ACCUPENSE neo & MASTERPENSE neo

Bottle Top Dispenser

Operating Manual

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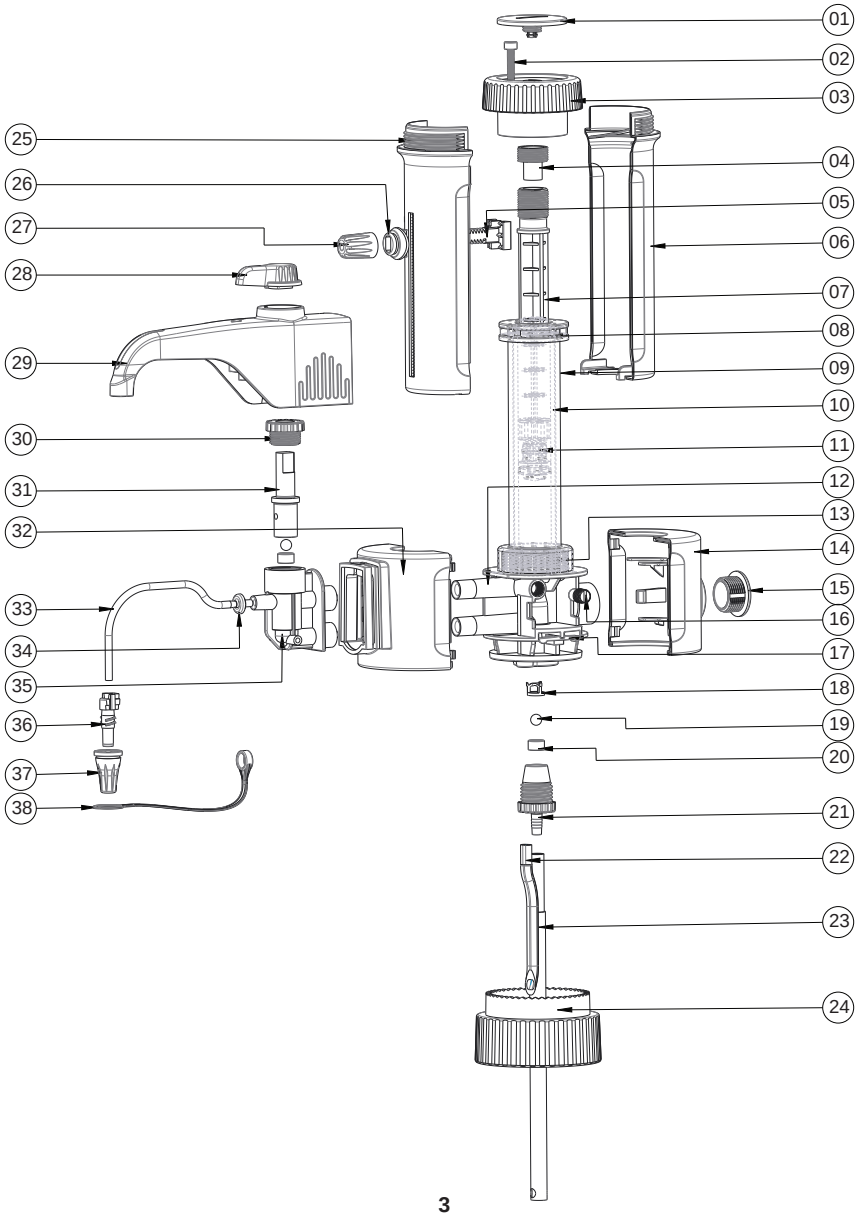

Spare Parts:

1. CALIBRATION SAFETY CAP
2. CALIBRATION SCREW
3. TOP CAP
4. PISTON ROD LOCK SCREW
5. TOGGLE SWITCH
6. TOP BODY COVER B
7. PISTON ROD
8. GLASS GUIDING RING-TOP
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20. BALL SEAT
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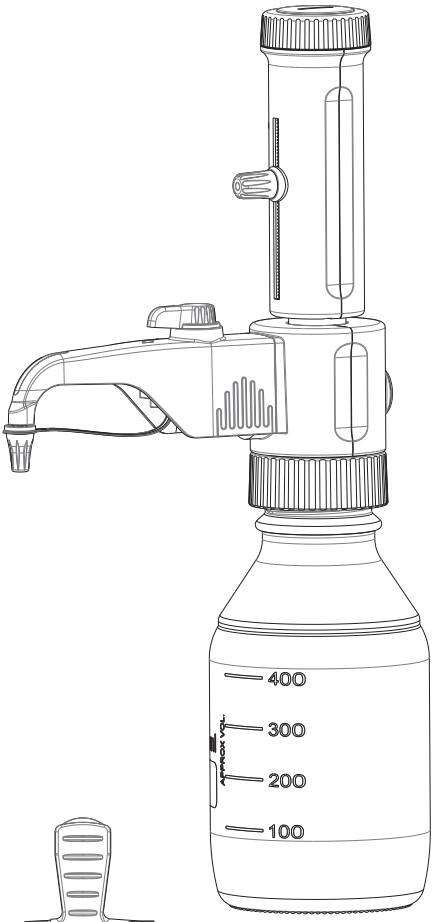
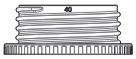
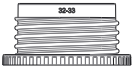


