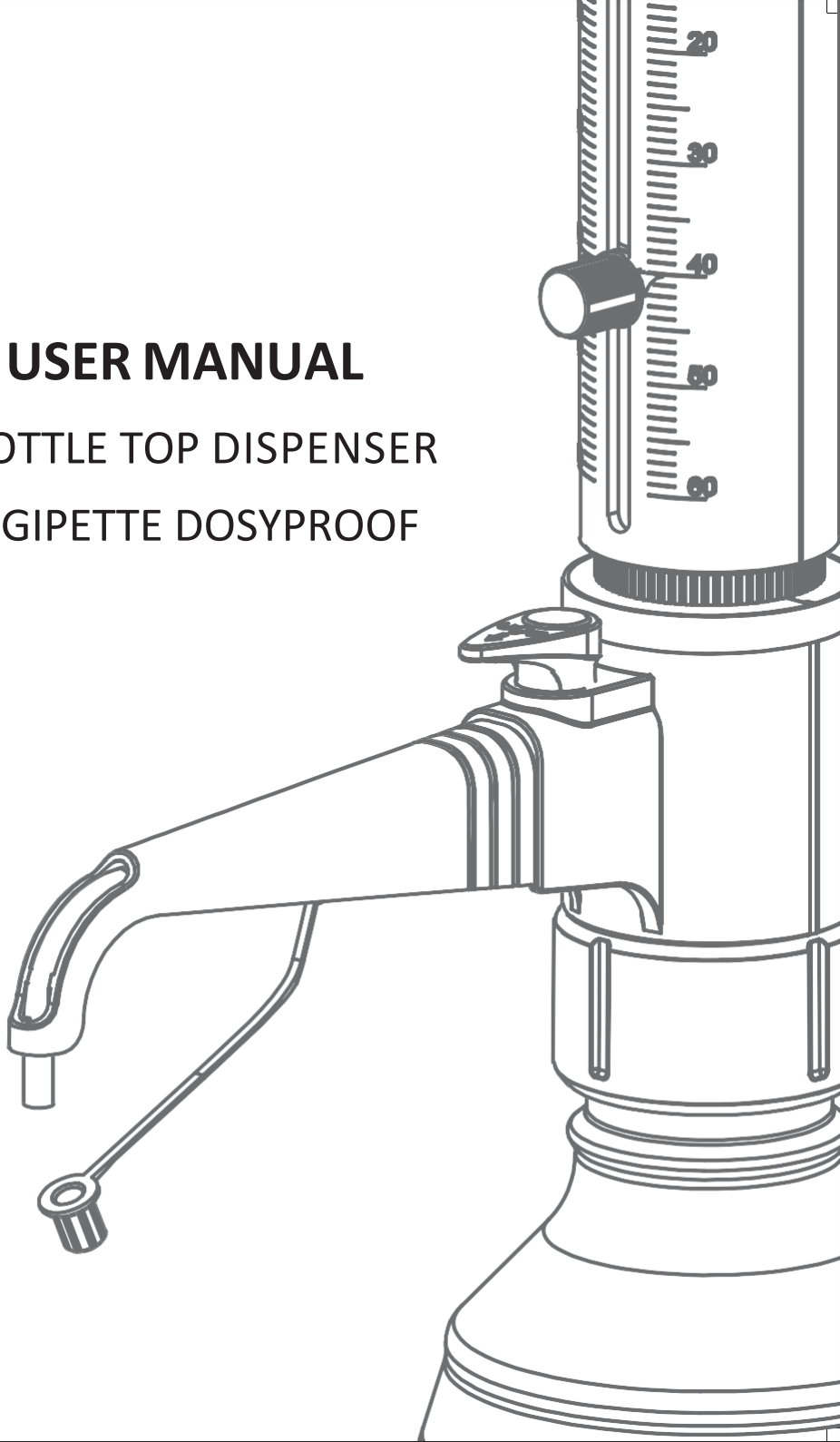
USER MANUAL

BOTTLE TOP DISPENSER

DIGIPETTE DOSYPROOF



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1. Safety Instructions

Please read the instruction manual carefully before using the dispenser. Although we have tried to cover the maximum safety instructions, this manual can not describe all possible safety hazards. It is the responsibility of the user to establish their own safety, health practices and determine the applicability of regulatory limitations prior to the usage of dispenser.

