

## CALIBRATION

Each pipette has been checked & calibrated at factory with procedure conforming to EN-ISO 8655-6 standards.

Depending upon use, we recommend checking of calibration every six months. However this can be adjusted to individual requirements.

### Procedure to check calibration

Each channel of the pipette is checked at maximum volume, at 50% of maximum volume and at minimum or 10% of maximum volume, whichever is higher.

- A new tip is first pre-wetted 3-5 times and a series of ten pipetting is done at each volume.
- Use of forward pipetting technique is recommended.
- Calculate the inaccuracy and imprecision for all three volumes as per EN ISO 8655-6 /DIN 12650 standards on the basis of the following calculation

### Conversion of weight readings to volume

$$\text{Mean Value } \bar{V} = \bar{X} \cdot Z$$

$$\text{Mean Value } \bar{X} = \frac{\sum X_i}{n}$$

$X_i$  = Balance Reading

$n$  = Number of Reading

$Z$  = Conversion Factor  
[example  $Z=1.0040 \mu\text{L}/\text{mg}$  at  $25^\circ\text{C}$  and  $1013 \text{ hPa}$ ]

### Calculation for inaccuracy (Systematic Error)

$$A\% = \frac{\bar{V} - V_0}{V_0} \cdot 100$$

$V$  = Mean Value

$V_0$  = Particular volume at which readings are taken

### Calculation for imprecision (Random Error)

$$S = \sqrt{\frac{\sum_{i=1}^n (V_i - \bar{V})^2}{n - 1}}$$

$S$  = Standard Deviation  
 $\bar{V}$  = Mean Value

$$CV\% = \frac{100 \cdot S}{\bar{V}}$$

$n$  = Number of Reading

- Compare the results to the limits with tables mentioned in Pipette description section.

## Requirements and test conditions

An analytical balance must be used. The balance selection depends upon selected model of the pipette and sensitivity of balance reading.

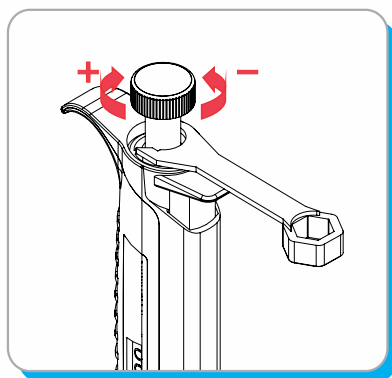
Test liquid: Water, distilled or deionised, grade 3 water conforming ISO3696.

Calibration should be carried out in a draft-free room at a constant ( $\pm 0.5^\circ\text{C}$ ) temperature of water, pipette and air between  $15^\circ\text{C}$  to  $30^\circ\text{C}$ . The relative humidity must be above 50% especially with volumes under  $50 \mu\text{L}$ , the air humidity should be as high as possible to reduce the effect of evaporation loss.

Special accessories for analytical balance, such as the evaporation trap are recommended for the calibration of volumes under  $50 \mu\text{L}$ .

### Recalibration

- 1 Place the service tool into grooves at the base of the push button as shown below, turn it clockwise to increase & anticlockwise to decrease the volume.
- 2 Repeat the procedure "to check calibration."



## STORAGE

When not in use, it is recommended that your pipettor is stored in a vertical position.

