

OPERATION MANUAL



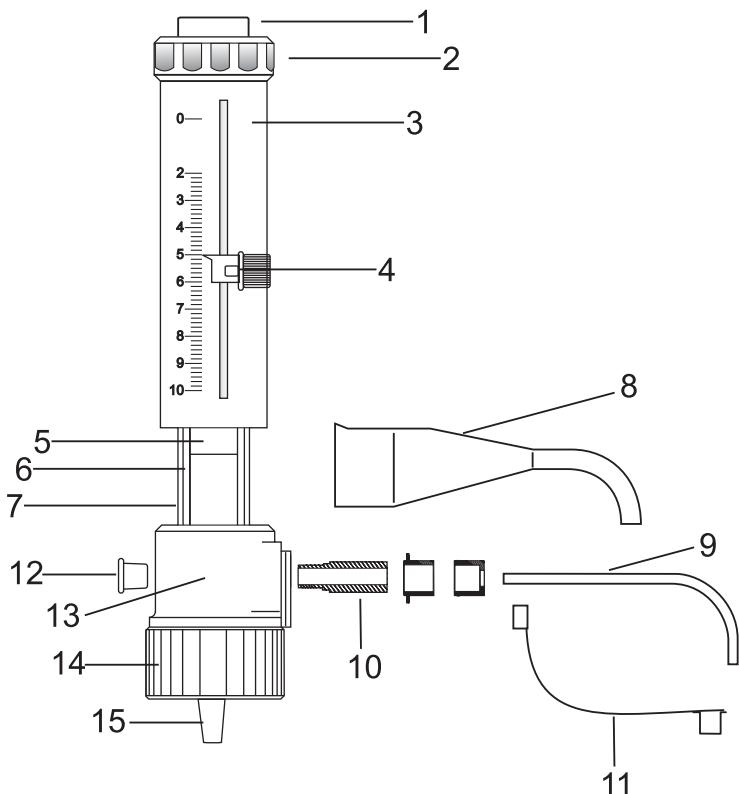
BOTTLE TOP DISPENSER



Certificate No.
2012-QACA-0139



An ISO 9001 : 2015
Certified Company



1. CALIBRATION KNOB	9. DELIVERY PIPE
2. PISTON BARREL	10. DISCHARGE VALVE
3. DISPENSER MAIN BODY	11. DELIVERY PLUG LOCK
4. VOLUME SETTING KNOB	12. AIR VENTILATION PLUG
5. PISTON	13. VALVE BLOCK HOsing
6. BOROSILICATE GLASS CYLINDER	14. VALVE BLOCK INSIDE
7. CYLINDER HOsing PROTECTION	15. FILLING VALVE
8. DELIVERY PIPE COVER	

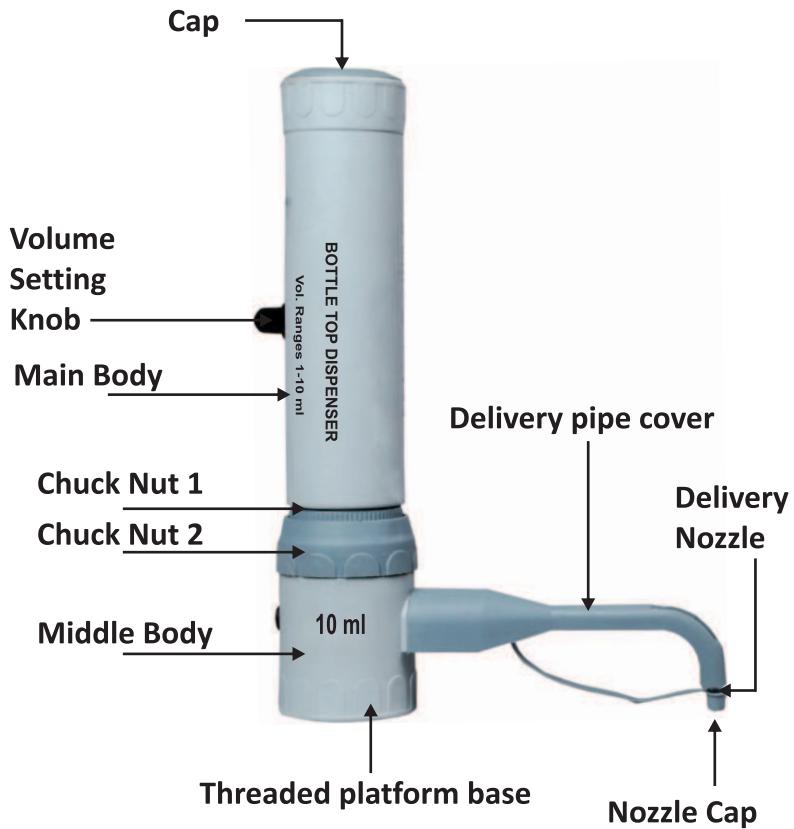
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1. Safety Precautions