Please follow below safety instructions carefully:

- Understand all the details in manual before you start using instrument.
- Use protective clothing, eye protection glasses and gloves while working with hazardous liquids.
- Do not dispense inflammable media into plastic vessels which generate static charge.
- This device is not suitable for the solutions below.
  Concentrated solutions (Hydrochloric Acid, Fluorinated Hydrocarbons, Saline Solutions, Nitric Acid), Highly Concentrated Alkaline Solution and Crystallizing Solution.
  The liquids that attack FEP, PFA, PTFE, Borosilicate Glass, $Al_2 O_3$, Organic Solvents, Trifluoroacetic Acid, Explosive liquids, Fuming Acids, Tetrahydrofuran, Suspension (e.g. of charcoal) as solid particles.
- Handle the dispenser carefully to avoid any accident during usage.
- The nozzle should always point away from the user while dispensing. Avoid splashes.
- Always use suitable vessels for dispensing liquids.
- Never push down the piston while nozzle cap is on.
- It is recommended to clean the discharge tube regularly.
- Do not give excess pressure while aspirating or dispensing. The glass tube may break inside. Follow trouble shooting guide if you find any difficulty in moving the piston up and down.
- Use original accessories to avoid any kind of accident.

2. Intended Use

The liquid handling instrument and their accessories are designed and constructed for accurate and precise liquid handling for general laboratory purposes only. These dispensers are used for dispensing measured volume of liquid, repetitively and safely from the bottle that are compatible with reagents and chemicals (Refer section 13 for chemical compatibility chart).

Our dispensers are made up of high-grade engineering plastics like PFA, FEP, PTFE etc. which ensure high performance and adaptability towards various types of liquid. In addition to ensure high accuracy, bore glass cylinder is used in the dispenser. These dispensers can be easily cleaned (Refer section 8) and its lower part is also autoclavable to avoid contamination (Refer section 11).

2.1 Functions

This instrument is designed for dispensing liquids observing the following limits.

- +15°C to +40°C (59°F to 104°F) instrument and reagent.
- Vapor pressure up to 500mbar.
- Density up to 2.2 g/cm^3
- Kinematic viscosity up to 500mm^2/sec.
  (dynamic viscosity [mPas]=Kinematic Viscosity [mm^2/s] x density [g/cm^3])

