




Eppendorf Xplorer®

Operating manual

eppendorf



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Xplorer pipettes are using U.S. Patents No. 6,778,917; 7,434,484 and U.S. Patent Applications No. 2007/0276546 A1; 2008/0006100 A1; 2008/0011042 A1; 2008/0034898 A1.

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1 User instructions

1.1 Using this manual

- ▶ Read this operating manual completely before using the device for the first time.
- ▶ Consider this operating manual as part of the product and keep it in a place where it can be easily accessed.
- ▶ Include this operating manual with the device when passing the device on to third parties.
- ▶ In case of loss of the operating manual, please request a replacement. The latest version can be found on our website at www.eppendorf.com.
- ▶ This operating manual applies to devices with software version 01.05.00 or higher.
- ▶ A more detailed operating manual, adjustment instructions and further information can be found on the Xplorer CD or on our website at www.eppendorf.com.

1.2 Warning signs and hazard icons

1.2.1 Hazard icons


	Biohazard		Explosion
	Electric shock		Toxic substances
	Hazard point		Material damage

1.2.2 Danger levels

The danger level is part of a safety note and defines the potential consequences if the information contained therein is not observed.

DANGER	<i>Will</i> lead to severe injuries or death.
WARNING	<i>May</i> lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Depiction	Meaning
▶	You are requested to perform an action.
1. 2.	Perform these actions in the sequence described.
•	List.
Text	Terms and key names from the software.
	References useful information.

1 User instructions

1.4 Glossary

A

Additional volumes The total of the remaining stroke and the reverse stroke.

Air-cushion principle An air cushion is located between the piston-cylinder system of the pipette and the liquid in the pipette tip. Upward movement of the piston produces a partial vacuum, causing the liquid to be drawn into the pipette tip. During the downward movement of the piston, the air cushion is pressed downwards and the liquid in the pipette tip is dispensed. Piston stroke optimization measures ensure that the stroke volume results in the liquid volume shown in the display.

Pipettes in which the piston is brought into contact with the liquid to be dispensed are defined as positive-displacement pipettes.

B

Biopur Eppendorf Biopur® is an Eppendorf AG quality and purity standard for disposables. In addition to the requirements for standard goods, e.g., precision, accuracy, wetting behavior and tightness, Biopur goods also meet the requirements for sterility, absence of ATP, human and bacterial DNA, pyrogen and RNase.

Inspection and certification of Biopur goods is conducted by an external laboratory.

Batch-specific Biopur certificates can be downloaded from our website at www.eppendorf.com.

F

Free jet dispensing Dispensing steps which do not contact the wall of the tube. If a drip forms on the pipette tip after free jet dispensing, this drip always belongs to the next dispensing step. We recommend completing a dispensing series using only the free jet method or wall dispensing method. Complete the reverse stroke in accordance with the dispensing series using either the free jet or wall dispensing method. The measurement deviations listed in the technical data were determined using the wall dispensing method.

I

Increment Step size or resolution. For example, with the volume selection on a 10 mL Xplorer pipette, the volume can be increased or decreased in 0.01 mL steps.

ISO 8655 The ISO 8655 standard defines, among other things, limiting values (systematic error [accuracy] and random error [precision]) and the testing procedures for dispensing devices.

N

Nominal volume The maximum dispensing volume of a pipette. The nominal volume is also used as the name of a pipette. The term nominal volume comes from the ISO 8655 standard.

P

PCR clean PCR clean is an Eppendorf AG purity standard for disposables. Products labeled with PCRclean are certified free of human DNA, DNase, RNase and PCR inhibitors. A batch-specific certificate can be downloaded from our homepage www.eppendorf.com.

PhysioCare Concept® Products that carry the Eppendorf PhysioCare Concept logo feature optimized ergonomics and make operation as simple as possible, even with complex dispensing tasks. PhysioCare products can be easily serviced and cleaned. They are made of extremely light materials and require minimal operating force.

1 User instructions

R

- Rechargeable lithium polymer battery** This rechargeable battery is a special version of the rechargeable lithium-ion battery. Like rechargeable lithium-ion batteries, rechargeable lithium-polymer-batteries have a very high charging capacity and a long service life. The special encapsulation of the rechargeable lithium-polymer-battery makes it lighter than rechargeable lithium-ion batteries.
- Remaining stroke** After completion of the dispensing steps there is still a small amount of liquid in the pipette tip as a safety reserve. This is referred to as the remaining stroke. The liquid of the remaining stroke can be discarded or reused by pressing the rocker in the desired direction.
- Reverse stroke** After aspiration, the piston is moved into a defined position. The reverse stroke is not a dispensing step.

V

- Vapor pressure** This term refers to the pressure exerted by the vapor of a material (solid or liquid) in an enclosed container. The vapor is in equilibrium with the solid or liquid phase of the same substance. The vapor pressure increases when the temperature increases. Each pure liquid has a vapor pressure of 1013 hPa (mbar) at boiling point. Volume errors caused by high vapor pressure can be reduced by prewetting the tip.

- Viscosity** Viscosity describes the viscosity of liquids and suspensions. Dynamic or absolute viscosity is now usually given in Pa · s or mPa · s. In older literature, the unit P or cP is frequently found. 1 mPa · s corresponds to 1 cP.

At room temperature a 50% glycerine solution has a viscosity of approx. 6 mPa · s. As the glycerine concentration increases, viscosity increases considerably. Absolutely anhydrous glycerine has a viscosity of approx. 1480 mPa · s at room temperature.

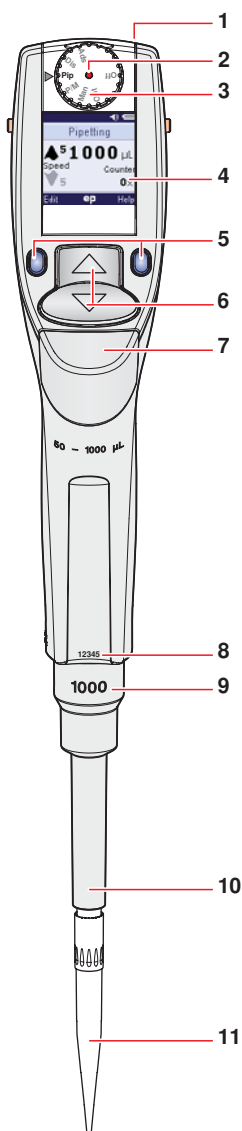
W

- Wall dispensing** Dispensing from a pipette while touching the tube wall with the pipette tip. We recommend completing a dispensing series using only the free jet method or wall dispensing method.

2 Product description

2.1 Main Illustration

2.1.1 Single-channel



1 Connector socket

For connecting the charging plug of an Eppendorf Xplorer power supply.

2 Hardware reset button

Situated at the center of the selection dial. Trigger the hardware reset with a sharp object.

3 Selection dial

For setting an operating mode.

4 Backlit color display

The backlit color display simultaneously shows the selected mode and parameter settings (such as the volume, aspiration and dispensing speed) and provides feedback and information on the work steps as well as further information.

5 Softkeys

The assignment of the respective softkey is shown in the footer in the display.

6 Rocker

You can either press the rocker up or down. The rocker can either be used to trigger the piston movement or to scroll through the menu and change the values of parameters. The color of the rocker is different for the various volumes and matches the color of the trays for the suitable epT.I.P.S. pipette tips.

7 Ejector

The ejector moves the ejector sleeve and ejects the pipette tip. After a filled pipette tip has been ejected, the piston returns to the basic position again after a slight delay. This option can be switched off (see p. 30).

8 Serial number

The serial number is located at the lower end of the upper part.

9 Ejector sleeve

The ejector sleeve is marked with the nominal volume of the pipette.

10 Spring-loaded tip cone

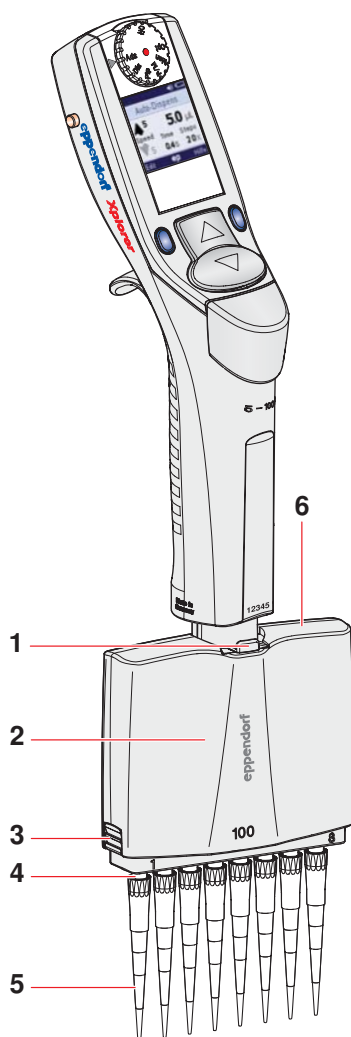
The spring loading action optimizes the force required for attaching and ejecting tips. The spring-loading action is available for all Xplorer pipettes up to 1 000 µL.

11 Pipette tip

The Xplorer pipettes must only be used with the suitable pipette tip fitted. It is recommended to use epT.I.P.S.

2 Product description

2.1.2 Multi-channel



For a description of the upper part, please refer to the total illustration of the single-channel pipette (see p. 8).

1 Lever

The lever is used to release the multi-channel lower part.

2 Multi-channel lower part

The multi-channel lower part is freely rotatable. It is not detached when rotated. The outer channels are marked with the numbers 1 and 8 (or 12).

The multi-channel version has a piston for each channel so that less than 8 or 12 tips can also be mounted.

You can open the multi-channel lower part in order to exchange or remove individual channels.

The 1 200 µL multi-channel lower part is only available as a 8 channel version.

3 Right and left latches

Unlocks the cover plate (6) with interior ejector rail.

The 1 200 µL multi-channel lower part can be opened with a pin (see p. 42).

4 Spring-loaded tip cones

The spring loading action optimizes the force required for attaching and ejecting tips. It is available for the volumes 10 µL, 100 µL and 300 µL.

5 Pipette tips

It is recommended to use epT.I.P.S.

6 Cover plate for 10 µL, 100 µL and 300 µL

Detachable cover plate with an interior ejector rail. The cover plate is opposite the side with the lever (1).

2 Product description

2.2 Delivery package

Number	Description
1	Eppendorf Xplorer pipette
1	Rechargeable lithium-polymer battery
1	Power supply with power plug adapters
1	Operating manual English/German
1	CD Eppendorf Xplorer with extended operating manual in several languages, ordering information and additional documents.
1	Eppendorf Xplorer Short Instructions English Additional languages on the Eppendorf Xplorer CD.
1	Locking ring for deactivating the spring loading action in the case of $\leq 1\ 000\ \mu\text{L}$ single-channel Eppendorf Xplorer pipettes
1	For multi-channel pipettes from $100\ \mu\text{L}$: Multi-channel tool for cutting the O-rings on the tip cones.
1	Unlocking tool for opening the multi-channel lower part of $1\ 200\ \mu\text{L}$ Eppendorf Xplorer pipettes
1	Pipette wrench for opening the lower part of $5\ \text{mL}$ and $10\ \text{mL}$ Eppendorf Xplorer pipettes

2.3 Features

The Xplorer pipettes are motorized and electronically controlled piston-stroke pipettes designed to aspirate and dispense liquid volumes according to the air-displacement principle. The Xplorer pipette family includes single-channel and multi-channel pipettes (8 or 12 channels). Depending on the Xplorer pipette, you can dispense volumes ranging from $0.5\ \mu\text{L}$ to $10\ \text{mL}$. The liquid is aspirated into a pipette tip which is attached to the Xplorer pipette.

The main control element of the Xplorer pipette is a rocker. The color of the rocker differs depending on the volume range of the Xplorer pipette. It has different functions during dispensing operations and in the dispensing parameter editing mode. The rocker can either be pressed up or down.

The lower parts of the Xplorer pipettes are autoclavable.

