Applications
Favourites
Pipetting
OK
OK
ESC
OXFORD
BenchMate E
0.5-10

Electronic Pipette
User Guide

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1. Introduction

The BenchMate E Electronic Pipette from Oxford Lab Products offers one of the most ergonomic designs in the field of liquid handling devices. The ergonomic design of this electronic pipettes reduces the risk of repetitive strain injuries (RSI). The intuitive and easy-to-use functions and features of this electronic pipette allow easy access to, and setting of, each operational mode. The electronically operated piston movement reduces the risk of user or human error, and provides a greater level of accuracy than mechanical pipetting.

2. Volume Range

Number of Channel	Volume Range (µl)	Increment	Color
1 Channel	0.5-10	0.01	
1 Channel	5-100	0.1	
1 Channel	10-200	0.1	
1 Channel	50-1000	1	
1 Channel	250-5000	5	
8 Channel	0.5-10	0.01	
8 Channel	2-20	0.01	
8 Channel	5-100	0.1	
8 Channel	10-200	0.1	
8 Channel	15-300	0.1	
12 Channel	0.5-10	0.01	
12 Channel	2-20	0.01	
12 Channel	5-100	0.1	
12 Channel	10-200	0.1	
12 Channel	15-300	0.1	

3. Before You Start

Please verify your box includes following:

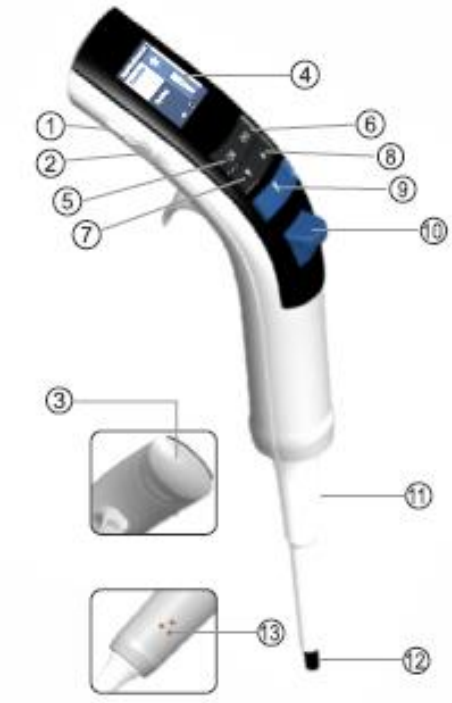
- Electronic Pipette
- Li-ion Battery
- Charger
- User Guide
- Calibration Report
- Tool Kit
- Grease Container
- Tips

4. Getting Started

Please insert the Li-ion battery as shown in section 8.1. Charge the battery for 3 hours, or until the charging icon bar in the upper right-hand corner of the display screen stops pulsing. Follow the charging instructions as shown and described in section 8.2 of this manual.

Switch on the Pipette by switching the ON/OFF switch to the ON position. The pipette is now ready for use.

5. 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 Button
11. Tip Ejector
12. Tip Cone
13. Charging Point for Auto Charging Stand

6. Modes

There are various pipetting modes available on the main menu. These modes are designed to meet various popular pipetting requirements, allowing you to complete your pipetting tasks more quickly and accurately, with minimal set-up required, saving you time.

Special Note:

Press the "OK" button to select an option.
Press the "ESC" button to go back.

6.1 Favorites

Steps:

1. Select Favorites from the main menu.
2. Select Prog1/Prog2/Prog3 from the Favorites menu.
3. Select the pipetting mode you wish to use.
4. Select the volume you want to pipette using the Up/Down arrow keys.
5. Select the Aspiration Speed using the Up/Down arrow keys.
6. Select the Dispensing Speed using the Up/Down arrow keys.
7. Select one of the 3 options below:
   a) **Save & Run**
      This will save the program, and it will be ready to use immediately.
   b) **Save & Exit**
      This will save the program, and will then exit from the menu.
   c) **Do Not Save**
      No program will be saved. You can also use the ESC key to exit and not save the program.

6.1.1 Edit

This option allows you to edit your saved Favorite programs. You can also change the sequence of saved programs.

Edit Program

This option allows you to edit the pipetting mode, aspiration speed, dispensing speed and volume. You can also delete the program entirely using this option.

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 pipetting mode.
   - **b) Volume:** This will allow you the change the liquid volume.
   - **c) Speed:** This will allow you to change the aspiration and dispensing speed.
   - **d) Save & Exit:** Exit the mode after saving the program.
   - **e) Do Not Save:** It will not save any changes.
   - **f) Delete prog:** This will delete the selected program.

Edit Sequence

This will allow the user to edit the sequence or order in which the saved programs are listed.

Steps:

1. Select Favorites.
2. Select Edit.
3. Select Edit Seq.
4. Select the program whose position you want to change.
5. Press OK button.
6. Select the position with which you want to swap your program, using the Up/Down arrow keys.
7. Press OK button. You will be redirected to the Favorites menu where you can see the changes.