3. Package information

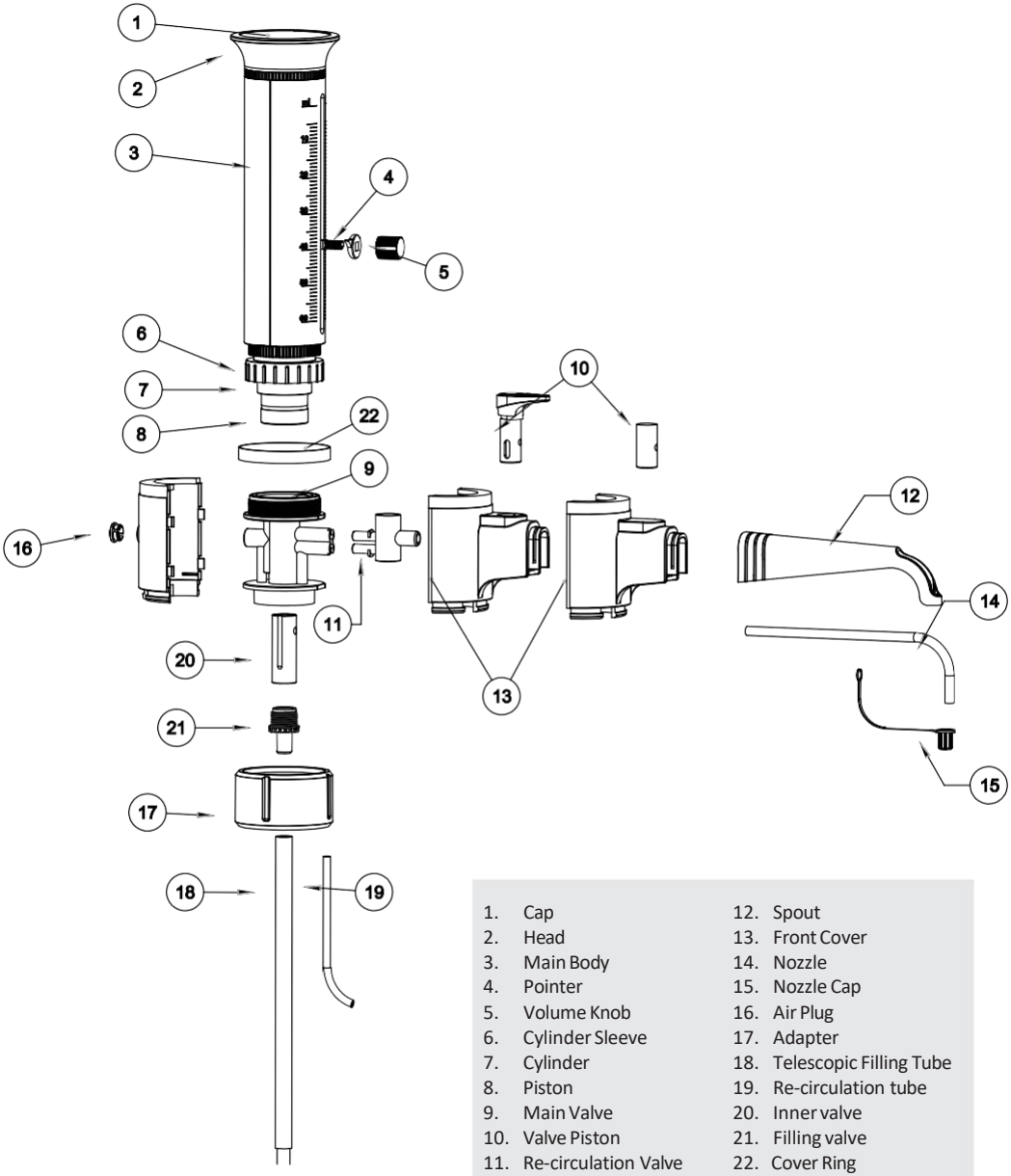
This package includes the following:

- Dispenser - 1
- Telescopic filling tube - 1
- Re-circulation tube - 1*
- Bottle adapters - 4 (Thread sizes: 28, 38, 40 & 45mm)
- Calibration tool - 1
- Service tool - 1
- Connector (only for 100 ml) - 1 (Thread size: 40 / 32mm)
- User manual
- Certificate of conformity / Calibration report
- Warranty card

* This accessory is available only with recirculation valve product.

Note: Bottle adapter of 32 mm thread size is by default and attached with dispenser.

4. Overview



1. Cap
2. Head
3. Main Body
4. Pointer
5. Volume Knob
6. Cylinder Sleeve
7. Cylinder
8. Piston
9. Main Valve
10. Valve Piston
11. Re-circulation Valve
12. Spout
13. Front Cover
14. Nozzle
15. Nozzle Cap
16. Air Plug
17. Adapter
18. Telescopic Filling Tube
19. Re-circulation tube
20. Inner valve
21. Filling valve
22. Cover Ring

Note: Re-circulation tube should be used only in dispenser with re-circulation valve mechanism.

5. Assembly

1. Mounting the telescopic filling tube/ re-circulation tube

Adjust length of the telescoping filling tube to the bottle height and attach it carefully in center. If dispenser with re-circulation valve mechanism is used, the optional re-circulation tube should also be installed. Insert it with opening pointing outward (Fig. 1)

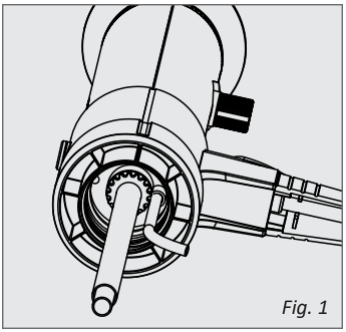


Fig. 1

2. Mounting the dispenser on a bottle

Screw the dispenser (GL 32 threads) onto the reagent bottle and ensure to tighten it properly. It is preferable to align the nozzle with graduation mark on main body.