For all Xplorer pipettes from $10\ \mu\text{L}$ to $1\ 000\ \mu\text{L}$ nominal volumes, the tip cone responds with spring-loading action when a pipette tip is attached.

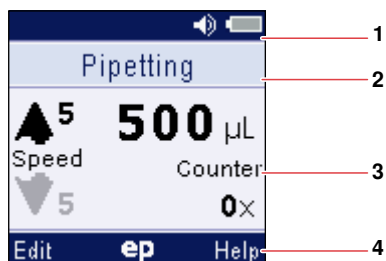
2.4 Warranty

In case of warranty claims, contact your local Eppendorf contractual partner. No warranty is provided for any damage due to misuse or if the upper part has been opened by unauthorized persons. The Rechargeable lithium polymer battery and all other wear parts are excluded from the warranty.

2 Product description

2.5 Display

You can change the brightness of the display in the Options. The display dims during usage intervals and switches off after a prolonged usage interval. Touch any key to return the dimmed or switched off display back to the defined brightness. If the selection dial is set to **Off**, you first have to set the selection dial to an operating mode.



1 Header	2 Status line
3 Main field	4 Footer

Header



Adjustment: If you changed the factory setting, a wrench symbol will appear in the left part of the header. If the factory setting is active, no symbol will appear in the header.

Additional symbols on the right indicate which adjustment has been set in the Options:



1-point adjustment

Single-point adjustment by the user.



2-point adjustment

Two-point adjustment by the user.



3-point adjustment

Three-point adjustment by the user.



Glycerol 50%

Adjustment to liquid type 50 % glycerol.



Ethanol 75%

Adjustment to liquid type 75 % ethanol.



Altitude

Adjustment to an altitude other than 0 m above sea level.



epTIPS long

Adjustment to an epT.I.P.S. long.



Sound volume: You can change the sound volume setting for the acoustic signals in the Options (see p. 30).

If the volume has been set to **0**, no loudspeaker symbol is displayed.

Rechargeable battery: Information on the charging capacity of the rechargeable lithium-polymer-battery.



Rechargeable battery fully charged.



Rechargeable battery partially discharged.



Rechargeable battery almost discharged. Rechargeable battery must be charged (see p. 17).

2 Product description

Status line

Selected operating mode

The selected operating mode is displayed here during operation.

In edit mode the name of the parameter to be edited is displayed.

In the **Edit** mode the status line shows the name of the parameter to be edited. The parameter to be edited is also displayed outlined and marked in red in the main field.

Footer

Assignment of the softkeys with variable functions.

Edit Open the edit mode.

Next Select next parameter.

Help Show help.

End Exit the edit mode or help.

Main field

All the dispensing parameters of an operating mode are displayed at the same time.

In edit mode, the parameter to be edited is marked in red.

Some of the dispensing parameters in the main field are:

The dispensing volume.

Speed: 8 speed levels for aspiration and dispensing.

Counter: Number of dispensing operations performed. Optional setting in the **Pip** mode.



An explanation of all dispensing parameters can be found in the chapter "Setting parameters" (see p. 20).

2 Product description

2.6 Materials



Aggressive substances can damage the device, dispensing unit and accessories.

- ▶ Check for material compatibility before using organic solvents and aggressive chemicals.
- ▶ Follow the cleaning instructions (see *Cleaning on p. 36*).

The user-accessible components of the Xplorer pipette are made of the following materials:

Component	Material
External surfaces of the upper part	<ul style="list-style-type: none"> • Highly purified polypropylene (PP) • Polycarbonate (PC) • PC coated • PC tinted • Gold plating
Exterior and interior of lower parts	<ul style="list-style-type: none"> • Highly purified polypropylene (PP) • Polyvinylidene fluoride (PVDF) • Polyetherimide (PEI) • Polyphenylene sulfide (PPS) • Polyetheretherketone (PEEK) • Polytetrafluorethylene (PTFE) • Ethylene propylene diene M-class rubber (EPDM) • Silicone • Steel (stainless steel and spring steel)

Pipette tip	Material
epT.I.P.S.	Polypropylene (PP)
epDualfilter T.I.P.S. filter	Polyethylene (PE)

3 Safety

3.1 Intended use

The Xplorer pipette is a lab device intended for dispensing liquids in the volume range from 0.5 µL to 10 mL, in combination with matching pipette tips. In vivo applications (applications in or on the human body) are not permitted.

The Xplorer pipette may only be operated by trained specialist staff. All users must have read the operating manual carefully and familiarized themselves with the device's mode of operation.

3.2 Warnings for intended use



DANGER!

Danger of explosion!

- ▶ Do not operate the device in areas where work is completed with explosive substances.
- ▶ Do not use this device to process any explosive or highly reactive substances.
- ▶ Do not use this device to process any substances which could create an explosive atmosphere.



WARNING!

Damage to health due to handling infectious liquids and pathogenic germs.

- ▶ Observe the national regulations for handling these substances, the biological security level of your laboratory, the material safety data sheets and the manufacturer's application notes.
- ▶ Wear personal protective equipment (PPE).
- ▶ Follow the instructions regarding hygiene, cleaning and decontamination.
- ▶ For complete instructions regarding the handling of germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, current edition of the Laboratory Biosafety Manual).



WARNING!

Damage to health due to toxic, radioactive or aggressive chemicals.

- ▶ Observe the national regulations for handling these substances as well as the material safety data sheets and manufacturer's application notes.
- ▶ Wear personal protective equipment (PPE).



WARNING!

Personal injury caused by the incorrect handling of the rechargeable battery.

- ▶ Do not disassemble or modify the rechargeable battery.
- ▶ Never pierce, crush or throw the rechargeable battery.
- ▶ Only use the rechargeable battery in the Xplorer pipette.
- ▶ Do not touch leaky rechargeable batteries.
- ▶ Do not use any damaged rechargeable batteries.
- ▶ Dispose of damaged rechargeable batteries in accordance with legal regulations.



CAUTION!

Danger to persons from careless use.

- ▶ Never point the opening of a Xplorer pipette fitted with pipette tip at yourself or anyone else.
- ▶ Only initiate dispensing if it is safe to do so.
- ▶ For all dispensing tasks, make sure that you are not endangering yourself or anyone else.



CAUTION!

Poor safety due to incorrect accessories and spare parts.

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, functioning and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts or from the improper use of such equipment.

- ▶ Only use accessories and original spare parts recommended by Eppendorf.

3 Safety



NOTICE!

Damage to device from missing pipette tips.

- ▶ Only use the Xplorer pipette with fitted pipette tips.



NOTICE!

Carry-over, contamination and incorrect dispensing results due to the incorrect use of pipette tips.

The pipette tips are for single use only. Prolonged use can have a negative impact on dispensing tasks.

- ▶ Use the pipette tips only once.
- ▶ Do not autoclave the epT.I.P.S. Dualfilter.



NOTICE!

Incorrect dispensing volume with special liquids and from temperature differences.

Solutions which differ greatly from water in terms of their physical data, or temperature differences between the pipette, pipette tip and liquid, can result in incorrect dispensing volumes.

- ▶ Avoid temperature differences between pipette, pipette tip and liquid.
- ▶ Make sure that the temperature is constant, between 20 and 25°C and at $\pm 0.5^\circ\text{C}$.
- ▶ Check the dispensing volume and make sure that you can affirm all the questions listed in the general information.



NOTICE!

Damage to device from penetration of liquids.

- ▶ Do not deposit the Xplorer pipette with a filled pipette tip.
- ▶ Do not allow any liquids to penetrate the inside of the housing.
- ▶ If liquid has penetrated the inside of the housing, have the upper part of the Xplorer pipette repaired only by service partners of Eppendorf AG. Contact your responsible sales office before returning a product.

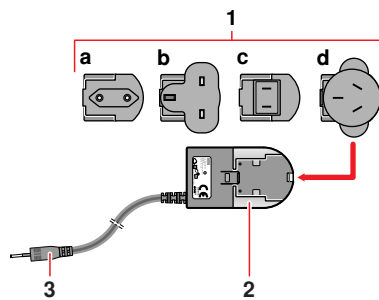
3.3 Information on product liability

In the following cases, the protection provided by the device may be impaired. The liability for the function of the device passes to the operator if:

- The device is not used in accordance with the operating manual.
- The device is used outside of the range of application described in the preceding chapters.
- The owner has made unauthorized modifications to the device.

4 Installation

4.1 Power supply assembly



1 Power plug adapters

- a EU
- b United Kingdom
- c USA
- d Australia

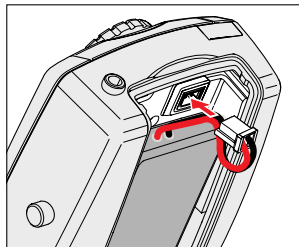
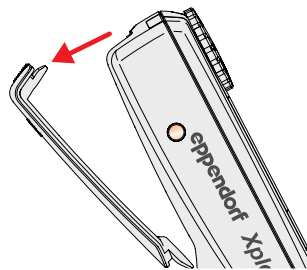
2 Power supply

3 Charging plug

- ▶ Fit the power plug adapter required for your power supply into the opening of the power supply. In the event of any doubt which power plug adapter should be used for the power supply unit, you should ask an electrician for advice.

4.2 Inserting the Rechargeable lithium polymer battery

Insert the rechargeable lithium polymer battery as follows:



1. Open the rechargeable battery compartment cover.

2. Insert the rechargeable lithium polymer battery.
3. Connect the plug of the rechargeable lithium polymer battery to the connector socket.
4. Close the rechargeable battery compartment cover.

4 Installation

4.3 Charge the rechargeable battery



Use of incorrect power supplies may result in fatal injuries and damage to the device.

Use of incorrect power supplies may result in overheating, burning, melting, short-circuiting of the Xplorer pipette or similar damage.

- ▶ Only use the supplied power supply for charging the device. You can recognize the correct power supply unit by the Eppendorf logo and the device name on the power supply.



Loss of full rechargeable battery charging capacity if charged incorrectly.

The supplied rechargeable battery is not charged completely. If the rechargeable battery is not charged completely before it is used for the first time, its charging capacity will remain permanently greatly reduced. The rechargeable battery will only achieve its full capacity after a few discharge/charge cycles.

- ▶ Charge the rechargeable battery for at least three hours before it is used for the first time.
- ▶ Do not charge the rechargeable battery in a hot location (>60 °C).
- ▶ Only charge the rechargeable battery using the supplied power supply.



To identify the power supply unit, each unit is provided with a label with the names "Multipette stream/Xstream", "Repeater stream/Xstream" and "Xplorer". The power supply unit is designed for the range from 100 - 240 V.

eppendorf 4986 603.005
Multipette® stream/Xstream
Repeater® stream/Xstream
Xplorer™

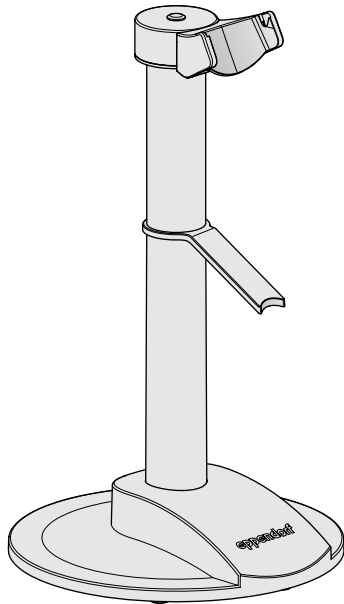
Recharging the rechargeable battery

1. Insert the assembled power supply unit (order number 4986 603.005) into a power outlet.
2. In the Xplorer pipette check whether a rechargeable battery is inserted and connected.
3. Insert the charging plug of the power supply unit into the connector socket of the Xplorer pipette. The display briefly shows the connection with the power supply unit. The charging process is indicated in the display by a flashing rechargeable battery symbol. If the rechargeable battery is almost completely discharged, the display will only switch on after a slight delay.
4. Charge the rechargeable battery for at least three hours.
 The rechargeable battery will only achieve its full capacity after a few discharge/charge cycles.

