

# Microlit

*Redefining Liquid Handling Systems*



**Australian Distributors**  
 Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

Website NEW : [www.chromalytic.net.au](http://www.chromalytic.net.au) E-mail : [info@chromtech.net.au](mailto:info@chromtech.net.au) Tel: 03 9762 2034 . . . in AUSTRALIA





# BOTTLE TOP DISPENSER | *Beatus*

With Re-Circulation Valve

*Beatus* is the next generation of highly robust and reliable dispensing, designed and developed by MICROLIT's strong R&D. Several unique features provided in *Beatus*, makes it usable with a wider range of reagents with high precision and accuracy. *Beatus* has re-circulation valve for re-directing the liquid into the bottle for bubble free dispensing without any loss of reagent.

Special emphasis has been given to ensure smooth & soft plunger operation and ease of working in demanding laboratory conditions.

## FEATURES :

### Six unique volume ranges :

- 0.25 - 2.5 ml
- 0.5 - 5 ml
- 1 - 10 ml
- 2.5 - 30 ml
- 5 - 60 ml
- 10 - 100 ml

**Fully Autoclavable at 121°C , 15psi. for 10 - 15 mins.**



### SPECIALLY DESIGNED VOLUME ADJUSTMENT KNOB

180° Rotation for Easy & Effortless Volume Setting.



### SPRINGLESS VALVE

Specially designed, springless, PTFE valve manifold ensures high chemical compatibility and jamming free valve functioning.



### RE-CIRCULATION VALVE

Prevents loss of reagent during purging.



### ADJUSTABLE DELIVERY NOZZLE

Adjustable delivery nozzle to facilitate dispensing ease in all demanding laboratory conditions.



### 360° ROTATION

Specially designed adapter allows 360° rotation, providing full flexibility in working.



### UNIQUE PISTON

PTFE Piston with ETP O-Ring Ensures Very High Chemical Compatibility & Wiper Like Smooth, Effortless Piston Movement.



### ADAPTORS

Adaptors to fit most of the laboratory reagent bottles are provided in the following sizes : 28, 30, 32, 36, 40 & 45mm.



# BOTTLE TOP DISPENSER | Beatus

With Re-Circulation Valve

## CALIBRATION :

Specially designed calibration tool is provided for convenient and quick in-lab user re-calibration. This is in compliance with GLO/ISO norms.



Removable Cap for Calibration



Calibration Tool



## COMPONENT DESCRIPTION

Component	Description
Piston	PTFE & ETP
Cylinder	Borosilicate Glass
Volume Adjustment Knob	PP, 180° Rotation
Valve Housing	PFA
Re-Circulation Valve Housing	PFA
Valve Assembly	Borosilicate Glass Ball & Seat
Discharge Assembly	PTFE
Delivery Tube	FEP
Inlet Tube	FEP
Calibration	Individually calibrated and certified. In-lab easy Calibration by the user is also possible.
Accuracy & Reproducibility	In accordance with ISO 8655 standards.
Compatibility	Excellent compatibility with all reagents except HF

## SPECIFICATIONS & ORDERING INFORMATION

Model No.	Vol. Range	Increment	Accuracy ±% ± ml	CV ±% ± ml
BEAT-2.5	0.25-2.5 ml	0.05 ml	0.6 0.015	0.2 0.005
BEAT-5	0.5-5 ml	0.1 ml	0.6 0.030	0.2 0.010
BEAT-10	1-10 ml	0.2 ml	0.6 0.060	0.2 0.020
BEAT-30	2.5-30 ml	0.5 ml	0.6 0.180	0.2 0.060
BEAT-60	5-60 ml	1.0 ml	0.6 0.360	0.2 0.120
BEAT-100	10-100 ml	2.0 ml	0.6 0.600	0.2 0.200



# BOTTLE TOP DISPENSER | *Ultimus*

With Dual Inlet Technology

Microlit has yet again answered the needs of the customers. With this Bottle Top Dispenser Microlit's R&D has solved the biggest problem of the users : Re-filling the bottle and rinsing the instrument WITHOUT DISMOUNTING from the Bottle.

Microlit is proud to present most advanced, state of the art Dispenser in the world : Ultimus. With a world wide patented technology Microlit's R&D has delivered a product that combines unique functionality, user-friendliness and performance. Ultimus offers its users 4 modes of dispensing in one Dispenser. First ever Dispenser offering Dilution, Rinsing, Dual Liquid Handling and Re-circulation in a single unit.

## FEATURES :

### Six unique volume ranges :

- 0.25 - 2.5 ml
- 0.5 - 5 ml
- 1 - 10 ml
- 2.5 - 30 ml
- 5 - 60 ml
- 10 - 100 ml

**Fully Autoclavable** at 121°C , 15psi. for 10 - 15 mins.



### SPECIALLY DESIGNED VOLUME ADJUSTMENT KNOB

180° Rotation for Easy & Effortless Volume Setting.



### SPRINGLESS VALVE

Specially designed, springless, PTFE valve manifold ensures high chemical compatibility and jamming free valve functioning.



### ADJUSTABLE DELIVERY NOZZLE

Adjustable delivery nozzle to facilitate dispensing ease in all demanding laboratory conditions.



### 360° ROTATION

Specially designed adapter allows 360° rotation, providing full flexibility in working.



### UNIQUE PISTON

PTFE Piston with ETP O-Ring Ensures Very High Chemical Compatibility & Wiper Like Smooth, Effortless Piston Movement.



### RESERVOIR COVERS

There is an additional set of reservoir covers for the second bottle. Available sizes: 28, 32, 36, 40 & 45 mm



### ADAPTORS

Adaptors to fit most of the laboratory reagent bottles are provided in the following sizes : 28, 30, 32, 36, 40 & 45mm.



## CALIBRATION :

Specially designed calibration tool is provided for convenient and quick in-lab user re-calibration. This is in compliance with GLO/ISO norms.



Calibration Tool



### EXTENDABLE TUBES

Coiled extension tube and telescoping inlet tube adjust to a variety of bottle sizes

## COMPONENT DESCRIPTION

Component	Description
Piston	PTFE & ETP
Cylinder	Borosilicate Glass
Volume Adjustment Knob	PP, 180° Rotation
Valve Housing	PFA
Re-Circulation Valve Housing	PFA
Valve Assembly	Borosilicate Glass Ball & Seat
Discharge Assembly	PTFE
Delivery Tube	FEP
Inlet Tube	FEP
Calibration	Individually calibrated and certified. In-lab easy Calibration by the user is also possible.
Accuracy & Reproducibility	In accordance with ISO 8655 standards.
Compatibility	Excellent compatibility with all reagents except HF

*Ultimus offers four modes of operation:*



### 1. STANDARD DISPENSING

Knob A - Open  
Knob B - Closed

In this mode the dispenser dispenses the liquid normally into the receiver from the bottle it is mounted on.



### 2. PURGING

Knob A - Closed  
Knob B - Closed

In this mode the liquid is re-circulated into the same bottle on which the dispenser is mounted. This process removes the air from the dispenser without wasting any reagent.



### 3. DILUTION/RINSING/SECOND LIQUID DISPENSING

Knob A - Open  
Knob B - Open

In this mode the liquid from a second source can be dispensed into the receiver. The second liquid can be distilled water, thus allowing the user to rinse the instrument without dismounting from the bottle or for dilution of the reagent in the receiver.



### 4. BOTTLE REFILLING

Knob A - Closed  
Knob B - Open

In this mode the liquid from a second source can be used to refill the bottle without dismounting the dispenser.

## SPECIFICATIONS & ORDERING INFORMATION

Model No.	Vol. Range	Increment	Accuracy		CV	
			±%	± ml	±%	± ml
ULT-2.5	0.25-2.5 ml	0.05 ml	0.6	0.015	0.2	0.005
ULT-5	0.5-5 ml	0.1 ml	0.6	0.030	0.2	0.010
ULT-10	1-10 ml	0.2 ml	0.6	0.060	0.2	0.020
ULT-30	2.5-30 ml	0.5 ml	0.6	0.180	0.2	0.060
ULT-60	5-60 ml	1.0 ml	0.6	0.360	0.2	0.120
ULT-100	10-100 ml	2.0 ml	0.6	0.600	0.2	0.200



Microlit Bottle top dispenser is another genius of its strong R & D base. Responding to the needs of the present generation, Microlit is proud to offer its NEW BOTTLE TOP DISPENSER which is an unique combination of competitive pricing and high performance.

All wetted parts are PTFE, FEP and Borosilicate Glass only which allows the instrument to be used with wide variety of laboratory chemicals.

High precision and accuracy is ensured through careful selection of raw material and several stages of strict quality checks during manufacturing process.

Each instrument is individually calibrated in ISO 17025 accredited laboratory in accordance with ISO 8655 standards and comes with Individual Calibration certificate.

#### FEATURES :

##### Six unique volume ranges :

- a. 0.25 - 2.5 ml
- b. 0.5 - 5 ml
- c. 1 - 10 ml
- d. 2.5 - 30 ml
- e. 5 - 60 ml
- f. 10 - 100 ml

**Fully Autoclavable** at 121°C , 15psi. for 10 - 15 mins.

Smooth, effortless plunger movement and bubble free dispensing.

Easy to dis-assemble for cleaning and servicing.



#### PISTON

PTFE Piston with ETP O-Ring Ensures Very High Chemical Compatibility & Wiper Like Smooth, Effortless Piston Movement.



#### GLASS BARREL PROTECTION

Glass Barrel is protected by a polypropylene sleeve. It also ensures no glass splitting in case of any accidental breakage.



#### ADAPTORS

Adaptors to fit most of the laboratory reagent bottles are provided in the following sizes :



#### ADJUSTABLE DELIVERY NOZZLE

Adjustable delivery nozzle to facilitate dispensing ease in all demanding laboratory conditions.



#### SPECIALLY DESIGNED VOLUME ADJUSTMENT KNOB

Convenient and easy volume setting with minimal force ensuring no fatigue or strain. A 270 degree turn in the clockwise and anticlockwise direction.



#### NOZZLE CAP

Nozzle cap prevents any unwanted drop on the work space and avoids contact with hazardous chemicals.



#### VALVE MANIFOLD

Specially designed, springless, PTFE valve manifold ensures excellent chemical compatibility and leak proof valve functioning.



**CALIBRATION :**

Specially designed calibration tool is provided for convenient and quick in-lab user re-calibration. This is in compliance with GLO/ISO norms.



Removable Cap for Calibration



Calibration Tool

Specially designed calibration tool is provided for convenient and quick In-lab user re-calibration. This is in compliance with GLO/ISO Norms.

**COMPONENT DESCRIPTION**

Component	Description
Piston	PTFE & ETP
Cylinder	Borosilicate Glass
Volume Adjustment Knob	PP, 180° Rotation
Valve Housing	PFA
Re-Circulation Valve Housing	PFA
Valve Assembly	Borosilicate Glass Ball & Seat
Discharge Assembly	PTFE
Delivery Tube	FEP
Inlet Tube	FEP
Calibration	Individually calibrated and certified. In-lab easy Calibration by the user is also possible.
Accuracy & Reproducibility	In accordance with ISO 8655 standards.
Compatibility	Excellent compatibility with all reagents except HF

**SPECIFICATIONS & ORDERING INFORMATION**

Model No.	Vol. Range	Increment	Accuracy		CV	
			±%	± ml	±%	± ml
BTDR-1	0.25-2.5 ml	0.05 ml	0.6	0.015	0.2	0.005
BTDR-2	0.5-5 ml	0.1 ml	0.6	0.030	0.2	0.010
BTDR-3	1-10 ml	0.2 ml	0.6	0.060	0.2	0.020
BTDR-4	2.5-30 ml	0.5 ml	0.6	0.180	0.2	0.060
BTDR-5	5-60 ml	1.0 ml	0.6	0.360	0.2	0.120
BTDR-5	10-100 ml	2.0 ml	0.6	0.600	0.2	0.200



# MICROPIPETTE | RBO Series

Variable Volume Fully autoclavable

In order to keep pace with the rapid progress made in research sector in recent years, MICROLIT has made one logical step further and proudly presents the new, high precision micropipette series for today's sophisticated users in the field of Molecular biology, Microbiology, Immunology, cell culture, Analytical Chemistry, Biochemistry, Genetics etc.