6.2 Pipetting

This will allow you to aspirate and dispense your selected volume in a standard and straight forward pipetting mode.

Steps:

1. Select Pipetting from the main menu.
2. Select the desired volume using the Up/Down arrow keys.
3. Press OK to finalize the volume.
4. Press the trigger key to aspirate the volume.
5. Press the trigger key to dispense the volume.
6. Press the trigger key again to repeat the process, or press the ESC key to exit the mode.

6.3 Reverse Pipetting

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

Steps:

1. Select Reverse Pipetting from the main menu.
7. Select the desired volume using the Up/Down arrow keys.
2. Press OK to finalize the volume.
3. Press the trigger key to aspirate the volume.
4. Press the trigger key to dispense the volume.
    - *The excess liquid will remain in the tip.*
6. Press the trigger key to discard the excess liquid.
7. Press the trigger key to repeat the process, or press the ESC key to exit the mode.

6.4 Multi Dispense

6.4.1 Repeat Dispense

The repeat dispense mode repeatedly dispenses the selected volume for the selected number of dispenses. For better accuracy, it will aspirate an excess volume, which needs to be discarded at the end.

Steps:

1. Select Multi Dispense from the main menu.
2. Select Repeat Dispense from the Multi Dispense menu.
3. Select the desired dispense volume using the Up/Down arrow keys.
4. Select the number of Dispensing Steps. The pipette will calculate the maximum number of steps possible once you select the dispensing volume.
5. Use the Up/Down arrow keys to modify the number of dispensing steps and then press the OK button.
6. Press the trigger key to aspirate the liquid.
7. Press the trigger key to dispense the liquid.
    - *The excess liquid will remain in the tip.*
8. Press the trigger key to discard the excess liquid.
9. Press the trigger key to repeat the process, or press the ESC key to exit the mode.

6.4.2 Auto Dispense

Like Repeat Dispense above, except with the pipette automatically dispensing the repeated volume at a preset time interval.

Steps:

1. Select Multi Dispense from the main menu.
2. Select Auto Dispense from the Multi Dispense menu.
3. Select the desired dispense volume using the Up/Down arrow keys.
4. Select the number of Dispensing Steps. The pipette will calculate the maximum number of steps possible once you select the dispensing volume.
5. Use the Up/Down arrow keys to modify the number of dispensing steps and then press the OK button.
6. Select the desired Time Gap between each dispense step (from 1 to 3 seconds) and press the OK button.
7. Press the trigger key to aspirate the liquid.
8. Press the trigger key to dispense the liquid.
    - *The excess liquid will remain in the tip.*
9. Press the trigger key to discard the excess liquid.
10. Press the trigger key to repeat the process, or press the ESC key to exit the mode.

6.4.3 Sequence Dispense

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

Steps:

1. Select Multi Dispense from the main menu.
2. Select Sequence Dispense from the Multi Dispense menu.
3. Select the No. of Sequences by pressing the Up/Down arrow keys (max. no. of 4 sequences can be selected).

4. Select the 1st volume by using the Up/Down arrow keys.
5. Repeat this process for the 2nd, 3rd and 4th sequence selected.
6. Aspirate the volume using the trigger key.
7. Dispense the 1st volume in the sequence.
8. Repeat the process until all the volumes in the sequence have been dispensed.
9. Discard the excess liquid using the trigger key.

Note: If you choose the maximum volume in the 1st selection then you won't be able to add other sequences selections.

6.5 Diluting

This technique is used to mix two different liquids together.

6.5.1 Diluting

Steps:

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

6.5.2 Diluting + Mixing

Steps:

1. Select Diluting from the main menu.
2. Select Diluting + Mixing from the Diluting menu.
3. Select the No. of Dilutants (Max. 2 dilutants can be selected).
4. Select the 1st volume using the Up/Down arrow keys.
5. Select the 2nd volume using the Up/Down arrow keys.
6. Select the number of Mixing Cycles using the Up/Down arrow keys. Max. 10 cycles can be selected.
7. Aspirate the 1st volume by pressing the trigger key.
8. Aspirate Air by pressing the trigger key.
9. Aspirate the 2nd volume by pressing the trigger key.
10. Dispense the total volume in the vessel using the trigger key.
11. Mixing will automatically start once you dispense the liquid into the vessel.
12. You can stop mixing if required by pressing the ESC key.
13. Press the trigger to start the mixing again, or press the ESC key to completely stop the mixing action. This will discard the excess liquid remaining in the tip.

6.6 Mixing

This mode can be used to mix liquids. There are three separate modes available under the Mixing menu.

a) Mixing.
b) Pipetting + Mixing.
c) Diluting + Mixing.

6.6.1 Mixing

Steps:

1. Select Mixing from the main menu.
2. Select Mixing from the Mixing menu.
3. Select the volume using the Up/Down arrow keys.
4. Select the number of Mixing Cycles using the Up/Down arrow keys. Max. no. of 10 cycles can be selected.
5. Aspirate the volume by pressing the trigger key.
6. Mixing will automatically start.
7. You can stop mixing using the ESC key.
8. Press the trigger key to start the mixing again or press the ESC key to completely stop the mixing at any time during the process. The pipette will discard the excess liquid remaining in the tip.

