labForce®
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Instruction Manual

BOTTLE TOP DISPENSER
For Hydrofluoric (HF) Acid

Thomas. No. 22A00H679
22A00H680

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Safety Instructions

LabForce HF Bottle Top Dispenser may sometimes be used for operations involving hazardous materials and equipment. 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 sole responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.limitations, prior to the usage of this instrument.

Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.

1. Follow general and safety instructions for hazard prevention. E.g., always wear protective clothing, protective gear for the eyes and hands.
2. Carefully observe the specifications provided by reagent manufacturers.
3. When dispensing inflammable fluids, avoid the built up of static charge. Make sure that you do not dispense into plastic vessels and do not wipe the instrument/equipment with a dry cloth.
4. Use the instrument only for dispensing liquids, with strict regard to the defined limitations of use and operating constraints.
5. Observe operating exclusions. When 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 in danger. While dispensing, the discharge tube must always point away from you or any other person. Only dispense into appropriate vessels and avoid splashes.
7. Do not press the piston when the discharge tube closure is attached.
8. Do not remove the discharge tube while the dispensing cylinder is being filled.
9. Reagents can accumulate in the cap of the discharge tube. Thus, clean it regularly.
10. Do not carry the mounted instrument by the cylinder sleeve or the valve block. Breakage or loosening of the cylinder may lead to personal injury.
11. Use only original 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 Operation Manual.
13. Always check the instrument for visual damage before use.
14. If there is any sign of a potential malfunction (e.g. piston difficult to move, stuck valve or leakage), immediately stop dispensing. Consult the 'Troubleshooting' section of this Operation Manual and contact the manufacturer if needed.

Package Contents

Description	Quantity
Bottle Top Dispenser	1
Telescopic tube	1
Calibration Tool	1
Bottle Adapters	5
Dispenser Thread Reducer	1
Calibration Certificate	1
Operation Manual	1

Installation

1. Adjust length of telescoping inlet tube to fit your particular reservoir. If you require a longer tube, it is provided on request. (Fig. 1)

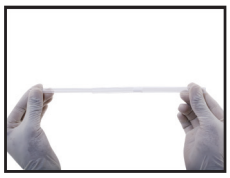


Fig.1

2. Fix the telescoping tube. The tube's ends have different diameters. Please select the correct side for your dispenser. (Fig. 2)

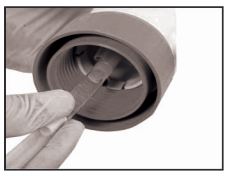


Fig.2

3. Choose the correct adapter for the bottle. The threaded platform base of dispenser has a 30 mm screw thread. Five adapters are supplied to suit containers with a 28, 32, 38, 40, 45 mm and 30 mm (inbuilt adapter) screw neck. (Fig. 3)

Fig.3

4. Fix the adapter.
   (Fig. 4)
5. Mount the dispenser-
   Screw it to the reservoir by applying gentle hand torque applied to the threaded platform base only. In case of removal, apply the same technique to the base, in the opposite direction.
   (Fig. 5)
6. Ready to Use

Fig. 4

Fig. 5

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

Intended Use

LabForce HF Bottle Top Dispenser is a high precision liquid handling instrument engineered with carefully selected and tested materials for use with HYDROFLUORIC ACID (HF) and other reagents & chemicals which are compatible with it. (Refer to chemical compatibility chart). This HF Bottle Top Dispenser can precisely dispense high-purity media. When high-purity materials are dispensed with the dispenser after appropriate cleaning, they release virtually no metal ions. This makes the dispenser suitable for trace analysis. (Refer to cleaning for trace analysis).

Symbols and Conventions

⚠	CAUTION This symbol indicates a potential risk and alerts you to proceed with caution.

