NeoLine Electronic Pipette

NB-12-6085

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NeoLine Electronic Pipette

#Cat: NB-12-6085-10	**Size: Single Channel - 0.5 -10ul**
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#Cat: NB-12-6085-100	**Size: Single Channel - 5-100ul**
#Cat: NB-12-6085-8-10	**Size: 8 Multi Channel - 0.5-10ul**
#Cat: NB-12-6085-8-20	**Size: 8 Multi Channel - 2 - 20ul**
#Cat: NB-12-6085-1000	**Size: Single Channel - 50-1000ul**
#Cat: NB-12-6085-5000	**Size: Single Channel - 250-5000ul**
#Cat: NB-12-6085-12-20	**Size: 12 Multi Channel - 2 - 20ul**
#Cat: NB-12-6085-12-10	**Size: 12 Multi Channel - 0.5-10ul**
#Cat: NB-12-6085-8-300	**Size: 8 Multi Channel - 15-300ul**
#Cat: NB-12-6085-8-200	**Size: 8 Multi Channel - 10-200ul**
#Cat: NB-12-6085-8-100	**Size: 8 Multi Channel - 5-100ul**
#Cat: NB-12-6085-8-1200	**Size: 8 Multi Channel - 50-1200ul**
#Cat: NB-12-6085-12-200	**Size: 12 Multi Channel - 10-200ul**
#Cat: NB-12-6085-12-300	**Size: 12 Multi Channel - 15-300ul**
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1. Introduction

Electronic pipette offers you the best ergonomic design in the field of liquid handling devices. The ergonomic design of the electronic pipettes reduces the risk of repetitive strain injuries (RSI). The self-explanatory functions of the pipette allow easy access of each operation. Electronically operated piston movement reduces the manual error and provide high accuracy.

1.1 Intended Use

The Electronic pipette is intended for dispensing liquid in the volume range from 0.5µL – 5mL in combination with its compatible pipette tips. It is general purpose laboratory device that fulfills ISO 9001 and ISO 13485 standard.

2. Warning/Safety Precautions⚠

This electronic pipettes comply to the recognized safety regulation and is safe to operate. Electronic pipette can only be operated when in perfect condition and while observing these operating instructions.

The device may be associated with residual risk if it is used or operated improperly by untrained personnel. Any personnel operating the electronic pipette must have read and understood this operating instructions and particularly the safety note, or must perform operation under the supervision of trained personnel so that safe operation of the device is guaranteed.

Regardless of the listed safety notes, additional applicable regulations and guidelines of trade association, health authorities, trade supervisory offices, etc. must be observed.

Do not open or modify the electronic pipette in any way. Repairs may only be performed by an authorized technician.

Always turn off power and disconnect the electronic pipette from the mains when carrying out maintenance work.

⚠ Warning

Do not use the electronic pipette near flammable material or in explosive areas. Also do not pipette highly flammable liquids such as acetone or ethers.
When handling dangerous substances comply with the material safety data sheet (MSDS) and all safety guidelines such as the use of protective clothing and safety goggles.

To prevent fire, electronic shock or any serious injury to persons, follow below safety instruction:

- Do not submerge the unit and its charger in any liquid.
- Do not operate the charger that has a damaged cord.
- Please use chargers that are compatible with the pipette.
- Do not handle the charger plug with moist hands.
- Do not burn, crush, damage the Lithium battery or expose it to excessive heat.
- Always use recommended battery.
- Do not use the pipette when it is charging.
- Avoid pipetting of liquid whose vapors could attack the material or use filter tips for reagent and chemicals generating aerosol particles.
- Corrosive vapors could also damage metallic part inside the device.

3. Before you start

Please verify your box includes following:

- Electronic pipette
- Li-ion battery
- Charger
- Instruction manual
- Calibration report
- Toolkit
  - Grease container
  - Tips

4. Volume Ranges

4.1 Single channel pipette range

Volume Range [µl]	Increments [µl]	Test Volume [µl]	Inaccuracy (±) %	Inaccuracy (±) µl	Imprecision (±) %	Imprecision (±) µl	Color Code
0.5-10 µl	0.01	1	2.5	0.025	1.8	0.02	
		5	1.2	0.060	0.7	0.04	
		10	1	0.100	0.4	0.04	
5-100 µl	0.1	10	2	0.200	1	0.10	
		50	0.7	0.350	0.2	0.10	
		100	0.5	0.500	0.15	0.15	
10-200 µl	0.1	20	2.5	0.500	0.7	0.14	
		100	0.7	0.700	0.3	0.30	
		200	0.6	1.200	0.2	0.40	
50-1000 µl	1	100	2	2.000	0.5	0.50	
		500	0.6	3.000	0.2	1.00	
		1000	0.45	4.500	0.15	1.50	
250-5000 µl	5	500	1.6	8.000	0.6	3.00	
		2500	0.7	17.500	0.25	6.25	
		5000	0.5	25.000	0.2	10.00	

4.2 Multi-channel pipette range (8 Channels & 12 Channels)

Volume Range [µl]	Increments [µl]	Test Volume [µl]	Inaccuracy (±) %	Inaccuracy (±) µl	Imprecision (±) %	Imprecision (±) µl	Color Code
0.5-10 µl	0.01	1	4	0.040	3	0.03	
		5	1.5	0.075	0.8	0.04	
		10	1.2	0.120	0.5	0.05	
2-20 µl	0.01	2	7	0.140	3	0.06	
		10	3	0.300	2	0.20	
		20	2	0.400	1.6	0.32	
5-100 µl	0.1	10	2.5	0.250	2	0.20	
		50	0.8	0.400	0.4	0.20	
		100	0.6	0.600	0.3	0.30	
10-200 µl	0.1	20	5	1.000	1.4	0.28	
		100	1	1.000	0.4	0.40	
		200	0.7	1.400	0.25	0.50	
15-300 µl	0.1	30	2.33	0.699	1	0.30	
		150	0.8	1.200	0.5	0.75	
		300	0.6	1.800	0.3	0.90	
50-120 0 µl	1.0	120	2.5	3.000	1.1	1.32	
		600	1	6.000	0.5	3.00	
		1200	0.6	7.200	0.3	3.60	

5. Getting Started

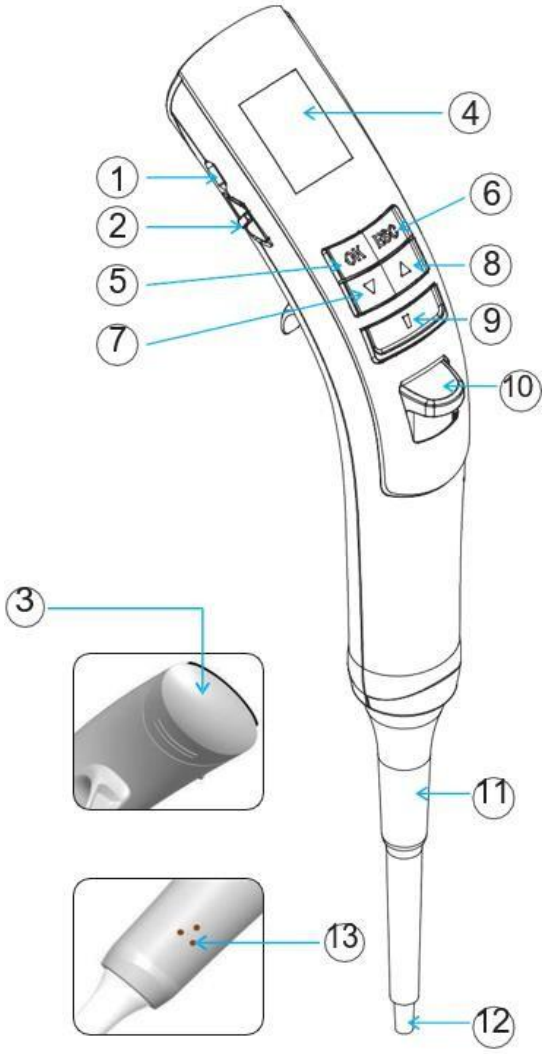
Please insert the Li-ion battery as shown in 8.1. Please charge the battery for 3 hours or unless bar stops moving in pipette display. Please follow charging instruction as shown in 8.2.

Please switch on the instrument by pressing ON / OFF switch. Here you can start working in any modes of the pipette.

CAUTION Use only the included battery, power supply or charging stand. Use of an incompatible power transformer can damage the pipette.

CAUTION Always use the correct power supply for the charging stand.

6. Overview



1. Micro USB Charging Port
2. ON/OFF Switch
3. Battery Cover
4. Display
5. OK Key
6. ESC Key
7. Down Arrow Key
8. UP Arrow Key
9. Trigger Key
10. Tip Ejector Pusher
11. Tip Ejector
12. Tip Cone
13. Charging Point for Auto Charging stand

7. Modes

There are various modes available on the application menu. You can use them according to requirement.

Special Note:
Press "OK" button for selection.
Press "ESC" button to exit from the mode at any time.

7.1 Favorites

Steps:

1. Select Favorites from applications.
2. Select Prog1 / Prog2 / Prog3.
3. Select the mode.
4. Select volume by using up / down arrow key.
5. Select Aspiration Speed by using up / down arrow key.
6. Select Dispensing Speed by using up / down arrow key.
7. Select one of the 3 options.
   1. Save & Run: 2. Save & Exit: 3. Do not save:
   a Save & Run
   This will save the program and it will be ready for pipetting.
   b Save & Exit
   This will save the program and will exit from menu.
   c Do not save
   No program will be saved. You can use ESC key as well if you do not want to save this program.

7.1.1 Edit

This program allows you to edit your saved favorite program. Also, you can change the sequence of saved programs.

Edit Program

This program allows you to edit the Mode, aspiration speed, dispensing speed and volume. Also, you can delete the program from this function.

Steps:

1. Select Favorites.
2. Select Edit.
3. Select Edit prog.
4. Select any of the following options:
   a) Mode:This will allow you to change the mode.
   b) Volume:This will allow you the change the volume.
   c) Speed:This will allow you to change the aspiration and dispensing speed.
   d) Save & Exit: Come out of the mode after saving the program.
   e) Do not save: It will not change anything.
   f) Delete prog: This will delete the existing program.

Edit Sequence

This will allow user to edit the sequence of the saved program. You can change the position of your program from 1st to 2nd or 3rd or vise versa.

Steps :

1. Select Favourites.
2. Select Edit.
3. Select Edit Seq.
4. Select program position which you want to swap.
5. Press OK button.
6. Select the position with which you want to swap your program by using up / down arrow key.
7. Press OK button.

You will be directed to the favourite mode where you can see the changes.

7.2 Pipetting

This will allow you to aspirate and dispense the selected volume.

Steps :

1. Select Pipetting from the applications.
2. Select volume by pressing up / down arrow key.
3. Press OK to finalize the volume.
4. Press trigger key to aspirate the volume.
5. Press trigger key to dispense the volume.
6. Press trigger key to repeat the process or press ESC key to exit the mode.

7.3 Reverse Pipetting

This mode is generally used for pipetting highly viscous liquids accurately. It aspirates a little excess liquid than the selected volume and it dispenses the exact liquid of the selected volume. The rest of the liquid in the tip need to be discarded.

Steps :

1. Select Reverse Pipetting from the applications.
2. Select volume by pressing up / down arrow key.
3. Press OK to finalize the volume.
4. Press trigger key to aspirate the volume.
5. Press trigger key to dispense the volume.
   Note: The excess liquid will remain in the tip.
6. Press trigger key to discard the excess liquid.
7. Press trigger key to repeat the process or press ESC key to exit the mode.

7.4 Multi Dispense

7.4.1 Repeat Dispense

The repeat dispense mode repeatedly dispenses the volume in selected increments. For better accuracy, it will aspirate the excess volume which need to be discarded at the end.

