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SCILOGEX

Laboratory Equipment and Supplies

SCILOGEX

MicroPette Plus Autoclavable Pipettor

User Manual

CONTENTS

1. YOUR NEW PIPETTOR

Your new hand held pipettor is a general purpose pipettor for the accurate and precise sampling and dispensing of liquid volumes. The pipettors operate on the air displacement principle and use disposable tips.

The range of pipettors cover a volume range from 0.1 µl to 5 ml.

All pipettors have been quality tested according to ISO 8655/DIN 12650. The quality control according to ISO 8655/DIN 12650 involves gravimetric testing of each pipettor with distilled water (quality 3, DIN ISO 3696) at 22°C using the manufacturer's original tips.

1.1. Adjustable volume pipettors

Volume range	Increment	Tip
0,1 - 2,5 µl	0,05 µl	10 µl
0,5 - 10 µl	0,1 µl	10 µl
2-20 µl	0,5 µl	200,300 µl
5 - 50 µl	0,5 µl	200,300,350 µl
10-100 µl	1 µl	200,300,350 µl
20-200 µl	1 µl	200,300,350 µl
50 -200 µl	1 µl	200,300,350 µl
100-1000 µl	5 µl	1000 µl
200 - 1000 µl	5 µl	1000 µl
1- 5 ml	50 µl	5 ml

Volume range	Increment	Tip
8-ch 0,5-10 µl	0,1 µl	10 µl
8-ch 5-50 µl	0,5 µl	200,300,350 µl
8-ch 50-300 µl	5 µl	350µl
12-ch 0,5-10 µl	0,1 µl	10 µl
12-ch 5-50 µl	0,5 µl	200,300,350 µl
12-ch 50-300 µl	5 µl	350 µl

1.2. Fixed volume pipettors

Volume	Tip
5 µl	10 µl
10 µl	10 µl
20 µl	200,300,350 µl
25 µl	200,300,350 µl
50 µl	200,300,350 µl
100 µl	200,300,350 µl

Volume	Tip
200 µl	200,300,350 µl
250 µl	1000 µl
500 µl	1000 µl
1000 µl	1000 µl
2000 µl	5000 µl
5000 µl	5000 µl

1.3 Fully autoclavable

The pipettor can be fully autoclaved, withstanding steam sterilizing at 121°C, 1 atm for 20 minutes. The single channel pipettors can be autoclaved without special preparation. For multichannel pipettors, the 8 screws must be loosened on the pipettor before autoclaving. After autoclaving the pipettor must be cooled down and left to dry over 12 hours, and screws tightened before use. It is recommended to check the performance of the pipettor after each autoclaving. It is also recommended to grease the piston and seal of the pipettor after 10 autoclavings.

1.4 Tips

These detachable, disposable tips are made of natural colour poly-propylene.

Note: Never pipette liquid without attaching a tip to the pipettor!

Product	Qty of tips/Unit
Tip 10 µl in single tray	8x12
Tip 10 µl in bag	1000
Tip 300 µl in single tray	8x12
Tip 300 µl in bag	1000
Tip 350 µl in single tray	8x12
Tip 350 µl in bag	1000
Tip 1000 µl in single tray	8x12
Tip 1000 µl in bag	500
Tip 5 ml Plus in bag	100

2. UNPACKING

The pipettor package contains the following items:

- Pipettor
- Calibration/Opening tool
- Grease
- Instructions for use
- Pipettor holder
- Tip
- Performance certificate according to ISO8655/DIN12650

3. INSTALLING THE PIPETTOR HOLDER

For convenience and safety always keep the pipettor vertically on its own holder when not in use. When installing the holder, please follow the instructions below:

1. Clean the shelf surface with ethanol.
2. Remove the protective paper from the adhesive tape.
3. Install the holder as described in Figure 2A.
   (Make sure the holder is pressed against the edge of the shelf.)
4. Place the pipettor onto the holder as shown in Figure 2B.

