




# Multipipette®/Repeater® (X)stream

Operating manual

**eppendorf**



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U.S. Pat. No.

5,620,660

5,620,661

US Design Patents:

Combitip plus 0.1 mL 384,163

Combitip plus 2.5 mL 384,162

Combitip plus 10 mL 387,426

This operating manual belongs to the software version: 03.06.00

The software version is displayed when a hardware reset is performed. Or when you connect the battery. It is also available in the instrument settings.

## Table of contents

<b>1</b>	<b>User instructions</b>	<b>5</b>
1.1	Using this manual	5
1.2	Warning signs and hazard icons	5
1.2.1	Hazard icons	5
1.2.2	Degrees of danger	5
1.3	Symbols used	6
1.4	Glossary	6
<b>2</b>	<b>Product description</b>	<b>8</b>
2.1	Main illustration	8
2.2	Delivery package	10
2.3	Features	11
2.3.1	Operating modes	11
2.3.2	Dispensing tasks and ranges	11
2.4	Warranty	11
2.5	Display	12
2.6	Combitips plus overview	13
2.7	Materials	14
<b>3</b>	<b>Safety</b>	<b>15</b>
3.1	Intended use	15
3.2	Warnings for intended use	15
3.3	Information on product liability	16
<b>4</b>	<b>Installation</b>	<b>17</b>
4.1	Power supply assembly	17
4.2	Inserting the Li-ion battery	17
4.3	Charge the rechargeable battery	18
4.4	Assembly of Combitip plus with Adapter plus	19
4.5	Inserting the Combitip plus	20
4.6	Removing the Combitip plus	21
4.6.1	Finishing the dispensing operation and removing the Combitip plus	21
4.6.2	Emptying and removing the Combitip plus	21
<b>5</b>	<b>Operation</b>	<b>22</b>
5.1	Principle of operation	22
5.2	Prepare the Multipette stream/Repeater stream	23
5.3	Dispensing	25
5.4	Automatic dispensing	26
5.5	Sequential dispensing mode	27
5.6	Aspirating	28
5.7	Pipetting	29
5.8	Titration	30
5.9	Stopping or canceling pipetting operations	31
5.10	Adjusting the device settings	32

<b>6</b>	<b>Troubleshooting</b> .....	<b>33</b>
6.1	Error search .....	33
6.2	Pipette self-test .....	36
6.3	Hardware reset .....	37
<b>7</b>	<b>Maintenance</b> .....	<b>37</b>
7.1	Cleaning .....	37
7.2	Maintenance .....	37
<b>8</b>	<b>Technical data</b> .....	<b>38</b>
<b>9</b>	<b>Ordering Information</b> .....	<b>40</b>
9.1	Multipette stream/Repeater stream .....	40
9.2	Combitips plus and Adapter plus .....	40
9.3	Accessories .....	41
<b>10</b>	<b>Transport, storage and disposal</b> .....	<b>43</b>
10.1	Decontamination before shipping .....	43
10.2	Storage .....	43
10.3	Disposal .....	44







## 1 User instructions

### 1.1 Using this manual

- ▶ Please read this operating manual completely before using the device for the first time.
- ▶ Please view this operating manual as part of the product and keep it somewhere easily accessible.
- ▶ When passing the device on to third parties, be sure to include this operating manual.
- ▶ If this manual is lost, please request another one. The current version can be found on our website [www.eppendorf.com](http://www.eppendorf.com).
- ▶ If information in this manual refers to the Multipette stream / Repeater stream, it is also valid for the Multipette Xstream / Repeater Xstream. If information is only valid for the Multipette Xstream / Repeater Xstream, this is explicitly mentioned in the text.
- ▶ These instructions apply to all devices as of software version 03.06.00. For devices with older software and hardware, use the Multipette (X)stream/Repeater (X)stream 4986 900.115-01 operating manuals.

### 1.2 Warning signs and hazard icons

#### 1.2.1 Hazard icons




	<b>Biohazard</b>		<b>Explosion</b>
	<b>Electric shock</b>		<b>Toxic substances</b>
	<b>Hazard point</b>		<b>Material damage</b>

#### 1.2.2 Degrees of danger

The degree of danger is a part of a safety note and distinguishes the possible results of non-observance from each other.

<b>DANGER</b>	<i>Will</i> lead to severe injuries or death.
<b>WARNING</b>	<i>May</i> lead to severe injuries or death.
<b>CAUTION</b>	May lead to light to moderate injuries.
<b>NOTICE</b>	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.
①	Shows action sequence in images.
	Shows direction of movements.
<b>Text</b>	Terms and key names from the software.
	References useful information.

### 1.4 Glossary

#### A

**Adapter plus** Enables secure guidance of the piston in the cylinder of the Combitips plus. Two versions: Adapter plus (blue) for the 25 mL Combitip plus and Adapter plus (dark gray) for the 50 mL Combitip plus.

#### 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](http://www.eppendorf.com).

#### C

**Combitip plus** Dispensing tip for all Eppendorf Multipettes and Repeaters. With the Combitip plus, the Multipette stream/Repeater stream becomes a fully functioning dispensing device. Combitips plus are for single use and are composed of a piston and a cylinder. They are offered for nine different volume ranges.

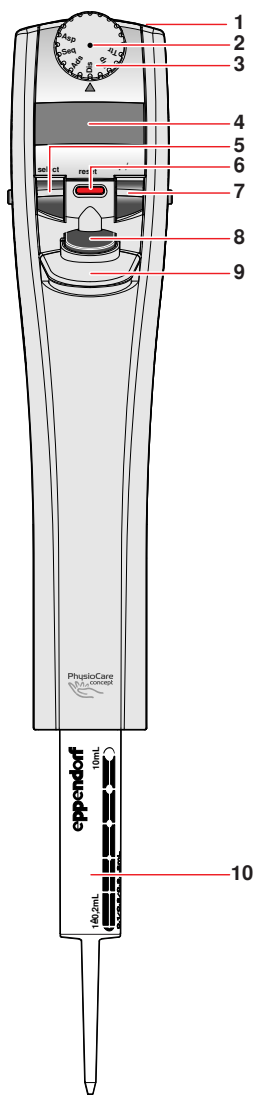
#### F

**Free jet dispensing** Dispensing steps without touching the tube wall. If a drip forms on the Combitip plus 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.

	<b>I</b>
<b>Increment</b>	Step size or resolution. For example, with the volume selection on a 10 mL Combitip plus, the volume can be increased or decreased in 0.01 mL steps.
<b>ISO 8655</b>	The ISO 8655 standard defines, among other things, limiting values (systematic error [accuracy] and random error [precision]) and the test procedure for dispensing devices.
	<b>N</b>
<b>Nominal volume</b>	The maximum dispensing volume of a Combitip plus.
	<b>P</b>
<b>PhysioCare Concept®</b>	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.
<b>Positive displacement principle</b>	The liquid is in direct contact with the piston of the direct displacer during aspiration and dispensing operations. Unlike with a pipette, the liquid and piston are not separated by an air cushion. A little air bubble is visible at the piston during dispensing.
	<b>R</b>
<b>Rechargeable lithium-ion battery</b>	Rechargeable lithium-ion batteries have a very high charging capacity and a long service life.
<b>Reverse stroke</b>	After aspiration, the piston is moved into a defined position. The reverse stroke is not a dispensing step.
	<b>V</b>
<b>Viscosity</b>	<p>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.</p> <p>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.</p>

## 2 Product description

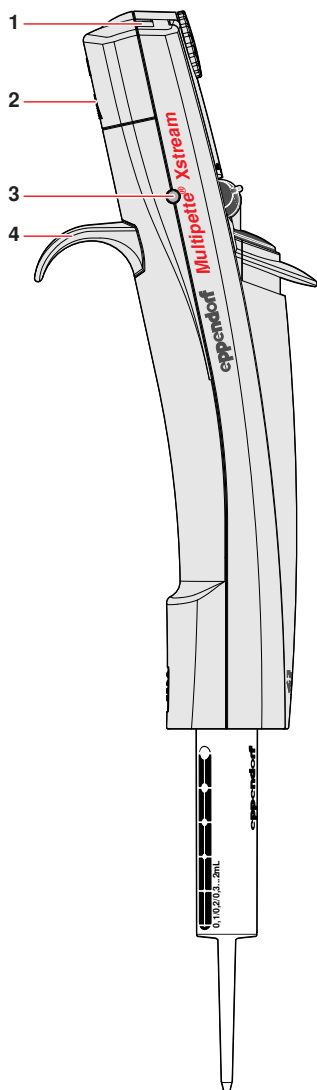
### 2.1 Main illustration



- 1 Connector socket**  
For connecting the charging plug of an Eppendorf Multipette stream/Repeater stream power supply.
- 2 Hardware reset button**  
Triggering a hardware reset interrupts the power supply (see p. 37).
- 3 Selection dial**  
For setting the operating mode.  
Depending on the Multipette stream/Repeater stream version, different operating modes are available. The illustration shows the Xstream.
- 4 Illuminated display**  
Displays the parameter settings (volume, dispensing steps, speeds) and provides feedback and information on the operating steps.
- 5 Select rocker switch**  
For switching between the execution and editing displays.
- 6 Reset key**  
For stopping or canceling dispensing operations (see p. 31).
- 7 +/- rocker switch**  
For changing parameters. Higher speed level with volume change when you press the +/- rocker switch more firmly.
- 8 Actuate key**  
For triggering dispensing operations. For saving entries while editing and returning to dispensing operation.
- 9 Ejector**  
Releases the inserted Combipip plus.  
**Caution!**  
Combipips plus may only be released when the piston is at the very bottom in the Combipip plus.
- 10 Combipip plus**  
Dispenser tip