Steps :

1. Select Multi Dispense from the applications.
2. Select Repeat Dispense from the Multi Dispense menu.
3. Select volume.
4. Select Dispensing Steps. The pipette will calculate the maximum Number of steps once you select the volume.
5. Use up/down arrow key to modify the dispensing steps and press OK button.
6. Press trigger key to aspirate the liquid.
7. Press trigger key to dispense the liquid.
   Note: The excess liquid will remain in the tip.
8. Press trigger key to discard the excess liquid.
9. Press trigger key to repeat the process or press ESC key to exit the mode.

7.4.2 Auto Dispense

It has a same function of Repeat Dispense but with automatic timer setting.

Steps :

1. Select Multi Dispense from the applications.
2. Select Auto Dispense from the Multi Dispense menu.
3. Select volume.
4. Select Dispensing Steps. The pipette will calculate the maximum number of steps automatically once you select the volume.
5. Use up/down arrow key to modify the Dispensing Steps and press OK button.
6. Select Time Gap between 1 to 3 sec. and press OK button.
7. Press trigger key to aspirate the liquid.
8. Press trigger key to dispense the liquid.
   Note: The excess liquid will remain in the tip.
9. Press trigger key to discard the excess liquid.
10. Press trigger key to repeat the process or press ESC key to exit the mode.

7.4.3 Sequence Dispense

This mode is used to dispense the liquid in different sequences.

Steps :

1. Select Multi Dispense from applications.
2. Select Sequence Dispense from Multi Dispense.
3. Select No. of Sequences by pressing up / down arrow key (max. 4 sequences can be selected).
4. Select 1st volume by using up / down arrow key.
5. Repeat this process for 2nd, 3rd and 4th sequence selected.
6. Aspirate the volume by using trigger key.
7. Dispense the 1st sequence of volume.
8. Press trigger key for dispensing until sequence is completed.
9. Discard the excess liquid by using trigger key.

Note : If you choose nominal volume in the 1st selection then you won't be allowed to select other sequences.

7.5 Diluting

This technique is used to mix two different liquids in one vessel.

7.5.1 Diluting

Steps :

1. Select Diluting from applications.
2. Select Diluting.
3. Select No. of Dilutants (Max. 2 dilutants can be selected).
4. Select 1st volume by using up / down arrow key.
5. Select 2nd volume by using up / down arrow key.
6. Aspirate 1st volume by pressing trigger key.
7. Aspirate Air by pressing trigger key.
8. Aspirate 2nd volume by pressing trigger key.
9. Dispense total volume in vessel by using trigger key.

7.5.2 Diluting + Mixing

Steps:

1. Select Diluting from applications.
2. Select Diluting + Mixing.
3. Select No. of Dilutants (Max. 2 dilutants can be selected).
4. Select 1st volume by using up / down arrow key.
5. Select 2nd volume by using up / down arrow key.
6. Select Mixing Cycle by using up / down arrow key. (Max. 10 cycles can be selected.)
7. Aspirate 1st volume by pressing trigger key.
8. Aspirate Air by pressing trigger key.
9. Aspirate 2nd volume by pressing trigger key.
10. Dispense total volume in vessel by using trigger key.
11. Mixing will automatically start once you dispense the liquid into vessel.
12. You can stop mixing if desired by using ESC key.
13. Press trigger to start the mixing again. Press the ESC key to completely stop the mixing in between the process. It will discard the excess liquid remaining in the tip.

7.6 Mixing

You can mix the liquids using this mode. There are three modes under mixing.
Mixing, Pipetting + Mixing, and Diluting + Mixing.

7.6.1 mixing

Steps:

1. Select Mixing from the applications.
2. Select volume by using up/down arrow key.
3. Select Mixing Cycles by using up/down arrow key. (Max. 10 cycles can be selected.)
4. Aspirate the volume.
5. Mixing will automatically start.
6. You can stop mixing by using ESC key.
7. Press trigger to start the mixing again. Press the ESC key to completely stop the mixing in between the process. It will discard the excess liquid remaining in the tip.

7.6.2 Pipetting + Mixing

Steps:

1. Select Pipetting + Mixing from the applications.
2. Select volume by using up/down arrow key.
3. Select Mixing Cycles by using up/down arrow key. (Max. 10 cycles can be selected.)
4. Aspirate the selected volume by using trigger key.
5. Dispense the selected volume by using trigger key.
6. Mixing will automatically start.
7. You can stop mixing by using ESC key.
8. Press trigger key to start the mixing again. Press the ESC key to completely stop mixing in between the process. It will discard the excess liquid remaining in the tip.

7.6.3 Diluting + Mixing:

Steps:

1. Select Diluting from applications.
3. Select Diluting + Mixing.
4. Select No. of Dilutants. (Max. 2 dilutants can be selected.)
5. Select 1st volume by using up / down arrow key.
6. Select 2nd volume by using up / down arrow key.
7. Select Mixing Cycle by using up / down arrow key. (Max. 10 cycles can be selected.)
8. Aspirate 1st volume by pressing trigger key.
9. Aspirate Air by pressing trigger key.
10. Aspirate 2nd volume by pressing trigger key.
11. Dispense total volume in vessel by using trigger key.
12. Mixing will automatically start once you dispense the liquid into vessel.
13. You can stop mixing by using ESC key.
14. Press trigger to start the mixing again. Press the ESC key to completely stop mixing in between the process. It will discard the excess liquid remaining in the tip.

7.7 Settings

This is a control menu where you can define Speed, Sound, User ID and Product ID of the pipette.

7.7.1 Speed

Steps:

1. Select Settings from the applications.
2. Select Speed.
3. Change the Aspiration Speed by using up/down arrow key and press OK.
4. Change the Dispense Speed by using up/down arrow key and press OK.
5. You will see new aspiration and dispense speeds on the display.
6. If you do not want to change any speed, press ESC key.

7.7.2 Sound

Steps :

1. Select Settings from the applications.
2. Select Sound.
3. Change the sound level by using up/down arrow key and press OK.
4. You will find new selected sound on the display.
5. If you do not want to change sound, press ESC key.

7.7.3 User ID

Steps :

1. Select Settings from applications.
2. Select User ID.
3. Select 1st character by using up / down arrow key and press OK. You can select letters from alphabets, numbers 1-9 and a few symbols.
4. After pressing OK button, 2nd character will be highlighted. Follow the same process until maximum characters are used.
5. Once you select the last character, display will show the setting menu with all changes.

7.7.4 Product ID

Steps :

1. Select Settings from applications.
2. Select Product ID.
3. Select 1st character by using up / down arrow key and press OK button once you select 1st character. You can select letters from alphabets, numbers 1-9 and a few symbols.
4. After pressing OK button, 2nd character will be highlighted. Follow the same process until maximum characters are used. Cali
5. Once you will select the last character, display will show the setting menu with all changes.

7.8 Calibration

Electronics pipette offers you 3 types of calibration setting depending on the user's requirement
By default, 3- Point Calibration has been adjusted on the pipette for supreme accuracy at each volume.

7.8.1 3-Point Calibration

Steps :

1. Select Calibration from the applications.
2. Select Enter Password from the sub menu by default, press "0000" if you have not set your own password.
3. Select 3-Point Cal. from the sub menu.
4. Select Expected Volume 1. By default, 10% of the nominal volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
5. Enter Delivered Volume 1.
6. Select Expected Volume 2. By default middle volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
7. Enter Delivered Volume 2.
8. Select Expected Volume 3. By default nominal volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
9. Enter Delivered Volume 3.
10. Select "Yes" to save the changes. It will show Calibration don't on the display. Select "No" to exit.

7.8.2 2-Point Calibration

Steps :

1. Select Calibration from the applications.
2. Select Enter Password from the sub menu by default, press "0000" if you have not set your own password.
3. Select 2-Point Cal. from the sub menu.
4. Select Expected Volume1. By default, 10% of the nominal volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
5. Enter Delivered Volume 1.
6. Select Expected Volume 2. By default nominal volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
7. Enter Delivered Volume 2.
8. Select "Yes" to save the changes. It will show Calibration done on the display.
9. Select "No" to exit.

7.8.3 1-Point Calibration

Steps:

1. Select Calibration from the applications.
2. Select Enter Password from the sub menu by default, press “0000” if you have not set your own password.
3. Select 1-Point Cal. from the sub menu.
4. Select Expected Volume1. By default, 10% of the nominal volume will be on the display; you can change this volume according to your requirement by using up / down arrow key.
5. Enter Delivered Volume1.
6. Select “Yes” to save the changes. It will show Calibration done on the display.
7. Select “No” to exit.

7.8.4 Restore Factory Calibration

This feature will allow to restore all the factory generated data of the product. So, all the user changes will be nullified and factory calibration will be restored.

Steps:

1. Select Calibration from the applications.
2. Select Enter Password from the sub menu. By default, press “0000” if you have not set your own password.
3. Select Restore Fact. Cal.
4. Select Yes by pressing up / down arrow key to restore the factory calibration. “Factory Calibration Restored” screen will appear for few seconds and you will directed to the calibration menu.
5. Select No by pressing up / down key to keep the user settings.

Special Note: Whenever the user makes any changes in the calibration, the Applications will show **“Calibration User”**. Once you restore the factory calibration, Applications will show **“Calibration Fact.”**.

7.8.5 Last calibration date

Here you can keep a track of your last calibration date.
Whenever you calibrate your pipette, you can enter the date of the calibration

Steps:

1. Select Calibration from the applications.
2. Select Enter Password from the sub menu. By default, press “0000” if you have not set your own password.
3. Select Last Cal. Date by using up / down arrow key.
4. Enter the date in DD/MM/YY format and you will be directed to the calibration menu.

7.8.6 Due calibration date

Here you can save your due date for re-calibration of the product.

Steps:

1. Select Calibration Fact. From the applications.
2. Select Enter Password from the sub menu by default, press “0000” if you have not set your own password.
3. Select Due Cal. Date by using up / down arrow key.
4. Enter the date in DD/MM/YY format and you will be directed to the calibration menu.

7.8.7 Edit Calibration Password

This feature will help user to edit the password. So only authorized persons can modify the calibration.

Steps:

1. Select Calibration from the applications.
2. Select Edit Password.
3. Enter “Existing Password” by using up / down arrow key. The default password is “0000”.
4. Enter New Password by using up / down arrow key.
5. Repeat the New Password.

If everything is ok then “Password Change Successful” window will appear

7.8.8 Forgot password

In case you forget the password, please contact your supplier. They will be able to reset your password.

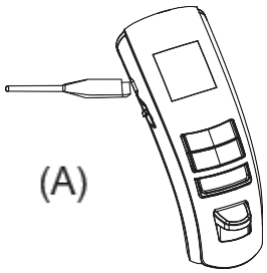
8. Battery and charging

8.1 Inserting a battery

1. Please follow the image to open the battery cover.
2. Insert battery supplied along with instrument in a way that metal pins inside pipette establish proper contact with metal points on battery.
3. Slide the battery cover down.