6.6.2 Pipetting + Mixing

Steps:

1. Select Mixing from the main menu.
2. Select Pipette + Mixing from the Mixing menu.
3. Select the volume using the Up/Down arrow keys.
4. Select the number of Mixing Cycles using the Up/Down arrow keys. Max. no. of 10 cycles can be selected.
5. Aspirate the selected volume using the trigger key.
6. Dispense the selected volume using the trigger key.
7. Mixing will automatically start.
8. You can stop mixing using the ESC key at any point during mixing.
9. Press the trigger key to start the mixing again or press the ESC key to completely stop mixing. The pipette will discard the excess liquid remaining in the tip.

6.6.3 Diluting + Mixing

Steps:

1. Select Diluting from the main menu.
3. Select Diluting + Mixing from the Diluting menu.
4. Select the no. of Dilutants. Max. of 2 dilutants can be selected.
5. Select the 1st volume using the Up/Down arrow keys.
6. Select the 2nd volume using the Up/Down arrow keys.
7. Select the number of Mixing Cycles using the Up/Down arrow keys. Max. no of 10 cycles can be selected.
8. Aspirate the 1st volume by pressing the trigger key.
9. Aspirate Air by pressing the trigger key.
10. Aspirate the 2nd volume by pressing the trigger key.
11. Dispense the total volume in the vessel using the trigger key.
12. Mixing will automatically begin once you dispense the liquid into the vessel.
13. You can stop mixing using the ESC key.
14. Press the trigger key to start the mixing again, or press the ESC key to completely stop mixing. The pipette will discard the excess liquid remaining in the tip.

6.7 Settings

Within this menu the user can define Speed, Sound, User ID and Product ID of the pipette.

6.7.1 Speed

Steps:

1. Select Settings from the main menu.
2. Select Speed from the Settings menu.
3. Change the Aspiration Speed using the Up/Down arrow keys, then press OK.
4. Change the Dispense Speed using the Up/Down arrow keys, then press OK.
5. The new aspiration and dispense speed will then be displayed on the screen.
6. If you do not want to change the speed, press the ESC key.

6.7.2 Sound

Steps:

1. Select Settings from the main menu.
2. Select Sound from the Settings menu.
3. Change the sound volume using the Up/Down arrow keys, then press OK.
4. The new sound volume will be displayed on the screen.
5. If you do not want to change the sound volume, press the ESC key.

6.7.3 User ID

Steps:

1. Select Settings from main menu.
2. Select User ID from the Settings menu.
3. Select the 1st character using the Up/Down arrow keys, then press OK. You can select letters from the alphabet, numbers from 1 to 9 and some available symbols.
4. After pressing the OK button, the 2nd character will be highlighted and available to edit. Edit the 2nd and subsequent characters by the same process as the 1st. Once the User ID is complete, the Settings menu will be displayed with all changes applied.

6.7.4 Product ID

Steps:

1. Select Settings from the main menu.
2. Select Product ID from the Settings menu.
3. Select the 1st character using the Up/Down arrow keys, then press OK. You can select letters from the alphabet, numbers from 1 to 9 and some available symbols.
4. After pressing the OK button, the 2nd character will be highlighted and available to edit. Edit the 2nd and subsequent characters by the same process as the 1st. Once the Product ID is complete, the Settings menu will be displayed with all changes applied.

6.8 Calibration

Electronics pipette offers you 3 types of calibration settings depending on the user's requirement.

a) 3 Point Calibration
b) 2 Point Calibration
c) 1 Point Calibration

3 Point Calibration is the default setting on the pipette for optimal accuracy at each volume.

6.8.1 3 Point Calibration

Steps:

1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password yet.
3. Select 3 Point Cal. from the sub-menu.
4. Select Expected Volume 1. By default, 10% of the maximum volume will be displayed. You can change this volume depending on your preferences, using the Up/Down arrow keys.
5. Enter Delivered Volume 1.
6. Select Expected Volume 2. By default, the mid-range volume will be displayed. You can change this volume depending on your preferences using the Up/Down arrow keys.
7. Enter Delivered Volume 2.
8. Select Expected Volume 3. By default, the maximum volume will be on the display. You can change this volume depending on your preferences using the Up/Down arrow keys.
9. Enter Delivered Volume 3.
10. Select “Yes” to save your changes. The display will read Calibration done. Select “No” to exit without saving.

6.8.2 2 Point Calibration

Steps:

1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password yet.
3. Select 2 Point Cal. from the sub-menu.
4. Select Expected Volume 1. By default, 10% of the maximum volume will be displayed. You can change this volume depending on your preferences, using the Up/Down arrow keys.
5. Enter Delivered Volume 1.
6. Select Expected Volume 2. By default, the maximum volume will be on the display. You can change this volume depending on your preferences using the Up/Down arrow keys.
7. Enter Delivered Volume 2.
8. Select “Yes” to save your changes. The display will read Calibration done. Select “No” to exit without saving.

