115.0 mm

260.0 mm

fixed volume

adjustable volume

multi-channel

single- channel

DiamondPosiStop™

low-force pipettor



User Guide

www.globescientific.com

TABLE OF CONTENTS

Sr. No.	Description	Page #
1	Introduction	1
2	Package Contents	1
3.1	Variable volume pipette range	4
3.2	Fixed volume pipette range	4
3.3	Multi channel pipette range	5
3.4	Setting the volume	5
3.5	Volume indicator display example	5
4	Pipette operation	6
4.1	Pipetting guidelines	6
4.2	Setting the volume	6
4.3	Loading tips	7
4.4	Optimum immersion depths	7
4.5	Forward pipetting	8
4.6	Reverse pipetting	8
4.7	Aspiration of sample	8
4.8	Dispensing of sample	9
4.9	Ejection of tips	9
5	Calibration and adjustment	9
5.1	Calibration requirements and test conditions	9
5.2	Calibration and adjustment	9
5.3	Procedure to check calibration	10
5.3.1	Conversion of weight readings to volume	10
5.3.2	Calculation for in-accuracy (systematic error)	10
5.3.3	Calculation for imprecision (random error)	11
6	Maintenance and servicing	11
6.1	Disassembly	11
6.2	Disassembling the lower part	11
6.2.1	Disassembling the single channel pipette up to 1ml	12
6.3	Assembling the single channel pipette up to 1ml	12
6.4	Disassembling the multi channel pipette	12
6.4.1	Removing the lower assembly	12
6.4.2	Opening the lower assembly	13
6.4.3	Removing the channel	13
6.4.4	Fitting the channel	13
6.4.5	Assembling the lower assembly	13
6.4.6	Checking the function	13
6.5	List of spare parts - Single Channel Pipette	14
6.6	List of spare parts - Multichannel Pipette	18
6.7	Autoclaving	19
7	Trouble shooting guide	19

1. INTRODUCTION

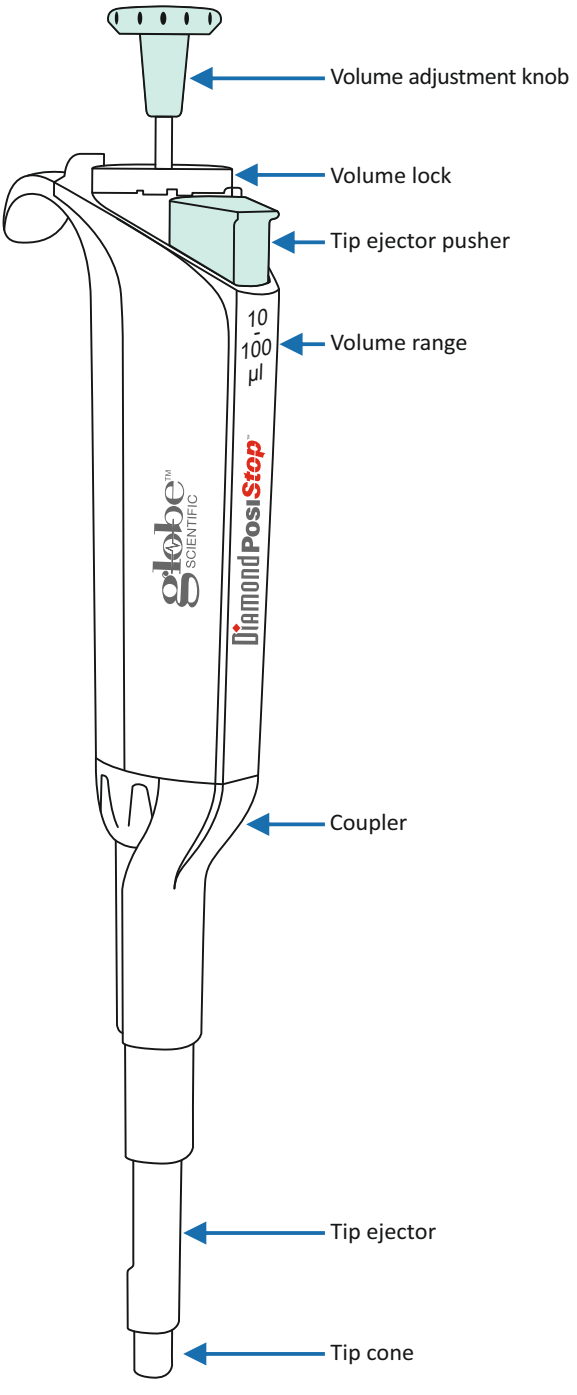
Thank you for choosing the Diamond PosiStop series of pipettors! Numerous advances in development have been implemented, including:

- Cylindrical tip cone design for easy fitment and smooth ejection
- Designed for high accuracy and precision where the tip and pipette works together as a system for improved accuracy and precision
- Magnet assisted piston for precise results
- Innovative spring and seal design for one of the lowest plunge force requirement
- Corrosion resistant plastic tip ejector mechanism with unique shock absorbing design
- Volume lock
- Fully autoclavable
- Ergonomic design
- Easy in-house calibration
- Highly durable positive stop tip cone

