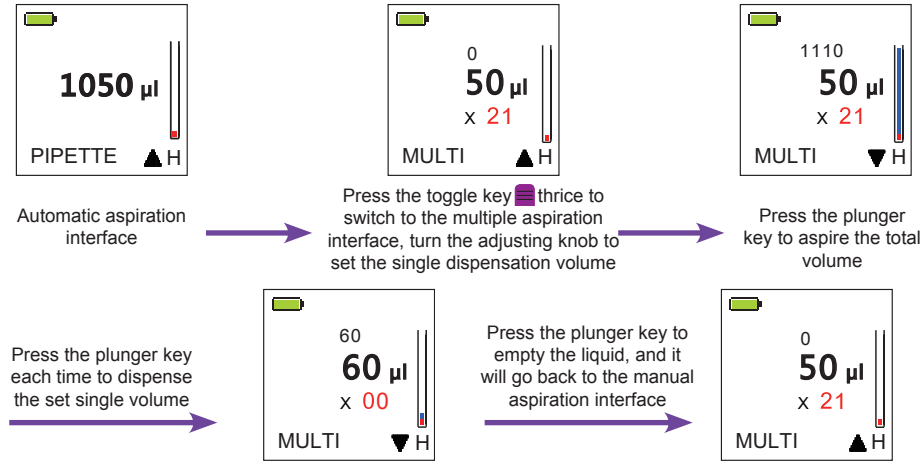
(3) Multiple aspiration

In this mode, you can set to aspirate equal volume or unequal volume of solution respectively, and then dispense in one press. The specific operation is as follows (take 50-1000 μl pipette as an example, aspirate 50 μl of different liquids in equal volume for 21 times, and then dispense 1050 μl at one time):



(4) Multiple dispensation

In this mode, the user sets the volume of each liquid dispensation, and the system automatically calculates the number of liquid dispensation according to the maximum range. When aspirating, the total volume (including the replenishment liquid calculated by the system) shall be aspirated at one time, and the liquid shall be dispensed in several times according to the set value. Specific operations are as follows (take a 50-1000 μl pipette as an example, set 50 μl for each liquid dispensation, which can be divided into 21 times. 1110 μl is aspirated, of which 60 μl is the replenishment volume that's included in the total number of liquid dispensation):



Tips: For 0.5-20 μl pipette, the default volume of replenishment is 2 μl.
For 5-200 μl pipette, the default volume of replenishment is 10 μl.
For 50-1000 μl pipette, the default volume of replenishment is 60 μl.
For 100-5000 μl pipette, the default volume of replenishment liquid is 300 μl.