Product Specifications

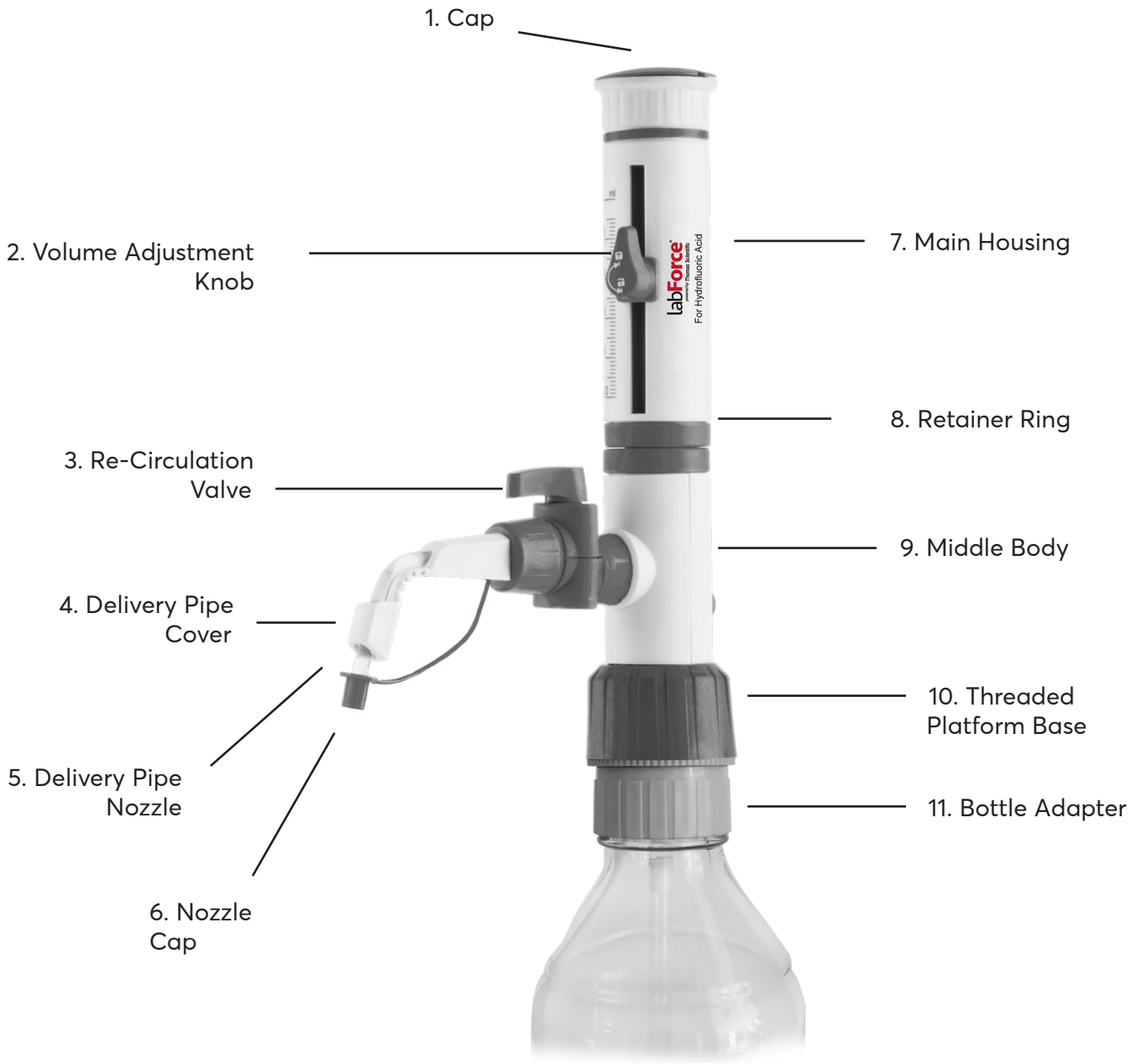
Specifications as per ISO 8655						
Thomas No.	Volume Range (ml)	Increment (ml)	Accuracy ±%	Accuracy ml	CV ±%	CV ml
---	0.25-2.5	0.05	0.5	0.0125	0.2	0.001
---	0.5-5	0.1	0.5	0.025	0.2	0.010
22A00H679	1-10	0.2	0.5	0.050	0.1	0.010
22A00H680	2.5-30	0.5	0.5	0.150	0.2	0.030

The error limits (Accuracy & Coefficient of Variation) mentioned below are in accordance with the nominal capacity (or maximum volume) indicated on the instrument. These are obtained by using the instrument with distilled water at equilibrium, ambient temperature of 20°C or 68°F, while operating the device smoothly and steadily.
The error limits are well within the limits of DIN EN ISO 8655-5.

