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Multipette® M4 · Repeater® M4

Operating manual

4982 900.099-06/082016

Table of contents

1 Operating instructions

1.1 Using this manual

- Read this operating manual completely before using the device for the first time. Also observe the instructions for use of the accessories.
- This operating manual is part of the product. Thus, it must always be easily accessible.
- Enclose this operating manual when transferring the device to third parties.
- You will find the current version of the operating manual for all available languages on our webpage under www.eppendorf.com.

1.2 Danger symbols and danger levels

1.2.1 Danger symbols

The safety instructions in this manual have the following danger symbols and danger levels:

	**Biohazard**		**Explosive substances**
	**Toxic substances**		**Material damage**
	**Hazard point**		

1.2.2 Danger levels

DANGER	*Will* lead to severe injuries or death.
WARNING	*May* 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
1. 2.	Actions in the specified order
▸	Actions without a specified order
•	List:
①	Step in the figures
Text	Display or software texts
	Additional information

1.4 Glossary

A

Adapter advanced
Connecting piece for the dispenser when using Combitips advanced 25 mL and 50 mL.

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

C

Coding
The dispenser uses coding to detect the Combitip's maximum volume.

Color code
The color code displays the maximum volume.

Combitip advanced
Dispensing tip for all Eppendorf Multipettes and Repeaters.Combitips advanced are consumables intended for single use. Combitips advanced consist of a piston and a cylinder and function according to the positive displacement principle.

D

Dispenser
A dispenser is a dispensing device which functions according to the positive displacement principle. There are multi-dispensers and single stroke dispensers.

Dispensing volume
Volume per dispensing step.

F

Free jet dispensing
Dispensing of liquid without the dispensing tip (pipette tip, dispenser tip) touching the tube inner wall.

G

Graduation
Incremental graduation of a range, a surface or a volume.

I

Increment
Step size or resolution. The smallest possible change by which a value can be increased.

ISO 8655
The standard defines limit values for the systematic error, the random error and the test methods for dispensers.

M

Maximum volume
The maximum volume that can be used for dispensing.

N

Nominal volume
The maximum dispensing volume of a dispensing system specified by the manufacturer.

P

Positive displacement principle
Design feature of piston-stroke dispensers. The liquid is in direct contact with the piston of the dispensing tip (Combitip) during aspiration and dispensing operations.

R

Random error
Precision, standard deviation. A measure for the scattering of the measured values around the average value.

Remaining stroke
Liquid reserve. The liquid which remains after all dispensing steps have been completed.

Residual stroke lock
When the operating lever is operated, the residual stroke lock prevents the incorrect volume from being dispensed if the liquid required for the dispensing volume is no longer available.

Reverse stroke
After liquid aspiration, the piston is moved to a defined initial position. Liquid is dispensed during the piston movement. The reverse stroke is not a dispensing step.

S

Stroke
The stroke is the distance traveled by the piston.

Systematic error
Inaccuracy. Deviation of the average value of the dispensed volumes from the selected volume.

W

Wall dispensing
Dispensing liquid against the tube wall. The pipette tip or the dispensing tip is held against the tube inner wall and the liquid is dispensed.

2 Safety

2.1 Intended use

The Multipette M4/Repeater M4 is a lab device and in combination with a Combitip advanced it is intended for dispensing aqueous solutions in the volume range of 1 µL – 10 mL. In vivo applications (applications in or on the human body) are not permitted.

The Multipette M4/Repeater M4 may only be operated by trained specialists. All users must have read the operating manual carefully and familiarized themselves with the device's mode of operation.

2.2 Warnings for intended use

WARNING! Damage to health due to infectious liquids and pathogenic germs.

- When handling infectious liquids and pathogenic germs, observe the national regulations, the biological security level of your laboratory, the Material Safety Data Sheets, and the manufacturer's application notes.
- Wear your personal protective equipment.
- For comprehensive regulations about handling germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, in its respectively current valid version).

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

- Wear your personal protective equipment.
- Observe the national regulations for handling these substances.
- Observe the Material Safety Data Sheets and manufacturer's application notes.

CAUTION! Danger to individuals due to careless use

- Never point the opening of the device toward yourself or others.
- Only initiate liquid dispensing if it is safe to do so.
- With any dispensing task please ensure that you do not endanger yourself and other persons.

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! 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.

- Only use the pipette tips once.
- Do not use autoclaved ep Dualfilter T.I.P.S. for dispensing.

NOTICE! Carry-over, contamination and incorrect dispensing results due to the incorrect use of Combitips.
Combitips are intended for single use. Prolonged use can have a negative impact on dispensing accuracy.