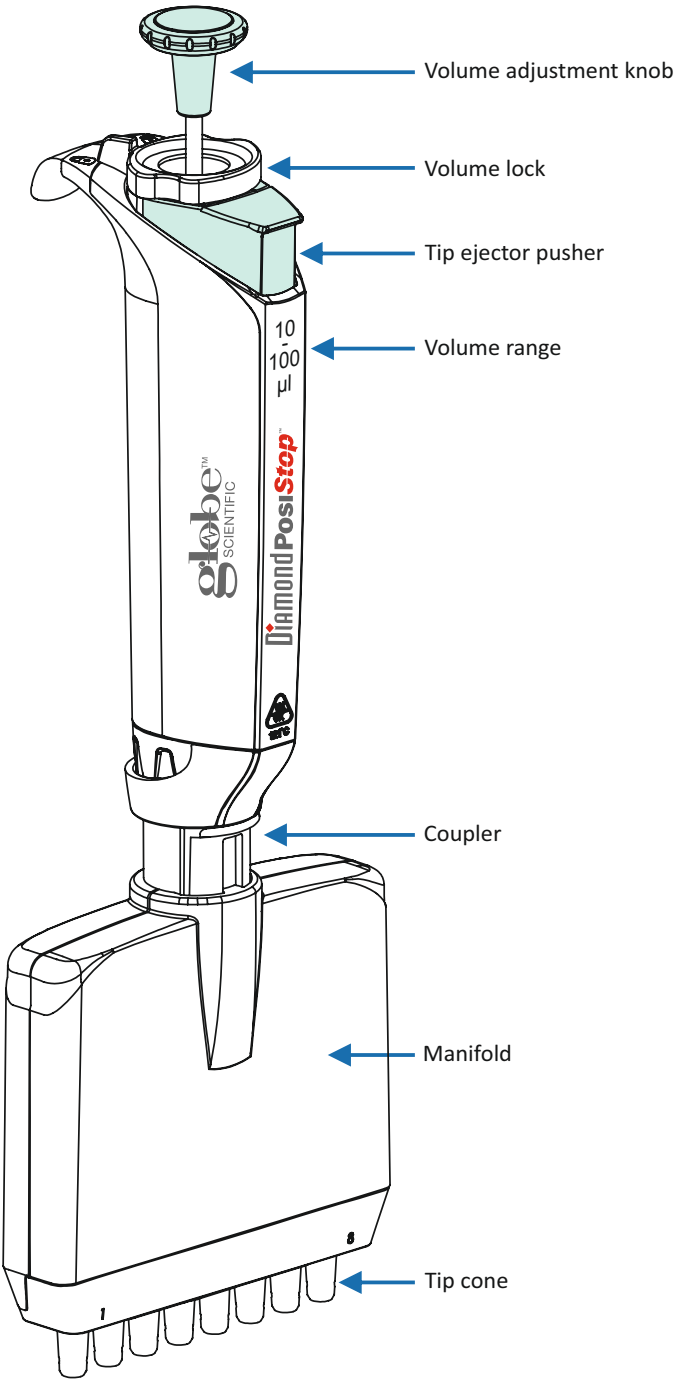
2. PACKAGE CONTENTS

Description	*Quantity*
• Diamond PosiStop Pipette	1
• Certificate of conformity including calibration report	1
• Warranty card	1
• Product manual	1
• Shelf-mounting stand	1
• Calibration tool	1
• Silicone grease	1
• Sample pack of tips	1

SINGLE CHANNEL VARIABLE VOLUME



MULTICHANNEL VARIABLE VOLUME



3.1 VARIABLE VOLUME PIPETTE RANGE

Inaccuracy and Imprecision are construed as per ISO 8655-2022 standard.

CAT No.	Color Code	Volume Range [µl]	Incre-ments [µl]	Test Volume [µl]	Inac-curacy (±) %	Impreci-sion (±) %
3361-1	🔴	0.1-2.5 µl	0.002	0.25	0.6	2.1
				1.25	0.3	1.0
				2.5	0.3	0.7
3361-10	🔴	0.5-10 µl	0.02	1	0.0	1.4
				5	0.5	0.5
				10	0.1	0.3
3361-20	🔴	2-20 µl	0.02	2	0.5	0.7
				10	0.0	0.2
				20	0.2	0.2
3361-50	🟢	5-50 µl	0.1	5	0.1	0.1
				25	0.2	0.1
				50	0.3	0.0
3361-100	🟢	10-100 µl	0.1	10	0.1	0.5
				50	0.2	0.2
				100	0.3	0.1
3361-200	🟢	20-200 µl	0.2	20	0.3	0.4
				100	0.1	0.2
				200	0.3	0.1
3361-1000	🔵	100-1000 µl	1	100	0.2	0.4
				500	0.1	0.2
				1000	0.2	0.1

3.2 FIXED VOLUME PIPETTE RANGE

CAT No.	Color Code	Volume Range [µl]	Test Volume [µl]	Inaccuracy (±) %	Imprecision (±) %
3362-2	🔴	2.5 µl	2.5	0.3	0.7
3362-5	🔴	5 µl	5	0.5	0.5
3362-10	🔴	10 µl	10	0.1	0.2
3362-20	🔴	20 µl	20	0.2	0.2
3362-25	🔴	25 µl	25	0.2	0.1
3362-50	🟢	50 µl	50	0.3	0.2
3362-100	🟢	100 µl	100	0.3	0.1
3362-200	🟢	200 µl	200	0.3	0.1
3362-250	🔵	250 µl	250	0.4	0.4
3362-500	🔵	500 µl	500	0.1	0.2
3362-1000	🔵	1000 µl	1000	0.2	0.1

3.3 MULTI-CHANNEL PIPETTE RANGE

8 Channels & 12 Channels

CAT No.	Color Code	Volume Range [µl]	Incre-ments [µl]	Test Volume [µl]	Inac-curacy (±) %	Impreci-sion (±) %
3364-10 3365-10	●	0.5-10 µl	0.02	1	8	5
				5	4	2
				10	2	1
3364-20 3365-20	●	2-20 µl	0.02	2	7	3
				10	3	2
				20	2	1.6
3364-50 3365-50	●	5-50 µl	0.1	5	3	2
				25	1.5	1
				50	1	0.7
3364-100 3365-100	●	10-100 µl	0.1	10	3	2
				50	1	0.8
				100	0.8	0.3
3364-200 3365-200	●	20-200 µl	0.2	20	5	1.4
				100	1	0.4
				200	0.7	0.25
3364-300 3365-300	●	30-300 µl	0.2	30	3	1
				150	1	0.5
				300	0.6	0.3

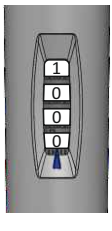
* Accuracy and precision calculated using Rainin® LTS tips.

3.4 SETTING THE VOLUME

Delivery volume is clearly indicated in the volume display seen in the main body of the pipette.

In variable volume models, the bottom volume wheel includes a small increment scale for precise setpoint and delivery capabilities.

Some variable volume pipettes include one or two decimal places in the setpoint volume wheels. This is indicated by the use of a black horizontal line as seen in the following examples section.