Fig. 1: Front view





- 1 Viewing window for the infrared interface**  
For Service.
- 2 Battery compartment lid**  
For covering the battery compartment. The battery compartment contains the serial number of the Multipette stream/Repeater stream.
- 3 Charging contact and mounting**  
For the battery charging option and for fixing the Multipette stream/Repeater stream in the charger stand (additionally available).
- 4 Finger rest**  
For ensuring a secure and comfortable grip.

Fig. 2: Side view

## 2.2 Delivery package

Quantity	Order No. (International)	Order No. (North America)	Description
1	4986 000.017		<b>Multipette stream</b>
or	4986 000.025		<b>Multipette Xstream</b>
or		022460803	<b>Repeater stream</b>
or		022460811	<b>Repeater Xstream</b>
1	0030 069.528	022266993	<b>Adapter plus Eppendorf Quality</b> 1 piece, autoclavable
1	0030 069.161	022266705	25 mL, blue 50 mL, dark gray
1			<b>Combitip plus Eppendorf Quality 5.0 mL</b>
1	4986 602.009	022462407	<b>Lithium-ion battery</b> For Multipette/Repeater (X)stream
1	4986 603.005	4986603005	<b>Power supply with power plug adapters</b> For Multipette/Repeater (X)stream, Xplorer, charger stand series 4880
1	4986 900.115	4986900115	<b>Operating Manual</b> <b>Multipette/Repeater (X)stream</b>
1	4986 900.140	4986900140	<b>Short instructions</b> <b>Multipette/Repeater (X)stream</b>

## 2.3 Features

In combination with a Combitip plus, the Multipette stream/Repeater stream is a motor-driven, electronically controlled manual dispenser that functions according to the positive displacement principle.

### 2.3.1 Operating modes

The Multipette stream/Repeater stream and Multipette Xstream/Repeater Xstream have the following operating modes:

	<b>Dis</b> Dispensing	<b>Ads</b> Auto dispensing	<b>Seq</b> Sequential dispensing	<b>Asp</b> Aspirating	<b>Pip</b> Pipetting	<b>Ttr</b> Titration
Multipette stream/ Repeater stream	●	●			●	
Multipette Xstream/ Repeater Xstream	●	●	●	●	●	●

- **Dis - Dispensing:** gradual dispensing of liquid in equal partial volumes.
- **Ads - Automatic dispensing:** automatic dispensing of liquid in equal partial volumes and at fixed intervals.
- **Seq - Sequential dispensing:** dispensing of liquid in up to 16 different volumes in one sequence.
- **Asp - Aspirating:** consecutive aspiration of liquid with the same volume in a Combitip plus.
- **Pip - Pipetting:** aspirating and dispensing liquid.
- **Ttr - Titration:** gradual dispensing of reagent into a sample solution. Multiple reagent aspiration into the Combitip plus is possible.

### 2.3.2 Dispensing tasks and ranges

It is possible to dispense aqueous solutions, but also solutions with a higher viscosity. At a higher viscosity, lower aspiration and dispensing speeds should be selected.

- If the lowest speed (1 bar) is used for aspiration and dispensing, it is possible to dispense solutions with a viscosity of  $\leq 300 \text{ mPa} \cdot \text{s}$  when using  $\leq 25 \text{ mL}$  Combitips plus.
- When using 50 mL Combitips plus, viscosity should not exceed  $100 \text{ mPa} \cdot \text{s}$ .
- With the 0.5 mL Combitips plus and the highest speed level, 5  $\mu\text{L}$  water can be dispensed in a free jet. Free jet dispensing of water is also possible with all larger Combitips. If large volumes are dispensed in a free jet, the liquid may splash back!

- 
- i** For solutions with a higher vapor pressure, it is recommended to saturate the small air bubble at the piston of the Combitip plus with liquid vapor by aspirating and dispensing the liquid several times.
- 

## 2.4 Warranty

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

## 2.5 Display

The display has 10 brightness levels when lit. The display switches off during usage intervals. The display switches on automatically again when a key is pressed. If the Multipette stream/ Repeater stream is not used for an extended period of time, the display is switched off completely after approx. 10 minutes.

The Multipette stream/Repeater stream saves the last setting for every Combitip plus size in every operating mode. When you insert a new Combitip plus of the corresponding size, the last used settings are shown in the display.

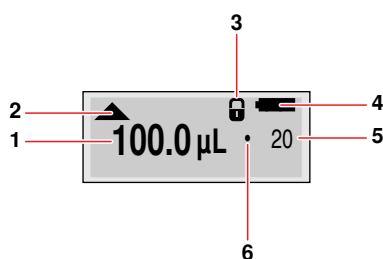


Fig. 3: Display of the Multipette stream/ Repeater stream

### 1 Volume

Unit in μL or mL.

### 2 Direction of the next piston movement

▲ Aspirate liquid

▼ Dispense liquid

### 3 Key lock

🔒 is only displayed if the +/- rocker switch is locked. Can be stored or activated for the device parameters (see p. 32).

### 4 Battery

Battery charging status. Possible displays:

■ Battery full

🔋 Battery exhausted

🔋 Battery severely discharged

🔋 Battery empty

If the battery is exhausted, complete the dispensing operation and charge the battery. If the battery is severely discharged, or **Warning Battery Low!** appears in the display, stop the dispensing operation **immediately** and charge the battery for at least two hours.

### 5 Dispensing step

In the **Dis**, **Ads** and **Seq** modes, the number of possible dispensing steps. In the **Asp** mode, the number of performed asp steps

### 6 Interpunct

Is displayed in the **Dis**, **Ads** and **Asp** modes before aspiration. Indicator for the number of dispensing steps. The pipetted volume must always be greater than the product of the multiplication of the volume (1) with dispensing step (5).

## 2.6 Combitips plus overview

Combitips plus are required for using Multipette stream/Repeater stream. For the 25 mL and 50 mL Combitips plus, Adapter plus are also required. The Combitips plus and Adapters plus are available in the following purity levels: "Eppendorf Quality", "Sterile" and "Biopur". Adapter plus can be autoclaved. If the smallest volume is selected, and the Combitip plus is completely filled, the **Dis** mode has 100 dispensing steps.

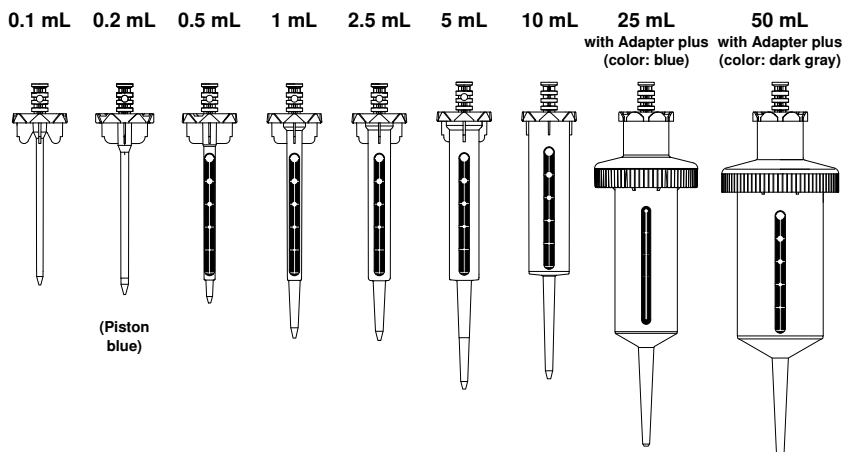


Fig. 4: Overview of all Combitips plus



**NOTICE! Carry-over, contamination and incorrect dispensing results due to the incorrect use of Combitips plus.**

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

- ▶ Use the Combitips plus only once.
- ▶ Do not use autoclaved Combitips plus for dispensing.