- Only use Combitips once.
- Do not use washed and/or autoclaved Combitips for dispensing.

NOTICE! Damage to the device due to penetration of liquids.

- Do not allow any liquids to penetrate the inside of the housing.

2.3 Information on product liability

In the following cases, the designated protection of the device may be compromised. Liability for any resulting property damage or personal injury is then transferred to the operator:

- The device is not used in accordance with the operating manual.
- The device is used outside of its intended use.
- The device is used with accessories or consumables which are not recommended by Eppendorf.
- The device is maintained or repaired by people not authorized by Eppendorf.
- The user makes unauthorized changes to the device.

3 Product description

3.1 Delivery package

Quantity	Description
1	Multipette M4/Repeater M4
1	Operating manual
1	Combitip advanced 2.5 mL
1	Holder
1	Battery (fitted)
1	Eppendorf certificate

3.2 Features

The Multipette M4/Repeater M4 dispenser can only be operated with a Combitip advanced. This makes the Multipette M4/Repeater M4 dispenser a positive displacement dispenser. Depending on the Combitip advanced used, you can dispense volumes in the range from 1 µL to 10 mL.

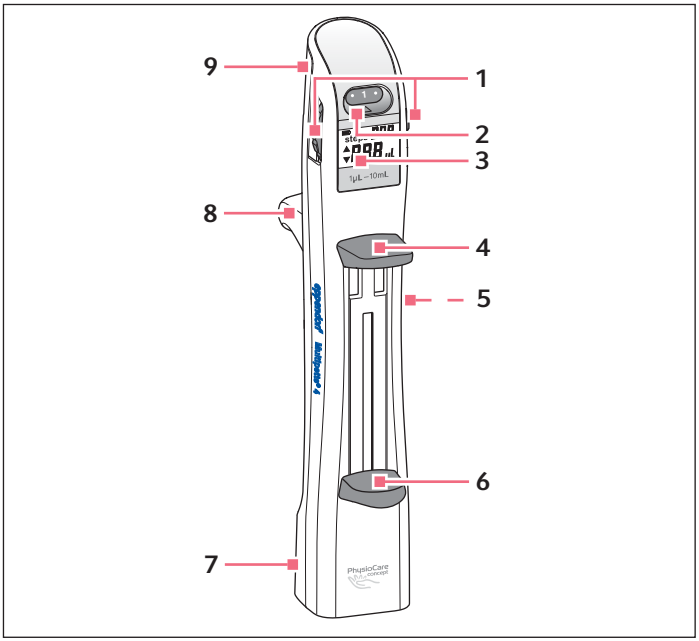
The dispensing volume is set with the volume selection dial and shown on the display. For each Combitip advanced 20 different dispensing volumes can be set with the volumen selection dial. Depending on the dispensing volume, 5 to 100 dispensing steps can be carried out with a Combitip advanced that is filled to capacity. The display shows the number of possible or completed dispensing steps. The display of the dispensing volume and the possible dispensing steps is made possible by the automatic detection of the size of the Combitip advanced. Automatic detection is via a coding on the Combitip advanced and a sensor ring in the dispenser Multipette M4/Repeater M4. The electrical supply for the electronics is via a battery.

The reliable detection and the secure seating during dispensing the Combitip advanced in the Multipette M4/Repeater M4 dispenser is ensured by a center sleeve in the Multipette M4/Repeater M4 dispenser.

The Combitip advanced is filled or emptied via the lower filling lever. Dispensing is carried out with the upper operating lever. If the piston in the Combitip advanced is pushed down as far as it will go with the filling lever, the Combitip advanced can be ejected by pushing the operating lever.

The 25 mL or 50 mL Combitip advanced can only be used together with the corresponding Adapter advanced. Combitip advanced and Adapter advanced are assembled before inserting into the Multipette M4/Repeater M4 dispenser. All Combitip advanced and the two Adapter advanced are color coded.

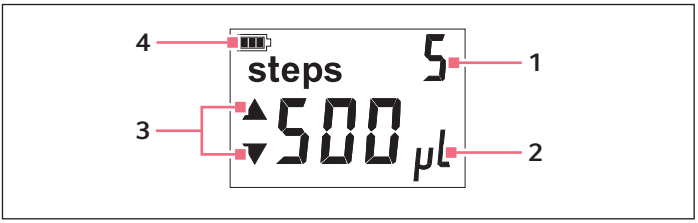
3.3 Product overview



1 **Volume selection dial**
2 **Position display**
3 **Display**
4 **Operating lever**
5 **RFID chip location**
6 **Filling lever**
7 **Serial number**
8 **Hand rest**
9 **Battery compartment lid**

3.4 Display

When you insert a Combitip, the display switches on automatically. The displays switches off automatically when it has not been used for a period of time (Sleep function). The display automatically switches back on when the dispenser is moved. If no Combitip is inserted, the display does not switch back on when moved.