3.5 VOLUME INDICATOR DISPLAY EXAMPLE

3361-1



2.25 µl

3361-10



10 µl

3361-20



18.3 µl

3361-100



100 µl

3361-1000



1 ml

3364-300



300 µl

4 PIPETTE OPERATION

4.1 PIPETTING GUIDELINES

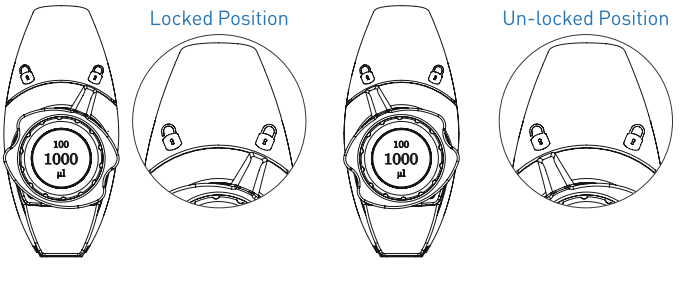
- Check the tip cone to make sure it is clean
- Make sure the pipette tip is firmly attached to the tip cone
- Ensure that the temperature of the pipette tip, pipettor and sample are at equilibrium
- Always press and release the plunger slowly and smoothly
- Pre-rinse the pipette tip before aspirating the sample by filling and emptying the pipette tip five (5) times. This is important when dispensing samples that have a viscosity and density different from water and for volatile solvents
- Do not pre-rinse the tip when pipetting samples with temperatures different from the current ambient temperature. Be sure to change the pipette tip after each pipetting.
- When aspirating, hold the pipettor in an upright position and keep the pipette tip at a constant depth below the surface of the sample liquid.
- After pipetting acids or other corrosive liquids, remove the tip cone and and rinse the piston, o-ring and seal with distilled water
- Do not pipette samples at a temperature above 70°C or below 4°C

Make sure that the sample never enters the tip cone. To prevent this:

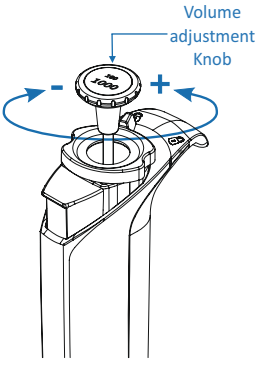
- Never lay the pipettor on it's side when there is liquid in the pipette tip
- Always press and release the plunger slowly and smoothly
- Never turn the pipettor upside-down

4.2 SETTING THE VOLUME

- To set the volume turn the volume lock lever to the “unlock” position so that the volume can be adjusted to the desired setpoint within the permitted volume range. Refer following images



- To decrease the volume, turn the volume setting knob clockwise.
- To increase the volume, turn the volume setting knob counterclockwise.
- Turn the volume lock lever to the 'lock' position to avoid accidentally changing the volume during pipetting.



⚠ The locking mechanism ensures that the volume adjustment knob remains at the desired setpoint while aspirating or dispensing sample liquids. Any effort to rotate the volume adjustment knob with the locking mechanism engaged will damage the locking mechanism and void the warranty.

⚠ Setting the volume beyond the allowable volume range is not permitted. Using excessive force to turn the volume adjustment knob outside the permitted range will jam the mechanism, damage the pipette and void the warranty.

4.3 LOADING TIPS

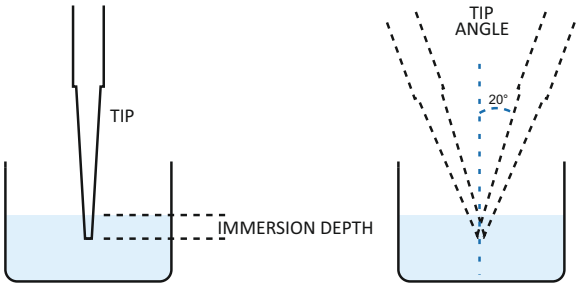
Globe Scientific recommends using authentic Globe Scientific pipette tips to ensure a perfect fit for maximum precision.

- Use the correct volume pipette tip according to the volume range of the pipettor.
- Be sure to check the tip cone to ensure it is clean.
- Firmly press the pipette tip on to the tip cone to ensure an airtight seal.

4.4 OPTIMUM IMMERSION DEPTHS

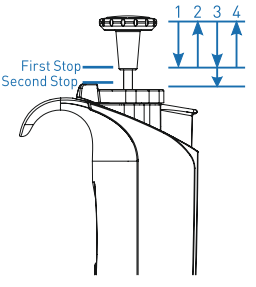
Volume	*Immersion depth*
0.1 µl - 1 µl	1 mm
1 µl - 100 µl	2 - 3 mm
100 µl - 1000 µl	2 - 4 mm
1ml - 10ml	3 - 5 mm

Tip immersion depth is critical and should not be exceeded or the volume may become inaccurate. Tip angle is also important; the pipettor should be used only at an angle between zero and twenty degrees (0°-20°):



4.5 FORWARD PIPETTING

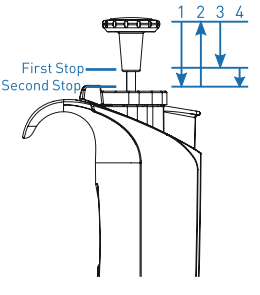
1. Press the plunger until the first stop.
2. Dip the pipette tip under the surface of the sample liquid in the reagent reservoir and then slowly release the plunger. Withdraw the pipette tip from the liquid, touching it against the edge of the reagent reservoir to remove any excess liquid or droplets.
3. Dispense the sample liquid by gently pressing the plunger to the first stop. After a delay of approximately one second, continue to press the plunger fully to the second stop, effectively emptying the pipette tip.
4. Release the plunger fully (to the 'ready' position). Change the pipette tip and continue pipetting as necessary.



4.6 REVERSE PIPETTING

The reverse pipetting technique is suitable for dispensing liquids that have high viscosity or a tendency to foam easily. This technique is also recommended for dispensing very small volumes.

1. Press the plunger fully to the second stop.
2. Dip the pipette tip under the surface of the sample liquid in the reagent reservoir and then slowly release the plunger. This step will fill the tip. Withdraw the pipette tip from the sample liquid and touch it against the edge of the reagent reservoir to remove any excess sample liquid.
3. Dispense the preset volume of sample liquid by gently pressing the plunger to the first stop. Hold the plunger at the first stop. Some of the sample liquid will remain in the pipette tip and it should not be dispensed.
4. The remaining sample liquid should either be discarded with the pipette tip or should be dispensed back into the reagent reservoir.