## FEATURES :

High quality spring mechanism ensures softer plunger movement.  
Nine volume ranges cover the complete pipetting range from 0.2  $\mu$ l to 10 ml offering a wide choice to select the most suitable model for any application.

## COLOUR CODING :

Attractive colour coding for easy identification between different volume ranges.



### EASY VOLUME ADJUSTMENT :

Easy Volume Adjustment by simply turning the plunger. Plunger does not snag gloves.



### UNIVERSAL TIP CONE :

Compatible with most of the internationally accepted standard tips.



### VOLUME SETTING :

Soft click sound at every increment ensures perfect volume setting and no accidental volume change. It also facilitates single handed operation.



### SOFT GRIP & ERGONOMIC DESIGN :

New body design with soft grip and improved ergonomics for more comfort and less fatigue during operation.



### DIGITAL DISPLAY :

4 digit display with sub divisions provides small volume increments.



### LARGE GRIPPY :

Specially designed large grippy is provided for comfortable grip and ease during working.



### USER ADJUSTMENT :

Re-calibration can be performed easily by the user.



### TIP EJECTOR :

Built-in streamlined tip ejector facilitates easy tip ejection and access to narrow necked bottles and tubes.



# MICROPIPETTE | RBO Series

Fixed Volume Fully autoclavable

Fixed Volume Pipettes are designed for many different types of routine laboratory work. Using the same state-of-art design and basic features of Variable Volume Pipettes, these fixed volume pipettes are ideal for Clinical Diagnostics, Control Analysis etc.

## FEATURES :

High quality spring mechanism ensures softer plunger movement.  
Sixteen volume ranges cover the complete pipetting range from 1  $\mu$ l to 10 ml offering a wide choice to select the most suitable model for any application.

## COLOUR CODING :

Attractive colour coding for easy identification between different volume ranges.



### EASY VOLUME ADJUSTMENT :

Easy Volume Adjustment by simply turning the plunger. Plunger does not snag gloves.



### UNIVERSAL TIP CONE :

Compatible with most of the internationally accepted standard tips.



### USER ADJUSTMENT :

Re-calibration can be performed easily by the user.



### SOFT GRIP & ERGONOMIC DESIGN :

New body design with soft grip and improved ergonomics for more comfort and less fatigue during operation.



### TIP EJECTOR :

Built-in streamlined tip ejector facilitates easy tip ejection and access to narrow necked bottles and tubes.



### LARGE GRIPPY :

Specially designed large grippy is provided for comfortable grip and ease during working.





In order to keep pace with the rapid progress made in research sector in recent years, MICROLIT has made one logical step further and proudly presents the new, high precision micropipette series for today's sophisticated users in the field of Molecular biology, Microbiology, Immunology, cell culture, Analytical Chemistry, Biochemistry, Genetics etc.

Recommended for ELISA, Molecular screening, Kinetic studies, DNA amplifications etc.

### FEATURES :

High quality spring mechanism ensures softer plunger movement.

Six volume ranges cover the complete pipetting range from 0.5  $\mu$ l to 300  $\mu$ l offering a wide choice to select the most suitable model for any application.

### COLOUR CODING :

Attractive colour coding for easy identification between different volume ranges.



#### EASY VOLUME ADJUSTMENT :

Easy Volume Adjustment by simply turning the plunger. Plunger does not snag gloves.



#### PIPETTE HOLDER :

The holder provided with the pipette allows easy, efficient and safe storage.



#### VOLUME SETTING :

Soft click sound at every increment ensures perfect volume setting and no accidental volume change. It also



#### SOFT GRIP & ERGONOMIC DESIGN:

New body design with soft grip and improved ergonomics for more comfort and less fatigue during operation.



#### DIGITAL DISPLAY :

4 digit display with sub divisions provides small volume increments.



#### LARGE GRIPPY :

Specially designed large grippy is provided for comfortable grip and ease during working.



8-CHANNEL



12-CHANNEL



#### TIP EJECTION KNOB :

Placement and good design allows easy single handed tip ejection.



#### OPERATION FLEXIBILITY :

Lower housing can be rotated 360° providing flexibility during operation.



#### EASY TIP EJECTION :

Specially designed sequential tip ejector allows effortless tip ejection.



### Fully Autoclavable Variable Volume Micropipettes

Model	Volume Range	Inc. $\mu\text{l}$	A		CV	
			$\pm\%$	$\pm\mu\text{l}$	$\pm\%$	$\pm\mu\text{l}$
RBO-2	0.2 - 2.0 $\mu\text{l}$	0.002	2	0.04	1.2	0.024
-10	0.5 - 10 $\mu\text{l}$	0.02	1	0.1	0.5	0.05
RBO-20	2 - 20 $\mu\text{l}$	0.02	0.8	0.16	0.4	0.08
RBO-50	5 - 50 $\mu\text{l}$	0.1	0.8	0.4	0.4	0.2
RBO-100	10 - 100 $\mu\text{l}$	0.2	0.6	0.6	0.2	0.2
RBO-200	20 - 200 $\mu\text{l}$	0.2	0.6	1.2	0.2	0.4
RBO-1000	100 - 1000 $\mu\text{l}$	1.0	0.6	6	0.2	2
RBO-5000	0.5 - 5 ml	10.0	0.6	30	0.2	10
RBO-10000	1 - 10 ml	20.0	0.6	60	0.2	20

### Fully Autoclavable Fixed Volume Micropipettes

Model	Vol. $\mu\text{l}$	A		CV	
		$\pm\%$	$\pm\mu\text{l}$	$\pm\%$	$\pm\mu\text{l}$
RBO-F-1	1.0	5	0.05	5	0.05
RBO-F-2	2.0	4	0.08	2	0.04
RBO-F-5	5.0	2	0.1	1	0.05
RBO-F-10	10.0	1	0.1	0.5	0.05
RBO-F-20	20.0	0.8	0.16	0.4	0.08
RBO-F-25	25.0	0.8	0.2	0.4	0.1
RBO-F-50	50.0	0.8	0.4	0.4	0.2
RBO-F-100	100.0	0.6	0.6	0.2	0.2
RBO-F-200	200.0	0.6	1.2	0.2	0.4
RBO-F-250	250.0	0.6	1.5	0.2	0.5
RBO-F-500	500.0	0.6	3	0.2	1
RBO-F-1000	1000.0	0.6	6	0.2	2
RBO-F-2000	2000.0	0.6	12	0.2	4
RBO-F-5000	5000.0	0.6	30	0.2	10
RBO-F-10000	10000.0	0.4	40	0.2	20

Error limits according to the nominal capacity (= maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20 °C, and with smooth, steady operation. The error limits are well within the limits of DIN EN ISO 8655-2. (See Table 1) A = Accuracy, CV = Coefficient of variation.

### 12-channel Fully Autoclavable Micropipette

Model	Volume Range	Inc. $\mu\text{l}$	A		CV	
			$\pm\%$	$\pm\mu\text{l}$	$\pm\%$	$\pm\mu\text{l}$
RBO-MCA-12/10	0.5 - 10 $\mu\text{l}$	0.02	1.6	0.16	1	0.1
RBO-MCA-12/20	0.2 - 20 $\mu\text{l}$	0.02	0.8	0.16	0.4	0.08
RBO-MCA-12/50	5 - 50 $\mu\text{l}$	0.1	0.8	0.4	0.4	0.2
RBO-MCA-12/100	10 - 100 $\mu\text{l}$	0.2	0.8	0.8	0.3	0.3
RBO-MCA-12/200	20 - 200 $\mu\text{l}$	0.2	0.8	1.6	0.3	0.6
RBO-MCA-12/300	40 - 300 $\mu\text{l}$	0.2	0.8	2.4	0.3	0.9

### 8-channel Fully Autoclavable Micropipette

Model	Volume Range	Inc. $\mu\text{l}$	A		CV	
			$\pm\%$	$\pm\mu\text{l}$	$\pm\%$	$\pm\mu\text{l}$
RBO-MCA-8/10	0.5 - 10 $\mu\text{l}$	0.02	1.6	0.16	1	0.1
RBO-MCA-8/20	0.2 - 20 $\mu\text{l}$	0.02	0.8	0.16	0.4	0.08
RBO-MCA-8/50	5 - 50 $\mu\text{l}$	0.1	0.8	0.4	0.4	0.2
RBO-MCA-8/100	10 - 100 $\mu\text{l}$	0.2	0.8	0.8	0.3	0.3
RBO-MCA-8/200	20 - 200 $\mu\text{l}$	0.2	0.8	1.6	0.3	0.6
RBO-MCA-8/300	40 - 300 $\mu\text{l}$	0.2	0.8	2.4	0.3	0.9

Table 1- Maximum permissible errors as per ISO 8655-2

Nominal volume	Maximum permissible systematic error		Maximum permissible random error	
	$\pm\%$	$\pm\mu\text{l}$	$\pm\%$	$\pm\mu\text{l}$
1	5.0	0.05	5.0	0.05
2	4.0	0.08	2.0	0.04
5	2.5	0.125	1.5	0.075
10	1.2	0.12	0.8	0.08
20	1.0	0.2	0.5	0.1
50	1.0	0.5	0.4	0.2
100	0.8	0.8	0.3	0.3
200	0.8	1.6	0.3	0.6
500	0.8	4.0	0.3	1.5
1000	0.8	8.0	0.3	3.0
2000	0.8	16	0.3	6.0
5000	0.8	40	0.3	15.0
10000	0.6	60	0.3	30.0

**Single Channel Fixed & Variable Volume Micropipettes :** In the conformity test, the maximum permissible errors for the nominal volumes in Tables 1 apply to every selectable volume throughout the useful volume range of the piston pipette; i.e. the maximum permissible systematic errors of variable-volume piston pipette with a useful volume range of 10  $\mu\text{l}$  to 100  $\mu\text{l}$  are  $\pm 0.8 \mu\text{l}$  and the maximum permissible random errors are  $\pm 0.3 \mu\text{l}$  for every measured volume.

**Multichannel Micropipettes :** The maximum permissible systematic and random errors of multi-channel piston pipettes shall be equal to twice the values specified in Table 1 for single-channel piston pipettes. Each channel of the multi-channel piston pipette, considered independently, shall meet these specifications.



It is a friendly, efficient and reliable electronic pipette filling instrument. Designed for ease and comfort to suit all types of liquid handling needs in every Laboratory.



### FEATURES :



Two LEDs  
Red - low charging  
Green - Charging status



Single Knob Dual Dispensing Mode  
1. Gravity Mode - on Half Press  
2. Blowout Mode (Motor Powered) - on Full Press



Continuous adjustment of pump speed during operation.



Comfortable grip.