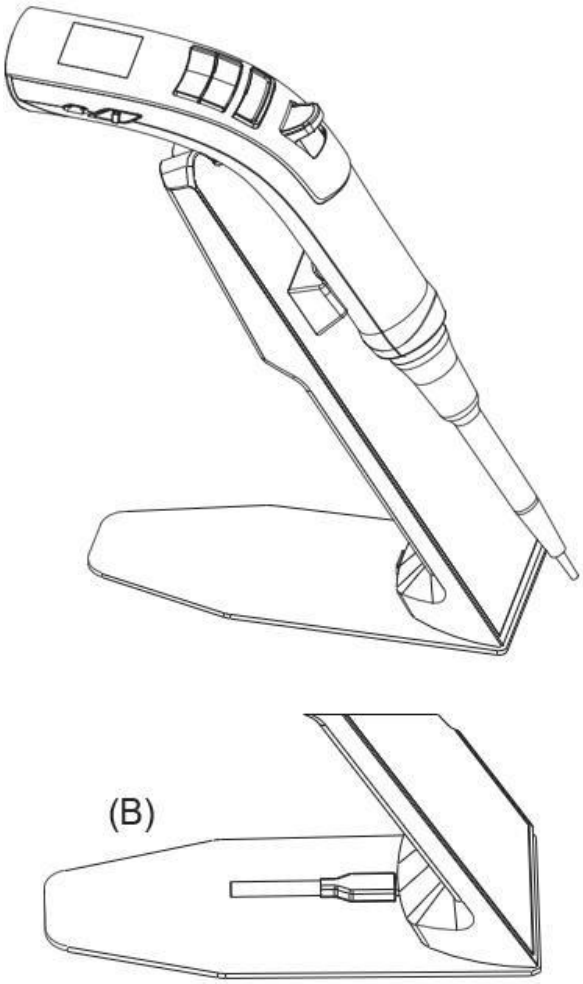
8.2 Charging through power adapter

1. Insert the power cable in the pipette as shown in the image (A).
2. Connect the power plug of the power adapter with the external power source



8.3 Charging through auto charging pod

1. Insert the power cable in the auto charging pod as shown in the image (B).
2. Connect the power plug of the power adapter with the external power source.
3. Place the pipette on the auto charging pod.



9. Maintenance

9.1 Single channel pipette maintenance

You should check the pipette at the beginning of each day for accumulation of dust and dirt on the outside surfaces. Attention should be paid to the tip cone. No other solvent except isopropanol should be used to clean the pipette. If the pipette is used daily, It should be inspected every three months.

The servicing procedure starts with the disassembly of the pipette. Please refer to the spare parts lists for better understanding of the components. After disassembling pipette as per mentioned procedure follow below routine maintenance steps:

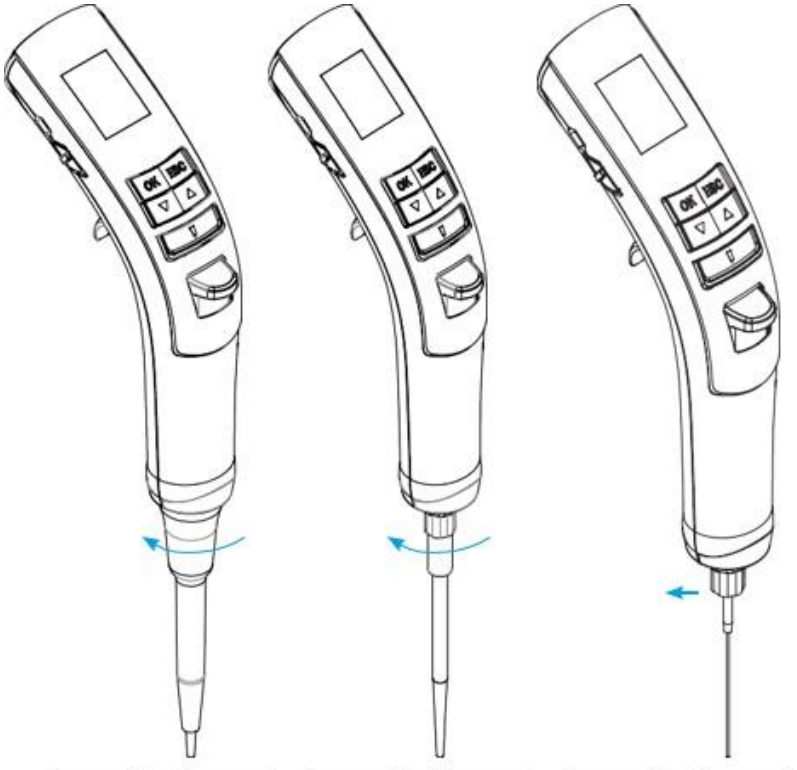
Pull out the piston and other parts and follow general maintenance. Remember to keep all parts in order for reassembly.

Clean piston, piston spring, seal and O-ring with a isopropanol and lint free tissue. Allow them to dry completely.

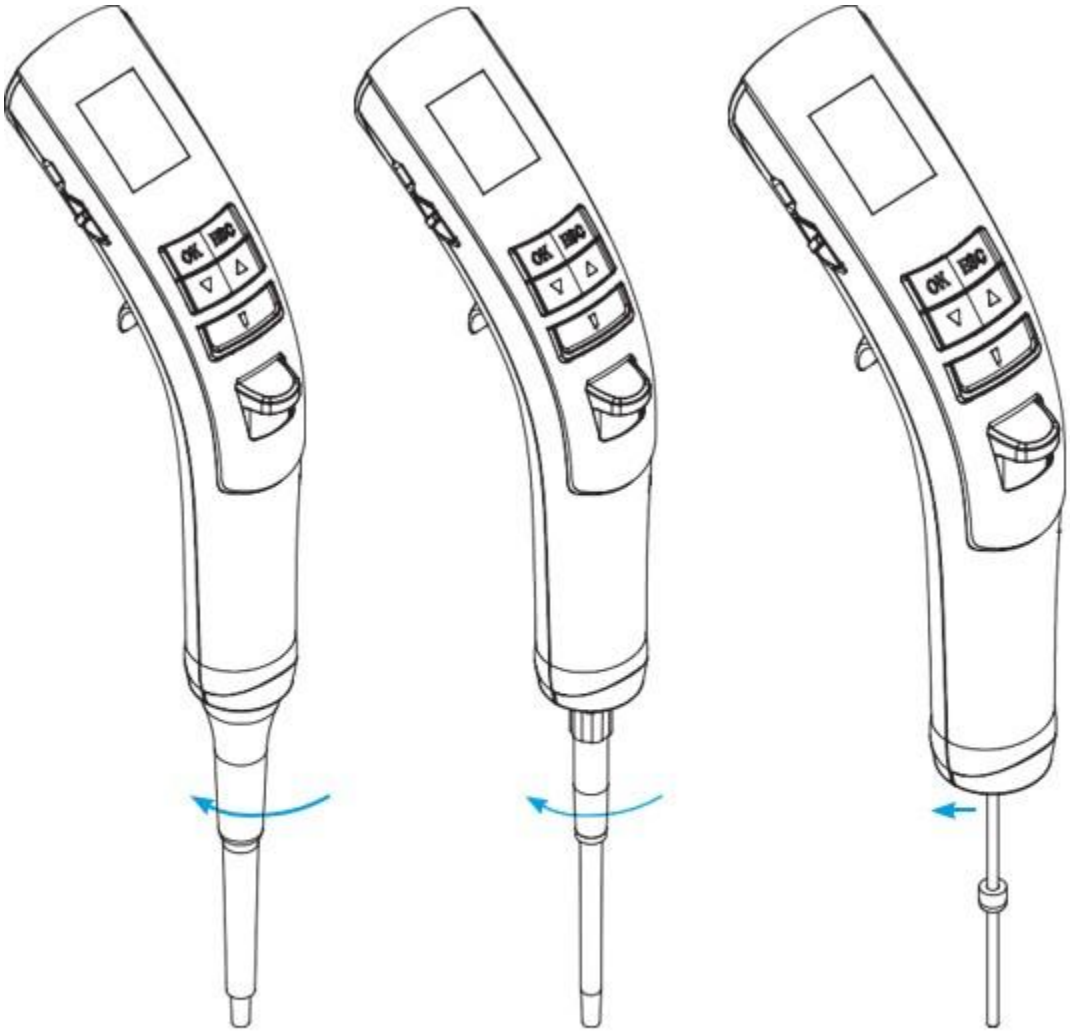
Check the tip cone for foreign particles and remove, if any. Grease the cleaned parts with the approved lubricant provided with each pipette.