1 **Number of steps**

2 **Volume**

3 **Possible direction of the next piston movement**

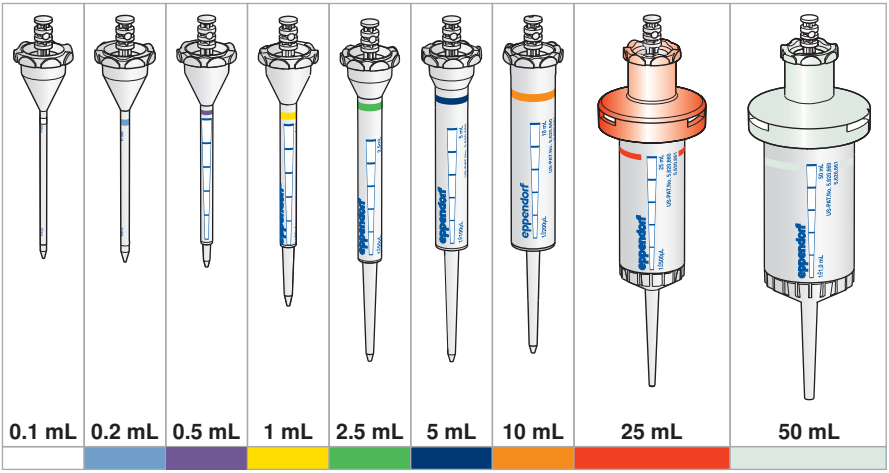
4 **Battery charge condition**

If the display flashes, the current or next operating step is not a dispensing step.

3.5 Combitip advanced

The dispenser can only be operated with Combitips advanced. Combitips advanced are disposable devices for aspirating and dispensing liquids according to the positive displacement principle. Combitips advanced are available in various sizes, which are marked using a color code.

3.6 Overview of Combitips advanced with color codes



3.7 Materials

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

- Check the resistance to chemicals when using organic solvents or aggressive chemicals.
- Observe the cleaning instructions.

The assemblies which can be accessed by the user are made of the following materials:

Assembly	Material
Housing parts	Improved polypropylene (PP)
Filling lever, operating lever	Refined polypropylene (PP), dyed
Viewing window	Polycarbonate (PC)
Volume selection dial	Acrylonitrile styrene copolymerisate with polycarbonate (ASA/PC)

Assembly	Material
Other external components	• Polyetherimide (PEI) • Polybutylene terephthalate (PBT) • Polyetheretherketone (PEEK) • Acrylonitrile styrene copolymerisate with polycarbonate (ASA/PC) • Silicone
Holder	Acrylonitrile styrene copolymerisate with polycarbonate (ASA/PC)

3.8 Warranty

In case of warranty claims, contact your local Eppendorf contractual partner.

No warranty is given in the following cases:

- In the case of misuse.
- If unauthorized persons open the dispenser.

The following assemblies are excluded from the warranty:

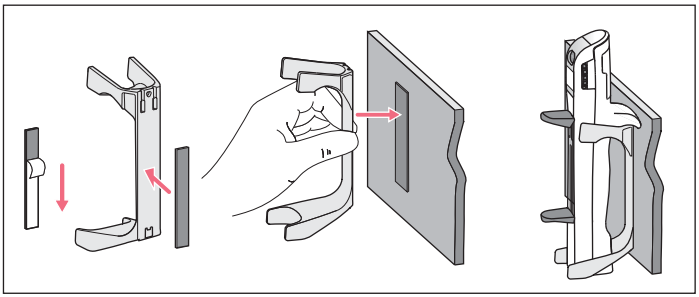
- Wear parts
- Battery

4 Installation

4.1 Using the holder

The accessories include a holder for the dispenser. The holder can be used for wall mounting or as a holder in the pipette carousel.

4.1.1 Mounting the holder on a wall



1. Remove the protective film on a hook-and loop tape and stick the hook-and loop tapes to the back of the holder. Press the hook-and-loop tapes down firmly.
2. Clean glass or ceramic surfaces (e.g., with ethanol) and allow them to dry.
3. Remove the protective film on the second hook-and-loop tape and press the hook-and-loop tape firmly against the clean surface. Join the hook-and-loop tape on the Multipette M4 holder to the hoop-and loop tape on the wall. It may only be placed under load after 24 hours.

5 Operation
5.1 Inserting the Combitip

NOTICE! Damage to the device due to incorrect Combitip.
The dispenser holder is only suitable for Combitips advanced. Other Combitips could damage the holder.