4.7 ASPIRATION OF SAMPLE

- Hold the pipettor vertically and press the plunger to its first stop. Place the pipette tip into the sample liquid at proper angle and depth (please refer to OPTIMUM IMMERSION DEPTHS) then gently release your thumb pressure on the plunger. The plunger will then move upward, aspirating the sample.
- Pause for about 1 second (longer for macro-volume pipettors) to ensure that the full volume of sample is drawn into the pipette tip.
- Withdraw the pipette tip from the sample liquid. If any liquid remains on the outer surface of the pipette tip, touch it off carefully in a lint-free tissue, taking care not to touch the pipette tip orifice.

4.8 DISPENSING OF SAMPLE

1. Place the pipette tip against the reagent reservoir wall to avoid any bubbles or splashing of the sample liquid out of the reagent reservoir.
2. Press the plunger slowly past the first stop and second stop for complete blow out of the sample liquid. For viscous samples, it is recommended to wait for few seconds until the sample fluid passes out to the reservoir.
3. Pull the pipette tip along the wall of the reagent reservoir and release the plunger slowly.
4. Discard the pipette tip to avoid any sample carryover / cross-contamination. It is highly recommended to replace the pipette tip prior to repeating the pipetting cycle.

4.9 EJECTION OF TIPS

The pipette tip ejector should be pressed downwards firmly and fully to ensure proper tip ejection. Pipette tips should be ejected and disposed of in a suitable waste container.

5 CALIBRATION AND ADJUSTMENT

All pipettes have been quality tested according to ISO8655-6. The quality control process according to ISO8655-6 involves gravimetric testing of each pipette with double distilled water.

All pipettes are calibrated in an ISO/IEC17025 accredited laboratory. Each pipette is calibrated, inspected and validated by qualified technicians according to defined quality systems.

5.1 CALIBRATION REQUIREMENTS AND TEST CONDITIONS

An analytical balance must be used. The balance selection depends upon the selected model of the pipettor and the sensitivity of the balance reading.

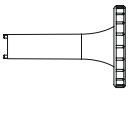
Test liquid: Water, distilled or deionized, grade 3 water conforming to ISO3696. Calibration should be performed in a draft-free room with the temperature of the water, pipettor and air between 15°C to 30°C (stable within ±0.5°C).

The relative humidity must be above 50%, especially with calibration volumes under 50µl to help reduce evaporation loss.

Special accessories for the analytical balance such as an evaporation trap are recommended for calibration volumes under 50µl.

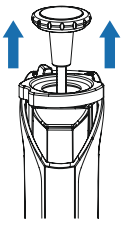
5.2 CALIBRATION AND ADJUSTMENT

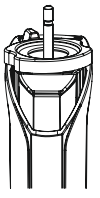
1. Calibration adjustment is performed with the calibration tool provided with the pipettor.
2. Rotate the volume locking lever to the “lock” position so the volume setting mechanism is locked and able to turn the calibration screw.



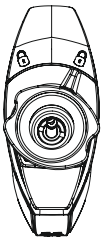


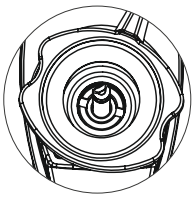
3. Remove the volume adjustment knob by pulling it upwards.

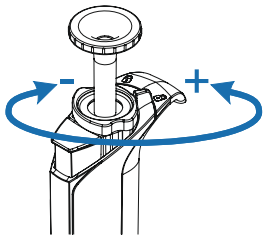




4. Place the calibration tool into the calibration grooves.







5. Turn the calibration tool counterclockwise to increase volume and clockwise to decrease volume.
6. After adjustment, check the calibration according to PROCEDURE TO CHECK CALIBRATION in the next section.

⚠ Depending upon use, we recommend a calibration check frequency of every six months. This schedule is only a general recommendation and should be adjusted according to your institution's use and requirement.

5.3 PROCEDURE TO CHECK CALIBRATION

The pipettor is checked at maximum volume, at 50 % of maximum volume and at minimum or 10% of maximum volume, whichever is higher.

- A new tip is first pre-wetted 3-5 times and a series of ten pipetting is done at each volume.
- Use of forward pipetting technique is recommended.
- Calculate the inaccuracy and imprecision for all three volumes as per EN ISO 8655-6 standards on the basis of the following calculation.

5.3.1 CONVERSION OF WEIGHT READINGS TO VOLUME

Mean Volume $\overline{V} = \overline{X} \cdot Z$

Mean Weight $\overline{X} = \frac{\sum Xi}{n}$

Xi = Balance Reading
n = number of reading
Z = Conversion factor
[example Z=1.0040 µl/mg at 25°C and 1013 hPa]

5.3.2 CALCULATION FOR IN-ACCURACY (SYSTEMATIC ERROR)

$A\% = \frac{\overline{V} - Vo}{Vo} \cdot 100$

$\overline{V}$ = Mean Value
Vo = Particular volume at which readings are taken

5.3.3 CALCULATION FOR IMPRECISION (RANDOM ERROR)

$$S = \sqrt{\frac{\sum_{i=1}^{n} (Vi - \bar{V})^2}{n - 1}}$$

$$CV\% = \frac{100 \cdot S}{\bar{V}}$$

S = Standard Deviation

$\bar{V}$ = Mean Value

n = number of readings

Compare the results to the limits in the earlier tables (Page# 4, 5)

6 MAINTENANCE AND SERVICE

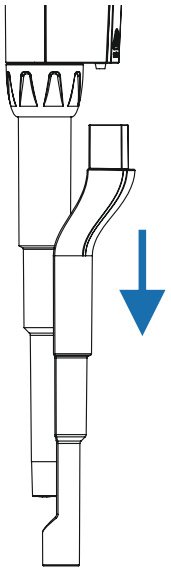
When the pipettor is not in use it should be stored in an upright position. The pipettor should be inspected prior to use each day for any dust or contamination on outside surfaces. Special attention should be given to the tip cone. No solvent other than isopropanol should be used to clean the pipette. If the pipettor is used daily, an internal parts inspection should be performed every three (3) months.

