Brinkmann Bottletop Dispenser

and ChemSaver™ Bottletop Dispenser

Instruction Manual

Mode d'emploi
Manual de Instrucciones
Istruzioni d'impiego
Bedienungsanleitung

Brinkmann Bottletop Dispenser and ChemSaver™ Bottletop Dispenser

Components

Brinkmann Bottletop Dispenser

Distributeur standard pour flacons Brinkmann

Dispensador de frasco Brinkmann

Brinkmann Dispensatore per flaconi

Brinkmann Flaschendispenser

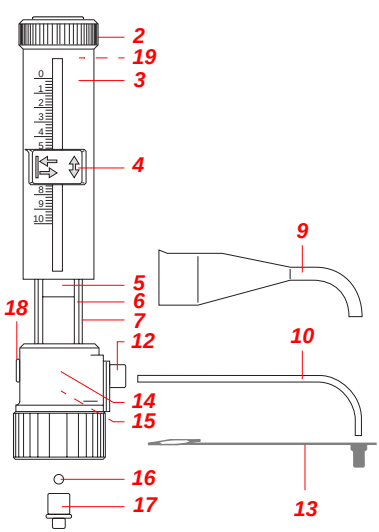
Brinkmann ChemSaver™ Bottletop Dispenser

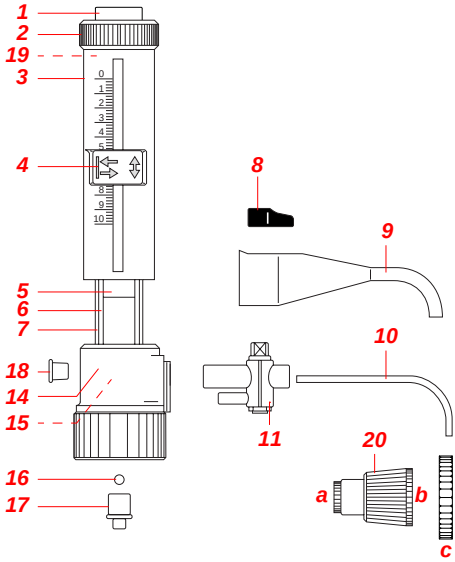
Distributeur pour flacons Chemsaver ™ Brinkmann

Dispensador de frasco Brinkmann ChemSaver™

Brinkmann ChemSaver™ Dispensatore per flaconi

Brinkmann ChemSaver™ Flaschendispenser





1 Fine volume adjustment knob
2 Piston holder
3 Cylinder sleeve
4 Volume setting knob
5 Piston
6 Glass cylinder
7 Protective cylinder sleeve
8 Discharge valve toggle
9 Discharge tube sleeve
10 Discharge tube
11 Discharge valve for Brinkmann ChemSaver™ Bottletop Dispenser
12 Discharge valve for Brinkmann Bottletop Dispenser
13 Cap for discharge tube
14 Valve block housing
15 Valve block (inside housing)
16 Valve ball
17 Filling valve
18 Air vent cover / filter connection
19 Cylinder ring (inside cylinder sleeve)
20 Tool:
   a) For sizes 1 / 2.5 / 5 / 10 mL
   b) For sizes 25 / 50 mL
   c) Enlarging ring for size 100 mL

Désignation des pièces

1 Bouton d'ajustage fin du volume
2 Support du piston
3 Manchon du cylindre
4 Bouton de réglage du volume
5 Piston
6 Cylindre de verre
7 Manchon de protection du cylindre
8 Bouton du robinet de distribution
9 Manchon de protection du tuyau distributeur
10 Tube distributeur
11 Robinet de fermeture du tuyau distributeur du modèle Chemsaver™
12 Vanne distributrice du distributeur pour flacons
13 Capuchon de fermeture du nez du tuyau distributeur
14 Bloc contenant les valves
15 Bloc-valve
16 Bille de la valve
17 Vanne de remplissage
18 Capuchon de l'évent / Raccord du filtre
19 Joint du cylindre (à l'intérieur du manchon du cylindre)
20 Outil:
   a) pour capacité de 1 / 2.5 / 5 / 10 mL
   b) pour capacité de 25 mL / 50 mL
   c) anneau adaptateur pour capacité de 100 mL

Componentes

1 Selector de ajuste fino del volumen
2 Soporte del émbolo
3 Carcasa del cilindro
4 Selector del volumen
5 Émbolo
6 Cilindro de vidrio
7 Carcasa de protección del cilindro
8 Llave de la válvula de descarga
9 Protector del tubo de descarga
10 Tubo de descarga
11 Válvula de descarga para el dispensador de frasco Brinkmann ChemSaver™
12 Válvula de descarga para el dispensador de frasco Brinkmann
13 Tapón del tubo de descarga
14 Carcasa del bloque de la válvula
15 Bloque de la válvula (interior de la carcasa)
16 Bola de la válvula
17 Válvula de llenado
18 Tapón de la salida de aire / Empalme del filtro
19 Junta del cilindro (interior carcasa del cilindro)
20 Herramienta:
   a) Para volúmenes de 1 / 2.5 / 5 / 10 mL
   b) Para volúmenes de 25 / 50 mL
   c) Prolongador para volumen de 100 mL