WARNING: Follow instruction manual, Wear eye protection
Fully Autoclavable at 121°C, 15 psi

- ✿ This instruction manual can not describe all possible safety hazards associated with the use of this dispenser. It is the responsibility of the user to observe all safety and health precautions and to determine and observe restrictions before use of the unit.
- ✿ Observe extreme caution when dispensing caustic, poisonous, radioactive or hazardous chemicals.
- ✿ Observe general safety regulations for laboratory hazard prevention (e.g. wear protective clothing, gloves, and glasses).
- ✿ Follow the reagent manufacturer's safety information.
- ✿ Every user must be acquainted with this instruction manual and have it readily available at all times.
- ✿ Use the instrument only for its proper purpose and within the limits stated in the Operating Limitations.
- ✿ Regularly inspect the instrument for leakage and signs of wear. Before use make sure all fittings and the connection to bottle are secure.
- ✿ Never use force on the instrument. Pull the piston up and press it down gently.
- ✿ Make sure the dispensing tube is facing away from the user or other persons when operating. Avoid splashes. Dispense only into suitable vessels.
- ✿ Do not dispense without discharge tube sleeve.
- ✿ Do not carry a mounted instrument by the cylinder. Always support both the instrument and the reagent bottle.
- ✿ Do not depress the piston when the cap for the discharge tube is in place.
- ✿ After use close the discharge tube by delivery plug lock.
- ✿ After using the dispenser lock it on '0' position.
- ✿ Use only original manufacturer's parts and accessories.
- ✿ If an instrument is not operating properly, immediately stop dispensing. Clean and repair the instrument according to the instructions in this manual



2. CONTENTS OF PACKAGE

The following items are included with each Dispenser

- Dispenser : Standard threads : 30mm
- Adaptors : 28 mm, 32mm, 38mm, 42mm & 45mm adapter
- Calibration Tool
- Instruction Manual
- Inlet Tube
- Calibration Report.

APPLICATION OF THE INSTRUMENT :

This Bottle top dispenser is intended for use in In-Vitro Diagnostic Laboratories for dispensing reagents and chemicals from bottles safely and accurately.

SPECIFICATIONS

BOTTLE TOP DISPENSER

Model No.	Vol. Range	Increment	Accuracy		CV	
			±%	± ml	±%	± ml
BTD-1	0.25-2.5 ml	0.05 ml	0.6	0.015	0.2	0.005
BTD-2	0.5-5 ml	0.1 ml	0.5	0.025	0.1	0.005
BTD-3	1-10 ml	0.2 ml	0.5	0.050	0.1	0.010
BTD-4	2.5-25 ml	0.5 ml	0.5	0.125	0.1	0.025
BTD-5	2.5-30 ml	0.5 ml	0.5	0.150	0.1	0.030
BTD-6	5-50 ml	1.0 ml	0.5	0.250	0.1	0.050
BTD-7	5-60 ml	1.0 ml	0.5	0.300	0.1	0.060
BTD-8	10-100 ml	2.0 ml	0.5	0.500	0.1	0.100

General Safety Instruction

- A) Dispenser when not in use:
 - Piston Barrel should always be empty.
 - Nozzle cap should be fixed on the nozzle.
- B) Dispenser when in use:
 - Nozzle cap should be removed.
 - Place a receiving vessel under nozzle before starting the operation.
 - Never use force.