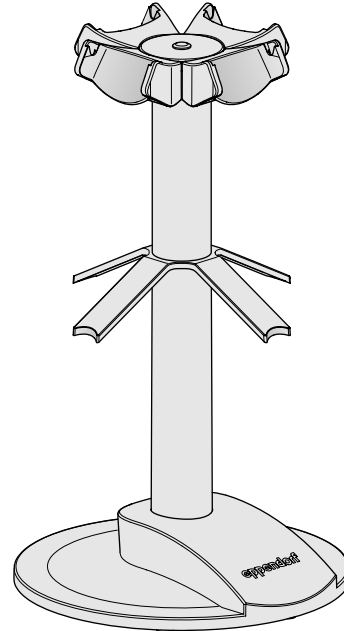
4 Installation



For storing and charging the single-channel and multi-channel Xplorer pipettes, you can alternatively use a series 4880 charger stand or a charging carousel (see ordering information on the Xplorer CD).



Charging stand 4880



Charging carousel 4880

5 Operation

5.1 Principle of operation

Each Xplorer pipette has 5 different operation modes and a higher-level mode for configuring the Xplorer pipette. The adjustable parameters and the operational procedures differ in the operating modes.

During operation, the piston in the pipette is moved according to how the rocker is actuated. When you press the rocker up, the piston in the pipette moves up. Liquid can be aspirated into the attached pipette tip. When you press the rocker down, the piston in the pipette moves down. The liquid is aspirated into the pipette tip is dispensed.

Press the **Edit** softkey to open the edit mode of the selected operating mode. You can change the parameter outlined and marked in red here with the rocker.



Special operating sequences with an electric pipette are possible with dispensing with the rocker. For example, you can abort a piston movement in the **Dis**, **Pip** and **P/M** modes at any time by pressing the rocker in the other direction. In the **Ads** and **Man** modes you can abort the piston movement by releasing the pressed rocker. After the piston has been stopped, you can either continue the aspiration or the dispensing process by pressing the rocker in the corresponding direction.

If the piston is in the basic position, you can repeat the blow-out (blow) at any time by pressing the rocker down.

Controlling the piston movement according to how the rocker is actuated ensures that the piston only moves in the pressed direction.

5.2 Operating modes

You can set the desired operating mode using the selection dial.

The following operating modes are available:

Ads	Automatic dispensing
Dis	Dispensing
Pip	Pipetting
P/M	Pipetting and Mixing
Man	Manual pipetting
Opt	Options

5.3 Switching the pipette on and off

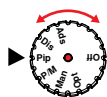


The Xplorer pipette automatically switches to standby mode after a certain period of inactivity. Press any key to reactivate the display.

Switch-on

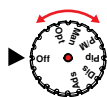


1. Press any key to activate the pipette.



2. Turn the selection dial so that the arrow points to an operating mode.

Power off



▶ Turn the selection dial so that the arrow points to **Off**.

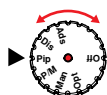
5 Operation

5.4 Preparing the Xplorer

Before dispensing can commence, you first need to select an operating mode, set its dispensing parameters, and attach a pipette tip(s) to the Xplorer pipette.

5.4.1 Selecting the operating mode

The arrow left next to the selection dial shows the current operating mode.



- ▶ Set the desired operating mode using the selection dial.

5.4.2 Set the parameter (edit mode)

Change the parameters as follows:

1. Press the **Edit** softkey to open the edit mode.
2. Press the **Next** softkey to go to the next dispensing parameter.
3. Change the dispensing parameter marked in the display with the rocker.
4. Press the **End** softkey to save the changes, to exit the edit mode and to continue with dispensing.








If you want to cancel editing without saving the changes made, briefly turn the selection dial to another mode.



You can also open the edit mode during dispensing in order to change the dispensing parameters **Speed**, **Time**, **Cycles** and **Counter**.

Display	Parameter	Available in				
		Ads	Dis	Pip	P/M	Man
	Set volume Aspiration and dispensing volume. Can only be changed prior to liquid aspiration.			●	●	
	Set max. volume Maximum aspiration and dispensing volume. Edit like Set volume . Can only be changed prior to liquid aspiration. The set value appears after editing in the display next to Max.					●

5 Operation

Display	Parameter	Available in				
		Ads	Dis	Pip	P/M	Man
	Set volume/step Volume per dispensing step. Can only be changed prior to liquid aspiration.	•	•			
	Aspiration speed Eight aspiration speed levels are available. The higher the numerical value, the higher the speed. Can be changed during operation. Aspiration speed is also automatically approximately used for the blow-out (blow).	•	•	•	•	•
	Dispensing speed Eight dispensing speed levels are available. The higher the numerical value, the higher the speed. Can be changed during operation. Dispensing speed is also automatically approximately used for the blow-out (blow).	•	•	•	•	•
	Set time Interval between the dispensing step (0.1 s to 10 s).	•				
	Number of steps The available number of dispensing steps depends on the setting for Set volume/step and is automatically set to the maximum number when Set volume/step is edited. The remaining dispensing steps are displayed during operation.	•	•			

5 Operation

5

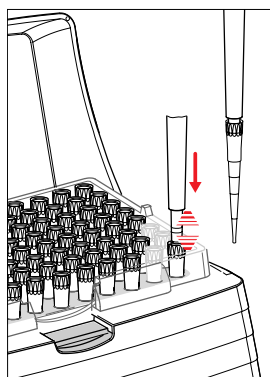
Operation

Display	Parameter	Available in				
		Ads	Dis	Pip	P/M	Man
	<p>Set counter</p> <p>The counter counts the number of dispensing operations performed. The numerical value of the counter is increased by 1 when the piston reaches the basic position after dispensing. You can also change this value during operation by going to the edit mode with the rocker.</p> <p>If the piston is in the basic position, you can alternatively set the counter to 0 by turning the selection dial forward or backward.</p> <p>You can switch the counter on and off in the Options.</p>			●		
	<p>Mixing volume</p> <p>The mixing volume used after pipetting. If you change the pipetting volume under Set volume, the mixing volume is also changed accordingly. You can edit mixing volume again afterwards when the Mix line has been reached.</p>				●	
	<p>Mixing cycles</p> <p>1 to 99 mixing cycles can be set for the mixing volume. The mixing cycles are counted down to 0. If you keep the rocker pressed down during mixing, after 0 has been reached, mixing is continued until the rocker is released. If you press the rocker up during mixing, the mixing process is stopped.</p> <p>The mixing speed matches the selected speed for aspiration and dispensing.</p>				●	

5 Operation

5.5 Using pipette tips

The liquid to be dosed is aspirated into pipette tips. It is recommended to use epT.I.P.S. The epT.I.P.S. pipette tips are available in different purities, as tips with and without a filter and as special tips. When using liquids whose surface tension is lower than that of water (e.g., due to the presence of a wetting agent in the liquid), the use of the special tips epT.I.P.S. LoRetention is recommended.



The pipette is only functional if a pipette tip has been attached. You can either attach the pipette tip by hand or directly insert the end of the pipette into a tip held in the tip storage box. If attaching a pipette tip by hand, it must be handled in such a way to avoid contamination and heating of the pipette tip.

The color of the rocker of the Xplorer pipette matches the color of the epT.I.P.S. tray.

- ▶ Fit the suitable pipette tip(s) on the tip cone, applying light pressure.

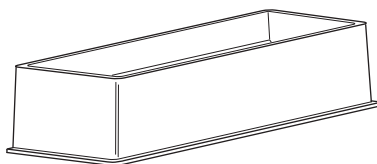
The pipette tip is securely fitted to the tip cone when it responds with spring-loaded action (exceptions: no spring-loading action with 5 mL and 10 mL single-channel pipettes and with 1 200 µL multi-channel pipettes).

You can deactivate the spring loading action of the tip cone in the case of single-channel pipettes (see p. 38).

5.6 Tips for correct pipetting

To achieve the highest precision and accuracy, we recommend that you follow the following hints:

5.6.1 Preparation



Reagent reservoir Tip-Tub

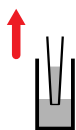
- ▶ Always place the liquid in a suitable tube. For multi-channel pipettes, we recommend the reagent reservoir Tip-Tub as a liquid reservoir. The liquid and the pipette should have approximately the same temperature.
- ▶ Use epT.I.P.S. LoRetention for solutions containing surfactants to minimize residual moisture in the tip after dispensing.
- ▶ Use ep Dualfilter T.I.P.S. to prevent contamination by aerosols in the tip.
- ▶ Use the pipette tips only once.
- ▶ Check whether the set aspiration and dispensing speeds are suitable for the liquid. The blow-out (blow) is carried out at approximately the same speed.

5 Operation

5

Operation

5.6.2 Aspirating liquid

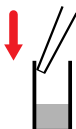


1. Wet the new pipette tip by aspirating and dispensing the liquid to be pipetted one to three times.
2. Immerse the pipette tip into the liquid vertically approx. 4 mm during aspiration.
3. Press the rocker up to aspirate liquid. Maintain the immersion depth, so that no air is aspirated accidentally.
4. After aspiration, keep the pipette tips in the liquid for approx. 3 seconds in the case of large volumes ddd.
5. After aspiration, pull the pipette tip slowly out of the liquid.
6. Wipe the pipette tip slowly against the tube wall to ensure that no outer wetting remains on the pipette tip.

5.6.3 Dispensing liquid



1. When dispensing liquid, place the pipette tip at a slight angle against the wall of the tube.
2. Press the rocker down to dispense the liquid.
3. After dispensing, wait until no more liquid is dispensed.
4. Press the rocker down again to trigger the blow-out (blow).



The following information applies especially to high viscous solutions:

- ▶ During the blow-out (blow), keep the rocker pressed down if the liquid is flowing out at a slow rate so that the liquid can flow out safely. If you keep the rocker pressed during the blow-out (blow), the piston in the pipette will remain at its lowest position.
- ▶ If present, wipe any outer wetting against the wall of the tube, while holding the rocker pressed down.
- ▶ Leave the dispensing vessel with the rocker pressed down. Only release the rocker outside of the dispensing vessel. The piston only moves to its basic position when you release the rocker.
- ▶ To repeat the blow-out (blow) if necessary, press the rocker down again.



Stopping the piston movement

Pressing the rocker in the other direction when the piston is still moving will stop the piston movement. You can then move the piston either up or down by pressing the rocker in the corresponding direction. A mixing process is aborted by pressing the rocker up.

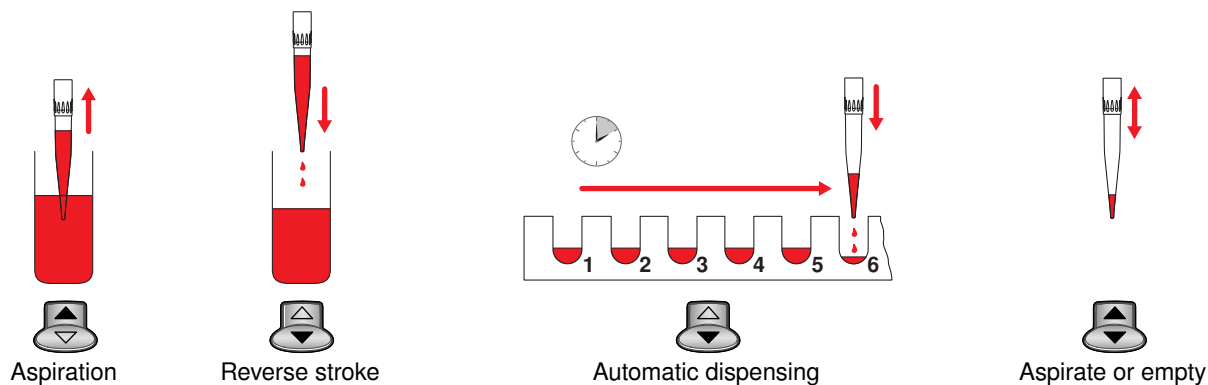
Operating modes with the rocker pressed down: In the **Man** mode the ongoing piston movement is immediately stopped by releasing the rocker. In the **Ads** mode an ongoing dispensing step is completed after the rocker is released. The next dispensing step is only performed when the rocker is pressed accordingly.