Componenti (Siete pregati di aprire la copertina pieghevole a fronte di questo manuale)

1 Manopola di microregolazione volume
2 Supporto del pistone
3 Manicotto del cilindro
4 Manopola di regolazione volume
5 Pistone
6 Clindro in vetro
7 Manicotto protettivo del cilindro
8 Commutatore della valvola di spurgo
9 Manicotto del tubo di spurgo
10 Tubo di spurgo
11 Valvola di spurgo per Brinkmann ChemSaver™ Dispensatore per flaconi
12 Valvola di spurgo per Dispensatore per flaconi
13 Tappo del tubo di spurgo
14 Alloggiamento del blocco valvola
15 Blocco valvola (nell'alloggiamento)
16 Sfera della valvola
17 Valvola di riempimento
18 Copertura di disaerazione / Collegamento del filtro
19 Anello del cilindro (nel manicotto del cilindro)
20 Utensile:
   a) per 1 / 2,5 / 5 / 10 mL
   b) per 25 / 50 mL
   c) rotella di incremento per 100 mL

Einzelteile (Bitte die erste Seite der Bedienungsanleitung ausklappen)

1 Feinjustierung
2 Kolbenhalter
3 Zylinderhülse
4 Volumen-Schnellverstellung
5 Kolben
6 Glaszylinder
7 Zylinder-Schutzmantel
8 Knebel des Ausstoßventils
9 Kanülensicherung
10 Ausstoßkanüle
11 Ausstoßventil für Brinkmann ChemSaver™ Flaschendispenser
12 Ausstoßventil für Flaschendispenser
13 Verschlußkappe der Ausstoßkanüle
14 Ventilkopfgehäuse
15 Ventil (im Gehäuseinneren)
16 Ventilkugel
17 Ansaugventil
18 Entlüftungsabdeckung / Filteranschluß
19 Zylinderring (im Inneren der Zylinderhülse)
20 Universalwerkzeug
   a) für die Größen 1 / 2,5 / 5 / 10 mL
   b) für die Größen 25 / 50 mL
   c) Vergrößerungsring für die Größe 100 mL

Contents

1 Safety Precautions

- This manual does not purport to address all the safety problems associated with the use of this dispenser. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine applicability of intended use.
- Observe extreme caution when dispensing caustic, poisonous, radioactive or hazardous chemicals.
- Observe general safety regulations for laboratory hazard prevention (eg. wear protective clothing, gloves, and glasses).
- Follow the reagent manufacturer's safety information.
- Every user must be acquainted with this instruction manual and have it readily available at all times.
- Use the instrument only for its proper purpose and within the limits stated in the Operating Limitations. If in doubt as to the suitability of your application or reagent, please be sure to consult Brinkmann Instruments.
- Regularly inspect the instrument for leakage and signs of wear. Before use, make sure all fittings and the connection to bottle are secure.
- Never use force on the instrument. Pull the piston up and press it down gently.
- Make sure the dispensing tube is facing away from the user or other persons when operating. Avoid splashes. Dispense only into suitable vessels.
- Do not dispense without discharge tube sleeve.
- Do not carry a mounted instrument by the cylinder. Always support both the instrument and the reagent bottle.
- Do not depress the piston when the cap for the discharge tube is in place.
- Use only original manufacturer's parts and accessories.
- If an instrument is not operating properly, immediately stop dispensing. Clean and repair the instrument according to the instructions in this manual or contact Brinkmann Instruments.

2 Contents of Package

The following items are included with every Dispenser

1 Dispenser

2 28 mm adapter

3 38 mm, 45 mm adapter with 1 mL, 2.5 mL, 5 mL, 10 mL dispensers, or
33 mm, 38 mm adapter with 25 mL, 50 mL, 100 mL dispensers

4 Manual

5 Telescoping filling tube

6 Assembly / Disassembly Tool

7 Performance Documentation on back page of manual

Verify that you have received all the items listed. If you are missing pieces, contact Brinkmann Instruments. Notify the supplier you purchased the instrument from at once if you find the instrument has been damaged in shipment.

3 Components

(Please open up the fold-out cover at the front of this manual)

4 Design Principle

The Brinkmann Bottletop Dispensers are designed for dispensing liquids in the milliliter range directly from a reagent bottle.

When the instrument is used correctly the dispensed reagent comes into contact with the following chemically resistant materials:
PFA, Borosilicate glass, Platinum Iridium, ETFE, PTFE, FEP.