Restriction of Use

NEVER use the Dispenser with :

- Liquids which are not compatible with PTFE, FEP and
- Borosilicate Glass.
- Hydrofluoric acid.
- Liquids which contain solid particles.
- Temperature limits are 15°C to 40°C.

Before Using the Dispenser

Check that the instrument has not been damaged in transit.

Assembly

The Dispenser is packed with the dispense nozzle attached and the inlet feed tube removed. The length of FEP inlet tubing provided should be adjusted to fit the particular reservoir. Longer lengths of inlet tube are available on request.

The threaded platform base of the Dispenser has a 30mm screw thread. 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 this same base. Do not operate the piston until the unit is safely and fully mounted on the reservoir bottle. Six adaptors are supplied to suit containers with 28mm, 32mm, 38mm, 42mm & 45mm



Operating Instructions

Priming:

Place a container under the Dispenser's delivery nozzle. Remove the Nozzle Cap. Set the "volume setting knob" to the maximum volume to enable free movement of the piston.

Prime the unit with a few gentle up and down strokes, taking the piston right down to its lowest stop position and lifting it up. Repeat until a steady bubble free flow is visible in the barrel.

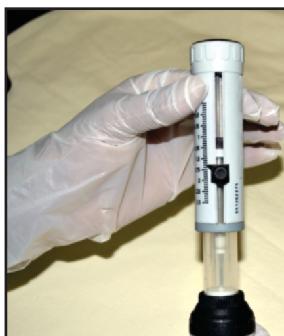
Dispensing:

Ensure that the nozzle cap is removed.

Ensure that a receiving container is placed the nozzle.
Dispenser is now ready for dispensing.

Volume setting knob

Volume setting knob is simple and easy to use. It is screw type knob. Simply unscrew the knob and slide up or down to set the desired volume by aligning the pointer on the volume adjustment knob with the scale on the main housing. Tighten the screw after aligning with the scale.



USER CALIBRATION PROCEDURE

Dispenser has been laboratory calibrated to its nominal volume. However, due to changes in environmental conditions and the viscosity of the media which you dispense, a re-calibration might be required.

You can either re-calibrate at regular intervals such as once a week or whenever you notice that the dispensed volume is different from the volume displayed by the unit.

To fully re-calibrate your Dispenser follow the following steps:

1. Set the Dispenser to the nominal volume or any other volume which is the most common volume you dispense.
2. 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.
3. For re-calibration pull the cap outwards to expose the Calibration Nut.
4. Using the calibration tool, turn the calibration nut clockwise to reduce the volume and anticlockwise to increase the volume. Repeat this procedure a few times till the desired volume is achieved.



Maintenance/Cleaning

Note : 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 bottle and lift the dispenser's intake tube carefully out of the bottle, whilst tapping it against the bottle's inner wall 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 syringe 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 :

A. Procedure to dis-assemble the PISTON

- Pull the cap outwards to expose the Calibration Nut.

Cap



- Unscrew the Calibration Nut with the help of calibration tool to dis- assemble the Piston and shaft out of the main body. Unscrew the piston from the shaft.



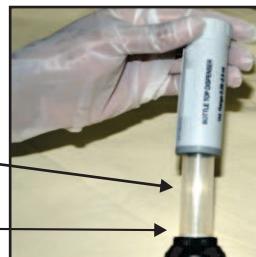
Calibration Nut



- Unscrew the piston from the shaft.

Shaft

Piston



B. Procedure to dis-assemble the CYLINDER

- lift the upper housing to expose the Cylinder and Cylinder Hosing Protection.

Cylinder



- Unscrew Chuck Nut 1 and remove Cylinder Hosing Protection.
- Glass Cylinder in now exposed.
- Gently pull the cylinder upwards to detach it from the Valve Manifold.
- Cylinder has been dis-assembled for cleaning.