9.1.1 Disassembly Procedures by Volume

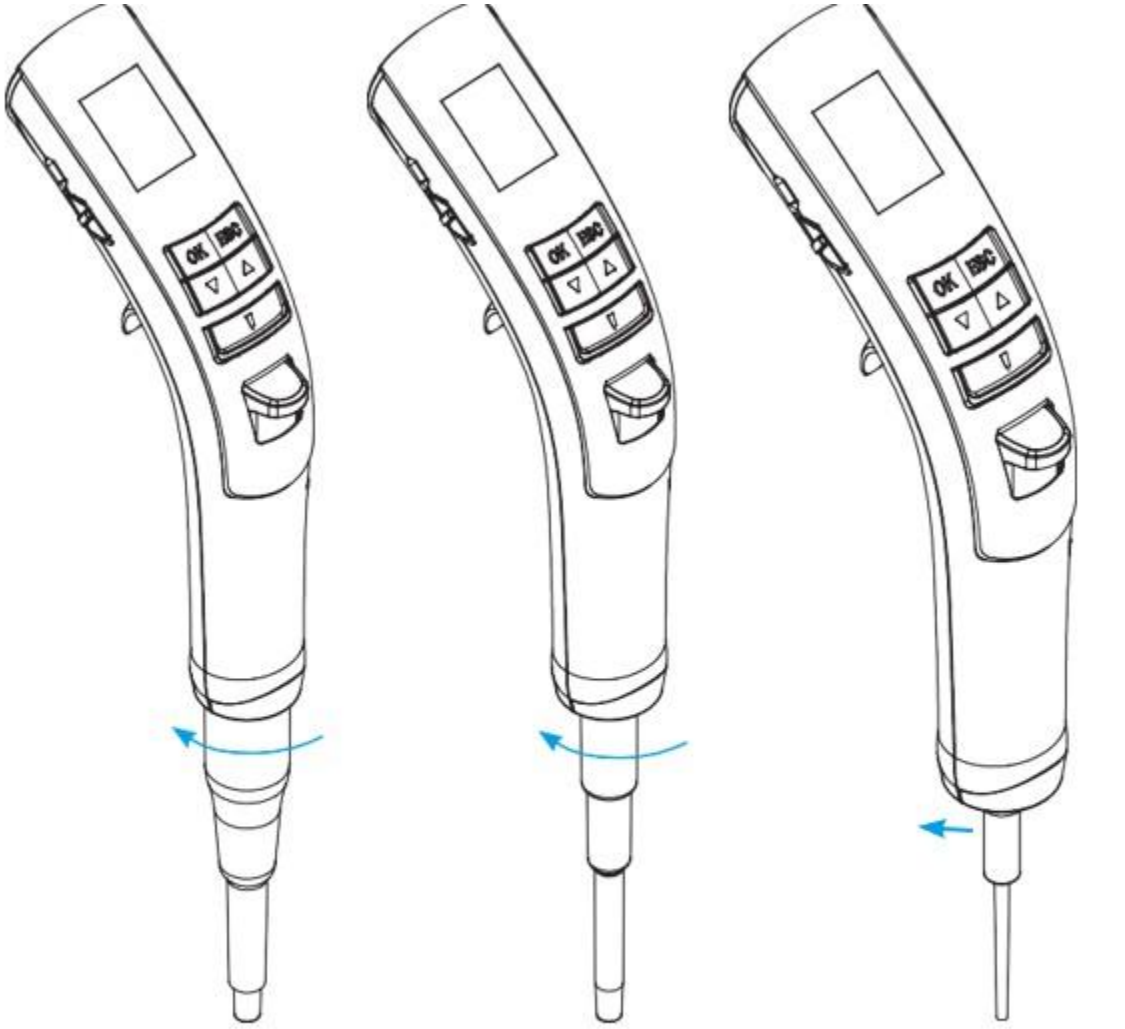
Volume 0.5-10µl



Volume 5-100µl and Volume 10-200µl



Volume 50-1000µl

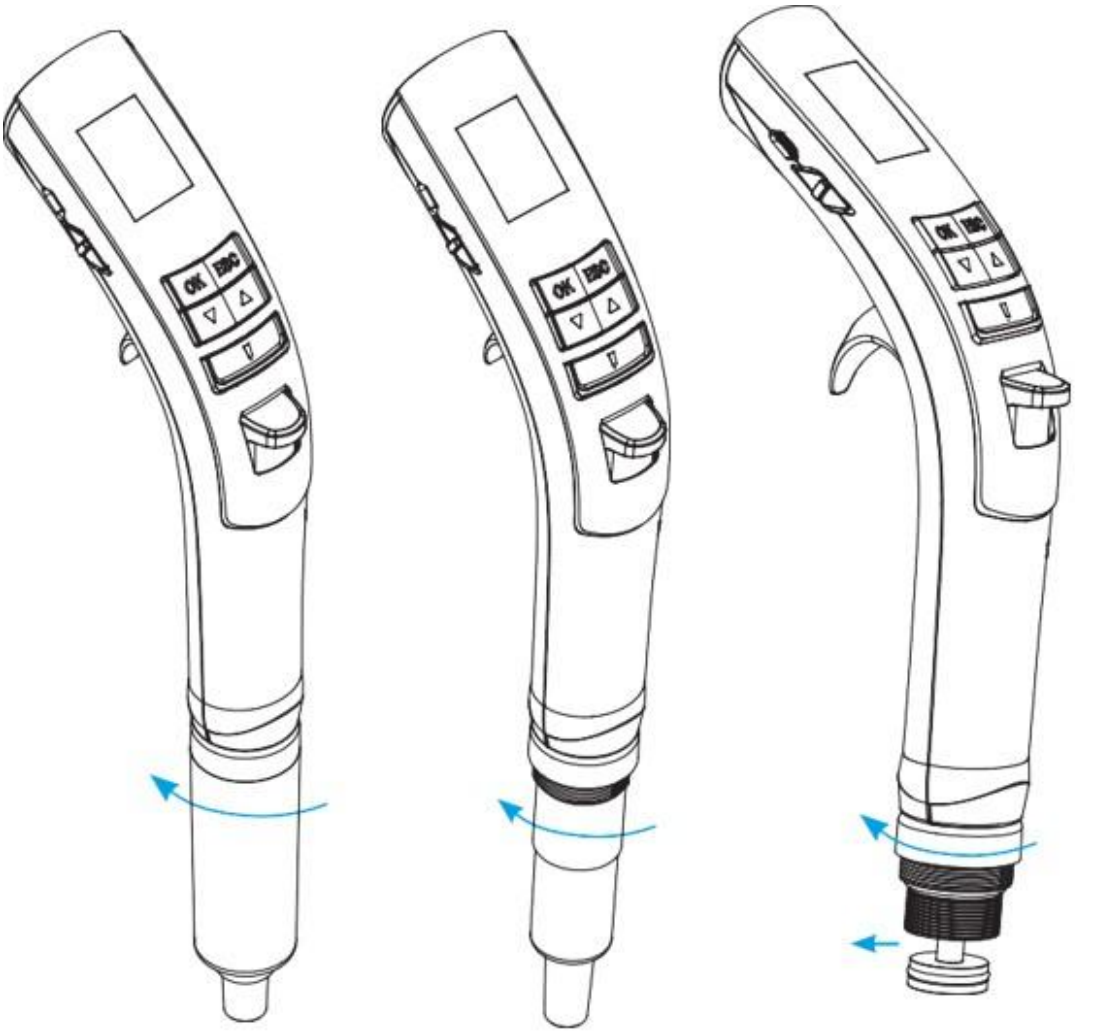


Step 1
Unscrew the Tip Ejector as per shown direction

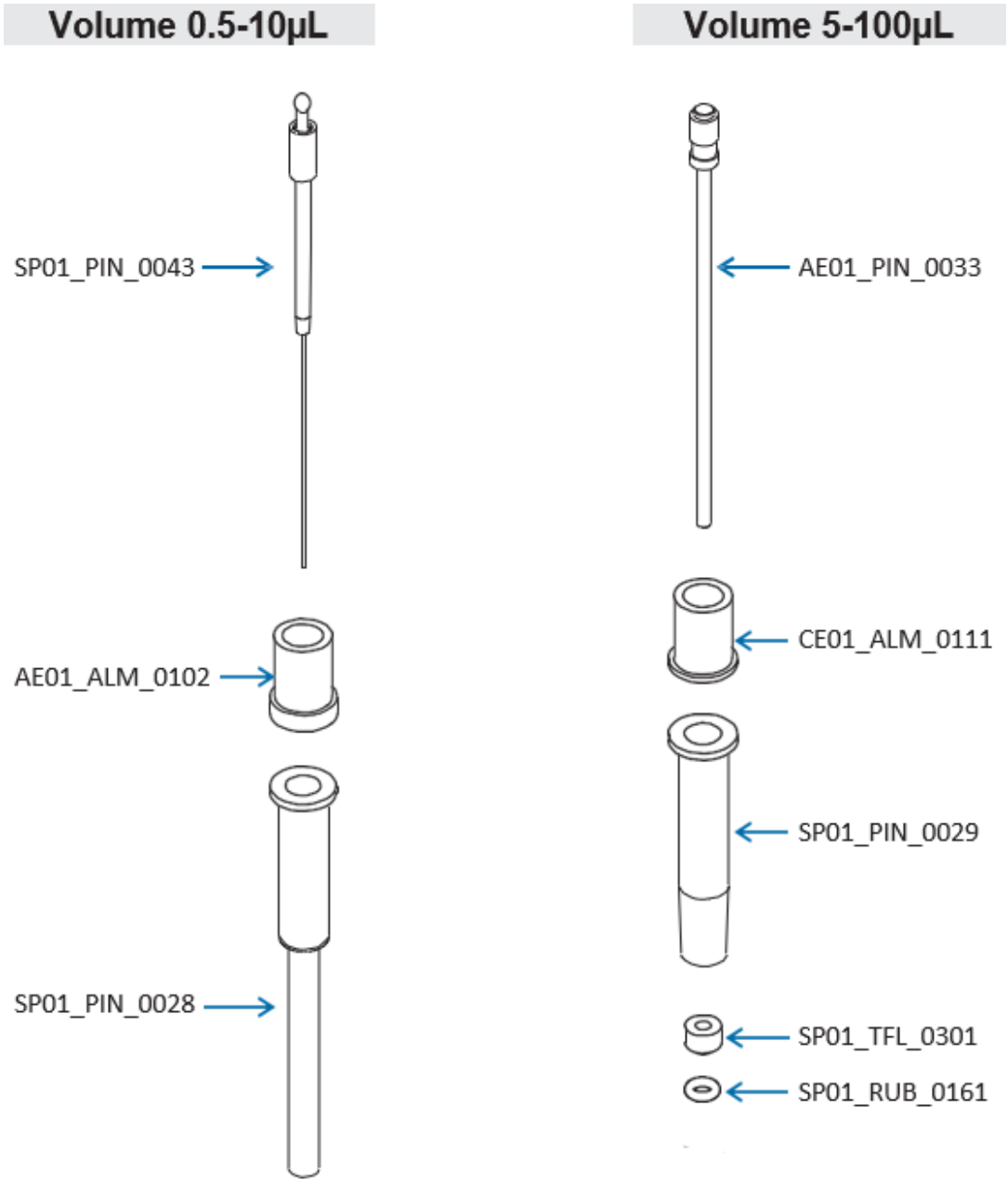
Step 2
Unscrew the Tip Cone as per shown direction

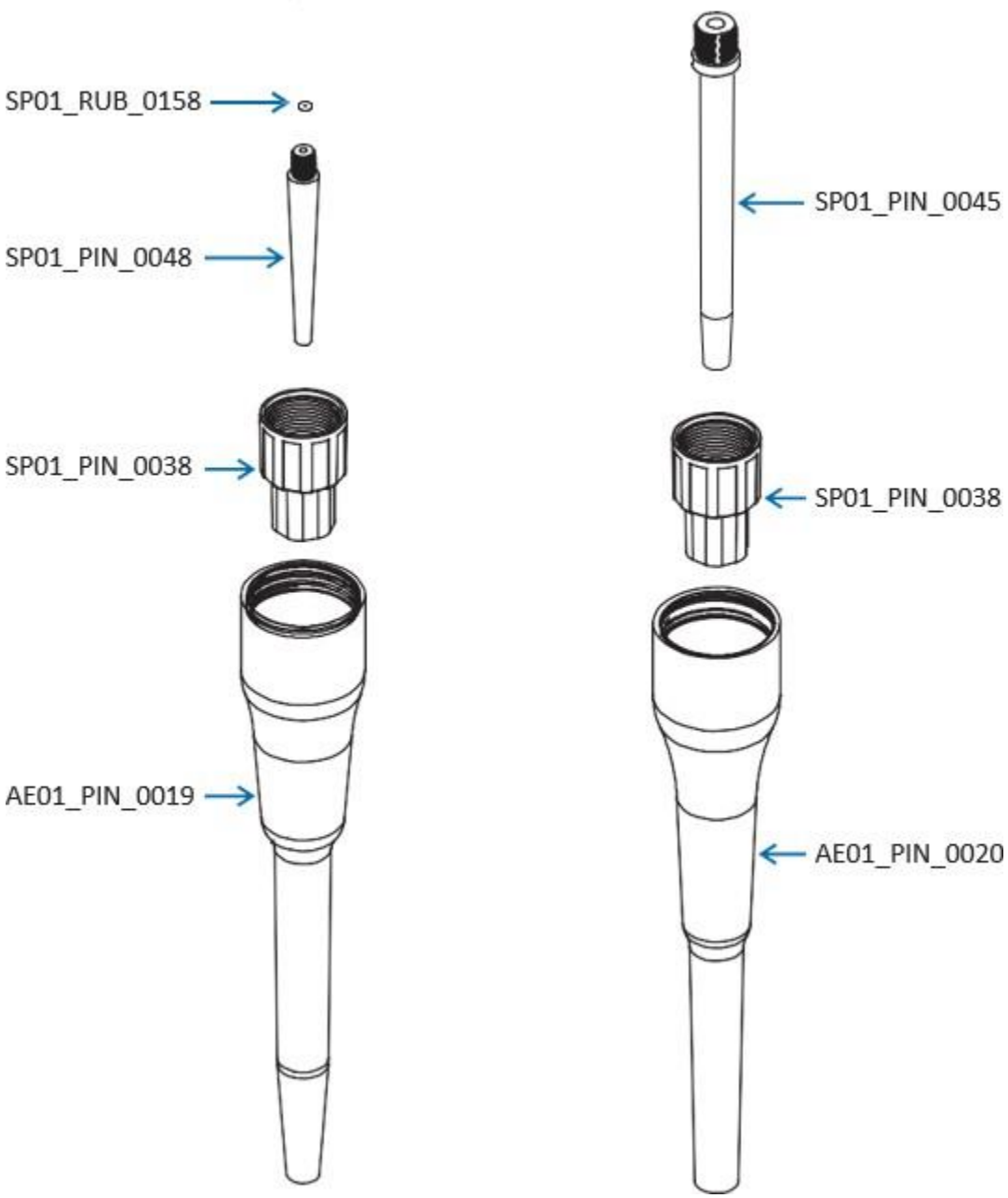
Step 3
Pull out the Piston as per shown direction