5 Operation

5.7 Automatic dispensing

The **Ads** mode is used to aspirate a liquid and dispense it in partial volumes of equal size in a selected interval.

The reverse stroke and remaining stroke are triggered before or after the dispensing steps. These additional volumes may result in volume limits when using filter tips (see p. 31).



1. Prepare the Xplorer pipette (see *Preparing the Xplorer* on p. 20).
2. Press the rocker up to aspirate liquid.
Then follow the instructions in the display.



To abort dispensing, you can press the **Empty** softkey. The tip is completely emptied.

3. Press the rocker down to trigger the reverse stroke.
4. Keep the rocker pressed for the duration of dispensing. The following dispensing steps will be triggered after the first dispensing step with the time interval that has been specified in the **Time** parameter.



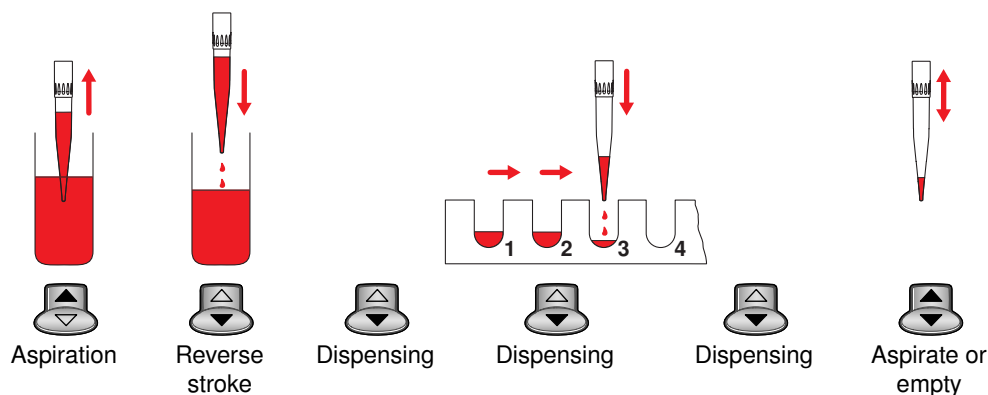
When you release the rocker, an ongoing dispensing operation is still ended. The display shows the remaining dispensing operations under **Steps**. Press the rocker again to continue dispensing.

After dispensing, decide whether the residual liquid should be dispensed or liquid should be aspirated again.

- ▶ **Liquid aspiration:** Press the rocker 1x up.
- ▶ **Liquid dispensing:** Press the rocker 2x down.

5 Operation

5.8 Dispensing



The **Dis** mode is used to aspirate a liquid and dispense it individually in partial volumes of equal size.

The reverse stroke and remaining stroke are triggered before or after the dispensing steps. These additional volumes may result in volume limits when using filter tips (see p. 31).

1. Prepare the Xplorer pipette (see *Preparing the Xplorer on p. 20*).
2. Press the rocker up to aspirate liquid.



To abort dispensing, you can press the **Empty** softkey. The tip is completely emptied.

3. Press the rocker down to trigger the reverse stroke.
4. Press the rocker down again for each dispensing operation. The display shows the remaining dispensing steps under **Steps**.

After dispensing, decide whether the residual liquid should be dispensed or liquid should be aspirated again.



An ongoing large dispensing volume operation can be stopped by pressing the rocker up.

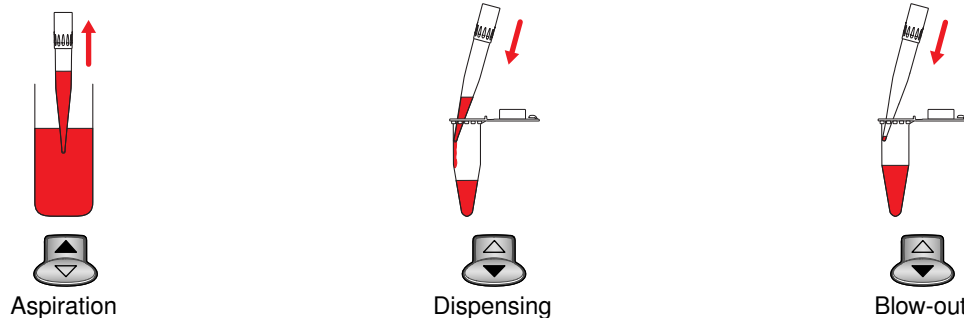
- ▶ **Liquid aspiration:** Press the rocker 1x up.
- ▶ **Liquid dispensing:** Press the rocker 2x down.

5 Operation

5.9 Pipetting

The **Pip** mode is used to aspirate a liquid and to dispense it again. The blow-out can be performed manually or automatically with the dispensing step.

5.9.1 Standard pipetting



1. Prepare the Xplorer (see *Preparing the Xplorer on p. 20*).
2. Press the rocker up to aspirate liquid.
3. Press the rocker down to dispense the liquid.
Keep the rocker pressed down during dispensing and the blow-out (blow) are to be performed in a single step.



Executing the blow-out (blow) immediately allows aqueous solutions to be processed faster. If you keep the rocker pressed down after dispensing and blow-out (blow) has been completed, the piston remains in the lowest position. The piston only moves to its basic position when you release the rocker. As a result, liquid flowing out at a slow rate can flow out completely. Or if immersed into the liquid of the destination tube, this liquid is not aspirated by accident.

4. If the piston is in the basic position, you can trigger the blow-out (blow) at any time by pressing the rocker down.
If you keep the rocker pressed during the blow-out (blow), the piston moves to the lowest position and remains there until the rocker is released.



It is possible to stop the aspiration or dispensing of liquids at any time by pressing the rocker in the other direction. The display shows the volume present in the pipette tip after the respective operation has been stopped.

You can then continue with liquid aspiration or dispensing.



The number of dispensing steps performed can be counted with a counter (**Counter**). The counter can be activated (**Counter**) if desired (see p. 30).

5 Operation

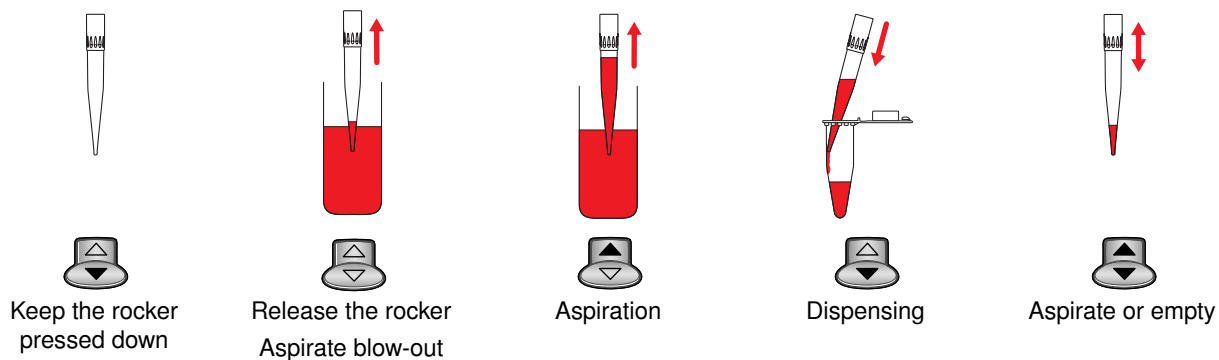
5

Operation

5.9.2 Reverse pipetting



Reverse pipetting is useful for plasma, serum and other liquids with a high protein content. *Reverse pipetting* is not necessary when pipetting aqueous solutions.



With reverse pipetting, more liquid is aspirated by using the blow-out than with standard pipetting. These additional volumes may result in volume limits when using filter tips (see p. 31). During dispensing, the blow-out (blow) does not belong to the dispensing volume.

Proceed as follows.

1. Keep the rocker pressed down.
2. Immerse the pipette tip into the liquid.
3. Release the rocker to aspirate the blow-out.
4. Press the rocker up to aspirate the dispensing volume.
5. Place the pipette tip on the wall of the destination tube.
6. Press the rocker down to dispense the liquid.
7. Remove the pipette tip from the destination tube. There is still residual liquid in the tip.

There are two courses of further action:

Aspirate the same liquid from the same reservoir tube.

- ▶ Press the rocker up again to aspirate the same liquid. The residual liquid in the tip is used for further processing.

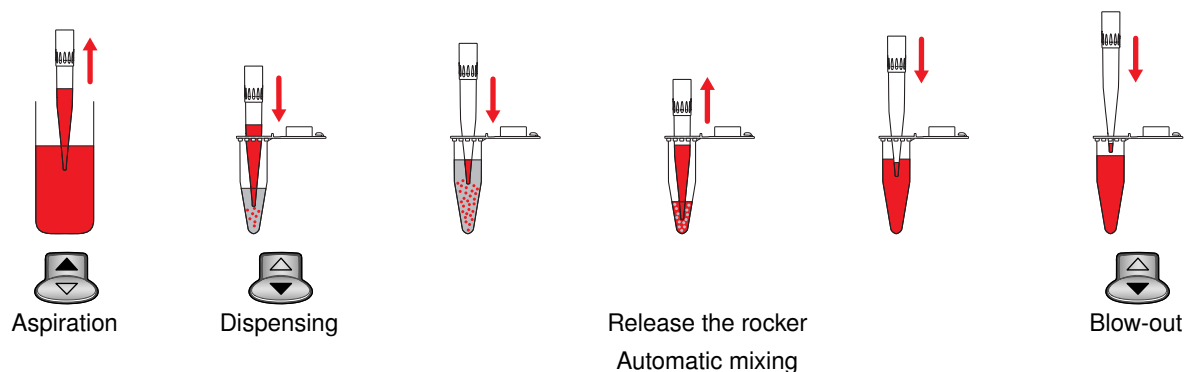
Dispense a different liquid

1. Press the rocker down to discard the residual liquid in the tip.
2. Eject the pipette tip.

Use a new pipette tip for the next dispensing operation.

5 Operation

5.10 Pipetting and mixing



The **P/M** mode is used to aspirate a liquid and to dispense it again. Afterwards an adjustable number of mixing cycles is automatically triggered. The mixing cycles can be continued as often as required.

1. Prepare the Xplorer pipette (see *Preparing the Xplorer on p. 20*).
2. Press the rocker up to aspirate liquid.



Stopping dispensing

Press the rocker down to stop aspiration. Press the rocker up to stop dispensing or the current mixing cycles.

3. Press the rocker down to dispense the liquid and to start the selected mixing cycles.
The mixing cycles shown in the main field of the display under **Cycles** are reduced with each cycle by **1**.



If required, you can keep the rocker pressed to perform an unlimited number of mixing cycles. When you release the rocker, the ongoing mixing cycle is ended after the piston has reached its basic position.

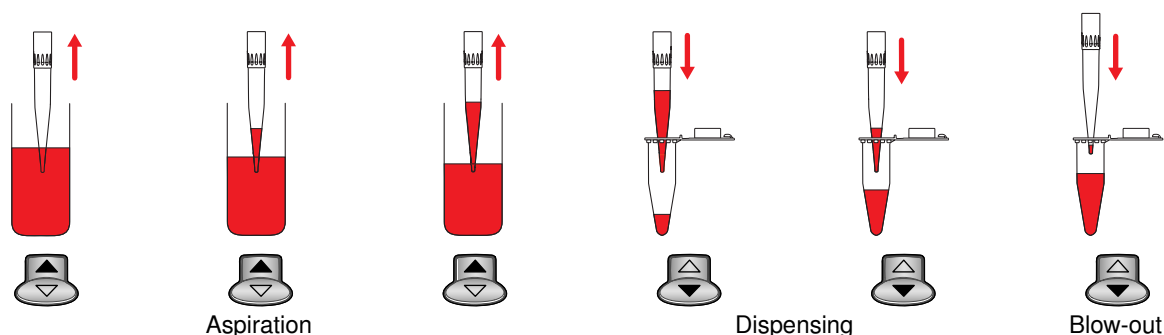
4. After the mixing process, press the rocker down to trigger the blow-out (blow).
If you keep the rocker pressed during the blow-out, the piston moves to the lowest position and remains there until the rocker is released.