### SPECIFICATIONS & ORDERING INFORMATION

Pipette Filling Device

Model	Description
NE-GG-220V	Grey body/ Grey collet and plunger
NE-GR-220V	Grey body/ Red collet and plunger
NE-GV-220V	Grey body/ Violet collet and plunger

An universal Silicon collet is provided to accept all standard pipettes up to 100ml. Internal knurlings on the collet holds the pipette firmly.

In-line membrane filter (0.2 micron) prevents

- a. Aerosol Contamination
- b. Liquid from entering the equipment by accident.

Ni-MH 3.6V rechargeable batteries are used in combination with low power consumption circuit and vacuum/pressure pump.

Allows eight hours of continuous operation.

Battery Charger is provided with all models.

Available in attractive colour combinations.





Microlit Electronic Pipette is based on Stepper Motor with Microprocessor controlled piston movement. These are user friendly and offer effortless pipetting. Accuracy & Precision levels are very high and user-independent. This is a complete solution for every pipetting need.

## FEATURES

### Modes (Easy selection of modes from a single key)

Standard mode  
Stepper mode  
Dilution mode  
Calibration mode

### Variable Working Speeds

Speed can be selected on a scale of 1-5.

Error limits according to the nominal capacity (=maximum volume) indicated on the instrument, obtained with instrument and distilled water at equilibrium with ambient temperature at 20° C, and with smooth, steady operation. The Error limits are well within the limits of DIN EN ISO 8655.2.

(see table 1)

A= Accuracy, CV=Coefficient of variation.



## Calibration

User friendly calibration mode facilitates easy calibration.

## Battery

9V Ni-MH rechargeable batteries are used.

8 hours of operation with fully charged batteries.

User friendly software.

Easy, User friendly calibration.

Rechargeable during operation.

Optimized ergonomics and working comfort.

Large Liquid Crystal Display (LCD).

Built-in tip ejector.

Five models cover the complete pipetting range from

0.2 µl to 5000 µl.

## SPECIFICATIONS & ORDERING INFORMATION

Model	Volume Range µl	Inc. µl	Acc. ±%	Acc. ±µl	CV ±%	CV ±µl
ME-10	0.2-10	0.05	1.2	0.12	0.8	0.08
ME-120	5-120	0.5	0.8	0.96	0.3	0.36
ME-300	20-300	1.0	0.8	2.4	0.3	0.9
ME-1000	50-1000	5.0	0.8	8	0.3	3
ME-5000	100-5000	10.0	0.8	40	0.3	15



Volume Selection

Easy volume selection by



Large Fire Button

Single 'FIRE BUTTON' for



Large Liquid Crystal Display

Two line Alphanumeric LCD.



Built-in streamlined tip ejector

For taken easy tip ejection and access to narrow necked bottles.

Table1 - Maximum permissible errors as per ISO 8655-2

Nominal Volume	ISO 8655 Specification Maximum Permissible Systematic Error		Microlit Specification Maximum Permissible Systematic Error	
	±%	±µl	±%	±µl
10	1.2	0.12	0.8	0.08
100	0.8	0.8	0.3	0.3
200	0.8	1.6	0.3	0.6
500	0.8	4.0	0.3	1.5
1000	0.8	8.0	0.3	3.0
5000	0.8	40	0.3	15



Microlit high precision tips are available in all sizes. We recommend use of Microlit Tips with Microlit Pipettes for best results.

MT-IV



MT-V



MT-II



MT-I



MTSP



#### SPECIFICATIONS & ORDERING INFORMATION

##### Tips for Micropipettes

Model	Description
MTSP	Capacity upto 10 µl Pkt. of 100 Nos.
MT-I	Capacity upto 200 µl Pkt. of 1000 Nos.
MT-II	Capacity upto 1000 µl Pkt. of 1000 Nos.
MT-V	Capacity upto 5000 µl Pkt. of 100 Nos.
MT-IV	Capacity upto 10000 µl Pkt. of 100 Nos.



Microlit Pipette stands are available in several designs for single channel and Multichannel pipettes.  
You can choose according to your requirement and application.



MS-I  
for Three Pipette



MS-II  
for Six Pipette



MS-V  
for Singal Channel Pipette



MS-III  
for 8 Channel Pipette



MS-IV  
for 12 Channel Pipette

#### SPECIFICATIONS & ORDERING INFORMATION

Stands for Micropipettes

Model	Description
MS-I	Stand for three Pipettes
MS-II	Stand for six Pipettes
MS-III	Stand for 8-Channel Pipettes
MS-IV	Stand for 12-Channel Pipettes
MS-V	Stand for one Pipettes (Modular)





# AUSTRALIAN

Effective January 1, 2016+ )

## Price List





## 1. Micropipette - Single Channel Fully Autoclavable (Premium Series)

### A. Fixed Volume - RBO - F Series

S.No.	Model No.	Capacity
1.	RBO-F-1	1 $\mu$ l
2.	RBO-F-2	2 $\mu$ l
3.	RBO-F-5	5 $\mu$ l
4.	RBO-F-10	10 $\mu$ l
5.	RBO-F-20	20 $\mu$ l
6.	RBO-F-25	25 $\mu$ l
7.	RBO-F-50	50 $\mu$ l
8.	RBO-F-100	100 $\mu$ l
9.	RBO-F-200	200 $\mu$ l
10.	RBO-F-250	250 $\mu$ l
11.	RBO-F-500	500 $\mu$ l
12.	RBO-F-1000	1000 $\mu$ l
13.	RBO-F-2000	2000 $\mu$ l
14.	RBO-F-5000	5000 $\mu$ l
15.	RBO-F-10000	10000 $\mu$ l

FOR ALL MODELS		
Quantity (Pcs)		List Price (AUD)
1 - 50		90.00
51+ > ASK!		

### B. Variable Volume - RBO Series

S.No.	Model No.	Volume Range
1.	RBO - 2	0.2 - 2 $\mu$ L
2.	RBO - 10	0.5 - 10 $\mu$ l
3.	RBO - 20	2 - 20 $\mu$ l
4.	RBO - 50	5 - 50 $\mu$ l
5.	RBO - 100	10 - 100 $\mu$ l
6.	RBO - 200	20 - 200 $\mu$ l
7.	RBO - 1000	100 - 1000 $\mu$ l
8.	RBO - 5000	500 - 5000 $\mu$ l
9.	RBO - 10000	1000 - 10000 $\mu$ l

FOR ALL VOLUME RANGES		
Quantity (Pcs)		List Price (AUD\$)
1 - 50		120
51 + ASK! -		





2. Micropipette - Multi Channel Fully Autoclavable (Premium Series)

A. 8 - Channel - RBO Series

S.No.	Model No.	Volume Range
1.	RBO-MCA-8/10	0.5 - 10 µl
2.	RBO-MCA-8/20	2 - 20 µl
3.	RBO-MCA-8/50	5 - 50 µl
4.	RBO-MCA-8/100	10 - 100 µl
5.	RBO-MCA-8/200	20 - 200 µl
6.	RBO-MCA-8/300	40 - 300 µl

FOR ALL VOLUME RANGES		
Quantity (Pcs)	Dealer Price (US\$)	List Price (AUD\$)
1 - 20		\$392.00
21 +	ASK!	

B. 12 - Channel - RBO Series

S.No.	Model No.	Volume Range
1.	RBO-MCA-12/10	0.5 - 10 µl
2.	RBO-MCA-12/20	2 - 20 µl
3.	RBO-MCA-12/50	5 - 50 µl
4.	RBO-MCA-12/100	10 - 100 µl
5.	RBO-MCA-12/200	20 - 200 µl
6.	RBO-MCA-12/300	40 - 300 µl

FOR ALL VOLUME RANGES		
Quantity (Pcs)	Dealer Price (US\$)	List Price (AUD\$)
1 - 20		\$440.00
21 o+	ASK !r above	





3. Miniature Fixed Volume Micro Pipettes

S.No.	Model No.	Capacity
1	MM-1	1 µl
2	MM-2	2 µl
3.	MM-5	5 µl
4.	MM-10	10 µl
5.	MM-20	20 µl
6.	MM-25	25 µl
7.	MM-50	50 µl
8.	MM-100	100 µl
9.	MM-200	200 µl
10.	MM-250	250 µl
11.	MM-500	500 µl
12.	MM-1000	1000 µl

FOR ALL MODELS	
Dealer Price (US\$)	List Price (AUD\$)
Please ask for prices based on quantity	
	36.00





#### 4. Pipette Filling Device

S.No.	Model No.	Color Combination	FOR ALL MODELS		
			Quantity (Pcs)		List Price (AUD\$)
1.	NE-GG	Grey Body / Grey Collet and Plunger			
2.	NE-GR	Grey Body / Red Collet and Plunger	1 - 20		AUD240.00
3.	NE-GV	Grey Body / Violet Collet and Plunger	21 or above		
4.	NE-GB	Grey Body / Blue Collet and Plunger			



#### 5. Electronic Micropipette

S.No.	Model No.	Volume Range	FOR ALL VOLUME RANGES		
			Quantity (Pcs)		List Price (AUD\$)
1.	ME-10	0.2 - 10 $\mu$ l			
2.	ME-120	5 - 120 $\mu$ l	1 - 20		\$450.00
3.	ME-300	20 - 300 $\mu$ l	21 or above		
4.	ME-1000	50 - 1000 $\mu$ l			
5.	ME-5000	100 - 5000 $\mu$ l			





## 6. Bottle Top Dispenser Research Model Fully Autoclavable

S.No.	Model No.	Volume Range	FOR BTDR-1, BTDR-2 & BTDR-3		
			Quantity (Pcs)		List Price (AUD\$)
1.	BTDR-1	0.25 - 2.5 ml	1 - 50		\$250.00
2.	BTDR-2	0.5 - 5 ml	51 + or above ASK!		
3.	BTDR-3	1 - 10 ml			

S.No.	Model No.	Volume Range	FOR BTDR-4 & BTDR-5		
			Quantity (Pcs)		List Price (AUD\$)
4.	BTDR-4	2.5 - 30 ml	1 - 50		\$320.00
5.	BTDR-5	5 - 60 ml	51 + ASK-		

S.No.	Model No.	Volume Range	FOR BTDR-6		
			Quantity (Pcs)		List Price (AUD\$)
6.	BTDR-6	10 - 100 ml	1 - 50		\$360.00
			51 + ASK !		





## 7. Bottle Top Dispenser with Re-Circulation Valve - *Beatus*

S.No.	Model No.	Volume Range	FOR BEAT-2.5, BEAT-5 & BEAT-10		
			Quantity (Pcs)		List Price (AUD\$)
1.	BEAT-2.5	0.25 - 2.5 ml	1 - 50		\$390.00
2.	BEAT-5	0.5 - 5 ml	51 + ASK!		
3.	BEAT-10	1 - 10 ml			

S.No.	Model No.	Volume Range	FOR BEAT-30 & BEAT-60		
			Quantity (Pcs)		List Price (US\$)
4.	BEAT-30	2.5 - 30 ml	1 - 50		\$420.00
5.	BEAT-60	5 - 60 ml	51 + ASK !		

S.No.	Model No.	Volume Range	FOR BEAT-100		
			Quantity (Pcs)	Dealer Price (US\$)	List Price (AUD\$)
6.	BEAT-100	10 - 100 ml	1 - 50		\$495.00
			51 + ASK !		