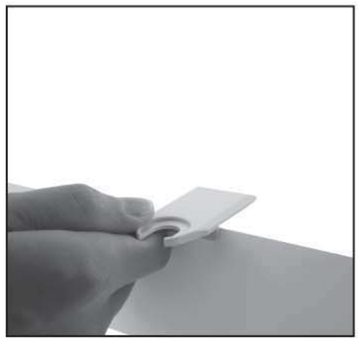
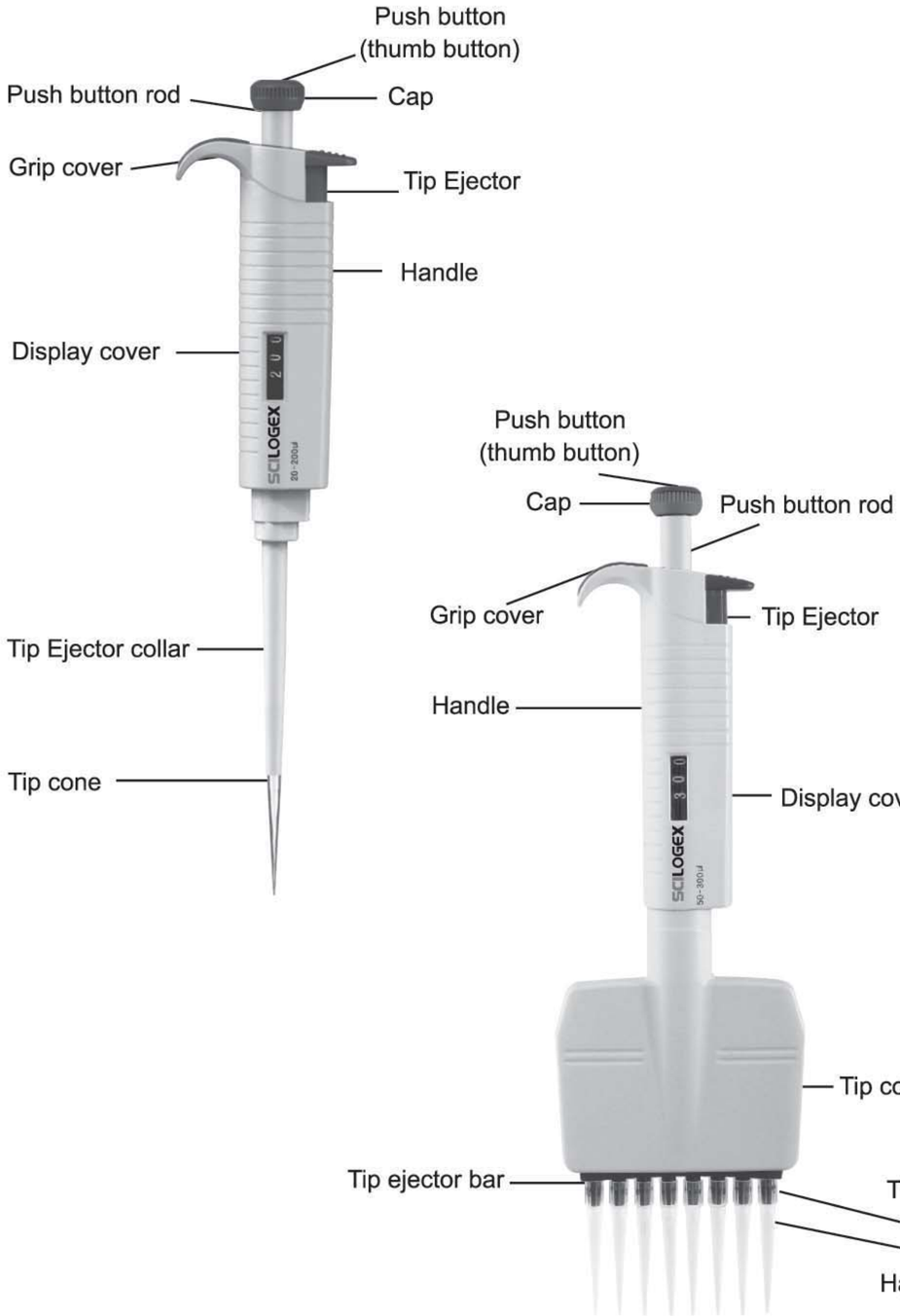