6.8.3 1 Point Calibration

Steps:

1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password yet.
3. Select 1 Point Cal. from the sub-menu.
4. Select Expected Volume 1. By default, 10% of the maximum volume will be displayed. You can change this volume depending on your preferences using the Up/Down arrow keys.
5. Enter Delivered Volume 1.
6. Select “Yes” to save your changes. The display will read Calibration done. Select “No” to exit without saving.

6.8.4 Restore Factory Calibration

This feature can be used to restore the calibration settings to the factory default. All user generated changes will be cleared and the factory calibration will be restored.

Steps:

1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password yet.
3. Select Restore Fact. Cal.
4. Select “Yes” using the Up/Down arrow keys to restore the factory calibration settings. “Factory Calibration Restored” will be displayed on the screen for a few seconds. You will then be directed to the calibration menu.
5. Select “No” using the Up/Down arrow keys to keep the user defined settings.

Special Note: Whenever a user makes any changes to calibration, the screen will display **“Calibration User”**. When a user restores the factory calibration settings, the screen will display **“Calibration Fact.”**.

6.8.5 Last Calibration Date

Here, the most recent calibration date is logged. Whenever you calibrate your pipette, you can enter the calibration date here.

Steps:

1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password.
3. Select” Last Cal. Date” using the Up/Down arrow keys.
4. Enter the date in DD/MM/YY format. You will then be directed to the calibration menu.

6.8.6 Due Calibration Date

Here, you can save the due-date for your next pipette calibration.

Steps:
1. Select Calibration from the main menu.
2. Select Enter Password from the Calibration menu. Enter “0000” if you have not set your own password.
3. Select Due Cal. Date using the Up/Down arrow keys.
4. Enter the date in DD/MM/YY format. You will then be directed to the calibration menu.

6.8.7 Edit Password

This feature allows the user to edit their password. This ensures that only authorized personnel can modify the calibration settings.

Steps:
1. Select Calibration from the main menu.
2. Select Edit Password.
3. Enter the existing password using the Up/Down arrow keys. The default password is “0000”.
4. Enter the new password using the Up/Down arrow keys and then press OK.
5. Repeat the New Password and press OK.
6. “Password Change Successful” will appear on the display.

6.8.8 Forgot Password

If you forget your password, please contact your supplier. They will be able to reset your password for you.

7. Warning/Safety Precautions

To prevent fire, electric shock or serious injury to users, follow the safety instructions below.

- Do not submerge the unit or its charger in any liquid.
- Do not operate a charger if the cord is damaged.
- Only use chargers that are compatible with the pipette.
- Do not handle the charger unit with moist hands.
- Do not burn, crush or damage the lithium battery, or expose it to excessive heat.
- Only use the recommended battery.

8. Battery and Charging

8.1 Inserting a Battery

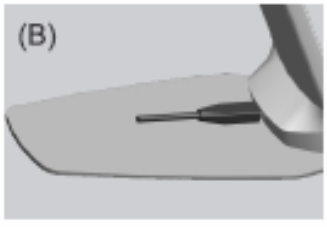
1. Open the battery cover (see the images below).
2. Insert the battery supplied with the unit, such that the metal pins inside the pipette establish a proper connection with metal pins on the battery.
3. Slide the battery cover back onto the unit.

8.2 Charging Through the Power Adopter

1. Insert the power cable into its slot on the pipette, as shown in the image (A) below.
2. Connect the power plug of the power adaptor to an external power source.

8.3 Charging Through the Auto Charging Stand

1. Insert the power cable into its slot on the auto charging stand, as shown in the image (B) below.
2. Connect the power plug of the power adaptor to an external power source.
3. Place the pipette on the auto charging stand.



9. Maintenance

9.1 Single Channel Pipette Maintenance

You should check the pipette at the beginning of each day for the accumulation of dust or dirt on the outside surface. Special 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 a better understanding of each of the components. After disassembling the pipette, follow the routine below for maintenance steps:

- Pull out the piston and associated parts, and follow general maintenance procedures. Remember to keep all parts in a logical order for reassembly.
- Clean the piston, piston spring, seal and O-ring with isopropanol and lint free tissue. Allow these parts 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.

9.1.1 Volume-wise Disassembly Procedure

Shown below is the disassembly procedure for different volume pipettes.