Tab. 1: Volume ranges for the Combitips plus

Combitip plus	Volume range	Increment
0.1 mL	1 µL - 100 µL	0.1 µL
0.2 mL (piston color: blue)	2 µL - 200 µL	0.2 µL
0.5 mL	5 µL - 500 µL	0.5 µL
1 mL	10 µL - 1,000 µL	1 µL
2.5 mL	25 µL - 2,500 µL	2.5 µL
5 mL	50 µL - 5,000 µL	5 µL
10 mL	0.1 mL - 10 mL	0.01 mL
25 mL (Adapter plus: blue)	0.25 mL - 25 mL	0.025 mL
50 mL (Adapter plus: dark gray)	0.5 mL - 50 mL	0.05 mL

## 2.7 Materials



**NOTICE! Aggressive substances may damage dispensers, Combitips and accessories.**

- ▶ Check for material compatibility before using organic solvents and aggressive chemicals.
- ▶ Observe the cleaning instructions (see *Cleaning* on p. 37).

Components of the Multipette stream/Repeater stream that can be accessed by the user are made of the following materials:

Component	Material
Housing parts	Acrylonitrile/styrene/acrylic ester (ASA) with polycarbonate (PC)
select rocker switch, +/- rocker switch	Silicone
Actuate key	Polyetherimide (PEI)
Charging contacts	Gold coating
Display, selection dial, window IR interface	Polycarbonate (PC), coated and uncoated

Combitip plus	Material
Cylinder	Polypropylene (PP)
Piston	Polyethylene (PE)

## 3 Safety

### 3.1 Intended use

The Multipette stream/Repeater stream is a lab device and, in combination with a Combitip plus, it is intended for dispensing aqueous solutions in the volume range between 1 µL and 50 mL. In vivo applications (applications in or on the human body) are not permitted.

The Multipette stream/Repeater stream 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).



#### **CAUTION! Danger to persons from careless use.**

- ▶ Never point the opening of a Multipette stream/Repeater stream equipped with a Combitip plus at yourself or anyone else.
- ▶ Only perform dispensing operations when you do not endanger yourself or anyone else.
- ▶ Check the set speed before commencing dispensing operations. For the dispensing operation select a speed which excludes the back-splashing of the liquid.



**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.



**NOTICE! Damage to device from penetration of liquids.**

- ▶ Do not allow any liquids to penetrate the inside of the housing.
- ▶ If liquid has penetrated the inside of the housing, have the inner parts of the Multipette stream/Repeater stream repaired only by service partners of Eppendorf AG. Contact your responsible sales office before returning a product.



**NOTICE! Termination or interruption of dispensing due to incorrect handling of the Combitip plus.**

In case of incorrect handling of the Combitip plus, an error message may be displayed or a safety shutdown may be triggered.

- ▶ Do not bend the Combitip plus.
- ▶ Do not press the Combitip plus too strongly against the bottom of the tube or against the tube inner wall when aspirating or dispensing.



**NOTICE! Material damage due to incorrect dispensing.**

The use of the larger Combitip plus and highly viscous solutions may cause the Multipette to heat up.

- ▶ Only use highly viscous solutions for short dispensing series.



**NOTICE! Incorrect dispensing results due to evaporation.**

If dispensing with an already filled Combitip is continued after a long waiting time, the next dispensing step may have a slightly reduced dispensing volume due to evaporation!

- ▶ If high trueness is required, this dispensing step should not be carried out.

### 3.3 Information on product liability

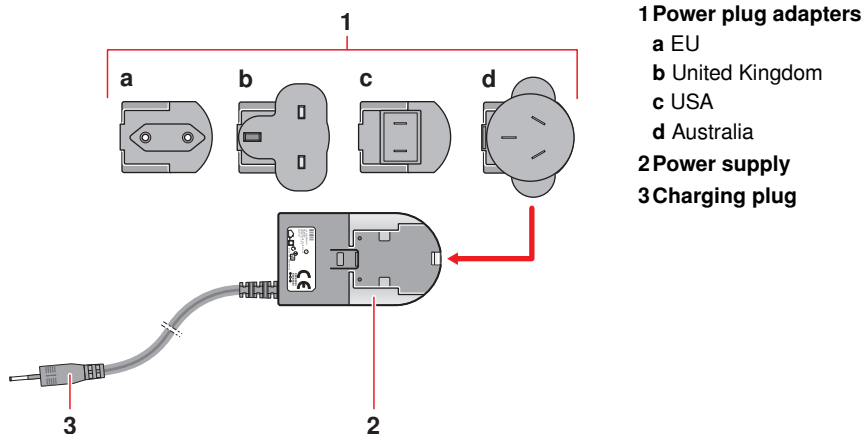
In the following cases, the protection provided by the device may be impaired. The liability for the function of the device passes to the operator if:

- 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

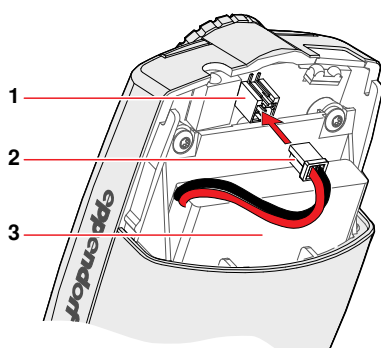
- a EU
- b United Kingdom
- c USA
- d Australia

#### 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 Li-ion battery



#### 1 Connector socket

#### 2 Plug

#### 3 Li-ion battery

Insert the battery as follows:

1. Take off the lid of the battery compartment.
2. Insert the Li-ion battery. Do not remove the foam insert in the battery compartment.
3. Connect the plug of the Li-ion battery to the connector socket.
4. Replace the battery compartment lid.

Fig. 5: Insert the Li-ion battery

## 4.3 Charge the rechargeable battery



**WARNING! 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 Multipette stream/Repeater stream 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.

- ❶ The supplied Multipette stream/Repeater stream can only be charged with the new power supply unit (order number 4986 603.005) included in this delivery. It is technically not possible to charge this Multipette stream/Repeater stream with a power supply unit from an older delivery. However, older Multipette stream/Repeater stream models can be charged with the new power supply unit included in this delivery. Every charger stand of the Multipette stream/Repeater stream can be operated with a new power supply unit.

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



### Recharging the rechargeable battery

1. Insert the assembled power supply (order number 4986 603.005) into a power outlet.
2. Check in the Multipette stream/Repeater stream whether a rechargeable battery has been inserted and connected.
3. Insert the charging plug of the power supply into the connector socket of the Multipette stream/Repeater stream.

The message **Device connected to power supply** is briefly displayed. The charging process is indicated in the display by a flashing rechargeable battery symbol. A fully discharged accumulator requires a charging time of at least two hours. The charging process is complete when the accumulator symbol stops flashing.

The rechargeable battery only achieves its full capacity after several charging cycles.

- ❶ You can also use the additionally available charger stand 4880 or the charger carousel 4880 (see *Accessories* on p. 41).  
To charge the Multipette stream/Repeater stream using the charger carousel 4880, you must order a suitable charger shell for the Multipette stream/Repeater stream in addition.

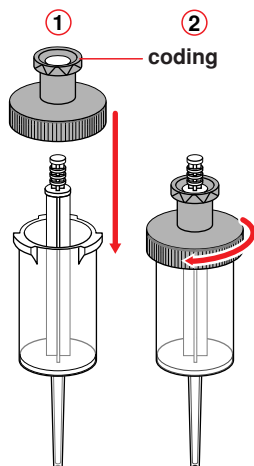
#### 4.4 Assembly of Combitip plus with Adapter plus

- i** The 25 mL and 50 mL Combitips plus can only be used with the suitable Adapter plus (see *Combitips plus overview* on p. 13).



**NOTICE! Damage to sensor from damaged or worn Adapter plus.**

- ▶ Always connect the Adapter plus to the Combitip plus outside the Multipette stream/ Repeater stream.
- ▶ Do not use any damaged or worn Adapter plus.
- ▶ Do not use any Adapter plus with a damaged coding.



1. Connect the Adapter plus to the Combitip plus ①.
2. Tighten the Adapter plus ②.

Fig. 6: Assembling the Combitip plus and the Adapter plus

## 4.5 Inserting the Combitip plus

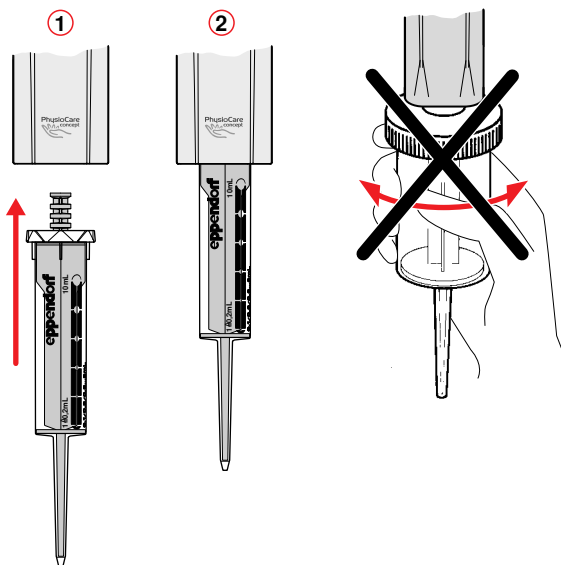


**NOTICE! Damage to device from incorrect use of inserted Combitip plus.**

- ▶ Insert the Combitip plus vertically from below into the Multipette stream/ Repeater stream.
- ▶ Do not rotate the inserted Combitip plus.
- ▶ Never hold the Multipette stream/Repeater stream by the Combitip plus.