Fig. 2A

Fig. 2B

4. PIPETTOR MATERIALS



5. PIPETTOR OPERATION

5.1. Volume setting

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

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

Fig. 3

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

5.2. Sealing and ejecting tips

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

Fig. 4

Each pipettor 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

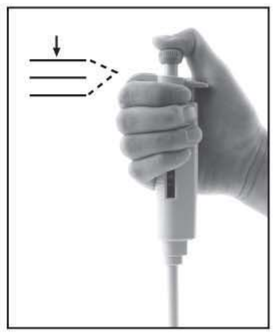
6. PIPETTING TECHNIQUES

6.1. Forward pipetting

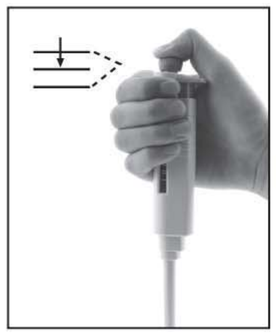
Make sure that the tip is firmly attached to the tip cone. For best results the thumb button should be operated slowly and smoothly at all times, particularly with viscous liquids.

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

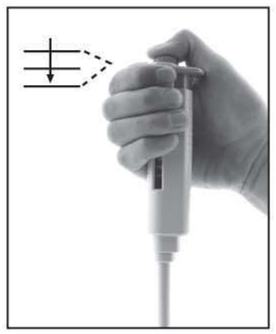
1. Depress the thumb button to the first stop (Fig. 6B).
2. Place the tip(s) just under the surface of the liquid (2-3 mm) and smoothly release the thumb button. Carefully withdraw the tip from the liquid, touching against the edge of the container to remove excess.
3. Liquid is dispensed by gently depressing the thumb button to the first stop (Fig. 6B). After a short delay continue to depress the thumb button to the second stop (Fig. 6C). This procedure will empty the tip(s) and ensure accurate delivery.
4. Release the thumb button to the ready position (Fig. 6A). If necessary change the tip(s) and continue with pipetting.



Starting position
Fig. 6A



First stop
Fig. 6B



Second stop
Fig. 6C

6.2. Reverse pipetting

The reverse technique is suitable for dispensing liquids that have a tendency to foam or have a high viscosity. This technique is also used for dispensing very small volumes when it is recommended that the tip is first primed with the liquid before pipetting. This is achieved by filling and emptying the tip(s).

1. Depress the thumb button all the way to the second stop (Fig. 6C). Place the tip(s) just under the surface of the liquid (2-3mm) and smoothly release the thumb button.
2. Withdraw the tip(s) from the liquid touching against the edge of the container to remove excess.
3. Deliver the preset volume by smoothly depressing the thumb button to the first stop (Fig. 6B). Hold the thumb button at the first stop. The liquid that remains in the tip(s) should not be included in the delivery.
4. The remaining liquid should now be discarded with the tip(s) or delivered back into the container vessel.

7. PIPETTING RECOMMENDATIONS

- Hold the pipettor vertically when aspirating the liquid and place the tip only a few millimetres into the liquid
- Prerinse the 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, prerinse the tip several times before use

8. STORAGE

When not in use it is recommended that your pipettor is stored in a vertical position. See Installing the pipettor holder (Chapter 3).

9. PERFORMANCE TEST AND RECALIBRATION

Each pipettor has been factory-tested and certified at 22°C according to ISO 8655/Din 12650. The following table shows the maximum permitted errors (Fmax) for manufacturers given in ISO 8655/DIN 12650, which further advises each user to establish their own maximum permitted errors (Fmax user). The Fmax user should not exceed the Fmax by more than 100%.