5 Specifications (Includes all dispensers)

Volume range	***Setting increments***	***Dead volume***	***Systematic error*** (Inaccuracy)	***Random error*** (Imprecision; CV)
0.50 – 2.5 mL	0.05 mL	0.21 mL	± 0.6 %	≤ 0.1 %
1.00 – 5.0 mL	0.10 mL	0.18 mL	± 0.5 %	≤ 0.1 %
2.00 – 10.0 mL	0.20 mL	0.17 mL	± 0.5 %	≤ 0.1 %
5.00 – 25.0 mL	0.50 mL	1.20 mL	± 0.5 %	≤ 0.1 %
10.00 – 50.0 mL	1.00 mL	1.31 mL	± 0.5 %	≤ 0.1 %
20.00 – 100.0 mL	2.00 mL	1.21 mL	± 0.5 %	≤ 0.1 %
1 mL Fixed	–	0.21 mL	± 0.4 %	≤ 0.3 %
5 mL Fixed	–	0.18 mL	± 0.5 %	≤ 0.1 %
10 mL Fixed	–	0.17 mL	± 0.5 %	≤ 0.1 %

Liquid: Bidistilled water

Reference Temperature: 20 °C, constant

Number of determinations: 10,
according to ISO 8655-6

Note: Specifications are given for maximum volume.

Technical specifications subject to change!

Materials

	Brinkmann Bottletop Dispenser	*Brinkmann ChemSaver™ Bottletop Dispenser*
Piston Holder	PP	PP
Cylinder Casing	PP	PP
Volume Adjustment Knob	PPN GV2/30	PPN GV2/30
Valve Block Housing	PP	PP
Valve Block	PTFE	PTFE
Air Vent Cap	PP	PP
Telescopic Filling Tube	FEP	FEP
Discharge valve	ETFE	PFA
Discharge Tube	PFA	PFA
Discharge Tube Support	PP	PP
Discharge Tube Cap	PVDF	–
Spring for Discharge Valve	Pt- Ir	Pt- Ir
Valve Balls	Borosilicate (Duran) Glass	Borosilicate (Duran) Glass
Filling Valve	ETFE	ETFE
Cylinder	Borosilicate (Duran) Glass	Borosilicate (Duran) Glass
Protective cylinder sleeve	PTFE	PTFE
Piston 1 – 10 mL 25 – 100 mL	ETFE Duran Glass	ETFE Duran Glass
Piston Seal	PTFE	PTFE

6 Operating Limitations

The instrument is suitable for most media with the following exceptions:

- Hydrofluoric acid solutions
- Solutions which tend to crystallize, contain or form solid particles
- Unstable substances which react catalytically with Platinum-Iridium (e.g. $H_2 O_2$)
- Liquids attacking bosilicate glass, PFA, ETFE, PTFE, Platinum- Iridium, FEP
- Oxidizable inorganic solutions which may precipitate metal oxides (e.g. Biuret reagent)

Recommended temperature range for operating the instrument and for reagent is 15 °C to 40 °C. Do not exceed these temperatures.

The user is responsible for verifying the suitability of the Brinkmann Bottletop Dispenser for his/her application. This includes verifying chemical compatibility of the reagent to be used.

7 Assembling the Instrument

7.1 Attaching threaded adapters

- The 1 mL, 2.5 mL, 5 mL, and 10 mL dispensers will directly attach to reagent bottles with a 33 mm threaded neck.
- The 25 mL, 50 mL and 100 mL dispensers will directly attach to reagent bottles with a 45 mm threaded neck.
- For bottles with different size necks, measure the inner diameter of cap for the reagent bottle. Choose the size adapter which best matches this diameter and thread it onto the reagent bottle.

Note: Be sure the adapter fits securely onto the bottle threads.

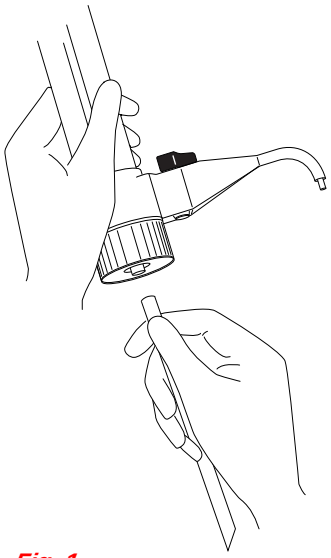


Fig. 1

7.2 Connecting the filling tube

(Fig. 1)

For dispenser 1, 2.5, 5.0 and 10.0 mL:

– Push the smaller diameter end of the filling tube onto the filling valve (17) as far as possible.

For dispensers 25, 50 and 100 mL:

– Push the larger diameter end of the tubing onto the filling valve.

Note: Be careful not to bend the tube.

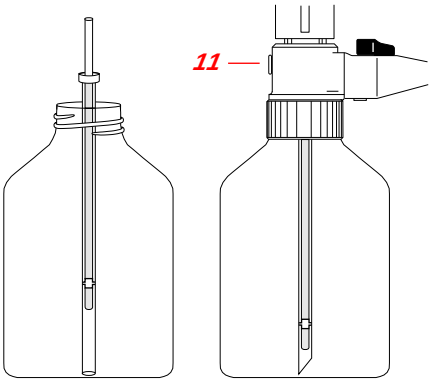


Fig. 2

– Determine the necessary length of the telescopic filling tube by measuring the distance from the bottom of the bottle to the top of the threaded base (Fig. 2).