Volume 0.5-10µl

Volume 5-100µl & Volume 10-200µl

Step 1
Unscrew the Tip Ejector as per shown direction

Step 2
Unscrew the Tip Cone Cap as per shown direction

Step 3
Pull out the Piston as per shown direction

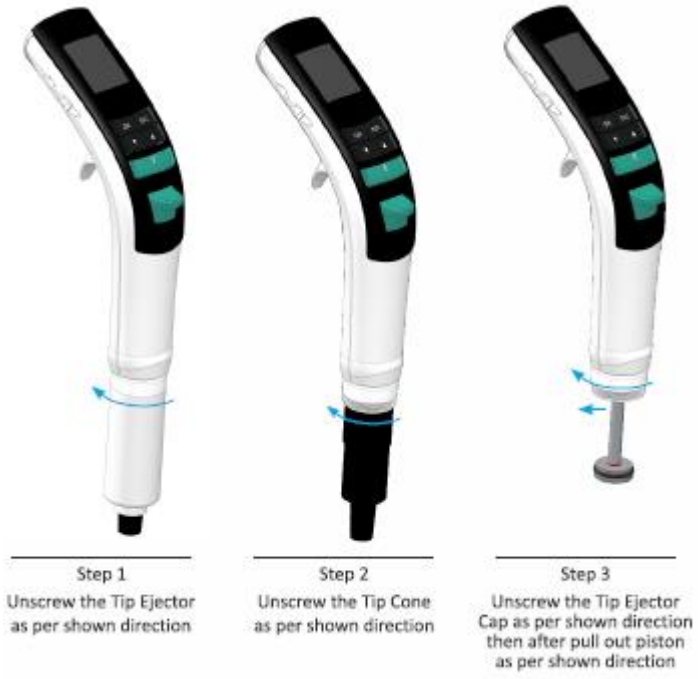
Volume 50-1000µl

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



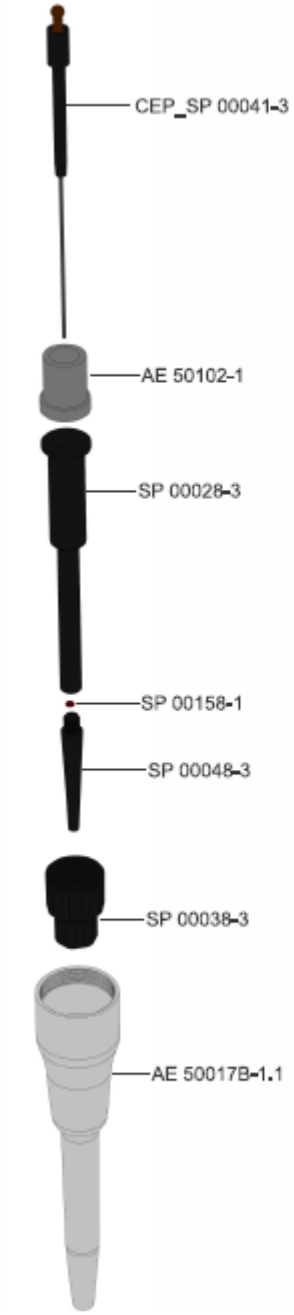
Step 1
Unscrew the Tip Ejector as per shown direction

Step 2
Unscrew the Tip Cone as per shown direction

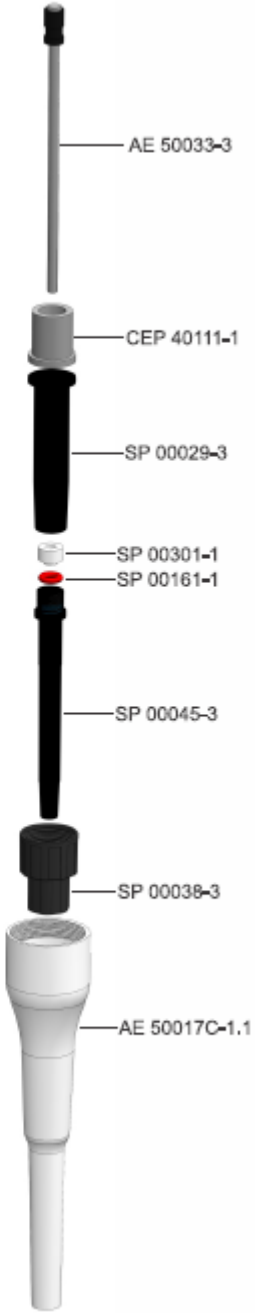
Step 3
Unscrew the Tip Ejector Cap as per shown direction then after pull out piston as per shown direction