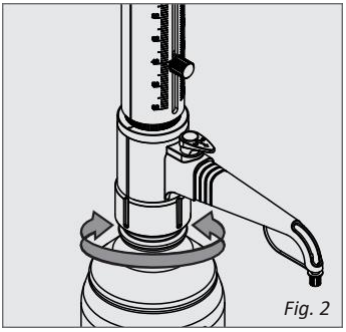


Fig. 2

Note: For bottles with other thread sizes, select a suitable adapter.
The adapters supplied with the dispenser are made of polypropylene (PP), and can only be used for reagent which do not attack PP.

⚠ WARNING

Always wear protective gloves when touching the dispenser or the bottle, especially when using dangerous liquids.
When mounted to a reagent bottle, always carry the dispenser as shown in Fig. 3

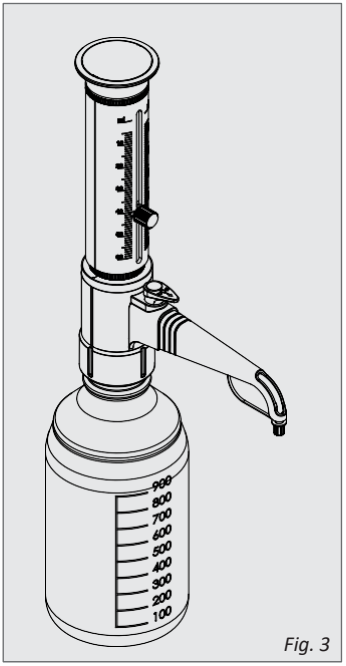


Fig. 3

6. Priming

6.1 Bottle Top Dispenser with re-circulation valve mechanism

⚠ **WARNING**

The nozzle should always point away from the user. Please ensure one should never press down the piston when the nozzle cap is mounted. Avoid splashing.

Please follow below steps for priming **(with re-circulation mechanism)**:

1. Adjust the knob to recirculation mode. (Fig. 5)
2. Slowly pull up the piston and push it down rapidly till the end. Repeat this process until air bubbles disappear from the cylinder. (Fig. 6)
3. Readjust the knob to dispense.

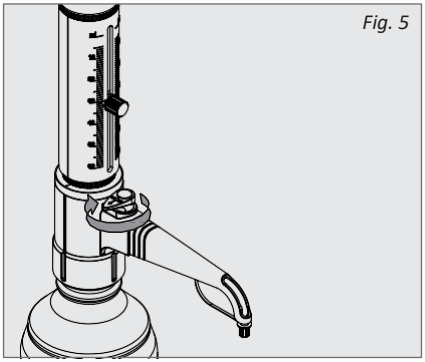


Fig. 5

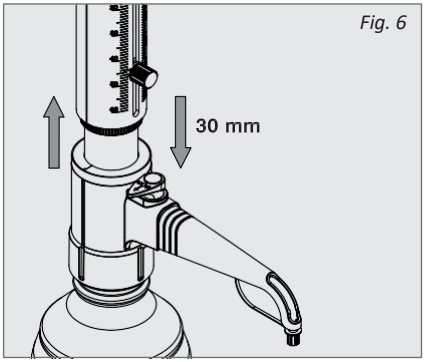


Fig. 6

6.2 Botle Top Dispenser without re-circulation valve mechanism

Please follow below steps for priming **(without re-circulation mechanism)**:

1. Keep a vessel below the nozzle.
2. Hold the spout and carefully open the nozzle cap. (Fig. 7)
3. Slowly pull up the piston and push it down rapidly till the end. Repeat this process until air bubbles disappear from the cylinder. (Fig. 6)

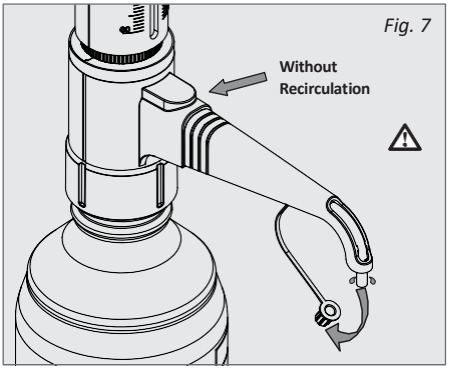


Fig. 7

7. Operating Instructions

7.1 Volume Setting

Please follow below steps for volume setting:

1) Turn the volume setting knob in anti-clockwise direction.
2) Adjust the knob to the desired volume by moving it up or down.
3) Match the pointer with the graduation mark and tighten the knob in clock wise direction.