5 Operation

5

Operation

5.11 Manual pipetting



In the **Man** mode the Xplorer pipette is used like a manual pipette. The maximum aspiration volume can be limited if required. Aspiration can be stopped or continued or the direction changed as often as required.



The amount of liquid aspirated is limited to the volume selected in editing mode. The volume selected in editing mode appears in the main field of the display to the right next to **Max**.

1. Prepare the Xplorer pipette (see *Preparing the Xplorer on p. 20*).
2. Keep the rocker pressed up or down to aspirate or dispense liquid. The piston movement stops when you release the rocker.
The display shows the liquid volume in the pipette tip.
You can switch between liquid aspiration and dispensing as often as required.
3. If the piston is in the basic position, you can trigger the blow-out (blow) at any time by pressing the rocker down.
If you keep the rocker pressed during the blow-out, the piston moves to the lowest position and remains there until the rocker is released.

5.12 Setting options

In the **Opt** mode you can set the following options which are applicable to all operating modes. Proceed as follows:

1. Move the selection dial to **Opt**.
2. Select the desired option with the rocker.
3. Press the **Select** softkey to open the option.
Follow the user prompts in the display.
4. Press the **End** or **Back** softkey to exit an option.
5. Turn the selection dial to an operating mode to exit the options and to continue with dispensing operations.



If required you can press the **Help** softkey to access information on the marked parameter.

5 Operation

5.12.1 General help

This describes the elementary steps for all modes. This option does not contain any adjustable parameters. The help texts in the Xplorer are not a substitute for reading the operating manual.

5.12.2 Volume limit

This limits the aspiration volume in all dispensing modes.

Use the volume limit in the following cases:

- For strongly foaming solutions in order to prevent contamination of the tip cone or the protection filter.
- When using epDualfilter T.I.P.S. in the **Ads**, **Dis** and **Pip** modes during reverse pipetting. With these three versions, there is the risk during aspiration that the liquid may come into contact with the Dualfilter because of the greater volumes - for blow-out and residual stroke.
- For pipette tips or filter tips whose aspiration volume is smaller than the nominal volume of the Xplorer pipette.

After setting a volume limitation, a message will appear in the display when the volume limit has been reached when editing the **Pip**, **P / M** and **Man** operating modes. In the **Dis** and **Ads** modes, the number of possible dispensing steps is automatically limited.

ep Dualfilter T.I.P.S.	Volume limit	
	Ads/Dis	Reverse Pipetting
10 µl	not required	not required
100 µl	not required	not required
300 µl	not required	260 µL
1 000 µL	not required	950 µL
1 250 µL long*	not required	1 130 µL
5 mL	4.9 mL	4.6 mL**
10 mL*	9.75 mL	8.5 mL**
<p>* To increase the dispensing accuracy of these filter tips, we recommend the use of the adjustment epTIPS long. The specified volume limit applies to the changed adjustment.</p> <p>** We also recommend this volume limit for "reverse pipetting" when using the 5 mL and 10 mL epT.I.P.S. without filter.</p>		

When using filter tips of other manufacturers other volume limits may apply. The volume limit is different depending on the tip geometry and the position of the filter in the tip.

The volume limit is dependent on the aspirated additional volumes of the Xplorer pipette. With the Xplorer the individual nominal volumes result in different additional volumes.

5 Operation

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Operation

Xplorer Single-channel and multi-channel	Additional volumes during aspiration	
	Ads/Dis	Reverse Pipetting
10 µl	approx. 0.6 µL	approx. 2 µL
100 µl	approx. 7 µL	approx. 20 µL
300 µl	approx. 20 µL	approx. 60 µL
1 000 µL	approx. 65 µL	approx. 200 µL
1 200 µL*	approx. 140 µL	approx. 220 µL
5 mL	approx. 0.3 mL	approx. 1 mL
10 mL	approx. 0.55 mL	approx. 1.8 mL
* only available as 8-channel		

5.12.3 Counter

The counter provides information on the performed dispensing operations in the **Pip** mode. You can switch the counter on and off with the rocker. After you select the **Pip** mode, an activated counter shows **0**. You can change the value in the **Pip** mode.

5.12.4 Ejector reset

When (**ON**) is activated, the piston moves to the basic position when a filled pipette tip is ejected.



Unintended dispensing when the Ejector reset option is activated.

- ▶ When working with a removed ejector sleeve, set the Ejector reset option to **OFF** to prevent unintended dispensing from the pipette tip in case the ejector is accidentally pressed .

5.12.5 Sound level

You can change the sound volume of the acoustic signals. If the volume has been set to **0**, the tone is switched off and no loudspeaker symbol appears in the header of the display.

5.12.6 Brightness

The display brightness can be adjusted to meet your requirements.

5 Operation

5.12.7 Adjustment



Changing the adjustment will change the dispensing volumes and will affect the accuracy of the Xplorer pipette! Carry out a gravimetric test of the adjustment.



Each Xplorer pipette whose adjustment has been changed must also be marked with a clearly visible label indicating the type of change made. This way you can ensure that other users will be informed of the changes to the adjustment, in addition to the information provided in the header of the display.

You can overwrite a selected adjustment by selecting another adjustment. The symbols which then apply to the new adjustment are displayed in the header of the display.



Instructions on performing the adjustment can be found in the document *Adjustment* on the Xplorer CD.

You can adapt the adjustment of the Xplorer pipette to meet your requirements. If you have changed the factory setting, the header of the display will show the "wrench" symbol indicating the change made by the user to the adjustment, followed by at least one other symbol. Before changing an adjustment, make sure to read the chapters "Display" (see p. 11) and "General information about adjustment" (see p. 45).

The following adjustments can be selected:

- **Factory settings**

Resets the adjustment to the factory setting.

- Liquid type **Ethanol 75%**

The factory setting is changed by a factor in order to allow 75% ethanol to be dispensed with higher accuracy. The internally used factor takes into account the density and the following work technique in the **Pip** mode:

1. Wet the tip with liquid three times at room temperature. Hold the Xplorer pipette in an upright position. Avoid outer wetting during dispensing.
2. Use speed level 5 (standard setting) for aspiration and dispensing.
3. Dispense liquid against the tube wall of the destination tube.
4. Trigger a blow-out (blow) approx. 2 seconds after dispensing. Then eject the tip.

- Liquid type **Glycerol 50%**

The factory setting is changed by a factor in order to allow 50% glycerol to be dispensed with higher accuracy. The internally used factor takes into account the density of the 50% glycerol and the same work technique as described previously for **Ethanol 75%** in the **Pip** mode.

- **epTIPS long**

In addition to the "standard tips", a second longer tip is available for most Xplorer pipettes. When **epTIPS long** is selected, the tip geometry of this longer tip is considered in the internal volume calculation. This reduces the systematic error of dispensing when using these tips.

5 Operation

Xplorer Nominal volume Volume range	color code Xplorer rocker	The adjustment for epTIPS long applies to		
		color code epT.I.P.S.	Model epT.I.P.S.	Length epT.I.P.S.
10 µL 0.5 - 10 µL	medium gray	light gray	20 µL long	46 mm
100 µL 5 - 100 µL	yellow	orange	300 µL	55 mm
300 µL 15 - 300 µL	orange	not available		
1 000 µL 50 - 1 200 µL	blue	dark green	1 250 µL long	103 mm
1 200 µL 50 - 1 200 µL	green	dark green	1 250 µL long	103 mm
5 mL 0.25 - 5 mL	purple	not available		
10 mL 0.5 - 10 mL	turquoise	turquoise	10 mL long	243 mm

The epT.I.P.S. specified here are also available as epDualfilter T.I.P.S..

- **Altitude**

At increased altitudes where there is a fall in air pressure the aspiration volume of a piston-stroke pipette is reduced. The average air pressure at the corresponding height is used to correct the stroke. The altitude can be selected in 250 m (820 ft) steps. The maximum altitude that can be selected is 5 000 m.

The Xplorer pipette is set to an altitude of 0 m on delivery. This is the factory setting.



The liquid type (**Ethanol 75%** or **Glycerol 50%**), **epTIPS long** and **Altitude** options can be combined.

For the following adjustments you must know the exact density of the solution to be dispensed. The recording of the weighing results requires the use of a fine balance with a high resolution. Dispensing operations under 10 µL require a balance with a resolution of 0.001 mg. An existing 1-3 point adjustment can be changed.

- **1-point adjustment**

After you enter the density, the selected volume and the corresponding weighing results, the Xplorer pipette will determine a correction factor. The factor is only correct for the selected volume and the selected work technique. However, the factor is used for the entire volume range of the Xplorer pipette. You must carry out a gravimetric test to check the validity of the factor.

- **2-point adjustment**

After you enter the density, two different volumes and the corresponding weighing result, the Xplorer pipette will determine a correction factor. The factor is only correct for the selected volume range and the selected work technique. However, the factor is used for the entire volume range of the Xplorer pipette, i.e., also below and above the two measuring points. You must carry out a gravimetric test to check the validity of the factor.

- **3-point adjustment**

After you enter the density, three different volumes and the corresponding weighing results, the Xplorer pipette determines two correction factors. The factors are correct from measuring point to measuring point in the selected volume sections and for the selected work technique. The respective factor is, however, also used below and above the first or third measuring point. You must carry out a gravimetric test to check the validity of the factors.

5 Operation



Each Xplorer pipette whose factory setting has been changed by selection or by performing the above-mentioned adjustments must be gravimetrically tested by you. This is the only way of ensuring that the selected adjustment meets the requirements regarding errors.

5.12.8 Language

- ▶ Mark a language in the selection list with the rocker.
The selected language is only activated after the completion of the language selection.



When selecting a language, the softkeys and the language selection list are always in English. This makes it easier to return to the desired language should you select an unknown language by mistake.

5.12.9 Personalization

You can use the rocker to select letters and numbers to personalize the pipette. Your personal settings are displayed when you activate the pipette from sleep mode or after a hardware reset. When the Xplorer pipette is delivered the personalization is **My Xplorer**.

5.12.10 Service

The options listed here are not needed during normal routine use. A selection list offers the following service options:

- **Software version:** Display of the software which is valid here.
- **Parameter version:** Display of the applicable data record for this Xplorer. The data record is different for the various volumes.
- **Initial reset:** After a confirmation request appears, all adjustment settings are reset to the factory settings and all entries are reset to the "default values". This type of reset may be useful when passing on the Xplorer pipette to another workstation.
- **Check procedure:** For service personnel only. Not released for general use.
- **Software update:** For service personnel only. Not released for general use. If the IRDA does not receive a signal within 30 seconds, the opened option is automatically closed.
- **IRDA:** For service personnel only. Not released for general use.

1. Turn the selection dial until the arrow points to **Opt**.
2. Press the rocker up or down to mark a parameter.
3. If required, press the **Help** softkey to read information on the marked parameter.
4. Press the **Select** softkey to open the marked parameter.
5. Press the rocker up or down to change the parameter or to select a parameter in the new lower level.
6. When the sublevel is opened, press the **Select** softkey, and follow the user prompts shown in the display.
7. Press the **End** or **Back** softkey until the display with the name **Option** appears again in the status line (second field from the top).
8. Turn the selection dial to an operating mode to continue with dispensing.

6 Maintenance

- All single and multi-channel lower parts are wear parts. Clean them after contamination, use of aggressive chemicals and/or heavy stress. If the lower parts are worn or damaged, replace the respective parts.
- Faulty dispensing results are sometimes due to lack of maintenance.

6.1 Cleaning



NOTICE!

Damage to device from unsuitable cleaning fluids or sharp or pointed objects

Unsuitable cleaning fluids can damage the display, surfaces and printing.

- ▶ Never use corrosive cleaning fluids, strong solvents or abrasive polishes.
- ▶ Check the compatibility with the materials used.
- ▶ Do not use acetone to clean the Xplorer pipette.
- ▶ Do not use sharp objects to clean the Xplorer pipette.