9.1.2 List of Spare Parts:

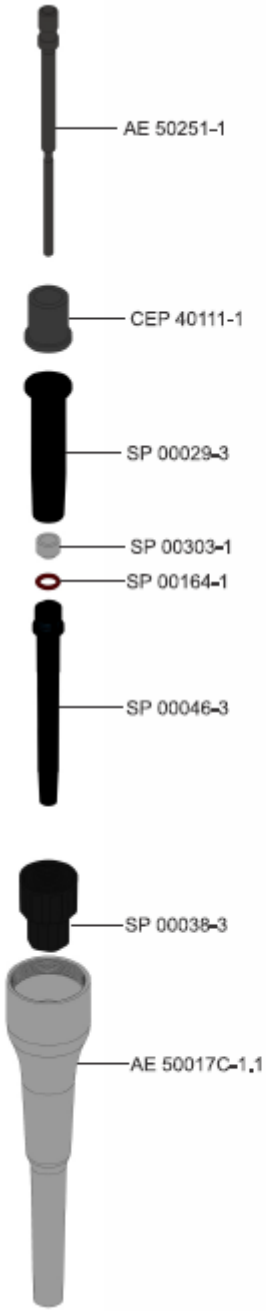
Volume 0.5-10µl



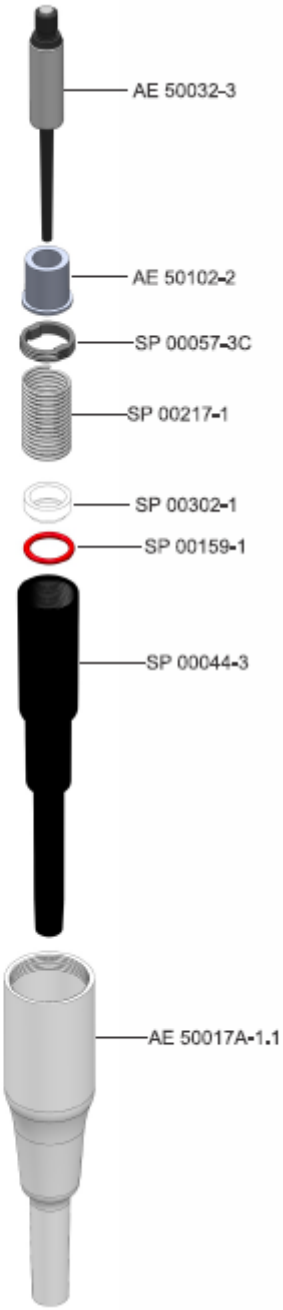
Volume 5-100µl



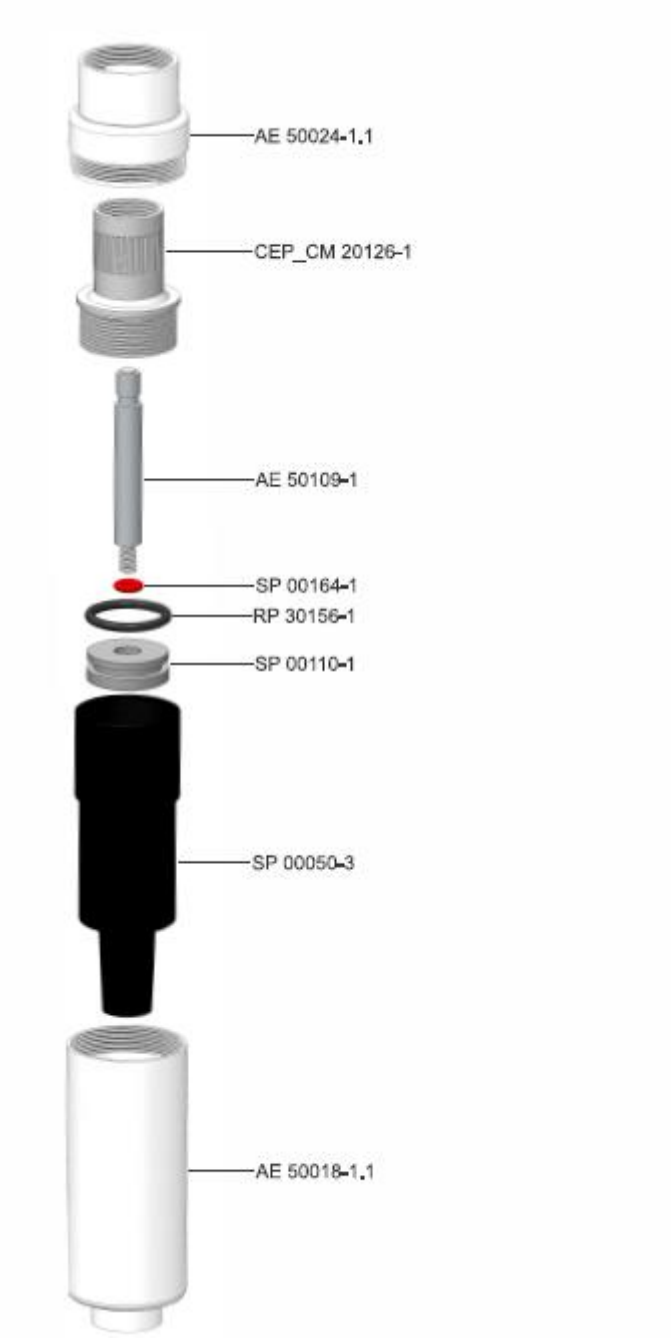
Volume 10-200µl



Volume 50-1000µl

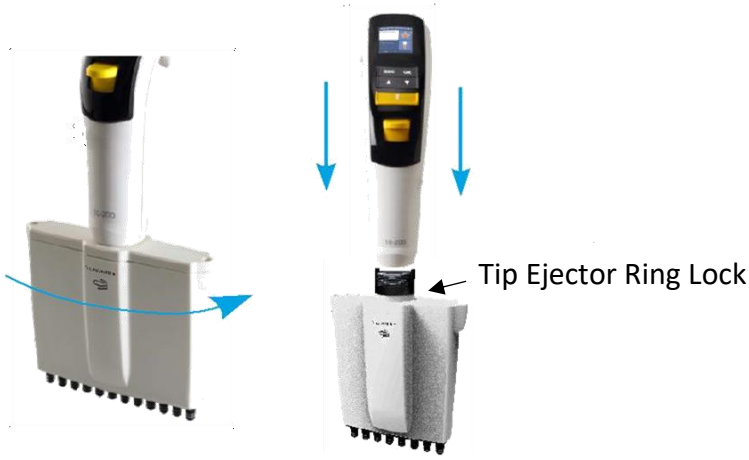


Volume 250-5000µl

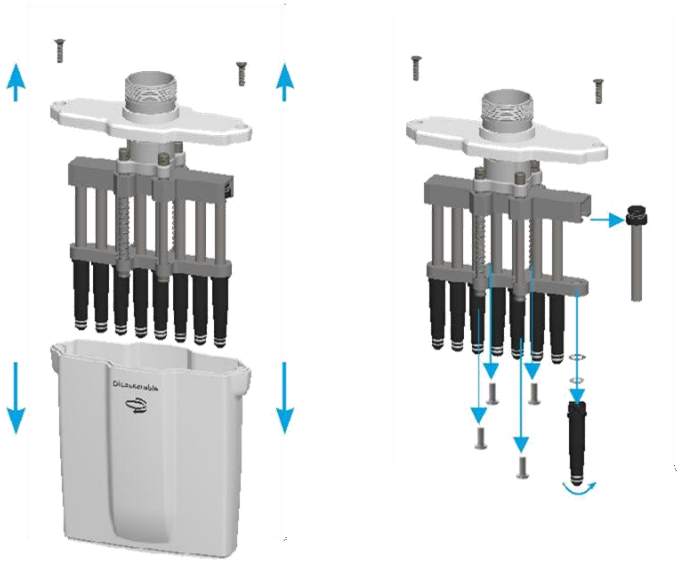


9.2 Multi Channel Pipette Maintenance

The servicing procedure starts with the disassembly of the pipette. Please refer to the spare parts list for a better understanding of the various components of the pipette. Shown below is an example of the disassembly and assembly procedure for a 2-20µl 8 channel pipette. The basic procedure is the same for all other 8 channel and 12 channel pipette volumes.