Volume 250-5000µl

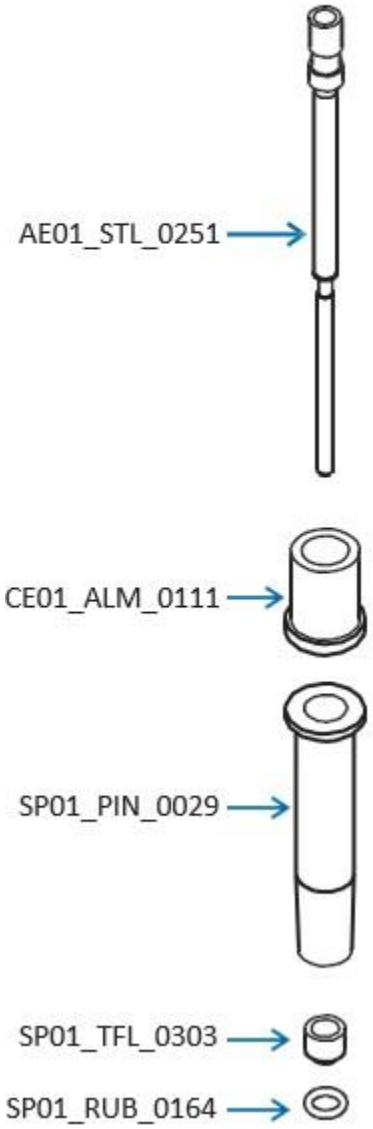


9.1.2 List of spares:

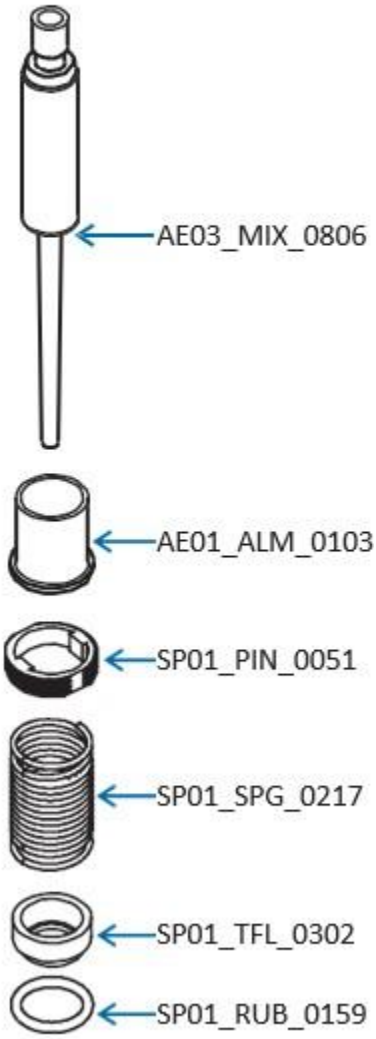


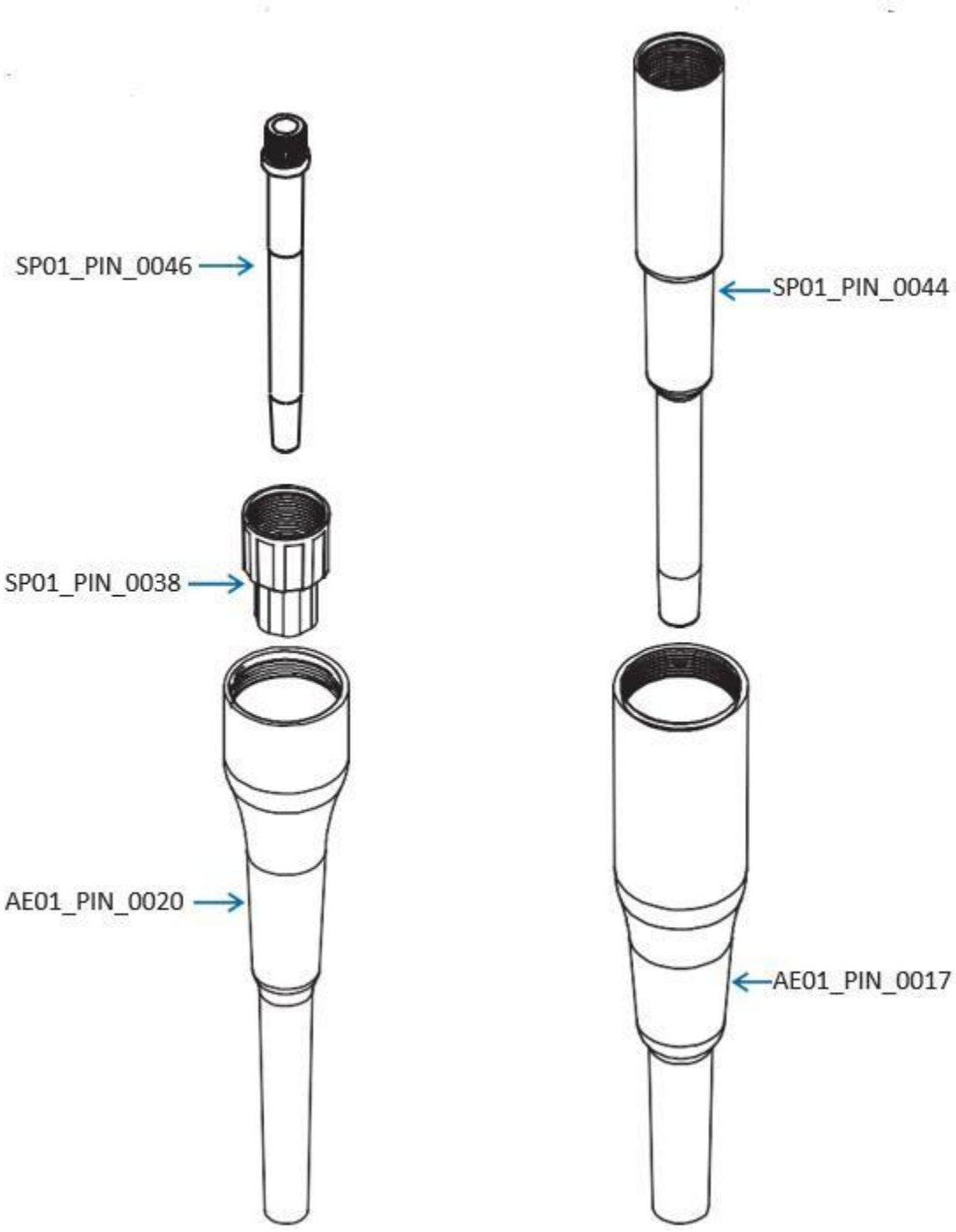

SP01_RUB_0158
SP01_PIN_0048
SP01_PIN_0038
AE01_PIN_0019
SP01_PIN_0045
SP01_PIN_0038
AE01_PIN_0020

Volume 10-200µL

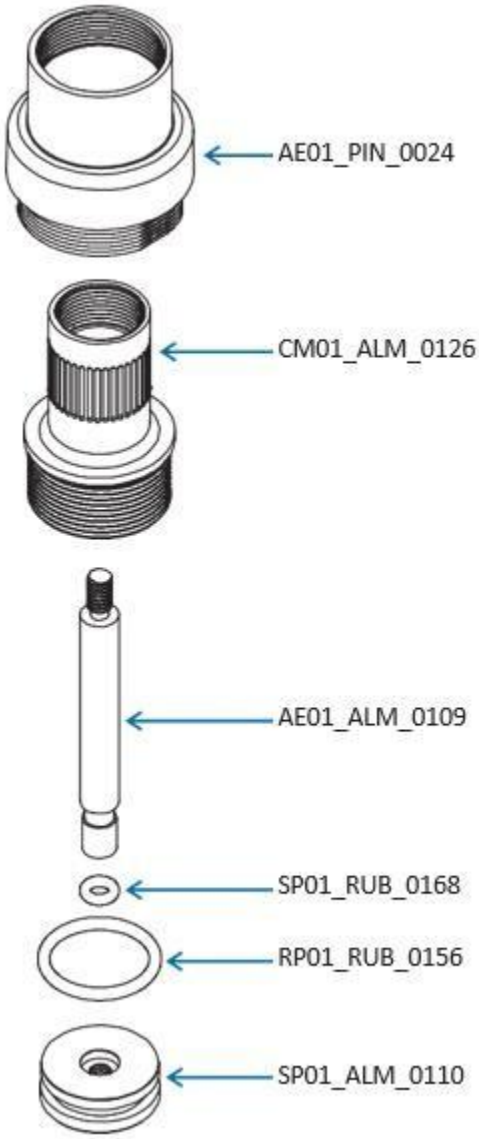


Volume 50-1000µL



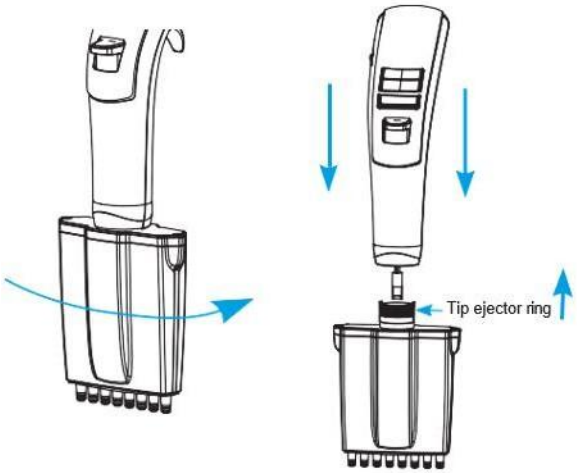

SP01_PIN_0046
SP01_PIN_0038
AE01_PIN_0020
SP01_PIN_0044
AE01_PIN_0017

Volume 250-5000µl

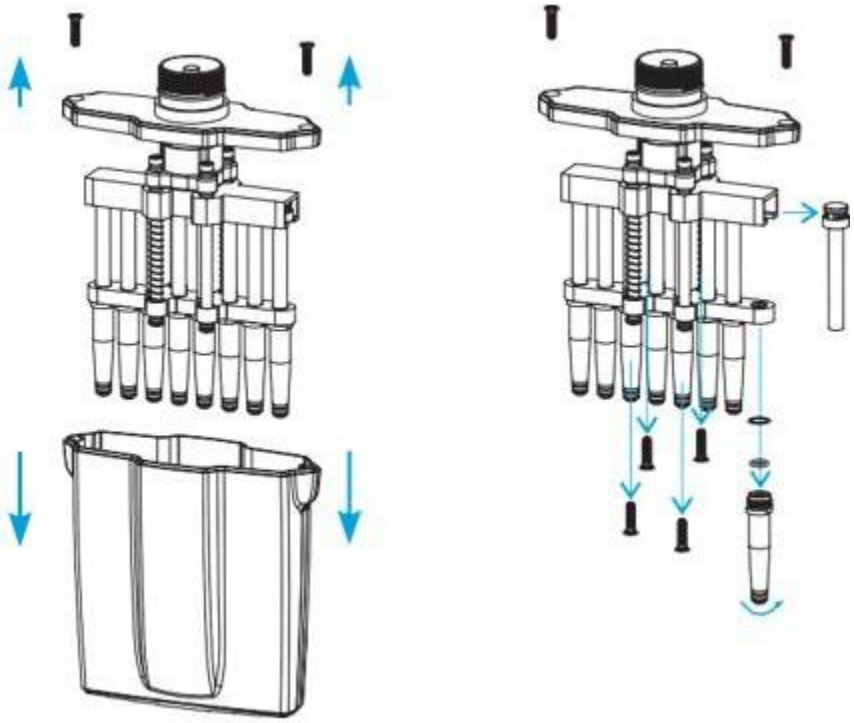


9.2 Multichannel Pipette Maintenance

The servicing procedure starts with the disassembly of the pipette. Please refer to the spare parts lists for better understanding of the components. Shown here is an example of dis-assemble and assemble procedure of 2-20µL 8 channel pipette. The basic procedure is the same for all other volumes in 8 channel as well in all 12 channel pipettes.