It is easier to insert the Combitip plus with the ejector pressed down.



1. If the piston of the Combitip plus is pushed out, press it into the Combitip plus cylinder.
2. Press the Combitip plus firmly into the opening at the bottom of the Multipette stream/ Repeater stream ①, until the Combitip plus clicks into place ②.

Fig. 7: Inserting the Combitip plus

## 4.6 Removing the Combitip plus



**CAUTION! Personal injury and damage to the Multipette stream/Repeater stream and the Combitip plus due to operation of the ejector at the wrong time.**

Liquid may escape from the Combitip plus when you eject it during the dispensing operation. If the ejector is operated at the wrong time, only the cylinder of the Combitip plus will be released. The piston can only be released if it is in the basic position.

- ▶ Only operate the ejector when the piston in the Combitip has reached its lowest position.

If you accidentally operate the ejector during dispensing, and the cylinder is released because of this, an error message appears (see *Error search* on p. 33).

The Combitip plus can be removed after dispensing. If the Combitip plus still contains liquid, it must be emptied first (see *Emptying and removing the Combitip plus* on p. 21).

### 4.6.1 Finishing the dispensing operation and removing the Combitip plus

1. Finish all dispensing steps.

The following information is displayed:

Long = aspirate ▲  
 1.Short = no step  
 2.Short = empty ▼

2. Hold the Multipette stream/Repeater stream over a tube.
3. Press the actuate key twice to move the piston to the basic position and dispense the residual liquid in the Combitip plus in a safe manner.

The following information is briefly displayed:

Release  
Combitip now

4. Press the ejector button and remove the Combitip plus.

### 4.6.2 Emptying and removing the Combitip plus

If you would like to terminate a dispensing operation prematurely, you must empty the residual liquid from the Combitip plus before you can remove the Combitip plus.

1. Hold the Multipette stream/Repeater stream over a tube.
2. Press the reset key to move the piston to the basic position and dispense the residual liquid in the Combitip plus in a safe manner.

The following information is briefly displayed:

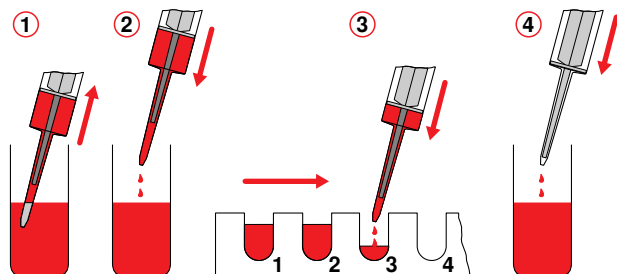
Release  
Combitip now

3. Press the ejector button and remove the Combitip plus.

## 5 Operation

### 5.1 Principle of operation

This chapter is provided for information purposes only and is not intended to provide instructions. All operating modes have a comparable procedure. The following steps occur in all operating modes except the aspiration (**Asp**) operating mode:



#### Parameter settings

- The parameters that are available can vary depending on the operating mode. For each Combitip plus size the last set parameters are saved.
  - Dispensing volume (**Pip**)
  - Dispensing volume per partial dispensing step (**Dis, Ads, Seq**)
  - Aspiration volume (**Asp**)
  - Number of dispensing steps (**Dis, Ads, Seq, Asp**)
  - Aspiration speed (all operating modes)
  - Dispensing speed (all operating modes)
  - Interval time (**Ads**)

#### Aspirating liquid ①

- You can stop aspiration by pressing the actuate or reset key. When you stop aspiration, the reduced number of dispensing steps is not stored for the next dispensing operation.

#### Reverse stroke ②

- Position the piston of the Combitip plus. Liquid escapes. This step is a safety step and not a dispensing step. The reverse stroke is indicated in the display as follows:



#### Dispensing steps ③

- Dispense liquid. You can change some parameters during dispensing.
- There are two possible variants for continuing execution:
  - Renewed aspiration**  
Perform further dispensing process with the previously set parameters.
  - Empty the Combitip plus completely ④**  
Discharge the residual liquid from the Combitip plus to complete the dispensing operation and to release the Combitip plus.

## 5.2 Prepare the Multipette stream/Repeater stream

This chapter describes general operating instructions for Multipette stream/Repeater stream. The Multipette stream/Repeater stream and Multipette Xstream/Repeater Xstream differ as regards the available operating modes (see p. 11). Setting the parameters is identical for every operating mode.

Proceed as follows to set the operating mode and the parameters:

- 
- i** At high viscosity, select low aspiration and dispensing speeds. Solutions with a viscosity up to 300 mPa · s must be dispensed using a 25 mL sized Combitip plus (maximum) which is set at the lowest speed. With a 50 mL Combitip plus, viscosity should not exceed 100 mPa · s.
- 

1. Select and insert the suitable Combitip plus (see p. 13) (see p. 20).  
The Combitip plus size is automatically recognized by the Multipette stream/Repeater stream and shown in the display for approx. 1 s.
2. If the Multipette stream/Repeater stream is in sleep mode, press any key to activate it.
3. Set the desired operating mode using the selection dial. The selected mode is shown temporarily in the display.  
The start display shows the parameters of the last operation with a Combitip plus of the same size.
4. Setting the parameters (Tab. on p. 24). It is also possible to change some parameters in all operating modes during operation. For this, press the select rocker switch during operation and set the parameters.
  - Change between the parameters using the select rocker switch.
  - Change the parameters using the +/- rocker switch.
5. Press the actuate key to save your settings.  
The display shows:

Changed data  
stored

If you eject the Combitip plus prior to pressing the actuate key (see p. 21), the changes are not saved.






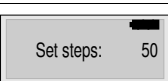
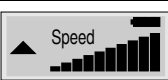

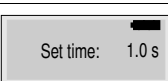
**CAUTION! Personal injury and damage to the Multipette stream/Repeater stream and the Combitip plus due to operation of the ejector at the wrong time.**

Liquid may escape from the Combitip plus when you eject it during the dispensing operation. If the ejector is operated at the wrong time, only the cylinder of the Combitip plus will be released. The piston can only be released if it is in the basic position.

- ▶ Only operate the ejector when the piston in the Combitip has reached its lowest position.

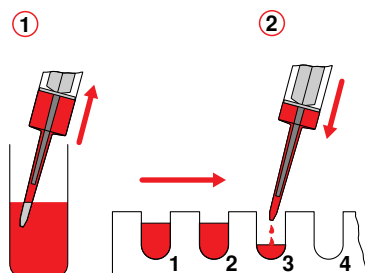
6. Read the chapter for your selected operating mode for operation instructions. Dispensing is performed with the actuate key. If you press the actuate key or the reset key during liquid aspiration or dispensing operations, you will interrupt the dispensing operation.

Tab. 2: Parameters of the Multipette stream/Repeater stream

Display	Parameter function	Dis	Ads	Seq	Asp	Pip	Ttr
	<b>Dispensing volume</b> Dependent on the size of the Combitip plus inserted.	•	•			•	
	<b>Dispensing volume per dispensing step</b> Dependent on the size of the Combitip plus inserted. Up to 16 different volumes can be selected.			•			
	<b>Aspiration volume</b> Dependent on the size of the Combitip plus inserted.				•		
	<b>Number of dispensing steps</b> The number of dispensing steps depends on the dispensing volumes.	•	•	•	•		
	<b>Aspiration speed</b> 10 speeds are available. The total of number of bars filled in black represents the speed level selected. The higher the speed, the lower the electric power consumption.	•	•	•	•	•	•
	<b>Dispensing speed</b> Select the highest speed for dispensing small volumes in free jet mode. Select a low speed for viscous solutions. If there is a risk of liquid splashing out of the destination tube during dispensing, reduce the dispensing speed.	•	•	•	•	•	•
	<b>Interval time</b> Distance of time between the dispensing steps. You can choose times between 0.1 - 10 s.		•				



## 5.3 Dispensing



During dispensing the aspirated liquid is dispensed step by step in partial volumes of equal size. With the smallest dispensing volume and a completely filled Combitip plus, 100 dispensing steps are possible.