Remove any contamination on the outside of the Xplorer pipette as follows:

- ▶ Wet a cloth with a mild cleaning fluid and water and remove the contamination.
- ▶ To remove heavy contamination resulting from liquid penetration, disassemble the lower part of the pipette (see *Xplorer pipette disassembly and assembly on p. 38*) and clean it with demineralized water.

Relubricate the piston sealing rings after contamination, use of aggressive chemicals and/or heavy stress. Remove the old grease before relubricating.

6.2 Sterilizing or disinfecting the pipette



NOTICE!

Damage to device from incorrect handling.

- ▶ Only autoclave the lower part of the Xplorer pipette.
- ▶ Do not use any additional disinfectants, decontamination agents or sodium hypochlorite when autoclaving the lower part.
- ▶ When autoclaving the lower part, make sure that the temperature does not exceed 121 °C.
- ▶ Before using disinfecting agents or decontaminating agents, test for material compatibility and check the manufacturer's instructions about chemical resistance. Consider also the material of the pipette.

6.2.1 Autoclaving

All Xplorer lower parts are steam autoclavable.

Before autoclaving

1. Remove any contamination from the exterior and in the lower part (see *Xplorer pipette disassembly and assembly on p. 38*).
2. If you remove grease, only relubricate the piston seal slightly with the grease specified in the ordering information (see the Xplorer CD).

Procedure

Follow the operating manual of the autoclave manufacturer.

1. Autoclave at 121 °C, 20 minutes, 1 bar pressure.
2. Put the lower part into the autoclave in such a way to ensure that the temperature at the lower part does not exceed 121 °C.
3. You can put the lower part into the autoclave as a whole unit or as individual parts.
4. Make sure that no parts of disassembled lower parts are confused during subsequent assembly (recommendation: use a plastic beaker for each lower part).

6 Maintenance

After autoclaving

1. Cool the lower part down to room temperature and leave to dry. The piston does not need to be greased following autoclaving.
2. Carry out a gravimetric test to check that the Xplorer pipette is functioning.

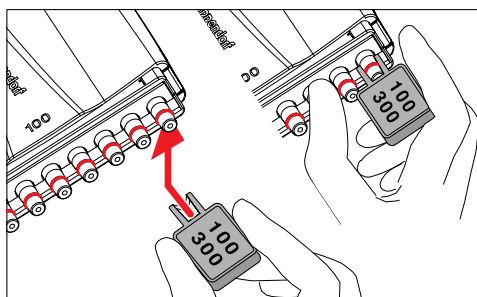
6.2.2 Disinfection

1. Carefully wipe off the outer surfaces with disinfectant, DNA/RNA decontamination agents or 70% isopropanol.
2. You can wipe the outside of the tip cone and the ejector sleeve with a sodium hypochlorite solution of 4%.
3. After the exposure time of the sodium hypochlorite solution has elapsed, thoroughly remove it using demineralized water.

6.3 Replacing O-rings

The 100 μL , 300 μL and 1 200 μL multi-channel lower parts are equipped with O-rings. These are wear parts. Replace old, worn or damaged O-rings. Defective O-rings result in the incorrect positioning of the tips and in dispensing errors.

6.3.1 Removing the O-ring



1. Push the opening of the O-ring tool (included in the delivery package) against the tip cone from the side so that the sharp edge in the opening of the O-ring tool is positioned on top of the o-ring. Do not slide the O-ring tool onto the cone! The figure shows the O-ring tool for 100 μL and 300 μL . A separate O-ring tool is available for 1 200 μL .
2. Supporting the O-ring tool with your thumb, push it firmly against the tip cone. This O-ring is cut in one place.
3. Remove the O-ring tool and the O-ring from the tip cone.

6.3.2 Mounting a new O-ring

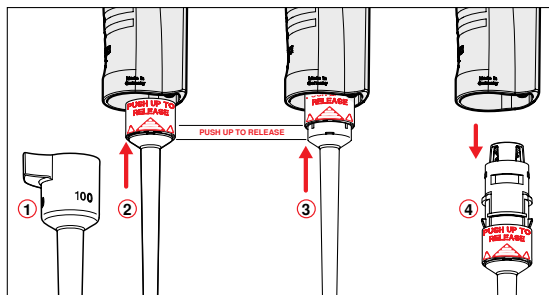
1. Fit the mounting aid (shortened pipette tip, included in the delivery package of the O-rings) on the tip cone.
2. Push the new O-ring over the tip onto the tip cone.
3. Check that the pipette tips are correctly positioned. Ensure that the tips are tightly sealed and properly aligned.

6 Maintenance

6.4 Xplorer pipette disassembly and assembly

6.4.1 Single-channel up to 1 000 µL

Removing the lower part



1. Keep the ejector pressed and remove the ejector sleeve ①.
2. ② and ③: on the lower part, slide the ring marked "PUSH UP TO RELEASE" up by about 5 mm until the lower part comes off.
3. ④: take the lower part out of the upper part.

Deactivating the spring-loading action: installing the locking ring

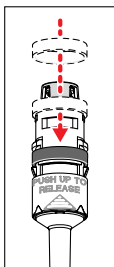
For the following dispensing tasks it can be helpful to deactivate the spring loading action of the tip cone.

- A pipette tip is to be used for a long period.
- The pipette tip is slightly bended during dispensing.

Deactivating this action can also be helpful for pipette tips which are not designed for the Eppendorf pipette tip cone.

The spring loading action of the tip cone can be deactivated by installing the locking ring. The locking ring is included in the delivery package.

1. Push the black locking ring onto the lower part from the top. Slightly squeeze the clamps on the lower part when doing so.
 2. Insert the lower part into the upper part until it engages audibly.
 3. Keep the ejector pressed. The ejector rod protrudes from the upper part.
 4. Fit the ejector sleeve onto the ejector rod. It is fitted correctly if it engages slightly.
- Remove the locking ring to reactivate the spring-loading action.



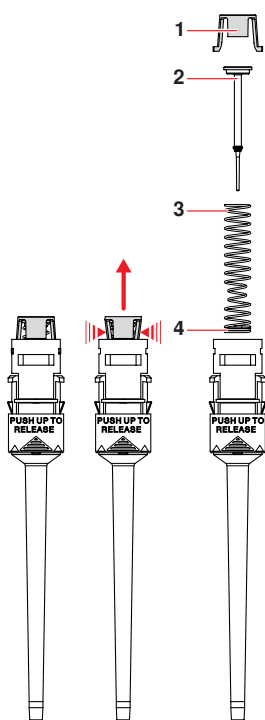
6 Maintenance

Opening and assembling the lower part ($\leq 1\ 000\ \mu\text{L}$)



To avoid confusion of parts, only disassemble and assemble one pipette at a time.

The piston must be in its basic position before separating the lower and upper part. If necessary, press the rocker down to move the piston to its basic position.



Opening the lower part:

1. On the piston mount (1) push the locking mechanisms together slightly.
2. Remove the piston mount.
3. Remove the piston (2) and the piston spring (3). The piston is under spring tension. Pistons and piston springs will look different for the individual volume versions.

Assembling the lower part:

1. Carefully guide the piston and the piston spring into the cylinder. Make sure that the piston is guided correctly in the piston spring and in the cylinder. There must not be any perceptible resistance. **Stop pushing as soon as any resistance is felt** This may indicate that the piston is not positioned correctly in the cylinder. There is a risk of bending the piston if too much force is applied. Carefully pull out the piston and repeat the process correctly. In the case of piston springs with double windings (4), these windings must point downwards.
2. Keep the piston and the piston spring pressed.
3. Keep the locking mechanisms on the piston mount pressed with the other hand.
4. Mount the piston mount in such a way that the two locking mechanisms engage in their retainers.
5. Gently press a pipette tip against the inserted piston. The piston must move down in the cylinder without any noticeable resistance.

Installing the lower part and ejector sleeve:

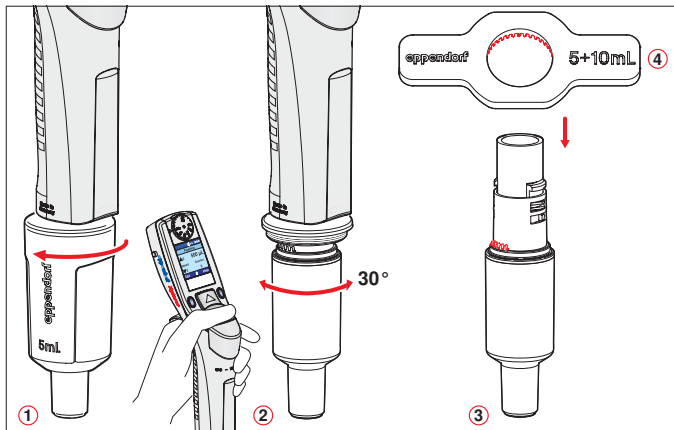
1. Insert the lower part into the upper part until it engages audibly.
2. Set the maximum volume and operate the rocker up and down several times. There should not be any unusual running noises.
3. Keep the ejector pressed. The ejector rod protrudes from the upper part.
4. Fit the ejector sleeve onto the ejector rod. It is fitted correctly if it engages slightly.
5. Carry out a gravimetric test of the systematic and random error (see *Technical data on p. 50*).

This test ensures that no parts were confused during assembly and that the pipette has been assembled correctly.

6 Maintenance

6.4.2 5 mL and 10 mL single-channel

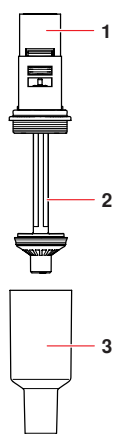
The piston must be in its basic position before separating the lower and upper part. Press the rocker down to move the piston to its basic position.



1. ①: unscrew the ejector sleeve.
2. ②: keep the ejector pressed and turn the lower part to the left or right by approximately 30°. Pull the lower part down to cancel the magnetic coupling of the lower part. The lower part is separated from the upper part.
3. ③: open the lower part: fit the pipette key ④ (included in the delivery package) onto the lower part. Hold the cylinder and unscrew it from the lower part. The cylinder with the tip cone is separated from the upper part of the lower part. The upper part of the lower part and the piston cannot be disassembled any further.

See the next figure.

The lower part consists of the following:



- 1 Upper part of the lower part
- 2 Piston (with seal)
Piston rod with magnet (covered here by 1 "Upper part of the lower part")
- 3 Cylinder and tip cone

The assembly is performed in reverse order. Make sure that the magnet on the piston in the lower part is coupled with the magnet on the spindle in the upper part. After the assembly:

- Carry out a gravimetric test of the systematic and random error (see *Technical data on p. 50*). This test ensures that no parts were confused during assembly and that the pipette has been assembled correctly.

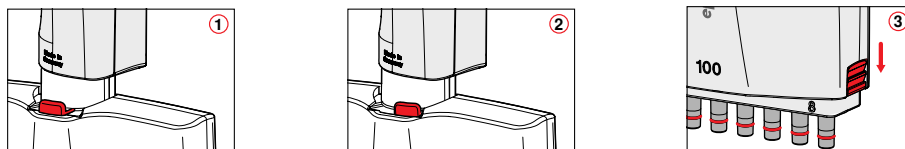


For the replacement of an ejector sleeve, the sizes 5 mL and 10 mL are delivered with an ejector sleeve and ejector carrier. The lower part has to be removed for the installation of a new ejector carrier.

6 Maintenance

6.4.3 Multi-channel

Loosen and open the 10 µL, 100 µL and 300 µL multi-channel lower part



1. ① and ②: slide the lever on the lower part to the left or right. Pull the lower part down to cancel the magnetic coupling of the lower part to the upper part.

This separates the lower part from the upper part so that it can be removed.