- Rotate the multi-channel manifold in the direction indicated until it is detached.
- Unscrew the manifold by taking out two screws from the top.
- Move upwards tip ejector ring lock (black part) to remove from bottom assembly. At the time of assembly pipette match two legs of tip ejector ring lock in pipette top half assembly.



- Take other four screws to disassemble piston housing.
- Pull out the piston and other parts including the seal and O-ring by unscrewing the tip cone. Remember to keep all parts in order for reassembly.
- Perform this procedure for each tip-cone and piston.
- Clean the piston, piston spring, seal and the O-ring with isopropanol and lint free tissue. Allow them to dry.

  Check the tip cone for foreign particles and remove, if any.
- Grease the cleaned parts with the approved lubricant provided with each pipette.

NOTE: It is recommended to check the performance of the pipette after in-house service or maintenance.

9.2.1 Disassembling The Multichannel 1200µl Pipette

9.2.1.1 Removing The Lower Assembly

1. First move motor down side into home position or dispense mode then press the Tip ejector pusher completely and hold it while unscrewing the coupler from upper part of pipette.
2. Gently remove the motor joint stud from lower assembly.

9.2.1.2 Opening The Lower Assembly

1 Use the fork side of the tool to disassemble collar bottom from the manifold.
2 Insert tool in to the collars hole to push back collar bottom
3 Apply pressure on the connecting sides of the bottom assembly to unhinge it further and snap open the collar from the bottom up. (image -4)

image -1

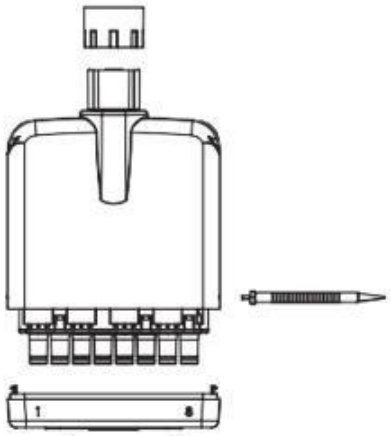


image -2

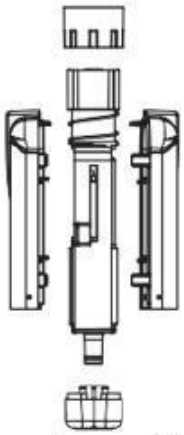


image -3

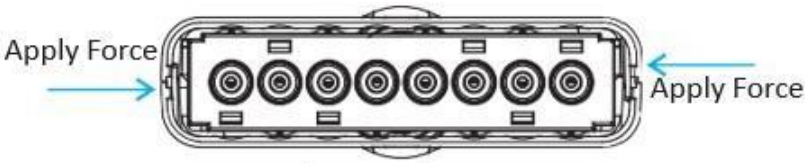


image -4

9.3 Removing the Channel

1. Disassemble to upper strip from the frame.
2. To do this, disconnect the upper strip from the back side of the frame with a flat-head side of tool at both end then center and then unlock the front side snap from the frame.
   2.1 Lubricating and Servicing can be done at this point:
   - To Lubricating the pipette at this stage is possible (without cylinder disassembly).
   - Move plunger downside, to apply oil into Tipbase.
   - Apply oil to the inner surface of the cylinder in the frame with a small brush, Check the plunger movement to complete the lubricating.
   - Close the assembly as per Re-assembly steps.
3. Use the flat-head side of the tool to snap down the lower strip from the frame.
4. Front and back side disengaging the connection of snap.

5. On the open side (front side) move the piston assembly up.
6. Slightly push the spring and pull up Tipbase to remove it from the lower rail.
7. Repeat on the closed side (back side).

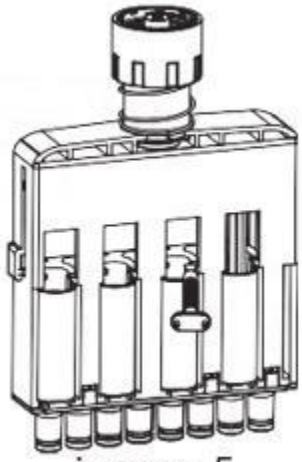
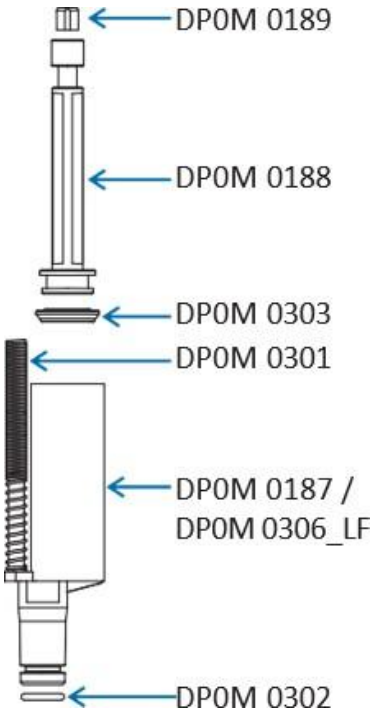


image - 5

image - 6

9.4 Removing Seal Holder Assembly

1. On the open side (front side) move the piston assembly up.
2. Pull out the seal holder assembly using a rotating motion on the open side(front side).
3. Then move the piston assembly down and use the flat side of the tool to push out the seal holder on the other side.

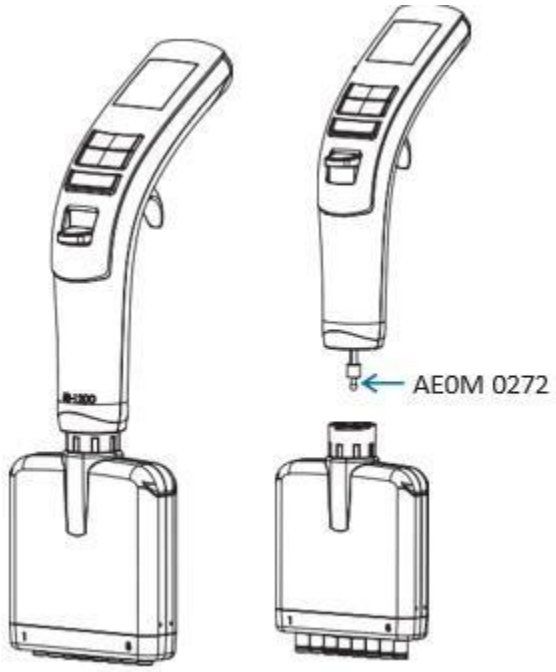


9.5 Re-assembly

1. Assemble the pistons by inserting back into the seal holder, 4 on the front side for 8 channel/6 on the front side for 12 channel and 4 on the back side for 8 channel/6 on the backside for 12 channels.
2. Insert the springs into the Tipbase assemble and slot the Tipbase with spring side facing toward the piston housing.
3. Attach the lower fixing strip and the upper fixing strip respectively.
4. Press the Tip ejector spring down, enclose the collar on the top side and snap the top side in place.
5. Special care needs to be taken while snapping the bottom side, push gently down on the side ridge to lock the lower side of the collar.
6. Finally, snap the bottom collar assemble in place to complete lower re-assembly.

9.6 Attaching Lower Assembly

1. By holding the ejector down, insert motor join stud into place onto the piston housing of the lower assembly.
2. Gently assemble the motor joint stud into lower assembly.
3. Screw in the coupler in place to complete the assembly.