Mounting Tool



40 standard Bottle neck

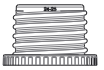
38 standard Bottle neck



32-33 standard Bottle neck

32 Indian Bottle neck

28 standard Bottle neck

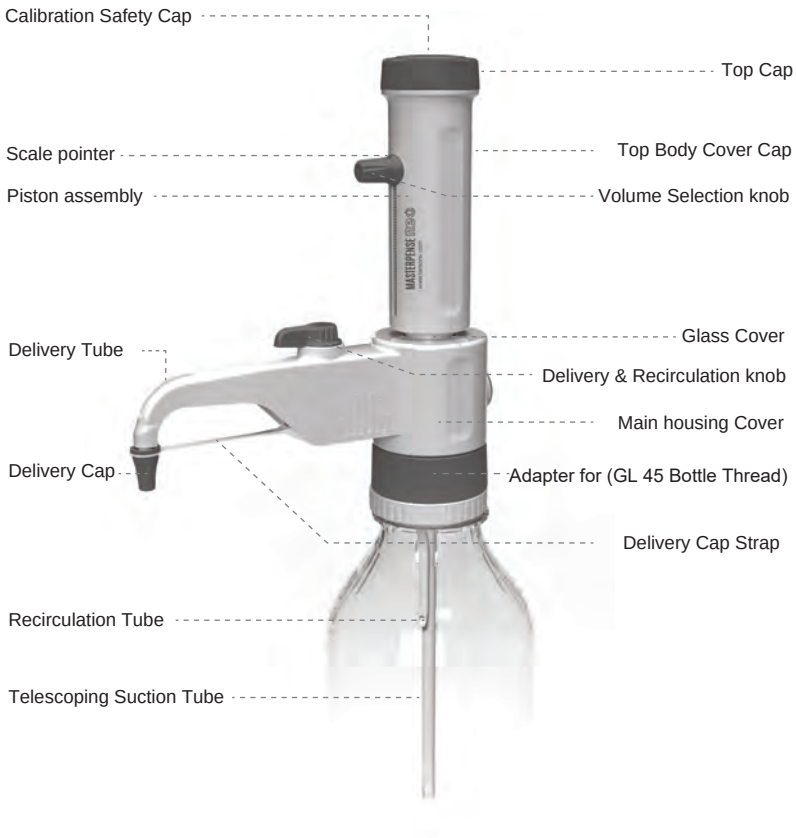


24-25 standard Bottle neck

2. Product Description

The New TARSONS ACCUPENSE & MASTERPENSE NEO Bottle Top Dispenser is an indispensable means for dispensing accurate amounts of your precious samples, reagents, chemicals, inorganic/organic solvents. It is very crucial when it comes to liquid handling and is primarily used for dispensing liquids with greater accuracy. These Dispensers are practically universally applicable and can be used with most organic and inorganic solutions.

Our Dispenser comes with a pre-attached GL-45 adapter, for quick & hassle-free setup, thus eliminating the need for additional fittings.



3. Product Features

- Universally applicable and can be used with most organic and inorganic solvents and solutions.
- Ergonomically designed.
- The parts that come in contact with media are resistant to most acids, solvents, and bases.
- Quick and accurate adjustment of volume is achieved with the help of innovative mechanism of screw and inner toothed bar.
- Easy to use calibration mechanism helps achieve monitoring of test equipment with negligible downtime.
- Springless valve for unhindered dispensing and easy to clean and maintenance.
- Reagent loss while bleeding and air bubbles is avoided with the innovative recirculation valve.
- Built-in GL-45 adapter for quick & seamless bottle compatibility.

4. Technical Specifications

Volume range (mL)	0.25-100
Inaccuracy	±0.5%
Imprecision	≤0.2%

***PTFE= Polytetrafluoroethylene**

MATERIALS

Outer Body and plunger	PP
Recirculation knob	PTFE
Valves, valve seats & Delivery chamber	PFA/ Borosilicate glass / Ceramic
Handle and Cap	PP
Tubings and fittings	FEP

PFA= Perfluoro Alkoxy alkanes;

PP= Plopropylene;

FEP= Fluorinated Ethylene Propylene

5. Intended Use

Masterpense Neo Bottle Top Dispensers are high precision instruments for crucial liquid handling purposes. The instrument is intended for use in laboratories for dispensing accurate amounts of your precious samples, reagents, chemicals, inorganic/organic solvents that are compatible with it. (Refer to section 9)

6. Safety Instructions

This instrument must be used, after carefully reading all the safety instructions. It is the user's sole responsibility to ensure one's safety while operating the instrument. No user manual can completely take over the responsibility of all the safety risks and hazards associated with use of the appliance.

Please refer to the following instructions carefully:

1) The operating manual must be read and understood by every user before operation.

2) All specifications provided by reagent manufacturers must be carefully observed.

3) General instructions for hazard prevention and safety instructions, e.g., wearing protective clothing, eye protection wear and gloves must be followed religiously.

4) Care must be taken that the build-up of static charge while dispensing inflammable media is AVOIDED at any cost., e.g., liquids must not be dispensed into plastic vessels; the instrument must not be wiped with a dry cloth.

5) The instrument is to be strictly used for the purpose of dispensing liquids with respect to the mentioned operating limitations and operating exclusions. (See page 11)! For any queries, please contact the manufacturer or supplier.

6) The instrument must be used in a certain way that neither puts the user nor anyone else in danger. It is strictly advised that the discharge tube be always pointed away from the user while liquids are being dispensed. Splashes and unsuitable vessels must be AVOIDED at all costs.

7) The piston must NEVER be pressed down while the closure cap is attached.

8) The discharge tube must NEVER be removed when dispensing cylinder is being filled.

9) Regular cleaning of the closure cap of the discharge tube is a must, since reagents may accumulate there.

10) A bottle stand is recommended while using the flexible discharge tube for small bottles, to prevent tipping over.