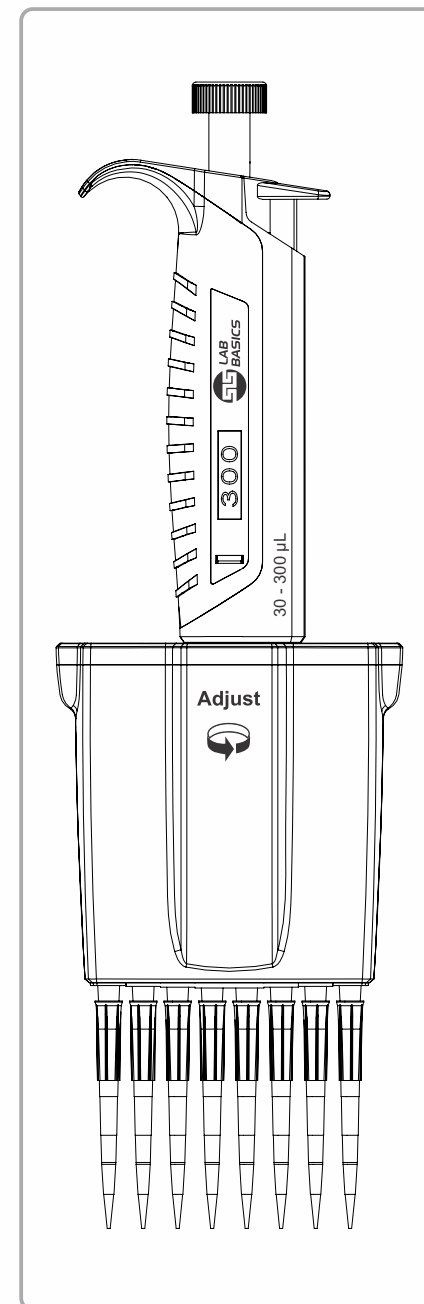
Leaving the pipette on its side can cause liquids to leak into the body of the pipette and cause corrosion.

## TROUBLE SHOOTING

Trouble	Possible Reason	Correction
Droplets left inside the tip	Unsuitable tip, non-uniform wetting of the plastic	Use new tip
Leakage or Pipetted volume too small	Tip holder (cone) scratched or damaged	Send for repair
	Organic solvent as liquid	Aspirate & discard the organic solvent several times before actual pipetting by the same tip.
	Tip incorrectly attached	Attach firmly
	Unsuitable tip	User new tip
Inaccuracies	Foreign particles between tip and tip cone	Clean the tip cone
	Incorrect operation	Follow instructions carefully
	Calibration altered	Recalibrate according to instructions
Push button jammed or moves erratically	Unsuitable for the particular liquid pipetting technique	Use correct pipetting technique
	Instrument damaged	Send for repair
Tip ejector jammed or moves erratically	Piston contaminated Penetration of solvent vapours	Send for repair
Volume setting is not properly click stopped	Tip cone contaminated from outside	Clean tip cone's outer surface with ethanol
Push button does not turn for volume setting	Click stop mechanism damaged	Send for repair
	Use of excessive force beyond the range of pipette	Send for repair



## Multichannel Pipette Instruction Manual



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## PIPETTE DESCRIPTION

These Multichannel Variable Volume 8 Channel Pipettes operate on the air displacement principle and use disposable tips.

All models are equipped with a built-in tip ejector.

They cover the volume range of 0.5  $\mu\text{L}$  to 300  $\mu\text{L}$ .

### 8 Channel Pipettes

Channel Ch.	Volume Range ( $\mu\text{L}$ )	Increment ( $\mu\text{L}$ )	Test Volume ( $\mu\text{L}$ )	Inaccuracy ( $\pm\%$ )	Imprecision ( $\pm\%$ )
8 Channel	0.5-10 $\mu\text{L}$	0.1	10	1.5	1.5
			5	2.5	2.5
			1	4	4
8 Channel	5-50 $\mu\text{L}$	0.5	50	1	0.7
			25	1.5	1
			5	3	2
8 Channel	10-100 $\mu\text{L}$	1	100	1	0.5
			50	1	0.5
			10	1.5	0.75
8 Channel	20-200 $\mu\text{L}$	1	200	0.7	0.25
			100	1	0.4
			20	1.5	0.75
8 Channel	30-300 $\mu\text{L}$	1	300	0.8	0.25
			150	1	0.5
			30	1.5	0.75

### 12 Channel Pipettes

Channel Ch.	Volume Range ( $\mu\text{L}$ )	Increment ( $\mu\text{L}$ )	Test Volume ( $\mu\text{L}$ )	Inaccuracy ( $\pm\%$ )	Imprecision ( $\pm\%$ )
12 Channel	0.5-10 $\mu\text{L}$	0.1	10	1.5	1.5
			5	2.5	2.5
			1	4	4
12 Channel	5-50 $\mu\text{L}$	0.5	50	1	0.7
			25	1.5	1
			5	3	2
12 Channel	10-100 $\mu\text{L}$	1	100	1	0.5
			50	1	0.5
			10	1.5	0.75
12 Channel	20-200 $\mu\text{L}$	1	200	0.7	0.25
			100	1	0.4
			20	1.5	0.75
12 Channel	30-300 $\mu\text{L}$	1	300	0.8	0.25
			150	1	0.5
			30	1.5	0.75