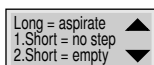
1. Prepare the Multipette stream/Repeater stream (see p. 23).
2. Immerse the Combitip plus in the liquid to be aspirated.
3. Press the actuate key. Liquid is aspirated.

The display then shows:



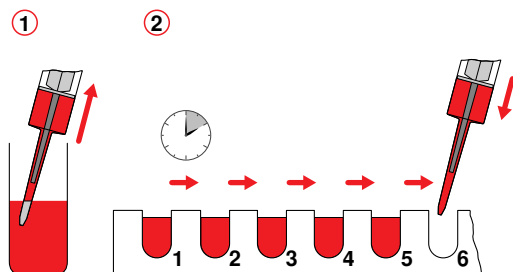
4. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key. The reverse stroke is performed. This step is not a dispensing step.
5. Hold the Combitip plus over the first tube into which the liquid is to be dispensed.
6. Press the actuate key to dispense the liquid. Repeat the process for every additional dispensing step. After every dispensing step, the display shows the volume of the next dispensing step and the number of remaining dispensing steps.

After complete dispensing, the display shows:



7. There are two possible variants for continuing execution:
  - **Renewed aspiration**
    - a Immerse the Combitip plus in the liquid to be aspirated.
    - b Keep the actuate key depressed for 2 s to aspirate the liquid.
  - **Completely empty and remove the Combitip plus**
    - a Hold the Multipette stream/Repeater stream over a tube to dispense the residual liquid.
    - b Press the actuate key twice to empty the residual liquid.
    - c Remove the Combitip plus (see p. 21).

## 5.4 Automatic dispensing



The **Ads** mode is performed automatically by keeping the actuate key depressed. This mode is more convenient and quicker especially for longer dispensing series (filling of plates) in comparison to the **Dis** mode. The dispensing volume, the dispensing speed and the interval time can be changed during dispensing.

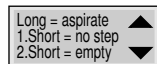
1. Prepare the Multipette stream/Repeater stream (see p. 23). When filling plates with 96 wells, we recommend that you set an interval time between 0.6 s to 2 s, depending on the liquid.
2. Immerse the Combitip plus in the liquid to be aspirated.
3. Press the actuate key. Liquid is aspirated.

The display then shows:



4. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key. The reverse stroke is performed. This step is not a dispensing step.
5. Hold the Combitip plus over the first tube into which the liquid is to be dispensed.
6. Keep the actuate key pressed to automatically dispense liquid. Move the Multipette stream/Repeater stream to the next tube within the previously set interval time. If the actuate key is released, the subsequent dispensing steps are not performed. You can continue with dispensing operations afterwards by keeping the actuate key depressed.

After complete dispensing, the display shows:

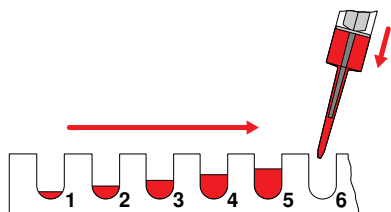


7. There are two possible variants for continuing execution:
  - **Renewed aspiration**
    - a Immerse the Combitip plus in the liquid to be aspirated.
    - b Keep the actuate key depressed for 2 s to aspirate the liquid.
  - **Completely empty and remove the Combitip plus**
    - a Hold the Multipette stream/Repeater stream over a tube to dispense the residual liquid.
    - b Press the actuate key twice to empty the residual liquid.
    - c Remove the Combitip plus (see p. 21).

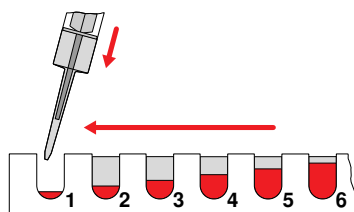
## 5.5 Sequential dispensing mode

(only Multipette Xstream/Repeater Xstream)

①



②



This mode is particularly suitable for dilution series. Sequential dispensing is performed with two different liquids with the same volumes in opposite directions. Different dilutions can be prepared for the same total volume. In **Seq** mode, up to 16 different volumes can be dispensed. You can vary the speed during dispensing. The dispensing speed is valid for all dispensing volumes. The number of dispensing steps and the different dispensing volumes cannot be changed during execution. If the total of all dispensing volumes exceeds the nominal volume of the Combitip plus, further dispensing steps are shown with: "nnnnn". We recommend that you delete these dispensing steps prior to dispensing to avoid operating errors. For this, reduce the number of dispensing steps under **Set steps**.

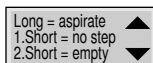
1. Prepare the Multipette stream/Repeater stream (see p. 23).
2. Immerse the Combitip plus in the liquid to be aspirated.
3. Press the actuate key to aspirate the liquid.

The display shows:



4. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key. The reverse stroke is performed. This step is not a dispensing step.
5. Hold the Combitip plus over the first tube into which the liquid is to be dispensed.
6. Press the actuate key to dispense the liquid. Repeat the process for every additional tube. The display shows the dispensing volume and the number of the next dispensing step.

After complete dispensing, the display shows:



7. There are two possible variants for continuing execution:

- **Renewed aspiration**

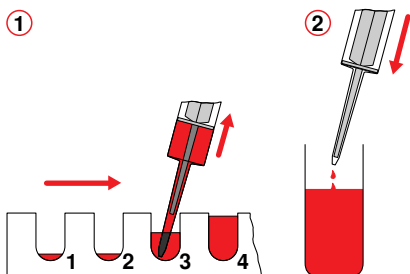
- a Immerse the Combitip plus in the liquid to be aspirated.
- b Keep the actuate key depressed for 2 s to aspirate the liquid.

- **Completely empty and remove the Combitip plus**

- a Hold the Multipette stream/Repeater stream over a tube to dispense the residual liquid.
- b Press the actuate key twice to empty the residual liquid.
- c Remove the Combitip plus (see p. 21).

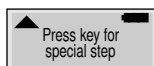
## 5.6 Aspirating

(only Multipette Xstream/Repeater Xstream)



In the **Asp** mode you aspirate a defined volume several times consecutively into the Combitip plus, for example, to take a defined volume from the wells of a plate. The **Asp** mode is performed approximately in reverse to the **Dis** mode. The aspiration volume, aspiration step and speed can be changed during aspiration. After aspiration of the partial volumes you dispense the total volume into a tube.

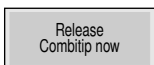
1. Prepare the Multipette stream/Repeater stream (see p. 23). To prevent the whirling up of sediment or to observe a phase limit, select a low aspiration speed.
2. Press the actuate key.  
The display shows:



3. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key to trigger a "special step" without aspiration of liquid. The reverse stroke is performed. This step is not a dispensing step.
4. Immerse the Combitip plus in the liquid to be aspirated. Press the actuate key to aspirate the liquid. Repeat the process for every additional well. The display shows the aspiration volume and the number of the next aspiration step.
5. Press the actuate key again.  
The display then shows:

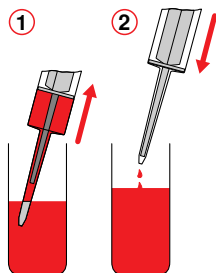


6. Hold the Combitip plus over the tube into which the liquid is to be dispensed.
7. Press the actuate key to dispense the liquid.  
After dispensing, the following is shown temporarily in the display:



8. Remove the Combitip plus (see p. 21).

## 5.7 Pipetting



If you only wish to dispense a volume once, use of the **Pip** mode is recommended. The **Pip** mode can also be used to mix a solution by repeated aspirating and dispensing. If a solution must be dispensed at low speed in the **Dis** mode, but quickly mixed before, this can be accomplished by combining these two modes.

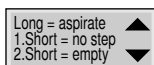
1. Prepare the Multipette stream/Repeater stream (see p. 23).
2. Immerse the Combitip plus in the liquid to be aspirated.
3. Press the actuate key to aspirate the liquid.

The display shows:



4. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key. The reverse stroke is performed. This step is not a dispensing step.
5. Hold the Multipette stream/Repeater stream over the destination tube. Press the actuate key to dispense the liquid.

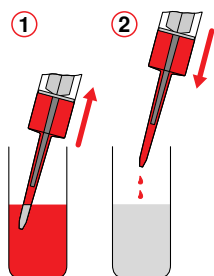
After complete dispensing, the display shows:



6. There are two possible variants for continuing execution:
  - **Renewed aspiration**
    - a Immerse the Combitip plus in the liquid to be aspirated.
    - b Keep the actuate key depressed for 2 s to aspirate the liquid.
  - **Completely empty and remove the Combitip plus**
    - a Hold the Multipette stream/Repeater stream over a tube to dispense the residual liquid.
    - b Press the actuate key twice to empty the residual liquid.
    - c Remove the Combitip plus (see p. 21).