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

	Nominal volume	Maximum permitted errors (Fmax)	Nominal volume	Maximum permitted errors (Fmax)
Single-channel pipettors:	5 µl 10 µl 20 µl 25 µl 50 µl 100 µl	±0.3 µl ±0.3 µl ±0.4 µl ±0.5 µl ±0.8 µl ±1.5 µl	200 µl 250 µl 500 µl 1000 µl 2000 µl 5000 µl	±2 µl ±2.5 µl ±5 µl ±10 µl ±20 µl ±50 µl
Multichannel pipettors:	10 µl 50 µl	±0.6 µl ±1.6 µl	250 µl 300 µl	±5.0 µl ±6.0 µl

9.1. Performance test (Checking calibration)

- Weighing should take place at 20-25°C, constant to ±0.5°C.
- Avoid drafts.

1. Set the desired testing volume of your pipettor.
2. Carefully fit tip onto the tip cone.
3. Prerinse tip with distilled water by pipetting the selected volume 5 times.

4. Carefully aspirate the liquid, keeping the pipettor vertical.
5. 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°C: 0.9982). This method is based on ISO 8655/DIN 12650.
6. Calculate the F-value by using the following equation:
   F=| inaccuracy (µl) | + 2 x imprecision (µl).
   Compare the calculated F-value to the corresponding Fmax user. If it falls within the specifications, the pipettor is ready for use. Otherwise check both your accuracy and precision and, when necessary, proceed to recalibration procedure.

9.2. Recalibration procedure

1. Place the calibration tool into the holes of the calibration adjustment lock (under the thumb button) (Fig. 7).
2. Turn the adjustment lock anticlock - wise to decrease and clockwise to increase the volume.
3. Repeat Performance test (Checking calibration) procedure from step 1 until the pipetting results are correct.

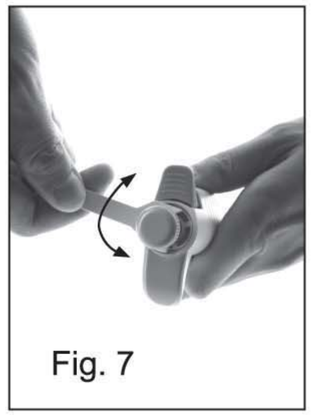


Fig. 7

10. MAINTENANCE

To maintain the best results from your pipettor each unit should be checked every day for cleanliness. Particular attention should be paid to the tip cone(s).

The pipettors have been designed for easy in-house service. However, we also provide complete repair and calibration service including a service report and performance certificate(s). Please return your pipettor to your local representative for repair or recalibration. Before returning please make sure that it is free from all contamination Please advise our Service Representa - tive of any hazardous materials which may have been used with your pipettor.

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

10.1. Cleaning your pipettor

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

10.2. In-house maintenance

1. Hold down the tip ejector.
2. Place the tooth of the opening tool between the tip ejector and the tip ejector collar to release the locking mechanism (Fig. 8).
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. 9). The 5 ml tip cone is removed by turning it anticlockwise. Do not use any tools (Fig. 10).
5. Wipe the piston, the O-ring and the tip cone with ethanol and a lint-free cloth.
   Note: Models up to 10 µl have a fixed O-ring located 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 pipettor (without liquid) several times to make sure that the grease is spread evenly.
8. Check the pipettor calibration.

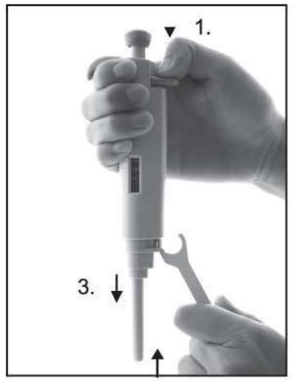


Fig. 8

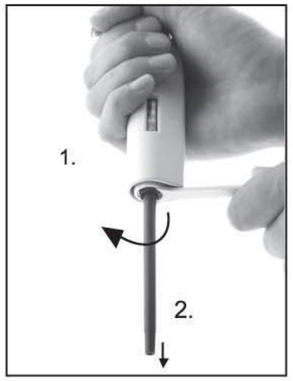


Fig. 9

Fig. 10

11. TROUBLE SHOOTING

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

12. WARRANTY INFORMATION

The pipettors are warranted for three years 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 pipettor against the instructions given in this manual.