Now your dispenser is ready to work at your desired volume. (Fig. 8)

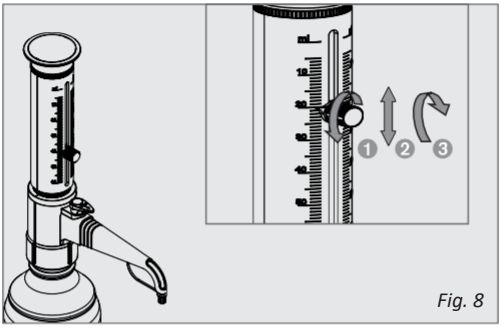


Fig. 8

7.2 Dispensing

⚠ WARNING
Please follow all safety instructions before you start.

Please follow below steps for dispensing liquids:

1. Please follow the priming process before you start (as shown in point # 6-Priming).
2. Turn the knob to dispensing.
3. Keep a vessel below the nozzle.
4. Set your desired volume (as shown in point # 7.1 - Volume setting).
5. Gently pull the piston until the upper stop and then push down the piston until lower stop.
6. Touch the nozzle against the inner wall of the receiving vessel. Repeat this process as per the number of dispensing cycles required.
7. Close the nozzle cap to the nozzle.

Note: Do not give excess force while pushing down the piston. If you feel the piston is jammed, please follow trouble shooting guide (point # 12).
Before you fix the nozzle cap, please ensure that the piston is at lower stop.
One can observe slight sound during aspirating the liquid and on shaking the dispenser as a result of ball design.

8. Cleaning

Please make sure to clean the dispenser regularly for its smooth functioning.
In the following conditions, cleaning must be done.

- When the piston is stuck inside the glass tube
- Before changing of reagents
- Before longer downtime
- Before autoclaving process
- Before any maintenance

Please make sure to wear suitable eye protection glasses and protective clothing.

Please follow below steps for cleaning:

1. Completely dispense the liquid present inside the dispenser.
2. Mount the dispenser on a bottle filled with deionized water or any other suitable cleaning agent and rinse the dispenser several times.
3. Pull off the telescopic tube and recirculation tube and clean it with the deionized water.
4. In case of dispenser with recirculation valve, change the knob position to re-circulation mode. Again, rinse the dispenser several times.

Please follow below steps to clean the piston and glass barrel:

This procedure must be followed if the piston is difficult to move or if dispenser is to be autoclaved.

1. Unscrew the head as shown in Fig. 9
2. Take out the piston completely as shown in Fig. 10
   Clean the piston & glass barrel and put them back in their original position and screw back the head

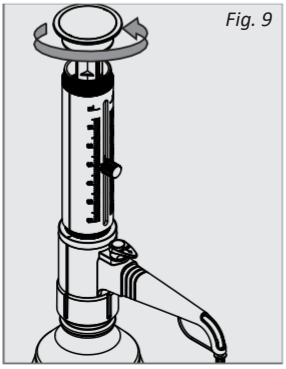


Fig. 9

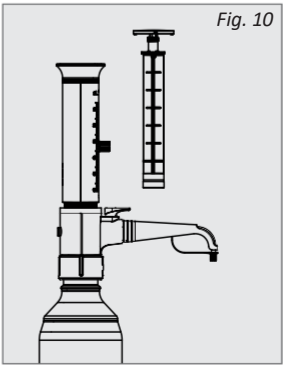


Fig. 10

Disassembly of the valve

1. Put out the Re-circulation tube & telescopic tube (Fig. 11)
2. Use the service tool to unscrew the filling valve and also take out the ball with care. (Fig. 12)