8. Bottle Top Dispenser with Patented Dual Inlet Technology - *Ultimus*

S.No.	Model No.	Volume Range
1.	ULT-2.5	0.25 - 2.5 ml
2.	ULT-5	0.5 - 5 ml
3.	ULT-10	1 - 10 ml

FOR ULT-2.5, ULT-5 & ULT-10
List Price (AUS\$)

A\$525.00

S.No.	Model No.	Volume Range
4.	ULT-30	2.5 - 30 ml
5.	ULT-60	5 - 60 ml

FOR ULT-30 & ULT-60
List Price (AUS\$)

\$575.00

S.No.	Model No.	Volume Range
6.	ULT-100	10 - 100 ml

FOR ULT-100
List Price (AUS\$)

\$595.00





9. Motorized Burette - e-Burette

S.No.	Model No.	Capacity
1.	TI-10	10 ml
2.	TI-25	25 ml
3.	TI-50	50 ml

FOR TI-10, TI-25, TI-50		
Quantity (Pcs)	Dealer Price (US\$)	List Price (AUD\$)
1 - 50		\$1020.00



10. Pipette Stands

S.No.	Model No.	Description	List Price (AUS\$)
1.	MS-I	For 3 Pipettes	40.00
2.	MS-II	For 6 Pipettes	48.00
3.	MS-III	For 8-Channel Pipette	56.00
4.	MS-IV	For 12-Channel Pipette	64.00
5.	MS-V	For 1 Pipette (Modular)	26.00





## 11. Tips for Micropipette

S.No.	Model No.	Capacity	Quantity		List Price (AUD\$)
1.	MTSP	upto 10 $\mu$ l	Pkt. of 100		18
2.	MT-I	upto 200 $\mu$ l	Pkt. of 1000		35
3.	MT-II	upto 1000 $\mu$ l	Pkt. of 1000		39
4.	MT-V	upto 5000 $\mu$ l	Pkt. of 100		45
5	MT-IV	upto 10000 $\mu$ l	Pkt. of 100		54

MT-IV



MT-V



MT-II



MT-I



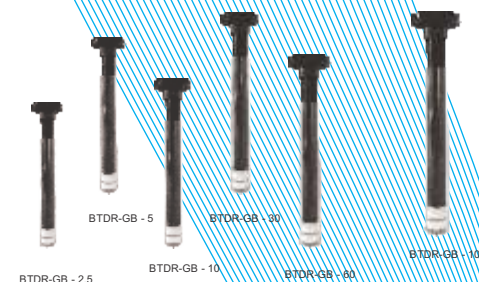
MTSP





## 12. Spare parts for Bottle Top Dispenser (Research Model)

S.No.	Part No.	Description	Dealer Price (US\$)
1.	BTDR-GB - 2.5	Borosilicate Glass Cylinder for 2.5 ml dispenser	18.00
2.	BTDR-GB - 5	Borosilicate Glass Cylinder for 5 ml dispenser	24.00
3.	BTDR-GB - 10	Borosilicate Glass Cylinder for 10 ml dispenser	10.00
4.	BTDR-GB - 30	Borosilicate Glass Cylinder for 30 ml dispenser	39..00
5.	BTDR-GB - 60	Borosilicate Glass Cylinder for 60 ml dispenser	42.00
6.	BTDR-GB - 100	Borosilicate Glass Cylinder for 100 ml dispenser	50.00
7.	BTDR - ADPT	Set of 5 adaptors 28, 32, 36, 40,45 (mm)	
8.	BTDR - IT	Telescopic Tube common for all size	10
9.	BTDR - VAK - I	Volume adjustment Knob for 2.5, 5 & 10 ml dispenser	8.00
10.	BTDR - VAK - II	Volume adjustment Knob for 30, 60 & 100 ml dispenser	10.00
11.	BTDR - DN - I	Delivery Nozzle with PTFE Screw adaptor and FEP tubing for 2.5, 5 & 10 ml dispenser	12...00
12.	BTDR - DN - II	Delivery Nozzle with PTFE Screw adaptor and FEP tubing for 30, 60 & 100 ml dispenser	12.00
13.	BTDR - DTC	Delivery Tube Cover with nozzle cap common for all sizes of di:	12.00





## 12. Spare parts for Bottle Top Dispenser (Research Model)

S.No.	Part No.	Description	Dealer Price (AUD\$)
14.	BTDR - PIS - 2.5	PTFE Piston with shaft for 2.5 ml dispenser	24.00
15.	BTDR - PIS - 5	PTFE Piston with shaft for 5 ml dispenser	24.00
16.	BTDR - PIS - 10	PTFE Piston with shaft for 10 ml dispenser	40.00
17.	BTDR - PIS - 30	PTFE Piston with shaft for 30 ml dispenser	52.00
18.	BTDR - PIS - 60	PTFE Piston with shaft for 60 ml dispenser	52.00
19.	BTDR - PIS - 100	PTFE Piston with shaft for 100 ml dispenser	60.00



## 13. Spare parts for Bottle Top Dispenser - Beatus (With Re-Circulation Valve)

S.No.	Part No.	Description	Dealer Price (AUD\$)
1.	BEAT - GB - 2.5	Borosilicate Glass Cylinder for 2.5 ml dispenser	24.00
2.	BEAT - GB - 5	Borosilicate Glass Cylinder for 5 ml dispenser	32.00
3.	BEAT - GB - 10	Borosilicate Glass Cylinder for 10 ml dispenser	40.00
4.	BEAT - GB - 30	Borosilicate Glass Cylinder for 30 ml dispenser	523.00
5.	BEAT - GB - 60	Borosilicate Glass Cylinder for 60 ml dispenser	52.00
6.	BEAT - GB - 100	Borosilical	





### 13. Spare parts for Bottle Top Dispenser - Beatus (With Re-Circulation Valve)

S.No.	Part No.	Description	Dealer Price (AUD\$)
7.	BEAT - ADPT	Set of 5 adaptors 28mm, 32mm, 36mm, 40mm, 42mm	32.00
8.	BEAT - IT	Telescopic Tube common for all size	12.00
9.	BEAT - VAK - I	Volume adjustment Knob for 2.5, 5 & 10ml dispenser	14.00
10.	BEAT - VAK - II	Volume adjustment Knob for 30, 60 & 100ml dispenser	16.00
11.	BEAT - DN-DTC - I	Delivery Nozzle with PTFE Screw adaptor and FEP tubing for 2.5, 5 & 10ml	20.00
12.	BEAT - DN-DTC - II	Delivery Nozzle with PTFE Screw adaptor and FEP tubing for 30, 60 & 100ml	24.00
13.	BEAT - PIS 2.5	PTFE Piston with shaft for 2.5ml dispenser	24.00
14.	BEAT - PIS 5	PTFE Piston with shaft for 5ml dispenser	32.00
15.	BEAT - PIS 10	PTFE Piston with shaft for 10ml dispenser	40.00
16.	BEAT - PIS 30	PTFE Piston with shaft for 30ml dispenser	52.00
17.	BEAT - PIS 60	PTFE Piston with shaft for 60ml dispenser	52.00
18.	BEAT - PIS 100	PTFE Piston with shaft for 100ml dispenser	60.00



BEAT - ADPT



BEAT - IT



BEAT - VAK - I



BEAT - VAK - II



BEAT - DN-DTC-I



BEAT - DN-DTC-II



BEAT - PIS - 2.5

BEAT - PIS - 5

BEAT - PIS - 10

BEAT - PIS - 30

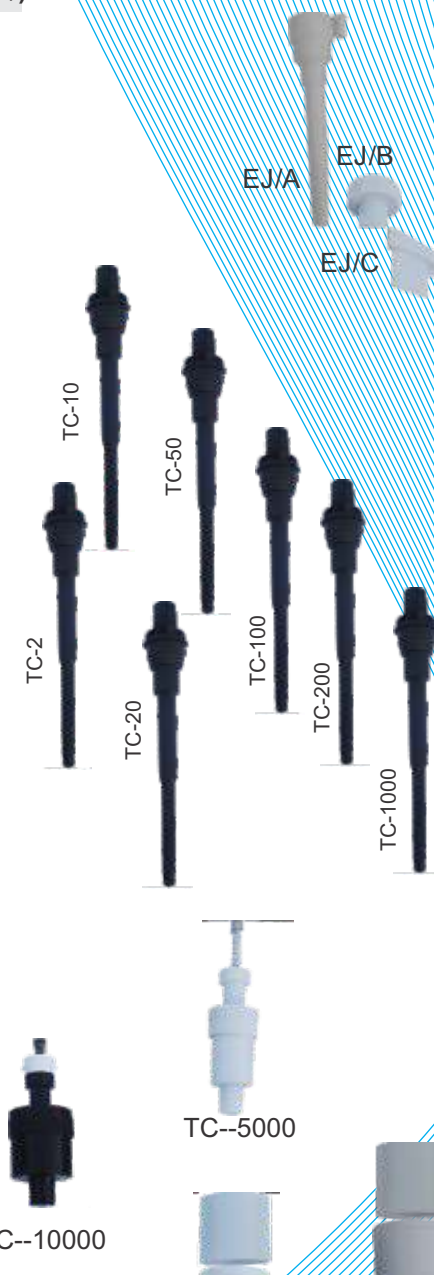
BEAT - PIS - 60

BEAT - PIS - 100



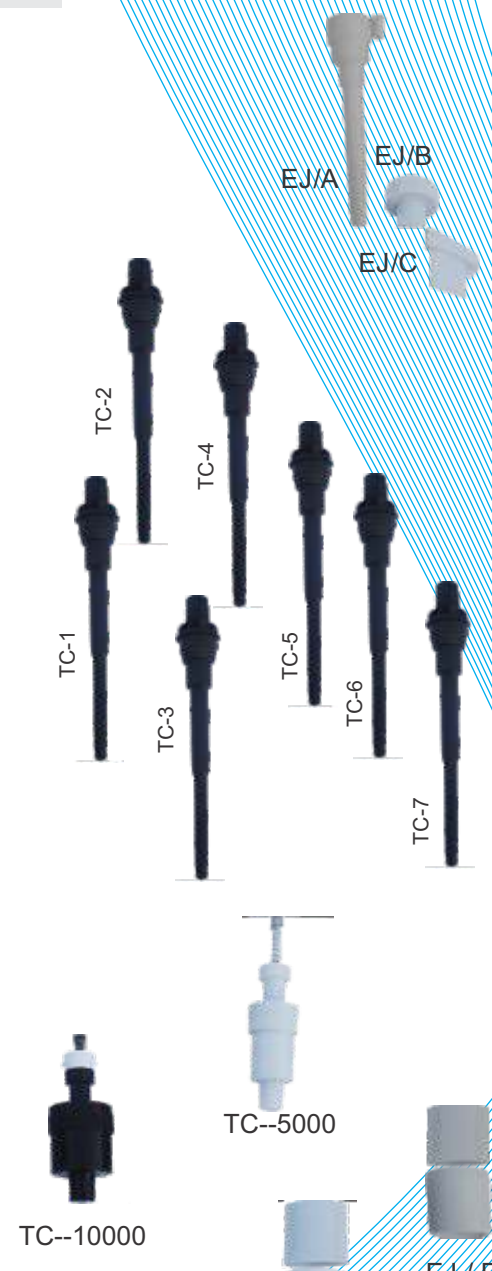
## 14. Spare parts for Micropipette - Variable Volume