11) It is advised to 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 (see page 16, Fig. 2.1-Assembly)

12) Force must NEVER be applied on the instrument, rather use of smooth gentle movements is recommended to operate the piston upwards and downwards.

13) Only the original manufacturer ‘s accessories and spare parts are advised to be used. Any sort of technical alterations must not be made. Dismantling of the instrument any further than is described in the manual must be STRICTLY AVOIDED.

14) Checking of instrument for visible damage before use is highly recommended. In case of a potential anomaly or malfunction which may include difficulty in moving the piston or leakage with valves sticking, dispensing must be immediately stopped. Consulting the ‘Troubleshooting’ section of this manual is highly recommended (Refer to section 20). For any further queries, the manufacturer may be contacted if needed.

7. Functions & Limitations of Use

Bottle top dispensers play a key role in dispensing accurate amounts of the liquid required directly from the supply bottle itself. These instruments meet the requirements of DIN EN ISO 8655-5.

The instrument, if correctly used, will directly come into contact with only the following listed chemically resistant materials:

- Borosilicate glass
- Al_2O_3 -ceramic
- FEP
- PFA
- PTFE

7.1 Physical Limitations

The following physical limits must be maintained while using this instrument for dispensing liquids-

- A temperature range of 15°C to 40°C of instrument and reagent is recommended
- A maximum of 600mbar vapour pressure is recommended. It is recommended that vapour pressure is to be slowly aspirated above 300mbar so that boiling of the liquid is prevented.
- Kinematic viscosity up to 500 mm^2/s
- Density up to 2.2g/cm^3

7.2 Operating limitations

The piston may become difficult to move or may be jammed because of dispensing liquids that are more prone to forming deposits (e.g., crystallizing solutions or concentrated alkaline solutions). In this case, the instrument must be cleaned immediately otherwise its movement may become sluggish and stiff (Refer to section 15)

Build-up of static charge must be avoided at all costs while dispensing inflammable media, e.g., dispensing into plastic vessels is strictly prohibited and wiping instrument with dry cloth must be avoided.

The intended use and application of this instrument is for general laboratory purposes which conforms with relevant standards, e.g., DIN EN ISO 8655. However, the instrument compatibility for separate applications like analysis of trace material must be verified by the user.

7.3 Operating exclusions

- The instrument must not be used with liquids that attack FEP, PFA and PTFE, Al_2O_3 (e.g., dissolved Sodium Azide) *
- It must also not be used with liquids that react with 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 that attack PP (Cap)

*Dissolved Sodium Azide may be allowed up to a maximum concentration of 0.1%

8. Storage conditions

The instrument and accessories are to be stored in a clean, dry and cool place. Storage temperature may vary from -20°C to +50°C (-4°F to 122°F)

9. Chemical Compatibility Chart

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 = Acid vapours (better resistance with lower concentration) Rinse the instrument in the rinse mode otherwise do not leave instrument on bottle.

2 = Risk of damage, softening/discolouration of external parts through vapours. Rinse the instrument in the rinse mode otherwise do not leave instrument on bottle.

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

4= Possible crystallisation blockage / possible coating peeling. Do not let dry plunger / barrel move together.

5= Swelling of plunger protection layer, possible peeling.

List of Reagents

Chemicals A - Z

A	
Acetaldehyde	A
Acetic acid (glacial), 100%	B/2
Acetic acid, 96%	A
Acetic anhydride	B/2
Acetone(Propanone)	B/2
Acetonitrile (MECN)	A
Acetophenone	B/2
Acetyl chloride	B/2
Acetylacetone	A
Acrylic acid	A
Acrylonitrile	B/2
Adipic acid	A
Allyl alcohol	A
Aluminium chloride	A
Amino acids	A
Ammonia, 20%	B/2
Ammonia, 20-30%	B/2
Ammonium chloride	A
Ammonium fluoride	A
Ammonium molybdate	A
Ammonium sulfate	A
n-Amyl acetate	B/2
Amyl alcohol (Pentanol)	A
Amyl chloride (Chloropentane)	B/2
Aniline	A
Ascorbic acid	A
B	
Barium chloride	A
Benzaldehyde	A
Benzene	B/2
Benzine (Petroleum benzine) - bp 70-180 °C	A
Benzoyl chloride	B/2
Benzyl alcohol	A
Benzyl amine	A
Benzyl Chloride	B/2
Bis (2-ethylhexyl) phthalate	B/2
Boric acid, 10%	A
Bromine	C/2
Bromobenzene	B/2
Bromonaphthalene	A
Butanediol	A
Butanol	A
Butyl acetate	B/2
Butyl methyl ether	B/2
Butylamine	B/2
Butyric acid	B/2

C	
Calcium carbonate	A
Calcium chloride	A
Calcium hydroxide	A
Calcium hypochlorite	A
Carbon disulfide	B/2
Carbon tetrachloride	B/2
Chlorine dioxide	B/2
Chlorine water	B/2
Chloro naphthalene	B/2
Chloroacetaldehyde, ≤45%	A
Chloroacetic acid	A
Chloroacetone	B/2
Chlorobenzene	B/2
Chlorobutane	B/2
Chloroethanol	B/2
Chloroform (Trichloromethane)	B/2
Nitro-hydrochloric acid (Aqua regia)	B/2
Chlorosulfonic acid	B/2
Chlorosulfuric acid 100%	B/1/2
Chromic acid, 100%	B/1/2
Chromosulfuric acid	C/1/2
Citric acid	A
Copper fluoride	A
Copper sulfate	A
Covi-Ox-T70/Mixed Tocopherol	A
Cresol	A
Cumene (Isopropyl benzene)	B/2
Cyanoacrylate	A
Cyclohexane	B/2
Cyclohexanone	B/2
Cyclopentane	B/2
D	
Decane	A
Di-(2-ethylhexyl) peroxydicardonate	B/2
1-Decanol	A
Dibenzyl ether	B/2
Dichloroacetic acid	A
Dichlorobenzene	A
Dichloroethane	A
Dichloroethylene	B/2
Dichloromethane	B/1
Diesel oil (Heating oil), bp 250-350°C	A
Diethanolamine	A
Diethylether	B/2
Diethylamine	B/2
1,2 Diethyl benzene	B/2
Diethylene glycol	A