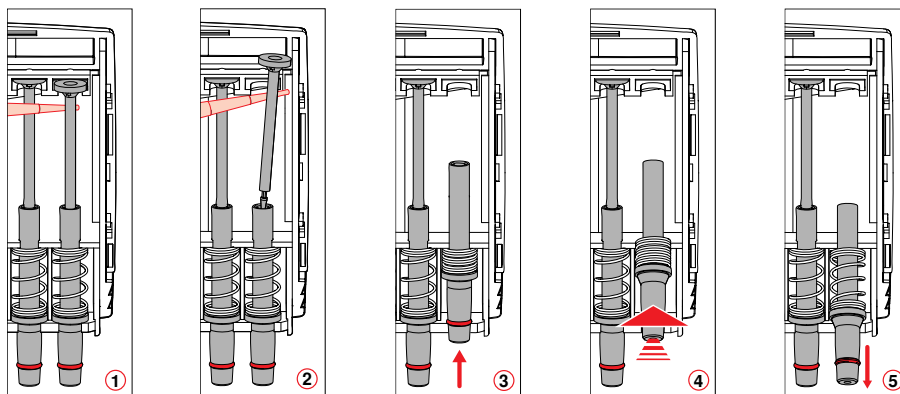
2. Put down the lower part with the lever facing downwards.
3. ③: slide the two latches (right and left at the side) down. Use a coin to do this. The lower part is still lying on the table with the lever facing downwards.

4. Remove the cover panel facing upwards with the integrated ejector rail.

Do **not** remove the ejector rail from the cover plate. The spring for the ejector rail could accidentally come off and get lost in this step.

Removing and installing channels

Channels must only be removed and installed if the multi-channel lower part is separated from the upper part! The channels in the lower parts consist of a piston, a cylinder and a spring. The channels for 100 µL and 300 µL are equipped with an O-ring at the tip cone (see *Replacing O-rings on p. 37*).



1. ① and ②: position a pipette tip under the piston and carefully take the piston off the upper rail.
2. Carefully pull the piston out in an upward direction. **Do not bend the piston.**
3. Hold the tip cone at the lower end and push it slightly upwards ③. This compresses the spring.
4. ④: lift the tip cone slightly and release it from the lower rail.
5. ⑤: relax the spring by letting the tip cone slide back again above the lower rail.
6. ⑥: take the tip cone with the cylinder and the spring out of the upper rail.

Before installation, slide the piston into the cylinder. Install the channels in reverse order.

6 Maintenance

Assembling the 10 - 300 μL multi-channel pipette

1. Fit the cover plate with the integrated ejector.
2. Push the latches upwards.
3. To mount, insert the lower part into the upper part until it audibly engages. Make sure that the magnet on the piston actuator in the lower part is coupled with the magnet on the spindle in the upper part (see p. 43).
4. Carry out a gravimetric test of the systematic and random error (see p. 50).
This test ensures that no parts were confused during assembly and that the pipette has been assembled correctly.

Loosening and opening the 1 200 μL multi-channel

The method of loosening the 1 200 μL lower part matches that of loosening the 5 mL or 10 mL lower parts.

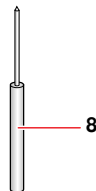
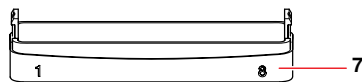
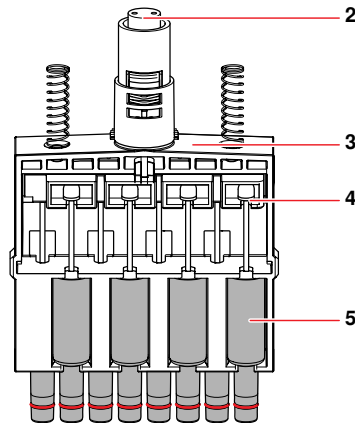
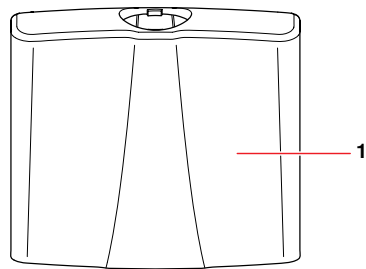
1. The piston must be in its basic position before loosening the lower part. Press the rocker down to move the piston into its basic position.
2. With the ejector pressed down, turn the lower part by approximately 30° and pull down to cancel the magnetic coupling. This releases the lower part from the upper part.



3. View the detached lower part from above. For this, slide the housing case down. Note the exact position of the red marked parts. **The red marked stops on the housing case and the red marked teeth on the inner part are adjacent.** If the stops and teeth are on top of each other after assembly, the housing case has been attached incorrectly.

6 Maintenance

Removing and installing 1 200 μ L channels



- 1 Housing case
- 2 Piston actuator
- 3 Inner part
- 4 Piston rod in the guiding rail of the piston actuator
- 5 Channel, consisting of a piston, a cylinder and a tip cone
- 6 Fixing strip
- 7 Base plate
- 8 Unlocking tool for 1 200 μ L lower part

Only disassemble the channels when the upper part is detached from the lower part.

1. Press the unlocking tool as far as it will go into the base plate.
The base plate can now be detached by pulling gently at the side - at the side with the unlocking tool inserted. This loosens the base plate on the other side. Remove the base plate.
2. Take the inner part out of the housing case.
3. Loosen the fixing strip from the inner part. To do this, push the fixing strip away from the inner part in the area near to the three catches of the fixing strip on the inner part.
4. Have a close look at the channel arrangement in the inner part. Four channels are accessible from each side. The tip cone of the channels is acentric to the cylinder. The channels on the opposite side are therefore positioned "mirror-inverted". Ensure that the channels are inserted so that they are aligned in the center again during subsequent assembly.
5. Completely press down the guiding rail for the piston rods. Press the piston rod lightly out of the guiding rail and remove the channels.

6 Maintenance

6. Before installation, slide the piston into the cylinder. Install the channels in reverse order in accordance with the previously mentioned instructions. After installing the channels, carefully push the guiding rail with the piston rods upwards to ensure that the magnetic coupling of the lower and upper part can be reestablished safely.
7. Insert the reassembled lower part into the upper part. The lower part automatically snaps into the upper part on insertion. Make sure that the magnet on the piston actuator in the lower part is coupled with the magnet on the spindle in the upper part.
8. Carry out a gravimetric test of the systematic and random error (see p. 50).
This test ensures that no parts were confused during assembly and that the pipette has been assembled correctly.

6.5 Maintenance

We recommend that you have all maintenance and servicing carried out by Eppendorf AG or Eppendorf service partners. No warranty is provided for any damage due to misuse or if the device has been opened by unauthorized persons.

7 General information on adjustment



NOTICE!

Incorrect dispensing volume with special liquids and from temperature differences.

Solutions which differ greatly from water in terms of their physical data, or temperature differences between the pipette, pipette tip and liquid, can result in incorrect dispensing volumes.

- ▶ Avoid temperature differences between pipette, pipette tip and liquid.
- ▶ Make sure that the temperature is constant, between 20 and 25°C and at $\pm 0.5^\circ\text{C}$.
- ▶ Check the dispensing volume and make sure that you can affirm all the questions listed in the general information.



Information on the random and systematic errors determined before delivery can be found in the enclosed **Eppendorf Certificate**. If the factory setting has been replaced by a different adjustment, this renders the validity of the **Eppendorf Certificate** invalid. If you reset the adjustment to the factory setting, the random and systematic errors determined before delivery and the enclosed **Eppendorf Certificate** will apply again.

The Xplorer pipette was adjusted before delivery and tested with aqua bidest. according to ISO 8655.

Changing the adjustment of the Xplorer pipette is sometimes recommended for solutions which are very different from water with regard to their density, viscosity, surface tension and/or vapor pressure etc. If the density of an aqueous solution changes by approximately $\pm 10\%$, for example because of the salt concentration, the volume will change by approximately $\pm 0.2\%$. This statement does not apply if other relevant properties of the liquid also change.

If the pipette is used at extremely high altitudes, it must be calibrated to the ambient air pressure. At 1 000 m above sea level, the volume error of a 100 μL pipette is about -0.3% .

When using tips which are very different to standard tips with regard to their geometry, changing the adjustment can improve the dispensing accuracy (systematic error).

You can reset a changed adjustment by means of a few simple steps.

Changes to the adjustment will not affect the dispensing precision (random error). Precision (random error) can be improved by replacing worn parts. Precision (random error) is also strongly influenced by handling.

Before making changes to the adjustment, you must check the existing adjustment in the factory setting with distilled water.

The actual volume can be checked by weighing:

$$\text{Actual volume} = \frac{\text{Mean value of the weighings}}{\text{Density liquids at weighing temperature}}$$

The density of distilled water is approx. 0.9982 $\text{mg}/\mu\text{L}$ at 20°C and 0.9965 $\text{mg}/\mu\text{L}$ at 27°C .

If the set volume corresponds to the actual volume, no correction is necessary.

If there is a difference between the actual volume and the set volume of distilled water, check the following:

- Is there any liquid dripping from the tip?
- Is the pipette tip fitted leak-proof?



Adequate leak tightness is ensured when no drop is formed at the pipette tip after aspiration of the nominal volume with distilled water and a waiting time of approx. 15 s. Hold the pipette vertically, making sure not to touch the pipette tip. Prewet the pipette tip several times.

- Is the tip cone undamaged?
- Are the piston and the cylinder leak-proof?
- Does the temperature of the pipetted liquid correspond to:
 - the temperature of the device?
 - the ambient air temperature?
- Is the weighing location free from drafts?

7 General information on adjustment

- Does the work method and pipetting speed permit complete aspiration and dispensing of the liquid?
- Has the correct numerical value for "Density liquids at weighing temperature" been used for the calculation of the actual volume?
- Is the set volume correct?
- For very small volumes (<10 µL): is the fine balance sufficiently sensitive (balance resolution: 0.001 mg)?
- Were original epT.I.P.S pipette tips used for testing?



Refer to the chapter "Technical data" in the operating manual for information on which pipette tip is to be used as the test tip for checking the technical data.

No adjustment changes are allowed unless you can answer all the questions with "yes".

In all other cases, the problems associated with the questions answered with "no" must be eliminated. If the problem is remedied by exchanging a complete lower part or other parts that have an effect on the volume, proper assembly must be verified by carrying out a gravimetric test. Refer to the technical data for the systematic and random errors to be met.

If you want to use the Xplorer to perform a 1 – 3 point adjustment for a liquid other than water, you must also refer to the points described above when determining the weighing results. Note in particular that the density of the test liquid must be determined exactly at the test temperature. The density is dependent on the temperature. The use of an incorrect density will result in an incorrect volume calculation.



When determining the weighing results and the measurement deviations, also refer to the instructions given in the document **Standard instructions for pipettes** on the Xplorer CD.

8 Troubleshooting

8.1 Hardware reset

This function resets the Xplorer pipette to its original state. Your saved settings are not lost.

- ▶ Press a pipette tip, or another pointed object, against the contact point in the center of the selection dial.

The display shows your personalization settings and the software version during a hardware reset.





If the piston is not in its basic position during the hardware reset, you will be prompted in the display to press the rocker down. Make sure that any liquid in the pipette tip is dispensed correctly.

8.2 Error search

Symptom	Possible cause	Solution
The display is dark	<ul style="list-style-type: none"> • The pipette is in sleep mode. • The rechargeable battery is not connected. • The rechargeable battery is discharged. 	<ul style="list-style-type: none"> ▶ Connect the rechargeable battery ▶ Press a softkey or the rocker. ▶ Charge the Xplorer pipette. <p>Note: If the rechargeable battery is almost completely discharged, the display will only switch on after a short charging time.</p>
Liquid is dripping from the tip and/or the dispensed volume is incorrect.	The pipette tip is loose or does not fit correctly.	<ul style="list-style-type: none"> ▶ Attach the tip firmly. ▶ Use epT.I.P.S.
	Liquid with high vapor pressure and/or different density.	▶ Wet the tip several times and adjust the pipette for the liquid used.
	Pipetted too quickly.	▶ Set a lower speed.
	Tip withdrawn from the liquid too early or too quickly.	▶ Withdraw the tip from the liquid slowly and with a time delay (of about 3 seconds for large volumes) after aspiration.
	Liquid dispensed without blow-out in Pip mode.	▶ Trigger blow-out after dispensing has been completed during standard pipetting applications.
	The piston is soiled or damaged.	▶ Clean the piston, relubricate slightly and/or replace.
	The tip cone is damaged.	▶ Replace the lower part or channel.
Liquid flows unevenly into or out of the tip.	The O-rings of the tip cones are damaged.	▶ Replace the O-rings (only 100 µL, 300 µL, 1 200 µL multi-channel).
	<ul style="list-style-type: none"> • The tip is damaged • The piston is soiled. • The seal is soiled. • The pipette is blocked. 	<ul style="list-style-type: none"> ▶ Use a new tip ▶ Clean the lower part. ▶ 5 mL and 10 mL sizes: replace the protection filter.
	The display shows a "wrench" in the left of the header.	The pipette has been adjusted for another liquid.