Instructions for Use

Overview

LabForce HF Bottle Top Dispenser is designed to dispense highly aggressive liquids like hydrofluoric acid directly from the reservoir bottle. It is calibrated in accordance with the guidelines 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 inlet and outlet tubes, FEP Barrel and highest purity ceramic valve system ball & seat.



Getting Started

Priming

First, open the cap of the dispensing tube.

⚠ For your safety, hold the discharge tube orifice against the inner wall of the appropriate receiving vessel.
(Fig. 6)

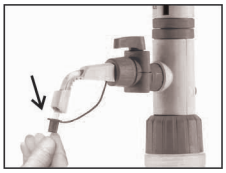


Fig. 6

1. Set the valve to 'Recirculate'.
(Fig. 7)

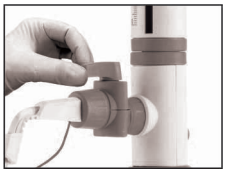


Fig. 7

2. For priming, gently pull the piston up (approximately by 30mm) and then down rapidly, till the lower end.
(Fig. 8)

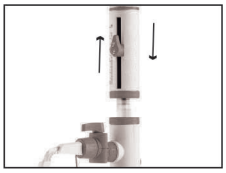


Fig. 8

Repeat this procedure five times.

3. Turn the valve to 'Dispense'. (Fig. 9)

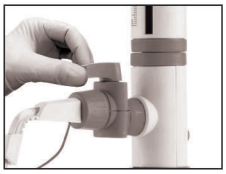


Fig. 9

⚠ To avoid splashes while priming, hold the discharge tube against the inner wall of the appropriate receiving vessel. Dispense liquid to prime the discharge tube until it is bubble free. Wipe away any remaining drops from the discharge tube.

⚠ Before using the instrument for the first time, ensure that it has been rinsed carefully and

Important Guidelines

Physical limits

LabForce HF Bottle Top Dispenser is designed to be operated under following physical limits.

- Maintain instrument temperature between +15°C and +40°C (from 59°F to 104°F).

- Maintain reagent vapour pressure up to 600 mbar (maximum). Aspirate slowly above 300 mbar in order to prevent the liquid from boiling.
- Kinematic viscosity upto 500 mm /s.
  (dynamic viscosity [mPas] = kinematic viscosity [mm /s] x density [g/cm])
- Use fluids with density upto 3.8 g/cm .

Operating limitations

- Liquids, which form deposits, may make it difficult for the piston to move or jam it (like crystallizing solutions or concentrated alkaline solutions). If the piston becomes too difficult to move, immediately clean the instrument.
- While dispensing inflammable fluids, avoid the built up of static charge. Make sure that you do not dispense into plastic vessels and do not wipe instruments with a dry cloth.
- LabForce HF Bottle Top Dispenser is designed for general laboratory applications and complies with relevant standards, like DIN EN ISO 8655. Please check the compatibility of the instrument for a specific application . Approvals for specific applications, like production and administration of food, pharmaceuticals and cosmetics are not available.

Operating Exclusions

Do not use the instrument with:

- Liquids that attack FEP, PFA and PTFE (e.g. dissolved Sodium Azide*)
- Caustic Potash, Potassium solution (cyanide, carbonate, hypochlorite) & Tricresyl phosphate against ceramic.
- Zinc chloride & Zinc sulfate
- Explosive liquids (e.g. Carbon Disulfide) and Uric Acid.
- Suspensions (e.g. of charcoal) as the solid particles may clog or damage the instrument
- Liquids that attack PP (cap)

* The permissible concentration of dissolved Sodium Azide is not more than 0.1%

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)

Operation

⚠ 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 (35).