List of Reagents

D	
Dimethylacetamide	A
Dimethyl sulfoxide (DMSO)	B/2
Dimethylaniline	A
Dimethylformamide (DMF)	B/2
1,4 Dioxane (Diethylene dioxide)	B/2
Diphenyl ether	A
E	
Essential oil	A
Ethanol	A
Ethanolamine	B/2
Ether	B/2
Ethyl acetate	B/2
Ethylbenzene	B/2
Ethylene chloride	B/2
Ethylene diamine	A
Ethylene glycol	A
F	
Fluoro acetic acid	B/2/4
Formaldehyde, ≤40% (Formalin)	A
Formamide	A
Formic acid, ≤100%	A
G	
Gamma-butyrolactone	A
Gasoline	B/2
Glycerin ≤40%	A
Glycerol	A
Glycol (Ethylene glycol)	A
Glycolic acid, ≤50%	B
H	
Heating oil (Diesel oil), bp 250-350°C	A
Heptane	A
Hexane	A
Hexanoic acid	B/4
Hexanol	A
Hydriodic acid, ≤57%	B/2
Hydrobromic acid	A
Hydrochloric acid, ≤20%	A
Hydrochloric acid, 20-37%	B/1
Hydrofluoric acid (HF)	C/3
Hydrogen peroxide	A
I	
Iodine	A
Iodine bromide	C/2
Iodine chloride	C/2
Isoamyl alcohol	A
Isobutanol	A

I	
Isooctane	A
Isopropanol (2-Propanol)	A
Isopropyl ether	B/2
Iso-propylamine	B/2
K	
Kerosene	A
L	
Lactic acid	A
M	
2-Methoxyethanol	A
Methanol	A
Methoxybenzene (Anisol)	B/2
Methyl benzoate	B/2
Methyl tert butyl ether	B/2
Methyl ethyl ketone (MEK/Butanone)	B/2
Methyl formate	A
Methyl iodide (Iodomethane)	B/2
Methyl methacrylate (MMA)	B/2
Methyl propyl ketone (2-Pentanone)	A
Methylene chloride (Chloromethane)	B/2
Methylene chloride - (Dichloromethane) (DCM)	B/2
Methylpentanone	A
Mineral oil (Engine oil)	A
Monochloroacetic acid	B/4
N	
Nitric acid 100%	C/3
Nitric acid, 30-70%	B/2
Nitric acid dil, <30%	B/2
Nitrobenzene	B/2
Nitromethane	B/2
N-methyl-2-pyrrolidone (NMP)	A
O	
Oleic acid	A
Oxalic acid	A
Octane	A
Octanol	A
Oil (Vegetable, Animal)	B/2
Oil of turpentine	B/2
Oleum (Fuming sulfuric acid)	A
P	
Pentane	B/2
Peracetic acid	A
Perchloric acid 100%	B/2
Perchloric acid diluted	A
Perchloroethylene	B/2
Petroleum	B/2

List of Reagents

P	
Petroleum ether, spirit	B/2
Phenol	A
Phenylethanol	B/2
Phenylhydrazine	B/2
Phosphoric acid 100%	A
Phosphoric acid, ≤85%	A
Piperidine	B/2
Potassium chloride	A
Potassium dichromate	A
Potassium dihydrogen phosphate	A
Potassium hydroxide	A
Potassium iodide	A
Potassium permanganate (persulfate)	A
Potassium peroxydisulfate	A
Potassium sulfate	A
Propionic acid (Propanoic acid)	A
Propylene glycol (Propane-1,2-diol)	A
Propylene oxide	A
Picric acid (Trinitrophenol)	B/2
Pyridine	B/2
Pyruvic acid	A
R	
Resorcin	A
S	
Salicylaldehyde	A
Scintilation fluid	A
Silver acetate	A
Silver nitrate	A
Sodium acetate	A
Sodium chloride	A
Sodium dichromate	A
Sodium fluoride	A
Sodium hydroxide, ≤30%	A
Sodium hypochlorite	A
Sodium thiosulfate	A

S	
Sulfonitric acid 100%	B/2
Sulfur dioxide	B/2
Sulfuric acid 100%	B/2
Sulfuric acid <10%	A
Sulfuric acid (10-75%)	B/1
Sulfuric acid (Cold conc.)	A
Sulfuric acid (Hot conc.)	B/2
T	
Tartaric acid	A
Tetrachloroethylene	B/2
Tetramethylammonium hydroxide	A
Toluene	B/2
Trichlorethylene	B/2
Trichloroacetic acid	B/2
Trichlorobenzene	B/2
Trichloroethane	B/2
Triethanolamine	A
Triethylamine	A
Trichloroethylene	B/2
Trichlorotrifluoro ethane	B/2
Triethanolamine	A
Triethylene glycol	A
Trifluoromethane (Fluoroform)	B/2
Trifluoro ethane	B/2
Trifluoroacetic anhydride (TFAA)	B/2
Turpentine	A
U	
Urea	A
X	
Xylene	B/2
Z	
Zinc chloride, ≤10%	A
Zinc sulfate, ≤10%	A

⚠ CAUTION:

Always follow instructions in the operating manual of the dispenser as well as the reagent manufacturer's specifications. In addition to these chemicals, a variety of organic and inorganic saline solutions (e.g., biological buffers), biological detergents and media for cell culture can be dispensed. If used with strong acids, it is advised to rinse & remove dispenser at the end of every working day & store it safety. If require information on chemicals not listed, please contact us.