S.No.	Part No.	Description	Dealer Price (AUD\$)
1.	EJ/A	Tip Ejector with push button & ejector button 0.2-2 $\mu$ l	10.00
2.	EJ/B	Tip Ejector with push button & ejector button 0.5--10, 2-20, 5-50, 10-100, 20-200 $\mu$ l	10.00
3.	EJ/C	Tip Ejector with push button & ejector button 100--1000 $\mu$ l	10.00
4.			
5.	TC-2	Tip Cone Assembly for 0.2 - 2 $\mu$ l	32.00
6.	TC--10	Tip Cone Assembly 0.5 - 10 $\mu$ l	32.00
7.	TC-20	Tip Cone Assembly 2 - 20 $\mu$ l	32.00
8.	TC-50	Tip Cone Assembly 5 - 50 $\mu$ l	32.00
9.	TC-100	Tip Cone Assembly 10 - 100 $\mu$ l	32.00
10.	TC-200	Tip Cone Assembly 20 - 200 $\mu$ l	32.00
11.	TC-1000	Tip Cone Assembly 100 - 1000 $\mu$ l	32.00
12.	TC-5000	Tip Cone Assembly 500 - 5000 $\mu$ l	40.00
13.	TC-10000	Tip Cone Assembly 1000 - 10000 $\mu$ l	40.00
24.	EJ/D	Tip Ejector (Higher Volume Micropipette) 500-5000 $\mu$ l Ejector Set ( Top & Bottom)	12.00
25.	EJ/E	Tip Ejector (Higher Volume Micropipette) 1000-10000 $\mu$ l Ejector Set ( Top & Bottom)	12.00



## 15. Spare parts for Micropipette - Fixed Volume

S.No.	Part No.	Description	Dealer Price (AUD\$)
1.	EJ/A	Tip Ejector with push button & ejector button 1 - 2 $\mu$ l	8.00
2.	EJ/B	Tip Ejector with push button & ejector button 10 $\mu$ l, 20 $\mu$ l, 50 $\mu$ l, 100 $\mu$ l, 200 $\mu$ l	8.00
3.	EJ/C	Tip Ejector with push button & ejector button 1000 $\mu$ l	8.00
4.	TC - 1	Tip Cone Assembly 1 - 2 $\mu$ l	20.00
5.	TC - 2	Tip Cone Assembly 5, 10, 20, 25 $\mu$ l	20.00
6.	TC - 3	Tip Cone Assembly 50	20.00
7.	TC - 4	Tip Cone Assembly 100, 200 $\mu$ l	20.00
8.	TC - 5	Tip Cone Assembly 250, 500, 1000 $\mu$ l	20.00
9.	TC - 6	Tip Cone Assembly 2000, 5000 $\mu$ l	20.00
10.	TC - 7	Tip Cone Assembly 10000 $\mu$ l	20.00
11.	EJ/ D	Tip Ejector High Vol. Micropipette Ejector Set (Tip & Button) 500-5000 $\mu$ l	12.00
12.	EJ / E	Tip Ejector High Vol. Micropipette Ejector Set (Tip & Button) 1000-10000 $\mu$ l	12.00





## 16. Spare parts for Pipette Filling Device

S.No.	Part No.	Description	Dealer Price (AUS\$)
1	E-FILL-FLTR	In-Line Membrane Filter 0.2ul for E-FILL (Set of 5 pcs.)	30.00
2.	E-FILL-SCOLT SET	Silicon Collet with PC Cover (Set of 5 pcs.)	20.00
3.	E-FILL-CHRG	Battery Charger for E-FILL	40.00



E-FILL-FLTR



E-FILL-SCOLT SET



E-FILL-CHRG

### *Satisfaction Guaranteed*

*Microlit products are manufactured under strict quality control and GMP norms. However, if you are dissatisfied in any way with the operation of any Microlit product, call us or your nearest Microlit dealer for a free replacement.*



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Product Description:

The pipettes are continuously adjustable, general purpose micropipettes for sampling and dispensing accurate liquid volume.

It operates on air displacement principal (i.e. an air interface is present between the piston and liquid) and uses a detachable, disposable tip. Desired volume is determined by the following formula.

$V = \pi r^2 h$   
where  
v = desired volume  
r = radius  
h = vertical distance traveled by the plunger.  
Nine Models cover a range from 0.2 µl to 10µl.

Digital Display:

The adjustable volume micropipettes are filled with easy to read digital display.

Raw Material:

The pipette are made of mechanically durable and autoclavable materials

Pipette Operation:

Setting the delivery volume  
1. Set the delivery volume using the pushbutton on the top of the pipette. To increase the delivery volume, turn the push button counter clockwise To decrease the delivery volume, turn it clockwise,  
2. Make sure that the desired delivery click in to place.  
3. Do not set volume outside the pipette's specified volume range.



Using excessive force to turn the push button out side the range may jam the mechanism and eventually damage the pipette.

Tip Ejection:

Each pipette is fitted with a tip ejector. This helps to eliminate the risk of contamination. To eject the tip, point the pipette at suitable waste receptacle and press the ejector button with your thumb.



Pipetting Techniques:

Push and release the push button slowly at all time particullary when working with high viscosity liquids. Never allow the push button to snap back, make sure that the tip is firmly attached to the tip cone. Check for foreign particles in the tip. Before you begin your actual pipetting work, fill and empty the tip 2-3 times with the solution that you will be pipetting. Hold the pipette in an upright position while aspirating liquid. The grippy should rest on your index finger. Make sure that the tips, pipette and solution are at the same temperature.

Forward Technique:

Fill a clean reagent reservoir with the liquid to be dispensed.  
1. Depress the push button to the first stop.  
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm. and slowly release the push button .  
Withdraw the tip from the liquid touching it against the edge of the reservoir to remove excess liquid.  
3. Deliver the liquid by gently depressing the push button to the



first stop. After a delay of about one second stop. this action will empty the tip.  
4. Release the push button to the ready position. If necessary change the tip and continue pipetting.

Reverse Technique:

The reverse technique is suitable for dispensing liquids that have a high viscosity or a tendency to foam easily. The technique is also recommended for dispensing very small volume. Fill a clean reagent reservoir with the liquid to be dispensed.  
1. Depress the push button all the way to the second stop.  
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm. and slowly release the push button. Withdraw the tip form the liquid touching it against the edge of the reservoir to remove excess liquid.  
3. Deliver the liquid by gently depressing the push button to the first stop. After a delay of about one second, continue to depress the push button all the way to the second stop. This action will empty the tip.  
4. The remaining liquid should either be discarded with the tip or pipetted back in to the container to be dispensed.  
1. Depress the push button all the way to the second stop.

Repetitive Technique

The repetitive technique offers a rapid and simple procedure for repeated delivery of the same volume.



Fill a clean regent reservoir with the liquid to be dispensed.  
1. Depress the push button all the

way to the second stop.  
2. Dip the tip under the surface of the liquid in the reservoir to a depth of about 1 cm. and slowly release the push button. This action will fill the tip. Withdraw the tip from the liquid touching against the edge of the reservoir to remove excess liquid.  
3. Deliver the preset volume by gently depressing the push button to the first stop. Hold the push button at the first stop. Some liquid will remain in the tip and this should not be included in the delivery.  
4. Continue pipetting by repeating step 3 and 4.



Pipetting of hetrogeneous samples

(deproteinization in blood glucose determination, for example)

Use steps 1 and 2 of the forward technique to fill the tip with blood. Wipe the tip carefully with a dry clean tissue.

1. Immerse the tip into the reagent and depress the push button to the first stop. making sure the tip is well below the surface.  
2. Release the push button slowly to the ready position. This will fill the tip. Keep the tip in the solution. First stop and release slowly. Keep repeating this procedure until the interior wall of the tip is clear.  
4. Finally, depress the push button all the way to completely empty the tip.

Calibration and adjustment

All the pipettes are factory calibrated

and adjusted to give the volume as specified with distilled or deionized water using the forward pipetting technique.

It should be noted that the use of other pipetting techniques may affect the calibration results. The pipettes are constructed to permit re-adjustment for other pipetting techniques or liquids of different temperature and viscosity.

Device requirements and test conditions

An analytical balance must be used. The scale graduation value of the balance should be chosen according to the selected test volume of pipette.

Volume Range Readable

Graduation under	
10 µl	0.001 mg
100 µl	0.01 mg
above100 µl	0.1 mg

Test liquid Water, distilled or deionized “grade 3” water conforming ISO 3696. Tests are done in a draft-free room at a constant (±0.5°C) temperature of water pipette and air between 15°C to 30°C. The relative humidity must be above 50% . Especially with volumes under 50 µl, the air humidity should be as high as possible to reduce the effect of evaporation trap are recommended.

Procedure

1. Do 10 Pipetting with the minimum volume.  
2. Do 10 Pipetting with the maximum volume.  
3. Calculate the inaccuracy (A) and imprecision (cv) of both series.  
4. Compare the result to the limits in

the Table 1.  
If the calculated results within the selected limits. The adjustments of pipette is correct adjustment

Range	Volume	Inaccuracy		Imprecision	
	µl	±%	µl	cv±%	µl
0.2 µl - 2 µl	2	2	.04	1.2	0.024
0.5 µl - 10 µl	10	1	0.1	0.5	0.05
2 µl - 20 µl	20	0.8	0.16	0.4	0.08
5 µl- 50 µl	50	0.8	0.4	0.4	0.2
10 µl - 100 µl	100	0.6	0.6	0.2	0.2
20 µl- 200 µl	200	0.6	1.2	0.2	0.4
100 µl- 1 ml	1000	0.6	6	0.2	2
0.5 ml - 5 ml	5000	0.6	30	0.2	10
1 ml -10 ml	10000	0.6	60	0.2	20

Fixed Volume	Inaccuracy		Imprecision	
µl	±%	µl	cv±%	µl
5	2	0.1	1	0.05
10	1	0.1	0.5	0.05
20	0.8	0.16	0.4	0.08
25	0.8	0.2	0.4	0.1
50	0.8	0.4	0.4	0.2
100	0.6	0.6	0.2	0.2
200	0.6	1.2	0.2	0.4
500	0.6	3	0.2	1
1000	0.6	6	0.2	2
2000	0.6	12	0.2	4
5000	0.6	30	0.2	10
10000	0.4	40	0.2	20

Adjustment

Adjustment is done with the service tool.  
1. Place the service tool into the openings of the calibration nut at the top of the handle.  
2. Turn the service tool clockwise to increase, or counter clockwise to decrease the volume.  
3. After adjustment check the calibration according to the Instructions above.

Formula for calculating results  
conversion of mass to volume  
V= (w+e) x Z  
v = volume (µl)  
w= weight (mg)  
e= evaporation loss (mg)  
z=conversion factor for µl/mg  
conversion  
Evaporation loss can be significant with low volume. To determine mass loss. Dispense water to the weighing vessel, note the reading and start a stopwatch. See how much the reading decreases during 30 seconds.  
(i.e. 6mg=0.2 mg/s )  
Compare this to the pipetting time from taring to reading, typically pipetting time might be 10 seconds and the mass loss is 2 mg (10s x 0.2 mg/s) in this example . If an evaporation trap or lid on the vessel is used the correction of evaporation is usually unnecessary. The factor Z is for converting the weight of the water to value is 1.0032 µl/mg at 22°C and 95 kPa. See conversion table below.