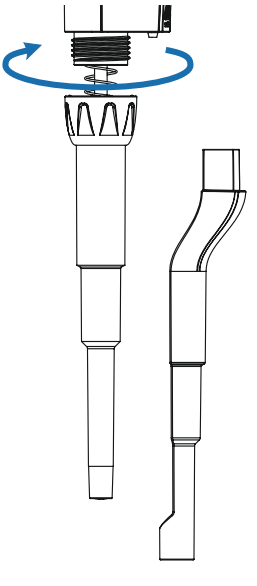
6.1 DISASSEMBLY

The servicing procedure starts with the disassembly of the pipettor. Please refer to the spare parts lists for better understanding of the components.

6.2 DISASSEMBLING THE LOWER PART

1. Press tip ejector pusher completely down and hold.
2. Pull down the tip ejector and release the tip ejector pusher.

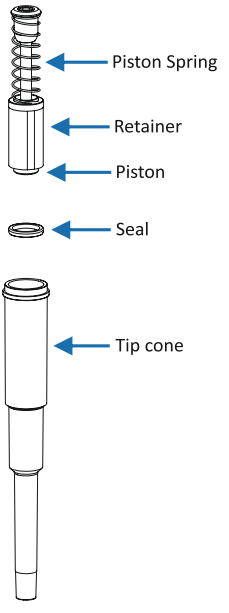




6.2.1 DISASSEMBLING THE SINGLE-CHANNEL PIPETTE UP TO 1ml

1. Unscrew the coupler and remove tip cone.
2. Remove the lower part and pull out the piston and other parts from tip cone.

- Remember to keep all parts in order for reassembly.
- Clean the piston, the piston spring, seal and the o-ring with isopropanol and lint free tissue. Allow them to dry.
- Check the tip cone for foreign articles and remove, if any. Grease the cleaned parts with the approved lubricant provided with each pipette.



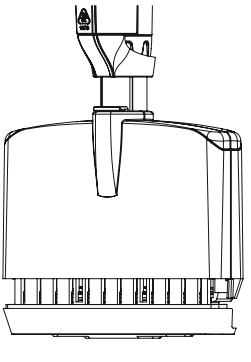
6.3 ASSEMBLING THE SINGLE-CHANNEL PIPETTE UP TO 1ml

1. Carefully insert the piston into the tip cone.
2. Press on piston from above and check for free movement. The piston must be able to move freely without resistance.
3. Reconnect the tip cone to the main body by screwing into the threaded section.
4. Reinstall the tip ejection collar.

6.4 DISASSEMBLING THE MULTI-CHANNEL PIPETTE

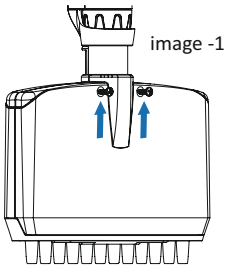
6.4.1 REMOVING THE LOWER ASSEMBLY

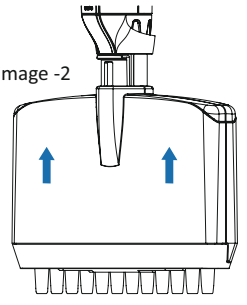
1. Press the tip ejector pusher completely and hold it while unscrewing the coupler from upper part of pipettor.
2. Remove the lower assembly.



6.4.2 OPENING THE LOWER ASSEMBLY

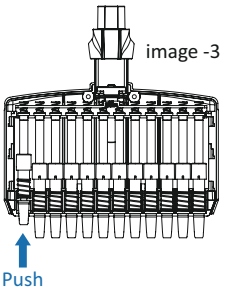
1. Unscrew the two small screws from back side and safely keep them. (Refer image -1)
2. Press and push up from side to open the front cover. (Refer image -2)

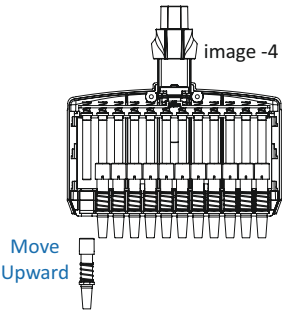




6.4.3 REMOVING THE CHANNEL

1. Slightly push the spring and pull up tip cone to remove it from the lower rail. (image -3)
2. Carefully release the piston from the upper rail and move upward to remove it. (image -4)





6.4.4 FITTING THE CHANNEL

1. Insert the spring with cylinder into the center rail.
2. Insert the piston into the cylinder and fit into upper rail.
3. Compress the spring with the cylinder and insert the cylinder into the lower rail.

6.4.5 ASSEMBLING THE LOWER ASSEMBLY

1. Attach the front cover and screw it.
2. Press the pusher completely and hold it while screwing the coupler nut to body.

6.4.6 CHECKING THE FUNCTION

It is to ensure that the pipettor has been assembled correctly.

- Carry out a gravimetric test for the systematic and random error.