– Extend the telescopic filling tube to the desired length and cut the end of the sleeve on an angle.

Note: If the bottle is shorter than the the filling tube, separate the two sections and cut the approriate piece to the necessary length.

Caution: When hygroscopic fluids are being used, a dry tube can be connected to the Dispenser. To do so, remove deairing cover (11) and push the dry tube into the opening. The dry tube can be filled with a moisture absorber (e.g. silica gel, 1 – 3 mm particle size) or $CaCO_2$. To absorb CO_2, fill the tube with NaOH pills (5 mm dia.)

8 Connecting to the Bottle

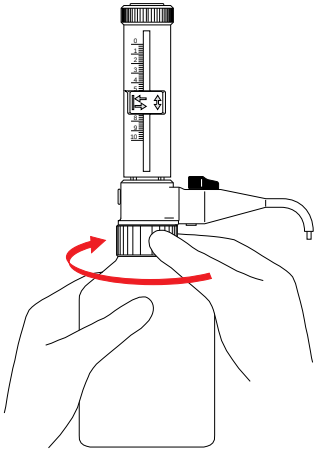


Fig. 3

– Holding the threaded base, mount the instrument onto the bottle or adapter by turning. Be sure the dispenser fits tightly onto the bottle.

Caution: Do not move the piston until the instrument is completely mounted.

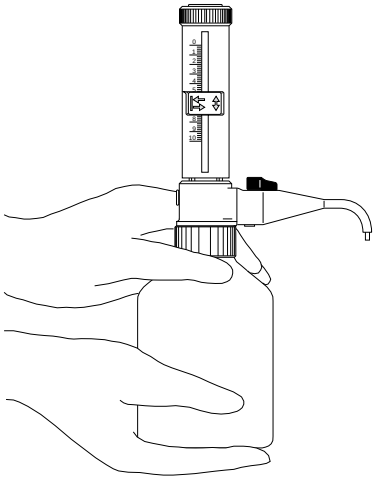


Fig. 4

Warning: Do not carry the mounted instrument by the upper casing. Always support both the dispenser and the bottle. Carry the mounted instrument only as shown in the figure.

9 Dispensing

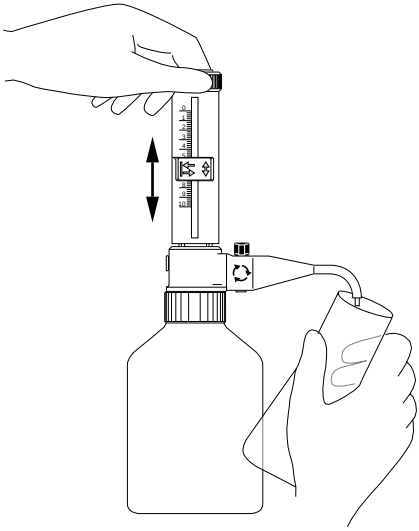


Fig. 5

9.1 Removing air from the instrument

(Fig. 5)

Caution: The discharge tube must always point away from the user and others at all times.

For Brinkmann ChemSaver™ Bottletop Dispensers

Caution: Do not move the piston until the instrument is completely mounted and the discharge valve is in the recirculate position (⟲).

– Turn the discharge valve into the recirculate position by turning the toggle until it points to the recirculate symbol (⟲) on the side of the discharge tube support sleeve.

– Place a collecting vessel below the discharge tube.

Caution: Be careful of chemicals dripping off the discharge tube.

– Raise the piston gently up approximately 2 cm and press down firmly. Repeat this movement until no more bubbles appear in the cylinder and discharge tube.

Turn the discharge valve into the dispensing position by turning the toggle so it lines up parallel with the discharge tube support sleeve and points to the arrow symbol (→). Raise the piston up slightly and down slowly until liquid appears at the end of the discharge tube.

For Brinkmann Bottletop Dispensers

– Place a collecting vessel below the discharge tube.

Remove stopper cap from the discharge tube.

Caution: Be careful of chemicals dripping off the discharge tube and stopper cap.

– Raise the piston gently up approximately 2 cm and depress down firmly. Repeat this movement until no more bubbles appear in the cylinder and discharge tube.

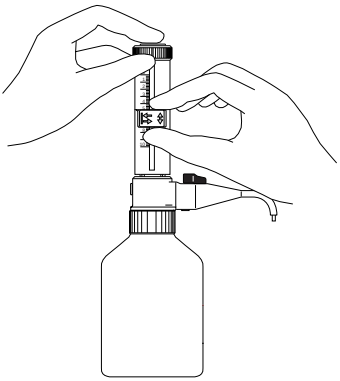


Fig. 6

9.2 Setting the volume

– Hold the cylinder casing down (Fig. 6).

– Slide the volume setting knob to the right and move it up or down to adjust to the desired volume.