10. First Steps

10.1 Are all the essentials in your package?

First of all, it must be made sure that your package includes the following:

1. Bottle top dispenser	
2. Recirculation Tube	
3. Telescopic tube	
4. Mounting tool	
5. Bottle adapters	
5. Calibration certificate	
7. Operating manual	

10.2 Installation

1. Setting up of the filling/recirculation tube:

The length of the telescope filling tube needs to be adjusted to the bottle height and attached. The filling tube must be in the center and attached carefully so that any damage to the nozzle is prevented. If you are using a discharge tube with a recirculation valve then you must install the optional recirculation tube. It must be inserted with the opening pointing outward (Fig. 1).

Fig.1

2. Setting up the instrument on a bottle and aligning:

The instrument must be screwed onto reagent bottle using GL45 threads and discharge tube must be aligned with bottle label. This is achieved by rotating the valve block with the discharge tube (Fig. 2,2.1). A bottle stand must be used for small bottles to avoid tipping over.

Fig.2

Fig.2.1

WARNING!!
Protective gloves are always advised to be worn when touching the instrument or the bottle, especially when using dangerous liquids.
When mounted to a reagent bottle, the instrument must always be carried as shown in the above picture.

11. Priming

WARNING!! Wear protective clothing, eye protection wear and gloves! The piston must never be pressed down when the closure cap is put on! Splashing the reagent must be avoided! Liquid may accumulate in the closure cap. It is advised to dispense slowly to avoid splashes. All safety instructions, limitations of use and operating limitations are to be strictly followed.

11.1 Instruments with Recirculation Valve

1. The closure cap is to be removed and the discharge tube must be opened. (Fig. 1).

Fig.1

2. The valve is to be set to ‘Recirculate’ (Fig. 2).

Fig.2

3. For priming, the piston is to be gently pulled up approx. 30 mm and pushed down rapidly until the lower stop. Repeat this step until there are no more air bubbles in the cylinder (Fig. 3).

Fig.3

4. The valve is to be set to ‘Dispense ‘(Fig. 4).

Fig.4

5. In order to avoid splashes when priming, the discharge tube must be held on the inner wall of a suitable receiving vessel and the liquid is to be dispensed so that the discharge tube can be primed until it is bubble-free. Any remaining drops from the discharge tube must be wiped away. (Fig. 5).

Fig.5

11.2 Instruments without Recirculation valve

1. The closure cap is to be removed and discharge tube opened (see ‘instrument with recirculation valve’, Fig. 1).

   The orifice of discharge tube is advised to be held on the inner wall of a suitable receiving vessel in order to prevent splashes.

2. For priming, the piston is to be pulled up approx. 30 mm and pushed down rapidly until the lower stop. The above step must be repeated until there are no air bubbles in the cylinder. (Fig. 3).

12. Dispensing

12.1 Setting volume

Variable: loosen the volume selector thumb screw half (½) turn (1), set the pointer to the desired volume (2), and retighten the volume thumb screw (3)

WARNING!! Wear protective clothing, eye protection and gloves! Never press down the piston when the closure cap is put on! Avoid splashing the reagent! Liquid may accumulate in the closure cap. To avoid splashes dispense slowly. Follow all safety instructions and observe limitations of use and operating limitations (page 9).

12.2 Dispensing

1. The closure cap of the discharge tube must be first removed. (Fig. 1).

2. When using instruments equipped with the recirculation valve, the valve is to be set to ‘Dispensing ‘.

3. The orifice of discharge tube is advised to be held on the inner wall of a suitable receiving vessel in order to prevent splashes.

4. Gently lift the piston until the upper stop and then depress piston slowly and steadily with minimal force until the lower stop (Fig. 2).

5. Finally, any drops from the discharge tube must be wiped away keeping it against the inner wall of the receiving vessel.

6. Close discharge tube with the closure cap (Fig. 3).

Fig.1

Fig.2

Fig.3

⚠ After using piston, always press it down to the lower stop.

13. Error limits

We obtain the error limits as indicated on the instrument related to the nominal capacity only 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 filled instrument and with uniform and smooth dispensing.

Nominal volume (ml)	A*< ± %	±ml	±µl	CV < %	±ml	±µl
2.5	0.6	0.015	15	0.2	0.005	4
5	0.5	0.025	25	0.2	0.01	10
10	0.5	0.05	50	0.2	0.02	20
25	0.5	0.125	125	0.2	0.05	50
30	0.5	0.15	150	0.2	0.06	60
60	0.5	0.3	300	0.2	0.12	120
100	0.5	0.5	500	0.2	0.2	200

How to calculate Partial accuracy
The percentage values for A and CV are relative to the nominal volume (VN) and must be converted for partial volumes (Vp).