▶ Only use Combitips advanced.

5.1.1 Selecting a Combitip

With the dispenser and every Combitip, 20 different dispensing volumes can be selected.

Select a Combitip according to the following criteria:

- The desired dispensing volume is possible.
- The desired number of dispensing steps is possible.
- The geometry of the Combitip matches the geometry of the aspiration and destination vessels.

▶ Use the volume table to select the corresponding volume and Combitip.

5.1.2 Volume table

Selection dial	Dispensing steps	0.1 mL white	0.2 mL light blue	0.5 mL purple	1.0 mL yellow	2.5 mL green	5.0 mL blue	10 mL orange	25 mL red	50 mL light gray
•	100	1.0 µL	2.0 µL	5.0 µL	10 µL	25 µL	50 µL	0.1 mL	0.25 mL	0.5 mL
1	50	2.0 µL	4.0 µL	10 µL	20 µL	50 µL	100 µL	0.2 mL	0.50 mL	1.0 mL
•	33	3.0 µL	6.0 µL	15 µL	30 µL	75 µL	150 µL	0.3 mL	0.75 mL	1.5 mL
2	25	4.0 µL	8.0 µL	20 µL	40 µL	100 µL	200 µL	0.4 mL	1.00 mL	2.0 mL
•	20	5.0 µL	10 µL	25 µL	50 µL	125 µL	250 µL	0.5 mL	1.25 mL	2.5 mL
3	16	6.0 µL	12 µL	30 µL	60 µL	150 µL	300 µL	0.6 mL	1.50 mL	3.0 mL
•	14	7.0 µL	14 µL	35 µL	70 µL	175 µL	350 µL	0.7 mL	1.75 mL	3.5 mL
4	12	8.0 µL	16 µL	40 µL	80 µL	200 µL	400 µL	0.8 mL	2.00 mL	4.0 mL
•	11	9.0 µL	18 µL	45 µL	90 µL	225 µL	450 µL	0.9 mL	2.25 mL	4.5 mL
5	10	10 µL	20 µL	50 µL	100 µL	250 µL	500 µL	1.0 mL	2.50 mL	5.0 mL
•	9	11 µL	22 µL	55 µL	110 µL	275 µL	550 µL	1.1 mL	2.75 mL	5.5 mL
6	8	12 µL	24 µL	60 µL	120 µL	300 µL	600 µL	1.2 mL	3.00 mL	6.0 mL
•	7	13 µL	26 µL	65 µL	130 µL	325 µL	650 µL	1.3 mL	3.25 mL	6.5 mL
7	7	14 µL	28 µL	70 µL	140 µL	350 µL	700 µL	1.4 mL	3.50 mL	7.0 mL
•	6	15 µL	30 µL	75 µL	150 µL	375 µL	750 µL	1.5 mL	3.75 mL	7.5 mL
8	6	16 µL	32 µL	80 µL	160 µL	400 µL	800 µL	1.6 mL	4.00 mL	8.0 mL
•	5	17 µL	34 µL	85 µL	170 µL	425 µL	850 µL	1.7 mL	4.25 mL	8.5 mL
9	5	18 µL	36 µL	90 µL	180 µL	450 µL	900 µL	1.8 mL	4.50 mL	9.0 mL
•	5	19 µL	38 µL	95 µL	190 µL	475 µL	950 µL	1.9 mL	4.75 mL	9.5 mL
10	5	20 µL	40 µL	100 µL	200 µL	500 µL	1000 µL	2.0 mL	5.00 mL	10.0 mL

5.1.3 Example for selecting a Combitip

The following table shows different ways of dispensing 50 µL.

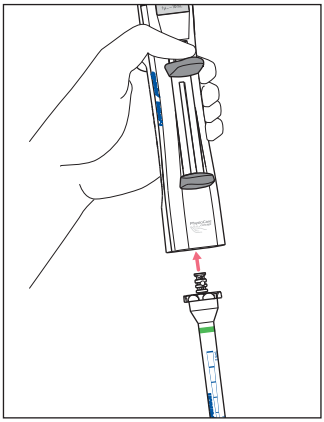
Combitip advanced	Number of dispensing steps when completely filled	Position of the volume selection dial
0.5 mL	10	5
1.0 mL	20	2.5
2.5 mL	50	1
5.0 mL	100	0.5

5.1.4 Inserting the Combitip into the dispenser

NOTICE! Damage to device due to incorrect handling of the inserted dispensing tip.

- Insert the dispensing tip straight into the dispenser from below.
- Do not turn the inserted dispensing tip.
- Never hold the dispenser by the dispensing tip.