– When the volume is selected, slide the volume setting knob to the left to lock it into place.

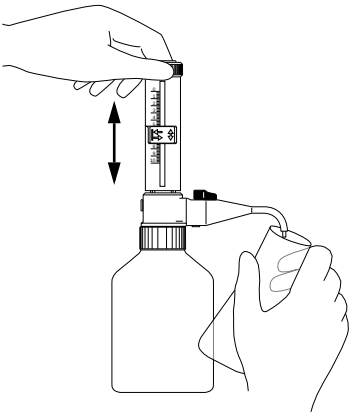


Fig. 7

9.3 Dispensing

(Fig. 7)

– Place an appropriate collecting vessel below the opening of the discharge tube.

For Brinkmann Bottletop Dispenser

– Remove the cap from the discharge tube.

Caution: Be careful of chemicals dripping off the discharge tube and stopper cap.

– Raise the piston slowly and evenly to the stop to pull reagent into the glass cylinder.

– Push down slowly and evenly to expel the reagent into the collecting vessel.

Avoid splashing the reagent!

Note: Never use force to move the piston!

– When not in use leave the piston in the down position and push the cap onto the discharge tube.

Caution: After completing the dispensing operation for the ChemSaver™ Bottletop Dispenser, always move the discharge valve into the recirculate position to prevent inadvertent dispensing from the discharge tube.

10 Cleaning

In order to maintain safe, accurate and precise operation, the dispenser must be cleaned in any of the following situations:

- Immediately when the piston action becomes difficult to move.
- When changing the reagent.
- Prior to long term storage.
- Prior to any maintenance or repair.
- Daily after use with reagents listed under operating limitations (e.g. solutions prone to crystallization, alkaline solutions, organic solvents, oxidizable inorganic solutions).
- Prior to sterilization.

10.1 Preparations for cleaning

Caution: Wear gloves, saftey glasses and a lab coat. Observe procedures for safe handling of hazardous reagents.

- If you are operating a ChemSaver™ Bottletop Dispenser, turn the valve to the recirculate position (⟲).
- Be sure the piston is in the down position, and the cap is securely on the end of the discharge tube of the Brinkmann Bottletop Dispenser.
- Place the mounted instrument into a sink or appropriate container.
- Adjust the volume to the maximum setting.

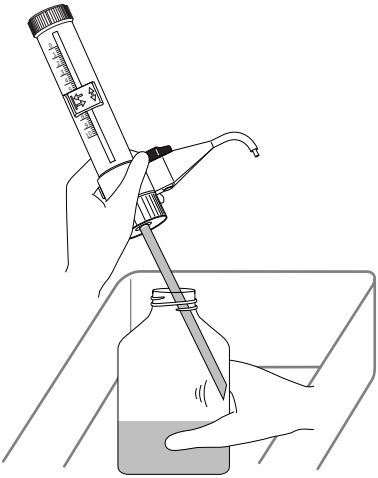


Fig. 8

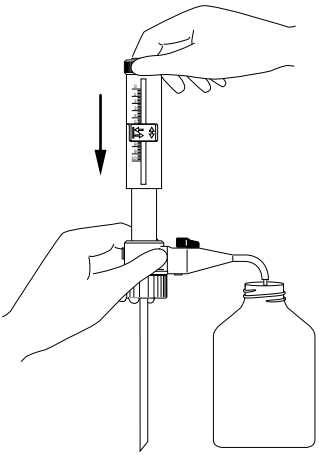


Fig. 9

– Holding the threaded base, disconnect the instrument from the bottle by turning it counter-clockwise at the threaded base. Lift the instrument up far enough so that the filling tube is no longer immersed.

– Carefully tap the filling tube against the bottle from the inside so that the reagent runs back into the bottle (Fig. 8).

– Lift the instrument from the bottle.

– If you are operating a ChemSaver™ Bottletop Dispenser, move the discharge valve toggle into the dispensing position (→).

– Remove the cap from the discharge tube of the Brinkmann Bottletop Dispenser.

– Hold the instrument so that the discharge tube is over the bottle opening and dispense the remaining reagent back into the bottle (Fig. 9).

Caution: During cleaning or changing of bottles, the discharge tube contains liquid even when the discharge valve on the ChemSaver™ Bottletop Dispenser is in the recirculate position.

10.2 Standard cleaning procedure

– Immerse the filling tube into a suitable neutral cleaning solution. Rinse by repeated dispensing of the maximum volume.

– Remove the dispenser from the cleaning solution and evacuate all solution from the unit.

– Place the filling tube into distilled water and rinse by repeated dispensing of the maximum volume.

– Lift the filling tube out of the distilled water and empty the instrument by repeated dispensing.

10.3 Intensive cleaning procedure

If the instrument becomes heavily soiled or extensive crystallization has formed, it may be partially disassembled for intensive cleaning. Refer to section 14 for disassembly and assembly procedures.