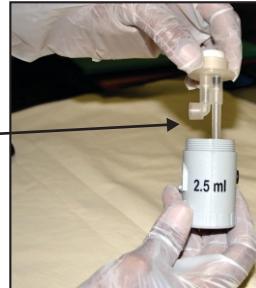
C. Procedure to dis-assemble the DELIVERY PIPE and VALVE MANIFOLD

- Remove the delivery pipe cover by pulling it upwards from the slot.
- Unscrew and remove the delivery pipe.
- Unscrew the chuck Nut 2.



- Remove Chuck Nut 2 and pull out the valve manifold

Valve Manifold →



AUTOCLAVING

Dis-assembling for Autoclaving

1. Unscrew Chuck Nut 1



2. Pull Chuck Nut 1 along with barrel cover, upper housing and piston all the way up.



3. Autoclave the two sub-assemblies at 121°C and 15 psi pressure for 10-15 mins.

Re-assembling after Autoclaving

1. Push the Piston in the Glass Barrel gently and go all the way down. (Caution : Ensure that the Nozzle cap is removed)



2. Tighten chuck nut 1 by screwing it properly.



3. Dispenser is now ready for use. No Re-calibration is required after Autoclaving.
However, a quick calibration check is recommended.

11. TROUBLESHOOTING GUIDE

Trouble	Possible Reasons	Correction
Piston is stiff or not move at all.	<ul style="list-style-type: none"> – Delivery plug lock not open – Crystallisation at the piston or valves 	<ul style="list-style-type: none"> – Open the delivery plug lock. – Stop dispensing and follow cleaning procedure If necessary soak it 24hrs. in 20% REASOL Cleaning solvent.
Suction or dispensing is impossible	<ul style="list-style-type: none"> – Volume scale set on "0" position. – Suction/discharge 	<ul style="list-style-type: none"> – Turn the volume scale to set the required volume – Follow cleaning procedure
Liquid is leaking from the gap between the valve block and the valves	<ul style="list-style-type: none"> – Valves loose or damaged 	<ul style="list-style-type: none"> – Tighten suction/discharge valves.
Liquid is leaking between the discharge tube and the valves	<ul style="list-style-type: none"> – Discharge tube is loose or damage – wrong discharge tube is used. 	<ul style="list-style-type: none"> – Mount tube correctly. – Use only the original discharge tube.
Unit is sucking air	<ul style="list-style-type: none"> – Unit is not primed – Suction tube is loose 	<ul style="list-style-type: none"> – Prime the unit. – Tighten the section tube.
Delivered volume is incorrect	<ul style="list-style-type: none"> – Suction tube is damaged – Discharge tube unit is loose or damaged – Suction tube loose or damaged – Suction/discharge valves loose or damaged 	<ul style="list-style-type: none"> – Replace with original suction tube. – Mount the original discharge tube. – Tighten the section tube. – Tighten the valve, clean the unit, if necessary change the valves

Chemical Resistance Chart at 20°C

Liquids dispensed with the dispenser will be in contact, constantly, with the following materials; Borosilicate glass, (BSG).PTFE & FEP.
The following table is a guide to help with the queries regarding liquid compatibility.

Please note that these tables are just a guide. We recommend that if there is a question regarding liquid compatibility you should exercise caution in use and refer to other chemical tables where available. Good laboratory practice would be to rinse out the liquid handing unit at the end of each day with distilled water to prevent corrosive liquids being left in contact with the parts for too long.

CHEMICAL ACIDS	BSG	PTFE	FEP
Acetic, Glaical	R	.	.
Acetic, 25%	R	R	R
Hydrochloric, Concentrated	R		
Hydrochloric, 25%	R	R	R
Sulphuric, concentrated	R		
Sulphuric, 25%	R	R	R
Nitric, Concentrated	R		
Nitric, 25%	R		
Phosphoric, 25%	R	R	R
Formic, 25%	R	R	R
Trichloroacetic 10%	R	R	R
Formic Acid, 85%	R	R	R
Arsenic Acid	R		
Boric Acid. 10%	R	R	R
Chromic Acid, 20%	R	R	R
Hydrofluoric Acid, 35%	NR	Exceptions	R
Phosphoric Acid 85%	R	R	R
Nitric Acid, 50%	R	R	R
Sulphuric Acid, 95%	R	R	R