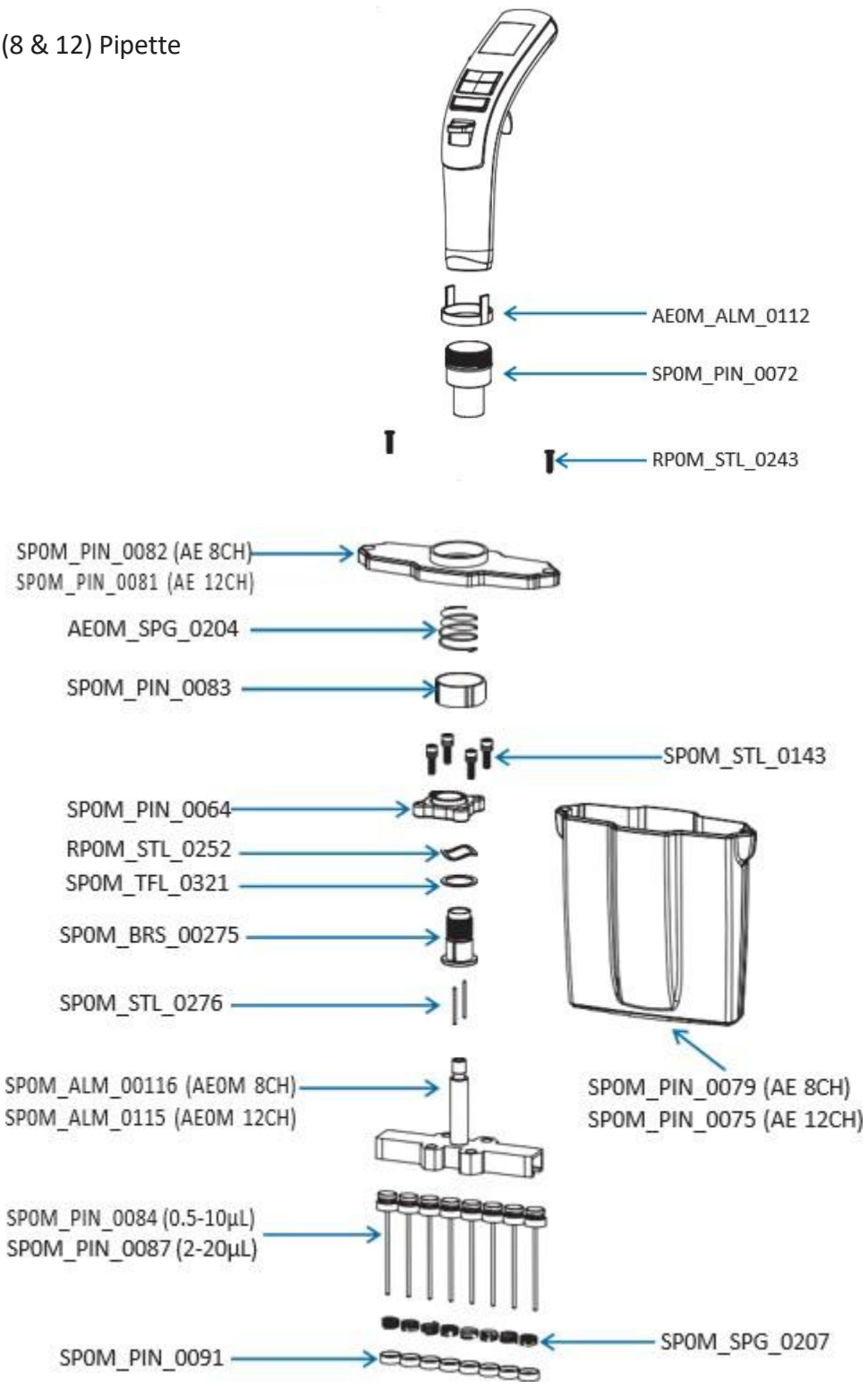
9.7 List of spare parts

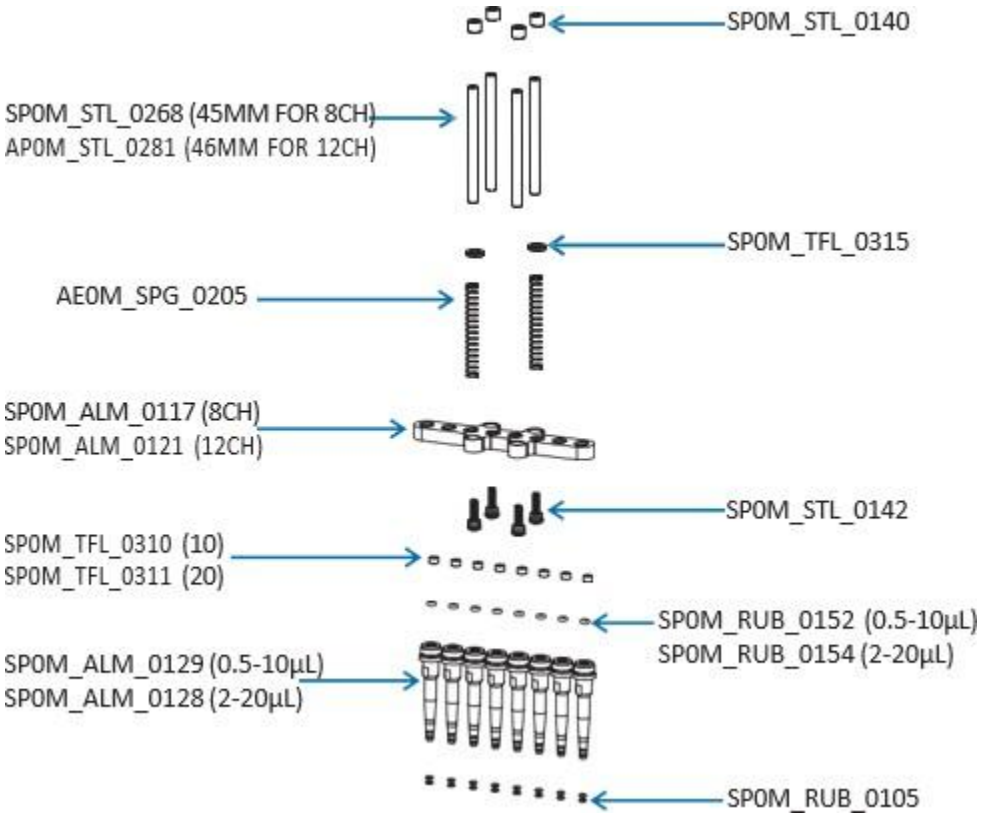
Group - 1

Multi Channel (8 & 12) Pipette

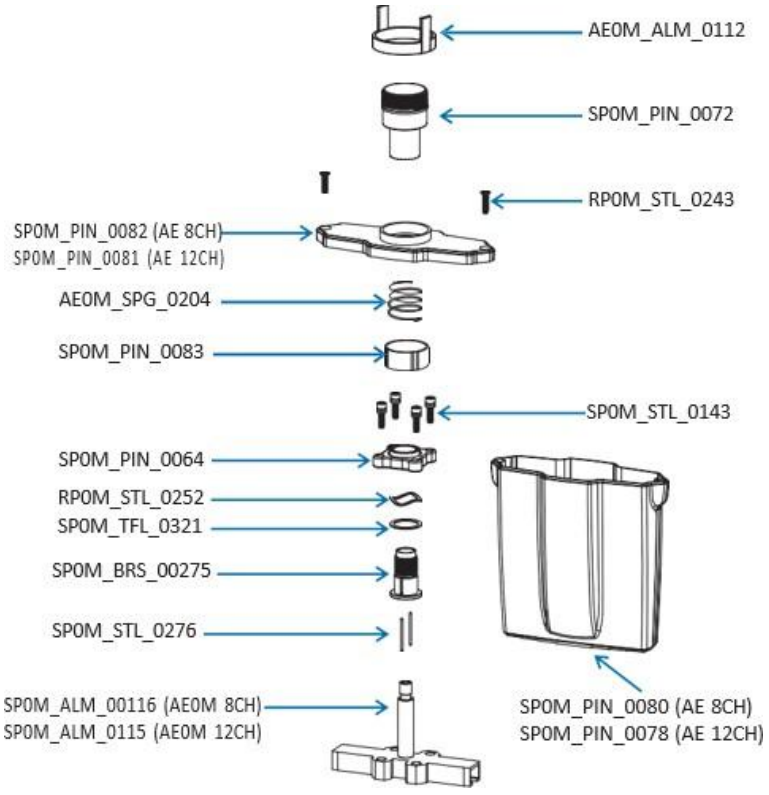
0.5 - 10µL

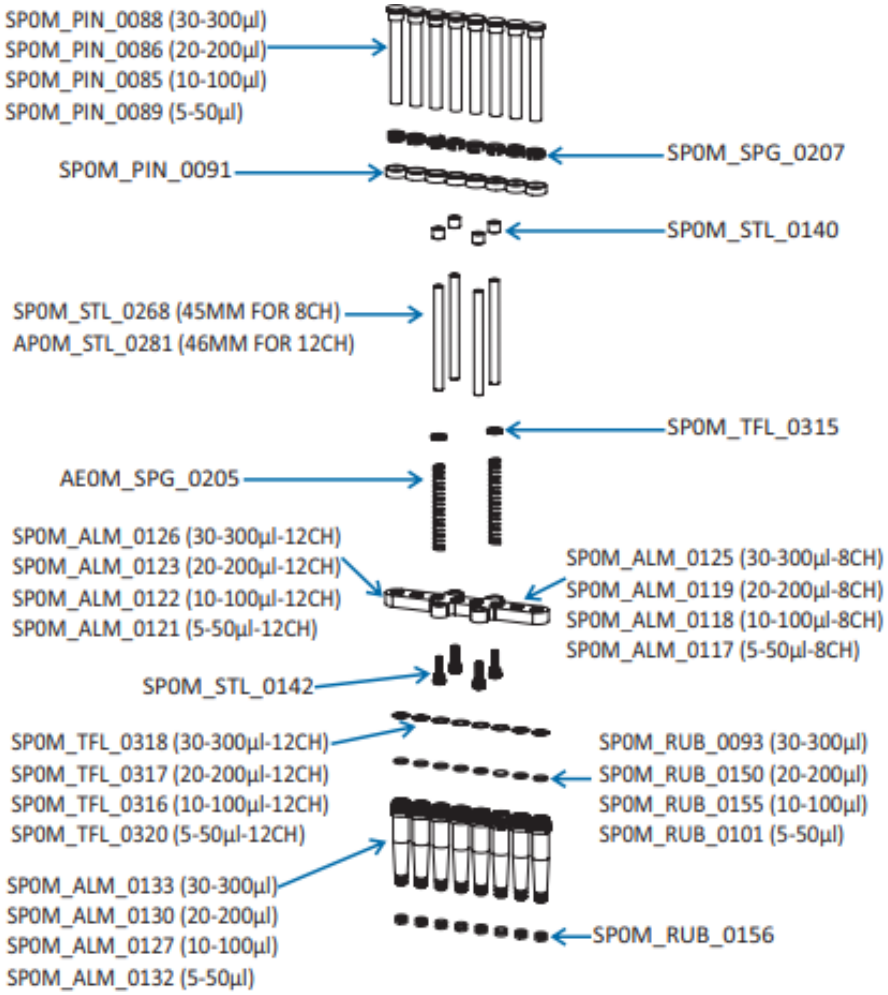
2 - 20 µL



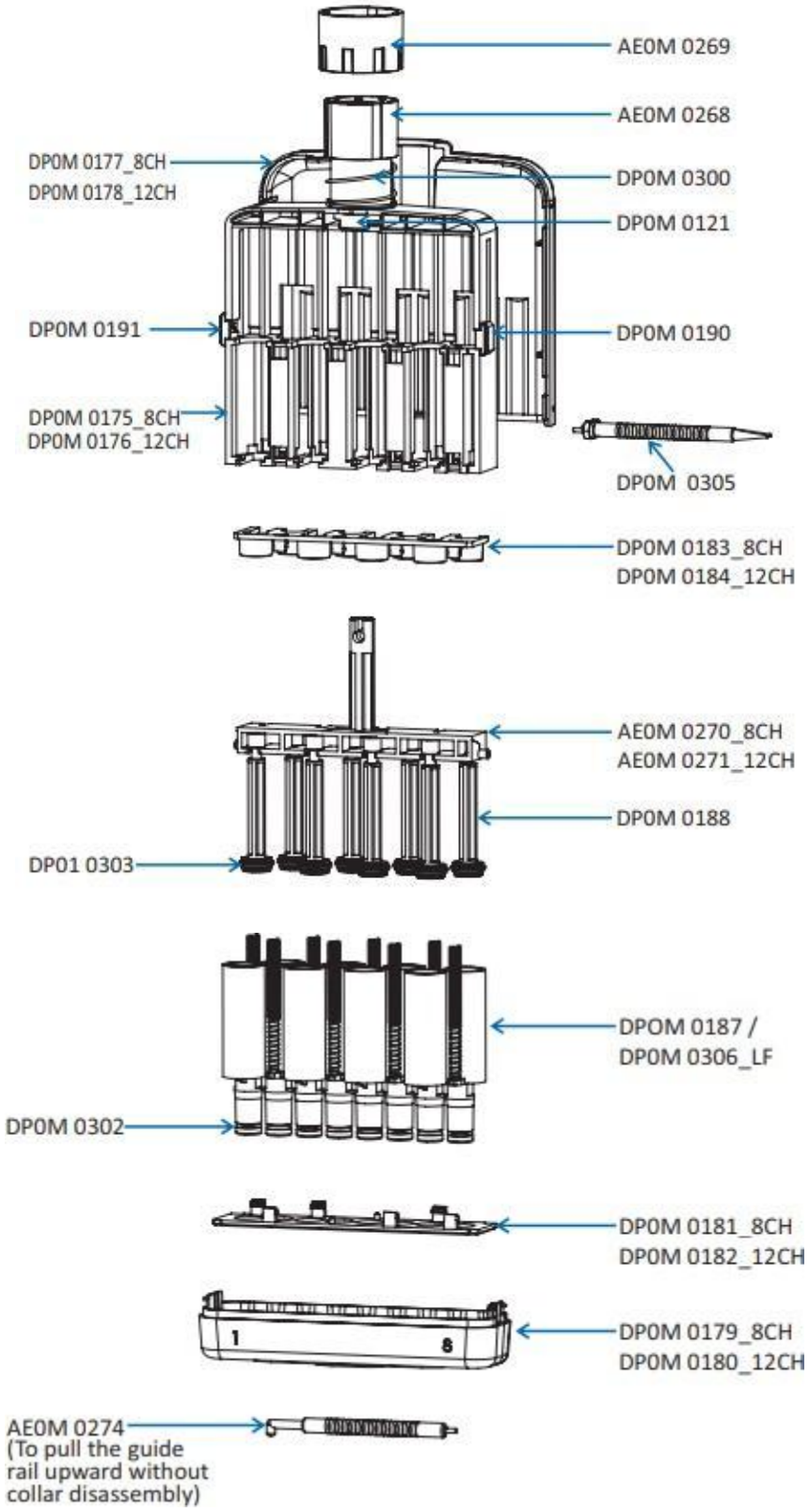


Group -2
Multi channel (8 & 12) Pipette
5-100µL
10-200µL
15-300µL




SP0M_PIN_0088 (30-300µl)
SP0M_PIN_0086 (20-200µl)
SP0M_PIN_0085 (10-100µl)
SP0M_PIN_0089 (5-50µl)
SP0M_PIN_0091
SP0M_SPG_0207
SP0M_STL_0140
SP0M_STL_0268 (45MM FOR 8CH)
AP0M_STL_0281 (46MM FOR 12CH)
SP0M_TFL_0315
AE0M_SPG_0205
SP0M_ALM_0126 (30-300µl-12CH)
SP0M_ALM_0123 (20-200µl-12CH)
SP0M_ALM_0122 (10-100µl-12CH)
SP0M_ALM_0121 (5-50µl-12CH)
SP0M_ALM_0125 (30-300µl-8CH)
SP0M_ALM_0119 (20-200µl-8CH)
SP0M_ALM_0118 (10-100µl-8CH)
SP0M_ALM_0117 (5-50µl-8CH)
SP0M_STL_0142
SP0M_TFL_0318 (30-300µl-12CH)
SP0M_TFL_0317 (20-200µl-12CH)
SP0M_TFL_0316 (10-100µl-12CH)
SP0M_TFL_0320 (5-50µl-12CH)
SP0M_RUB_0093 (30-300µl)
SP0M_RUB_0150 (20-200µl)
SP0M_RUB_0155 (10-100µl)
SP0M_RUB_0101 (5-50µl)
SP0M_ALM_0133 (30-300µl)
SP0M_ALM_0130 (20-200µl)
SP0M_ALM_0127 (10-100µl)
SP0M_ALM_0132 (5-50µl)
SP0M_RUB_0156