Temperature °C	Air pressure kPa						
	80	85	90	95	100	101.3	105
15.0	1.0017	1.0018	1.0019	1.0019	1.0020	1.0020	1.0020
15.5	1.0018	1.0019	1.0019	1.0020	1.0020	1.0020	1.0021
16.0	1.0019	1.0020	1.0020	1.0021	1.0021	1.0021	1.0022
16.5	1.0020	1.0020	1.0021	1.0021	1.0022	1.0022	1.0022
17.0	1.0021	1.0022	1.0022	1.0022	1.0023	1.0023	1.0023
17.5	1.0022	1.0022	1.0023	1.0023	1.0024	1.0024	1.0024
18.0	1.0022	1.0023	1.0023	1.0024	1.0025	1.0025	1.0025
18.5	1.0023	1.0024	1.0024	1.0025	1.0025	1.0026	1.0026
19.0	1.0024	1.0025	1.0025	1.0026	1.0026	1.0027	1.0027
19.5	1.0025	1.0026	1.0026	1.0027	1.0027	1.0028	1.0028
20.0	1.0026	1.0027	1.0027	1.0028	1.0028	1.0029	1.0029
20.5	1.0027	1.0028	1.0028	1.0029	1.0029	1.0030	1.0030
21.0	1.0028	1.0029	1.0029	1.0030	1.0031	1.0031	1.0031
21.5	1.0030	1.0031	1.0031	1.0031	1.0032	1.0032	1.0032
22.0	1.0031	1.0032	1.0032	1.0032	1.0033	1.0033	1.0033
22.5	1.0032	1.0033	1.0033	1.0033	1.0034	1.0034	1.0034
23.0	1.0033	1.0034	1.0034	1.0034	1.0035	1.0035	1.0036
23.5	1.0034	1.0035	1.0035	1.0036	1.0036	1.0036	1.0037
24.0	1.0035	1.0036	1.0036	1.0037	1.0037	1.0038	1.0038
24.5	1.0037	1.0038	1.0038	1.0038	1.0039	1.0039	1.0039
25.0	1.0038	1.0039	1.0039	1.0039	1.0040	1.0040	1.0040
25.5	1.0039	1.0040	1.0040	1.0041	1.0041	1.0041	1.0042
26.0	1.0040	1.0041	1.0041	1.0042	1.0042	1.0043	1.0043
26.5	1.0042	1.0043	1.0043	1.0043	1.0044	1.0044	1.0044
27.0	1.0043	1.0044	1.0044	1.0045	1.0045	1.0045	1.0046
27.5	1.0045	1.0046	1.0046	1.0046	1.0047	1.0047	1.0047
28.0	1.0046	1.0047	1.0047	1.0047	1.0048	1.0048	1.0048
28.5	1.0048	1.0048	1.0048	1.0049	1.0049	1.0050	1.0050
29.0	1.0049	1.0050	1.0050	1.0050	1.0051	1.0051	1.0051
29.5	1.0051	1.0051	1.0051	1.0052	1.0052	1.0052	1.0052
30.0	1.0052	1.0053	1.0053	1.0053	1.0054	1.0054	1.0054

Inaccuracy (systematic error):

Inaccruracy is the difference between the dispensed volume and the selected volume of a pipette.  
A =  $\bar{V}$  - V<sub>o</sub>  
A = inaccuracy  
 $\bar{V}$  = mean volume  
V<sub>o</sub> = normal volume  
Inaccuracy can be expressed as a relative value A%= 100% x A/V°  
imprecision (random error)  
Imprecision refers to the repeatability of the pipetting. It is expressed as standard deviation (s) or coefficient of variation (cv)

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

s= standard deviation

v= mean volume  
n= number of measurment  
Standard deviation can be expressed as a relative value (cv)  
CV = 100% x S/V

Maintenance:

When pipette is not in use, make sure it is stored in an upright position. We recommend a stand for this purpose .

Short term service:

The Pipette should be checked at the begining of each day for dust and dirt on the outside surface of the pipette. Particular attention should be paid to tip cone. No other solvents except 70% ethanol should be used to clean the pipette.

Long Term Service  
Single Channel Pipette:

If pipette is used daily it should be checked every three month. The servicing procedure starts with the disassembly of the pipette.

1. Press the tip ejector button and

pull the tip ejector out (fig. 1)  
2. Turn the tip cone counter clockwise to unscrew (fig.2).  
3. Fix the service tool on the O-ring seat and turn clockwise to open. P  
ull out the O-ring seat and turn the tip cone upside down and retrieve the O-ring.  
4. Clean the tip cone for foreign particles.  
5. Grease the cleaned parts with lubricant preferably silicon grease.

Reassembly:

For range 0.2-2 µl, 0.5-10µl, 5-10µl 5-50 µl, 10-100µl, 20-200µl.  
• Place the O-ring in the tip cone and screw the O-ring seat with help of service tool.  
• Place the spring on the piston and slide inside the tip cone.  
• Screw the assembled tip cone in the main housing.  
• Slide the tip ejector on the tip cone.  
• Turn the tip ejector clockwise while forcing the ejector panel downwards.

Dis-assembly:

For 0.5-5µl, 1-10ml pull the lower position of the ejector to dis-engage from the upper portion. Unscrew the tipcone from the main housing.  
The tip cone is in two portion, the lower portion can be unscrewed from the upper portion to expose the piston. (fig.12)

Sterlization:

The entire pipette can be sterlized by autoclaving it at 121°C(252°F)(2ata) (minimum 20 minutes) No special preperation are needed for autoclaving. You can use stream sterlization bags if nedded.

After autoclaving, the pipette must

be cooled to room temperature for at least two hours. Before pipetting, make sure that pipette is dry. We recommend that you check the calibration after every sterlization cycle to achieve the best possible accuracy.

Trouble shooting:

The table below lists possible problem and thier solutions.

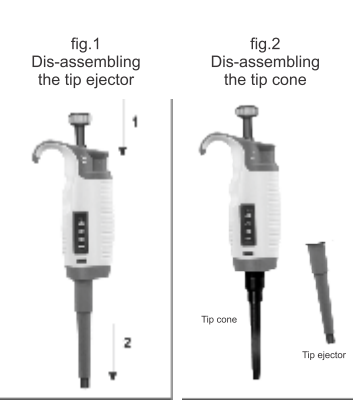
Defect	Possible reason	Solution
Leakage	Tip incorrectly attached	Attach firmly
	Foreign particles between tip and tip cone	Clean tip cones attach new tip
	Foreign particles between the piston, the o-ring and the cylinder	Clean and grease O-ring and Cylinder
	Insufficient amount of grease on cylinder and o-ring, O-ring Damaged	Grease accordingly Change the O-ring
Inaccurate dispensing	Incorrect operation Tip incorrectly attached calibration altered caused misuse,for examples	Follow instruction carefully attach firmly Recalibration according to instructions
Inaccurate dispensing with certain liquids	Unsuitable calibration High viscosity liquids may require recalibration	Recalibration with the liquids in quistion

Package:

The Pipette is shiped in a specially designed package containing the following items.  
1. Service Tool  
2. Tip Sample  
3. Instruction Manual  
4. Calibration Certificate  
5. Shelf Hanger

Caution:

The Pipette is designed to allow easy in-lab service. If you would prefer to have us or your local representative service your pipette, please make sure that the pipette has been decontaminated before you send it to us. Please note that the postal authorities in your country may prohibit or restrict the shipment of contaminated material by mail.



# Operation Manual MICROPIPETTE



# Operation Manual



BOTTLE TOP  
DISPENSER

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## Intended Use Of The Instrument

The Bottle Top Dispenser is a general purpose laboratory instrument intended for use in laboratories for dispensing reagents and chemicals which are compatible with the instrument. (see page 4)

## Safety Instructions

This instrument may sometimes be used with hazardous materials, operations and equipments. It is beyond the scope of this manual to address all of the potential risks associated with its use in such applications. It is the responsibility of the user of this instrument to consult and establish appropriate safety and health practice and determine the applicability of regulatory limitations prior to use.

 Please read the following carefully!

- 1). Every user must read and understand this operating manual before operation.
- 2). Follow general instructions for hazard prevention and safety instructions e.g. wear protective clothing, eye protection and gloves.
- 3). Observe all specifications provided by reagent manufacturers.
- 4). When dispensing inflammable media, make sure to avoid the built up of static charge, e.g. do not dispense into plastic vessels do not wipe instruments with a dry cloth.
- 5). Use the instrument only for dispensing liquids, with strict regard to the defined limitations of use and operating limitations. (see page 2) Observe operating exclusions.  
If in doubt, contact the manufacturer or supplier.
- 6). Always use the instrument in such a way that neither the user nor any other person is endangered. When dispensing, the discharge tube must always point away from you or any other person. Avoid splashes. Only dispense into suitable vessels.
- 7). Never press down the piston when the discharge tube closure is attached.
- 8). Never remove the discharge tube while the dispensing cylinder is filled.
- 9). Reagents can accumulate in the cap of the discharge tube. Thus, it should be cleaned regularly.
- 10). Never carry the mounted instrument by the cylinder sleeve or the valve block. Breakage or loosening of the cylinder may also lead to personal injury from chemicals.
- 11). Never use force on the instrument. Use smooth gentle movements to operate the piston upwards and downwards. Use only original manufacturer's accessories and spare parts.
- 12). Do not attempt to make any technical alterations. Do not dismantle the instrument any further than is described in the operating manual.

- 13). Always check the instrument for visual damage before use.
- 14). If there is a sign of a potential malfunction (e.g. piston difficult to move, sticking valve or leakage). immediately stop dispensing. Consult the 'Troubleshooting' section of this manual and contact the manufacturer if needed. (see page 19)

## Functions and Limitations of Use

The bottle top dispenser is designed for dispensing liquids directly from the reservoir bottle.

The instrument is calibrated according to the requirements of the DIN EN ISO 8655 – 5.

When the instrument is correctly used, the dispensed liquid comes into contact with only the following chemically resistant materials:

PTFE, FEP and Borosilicate glass.

### Limitations of use :

- This instrument is designed for dispensing liquids, observing the following physical limits:
- Use temperature from +15°C to +40°C (from 59°F to 104°F) of instrument and reagent
- Vapor pressure up to max. 600 mbar. Aspirate slowly above 300 mbar, in order to prevent the liquid from boiling.
- Kinematic viscosity 500 mm<sup>2</sup>  
(dynamic viscosity [mPas] = kinematic viscosity [mm<sup>2</sup> /s] x density [g/cm<sup>3</sup>])
- Density: up to 2.2 g/cm<sup>3</sup>

### Operating Limitations :

Liquids, which form deposits may make the piston difficult to move or may cause jamming (e.g., crystallizing solutions or concentrated alkaline solutions). If the piston becomes difficult to move, the instrument should be cleaned immediately. (see page 14)

When dispensing inflammable media, make sure to avoid buildup of static charge, e.g. do not dispense into plastic vessels, do not wipe instrument with a dry cloth.

The Dispenser is designed for general laboratory applications and complies with the relevant standards, e.g. DIN EN ISO 8655. Compatibility of the instrument for a specific application (e.g. trace material analysis, food sector etc.) must be checked by the user. Approvals for specific applications, e.g. for production and administration of food, pharmaceuticals and cosmetics are not available.

## Operating Exclusions

Never use with:

Liquids attacking FEP, PFA and PTFE (e.g. dissolved sodium azide\*)

Liquids attacking borosilicate glass (e.g. hydrofluoric acid)

Hydrochloric acid > 40% and nitric acid >70% | Tetrahydrofuran | Trifluoroacetic acid

Explosive liquids (e.g. carbon disulfide)

Suspensions (e.g. of charcoal) as solid particles may clog or damage the instrument

Liquids attacking PP (cap)\*\*

\* Dissolved sodium azide permitted up to a concentration of max. 0.1%.