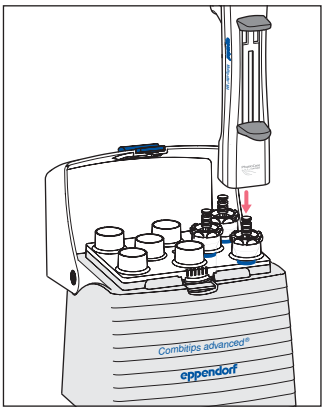
If you keep pushing the operating lever while inserting the Combitip, it will be easier to insert the Combitip.



1. Push the filling lever down.
2. Insert the Combitip straight from below.
3. If required, push the filling lever down again.
   The display shows the direction of the next piston movement, the selected dispensing volume and the possible dispensing steps.

If you want to have a different view of the text printed on the Combitip, eject the Combitip and re-insert it in a different position.

5.1.5 Picking up Combitips out of the rack



1. Push the dispenser onto the Combitip at right angle.
2. Push the filling lever down.
   The display shows the direction of the next piston movement, the selected dispensing volume and the possible dispensing steps.

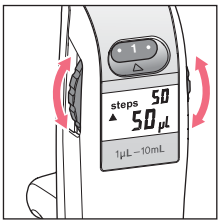
5.2 Setting the volume

The volume selection wheel has 20 positions. Every second position is marked with a figure. The other positions are marked with a dot. You can select the dispensing volume before liquid aspiration and change it during the dispensing steps.

5.2.1 Setting the volume before dispensing

Prerequisites

- Combitip advanced is inserted.



1. Turn the volume selection dial until it locks into the desired position.
   The display shows the volume and the number of possible dispensing steps.

5.3 Step counter

On the display, the step counter shows the dispensing steps next to *steps*. The possible dispensing steps are displayed when a Combitip is inserted or the volume is selected. The dispensing steps that were performed are displayed during dispensing. After the volume setting was changed and dispensing performed, the step counter starts again at *steps* 1. In case of aspiration without dispensing the residual liquid, the step counter continues. If the Combitip is only partially filled, the number of times the operating lever was pressed is also counted if the lowest position (residual stroke lock) was already reached. If the volume is changed in the case of partial filling, the possible steps are not shown.

The step counter will **not** continue to count when the Combitip is only partially filled after it has been filled to capacity.

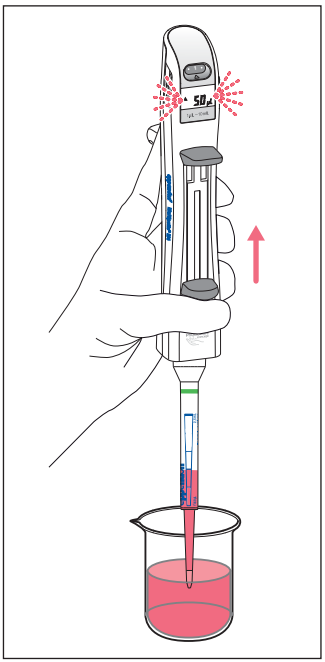
If the Combitip is partially filled, the step counter continues counting when the filling lever is pressed even if the lower stop was reached.

5.4 Aspirating liquid

If you are aspirating solutions with a high viscosity into a Combitip with a large volume, draw up the filling lever especially slowly. This prevents any leakage occurring between the piston and the cylinder in the Combitip.

Prerequisites

- Combitip is inserted.



1. Immerse the tip of the Combitip in the liquid.
2. Slowly and steadily slide the filling lever up.
   The display flashes during aspiration.
   The small air bubble at the Combitip piston is due to technical reasons. The Combitip is completely filled when the filling lever has reached the upper stop.
3. Wipe off any outer wetting on the tip of the Combitip on the inner wall of the tube.

To empty the Combitip, you can push the filling lever down at any time.

5.5 Dispensing liquid

If the Combitip is partially filled, you need to press the operating lever repeatedly if the selection dial setting is below 4.

Prerequisites

- Liquid has been aspirated.
- The display flashes.

1. Press the operating lever to trigger the reverse stroke.
   When the reverse stroke is completed, the display will stop blinking. The *steps* display is set to *0*. During the subsequent dispensing procedures the completed *steps* steps are displayed.

After the liquid is aspirated the reverse stroke must be triggered.

Dispense the reverse stroke into the aspiration tube or a waste tube. The reverse stroke is not a dispensing step.

- If you want to complete all dispensing steps using the wall dispensing method, also complete the reverse stroke using the wall dispensing method.
- If you want to complete all dispensing steps using the free jet dispensing method, also complete the reverse stroke using the free jet dispensing method.
- If a drip forms after free jet dispensing, this drip always belongs to the next dispensing step.