11 Sterilization

The entire instrument can be steam- sterilized at 121 °C, 15 psi (2 bar), for 20 min. Do not disassemble. The user must verify the efficiency of the sterilization.

– Clean the dispenser thoroughly following the procedures described under cleaning (sec. 10). Standard cleaning should be sufficient unless the instrument is heavily soiled.

– If you are operating a ChemSaver™ Bottletop Dispenser, leave the discharge valve toggle (8) in the dispensing position (→).

– Disengage the volume setting button (4) by moving it to the right. Push it into the middle position and leave it disengaged.

– Place the instrument on its side on a cloth. Avoid contact with hot metal surfaces.

Caution: Allow the instrument to cool slowly. Do not use the dispenser again until it has reached room temperature.

The instrument can also be sterilized by the following methods:

– Rinsing with an appropriate liquid, such as alcohol.

– Gas sterilization as long as temperature and pressure do not exceed 121 °C, 15 psi (2 bar).

12 Checking the Instrument Performance

The performance of a Brinkmann Dispenser can be checked using gravimetric testing. This involves the weighing of dispensings of distilled water. The method for gravimetric testing and formulas for calculating systematic error and random error are described below:

- Use a semi- micro balance that has been recently calibrated and located in a vibration-free, draft- free environment.
- All equipment used in the testing process must be isothermal (20 °C constant according ISO 8655-6)
- Set the instrument to the maximum volume.
- Dispense distilled water and then record the weight of the water.
- Perform at least 10 dispensings and weighing operations.

Convert the weights to volumes using the following formula and appropriate density of water for your lab temperature and barometric pressure:

$$\text{Volume} = \frac{\text{Weight (g)}}{\text{Density of water}}$$

The density of water at 16 – 21 °C = 0.998 g/mL
22 – 25 °C = 0.997 g/mL

Calculate the mean ($\bar{x}$) of the 10 volumes

$$\text{Mean } (\bar{x}) = 1/N \sum_{i=1}^{N} xi$$

- Determine the errors of the instrument by using the formulae below:

$$\text{Systematic error} = \frac{\text{actual volume} - \text{expected volume}}{\text{expected volume}} \times 100 \ [\%]$$

$$\text{Random error (CV)} = \frac{100s}{\bar{x}} \ [\%]$$

s = Standard Deviation
actual volume = the mean ($\bar{x}$) of the 10 volumes
expected volume = the maximum setting

$$s = \sqrt{\sum_{i=1}^{N} \frac{(xi - \bar{x})^2}{N-1}}$$

N = number of dispensings
xi = adjusted sample weight
$\bar{x}$ = mean

13 Calibration of the Brinkmann ChemSaver™ Bottletop Dispenser for Liquids with a Density other than Water

The Brinkmann ChemSaver™ Bottletop Dispenser has been calibrated with water by the manufacturer under the measuring conditions mentioned in section 5. If you are using a liquid that is viscous or has a density significantly different than water, the instrument volume can be fine tuned to compensate for performance differences these types of reagents might cause.

- The instrument and liquid to be dispensed must be equilibrated to the same temperature.
- Set the instrument to the maximum volume.
- Dispense and weigh the maximum volume 10 times.
- Convert the mean value of these weighings to volume using the formula:

$$\text{Volume} = \frac{\text{Weight}}{\text{Density}}$$

- If the volume delivered does not match the volume setting on the dispenser, the fine adjustment knob may be used to increase or decrease the volume dispensed at that setting.
- One full turn of the fine adjustment knob corresponds to the smallest setting increment.
- Turning the knob in the "+" direction increases the volume
- Turning the knob in the "–" direction decreases the volume
- Adjust the fine adjustment knob. Then repeat the steps above to confirm the volume delivered.
- Repeat until desired volume is obtained.

14 Maintenance

The instruments may be partially disassembled for cleaning or replacement of parts. Reference fold out diagram on the cover of this manual and section 17 for available spare parts.

Follow proper safety procedures for hazard prevention. Wear goggles, gloves and protective clothing.

Note: Never use force when disassembling or reassembling!

14.1 Disassembly

– Follow the cleaning procedure in section 10 before disassembling the dispenser.

14.1.1 Removing the piston and cylinder sleeve

– The piston (5) may be removed by unscrewing the piston holder (2). Slowly pull the piston (5) out fo the glass cylinder by lifting up on the piston holder (2).

– Insert the appropriate end of the tool (20) into the cylinder ring (19) and remove by turning counter clockwise.

– Remove the cylinder sleeve (3).

14.1.2 Removing the discharge tube sleeve and the discharge tube

Caution: Be careful not to splash the liquid remaining in the discharge tube when removing.

For Brinkmann ChemSaver™ Bottletop Dispenser

– Turn the valve toggle (8) to the recirculate position and remove the toggle by lifting up and off.

– Lift the discharge tube sleeve (9) up and off.

– Pull off the discharge tube (10).

For Brinkmann Bottletop Dispenser

– Lift the discharge tube sleeve (9) up and off.