Standard Formula:

$$\boldsymbol{A_P = \frac{V_N}{V_P} A_N}$$

e.g

For Volume Capacity of 25 mL-

- Nominal Volume (V_N) ml: 25ml
- Nominal Accuracy (A_N)% : 0.5%

Set1: Partial Volume = 50% of Nominal Volume

- Partial Volume (V_P) ml: 12.5ml
- Partial Accuracy (A_P) %

From Standard Formula -

Partial Accuracy (A_P) = $\frac{V_N}{V_P} A_N$ = ($\frac{25}{125}$ 0.5) % = 1%

13.1. How to calculate Partial volume

We obtain the error limits as indicated on the instrument related to the nominal capacity only 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 filled instrument and with uniform and smooth dispensing.

e.g.	Volume	A* ≤ ±%	µl	CV* ≤ %	µl
VN	25	0.5	125	0.1	25
Vp=50%	12.5	1.0	125	0.2	25
Vp=10%	2.5	5.0	125	1.0	25

*A = Accuracy, CV = Coefficient of Variation

NOTE: The error limits in DIN EN ISO 8655-5 are satisfied with a significant margin. The maximum error for a single measurement is calculated from the sum of error limits EL = A + 2 × CV (e.g., for the 25 ml size: 125 µl + 2 x 25 µl = 175 µl).

14. User Calibration

Gravimetric testing of the Bottle top dispenser is recommended every 3-12 months based on how often it is used. In addition, a short function test may also be performed at regular intervals, like dispensing the nominal volume into a volumetric test flask.

As per DIN EN ISO 8655-6, the volume testing for the instrument by Gravimetric analysis method, (for measurement conditions, see 'Error Limits' page 19) can be performed as follows:

- Preparation of the instrument

The instrument must be cleaned first, then filled with distilled H_2O and then primed carefully. Clean the instrument.

- Check the volume
  a) We recommend a total of 10 dispensing operations that needs to be dispensed with distilled water in 3 volume ranges (100 %, 50 %, 10 %)
  b) The piston is advised to be pulled up gently till the upper stop of the volume is set, while filling.
  c) The piston is advised to be depressed slowly and carefully with minimum force until the lower stop, while discharging.
  d) The tip of the discharge tube must be wiped off.
  e) The dispensed quantity of the analyte must be weighed on an analytical balance. The operating manual of its manufacturer is requested to be followed.
  f) Next, the dispensed volume must be calculated. The Z factor takes account of the temperature and air buoyancy.

Calculations

x_i = results of weightings
n = number of weightings

Z = correction factor
(e.g. 1.0029 µl/mg at 20° C, 1013 hPa)

Mean value $\overline{x}$ =

Mean volume $\overline{V} = \overline{x} . z$,

Accuracy

$$A\% = \frac{\overline{V} - V_0}{V_0} . 100$$

Standard deviation

$$S = Z . \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n - 1}}$$

Coefficient of variation

$$CV\% = \frac{100.s}{\overline{V}}$$

V_0 = nominal volume

14.1 Recalibration procedure

a) The volume of the instrument is advised to be set to a nominal value or any other value which is usually used by the user. The common rules for calibration that are used in Statistical quality control (ISO 8655-5) must be strictly followed.

b) The volume must be set and five full volumes of distilled water must be dispensed at 20°C on an electronic balance so that the actual mean volume of the dispensed liquid is established. In case the gravitational average result varies from the displayed volume, the instrument must be recalibrated.

c) For recalibration, the top cap must be open by using calibration tool rotating anti clockwise expose the calibration nut. (Fig.1)

Fig.1

Fig.2

d) With the help of calibration tool, the calibration nut must be turned clockwise for reducing the volume and anticlockwise for increasing it. This procedure is to be repeated until the desired volume is achieved (Fig.2)

15. Cleaning and Maintenance

The instruments must be cleaned and maintained properly especially in the following situations-

- Urgently when piston becomes difficult to move
- Before autoclaving
- Before dismantling the instrument
- Before changing valves
- Prior to long term storage
- Prior to reagent change
- Daily while using liquids that accumulate in the cap
- Daily while using liquids that form deposits

WARNING!! The cylinder, valves, telescoping filling tube and discharge tube contain reagent! The discharge tube is strictly advised to not be removed while dispensing cylinder is being filled. The valves and tube openings must always be pointed away from the user. Protective clothing, eye protection and appropriate hand protection is advised to be worn.

For cleaning the instrument and removing any dirt or particles that may have deposited in the parts through which liquids pass it is advised that the piston be completely withdrawn from the cylinder after rinsing with a suitable cleaning solution. If required, they can also be cleaned in an ultrasonic bath.

1. The instrument must be screwed onto an empty bottle and vacated completely by dispensing (Fig. 1). If the instrument is equipped with a recirculation valve, it must be emptied in both the ,dispense and recirculate settings(Fig.2).

Fig.1

Fig.2

2. The instrument must be screwed onto a bottle filled with a suitable cleaning agent (e.g., deionized water) and it must be rinsed several times by completely filling and emptying it.

3. Disassembly of the piston.

NOTE: The pistons and cylinders, being individually matched, must strictly not be interchanged with piston from other instruments!

The housing must be held securely and the piston seat unscrewed completely by moving to the left. The piston must be carefully pulled out and the housing removed.

4. The piston and cylinder must be carefully cleaned and any sort of deposits must be carefully removed from the edge of the glass cylinder, if necessary. (Fig. 3).

5. The piston and cylinder must be rinsed with deionized water and then dried carefully(Fig.4,4.1).

Fig.3

Fig.4

Fig.4.1

16. Disassembling parts for servicing

16.1 Disassembling the Delivery Housing

i. Straighten the delivery recirculation knob(Fig.1).

ii. Clean the pipe with deionized water.

a. Re-assembling the Delivery pipe

i. First push the delivery pipe into the lower housing till it stops going in further.
ii. Screw the chuck nut to complete the assembly(Fig.2).

