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Instruction Manual

1. PRODUCT DESCRIPTION

This pipette is a general purpose pipette for sampling and dispensing accurate liquid volumes. The pipettes operate on the air displacement principle and use disposable tips. The black tip cone can be sterilized (121℃,0.15Mpa).

The pipettes cover a volume range of 0.5ul to 5ml.

All pipettes have been quality tested according to our company's demands. The quality control according to our company's involves gravimetric testing of each pipette with distilled water at 22℃ using the manufacter's original tips.

1.1.Fixed volume pipette

Cat. No.	Volume(ul)	Inacc.%	Impr.%
A3001	0.1	±4.8	≤13.0
A3002	0.2	±4.6	≤12.8
A3003	0.25	±4.6	≤12.8
A3004	0.5	±4.5	≤12.8
A3005	1	±4.2	≤12.8
A3006	2	±4.0	≤12.6
A3007	2.5	±4.0	≤12.6
A3008	5	±3.8	≤12.4
A3009	10	±3.0	≤12.0
A3010	20	±2.4	≤11.0
A3011	25	±2.4	≤11.0
A3012	50	±2.4	≤11.0
A3013	100	±1.5	≤10.8
A3014	200	±1.2	≤10.7
A3015	250	±1.2	≤10.7
A3016	500	±1.2	≤10.7
A3017	1000	±1.0	≤10.5
A3018	2000	±1.0	≤10.5
A3019	2500	±1.0	≤10.5
A3020	5000	±1.0	≤10.5

1.2.Adjustable volume pipette

Cat No	Volome Range(m)	Increment (ul)	Test Volume (ul)	Inacc (%)	Impr (%)	Tip ID
A3021	0.1-2.5µl	0. 05 µl	2.5µl	±3.0	≤13.0	10µl
			1.25µl	±6.0	≤14.0	
			0.25µl	±12.0	≤16.0	
A3022	0.5-10µl	0. 1 µl	10 µl	±3.0	≤12.0	10 µl
			5 µl	±6.0	≤13.0	
			1 µl	±10.0	≤13.0	
A3023	2-20µl	0.5 µl	20 µl	±3.0	≤11.5	200µl
			10 µl	±3.0	≤12.0	
			2 µl	±10	≤13.0	
A3024	5-50µl	0.5 µl	50 µl	±2.4	≤11.5	200µl
			25 µl	±2.8	≤12.0	
			5 µl	±6.0	≤13.0	
A3025	10-100µl	1 µl	100 µl	±1.5	≤11.0	200µl
			50 µl	±2.2	≤11.5	
			10 µl	±3.0	≤12.0	

Cat No	Volome Range(m)	Increment	Test Volume	Inacc (%)	Impr (%)	Tip ID
A3026	20-200µl	1 µl	200 µl	±1.5	≤11.0	200µl
			100 µl	±1.5	≤11.0	
			20 µl	±3.0	≤11.5	
A3027	50-200µl	1 µl	200 µl	±1.5	≤11.0	200µl
			100 µl	±1.5	≤11.0	
			50 µl	±2.2	≤11.5	
A3028	100-1000µl	5 µl	1000 µl	±1.2	≤10.5	1000 µl
			500 µl	±1.5	≤10.5	
			100 µl	±1.5	≤11.0	
A3029	200-1000µl	5 µl	1000 µl	±1.2	≤10.5	1000 µl
			500 µl	±1.5	≤10.5	
			200 µl	±1.5	≤11.0	
A3030	1000-5000µl	50 µl	5000 µl	±1.0	≤10.5	5000 µl
			2500 µl	±1.0	≤10.5	
			1000 µl	±1.2	≤10.5	
A3031	2-10ml	0.1 ml	10ml	±0.5	≤10.3	10ml
			5ml	±0.8	≤10.3	
			2ml	±1.0	≤10.3	
A3045	8CH0.5-10µl	0.1 µl	10µl	±3.0	≤12.0	10µl
			5µl	±6.0	≤13.0	
			1µl	±10.0	≤13.0	
A3046	8CH5-50µl	0.5 µl	50µl	±2.4	≤11.5	200µl 300µl
			25µl	±2.8	≤12.0	
			5µl	±6.0	≤13.0	
A3047	8CH50-300µl	5 µl	300µl	±1.8	≤11.5	300µl
			150µl	±2.0	≤12.0	
			50µl	±2.2	≤13.0	
A3061	12CH0.5-10µl	0.1 µl	10µl	±3.0	≤12.0	10µl
			5µl	±6.0	≤13.0	
			1µl	±10.0	≤13.0	
A3062	12CH5-50µl	0.5 µl	50µl	±2.4	≤11.5	200µl 300µl
			25µl	±2.8	≤12.0	
			5µl	±6.0	≤13.0	
A3063	12CH50-300µl	5 µl	300µl	±1.8	≤11.5	300µl
			150µl	±2.0	≤12.0	
			50µl	±2.2	≤13.0	

1.3.Tips

These detachable, disposable tips are made of natural colour polypropylene. Tips packed in bulk or box

Note: never pipette liquid without attaching a tip to the pipette.