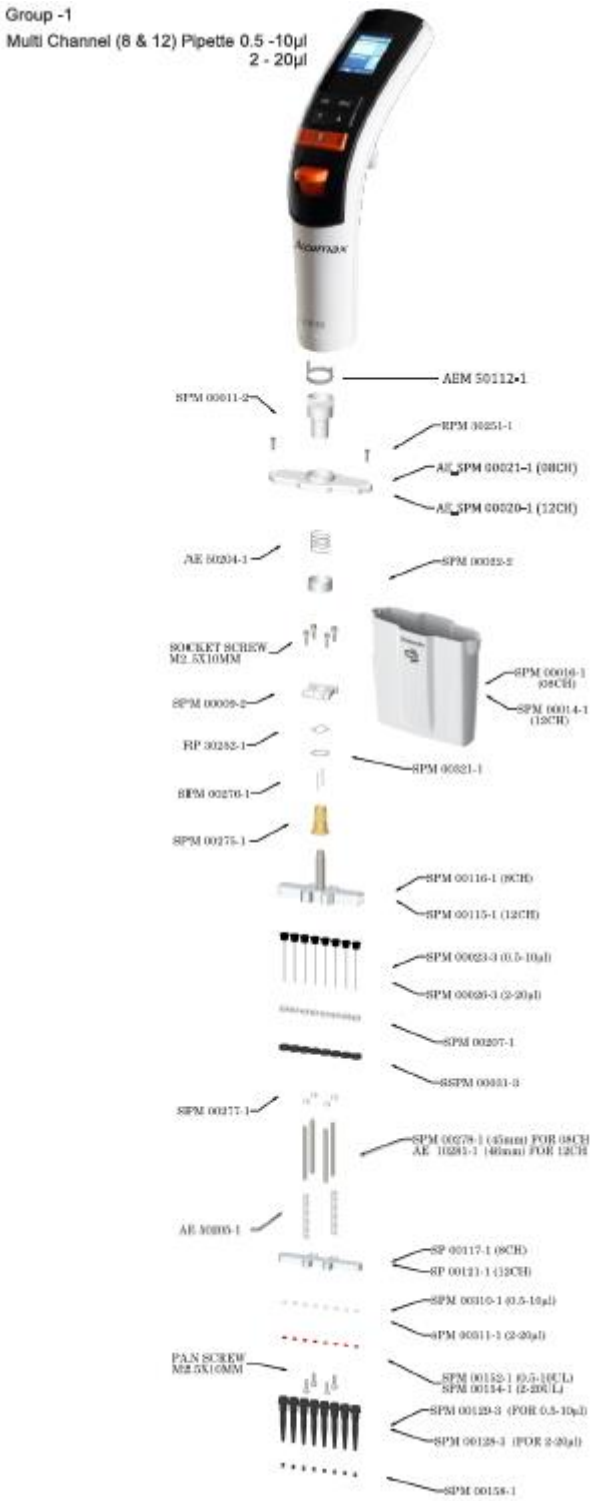


- Rotate the Multi-Channel manifold in the indicated direction until it detaches from the rest of the pipette unit.
- Take apart the manifold by taking out two screws out from the top side.
- Move upwards tip ejector ring lock (black part) to remove from bottom assembly. At the time of assembly pipette match two legs of tip ejector ring lock in pipette top half assembly.

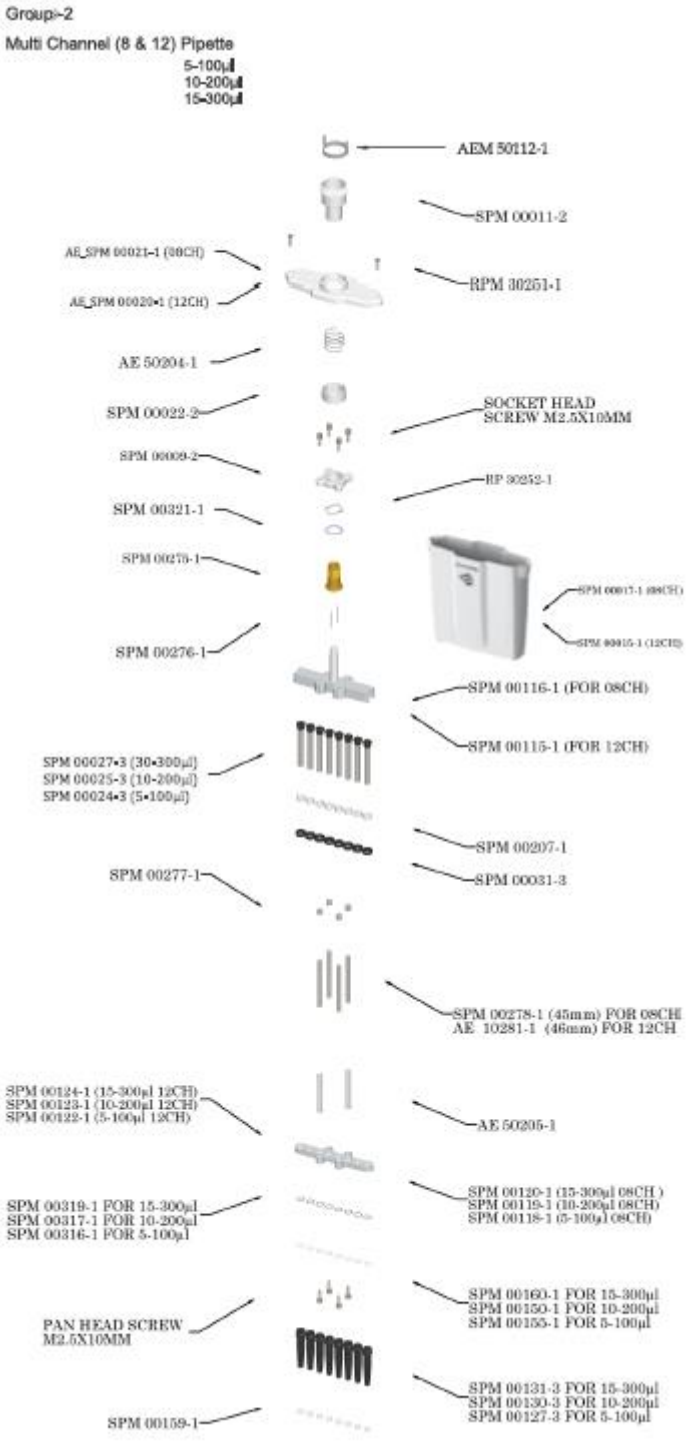


- Takeout the other four screws to disassemble the piston housing.
- Pull out the piston and other parts, including the seal and O-ring by unscrewing the tip cone. Remember to keep all parts in a logical order for later reassembly.
- Perform this procedure for each tip cone and piston.
- Clean the piston, piston spring, seal and the O-ring with isopropanol and lint free tissue and allow to dry.
- Check the tip cone for any foreign particles, and if any exist remove them.
- Grease the cleaned parts with the approved lubricant provided with each pipette.

9.2.1 List of Spare Parts



9.2.1 List of Spare Parts



10. Autoclavability

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

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 the unit. Do not autoclave the upper electronic portion of the pipette.

11. Trouble shooting

Trouble shooting		
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 6.8.4 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 fitment issue	wrong tips attached to the Tip cone	Use high quality standard tips