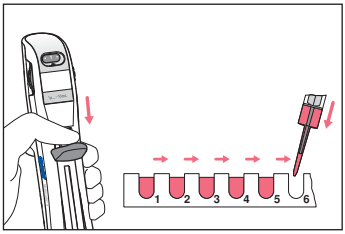
Position of the volume selection dial	Number of times the operating lever was pressed for the reverse stroke
• (= 0,5)	8
1	4
• (= 1,5)	3
2	2
• (= 2,5)	2
3	2
• (= 3,5)	2
≥ 4	1

5.5.1 Dispensing liquid

Prerequisites

- Liquid has been aspirated.
- Reverse stroke has been performed.

The liquid dispensing angle should always be as steep as possible. A dispensing angle greater than 45° can result in an incorrect dispensing volume during the final dispensing steps.



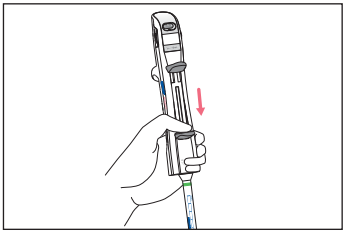
1. Place the tip of the Combitip at a steep angle on the tube inner wall of the target tube (wall dispensing) or hold the Combitip over the target (free jet dispensing).
2. Push the operating lever down as far as it will go.
   The display shows the *steps* and the number of dispensing steps performed.

The faster you push the operating lever down, the faster the liquid is dispensed. Adjust the liquid dispensing to the tube geometry to prevent liquid splashing out of the tube. For highly viscous liquids, always operate the operating lever slowly.

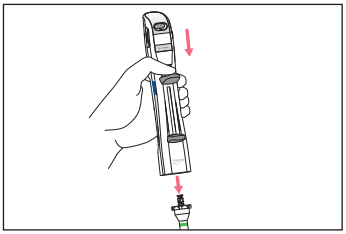
3. Let the operating lever slide back fully to its initial position.
4. Push the operating lever down again to perform the next dispensing step.
   If there is not enough liquid for the selected dispensing volume, the residual stroke lock will prevent any further dispensing operations.
   The Combitip can be filled again or the residual liquid can be discarded.

5.6 Ejecting the Combitip

To eject the Combitip, it must be completely empty.



1. Push the filling lever down as far as it will go.
   The display flashes.
   The display shows the ▼ symbol.



2. Push the operating lever down quickly and firmly.
   The Combitip is ejected.
3. Dispose of Combitip.

5.6.1 Ejecting the Combitip with adapter

Prerequisites

- The Combitip is empty.

1. Push the operating lever down quickly and firmly.
2. Unscrew the adapter.
3. If required, rinse the Adapter advanced with demineralized water and dry.

The Adapter advanced is a wear part. Do not reuse the adapter if it shows any visible signs of wear. An Adapter advanced is included in each box of 25 mL or 50 mL Combitips advanced.

5.7 Dispensing with an empty battery

The dispenser is also operational when the battery is empty.

- ▸ Use the volume table to set the volume.
- ▸ Charge the battery.

6 Troubleshooting

6.1 General errors

6.1.1 Battery

Problem	Cause	Solution
The battery symbol  appears on the display.	• Battery capacity is very low.	▸ Replace the battery.
The battery symbol  appears on the display.	• Battery capacity is extremely low.	▸ Replace the battery immediately.

6.1.2 Combitip advanced

Problem	Cause	Solution
Combitip cannot be ejected.	• Combitip not completely empty prior to ejection. • Operating lever not fully operated.	1. Push the filling lever down as far as it will go. 2. Operate the operating lever firmly and centered.

6.1.3 Display

Problem	Cause	Solution
Display is dark.	• Battery fully discharged.	▸ Replace battery.
	• Combitip sensor faulty.	▸ Call service.
	• Movement sensor faulty.	▸ Call service.
Number of the *steps* shown on the display is incorrect.	• Incorrect interpretation of the information.	▸ When selecting the volume, the possible dispensing steps are displayed. ▸ After the reverse stroke, the dispensing steps that were carried out are displayed.
	• Operating lever not fully pushed.	▸ Always push the operating lever down as far as it will go.

6.1.4 Error codes

Problem	Cause	Solution
C02 Err C03 Err	• Combitip advanced very heavily bent or distorted during and after inserting.	▸ Do not bend or distort inserted Combitip advanced.
	• Combitip advanced incorrectly or not fully inserted.	1. Press the filling lever down all the way. 2. Operate the operating lever to eject the Combitip advanced. 3. Check the Combitip advanced or the Adapter advanced for damage to the coding.
	• Combitip advanced not fully released.	▸ Operate the operating lever again fully and centered to eject the Combitip advanced.
	• Coding on the Combitip advanced or on the Adapter advanced faulty.	▸ Insert a new Combitip advanced.
S03 Err	• Volume selection dial not engaged.	▸ Let the number or point engage exactly above the position display.