## 5.8 Titration

(only Multipette Xstream/Repeater Xstream)



In **Ttr** mode, liquid dispensing takes place automatically with the actuate key held down or gradually with the actuate key pressed repeatedly. If the actuate key is released, the piston movement stops and the dispensed volume will be displayed. When titration continues, the dispensing speed is automatically reduced. The speed is also reduced when the +/- rocker switch is locked.

The speed can be changed during titration by moving the select rocker switch and changing the speed with the +/- rocker switch.

1. Prepare the Multipette stream/Repeater stream (see p. 23).
2. Immerse the Combitip plus in the liquid to be aspirated.
3. Press the actuate key to aspirate the liquid into the Combitip plus, until it is completely filled. If less liquid than the nominal volume of the Combitip plus should be aspirated, press the actuate key to stop aspiration.

For the first aspiration of liquid the display shows:



The display shows:



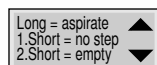
4. Hold the Multipette stream/Repeater stream over a waste container or the supply vessel and press the actuate key. The reverse stroke is performed. This step is not a dispensing step.
5. Hold the Combitip plus over the tube into which the liquid is to be titrated.

### Start titration

6. Keep the actuate key pressed or press the key step by step to dispense the liquid. If the actuate key is released, the piston movement stops and the display shows the total of previously titrated volumes. The speed decreases with each dispensing step. In this way you can reach the final point of titration.
7. When you have completed titration, before the Combitip plus is emptied, hold the Multipette stream/Repeater stream over a waste container and press the reset key to empty the Combitip plus.

After the emptying process is complete, the display shows the result of titration.

If the entire volume of the Combitip plus is needed, the display shows:



8. There are two possible variants for continuing execution:
- **Renewed aspiration**
    - a Immerse the Combitip plus in the liquid to be aspirated.
    - b Keep the actuate key depressed for 2 s to aspirate the liquid. You can continue titration afterwards. The dispensing volumes are added to the previously titrated volume.  
The volume of at least 10 fillings of a Combitip plus can be displayed. An out-of-range reading is indicated by "nnnnn".
  - **Completely empty and remove the Combitip plus**
    - a Hold the Multipette stream/Repeater stream over a tube to dispense the residual liquid.
    - b Press the actuate key twice to empty the residual liquid. The display then shows the titrated volume.
    - c Remove the Combitip plus (see p. 21). The volume display is then extinguished.

- 
- i** The volume of the last correctly completed titration is saved and displayed in the device settings (see p. 32).
- 

## 5.9 Stopping or canceling pipetting operations

In an emergency you can cancel pipetting as follows:

### During aspiration,

- ▶ Press the reset or actuate key. After a canceled aspiration operation the aspirated partial volume can be dispensed.

### During dispensing,

1. Press the reset key.  
Piston movement is stopped. After a stopped dispensing operation it is not possible to correctly dispense the remaining volume.
2. Hold the Multipette stream/Repeater stream over an empty tube or the supply vessel.
3. Press the reset key again to dispense all of the liquid out of the piston of the Combitip plus.

## 5.10 Adjusting the device settings

Under the device parameters you can make higher-order settings and view supplementary information. The acoustic signals indicating errors cannot be deactivated. The following settings and information are available:

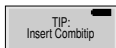
- **Key tones (BEEP):** switch key tones on (**ON**) or off (**OFF**).
- **Brightness (Light):** set display brightness level.
- **Titration results (Last Ttr.):** display results of the last titration. Only valid for the Multipette Xstream/Repeater Xstream.

It is also possible to display the last result if a new filling operation of the Combitip plus was accidentally started in **Ttr** mode. This is only possible if this operation is canceled with the reset key at the latest when **Discard next step** appears.

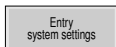
- **Software version:** display software version.
- **Lock +/- rocker (LOCK):** lock +/- rocker (**ON**) or unlock +/- rocker (**OFF**). When the +/- rocker switch is locked, a locked padlock is shown in the display. This option suitable for long dispensing series. The parameter values can be viewed during dispensing.

To access the device settings, proceed as follows:

1. If a Combitip plus is in the Multipette stream/Repeater stream: press ejector button.  
The display shows:



2. Press both rocker switches up at the same time.  
The following appears briefly in the display:






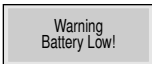

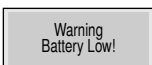
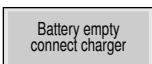
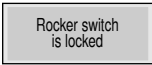

3. Select the parameter to be changed using the select rocker switch.
4. Change the setting of the selected parameter using the +/- rocker switch.
5. Press the actuate key to exit the menu. When the settings have been successfully saved, the following appears briefly in the display:






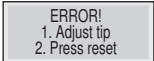
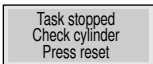
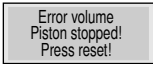
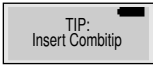


6 Troubleshooting

6.1 Error search

Symptom / Message	Cause	Elimination
Display:  One segment empty.	<ul style="list-style-type: none"> <li>Battery exhausted.</li> </ul>	<ol style="list-style-type: none"> <li>Finish dispensing.</li> <li>Charge battery (see p. 18).</li> </ol>
Display:  Two segments empty.	<ul style="list-style-type: none"> <li>Battery severely discharged.</li> </ul>	<ol style="list-style-type: none"> <li>Finish dispensing <b>immediately</b>.</li> <li>Charge battery (see p. 18).</li> </ol>
Display:  	<ul style="list-style-type: none"> <li>Battery severely discharged.</li> </ul>	<ol style="list-style-type: none"> <li>Confirm with the actuate key.</li> <li>Charge battery (see p. 18).</li> <li>Operation can be continued with the power supply connected.</li> </ol>
Display:  	<ul style="list-style-type: none"> <li>Battery very severely discharged.</li> </ul>	<ol style="list-style-type: none"> <li>Confirm with the actuate key.</li> <li>Charge battery immediately (see p. 18).</li> </ol> If the warning is repeatedly ignored, the Multipette stream/Repeater stream will be locked.
Display: 	<ul style="list-style-type: none"> <li>Battery empty</li> </ul>	Dispensing not possible. <ul style="list-style-type: none"> <li>▶ Charge battery for at least 15 minutes.</li> </ul> Eppendorf recommends charging the battery for at least 2 hours.
If you press the +/- rocker, the following text is displayed:  During operation,  is displayed.	<ul style="list-style-type: none"> <li>+/- rocker is locked.</li> </ul>	<ol style="list-style-type: none"> <li>Ensure that you are allowed to unlock the +/- rocker.</li> <li>Cancel the lock (see <i>Adjusting the device settings</i> on p. 32).</li> </ol>

Symptom / Message	Cause	Elimination
Display is dark	<ul style="list-style-type: none"> <li>Multipette stream/ Repeater stream is switched off.</li> </ul>	<ul style="list-style-type: none"> <li>Press the actuate key to switch on the Multipette stream/Repeater stream.</li> </ul>
	<ul style="list-style-type: none"> <li>No battery in the Multipette stream/ Repeater stream.</li> <li>Battery is fully discharged (battery is also discharged when the device is not used).</li> </ul>	<ul style="list-style-type: none"> <li>Insert battery and charge it for 2 hours.</li> </ul>
	<ul style="list-style-type: none"> <li>Battery is defective.</li> </ul>	<ul style="list-style-type: none"> <li>Insert a new battery and charge it for 2 hours.</li> </ul>
Display switches off during use	<ul style="list-style-type: none"> <li>Overcurrent protection has been triggered.</li> <li>Combitip plus ejection at the wrong time.</li> <li>High backpressure (viscosity, blockage) when dispensing.</li> </ul>	<p><b>Caution!</b> The following steps will trigger a piston movement and may cause the dispensing of liquid!</p> <ol style="list-style-type: none"> <li>In case of a Combitip plus ejection at the wrong time: carefully pull the cylinder downwards by a few millimeters.</li> <li>Trigger a hardware reset (see p. 37).</li> <li>Hold the Combitip plus over a tube.</li> <li>Press the reset key.</li> </ol>
Display: <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">             Press reset! Attention! Piston moves!           </div>	<ul style="list-style-type: none"> <li>Reset key pressed while dispensing.</li> </ul>	<p><b>Caution!</b> The following steps will trigger a piston movement and the dispensing of liquid!</p> <ol style="list-style-type: none"> <li>Hold the Multipette stream/ Repeater stream over an empty tube.</li> <li>Press the reset key again.</li> </ol>
Display flashes: <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto; text-align: center;">  <p>Task aborted! Press reset to empty Combitip</p> </div>	<ul style="list-style-type: none"> <li>Ejector actuated while dispensing, releasing the Combitip plus cylinder.</li> <li>Cylinder pressed against the wall too strongly or bent when dispensing.</li> <li>Accidentally released Combitip plus cylinder not inserted or incorrectly inserted.</li> </ul>	<ol style="list-style-type: none"> <li>Hold the Multipette stream/ Repeater stream over an empty tube.</li> <li>To empty the Combitip plus, press the reset key again.</li> <li>Press the ejector button to remove the Combitip plus.</li> <li>Dispose of the Combitip plus.</li> </ol>