8 Troubleshooting

Symptom	Possible cause	Solution
No spring-loading action of the tip cone when taking up pipette tips.	Spring-loading action is blocked by a locking ring.	▶ Remove the locking ring again.
	Use a 5 mL, 10 mL single-channel pipette or a 1 200 µL multi-channel pipette.	No remedy. The tip cone of these sizes do not have spring-loading action.
	The rechargeable battery is highly discharged.	Confirm the message with the OK softkey. Complete the dispensing operation as quickly as possible and charge the rechargeable battery for 3 hours. You can continue dispensing with the power supply unit connected. Then charge for an additional 3 hours.
	The rechargeable battery is almost completely discharged. The remaining rechargeable battery capacity is only sufficient for displaying the information to the left. Dispensing is not possible.	The rechargeable battery must be charged for at least 15 minutes before further use. A charging time of 3 hours is recommended
Prior to aspiration the following appears temporarily: Selected volume not possible with stored adjustment!	A factor, which was determined during the adjustment of the Xplorer, leads to a very high stroke increase ddd. This high stroke increase limits the dispensing volume.	▶ Confirm the error message with the OK softkey. The only remedy is to change the adjustment. ▶ Make sure that you are authorized to carry out the adjustment.
For the selected volume the following appears temporarily: Volume limit XXXX µL/mL	The Volume limit option was used to limit the volume to the displayed value.	1. Make sure that your are allowed to change the Volume limit option. 2. Move the selection dial to Opt . 3. Select the Volume limit option.

Regularly check the precision and accuracy of the Xplorer pipette to avoid dispensing errors. You can use the "PICASO" software from version 2.3.18 for determining the maximum permissible systematic and random error. If the pipette is used at an extremely high location, it must be adjusted to the ambient air pressure (see *Adjustment on p. 33*).



You can find an SOP (Standard Operation Procedure) for the test on our website www.eppendorf.com or on the Xplorer CD.

9 Transport, storage and disposal

9.1 Decontamination before shipment

Decontaminate the pipette before shipping it to the authorized Technical Service for repairs or to your authorized dealer for disposal. Please note the following:



Risk to health from contaminated device

1. Follow the instructions in the decontamination certificate. It is available in PDF format on our homepage (www.eppendorf.com/decontamination) and on the enclosed CD.
2. Decontaminate all the parts you want to dispatch.
3. Enclose the fully-completed decontamination certificate for returned goods (including the serial number of the device) with the dispatch.

9.2 Storage



Damage to device due to inserted rechargeable battery during storage.

- ▶ Remove the rechargeable battery from the Xplorer pipette if you do not intend to use the Xplorer pipette for an extended period.

	Air temperature	Rel. humidity	Air pressure
In transport packaging	-25 to 55 °C	10 to 95%	70 to 106 kPa
Without transport packaging	-5 to 45 °C	10 to 95%	70 to 106 kPa

9.3 Disposal

In case the product is to be disposed of, the relevant legal regulations are to be observed.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2002/96/EC pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, to the business-to-business area this product is assigned to, may no longer be disposed of in municipal or domestic waste. To document this they have been marked with the following symbol:

As disposal regulations may differ from country to country within the EU, please contact your supplier if necessary.



Risk of explosion and fire from overheated batteries.

- ▶ Do not heat the battery above 80 °C and do not throw it into the fire.

Disposal of batteries

Do not dispose of batteries together with domestic waste. Dispose of batteries in accordance with local, legal regulations.



10 Technical data

10.1 Eppendorf Xplorer single-channel

Model Increment	Test tip epT.I.P.S. color code Volume range Length	Testing volume	Eppendorf AG error limits			
			Error			
			Systematic		Random	
			± %	± µL	± %	± µL
0.5 - 10 µL Increment: 0.01 µL	medium gray 0.1 - 20 µL 40 mm	1 µL	± 2.5	± 0.025	± 1.8	± 0.018
		5 µL	± 1.5	± 0.075	± 0.8	± 0.04
		10 µL	± 1.0	± 0.1	± 0.4	± 0.04
5 - 100 µL Increment: 0.1 µL	yellow 2 - 200 µL 53 mm	10 µL	± 2.0	± 0.2	± 1.0	± 0.1
		50 µL	± 1.0	± 0.5	± 0.3	± 0.15
		100 µL	± 0.8	± 0.8	± 0.2	± 0.2
15 - 300 µL Increment: 0.1 µL	orange 15 - 300 µL 55 mm	30 µL	± 2.5	± 0.75	± 0.7	± 0.21
		150 µL	± 1.0	± 1.5	± 0.3	± 0.45
		300 µL	± 0.6	± 1.8	± 0.2	± 0.6
50 - 1 000 µL Increment: 1 µL	blue 50 - 1 000 µL 71 mm	100 µL	± 3.0	± 3.0	± 0.6	± 0.6
		500 µL	± 1.0	± 5.0	± 0.2	± 1
		1 000 µL	± 0.6	± 6.0	± 0.2	± 2
0.25 - 5 mL Increment: 0.005 mL	purple 0.1 - 5 mL 120 mm	0.5 mL	± 3.0	± 15.0	± 0.6	± 3
		2.5 mL	± 1.2	± 30.0	± 0.25	± 6.25
		5 mL	± 0.6	± 30.0	± 0.15	± 7.5
0.5 - 10 mL Increment: 0.01 mL	turquoise 1 – 10 ml 165 mm	1 mL	± 3.0	± 30.0	± 0.60	± 6.0
		5 mL	± 0.8	± 40.0	± 0.20	± 10.0
		10 mL	± 0.6	± 60.0	± 0.15	± 15.0

10 Technical data

10.2 Eppendorf Xplorer multi-channel

The technical data applies to both the 8 channel and the 12 channel pipette.

Model Increment	Test tip epT.I.P.S. color code Volume range Length	Testing volume	Eppendorf AG error limits			
			Error			
			Systematic		Random	
			± %	± µL	± %	± µL
0.5 - 10 µL Increment: 0.01 µL	medium gray 0.1 - 20 µL 40 mm	1 µL	± 5.0	± 0.05	± 3.0	± 0.03
		5 µL	± 3.0	± 0.15	± 1.5	± 0.075
		10 µL	± 2.0	± 0.2	± 0.8	± 0.08
5 - 100 µL Increment: 0.1 µL	yellow 2 - 200 µL 53 mm	10 µL	± 2.0	± 0.2	± 2.0	± 0.2
		50 µL	± 1.0	± 0.5	± 0.8	± 0.4
		100 µL	± 0.8	± 0.8	± 0.25	± 0.25
15 - 300 µL Increment: 0.1 µL	orange 15 - 300 µL 55 mm	30 µL	± 2.5	± 0.75	± 1.0	± 0.3
		150 µL	± 1.0	± 1.5	± 0.5	± 0.75
		300 µL	± 0.6	± 1.8	± 0.25	± 0.75
50 - 1 200 µL (only 8-channel) Increment: 1 µL	green 50 - 1 250 µL 76 mm	120 µL	± 6.0	± 7.2	± 0.9	± 1.08
		600 µL	± 2.7	± 16.2	± 0.4	± 2.4
		1 200 µL	± 1.2	± 14.2	± 0.3	± 3.6

The errors specified apply only when the epT.I.P.S. pipette tips are used. Test conditions and test evaluation in compliance with ISO 8655, Part 6. Test using a standardized fine balance with a moisture trap.

- Check the volumes in the **Pip** mode; keep the rocker pressed during the blow-out (blow)
- Set speed level: 5
- Number of determinations: 10
- Use of water in accordance with ISO 3696
- Test at 20°C - 25°C ± 0.5°C
- Dispensing against the tube wall

10 Technical data

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Technical data

Rechargeable battery	
Type:	Rechargeable Li-polymer battery
Capacity:	750 mAh / 3.7 V
Charging time:	approx. 3 hours
Number of dispensing operations:	approx. 3000 in the Pip mode with a fully charged rechargeable battery and medium dispensing speeds with a single-channel version $\leq 1\,000\ \mu\text{L}$.
Weight:	approx. 20 g
Power supply	
Type:	Power supply for Xplorer, Multipette/ Repeater stream/ Xstream with plug-in power plug adapters
Input voltage:	100 V to 240 V $\pm 10\%$ 50/60 Hz
Output voltage:	5 V, 1 A
Xplorer	
Operating temperature:	+5 to +40 °C
Air humidity during operation:	10 to 95% rel. humidity
Storage temperature:	-5 to +45 °C
Air humidity during storage:	10 to 95% rel. humidity
Weight without rechargeable battery, without pipette tip:	Single-channel 100 μL approx.: 135 g Eight-channel 100 μL approx.: 213 g

10 Technical data

10.3 Speed table for Xplorer single-channel

The following speed table is valid for Xplorer pipettes with the software version 01.05.00.

Speed level	10 μ l	100 μ l	300 μ l	1 000 μ l	5 mL	10 mL
(Speed)	Time [sec]	Time [sec]	Time [sec]	Time [sec]	Time [sec]	Time [sec]
1	12.01	12.01	12.01	12.01	12.01	12.01
2	8.0	8.0	8.0	8.0	8.0	8.0
3	4.0	4.0	4.0	4.0	6.01	6.01
4	2.8	2.8	2.8	2.8	4.8	4.8
5	2.2	2.2	2.2	2.2	3.6	3.6
6	1.6	1.6	1.6	1.6	3.2	3.2
7	1.2	1.2	1.2	1.2	2.8	2.8
8	0.86	0.87	0.87	0.85	2.6	2.6

10.4 Speed table for Xplorer multi-channel

The following speed table is valid for Xplorer pipettes with the software version 01.05.00.

Speed level	10 μ l	100 μ l	300 μ l	1 200 μ L
(Speed)	Time [sec]	Time [sec]	Time [sec]	Time [sec]
1	12.01	12.01	12.01	12.01
2	8.0	8.0	8.0	8.0
3	4.0	4.0	4.0	4.0
4	2.8	2.8	2.8	2.8
5	2.2	2.2	2.2	2.2
6	1.6	1.6	1.6	1.6
7	1.2	1.2	1.2	1.2
8	0.85	0.87	0.85	1.0

11 Ordering Information



The ordering information can be found on the CD for the Xplorer pipette.

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EG-Konformitätserklärung EC Conformity Declaration

Das bezeichnete Produkt entspricht den einschlägigen grundlegenden Anforderungen der aufgeführten EG-Richtlinien und Normen. Bei einer nicht mit uns abgestimmten Änderung des Produktes oder einer nicht bestimmungsgemäßen Anwendung verliert diese Erklärung ihre Gültigkeit.

The product named below fulfills the relevant fundamental requirements of the EC directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid.

Produktbezeichnung, Product name:

Eppendorf Xplorer®

incl. Netzteil / including charging adapter

Produkttyp, Product type:

elektrische Pipette / electronic pipette

Einschlägige EG-Richtlinien/Normen, Relevant EC directives/standards:

2006/95/EG, EN 61010-1

EN ISO 8655-2

2004/108/EG, EN 55011/B, EN 61326-1, EN 61000-6-1

Vorstand, Board of Management:

17.09.2009

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Projektmanagement, Project Management:

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