6.1.5 Liquid aspiration

Problem	Cause	Solution
Large air bubble in Combitip advanced after the liquid has been aspirated.	• Air has been aspirated while aspirating the liquid.	▸ Re-aspirate the liquid.
	• Highly viscous liquid has been aspirated too quickly.	▸ Aspirate liquid more slowly.
	• Lag time of the liquid not observed.	▸ Aspirate liquid more slowly.

6.1.6 Errors of measurement

Problem	Cause	Solution
Systematic and/or random error is too high.	• Reverse stroke given as dispensing volume by mistake.	▸ Repeat dispensing.
	• Operating lever not fully pushed during dispensing.	▸ Repeat dispensing.
	• Combitip advanced used too many times, too old.	▸ Use other Combitip.
	• Many air bubbles in the aspirated liquid. • Combitip held at an incorrect angle during dispensing	▸ Repeat dispensing.

Regularly check the precision and accuracy of the dispenser with the Combitips advanced lots you are using to prevent dispensing errors.

You can use the "PICASO" software to determine the maximum permissible systematic and random errors.

A Standard Operating Procedure (SOP) for the inspection is available on our webpage www.eppendorf.com.

7 Maintenance

7.1 Cleaning

NOTICE! Damage to device from unsuitable cleaning fluids or sharp or pointed objects.
Unsuitable cleaning agents can damage the device.

- Never use corrosive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Please note the information on chemical resistance.
- Do **not** clean the device with acetone or organic solvents with a similar effect.
- Do **not** clean the device with sharp objects.

NOTICE! Damage to the device due to penetration of liquids.

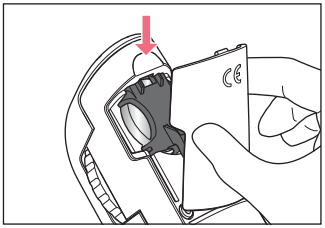
- Do not allow any liquids to penetrate the inside of the housing.

Proceed as follows:

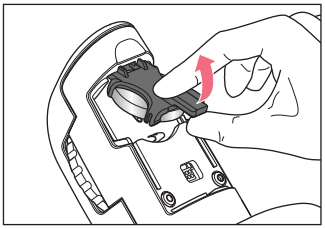
1. To remove any contamination on the outside, dampen a soft cloth with a mild detergent and wipe the housing.
2. To disinfect the dispenser, wipe the housing with isopropanol (70 %) .
3. Rinse the Adapter advanced with demineralized water and dry.
4. The Adapter advanced can be steam autoclaved at 121 °C at an overpressure of 1 bar for 20 min. The Adapter advanced can be autoclaved a maximum of 100 times.
5. The Combitip rack advanced can be steam autoclaved at 121 °C at an overpressure of 1 bar for 20 min. The Combitip rack advanced can be autoclaved a maximum of 100 times.

7.2 Replacing the battery

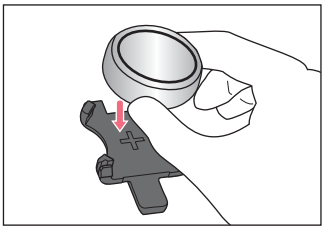
When the display shows the battery symbol  , this indicates that the battery can still be used for approx. 2 weeks. When the display shows the battery symbol  , you need to replace the battery.



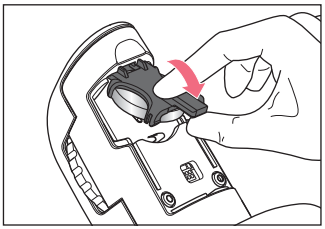
1. Press the indentation and remove the battery compartment lid.



2. Lift the battery holder and remove it.



3. Insert the new battery into the battery holder.
   The positive terminal is marked in the battery holder.



4. Insert the battery holder and let it engage.
   The display switches on briefly.
   All segments light up briefly.
5. Close the battery compartment lid

7.3 Decontamination before shipment

CAUTION! Use of a contaminated device may result in personal injuries and damage to the device.

- Clean and decontaminate the device in accordance with the cleaning instructions before shipping or storage.

Hazardous substances are:

- solutions presenting a hazard to health
- potentially infectious agents
- organic solvents and reagents
- radioactive substances
- proteins presenting a hazard to health
- DNA

1. Please note the information in the document "Decontamination certificate for product returns".
   It is available as PDF document on our website www.eppendorf.com/manuals.
2. Enter the serial number of the device in the decontamination certificate.
3. Enclose the completed decontamination certificate for returned goods with the device.
4. Send the device to Eppendorf AG or an authorized service center.