Fig.1

1.4. Black tip cone

The black tip cone can be sterilized(121℃,0.15Mpa)

1.5. Pipette materials

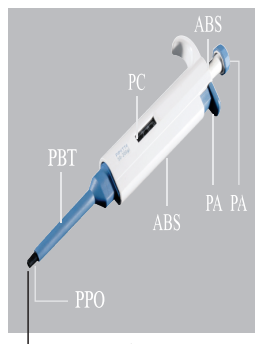

Fig.2

2. PACKAGE

The pipette package contains the following items:

- Pipette
- Calibration/opening tool
- Grease
- Instructions for use

3.PIPETTE OPERATION

3.1.Volume setting

The volume of the pipette is clearly shown through the handle grip window. The delivery volume(variable volume pipettes only) is set by turning the thumb button clockwise or anticlockwise(Fig.3). When setting the volume, please make sure that:

Fig.3

- the desired delivery volume clicks into place.
- the digits are completely visible in the display window.
- the selected volume is within the pipette's specified range.

Note: Using excessive force to turn the push button outside the range may jam the mechanism and damage the pipette.

3.2.Sealing and ejecting tips

Before fitting a tip, make sure that the pipette tip cone is clean. Press the tip on the cone of the pipette firmly to ensure an airtight seal. The seal is tight when a visiblesealing ring forms between the tip and the black tip cone(Fig.4).

Fig.4

Each pipette is fitted with a tip ejector to help eliminate the safety hazards associated with contamination. The tip ejector needs to be pressed firmly downwards to ensure proper tip ejection(Fig.5). Make sure that the tip is disposed of into a suitable waste container.

Fig.5

3.3.Removing the tip ejector

Please removing the tip ejector collar by following instructions (Fig.6)

- Push the tip ejector down. (1)
- Push the opening tool pin between the ejector bar and ejector collar to release the locking mechanism. (2)
- Pull the ejector collar off (3)
- Pushing the collar locking pin into the ejector bar hole, keeping the tip ejector pushed down.
- Release the tip ejector and test that it runs smoothly.

Fig.6

4.PIPETTING TECHNIQUES

4.1 Forward technique

For the best possible accuracy, please push and release the button slowly at all times, particularly when working with liquids that have a high viscosity. Never allow the operating button to snap back. Ensure that a clean tip is firmly pushed on to the tip cone of the pipette and there are no foreign particles in the tip itself.

Hold the pipette vertically during aspiration. Make sure that the liquid and container vessel are clean and that the pipette, tips and the liquid are at the same temperature.

1. Depress the operating button to the first stop(Fig.8B).
2. Dip the tip under the surface of the liquid about 2-3mm deep and slowly release the operating button(Fig. 8A). Withdraw the tip from the liquid touching it against the edge of the container to remove excess liquid.
3. Deliver the liquid by gently depressing the operating button to the first stop (Fig.8B). After a delay of about one second, continue to depress the operating button all the way down to the second stop (Fig. 8C). This action will empty the tip.
4. Release the operating button to the ready position.(Fig. 8A). If necessary, change the tip and continue with the pipetting.

Starting position Fig.8A | First stop Fig.8B | Second stop Fig.8C

4.2 Reverse technique

The reverse technique is suitable for dispensing liquids having high viscosity or a tendency to foam easily. The technique is also recommended for dispensing very small volumes. This is achieved by filling and emptying the tip.

1. Depress the operating button all the way down to the second stop (Fig. 8C).
2. Dip the tip under the surface of the liquid about 2-3mm deep and slowly release the operating button(Fig. 8A). This action will fill the tip. Withdraw the tip from the liquid touching it against the edge of the container to remove excess liquid.
3. Deliver the preset volume by gently depressing the operating button to the first stop (Fig.8B). Hold the operating button at the first stop. Some liquid will remain in the tip and should not be included in the delivery.
4. The remaining liquid is either discarded with the tip or pipette back into the container.

5.PIPETTING RECOMMENDATIONS

- Hold the thumb button vertically when aspirating the liquid and place the tip only a few millimeters into the liquid.

- Prewet tip before aspirating the liquid by filling and emptying the tip 5 times.This is important especially when dispensing liquids which have a viscosity and density different from water .
- Always control the push button movements with the thumb to ensure consistency.
- When pipetting liquids at a temperature different from ambient, prewet the tip several times before use.

6. STORAGE

When the pipette is not in use make sure it is safely stored in a vertical position.