● 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. 11)

Volume Setting

Volume Adjustment Knob is simple and easy to operate.
There are two positions of the knob as shown:

Position 1 : Locked | Position 2 : Unlocked
(Fig. 10.1) (Fig. 10.2)

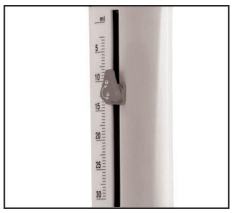


Fig. 10.1

To set the volume, follow these simple steps:
1. Unlock the Knob by rotating it ANTICLOCKWISE.
2. The slider is now loose and can be moved up and down.
3. Set your desired volume by aligning the pointer with the scale.
4. To lock the set volume, turn the Knob from Position 2 to Position 1 by rotating it CLOCKWISE.
● Over rotating the knob may lead to breakage.

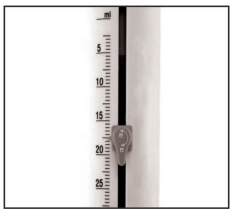


Fig. 10.2

Dispensing

⚠ Wear protective clothing, eye protection and gloves. Liquid may accumulate in the cap. To avoid splashes dispense slowly. Follow all safety instructions and observe limitations of use and operating limitations.

1. Remove cap from the discharge tube. (Fig. 11)

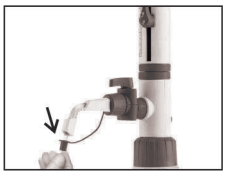


Fig.11

2. When using the instrument (with recirculation valve) turn the valve to Dispensing. (Fig. 12)

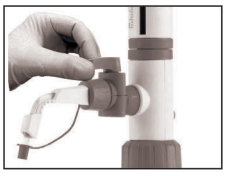


Fig.12

3. Hold the discharge tube orifice on the inner wall of a suitable receiving vessel. (Fig. 13)

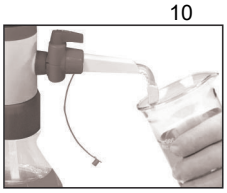


Fig.13

4. Gently lift the piston until the upper stop and then depress piston slowly and steadily with minimal force until the lower stop. (Fig. 14)

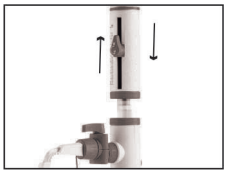


Fig.14

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

6. Reattach cap to discharge tube. (Fig. 15)

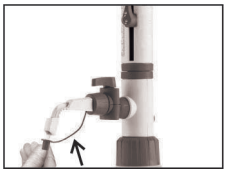


Fig.15

Troubleshooting

Trouble	Possible cause	Solution
Piston difficult to move	Formation of crystals, dirty	Stop dispensing immedately. Loosen piston with circular motion, but do not disassemble. Follow all cleaning instructions.
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.
	Filling tube is loose or damaged	Push the filling tube on firmly. if necessary cut off approx. 1 cm of the tube at 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 & Dispence slowly
	Leaking Piston	Clean piston, If Problem persist replace piston.
	Leaking discharge valve	Clean by flushing throughly with distilled water.
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
Wrong Dispenser Volume	Instrument not calibrated	Follow steps of user calibration.
Barrel does not fill with liquid	Inlet tube not fitted firmly	Connect inlet tube correctly.
Filling Not Possible	Volume adjustment to minimum setting	Set to required volume.

General Maintenance

LabForce HF Bottle Top 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)

Cleaning for Trace Analysis

Designed to dispense Hydrofluoric Acid, LabForce HF Bottle Top Dispenser can also be used in trace analysis. The precise volume dispensing of high-purity media makes the dispenser suitable for this application.
The wetted components of LabForce HF Bottle Top Dispenser have been carefully selected to only contain the highest purity materials.