Fig.1

Fig.2

16.2 Replacing the suction valve

Filling valve

i. Pull out the recirculation tube and the telescoping filling tube
ii. Use the mounting tool to unscrew the filling valve
iii. Screw in the new filling valve first by hand and then tighten it with the mounting tool

17. Autoclaving

The instrument can be autoclaved at 121°C (250°F), 1 bar with a hold time of at least 15minutes, according to DIN EN 285.

Preparation for autoclaving

1. The instrument must be carefully cleaned prior to autoclaving (see Cleaning page 23).

2. Open the closure cap on the discharge tube, and for instruments with a recirculation valve, set the valve to Dispense .

3. The filling valve must be checked if it is securely sealed. (Fig. 1).

4. The instrument must be held with the discharge piston pressed vertically downwards and gently tapped against the casing with one's hand to ensure unhindered access for the steam and also to prevent the ball valve in the filling valve from possibly getting stuck. (Fig. 2).

5. The dispenser must be kept in an inverted (upside down) position while placing it inside the autoclave (Fig.3).

Fig.1

Fig.2

Fig.3

Dispenser is now ready for use. Recalibration is required after Autoclaving.

18. Ordering information

Dispenser variable

Capacity (ml)	Dispensing step (ml)	A* + %	CV* + %	Cat No. Accupense Neo	Cat No. Masterpense Neo
0.25-2.5	0.05	0.6	0.2	BTD-A002	BTD-M002
0.5-5.0	0.10	0.5	0.2	BTD-A005	BTD-M005
1.0-10.0	0.20	0.5	0.2	BTD-A010	BTD-M010
2.5-30.0	1.00	0.5	0.2	BTD-A030	BTD-M030
5.0-60.0	1.00	0.5	0.2	BTD-A060	BTD-M060
20.0-100.0	2.00	0.5	0.2	BTD-A100	BTD-M100

19. Accessories & Spares

The packaging unit is always 1 unless otherwise specified.

Bottle Adapters

Outer thread	for bottle thread / ground joint	Material	Adapter ID No.	Code
GL 32	GL 25	PP	24-25	S0A-GL25
GL 32	GL 28/S 28	PP	28	S0A-GL28
GL 45	GL 32	PP	32-33	S0A-GL33
GL 45	GL 38	PP	38	S0A-GL38
GL 45	S* 40	PP	40	S0A-S40
GL 32	GL 32	PP	32	S0A-GL32

*Buttress threads

19.a Suction Valve

Made of: PFA, ceramic Al203

Nominal volume (ml)	Code	Product Description	Packing (Pcs/Case)
2.5,5,10	S0SV01	Suction valve for 2.5 / 5 / 10 ml	1pc/Case
30,60,100	S0SV02	Suction valve for 30 / 60 / 100 ml	1pc/Case

19.b Telescoping filling tube

Made of: FEP, PTFE

Nominal volume: 2.5,5,10 ml			
Length range (mm)	**Code**	**Product Description**	**Packing (Pcs/Case)**
125-240	S0TFT01	Telescoping filling tube 125-240 mm	1pc/Case
255-365	S0TFT02	Telescoping filling tube 255-365 mm	1pc/Case
255-480	S0TFT03	Telescoping filling tube 255-480 mm	1pc/Case
Nominal volume: 30,60,100 ml			
175-340	S0TFT04	Telescoping filling tube 175-340 mm	1pc/Case
350-480	S0TFT05	Telescoping filling tube 350-480 mm	1pc/Case

19.c Closure cap with strip

Made of: PP

Nominal volume (ml)	Code	Product Description	Packing (Pcs/Case)
2.5,5,10	S0CCWS1	Closure cap with strip for 2.5 / 5 / 10 ml	1pc/Case
30,60,100	S0CCWS2	Closure cap with strip for 30 / 60 / 100 ml	1pc/Case

19.d Discharge Valve set

Made of: PFA, Ceramic Al203, PTFE

Nominal volume (ml)	Code	Product Description	Packing (Pcs/Case)
2.5,5,10	S0DVS1	Discharge Valve Set for 2.5 / 5 / 10 ml	1pc/Case
30,60,100	S0DVS2	Discharge Valve Set for 30 / 60 / 100 ml	1pc/Case

19.e Recirculation tube

Made of: FEP

Nominal volume (ml)	Code	Product Description	Packing (Pcs/Case)
2.5, 5, 10, 30, 60, 100	S0RT01	Recirculation Tube for 2.5 / 5 / 10 / 30 / 60 / 100 ml	1pc/Case

19.f Calibration tool

Made of: PA6 (Nylon)

Nominal volume (ml)	Code	Product Description	Packing (Pcs/Case)
2.5, 5, 10, 30, 60, 100	S0CT01	Calibration Tool for 2.5 / 5 / 10 / 30 / 60 / 100 ml	1pc/Case

Suction Valve

Discharge Valve

Telescoping filling tubes

Recirculation tube

Calibration tool

Closure cap

20. Troubleshooting

Problem	Possible reason	Solution
Piston moves with difficulty or is stuck	Formation of crystals/deposition of dirt	Stop dispensing immediately. The piston must be loosened in circular motion but must not be disassembled. Follow cleaning instructions. (Refer to page 24)
Dispensing not possible	Dispensing nozzle is blocked or discharge valve is stuck	Unscrew the discharge valve from the valve block, clean it, replace the discharge valve, if necessary, use a 200 µL plastic tip to loosen any ball valve that is stuck.
Air bubbles in the instrument	Reagent with high vapour pressure has been drawn in too quickly.	Draw in the reagent slowly.
	Valve screw connections are loose	Tighten the valves firmly with mounting tool.
	The instrument has not been primed	Prime the instrument (refer to page 18)
	Filling tube is loose/damaged	Push the filling tube on firmly. If necessary, cut off approx. 1cm of tube at the upper end and re-connect it or replace it.
	Valves not firmly connected or are damaged	