7. CALIBRATION

Each pipette has been factory-tested and certified at 22℃ according to ISO 8655/DIN 12650. The Fmax user shoud not exceed the Fmax by more than 100%.

Note: Pipette specifications are guaranteed only with manufacturer's tips.

7.1 Checking calibration

Weighing should take place at 20-25℃, constant to 0.5℃.
Avoid drafts

- Set the desired testing volume of your pipette.
- Carefully fit tip onto the tip cone.
- Prewet tip with distilled water by pipetting the selected volume 5 times.
- Carefully aspirate the liquid, keeping the pipette vertical.
- Pipette distilled water into a tared container and read the weight in mgs. Repeat at least five times and record each result. Use an analytical balance with a readability of 0.01 mgs. To calculate the volume, divide the weight of the water by its density(at 20℃ : 0.9982).
- Calculate the F-value by using the following equation:
- F=｜inaccuracy(ul)｜+2×imprecision(ul)
- Compare the calculated F-value to the corresponding Fmax user. Otherwise check both your accuracy and precision , when necessary, proceed to recalibration procedure.

7.2 Recalibration

1.Place the calibration tool into the holes of the calibration adjustment lock(under the operating button)(Fig. 9).
2.Turn the adjustment lock anticlockwise to decrease and clockwise to increase the volume.
3.Reapeat performance test procedure form step 1 until the pipetting results are correct.

Fig.9

8.MAINTENANCE

To maintain the best results from your pipette each unit should be checked every day for cleanliness. Particular attention should be paid to the tip cones.

The pipettes have been designed for easy in-house service. However, we also provide complete repair and calibration service. Please return your pipette to your local representative for repair or recalibration. Before returning, please make sure that it is free from all contamination. Please advice our Service Representative of any hazardous materials which may have been used with your pipette .

Note: Check the performance of your pipette regularly e.g.every 3 months and always after in-house service or regularly.

8.1.Cleaning your pipette

To clean your pipette, use ethanol and soft cloth or lint-free tissue. It is recommended to clean the tip cone regularly.

8.2.In-house maintenance

1.Hold down the tip pipette.
2.Place the tooth of the opening tool between the tip ejector and the tip ejector collar to release the locking mechanism. (Fig.10)
3.Carefully release the tip ejector and remove the ejector collar.
4.Place the wrench end of the opening tool over the tip cone, turning it anticlockwise. Do not use any other tools . (Fig.11)
5.Wipe the piston, the O-ring and the tip cone with ethanol and a lint-free cloth.
Note: Models up to 10µl have a fixed O-ring locked inside the tip cone. Therefore, the O-ring cannot be accessed for maintenance.
6.Before replacing tip cone it is recommended to grease the piston slightly using the silicone grease provided.
Note: Excessive use of grease may jam the piston.
7.After reassembling use the pipette (without liquid) several times to make sure that the silicone grease is spread evenly.
8.Check the pipette calibration.

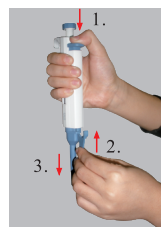

Fig.10

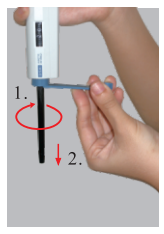

Fig.11

9. TROUBLE SHOOTING

The accompanying table is a guide to possible problems and their solutions.

Trouble	Possible cause	Solution
Droplets left inside the tip Leakage or pipetted volume too small	Unsuitable tip Non-uniform wetting of the plastic Tip incorrectly attached Unsuitable tip Foreign particles between tip and tip cone Instrument contaminated Insufficient amount of grease on piston and O-ring O-ring not correctly positioned or damaged Incorrect operation Calibration altered or unsuitable for the liquid Instrument damage	Use original tips Attach new tip Attach firmly Use original tips Clean the tip cone, attach new tip Clean and grease O-ring and piston, clean the tip cone Grease accordingly Change the O-ring Follow instructions carefully Recalibrate according to instructions Send for service
Push button jammed or moves erratically	Piston contaminated Penetration of solvent vapours	Clean and grease O-ring and piston,clean the tip cone
Pipette blocked, aspirated volume too small	Liquid has penetrated tip cone and dried	Clean and grease O-ring and piston, clean the tip cone
Tip ejector jammed or moves erratically	Tip cone and/or ejector collar contaminated	Clean the tip cone and the ejector collar

10.WARRANTY INFORMATION

The pipettes are warranted for one year against defects in materials and workmanship. Should it fail to function in any period of time, please contact your local representative immediately. The warranty will not cover defects caused by normal wear or by using the pipette against the instructions given in this manual.

Each pipette is tested before shipping by the manufacturer. The pipette you have purchased is ready for use.