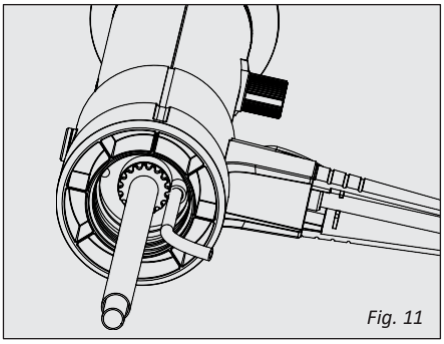


Fig. 11

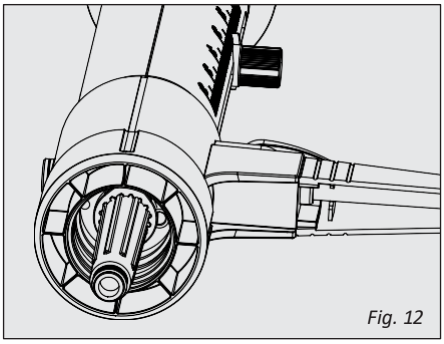


Fig. 12

3. Use the other side of service tool for screwing with inner valve (Fig. 13) and pull it out- (Fig. 14)
4. After Cleaning/Replacement, insert inner valve at same position (Fig. 14)

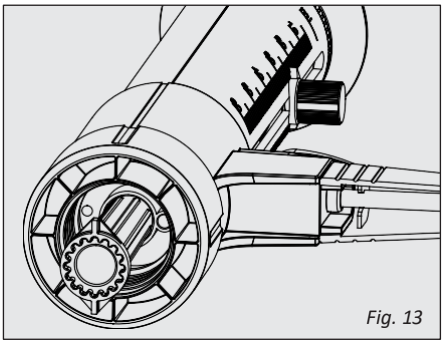


Fig. 13

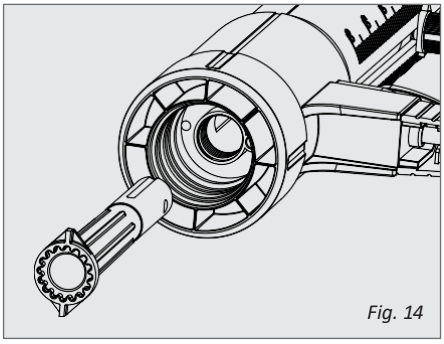


Fig. 14

5. Screw the filling valve first by hand and then tighten it with the service tool.

While aspirating the reagent, if some elastic resistance is evident, then it is possible that the ball valve is stuck.

In this case, loosen the ball valve using light pressure, for example, 200 µl plastic pipette tip (Fig. 15)

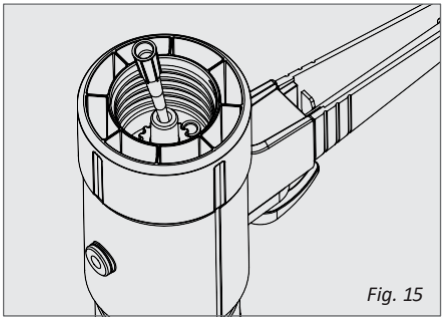


Fig. 15

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). The calibration process is performed as per the EN ISO 8655-5 standard with a completely assembled instrument and uniform dispensing.

Volume (ml)	Increment (ml)	Inaccuracy (±) %		Imprecision (±) %	
		± %	± ml	± %	± ml
0.25 - 2.5	0.05	0.6	0.015	0.2	0.005
0.5 - 5	0.1	0.5	0.025	0.2	0.01
1 - 10	0.2	0.5	0.05	0.2	0.02
2.5 - 25	0.5	0.5	0.125	0.2	0.05
2.5 - 30	0.5	0.5	0.15	0.2	0.06
5 - 50	1.0	0.5	0.25	0.2	0.1
5 - 60	1.0	0.5	0.3	0.2	0.12
10 - 100	2.0	0.5	0.5	0.2	0.2

* The specifications (inaccuracy and imprecision) are decided on the basis of EN ISO 8655-5 standard.

10. Calibration

⚠ **WARNING**

During calibration process one has to take the reading at lowest volume first, ensure not to move the body before you close the cap and then proceed to the medium and high volume.

Calibration check

1. Please follow complete calibration procedure given in EN ISO 8655-5 standard like environment conditions, water, weighing balance etc.