To use LabForce HF Bottle Top Dispenser for trace analysis, it should be first thoroughly cleaned.
Pure chemicals used for analytical purposes are used for this cleaning procedure. To use the dispenser for trace metal analysis, perform the cleaning in both dispensing and recirculation modes.

We recommend the following cleaning procedure to obtain good results. However, modification can be done according to the need of the user.

1. Mount the dispenser onto a bottle filled with Acetone, prime it and then fill it completely. Leave the piston at the upper stop and close the dispensing nozzle with the nozzle cap. Let the dispenser stand in this position for approximately 24 hours. After this, perform dispensing twice, then completely empty the dispenser and rinse it 5 times with pure water.
2. Mount the dispenser onto a bottle filled with 20% Hydrochloric acid, prime it and then fill it completely. Leave the piston at the upper stop and close the dispensing nozzle with the nozzle cap.
3. After approximately 24 hours contact time, perform dispensing twice and then completely fill the dispenser again.
4. Repeat step 3 for two more times. After another approx. 24 hours contact time, empty the dispenser completely. Then, rinse it five times with pure water.
5. Repeat the steps 2, 3 and 4 with 30% Nitric acid.

6. Mount the dispenser onto a bottle filled with the desired dispensing medium, prime the dispenser and then fill it completely. Leave the piston at the upper stop and close the dispensing nozzle with the nozzle cap.
7. After approximately 24 hours contact time, perform dispensing twice and then completely fill the dispenser again.
8. Repeat step 7 for two more times. After another approx. 24 hours contact time, perform dispensing twice and then leave the piston at the lower stop.

Note: The cleaning procedure can be repeated, if the cleaning is not found sufficient.

Pre Dis-assembly Procedure

⚠ 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-assembly and assembly Procedure

1. Pull the cap outwards to expose the Calibration Nut. (Fig. 16)

Fig.16

2. Unscrew the Calibration Nut with the help of calibration tool to dis-assemble the Piston and shaft out of the main housing. (Fig. 17)

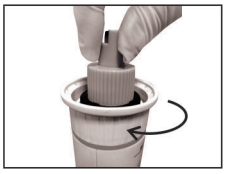


Fig.17

3. After unscrewing pull out the shaft.
   (Fig. 18)

Fig.18

4. Rinse the piston and shaft with deionized water.
   (Fig. 19)

Fig.19

5. Clean the cylinder with a bottle-brush. If necessary carefully remove deposits at the edge of the glass cylinder.
   (Fig. 20)

Fig.20

6. Then flush all the parts of the instrument with deionized water.
   (Fig. 21)

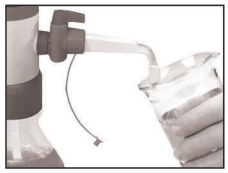


Fig.21

7. Insert the piston completely into the cylinder and then reassemble the instrument using the calibration tool by screwing back the piston.
   (Fig. 22)

Fig.22

8. Snap back the cap to complete the assembly.
   (Fig. 23)

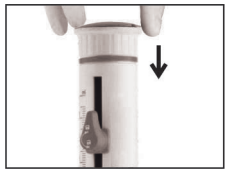


Fig.23

Dis-assembling and Assembling the Delivery Pipe

1. Unscrew the chuck nut and pull out the delivery pipe.
   (Fig. 24) & (Fig. 25)

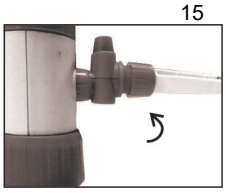


Fig.24

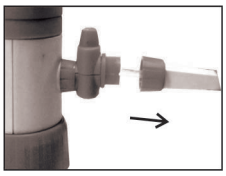


Fig.25

2. Clean the delivery pipe with deionized water.

3. First push the delivery pipe into the lower housing till it stops going in further.
   (Fig. 26)

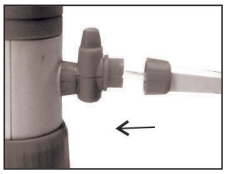


Fig.26

4. Screw the chuck nut to complete the assembly.
   (Fig. 27)

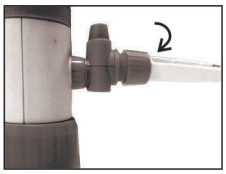


Fig.27

Autoclaving

LabForce HF Bottle Top Dispenser is fully 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