Group - 3
Multi Channel (8 & 12) Pipette
50 - 1200µL



9.8 Multi-channel Lower Parts 1200µl

Sr.no	Part code	Part name
1	DP0M 0121	Ratchet clip
2	DP0M 0175	Frame 8CH
3	DP0M 0176	Frame 12CH
4	DP0M 0177	Collar 8CH
5	DP0M 0178	Collar 12CH
6	DP0M 0179	Collar bottom-8CH
7	DP0M 0180	Collar bottom-12CH
8	DP0M 0181	Lower fixing strip-8CH
9	DP0M 0182	Lower fixing strip-12CH
10	DP0M 0183	Upper fixing strip-8CH
11	DP0M 0184	Upper fixing strip-12CH
12	DP0M 0187 / DP0M 0306_LF	Tipbase
13	DP0M 0188	Seal Holder
14	DP0M 0190	RH plug
15	DP0M 0191	LH plug
16	DP0M 0300	Ejector spring
17	DP0M 0301	Adjustable spring
18	DP0M 0302	Tipbase oring
19	DP0M 0303	Seal
20	DP0M 0305	Tool (Flat/Fork-head)
21	AE0M 0268	Coupler
22	AE0M 0269	Tip ejector ring
23	AE0M 0270	Piston housing-8CH
24	AE0M 0271	Piston housing-12CH
25	AE0M 0272	Motor join stud
26	AE0M 0274	Tool (L type)

10. Autoclavability

The lower part of the pipette, tip cone, ejector collar, piston and O-ring are autoclavable parts. Please autoclave under below conditions.

Temperature : 121°C / 250° Fahrenheit

Pressure : 1 bar / 15 psi (Pounds)

Time : 25 minutes or less

After autoclaving, allow parts to cool down for 8 hours in normal condition before reassembling it.

11. UV Sterilization

Electronic pipette are made of UV-resistant materials. Pipette will tolerate to temporary exposure to UV radiation. Prolonged or frequent exposure to UV radiation may cause yellowing and brittleness of the pipette.

12. Performance Testing

It is recommended that the performance of pipette is checked regularly (e.g. every 6 months) and always after in-house maintenance. A regular testing routine should be established by users, taking into consideration accuracy requirements of the application, frequency of use, number of operation using the pipette, nature of the liquid dispensed and acceptable maximum permissible error (ISO 8655-1).

Performance tests should take place in draught free room at 15-30°C, kept constant within ±0.5°C and with relative humidity above 50%. The pipette tip, and test water should have stood in the test room for long enough to reach equilibrium with the room condition (at least 1 hour). Use distilled or de-ionised water (ISO3696, grade 3) and an analytical balance that conforms to ISO 8655-6.

Gravimetric method

1. Adjust the desired test volume and fit the tip onto the tip cone.
2. Fill the pipette at least 3 times with the test liquid and discard the filling (pre-wetting), in order to create a moisture balance in the dead air volume.
3. Aspirate the test water, immersing the tip only 2-3 mm below the surface of the water. Keep the pipette vertical.
4. Withdraw the pipette vertically and touch the tip against side wall of the test water container. 5. Pipette the water into the weighing vessel, touching the tip against the inside wall of the vessel just above the liquid surface at an angle of 30°- 45°. Withdraw the pipette by drawing the tip 8- 10mm along the inner wall of weighing vessel.
6. Read the weight in milligram (mg).
7. Repeat the test cycle until 10 measurement have been recorded.
8. Convert the recorded masses to volume by multiplying the mass with the correction factor Z (refer the table below).

V= W x Z

V= Volume (µL),
W= Weight (mg),
Z= Correction factor for mg/µl conversion

9. Calculate the mean volume delivered (V).
10. For conformity evaluation calculate the systematic error of the measurement and calculate random error of the measurement as standard deviation or as coefficient of variation.
11. Compare the systematic error and random error to the performance specification values of your own laboratory Systematic Error (Accuracy).

A= V - V0

A=Accuracy,
V=Mean volume,
V0=Nominal volume

Accuracy can be expressed as a relative value:

A%=100% xA/V0

Random error (precision)

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

s= standard deviation
v= mean volume
n= number of measurements
vi= single measurem ent result (i=1...n)

Relative standard deviation (%CV)
%CV = 100% x s/V

NOTE: Systematic error is the difference between the dispensed volume and the target volume. Random error is the scatter of the dispensed volume around the mean of the dispensed volume (ISO 8655-1).
NOTE: Specifications are achieved in strictly controlled condition(ISO 8655-1). Users should establish acceptable maximum permissible error based on the field of use and the accuracy requirement placed on the pipette.
NOTE: Measure room pressure using barometer in mmHg and convert it into Kpa by multiplying with following correction factor.
1mmHg = 0.13332239 Kpa

Z factor(µL/mg) corresponding barometric pressure with respect to temperature						
Temperature (°C)	Barometric Pressure (Kpa)					
	80	85	90	95	100	105
15.0	1.0017	1.0018	1.0019	1.0019	1.0020	1.0020
15.5	1.0018	1.0019	1.0019	1.0020	1.0020	1.0021
16.0	1.0019	1.0020	1.0020	1.0021	1.0021	1.0022
16.5	1.0020	1.0020	1.0021	1.0021	1.0022	1.0022
17.0	1.0021	1.0021	1.0022	1.0022	1.0023	1.0023
17.5	1.0022	1.0022	1.0023	1.0023	1.0024	1.0024
18.0	1.0022	1.0023	1.0023	1.0024	1.0025	1.0025
18.5	1.0023	1.0024	1.0024	1.0025	1.0025	1.0026
19.0	1.0024	1.0025	1.0025	1.0026	1.0026	1.0027
19.5	1.0025	1.0026	1.0026	1.0027	1.0027	1.0028
20.0	1.0026	1.0027	1.0027	1.0028	1.0028	1.0029
20.5	1.0027	1.0028	1.0028	1.0029	1.0029	1.0030
21.0	1.0028	1.0029	1.0029	1.0030	1.0031	1.0031
21.5	1.0030	1.0030	1.0031	1.0031	1.0032	1.0032
22.0	1.0031	1.0031	1.0032	1.0032	1.0033	1.0033
22.5	1.0032	1.0032	1.0033	1.0033	1.0034	1.0034
23.0	1.0033	1.0033	1.0034	1.0034	1.0035	1.0036
23.5	1.0034	1.0035	1.0035	1.0036	1.0036	1.0037
24.0	1.0035	1.0036	1.0036	1.0037	1.0037	1.0038
24.5	1.0037	1.0037	1.0038	1.0038	1.0039	1.0039
25.0	1.0038	1.0038	1.0039	1.0039	1.0040	1.0040
25.5	1.0039	1.0040	1.0040	1.0041	1.0041	1.0042
26.0	1.0040	1.0041	1.0041	1.0042	1.0042	1.0043
26.5	1.0042	1.0042	1.0043	1.0043	1.0044	1.0044
27.0	1.0043	1.0044	1.0044	1.0045	1.0045	1.0046
27.5	1.0045	1.0045	1.0046	1.0046	1.0047	1.0047
28.0	1.0046	1.0046	1.0047	1.0047	1.0048	1.0048
28.5	1.0047	1.0048	1.0048	1.0049	1.0049	1.0050
29.0	1.0049	1.0049	1.0050	1.0050	1.0051	1.0051
29.5	1.0050	1.0051	1.0051	1.0052	1.0052	1.0053
30.0	1.0052	1.0052	1.0053	1.0053	1.0054	1.0054

13. Troubleshooting

13.1 Hardware reset

To turn off an unresponsive pipette, pull the switch down to Off position on the left side of the pipette, pipette will turn off and then can be turned on again by pulling the switch up.

Troubleshooting		
Issue	**Probable Cause**	**Recommendation**
Low battery symbol	Battery is low	Charge the battery
Blank Display	Low battery / Instrument in Standby mode / No battery / Battery damage / battery connection issue	Charge the battery / Press any key come out from Standby mode / Insert the battery / insert new battery / Remove and Insert the battery again
High vibration of motor	Motor speed is set to the lower speed	Set the motor speed at highest level
Aspiration / Dispense time is slow / different	Aspiration / Dispense Motor speed is set to the lower speed or different speed	Set the motor speed at highest level
Wrong pipetting volume	User change calibration / Tip issue	Restore Factory calibration. See section 7.8.4 to restore factory calibration / Use recommended standard tips
Unable to ENTER into Calibration menu	Password issue	Contact authorized distributor
Leakage	Not maintained regularly	Open bottom assembly and perform routine maintenance
Hard plunger movement	Excessive usage of pipette	Open bottom assembly and perform routine maintenance
Tip fit issue	Wrong tips attached to the tip cone	Use high quality standard tips at correct volume

14. Disposal (WEEE)

In compliance with European Directive (2012/19/EU) on waste and reduction of hazardous substance of electrical and electronic equipment, it must not be disposed of as unsorted municipal waste. Instead, this device must be collected separately in accordance with local recycling regulation. Batteries should also be disposed of in accordance with local legal regulation.

⚠ Warning

The used lithium (Li-ion) battery is regulated waste and must be disposed of according to the local regulations.

⚠ Dispose of the instrument according to the legislation stipulated by the local authorities concerning take back of electronic equipment and waste. The procedure may vary by country.

Pollution degree: 2

The pollution degree describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only non-conductive pollution such as dust, occurs with exception of occasional conductivity caused by condensation.

15. Technical data

Rechargeable battery		
Type	Li-ion battery	
Capacity	3.7V/1150 mAh	
Charging time	Approx 3 hours	
Charging temperature	0°C to +40°C	
Chargers, charging stands		
Input voltage	100-240 V 50/60Hz 150mA	
Output voltage	5V DC, l000mA	
Output connector type	Micro USB	
Operating temperature	15°C to 40°C	
Air humidity	Max. 80%	
Altitude range	< 2000m	
Weight and Length of Pipettors		
Single channel	Weight	Length
24501-25	180 gm	295 mm
24501-26	182 gm	288 mm
24501-27	185 gm	288 mm
24501-28	193 gm	282 mm
24501-29	207 gm	267 mm
Multichannel		
24501-30	266 gm	282 mm
24501-31	267 gm	282 mm
24501-32	291 gm	282 mm
24501-33	288 gm	282 mm
24501-34	297 gm	282 mm
24501-35	302 gm	282 mm
24501-36	304 gm	282 mm
24501-37	329 gm	282 mm
24501-38	326 gm	282 mm
24501-39	340 gm	282 mm

Altitude Statement: Geographic altitude affects accuracy through air pressure. Air pressure decreases in higher altitude and conversion factor Z decreases as well. Also, with some liquid the boiling point decrease quite close to room temperature, which will increase the evaporation loss dramatically. Therefore while making your own adjustment you should use tip catalogue type that was used for adjustment.