Volume adjustment

Please follow below steps to calibrate the dispenser if there is a variation in the desired volume and actual volume:

1. Open the cap with calibration tool as shown in Fig. 16
2. Insert the hex tool on hex nut as shown in Fig. 17
3. Rotate the hex tool in clockwise direction to decrease the volume, rotate the hex tool in anti-clockwise direction to increase the volume.
4. Take out the hex tool and close the cap.

Fig. 16

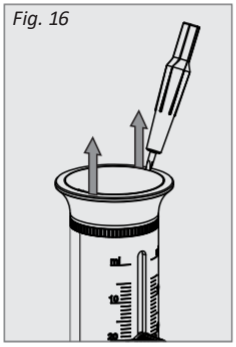
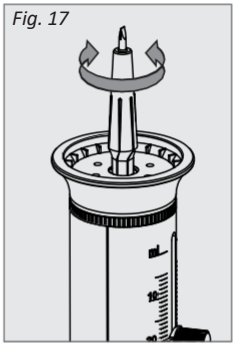


Fig. 17



11. Autoclaving

This dispenser is autoclavable in following conditions.

Temperature	:	121°C / 250° Fahrenheit
Pressure	:	1.05 bar / 15 psi (pounds)
Time	:	20 minutes or less

WARNING

Exceeding the above conditions will damage the parts.

Please follow below steps to autoclave the dispenser:

1. Clean the dispenser thoroughly as described in the cleaning section before you start autoclaving.
2. Take out the following parts:
   a) Pull out the piston by unscrewing the head
   b) Pull off the nozzle cap and telescopic filling tube
3. Autoclave all the parts as per the above procedure.
4. Cool down the parts for at least 8 hours in room temperature and then reassemble the parts.
5. Now the dispenser is ready to be used.

It is recommended to do quick calibration check.

12. Troubleshooting

Troubleshooting		
Issue	**Possible root cause**	**Corrective action**
Piston moves with difficulty or is stuck	Dirt disposition or Formation of crystals	Immediately stop dispensing. Loosen piston with circular motion, but do not disassemble. Follow all cleaning instructions (page 8)
liquid filling/ dispensing problems	Volume adjusted to minimum setting	Set to required volume (see page 7)
	Filling valve stuck	Unscrew the filling valve from the main valve, clean it, replace the filling valve if necessary. If the valve ball is stuck use a 200 µl pipette tip to loosen it (see page 9)
Dispensing not possible	Discharge valve stuck	Pull out the inner valve from the Main valve, clean it, replace the discharge valve, if necessary (see page 9), use a 200 µl plastic tip to loosen any ball valve that is stuck
Air bubbles in the instrument	Reagent with high vapor pressure has been drawn in too quickly	Slowly draw in reagent
	Valve screw connections loose	Tighten the valves firmly with the service tool
	The instrument has not been primed	Prime the instrument (see page 6)
	Filling tube is loose or damaged	Push the filling tube on firmly. If necessary, cut off approx. 1 cm of tube at the upper end and re-connect it or replace filling tube
	Valves not firmly connected or damaged	After cleaning the instrument (page 8), tighten the valves using the service tool
Dispensed volume is too low	Filling tube is loose or damaged	After cleaning the instrument (page 8), push the filling tube on firmly. If necessary, cut off approx. 1 cm of the tube at the upper end and re-connect it or replace filling tube
	Filling valve is loose or damaged	After cleaning the instrument (page 8), tighten the valves using the service tool. If necessary, replace filling valves
Leaking liquid between instrument and bottle	Re-circulation tube not connected	Connect re-circulation tube

13. Chemical Compatibility Chart

Storage Conditions

Store the instrument and accessories only in clean conditions in a cool and dry place.

Chemical Compatibility Table

Chemicals from A to Z

The following list includes the 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 vapors (better resistance with lower concentration).
Rinse the instrument in the rinse mode otherwise do not leave the instrument on bottle.

2 = Risk of damage, softening or discoloration of external parts through vapors.
Rinse the instrument in the rinse mode otherwise do not leave the instrument on bottle.

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

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
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%	A
H	
Heating oil (Diesel oil), bp 250-350°C	A
Heptane	A
Hexane	A
Hexanoic acid	A
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	A
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 safely. If require information on chemicals not listed, please contact us.