6.5 LIST OF SPARE PARTS - SINGLE CHANNEL PIPETTE

Group 1

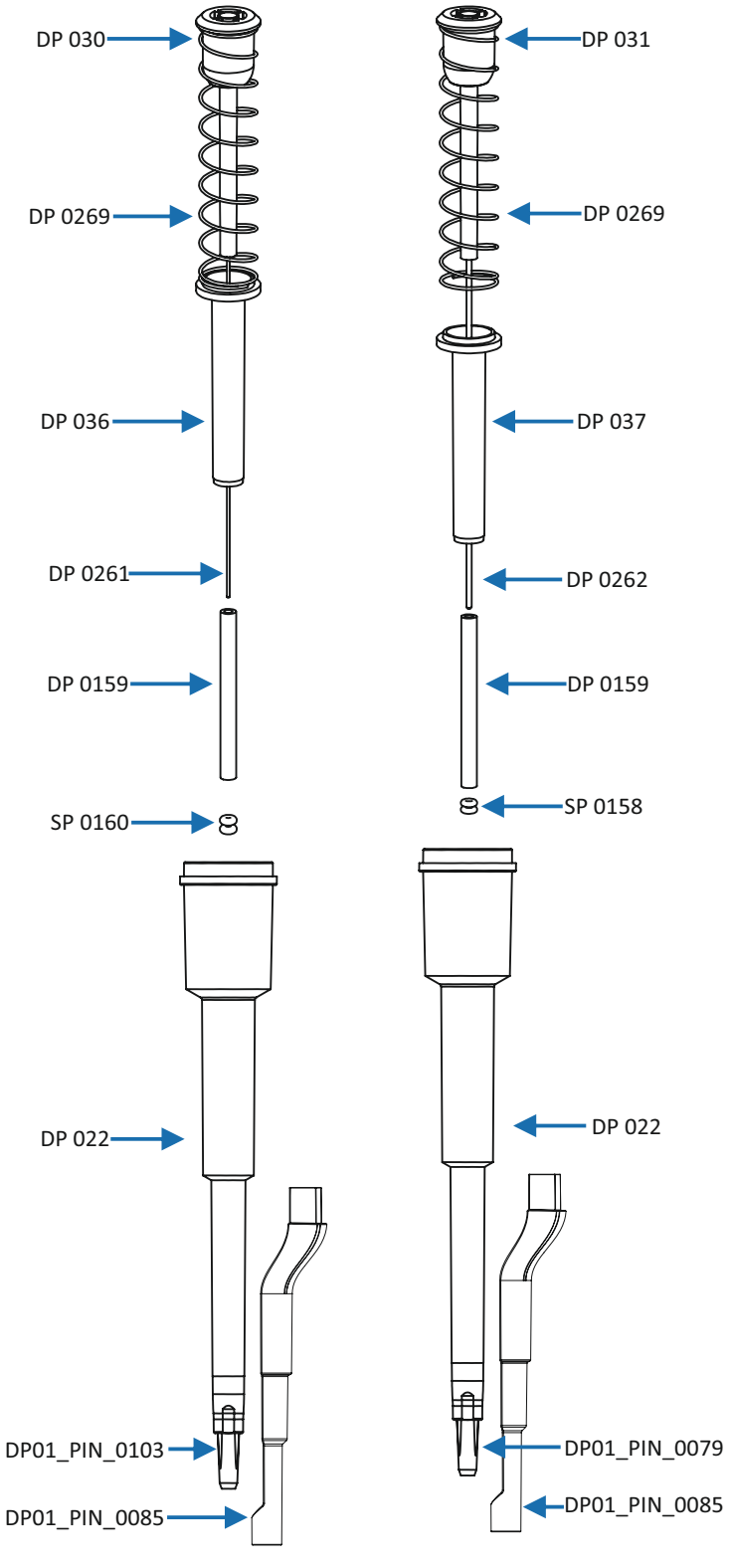
Adjustable volume 0.1-2.5µl

Fix volume 2.5µl

Group 2

Adjustable volume 0.5-10µl

Fix volume 10µl

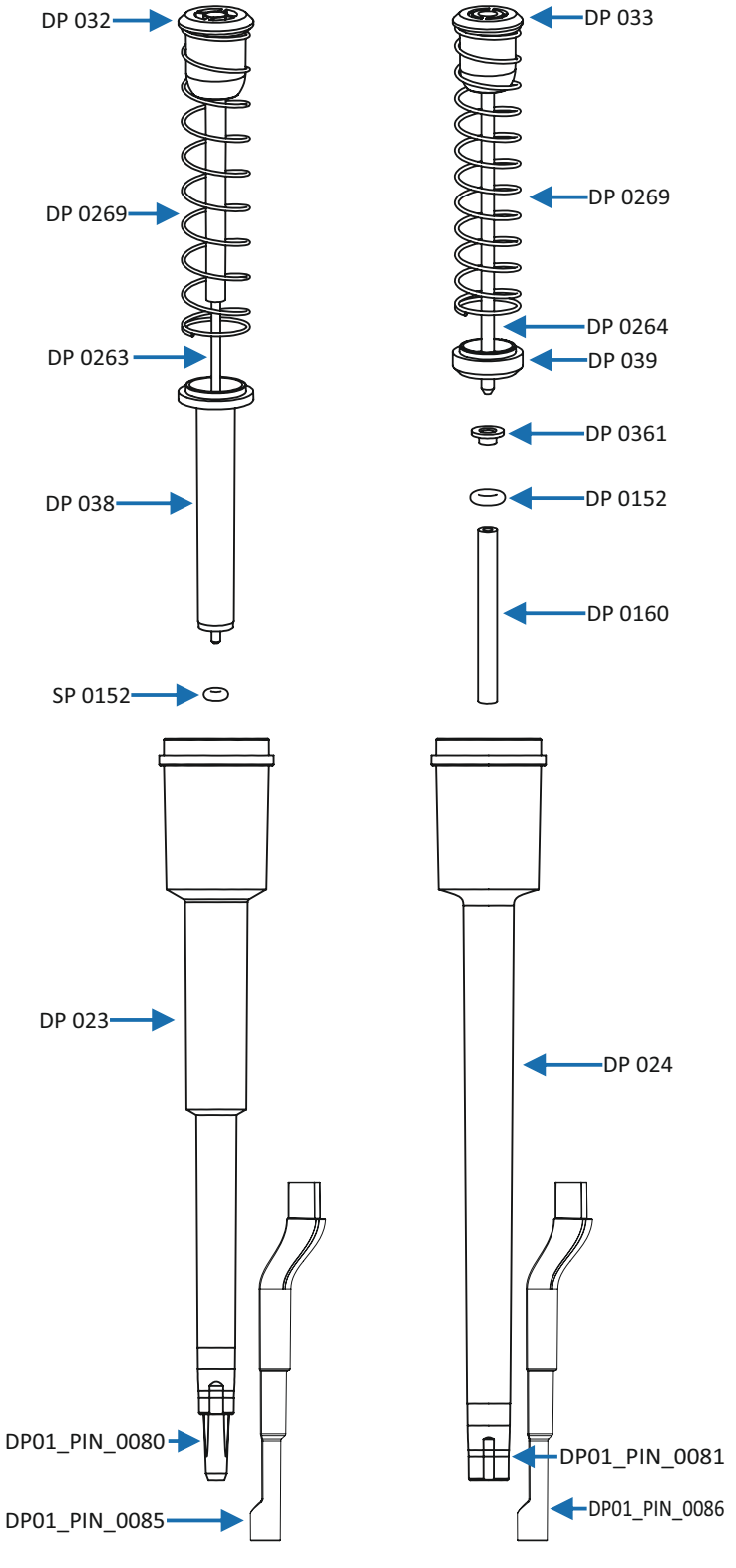


Group 3
Adjustable volume 2-20µl

Fix volume 20µl

Group 4
Adjustable volume 5-50µl

Fix volume 25µl
50 µl

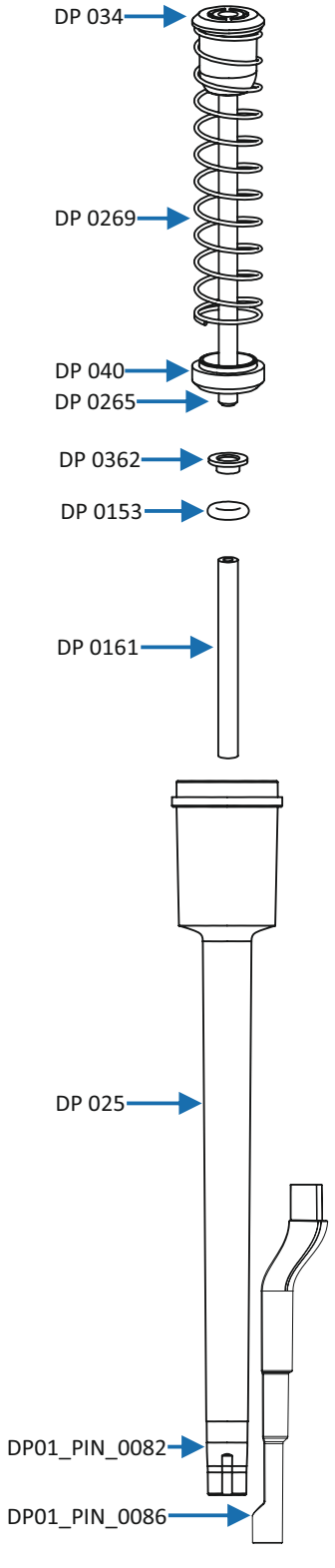


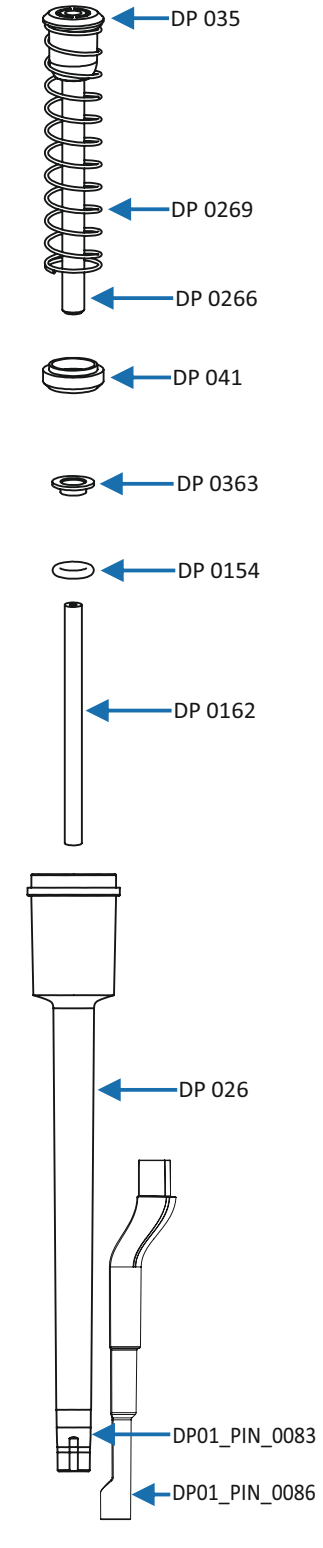
Group 5
Adjustable volume 10-100µl

Fix volume 100µl

Group 6
Adjustable volume 20-200µl

Fix volume 200µl

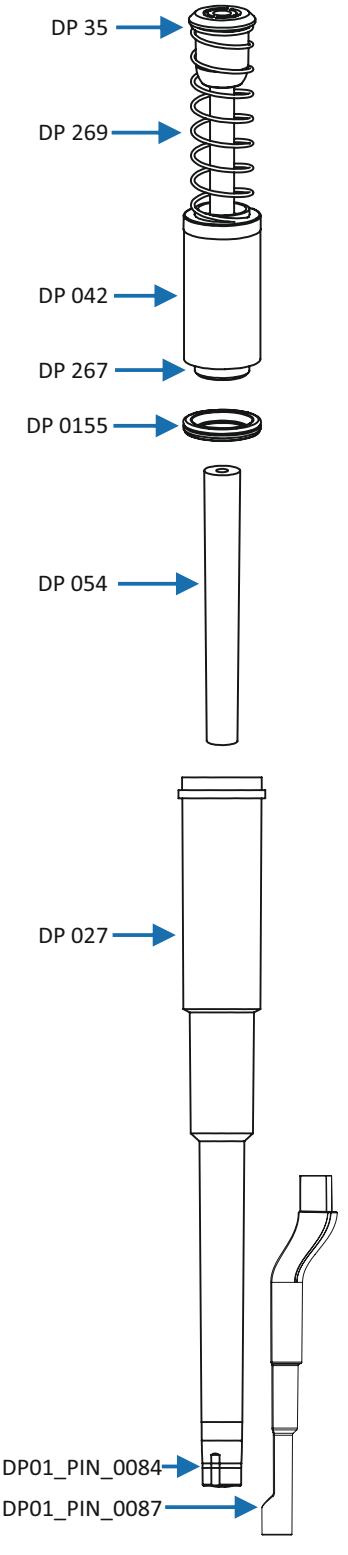




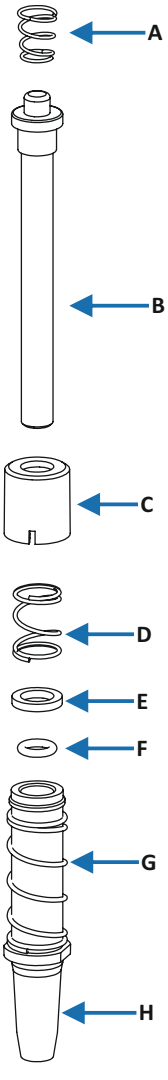
Group 7

Adjustable volume 100 - 1000µl

Fix volume 250µl / 500µl / 1000µl



6.6 LIST OF SPARE PARTS - MULTICHANNEL PIPETTE



Part	Cat#					
	3364-10 3365-10 (0.5-10µl)	3364-20 3365-20 (2-20µl)	3364-50 3365-50 (5-50µl)	3364-100 3365-100 (10-100µl)	3364-200 3365-200 (20-200µl)	3364-300 3365-300 (30-300µl)