– Pull off the discharge tube (10) and cap for discharge tube (13).

14.1.3 Removing the filling valve

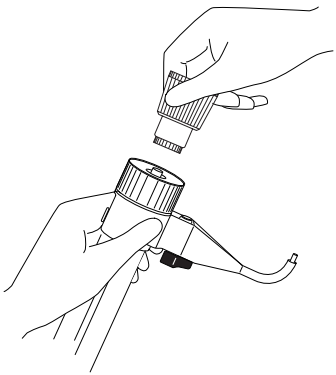


Fig. 10

– The filling valve (17) may be removed by using the tool (20). Hold the instrument upside down and place the appropriate end of the tool over the valve. Loosen the valve by turning counterclockwise.

Note: The valve ball is loose inside the valve block. Be careful not to lose it.

14.2 Cleaning of parts

Parts may be cleaned with a soft brush and appropriate cleaning solution. Do not use abrasive cleaners which could scratch the surface of the piston or cylinder.

Note: Be careful not to damage the seal on the end of the piston.

– Allow parts to dry.

14.3 Assembly

- Place the cylinder sleeve (3) over the cylinder.
- Using the appropriate end of the universal tool (20), thread the cylinder ring (19) onto the protective sleeve (7) of the glass cylinder by turning clockwise until it is tight.
- Insert the piston (5) into the cylinder being careful not to damage the piston seal.
- Thread the piston holder (2) together with the cylinder sleeve (3) by turning clockwise until tight.
- Hold the instrument upside down and insert the valve ball (16) into the bottom of the valve block (15).
- Thread the filling valve (17) into the bottom of the valve block (15) by turning clockwise. Use the appropriate end of the tool (20) to tighten the valve.
- Push the discharge tube (10) into the discharge valve (11) or (12).
- For Brinkmann Bottletop Dispensers attach the cap for the discharge tube (13) by guiding the end of the discharge tube (10) through the loop on the cap.
- Mount the discharge tube sleeve (9) onto the valve block housing (14) by first sliding the discharge tube (10) through the bottom of the sleeve, then slide the end of the sleeve over the grooves on the valve block housing.
- If you are assembling a ***Brinkmann ChemSaver™ Bottletop Dispenser***, push on the toggle (8) and set to recirculate.

Caution: When reassembling the instrument be sure all parts are securely in place. Test the dispenser for leaks and proper operation with distilled water ***before*** using the dispenser with reagent.

- After disassembling and reassembling the instrument check the performance of the instrument gravimetrically (section 12).

15 Troubleshooting Guide

Error	Cause	Solution
Piston movement is difficult.	– Cap pushed onto discharge tube.	– Remove stopper cap.
	– Formation of crystals.	– Immediately stop dispensing and follow cleaning procedure (sec. 10).
	– Damaged piston seal.	– Immediately stop dispensing and follow cleaning procedure (sec.10), replace piston or send the dispenser to Brinkmann Instruments for repair if necessary.
No reagent is aspirated.	– Adjusted to minimum volume setting.	– Use volume setting knob to set higher volume.
	– Filling valve clogged or sticking.	– Follow cleaning procedure. Remove filling valve (sec. 10), replace valve if necessary.
Air bubbles in aspirated liquid.	– Instrument not properly primed.	– Follow the procedure for removing air from the instrument (sec.9).
	– Filling tube not attached correctly, or damaged.	– Follow cleaning procedure (sec.10). Push filling tube all the way up onto the filling valve. Shorten extend or replace filling tube when necessary.
	– Reagent aspirated too quickly.	– Raise piston slower when aspirating.
	– Filling valve loose or damaged.	– Follow cleaning procedure (sec 10). Remove filling tube. Tighten valve or replace.
	– End of filling tube is above liquid level.	– Extend filling tube so the end is below the liquid level.
		– Fill empty bottle.
Dispensed volume too low.	– Filling valve loose or damaged.	– Follow cleaning procedure (sec 10). Remove filling tube.Tighten valve or replace.
	– Filling tube not attached correctly or damaged.	– Follow cleaning procedure (sec.10). Push filling tube all the way up onto the filling valve. Shorten extend or replace filling tube when necessary.

16 Sending in for Repair

If a problem cannot be solved with the aid of this instruction manual, we recommend you return the Brinkmann Bottletop Dispenser to Brinkmann Instruments for repair.

The dispenser must be cleaned and decontaminated before returning to Brinkmann Instruments. Never send an instrument filled with reagent. Returned instruments must be free from toxic or biohazardous material.

Instruments from biological applications must be steam sterilized.

The application of force in opening or disassembling of the instrument will void the warranty.

Send the cleaned instrument to Brinkmann Instrument Services, Inc. at the address printed on the back of this manual.

In your package include information describing the observed fault and the liquids which have been dispensed. For warranty claims include a copy of an invoice or purchase order as proof of purchase.