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

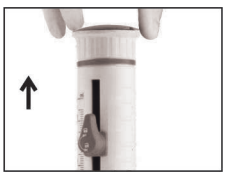


Fig.28

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

Fig.29

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

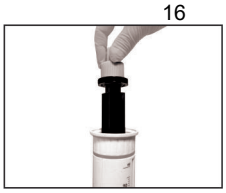


Fig.30

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

Fig.31

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

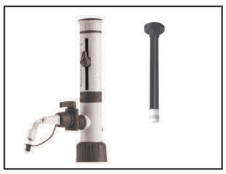


Fig.32

6. The volume adjustment knob should always be kept in the 'unlocked' position while autoclaving.
   (Refer fig. 10.1)

Re-assembling after Autoclaving

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

Fig.33

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

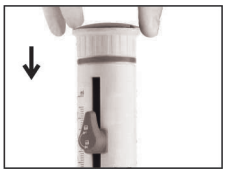


Fig.34

3. Dispenser is now ready for use.
   (Fig. 35)

Re-calibation is required after autoclaving.

Fig.35

User Calibration

LabForce HF Bottle Top 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 is performed as follows:

Re-Calibration Procedure

1. Set the instrument to the nominal volume or any other volume which is most commonly used by you. Follow the common rules for calibration used in statistical quality control (ISO 8655-5).

2. Set the volume and dispense five full volumes of distilled water at 20°C on an 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 instrument.

3. For re-calibration pull the cap outwards to expose the Calibration nut. (Fig. 36)

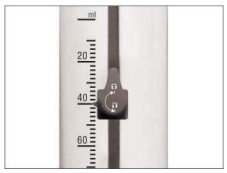


Fig. 36

4. 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. 37)

Fig. 37

Accessories and Spares

Descripton	Quantity	Cat. No.
Discharge Nozzle for 1-10ML Bottle Top Dispenser	1	22A00H681
Discharge Nozzle for 10-100ML Bottle Top Dispenser	1	22A00H682
BTD Bottle Adapter Assortment PK5	1	22A00H683
BTD Bottle Adapter 28MM PK3	1	22A00H684
BTD Bottle Adapter 32MM PK3	1	22A00H685
BTD Bottle Adapter 38MM PK3	1	22A00H686
BTD Bottle Adapter 40MM PK3	1	22A00H687
BTD Bottle Adapter 45MM PK3	1	22A00H688
BTD Inlet Tube (310mm Length) PK5	1	22A00H689
BTD Inlet Tube (450mm Length) PK5	1	22A00H690

Warranty

LabForce warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, LabForce will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY

Compliance with Local Laws and Regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. LabForce will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

Appendix

Chemical Compatibility Chart

Chemicals from A to Z
The following tables enlist the most frequently used reagents.
They provide useful information for the safe and efficient use of dispenser.
All the safety precautions and recommendations
within this Operation Manual must be followed carefully.

Code explanations:

A = Good resistance

B = Acceptable with limitations

C = Not recommended

1 = Acid vapours (better resistance with lower concentration).
Do not leave the instrument on the bottle.
Rinse with distilled water after use.

2 = Risk of damage, softening or discoloration of external parts through vapours.
Do not leave the instrument on the bottle.
Rinse with distilled water after use.

3 = Reactivity with high purity ceramic valve system components.