A	CE 0200	CE 0200	CE 0200	CE 0200	CE 0200	CE 0200
B	DPM 140	DPM 141	DPM 136	DPM 137	DPM 138	DPM 139
C	DPM 123	DPM 123	DPM 124	DPM 125	DPM 126	DPM 127
D	DPM 276	DPM 276	DPM 281	DPM 277	DPM 281	DPM 281
E	DPM 364	DPM 364	DPM 365	DPM 366	DPM 367	DPM 368
F	SPM 152	SPM 154	DPM 166	SPM 155	DPM 171	DPM 168
G	DPM 304	DPM 304	DPM 304	DPM 304	DPM 304	DPM 304
H	DPM 369	DPM 369	DPM 370	DPM 371	DPM 372	DPM 373

6.7 AUTOCLAVING

Diamond PosiStop pipettor is completely autoclavable at 1 bar pressure and 121°C temperature for 20 minutes exposure time.

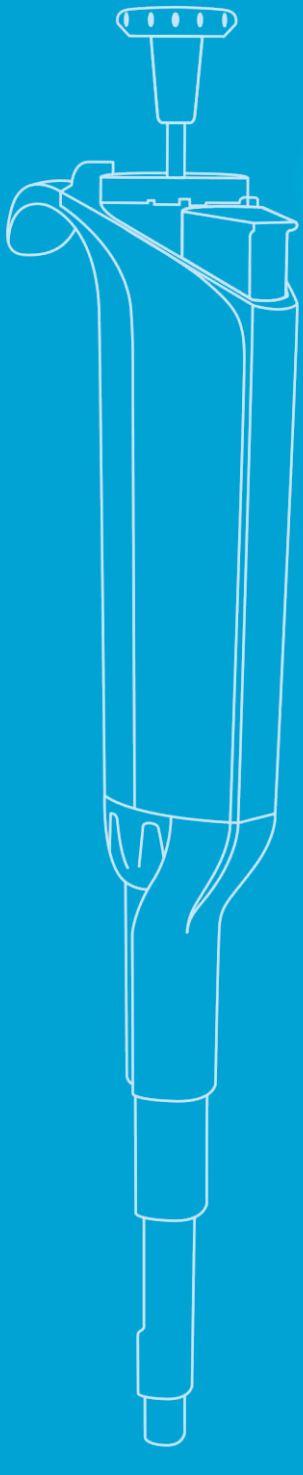
AUTOCLAVING INSTRUCTIONS

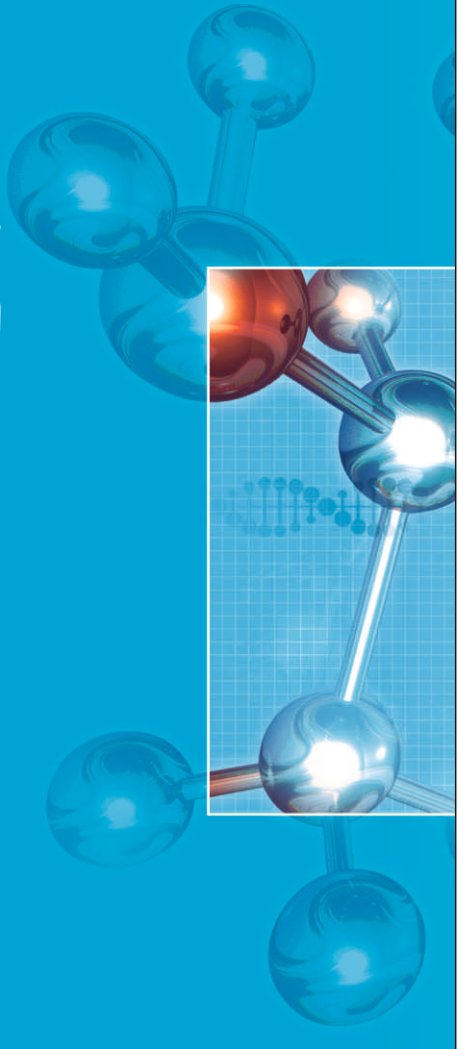
- Keep the volume adjustment in the unlocked position.
- Do not disassemble the pipettor for autoclaving.
- After autoclaving, allow the pipettor to completely cool and fully dry for a minimum of four (4) hours.

If the pipettor is autoclaved frequently, the piston and springs should be greased with the supplied lubricant to maintain smooth movement.

7 TROUBLE SHOOTING GUIDE

Problem area	Possible Cause	Solution
Pipettor is leaking	Worn o-ring or seal	Replace worn parts
	Foreign particles between tip and tip cone	Clean tip cone, attach new tip
	Foreign particles between piston and seal	Clean seal and piston
Pipettor does not aspirate the solution	Worn o-ring or seal	Replace worn parts
	Tip cone is loose	Tighten tip cone
	Piston is damaged (Chemically or mechanically)	Return pipettor to authorised distributor
	Damaged tip cone	Replace the tip cone
Pipettor is inaccurate	Improper assembly	See “Maintenance” section
	Tip cone is loose	Tighten tip cone
	Tip incorrectly attached	Attach firmly
	Calibration altered	Recalibrate according to instructions
Inaccurate dispensing with certain liquids	Calibration not suitable for particular liquid	Recalibrate with the liquid in question





globe™
SCIENTIFIC

www.globescientific.com