20. Troubleshooting

Problem	Possible reason	Solution
Discharge tube/discharge tube with recirculation valve cannot be mounted sufficiently	The Discharge valve may not be screwed in deeply enough	The discharge valve must be tightened with the mounting tool until it meets the stop making the threads not visible
Dispensed volume is too low	Filling tube is loose/damaged Filling valve is loose/damaged	Cleaning procedure (Refer to page 23). If necessary, cut off approx. 1cm of tube at the upper end and re-connect it or replace it. Cleaning procedure (Refer to page 24). Tighten the valves using the mounting tool. If necessary, replace filling valves.
Leaking liquid between instrument and bottle	Recirculation tube not connected	Connect recirculation tube (see page 16)
Wrong dispensing volume	The instrument is not calibrated.	Follow user calibration steps (see page 22)
Barrel does not fill with liquid	Inlet tube is not fitted firmly.	Connect inlet tube correctly.

21. FAQs:

How can small air bubbles be removed from the barrel?
To remove air bubbles from the barrel, you are advised to perform purging or priming. For priming, you must gently pull the piston up and then push down till the piston hits the base. Repeat the steps 4-5 times.

Can we autoclave a bottle top dispenser?
Yes, autoclaving of the bottle top dispenser is important for sterilization purposes. Autoclaving can be done at **121° C, 15psi.** for **15-20** mins. Before autoclaving, instruments must be disassembled properly and the volume knob must be kept in an unlocked position.

How should I clean the dispenser?
It is recommended to rinse the dispenser with deionized or distilled water before and after use. In case of sensitive or sticky reagents, the dispenser must be cleaned intensively. For further queries, you are requested to check the cleaning and maintenance section above.

Do we need an adapter while using a bottle top dispenser?
Yes, you require an adapter in case you want to use the dispenser with any kind of bottle. Mostly bottle top dispensers come with different standard size adapters which fit to maximum standard size bottle neck.

Is the telescopic tube extendable?
Yes, the telescopic tube is extendable and may be done so according to the type of reagent bottle used. For further queries regarding minimum and maximum limit of the tube, the user/operating manual may be referred which is provided along with the instrument.

Can I use bottle top dispensers for dispensing any kind of liquid?
Yes, you may, but make sure to check the limitations of the liquid and the bottle top dispenser. Mostly bottle top dispensers can be used efficiently with liquids which have kinematic viscosity less than 75 mm^2/second. If you are dispensing highly aggressive and corrosive chemicals like Hydrofluoric acid, a special dispenser is recommended to be used which has components like PTFE Piston, FEP inlet and outlet tubes and ceramic valve system. The chemical compatibility chart is advised to be referred before dispensing such liquids.

What is the function of the recirculation valve?
The recirculation valve allows to purge or prime the dispenser without wasting the reagents. The dispenser must be primed for removing all air bubbles before first use. The reagent does not get wasted while priming when dispenser is used with a recirculation valve.

What should I do when I see air bubbles and liquid are being drawn up the bottle top dispenser?
Your dispenser may have some air leak somewhere which may have happened due to the filling and discharging valves. Check whether the filling and discharging valves are tight. Additionally, if the dispenser is accidentally dropped it may lead to cracks in cylinder or loosening of valve block.

Does the dispenser come with the bottle?

No, the dispenser does not come with any bottle. It is designed in a way which allows reagent bottles of different neck sizes to fit with the adapters made for it. TARSONS bottle top dispensers comes with adapters of sizes **24mm-25mm, 28mm, 32mm, 32mm** long for Indian Bottle Neck **38mm, 40mm and 45mm.** An appropriate bottle adapter may be chosen as per your requirements depending upon the reagent bottle and it must be mounted with your dispenser for proper dispensing.

What are the Autoclaving (sterilization) parameters?
By standard, the instrument should be autoclaved at **121°C** with **15psi** for **15–20 mins**. It is advised that the equipment is disassembled properly before autoclaving so that proper cleaning is achieved. All TARSONS dispensers come with autoclaving features to improve the safety of technician and testing results.

What is the meaning of "Instrument Calibration"?
Instrument calibration may be defined as the task of measuring the data and output from instrument which enables the user to properly determine its accuracy and precision.

What is "Gravimetric Testing"?
One of the many methods for performing calibration is the Gravimetric testing method. This method involves weighing the dispensed amount of distilled water repeatedly until accuracy and precision is determined. From the known value of density of distilled water at a specific temperature and atmospheric pressure, the mass can be calculated from which the actual volume of water can be found out. From these values the accuracy and precision can be easily determined.

What is "Volumetric Adjustment"?
Volumetric adjustment refers to the physical change in instrument that was formerly calibrated.

Does temperature play a big role in Gravimetric testing?
Yes, it does. Calibration should be done in an ideal room temperature as per standard. When calibration is performed, temperature should be recorded with a thermometer having an error tolerance of max **0.2°C.**

22. Return for Repair

–It is strictly advised to clean and decontaminate the instrument carefully before sending.

– It is always essential to include an exact description of the type of malfunction and the media used. If information regarding media used is missing, the instrument cannot be repaired.

– Shipment is at the risk and the cost of the sender.

23. Disposal

For the disposal of instruments, please observe the relevant national disposal regulations.

Subject to technical modifications without notice

Note:

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