17 Ordering Information

17.1 Bottletop Dispensers

Brinkmann ChemSaver™ Bottletop Dispensers

Adjustable volume

Volume Range (mL)	Thread	Cat.No.
0.1 – 2.5	32 mm	22 22 090-0
1 – 5	32 mm	22 22 100-1
2 – 10	32 mm	22 22 110-8
5 – 25	45 mm	22 22 120-5
10 – 50	45 mm	22 22 130-2
20 – 100	45 mm	22 22 140-0

Brinkmann Bottletop Dispensers

Adjustable volume

Volume Range (mL)	Thread	
0.1 – 2.5	32 mm	22 22 000-4
1 – 5	32 mm	22 22 010-1
2 – 10	32 mm	22 22 020-9
5 – 25	45 mm	22 22 030-6
10 – 50	45 mm	22 22 040-3
20 – 100	45 mm	22 22 050-1

Fixed volume

Volume (mL)	Thread	Cat.No.
1	32 mm	22 22 060-8
5	32 mm	22 22 070-5
10	45 mm	22 22 080-2

17.2 Accessories

Extended Discharge Tube, 80 cm long

For Dispenser Sizes
1 to10 mL22 22 300-3
25 to100 mL22 22 305-4

Threaded adapter, polypropylene, set of 3

for 1 – 10 mL

28 mm	22 22 310-1
38 mm	22 22 315-1
45 mm	22 22 320-8
set one of each size 28 mm, 38 mm, 45mm	22 22 335-6

for 25 – 100 mL

33 mm	22 22 312-7
38 mm	22 22 318-6
40 mm	22 22 322-4

Standard tapered joint adapters, polypropylene, pkg. of 1

STJ 24/40	22 22 325-9
STJ 29/42	22 22 330-5

Threaded adapter, Teflon, pkg. of 1

for 1 – 10 mL

28 mm	22 22 340-2
38 mm	22 22 345-3
45 mm	22 22 350-0

for 25 – 100 mL

33 mm	22 22 352-6
38 mm	22 22 355-1
40 mm	22 22 357-7

Adapter for Drum

45 mm / 2.25 inch	22 22 360-7

17.3 Spare Parts

For Brinkmann ChemSaver™ Bottletop Dispensers

Piston (5) complete with piston holder (2) and fine adjustment (1)	Cat.No.
0.1 – 2.5 mL	22 22 500-6
1 – 5 mL	22 22 505-7
2 – 10 mL	22 22 510-3
5 – 25 mL	22 22 515-4
10 – 50 mL	22 22 520-1
20 – 100 mL	22 22 525-1

Cylinder sleeve (3)

0.1 – 2.5 mL	22 22 600-2
1 – 5 mL	22 22 605-3
2 – 10 mL	22 22 610-0
5 – 25 mL	22 22 615-1
10 – 50 mL	22 22 620-7
20 – 100 mL	22 22 625-8

Discharge tube (10)

0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 560-0
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 565-1

Discharge tube sleeve (9)

0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 550-2
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 555-3

Discharge valve toggle (8)

0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 530-8
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 535-9

For Brinkmann Bottletop Dispensers

Piston (5) complete with piston holder (2)	
0.1 – 2.5 mL	22 22 700-9
1 – 5 mL	22 22 705-0
2 – 10 mL	22 22 710-6
5 – 25 mL	22 22 715-7
10 – 50 mL	22 22 720-3
20 – 100 mL	22 22 725-4
1 mL fixed	22 22 730-1
5 mL fixed	22 22 735-1
10 mL fixed	22 22 740-8

	Cat.No.
Discharge tube (10)	
0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 765-3
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 565-1
Cylinder sleeve (3)	
0.1 – 2.5 mL	22 22 815-3
1 – 5 mL	22 22 820-0
2 – 10 mL	22 22 825-1
5 – 25 mL	22 22 830-7
10 – 50 mL	22 22 835-8
20 – 100 mL	22 22 840-4
1 mL fixed	22 22 845-5
5 mL fixed	22 22 850-1
10 mL fixed	22 22 855-2
Discharge tube sleeve (9)	
0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 755-6
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 760-2

For both Model Dispensers

Filling Valve (17)	
0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 765-3
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 765-1
Valve ball (16)	
0.1 – 2.5 mL, 1 – 5 mL, 2 – 10 mL	22 22 660-6
5 – 25 mL, 10 – 50 mL, 20 – 100 mL	22 22 665-7
Telescopic filling tube	22 22 675-4
Drying tube, cpl. (not filled)	27 31 110-5
Tool	22 22 680-1
Enlarging ring f. Tool (for 100 mL)	22 22 682-7

Quality assurance

This Brinkmann ChemSaver™ Bottletop Dispenser has been manufactured and tested under stringent quality controls to ensure its accuracy and precision. It is guaranteed against defects in workmanship or faulty parts

for 12 months

after the date of delivery. Please refer to the notes in this instruction manual. If, in spite of our extensive controls, the Brinkmann ChemSaver™ Bottletop Dispenser is defective, please return it to Brinkmann Instruments.

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