List of Reagents

Chemicals A - Z

A	
Acetaldehyde (Ethanal)	A
Acetic acid 96%	A
Acetic acid 100% (glacial)	B/2
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
Aluminum 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
Amyl alcohol (Pentanol)	A
Amyl chloride (Chloropentane)	B/2
Aniline	A
Ascorbic acid	A
n-Amyl acetate	B/2
B	
Barium chloride	A
Benzaldehyde	A
Benzene	B/2
Benzine	A
Benzoyl chloride	B/2
Benzyl alcohol	A
Benzyl chloride	B/2
Bis(2-ethylhexyl) phthalate	B/2
Boric acid 10%	A
Bromine	C/2
Bromobenzene	B/2
Bromonaphtalene	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

List of Reagents

Chemicals A - Z

C	
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 100%	C/1/2
Citric acid	A
Copper fluoride	A
Copper sulfate	A
Covi-Ox-T70/ Mixed Tocopherol	A
Cresol	A
Cumene (Isopropylbenzene)	B/2
Cyanoacrylate	A
Cyclohexane	B/2
Cyclohexanone	B/2
Cyclopentane	B/2
D	
1,2-Diethylbenzene	B/2
1,4-Dioxane (Diethylene dioxide)	B/2
1-Decanol	A
Decane	A
Di-(2-ethylhexyl) peroxydicarbonate	B/2
Dibenzyl ether	B/2
Dichloroacetic acid	A
Dichlorobenzene	A
Dichloroethane	A
Dichloroethylene	B/2
Diesel oil (Heating oil)	A
Diethanolamine	A
Diethylamine	B/2
Diethylene glycol	A
Diethylether	B/2
Dimethylacetamide	A
Dimethyl sulfoxide (DMSO)	B/2
Dimethylaniline	A
Dimethylformamide (DMF)	B/2

List of Reagents

Chemicals A - Z

E	
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	
Fluoroacetic acid	B/2
Formaldehyde (Formalin)	A
Formamide	A
Formic acid	A
G	
Gamma-butyrolactone	A
Gasoline	B/2
Glycerin <40%	A
Glycolic acid 50%	A
H	
Heating oil (Diesel oil)	A
Heptane	A
Hexane	A
Hexanoic acid	A
Hexanol	A
Hydriodic acid	B/2
Hydrobromic acid	A
Hydrochloric acid 20% (HCl)	A
Hydrochloric acid 37% (HCl)	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
Isooctane	A
Isopropanol	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 chloride (Chloromethane)	B/2

List of Reagents

Chemicals A - Z	
M	
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
Methyl tert-butyl ether	B/2
Methylene chloride (Dichloromethane) (DCM)	B/2
Methylpentanone	A
Mineral oil (engine oil)	A
Monochloroacetic acid	A
N	
Nitric acid 100%	A
Nitric acid 30-70%	A
Nitric acid dil. <30%	A
Nitrobenzene	B/2
Nitromethane	B/2
N-methyl-2-pyrrolidone (NMP)	A
O	
Octane	A
Octanol	A
Oil (vegetable, animal)	B/2
Oil of turpentine	B/2
Oleic acid	A
Oleum (Fuming Sulfuric acid)	A
Oxalic acid	A
P	
Pentane	B/2
Peracetic acid	A
Perchloric acid 100%	B/2
Perchloric acid diluted	A
Perchloroethylene	B/2
Petroleum	B/2
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

List of Reagents

Chemicals A - Z	
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 (kitchen salt)	A
Sodium dichromate	A
Sodium fluoride	A
Sodium hydroxide 30%	A
Sodium hypochlorite	A
Sodium thiosulfate	A
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	
1,1,2-Trichlortrifluoroethane	B/2
Tartaric acid	A
Tetrachlorethylene	B/2
Tetrahydrofuran (THF)	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
Triethylene glycol	A
Trifluoroacetic anhydride (TFAA)	B/2
Trifluoromethane (Fluoroform)	B/2
U	
Urea	A
X	
Xylene	B/2
Z	
Zinc chloride 10%	A
Zinc sulfate 10%	A