CHEMICAL ACIDS	BSG	PTFE	FEP
Alkalies	.	.	.
Ammonium Hydroxide, 25%	R	R	R
Sodium Hydroxide	R	R	R
Potassium Hydroxide	R	R	R
Sodium Hydroxide	R	R	R
Alcohols			
Methanol, 98%	R	R	
Ethanol, 98%	R		
Ethanol, 70%	R		
Isopropanol, n-Propanol	R		
Amyl Alcohol, Butanol	R		
Benzyl Alcohol	R	R	R
Ethylene Glycol	R	R	R
Propylene Glycol	R	R	R
Glycerol	R	R	R
Hydrocarbons			
Hezane, Xylene	R	R	R
Toluene, Benzene	R	R	R
Kerosene, Gasoline	R		R
Tetralin, Decalin	R		R
Halogenated Hydrocarbons			
Methyl Chloride	R		
Chloroform	R	R	R
Trichloroethylene	R	R	R
Monochlorobenzene, Freon	R		
Carbon Tetrachloride	R	R	R
Ketones			
Acelone	R	R	R
Methyl Ethyl Ketone	R	R	
Isopropylacetone	R		
methyl Isobutyl Ketone	R		

CHEMICAL ACIDS	BSG	PTFE	FEP
Ethyl Acetate	R	R	.
Methyl Acetate	R		
Amyl & Propyl Acetate	R		
Butyl Acetate	R	R	R
Propylene Glycol Acetate	R		
2-Ethoxyethyl Acetate	R		
Methyl Cellosolve Acetate	R		
1 Benzoate	R		
Isopropyl Myristate	R		
Tricesyl Phosphate	R		
Oxides-Ethers			
Ethyl Ether	R		
1,4 Dioxane & Tetrahydrofuran	R	R	R
Dimethylsulphoxide(DMSO)	R	R	R
Isopropyl Ether	R		
Solvents with Nitrogen			
Dimethyl Formamide	R	R	R
Diethylacetamide	R	R	
Triethanolamine	R		
Aniline	R	R	R
pyridine	R	R	R

KEY :

R = RESISTANT **VR** = VIRTUALLY RESISTANT

\$R = SLIGHTLY RESISTANT **NR** = NON-RESISTANT

EXCEPTIONS = RESISTANT WITH EXCEPTIONS

NOTES: Depends on temperature Up to 300° C

Caution:

Do not use HF or reagents not compatible with PTFE or Borosilicate Glass.

When used with strong acids, it is advised to rinse & remove instrument at the end of every working day & store safely.

CHEMICAL RESISTANCE for Bottle top dispenser

Classes of substances at room temperature	PP	PTFE	FEP	BOROCILICATE GLASS
Acids, dilute or weak	E	E	E	E
Acids, Strong and concentrated	X	E	E	E
Alcohols, Aliphatic	E	E	E	E
Aldehydes	G	E	E	E
Bases	E	E	E	E
Esters	G	E	E	E
Hydrocarbons, Aliphatic	G	E	E	E
Hydrocarbons, Aromatic	X	E	E	E
Hydrocarbons, Halogenated	X	E	E	E
Ketones	G	E	E	E
Oxidizing Agents, Strong	F	E	E	E

Chemical resistance Classification:

- E Excellent-30 days of constant exposure cause no damage.
Plastics may even tolerate for years.
- G Good-little or no damage after 30 days of constant exposure to the reagent
- F Fair-Some effect after 7 days of constant exposure to the reagent like crazing, cracking, loss of strength or discoloration
- X Never use with these chemicals.

RESIN CODE:-

- PP : Polypropylene
- PTFE : Polytetrafluoroethylene
- FEP : Teflon FEP (Fluorinated ethylene propylene)
- Borosilicate Glass : 3.3

WARRANTY:

As provided by law, any and all warranties are null and void if the product has been misused, modified or repaired by unauthorized personnel, if the defects are caused by negligence (instruction manuals, maintenance) or by normal wear and tear. Use only original manufacturer's accessory/spare parts.

For conditions and extent of warranty refer to our General Conditions of Sale.