Symptom / Message	Cause	Elimination
Display flashes: 	<ul style="list-style-type: none"> <li>Combitip plus pressed against the tube wall too strongly while or before dispensing.</li> <li>Ejector accidentally operated and cylinder of the Combitip plus released while the Combitip plus was full.</li> </ul>	<ul style="list-style-type: none"> <li>Do not press the inserted Combitip plus against the tube wall with force. If the cylinder has been released:                             <ol style="list-style-type: none"> <li>Slide the cylinder of the Combitip plus carefully upwards until it locks into place.</li> <li>Press the reset key. Further information on how to proceed is displayed.</li> </ol> </li> </ul>
Display flashes: 	The following error message was cleared: 	<ol style="list-style-type: none"> <li>Dispense the residual volume into the affected tube.</li> <li>Continue dispensing.</li> </ol>
Display: 	<ul style="list-style-type: none"> <li>Step error during piston movement.</li> <li>Piston movement was obstructed.</li> </ul>	<ol style="list-style-type: none"> <li>Remove obstruction.</li> <li>If necessary: operate the ejector to release the cylinder.</li> <li>Pull the released cylinder downwards by a few millimeters.</li> <li>Empty and remove the Combitip plus (see p. 21).</li> </ol>
Display: 	<ul style="list-style-type: none"> <li>Step error while aspirating or dispensing liquid.</li> <li>Dispensing error.</li> <li>Combitip plus opening was closed or viscosity too high.</li> </ul>	<ol style="list-style-type: none"> <li>Hold the Multipette stream/ Repeater stream over an empty tube.</li> <li>To empty the Combitip plus, press the reset key.</li> <li>In case of high viscosity: repeat the dispensing operation at low speed.</li> </ol>
Display: 	<ul style="list-style-type: none"> <li>No Combitip plus inserted.</li> </ul>	<ul style="list-style-type: none"> <li>Insert Combitip plus.</li> </ul>
You want to empty or remove a filled Combitip plus.	<ul style="list-style-type: none"> <li>The present residual liquid is no longer required.</li> <li>You want to insert a different Combitip plus.</li> </ul>	<ol style="list-style-type: none"> <li>Hold the Multipette stream/ Repeater stream over an empty tube.</li> <li>To empty the Combitip plus, press the reset key.</li> <li>Press the ejector button to remove the Combitip plus.</li> <li>Dispose of the Combitip plus.</li> </ol>
Combitip plus is dripping.	<ul style="list-style-type: none"> <li>Combitip plus is not leak-tight.</li> </ul>	<ul style="list-style-type: none"> <li>Change Combitip plus.</li> </ul>

Symptom / Message	Cause	Elimination
Battery must be charged very often.	<ul style="list-style-type: none"> <li>Charging capacity of the battery has decreased.</li> <li>A large number of dispensing operations has been performed.</li> </ul>	<p>If the charging capacity has decreased:</p> <ol style="list-style-type: none"> <li>Order a new rechargeable lithium-ion battery.</li> <li>Insert new rechargeable lithium-ion battery (see p. 17).</li> <li>Charge new rechargeable lithium-ion battery for 2 hours (see p. 18).</li> </ol>

Further error messages displayed are intended only for error diagnosis by service personnel. Contact your local Eppendorf partner if the error message cannot be cleared by pressing the reset key or performing a hardware reset.

**Avoiding dispensing errors**

The precision and trueness of the Multipette stream/Repeater stream must be verified on a regular basis. An SOP (Standard Operating Procedure) for the Multipette stream/Repeater stream can be found on our homepage, [www.eppendorf.com](http://www.eppendorf.com).

**6.2 Pipette self-test**



**CAUTION! Injury to persons and material damage from the release of sample material when triggering the self-test.**

When the self-test is triggered, the liquid is dispensed from the Combitip plus.

- ▶ Hold the Multipette stream/Repeater stream over an empty tube, while you trigger the self-test.

The Multipette stream/Repeater stream can be tested as follows:

- Make sure that the Combitip plus is in the basic position, or no Combitip plus is inserted.
- Hold the Multipette stream/Repeater stream over an empty tube.
- Keep the reset key depressed for 5 s.

The self-test begins and the display shows the software version of the Multipette stream/Repeater stream.

If the self-test was successful, **Check procedure OK** is displayed.

## 6.3 Hardware reset

The hardware reset will interrupt the power connection to the rechargeable Li-ion battery. Only trigger a hardware reset in emergencies, for example, after a overcurrent protection has been triggered.

### Without inserted Combitip

- ▶ Press the tip of a 5 mL Combitip plus, or another pointed object, against the contact point in the center of the selection dial.

### With inserted Combitip

1. Press the tip of a 5 mL Combitip plus, or another pointed object, against the contact point in the center of the selection dial.
2. Hold the Multipette stream/Repeater stream over a waste container.
3. Press the red reset key. The piston of the Combitip is moved to the basic position.

After the reset, the software version is displayed for a few seconds.

## 7 Maintenance

### 7.1 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 Multipette stream/Repeater stream.
- ▶ Do not use sharp objects to clean the Multipette stream/Repeater stream.



#### **NOTICE! Damage to device from penetration of liquids.**

- ▶ Do not allow any liquids to penetrate the inside of the housing.
- ▶ If liquid has penetrated the inside of the housing, have the inner parts of the Multipette stream/Repeater stream repaired only by service partners of Eppendorf AG. Contact your responsible sales office before returning a product.

Perform the following steps:

1. Remove soiling at the Combitip plus aspiration area very carefully with a cotton tip.
2. Carefully wipe the housing of the Multipette stream/Repeater stream with a slightly damp or dry cloth.

### 7.2 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.

8 Technical data

Combitip plus	Volume range	Testing volume	Maximum permissible errors			
			Systematic error		Random error	
			± %	± µL	± %	± µL
0.1 mL (white piston) Increment: 0.1 µL	1 - 100 µL	10 µL	± 1.6	± 0.16	± 2.5	± 0.25
		50 µL	± 1.0	± 0.5	± 1.5	± 0.75
		100 µL	± 1.0	± 1	± 0.5	± 0.5
0.2 mL (blue piston) Increment: 0.2 µL	2 - 200 µL	20 µL	± 1.3	± 0.26	± 1.5	± 0.3
		100 µL	± 1.0	± 1	± 1.0	± 1
		200 µL	± 1.0	± 2	± 0.5	± 1
0.5 mL Increment: 0.5 µL	5 - 500 µL	50 µL	± 0.9	± 0.45	± 0.8	± 0.4
		250 µL	± 0.9	± 2.25	± 0.5	± 1.25
		500 µL	± 0.9	± 4.5	± 0.3	± 1.5
1 mL Increment: 1 µL	10 - 1 000 µL	100 µL	± 0.9	± 0.9	± 0.55	± 0.55
		500 µL	± 0.6	± 3	± 0.3	± 1.5
		1 000 µL	± 0.6	± 6	± 0.2	± 2
2.5 mL Increment: 2.5 µL	25 - 2 500 µL	250 µL	± 0.8	± 2	± 0.45	± 1.125
		1 250 µL	± 0.5	± 6.25	± 0.3	± 3.75
		2 500 µL	± 0.5	± 12.5	± 0.15	± 3.75
5 mL Increment: 5 µL	50 - 5 000 µL	500 µL	± 0.8	± 4	± 0.35	± 1.75
		2 500 µL	± 0.5	± 12.5	± 0.25	± 6.25
		5 000 µL	± 0.5	± 25	± 0.15	± 7.5
<b>mL</b>	<b>mL</b>	<b>mL</b>	<b>%</b>	<b>mL</b>	<b>%</b>	<b>mL</b>
10 mL Increment: 0.01 mL	0.1 - 10 mL	1 mL	± 0.5	± 0.005	± 0.25	± 0.0025
		5 mL	± 0.4	± 0.02	± 0.25	± 0.0125
		10 mL	± 0.4	± 0.04	± 0.15	± 0.015
25 mL (blue adapter) Increment: 0.025 mL	0.25 - 25 mL	2.5 mL	± 0.3	± 0.0075	± 0.35	± 0.0088
		12.5 mL	± 0.3	± 0.0375	± 0.25	± 0.0313
		25 mL	± 0.3	± 0.075	± 0.15	± 0.0375
50 mL (dark gray adapter) Increment: 0.05 mL	0.5 - 50 mL	5 mL	± 0.3	± 0.015	± 0.50	± 0.025
		25 mL	± 0.3	± 0.075	± 0.20	± 0.05
		50 mL	± 0.3	± 0.15	± 0.15	± 0.075

The above-mentioned technical data applies only when Combitips plus are used. Test conditions and test evaluation in compliance with ISO 8655, Part 6. Test using a standardized fine balance with a moisture trap.