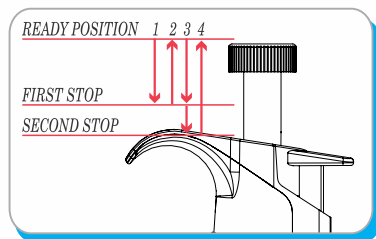
### Intended Use

These pipettes are designed and constructed for accurate and precise liquid handling. These devices are intended to dispense liquid in the volume range from 0.5  $\mu\text{L}$  to 300  $\mu\text{L}$ , in combination with matching pipette tips, especially for the samples from the human body within the scope of in-vitro diagnostic applications, in order to allow the in-vitro diagnostic medical device to be used as intended.

These pipettes may only be operated by trained specialist staff. All users must have read the operating manual carefully and familiarized themselves with the device's mode of operation. In vivo applications (application in or on the human body) are not permitted.

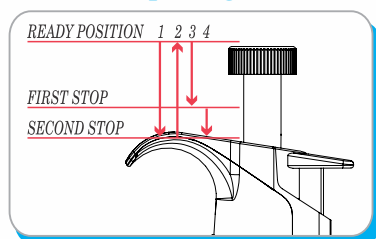
## PIPETTING TECHNIQUE

### A. Forward Pipetting



1. Press the operating button to the first stop.
2. Dip the tip attached to the pipette into the solution to a depth of about 1cm, and slowly release the operating button. Wait for a while, then withdraw it from the liquid.
3. Dispense the liquid into the receiving vessel by gently pressing the operating button to the first stop. After a second, press the operating button to the second stop. This will empty the tip completely.
4. Release the operating button to the ready position.

### B. Reverse Pipetting



1. Press the operating button to the second stop.
2. Dip the tip attached to the pipette into the solution to a depth of about 1cm, and slowly release the operating button. This action will fill the tip with a volume that is larger than the set volume. Wait 1-2 seconds and withdraw the tip from the liquid.
3. Dispense the liquid into the receiving vessel by pressing the operating button gently and steadily to the first stop. This volume is equal to the set volume. Hold button in this position. Some liquid will remain in the tip, which should not be dispensed.
4. The liquid remaining in the tip can be dispensed back into the original solution by pressing the button to the second stop or disposed together with the tip.
5. Release the operating button to the ready position.

Note : Reverse pipetting technique is recommended for viscous solutions, solutions having tendency to foam or for dispensing very small volumes.

## PIPETTING RECOMMENDATIONS

- ◆ Aspirate liquid into the pipette only when a tip is attached to its tipcone.
- ◆ While pipetting, the pipettor should be vertically straight and tip should be dipped only a few millimeters into the liquid.
- ◆ Pre-rinsing of tip 5 times with the liquid to be dispensed is recommended. 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 for consistency.
- ◆ Allow liquids, tips, and pipettes to equilibrate to the ambient temperature.
- ◆ Pre-rinse the tips several times before use when pipetting liquids at temperature different from ambient.
- ◆ Wipe the tips only if there is liquid on the outside of the tips, be careful to avoid touching the tip's orifice.
- ◆ Don't keep pipette in your hand while not working, to avoid transferring of body heat.
- ◆ Use the correct pipette tip designed for use with the particular pipette.
- ◆ Select the correct pipetting technique (e.g. Reverse, Forward etc.) depending on the nature of the liquid.
- ◆ Avoid using excessive force to turn the push button outside the range specified for it.

## 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).

This pipettor has been designed for easy in-house service. However, we also provide complete repair and calibration services. Please return your pipettor to your local distributor for repair or calibration. Before returning, please make sure that it is free from any contamination.

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

### 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.

### Autoclaving

This entire pipette can be autoclaved (Sterilized) by steam at 121°C for 20 minutes at 1 bar pressure.

After the autoclaving, let the pipette cool down and dry for 6 hours before use.

Verify calibration after each autoclaving cycle.

Perform cleaning & lubrication of internal parts at regular intervals to keep smooth pipetting operation.