\*\* Liquids attacking PP (cap)

## Storage Conditions

Store the instrument and accessories only in clean conditions in a cool and dry place. Storage temperature: from – 20°C to +50°C (from – 4°F to 122°F)

## Chemical Resistance

### Chemicals from A to Z

The following list includes most frequently used chemicals. It provides useful information for the safe and adequate use of the Dispenser. However, safety precautions and recommendations in operating instructions must be followed carefully.

### Code explanations

A = Good resistance      B = Acceptable with limitations      C = Not recommended

1 = Possible crystallisation - blockage or possible coating peeling  
(do not let dry plunger/barrel together).

2 = Swell of plunger protection layer, possible peeling.

3 = Acid vapours (better resistance with lower concentration).

Do not leave instrument on bottle.

4 = Risk of damage, softening or discoloration of external parts through vapours.

Do not leave instrument on bottle.

5 = Chemical degradation of glass parts (plunger/barrel).

## List of Reagents

Chemicals A - Z	
<b>A</b>	
Acetaldehyde (Ethanal)	A
Acetic acid 96%	A
Acetic acid 100% (glacial)	B/4
Acetic anhydride	B/4
Acetone (Propanone)	B/4
Acetonitrile (MECN)	B/4
Acetophenone	B/4
Acetyl Chloride	B/4
Acetylacetone	A
Acrylic acid	A
Acrylonitrile	B/4
Adipic acid	A
Allyl alcohol	A
Aluminum chloride	A
Amino acids	A
Ammonia 20%	B/4
Ammonia 20-30%	B/4
Ammonium chloride	A
Ammonium fluoride	A
Ammonium molybdate	A
Ammonium sulfate	A
Amyl alcohol (Pentanol)	A
Amyl chloride (Chloropentane)	B/4
Aniline	A
Ascorbic acid	A
n-Amyl acetate	B/4
<b>B</b>	
Barium chloride	A
Benzaldehyde	A
Benzene	B/4
Benzine	A
Benzoyl chloride	B/4
Benzyl alcohol	A
Benzyl chloride	B/4
Bis(2-ethylhexyl) phthalate	B/4
Boric acid 10%	A
Bromine	C/4
Bromobenzene	B/4
Bromonaphthalene	A
Butanediol	A
Butanol	A
Butanone (MEK)	B/4
Butyl acetate	B/4
Butyl methyl ether	B/4
Butylamine	B/4
Butyric acid	B/4



## List of Reagents

Chemicals A - Z	
C	
Calcium carbonate	A
Calcium chloride	A
Calcium hydroxide	A
Calcium hypochlorite	A
Carbon disulfide	B/4
Carbon tetrachloride	B/4
Chlorine dioxide	B/4
Chlorine water	B/4
Chloro naphthalene	B/4
Chloroacetaldehyde 45%	A
Chloroacetic acid	A
Chloroacetone	B/4
Chlorobenzene	B/4
Chlorobutane	B/4
Chloroethanol	B/4
Chloroform	B/4
Nitro-hydrochloric acid (Aqua regia)	B/4
Chlorosulfonic acid	B/4
Chlorosulfuric acid 100%	B/3/4
Chromic acid 100%	B/3/4
Chromosulfuric acid 100%	C/3/4
Citric acid	A
Copper fluoride	A
Copper sulfate	A
Cresol	A
Cumene (Isopropylbenzene)	B/4
Cyanoacrylate	A
Cyclohexane	B/4
Cyclohexanone	B/4
Cyclopentane	B/4
D	
1,2-Diethylbenzene	B/4
1,4-Dioxane (Diethylene dioxide)	B/4
1-Decanol	A
Decane	A
Di-(2-ethylhexyl) peroxydicarbonate	B/4
Dibenzyl ether	B/4
Dichloroacetic acid	A
Dichlorobenzene	A
Dichloroethane	A
Dichloroethylene	B/4
Diesel oil (Heating oil)	A
Diethanolamine	A
Diethylamine	B/4
Diethylene glycol	A
Diethylether	B/4
Dimethyl sulfoxide (DMSO)	B/4
Dimethylaniline	A
Dimethylformamide (DMF)	B/4

## List of Reagents

Chemicals A - Z	
E	
Ethanol	A
Ethanolamine	B/4
Ether	B/4
Ethyl acetate	B/4
Ethylbenzene	B/4
Ethylene chloride	B/4
Ethylene diamine	A
Ethylene glycol	A
F	
Fluoroacetic acid	B/1/4
Formaldehyde (Formalin)	A
Formamide	A
Formic acid	A
G	
Gamma-butyrolactone	A
Gasoline	B/4
Glycerin <40%	A
Glycolic acid 50%	B/1
H	
Heating oil (Diesel oil)	A
Heptane	A
Hexane	A
Hexanoic acid	B/1
Hexanol	A
Hydriodic acid	B/4
Hydrobromic acid	A
Hydrochloric acid 20% (HCl)	A
Hydrochloric acid 37% (HCl)	B/3
Hydrofluoric acid (HF)	C/5
Hydrogen peroxide	A
I	
Iodine	A
Iodine bromide	C/4
Iodine chloride	C/4
Isoamyl alcohol	A
Isobutanol	A
Isooctane	A
Isopropanol	A
Isopropyl ether	B/4
Iso-propylamine	B/4
L	
Lactic acid	A
M	
2-Methoxyethanol	A
Methanol	A
Methoxybenzene (Anisol)	B/4
Methyl benzoate	B/4
Methyl chloride (Chloromethane)	B/4
Methyl formate	A

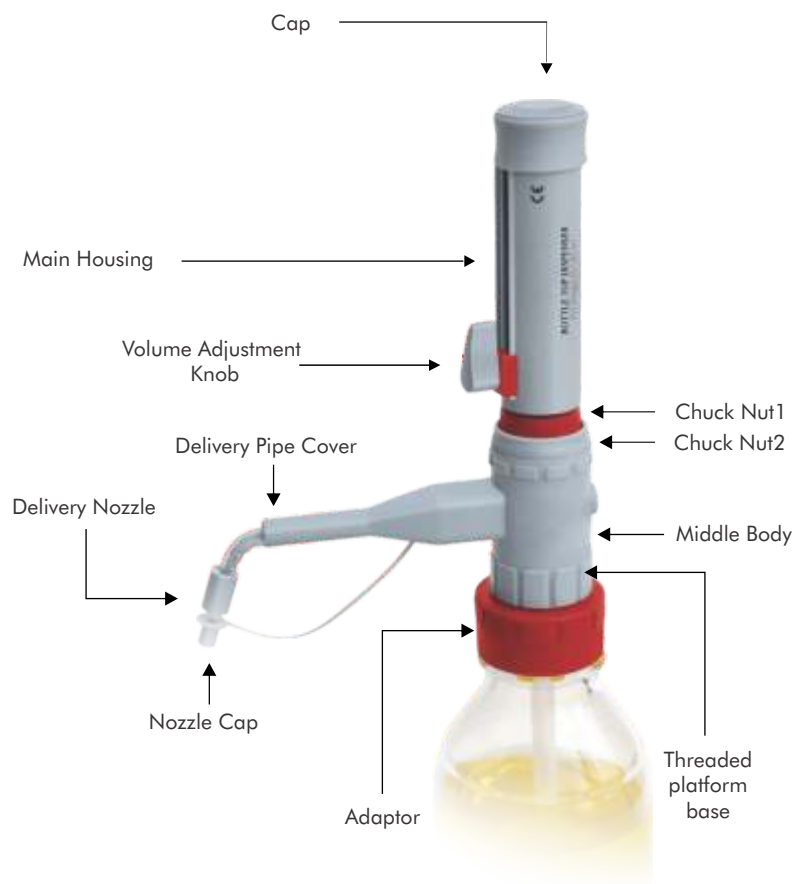
## List of Reagents

Methyl iodide (Iodomethane)	B/4
<b>Chemicals A - Z</b>	
<b>M</b>	
Methyl methacrylate (MMA)	B/4
Methyl propyl ketone (2-Pentanone)	A
Methyl tert-butyl ether	B/4
Methylene chloride (Dichloromethane) (DCM)	B/4
Methylpentanone	A
Mineral oil (engine oil)	A
Monochloroacetic acid	B/1
<b>N</b>	
N-Butylamine	B/4
Nitric acid 100%	C/4
Nitric acid 30-70%	B/4
Nitric acid dil. <30%	B/4
Nitrobenzene	B/4
Nitromethane	B/4
N-methyl-2-pyrrolidone (NMP)	A
<b>O</b>	
Octane	A
Octanol	A
Oil (vegetable, animal)	B/4
Oil of turpentine	B/4
Oleic acid	A
Oxalic acid	A
<b>P</b>	
Pentane	B/4
Peracetic acid	A
Perchloric acid 100%	B/4
Perchloric acid diluted	A
Perchloroethylene	B/4
Petroleum	B/4
Petroleum ether / spirit	B/4
Phenol	A
Phenylethanol	B/4
Phenylhydrazine	B/4
Phosphoric acid 100%	A
Phosphoric acid 85%	A
Piperidine	B/4
Potassium chloride	A
Potassium dichromate	A
Potassium hydroxide	A
Potassium iodide	A
Potassium permanganate	A
Potassium peroxydisulfate (persulfate)	A
Potassium sulfate	A
Propionic acid (Propanoic acid)	A
Propylene glycol (Propane-1,2-diol)	A
Propylene oxide	A
Pyric acid (Trinitrophenol)	B/4
Pyridine	B/4

## List of Reagents

<b>Chemicals A - Z</b>	
<b>P</b>	
Pyruvic acid	A
<b>R</b>	
Resorcin	A
<b>S</b>	
Salicylaldehyde	A
Scintillation fluid	A
Silver acetate	A
Silver nitrate	A
Sodium acetate	A
Sodium chloride (kitchen salt)	A
Sodium dichromate	A
Sodium fluoride	A
Sodium hydroxide 30%	A
Sodium hypochlorite	A
Sodium thiosulfate	A
Sulfonitric acid 100%	B/4
Sulfur dioxide	B/4
Sulfuric acid 100%	B/4
<b>T</b>	
1,1,2-Trichlorotrifluoroethane	B/4
Tartaric acid	A
Tetrachlorethylene	B/4
Tetrahydrofuran (THF)	B/4
Tetramethylammonium hydroxide	A
Toluene	B/4
Trichlorethylene	B/4
Trichloroacetic acid	B/4
Trichlorobenzene	B/4
Trichloroethane	B/4
Trichloromethane (Chloroform)	B/4
Triethanolamine	A
Triethylene glycol	A
Trifluoroacetic anhydride (TFAA)	B/4
Trifluoromethane (Fluoroform)	B/4
<b>U</b>	
Urea	A
<b>X</b>	
Xylene	B/4
<b>Z</b>	
Zinc chloride 10%	A
Zinc sulfate 10%	A





## First Steps

Is everything in the package ? Confirm that package includes :

Bottle Top Dispenser, discharge tube, telescoping filling tube, calibration tool, different bottle adapters, a calibration certificate and this operation manual.

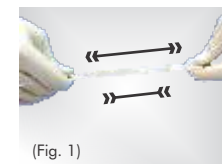
All dispensers will have the following adapters : 28, 32, 36, 40 & 45 mm.

## Assembly

**!** Wear protective clothing, eye protection and gloves. Follow all Safety instruction and observe limitations of use and operating limitations. (see page 2)

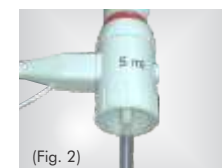
1. Adjust length of telescoping inlet tube.