- Volume tests in the **Dis** mode.
- Set speed level: 7
- 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

**i** The test volumes for the systematic and random errors of the Multipette plus/ Repeater plus are not identical using the Multipette stream/Repeater stream. The different selection of published test volumes is attributable to corresponding specifications in ISO 8655, Part 5.

## Battery

Type:	Rechargeable lithium-ion battery; overcharge protection in connection with the Multipette stream/Repeater stream
Capacity:	1200 mAh / 3.7 V
Charging time:	Approx. 2 hours
Number of dispensing operations:	Up to 2000 dispensing operations are possible with a fully-charged battery and at maximum aspiration and dispensing speed.
Weight:	Approx. 32 g

## power supply

Type:	Power supply with insertable power plug adapter
Input voltage:	100 V to 240 V ± 10% 50/60 Hz
Output voltage:	5 V / 1.0 A

## Multipette stream/Xstream

Operating temperature:	+5 °C to +40 °C
Air humidity during operation:	Between 20 % and 92 %
Storage temperature:	-10 °C to +45 °C
Air humidity during storage:	Between 10 % and 92 %
Weight without battery, without Combitips plus:	Approx. 150 g

9 Ordering Information

9.1 Multipette stream/Repeater stream

Order No. (International)	Order No. (North America)	Description
4986 000.017		<b>Multipette stream</b>
4986 000.025		<b>Multipette Xstream</b>
	022460803	<b>Repeater stream</b>
	022460811	<b>Repeater Xstream</b>

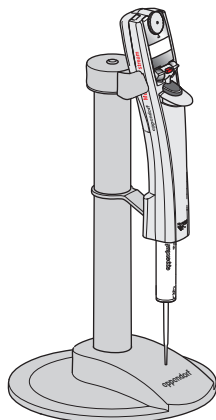
9.2 Combitips plus and Adapter plus

Order No. (International)	Order No. (North America)	Description
		<b>Combitips plus Eppendorf Quality</b> 100 pieces
0030 069.200	022265954	0.1 mL
0030 069.218	022266004	0.2 mL
0030 069.226	022266101	0.5 mL
0030 069.234	022266209	1 mL
0030 069.242	022266306	2.5 mL
0030 069.250	022266403	5 mL
0030 069.269	022266501	10 mL
0030 069.293	022266551	25 mL, incl. 1 Adapter plus Eppendorf Quality
0030 069.277	022266608	50 mL, incl. 1 Adapter plus Eppendorf Quality
		<b>Combitips plus sterile</b> 10 bags of 10 pieces
	022267001	0.1 mL
	022267108	0.2 mL
	022267205	0.5 mL
	022267302	1 mL
	022267400	2.5 mL
	022267507	5 mL
	022267604	10 mL
	022267655	25 mL, incl. 1 Adapter plus Eppendorf Quality
	022267701	50 mL, incl. 1 Adapter plus Eppendorf Quality
		<b>Combitips plus Biopur</b> 100 pieces individually packed
0030 069.404	022496000	0.1 mL
0030 069.412	022496026	0.2 mL
0030 069.420	022496042	0.5 mL
0030 069.439	022496069	1 mL
0030 069.447	022496085	2.5 mL
0030 069.455	022496107	5 mL
0030 069.463	022496123	10 mL
0030 069.390	022496131	25 mL, incl. 1 Adapter plus Biopur
0030 069.471	022496140	50 mL, incl. 1 Adapter plus Biopur



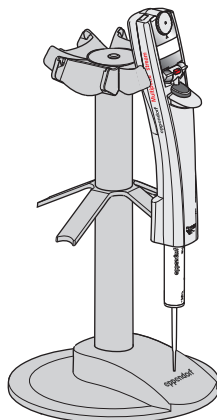
Order No. (International)	Order No. (North America)	Description
0030 069.528 0030 069.161	022266993 022266705	<b>Adapter plus Eppendorf Quality</b> 1 piece, autoclavable 25 mL, blue 50 mL, dark gray
0030 069.498 0030 069.480	022496158 022496166	<b>Adapter plus Biopur</b> 7 pieces, autoclavable 25 mL, blue 50 mL, dark gray
0030 069.285	022266624	<b>Assortment pack Combitips plus Eppendorf Quality</b> 5 Combitips plus of each size plus one 50 mL and one 25 mL Adapter plus Eppendorf Quality

### 9.3 Accessories



**Charger stand 4880**

For the Multipette stream/Repeater stream



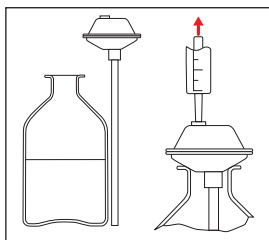
Modified **charger carousel 4880**

For Xplorer pipettes and a Multipette stream/Repeater stream

A charger stand or charger carousel can be used for storing the Multipette stream/Repeater stream and simultaneously charging the rechargeable Li-ion battery.

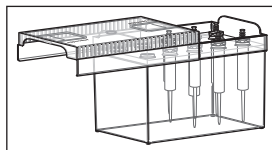
The power supply included in the accessories of the Multipette stream/Repeater stream can be connected to the charger stand. The charger carousel is supplied with a more powerful power supply.

- i** The charger carousel 4880 is intended for Xplorer pipettes. To store and charge the Multipette stream/Repeater stream in the charger carousel 4880, you must order a Multipette stream/Repeater stream charger shell and use it instead of an Xplorer charger shell. The charger shell for a Multipette stream/Repeater stream is partly colored in blue.



### Combilong/Combitube

The Combilong/Combitube is an aspirating aid for the Multipette stream/Repeater stream. It enables liquids to be directly taken out of all bottles.



### Combitip rack

A Combitip rack is available for storing Combitips plus ( $\leq 10$  mL). It is especially recommended for sterile Biopur Combitips plus and can be autoclaved.

Order No. (International)	Order No. (North America)	Description
4880 000.018	4880000018	<b>Charger stand 4880</b> For 1 Multipette/Repeater (X)stream
4880 000.026	4880000026	<b>Charger carousel 4880</b> For 4 Xplorer, Multipette/Repeater (X)stream Incl. power supply 4880 603.006
4880 601.003	4880601003	<b>Charger shell</b> For charger carousel series 4880 Blue, for Multipette/Repeater (X)stream
4986 602.009	022462407	<b>Lithium-ion battery</b> For Multipette/Repeater (X)stream
4986 603.005	4986603005	<b>Power supply with power plug adapters</b> For Multipette/Repeater (X)stream, Xplorer, charger stand series 4880
0030 059.506		<b>Combilong</b> Aspirating aid for removing liquids from volumetric flasks and tall bottles 2 pieces
	022261550	<b>Combitube</b> Aspirating aid for removing liquids from volumetric flasks and tall bottles 2 pieces
0030 069.897	022268007	<b>Combitip Rack</b> for Combitips plus (0,1 - 10 mL)
4986 900.115	4986900115	<b>Operating Manual Multipette/Repeater (X)stream</b>
4986 900.140	4986900140	<b>Short instructions Multipette/Repeater (X)stream</b>

## 10 Transport, storage and disposal

### 10.1 Decontamination before shipping

If you are shipping the device to the authorized Technical Service for repairs or to your authorized dealer for disposal please note the following:



**WARNING! 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](http://www.eppendorf.com/decontamination)).
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.

### 10.2 Storage



**NOTICE! Damage to device due to incorrect storage.**

- ▶ Do not store the Multipette stream/Repeater stream with the Combitip plus inserted.
- ▶ Select a secure storage area or charger stand.
- ▶ Do not expose the Multipette stream/Repeater stream to aggressive gases over a longer period of time.



**NOTICE! Damage to device due to inserted rechargeable battery during storage.**

- ▶ Remove the rechargeable battery from the Multipette stream/Repeater stream if you do not intend to use the Multipette stream/Repeater stream for an extended period.

	<b>Air temperature</b>	<b>Rel. humidity</b>	<b>Air pressure</b>
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

### 10.3 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, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this:

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



#### **WARNING! Risk of explosion and fire from overheated batteries.**

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

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#### **Disposing of rechargeable batteries**

Do not dispose of rechargeable batteries as household waste. Dispose of rechargeable batteries in compliance with local legal disposal regulations.



# 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:

Multipette® stream, Multipette® Xstream

Produkttyp, Product type:

Elektronischer Handdispenser / Electrical manual dispenser

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

2006/95/EG, EN 61010-1

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



Vorstand, Board of Management:

25.03.2009

Hamburg, Date:



Projektmanagement, Project Management:



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