Each pipettor is tested before shipping by the manufacturer. The Quality Assurance Procedure is your guarantee that the pipettor you have purchased is ready for use.

SPECIFICATIONS

Adjustable volume pipettors

Volume range	Volume	Inaccuracy ±	Imprecision ±
0.1-2.5 µl	2.5 µl	2,50 %	2,00 %
	1.25 µl	3,00 %	3,00 %
	0.25 µl	12,00 %	6,00 %
0.5-10 µl	10 µl	1,00 %	0,80 %
	5 µl	1,50 %	1,50 %
	1 µl	2,50 %	1,50 %
2-20 µl	20 µl	0,90 %	0,40 %
	10 µl	1,20 %	1,00 %
	2 µl	3,00 %	2,00 %
5-50 µl	50 µl	0,60 %	0,30 %
	25 µl	0,90 %	0,60 %
	5 µl	2,00 %	2,00 %
10-100 µl	100 µl	0,80 %	0,15 %
	50 µl	1,00 %	0,40 %
	10 µl	3,00 %	1,50 %
20-200 µl	200 µl	0,60 %	0,15 %
	100 µl	0,80 %	0,30 %
	20 µl	3,00 %	1,00 %
50-200 µl	200 µl	0,60 %	0,15 %
	100 µl	0,80 %	0,30 %
	50 µl	1,00 %	0,40 %
100-1000 µl	1000 µl	0,60 %	0,20 %
	500 µl	0,70 %	0,25 %
	100 µl	2,00 %	0,70 %
200-1000 µl	1000 µl	0,60 %	0,20 %
	500 µl	0,70 %	0,25 %
	200 µl	0,90 %	0,30 %
1-5 ml	5 ml	0,50 %	0,15 %
	2.5 ml	0,60 %	0,30 %
	1 ml	0,70 %	0,30 %

Volume range	Volume	Inaccuracy ±	Imprecision ±
8-ch 0,5-10 µl	10 µl	1,50 %	1, 50 %
	5 µl	2,50 %	2, 50 %
	1 µl	4,00 %	4, 00 %
8-ch 5-50 µl	50 µl	1,00 %	0, 50 %
	25 µl	1,50 %	1, 00 %
	5 µl	3,00 %	2, 00 %
8-ch 50-300 µl	300 µl	0,70 %	0, 25 %
	150 µl	1,00 %	0, 50 %
	50 µl	1,50 %	0, 80 %
12-ch 0,5-10 µl	10 µl	1,50 %	1, 50 %
	5 µl	2,50 %	2, 50 %
	1 µl	4,00 %	4, 00 %
12-ch 5-50 µl	50 µl	1,00 %	0,50 %
	25 µl	1,50 %	1, 00 %
	5 µl	3,00 %	2, 00 %
12-ch 50-300 µl	300 µl	0,70 %	0, 25 %
	150 µl	1,00 %	0, 50 %
	50 µl	1,50 %	0, 80 %

Fixed volume pipettors

Volume	Volume	Inaccuracy ±	Imprecision ±
5 µl	5 µl	1,30 %	1,20 %
10 µl	10 µl	0,80 %	0,80 %
20 µl	20 µl	0,60 %	0,50 %
25 µl	25 µl	0,50 %	0,30 %
50 µl	50 µl	0,50 %	0,30 %
100 µl	100 µl	0,50 %	0,30 %
200 µl	200 µl	0,40 %	0,20 %
250 µl	250 µl	0,40 %	0,20 %
500 µl	500 µl	0,30 %	0,20 %
1000 µl	1000 µl	0,30 %	0,20 %
2000 µl	2000 µl	0,30 %	0,15 %
5000 µl	5000 µl	0,30 %	0,15 %

Liquid: Distilled water (quality 3, DIN ISO 3696)
Reference temperature: 22°C, constant to ±0.5°C
Tested: According to ISO 8655/DIN 12650 using original manufacturer's tips