The length of FEP inlet tubing provided should be adjusted to fit your particular reservoir. Longer length of inlet tube are available on request. (Fig. 1)



(Fig. 1)

2. Fix the telescoping tube. (Fig. 2)



(Fig. 2)

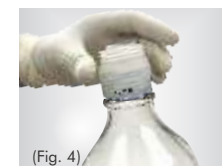
3. Choose the correct adapter for the bottle.

The threaded platform base of dispenser has a 30 mm screw thread. Four adapters are supplied to suit containers with a 28, 32, 36, 40, 45 mm and 30 mm (inbuilt adapter) screw neck. (Fig. 3)



(Fig. 3)

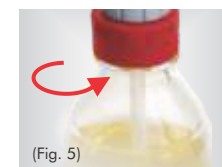
4. Fix the adapter. (Fig. 4)



(Fig. 4)

5. Mount the dispenser :

The assembled dispenser is screwed to the reservoir using gentle hand torque applied to the threaded platform base only. Removal should also be by means of hand torque applied to the same base. (Fig. 5)



(Fig. 5)

6. Ready to Use.

**!** Do not operate the piston until the unit is safely and fully mounted on the reservoir bottle.

- ⚠ Always wear protective gloves when touching the instrument or the bottle, especially when using dangerous liquids. When mounted to a reagent bottle, always carry the instrument as shown in the figure (5).
- ⚠ Never press down the piston when the cap is on. Avoid splashing the reagent. The reagent can drip out from the discharge tube and cap. (Fig. 9)

## Priming

- Place a receiving vessel under the Dispenser's delivery nozzle. (Fig.7)
- Remove the Nozzle Cap. (Fig.9)
- Prime the unit with a few gentle up and down strokes, taking the piston right down to it's lowest stop position and lifting it up. (Fig.8)
- Repeat until a steady bubble free flow is visible in the barrel.

## Dispensing

### Volume Adjustment Knob (Fig. 6)

It is simple and easy to operate. There are two positions of the knob as shown in Fig. 6 A :

- Position 1 : Locked Position
- Position 2 : Unlocked Position

Setting the Volume : Follow these simple steps :

- Turn the Knob from Position 1 to Position 2 by rotating it ANTICLOCKWISE as shown in Fig. 6 B1.
- The slider is now loose and can be moved up and down.
- Set your desired volume by aligning the pointer with the scale.
- To lock the set volume, turn the Knob from Position 2 to Position 1 by rotating it CLOCKWISE as shown in Fig. 6 B2 .

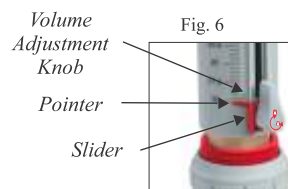


Fig. 6 A

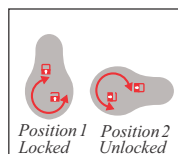


Fig. 6 B1

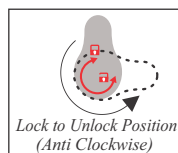


Fig. 6 B2

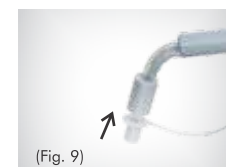
- Hold the discharge tube orifice on the inner wall of a suitable receiving vessel. (Fig. 7)



- Gently lift the piston until the upper stop and then depress piston slowly and steadily with minimal force until the lower stop. (Fig. 8)



- Wipe off the discharge tube against the inner wall of the receiving vessel.



- Reattach cap to discharge tube. (Fig. 9)

## Error Limits

Error Limits related to the nominal capacity (= maximum volume) indicated on the instrument, are obtained when instrument and distilled water are equilibrated at ambient temperature (20°C/68°F). Testing takes place according to DIN EN ISO 8655-6 with a completely assembled instrument and with uniform and smooth dispensing.

Error Limits		Specifications (ISO 8655 )			
Vol. Range	Increment	Accuracy ±% ± ml		CV ±% ± ml	
0.25-2.5 ml	0.05 ml	0.6	0.015	0.2	0.005
0.5-5 ml	0.1 ml	0.6	0.030	0.2	0.010
1-10 ml	0.2 ml	0.6	0.060	0.2	0.020
2.5-30 ml	0.5 ml	0.6	0.180	0.2	0.060
5-60 ml	1.0 ml	0.6	0.360	0.2	0.120
10-100 ml	2.0 ml	0.6	0.600	0.2	0.200



## User Calibration Procedure

Dispenser has been laboratory calibrated at its nominal volume. However, due to changes in environmental conditions and the viscosity of the media which you dispense, we recommend gravimetric testing every 3-12 months. Gravimetric volume testing according to DIN EN ISO 8655-6 (for measurement conditions, see 'Error Limits', page 13) is performed as follows:

### Re-Calibrate :

1. Set the Dispenser to the nominal volume or any other volume which is most commonly used by you. (Fig. 10)

Follow the common rules for calibration used in statistical quality control (ISO 8655/2). Set the volume and dispense five full volumes of distilled water at 20°C on Electronic Balance to establish the actual mean volume of liquid dispensed. If the gravitational average result varies from the volume displayed, you should re-calibrate the Dispenser.



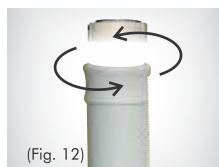
(Fig. 10)

2. For re-calibration pull the cap outwards to expose the Calibration nut. (Fig. 11)



(Fig. 11)

3. Using the calibration tool, turn the calibration nut clockwise to reduce the volume and anticlockwise to increase the volume. Repeat this procedure till the desired volume is achieved on the electronic balance. (Fig. 12)




(Fig. 12)

## Maintenance / Cleaning

The Dispenser should be cleaned in the following situations :

- Immediately when the piston is difficult to move.
- Before changing the reagent.
- Prior to long term storage.
- Prior to dismantling the instrument.
- Prior to autoclaving.
- Prior to changing the valve.
- Regularly when using liquids which form deposits (e.g. crystallizing liquids).
- Regularly when liquids accumulate in the cap.

 All maintenance should be carried out wearing suitable eye protection and protective clothing. If in doubt, consult your safety officer.

1. Make sure that the Dispenser is completely empty.
2. Place the instrument into an empty sink together with its reservoir.
3. Unscrew the threaded platform base from the reservoir and lift the dispenser's intake tube carefully out of the reservoir, whilst tapping it against the reservoir's aperture to shake off any droplets from the intake tube.
4. Hold the dispense nozzle over the aperture of the reservoir and apply gentle piston strokes in order to return any contents into the reservoir.
5. Empty the instrument completely and flush thoroughly with distilled water.
6. If the piston barrel is still not completely clean, you need to dis-assemble the dispenser. Refer Dis-assembling procedure given below.

## Dis-assembling the dispenser for cleaning and servicing :

1. Procedure to dis-assemble the piston:

- Pull the cap outwards to expose the Calibration Nut.

(Fig. 13)



(Fig. 13)

- Unscrew the Calibration Nut with the help of calibration tool to dis-assemble the Piston and shaft out of the main housing. (Fig. 14)



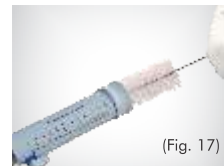
- After unscrewing pull out the shaft. (Fig. 15)



- Rinse the piston and shaft with deionized water. (Fig. 16)



- Clean the cylinder with a bottle-brush. If necessary carefully remove deposits at the edge of the glass cylinder. (Fig. 17)



- Then flush all the parts of the instrument with deionized water. (Fig. 18)



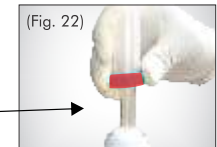
- Insert the piston completely into the cylinder and then reassemble the instrument using the calibration tool by screwing back the piston. (Fig. 19)



Snap back the cap to complete the assembly.

## 2. Procedure to dis-assemble the BARREL

- Remove the Barrel Cap.(Fig.13)
- Unscrew the Calibration using the special tool provided with the instrument. (Fig.14)
- After unscrewing pull out the shaft. (Fig. 15)
- Lift the upper housing to expose the Barrel and cover. (Fig20)
- Unscrew Chuck Nut 1 and remove Barrel cover. (Fig. 21)
- Glass Barrel is now exposed.
- Gently pull the barrel upwards to detach it from the Valve Manifold. (Fig.22)
- Barrel has been dis-assembled for cleaning. (Fig.23)



*Glass Barrel*

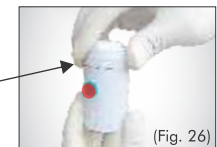
## 3. Procedure to dis-assemble the DELIVERY PIPE and VALVE MANIFOLD.

- Remove the delivery pipe cover by pulling it upwards from the slot. (Fig.24)
- Unscrew and remove the delivery pipe. (Fig.25)
- Unscrew the chuck Nut. (Fig.26)
- Remove Chuck Nut 2 and pull out the valve manifold. (Fig.27)

*Delivery Pipe Cover*



*Delivery Pipe*



*Chuck Nut 2*



*Valve Manifold.*



## Autoclaving

This instrument is autoclavable at 121° C ) (250° F) 1 bar absolute (15 psi) with a holding time of at least 15 minutes.



### Note :

Only the piston needs to be removed for autoclaving the instrument.

### Dis-assembling for Autoclaving :

- Pull the cap outwards to expose the Calibration Nut. (Fig. 28)



- Unscrew the Calibration Nut with the help of calibration tool to dis-assemble the Piston and shaft out of the main housing. (Fig. 29)



- After unscrewing pull out the shaft. (Fig. 30)



- This is the piston-shaft sub-assembly. (Fig. 31)



- Autoclave the two sub-assemblies at 121°C and 15 psi pressure for 10-15 mins. (Fig. 32)



### Re-assembling after Autoclaving :

- Insert the piston completely into the cylinder and then reassemble the instrument use in the calibration tool by screwing back the piston. (Fig. 33)



- Snap back the cap to complete the assembly. (Fig. 34)



Dispenser is now ready for use.

No Re-calibration is required after autoclaving.

However, a quick calibration check is recommended.

(Fig. 35)



## Troubleshooting

Trouble	Possible Cause	Solution
Piston Difficult to move	Formation of crystals, dirty	Stop dispensing immediately. Loosen piston with circular motion, but do not disassemble. Follow all cleaning instructions. (see page 14 )
Air bubbles appear in the Instrument	Reagent with high vapor pressure has been drawn in too quickly	Slowly draw in reagent.
	The instrument has not been primed	Prime the instrument. (see page 11)
	Filling tube is loose or damaged	Push the filling tube on firmly. if necessary cut off approx. 1 cm of the tube at the upper end and then re-connect it or replace filling tube.
	Liquid reservoir is empty	Refill reservoir and prime unit.
	Too fast filling action	Fill and dispense slowly.
	Leaking Piston	Clean Piston. (see page 14) If problem persist replace piston.
	Leaking discharge valve	Clean by flushing thoroughly with distilled water. (see page 14)
Dispensing not possible	Blocked Dispense nozzle	Disassemble the dispense nozzle and flush through with distilled water.
	Discharge valve stuck	Clean Unit by immersing valve assembly in distilled water. (see page 14)
Wrong Dispenser Volume	Instrument not calibrated	Follow steps of user calibration. (see page 13)
Barrel does not fill with liquid	Inlet tube not fitted firmly	Connect inlet tube correctly. (see page 10, Fig. 2)
Filling Not Possible	Volume adjustment to Minimum setting	Set to required volume. (see page 11)