8 Technical data

Multipette M4/Repeater M4	
Weight	105 g

Battery	
Type	Button cell
Voltage	3 V
Operational life	approx. 2 years

8.1 Adjustable sub-steps

Combitip advanced	**Increment**
0.1 mL white	1 µL
0.2 mL light blue	2 µL
0.5 mL violet	5 µL
1 mL yellow	10 µL
2.5 mL green	25 µL
5 mL blue	50 µL
10 mL orange	0.1 mL
25 mL red	0.25 mL
50 mL light gray	0.5 mL

8.2 Measurement errors

Testing tip Combitip advanced	Volume range	Testing volume	Error of measurement			
			Systematic error		Random error	
			± %	± µL	± %	± µL
0.1 mL white	0.1 µL – 20 µL	2 µL	1.6	0.032	3.0	0.06
		10 µL	1.2	0.12	2.4	0.24
		20 µL	1.0	0.2	2.0	0.4
0.2 mL light blue	2 µL – 40 µL	4 µL	1.3	0.052	2.0	0.08
		20 µL	0.8	0.16	1.5	0.3
		40 µL	0.8	0.32	1.5	0.6
0.5 mL violet	5 µL – 100 µL	10 µL	0.9	0.09	1.5	0.15
		50 µL	0.8	0.4	0.8	0.4
		100 µL	0.8	0.8	0.6	0.6
1 mL yellow	10 µL – 200 µL	20 µL	0.9	0.18	0.9	0.18
		100 µL	0.6	0.6	0.6	0.6
		200 µL	0.6	1.2	0.4	0.8
2.5 mL green	25 µL – 500 µL	50 µL	0.8	0.4	0.8	0.4
		250 µL	0.6	1.5	0.6	1.5
		500 µL	0.5	2.5	0.3	1.5
5 mL blue	50 µL – 1000 µL	100 µL	0.6	0.6	0.6	0.6
		500 µL	0.5	2.5	0.5	2.5
		1000 µL	0.5	5.0	0.25	2.5
10 mL orange	0.1 mL – 2 mL	0.2 mL	0.5	1.0	0.6	1.2
		1 mL	0.5	5	0.4	4
		2 mL	0.5	10	0.25	5.0
25 mL red	0.25 mL – 5 mL	0.5 mL	0.4	2.0	0.6	3.0
		2.5 mL	0.3	2.5	0.5	12.5
		5 mL	0.3	15	0.25	12.5
50 mL light gray	0.5 mL – 10mL	1 mL	0.3	3.0	0.5	5.0
		5 mL	0.3	15	0.5	25
		10 mL	0.3	30	0.3	30

Test conditions and test evaluation in compliance with ISO 8655, Part 6. Test using a standardized fine balance with a moisture trap.

- Number of determinations:10
- Use of water in accordance with ISO 3696
- Test was carried out with a Combitip advanced that was filled to capacity
- Test was carried out at 20 °C – 27 °C ±0.5 °C
- Dispensing onto the tube wall

The test volumes for the systematic and random errors of the Multipette M4/ Repeater M4 comply with the requirements of ISO 8655, part 5.

Technical specifications subject to change.

8.3 Ambient conditions

Ambience	Only for use indoors.
Ambient temperature	5 °C – 40 °C
Relative humidity	10 % – 95 %, non-condensing.
Atmospheric pressure	795 hPa – 1060 hPa

9 Transport, storage and disposal

9.1 Transport

- Use the original packaging for transport.

	Air temperature	Relative humidity	Atmospheric pressure
General transport	-25 °C – 60 °C	10 % – 95 %	300 hPa – 1060 hPa
Air freight	-40 °C – 45 °C	10 % – 95 %	300 hPa – 1060 hPa

9.2 Storage

NOTICE! Damage to device due to incorrect storage.

- Remove the battery if you will not be using the device for longer periods of time.
- Do not store the device while the Combitip is inserted.
- Select a secure storage location.
- Do not expose the device to aggressive gases over a longer period of time.

NOTICE! Damage due to UV radiation.

- Do not store consumables in areas with strong UV radiation.

	Air temperature	Relative humidity	Atmospheric pressure
In transport packaging	-25 °C – 55 °C	10 % – 95 %	700 hPa – 1060 hPa
Without transport packaging	-5 °C – 45 °C	10 % – 95 %	700 hPa – 1060 hPa

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, 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 due to overheated rechargeable batteries and batteries.

- Do not heat rechargeable batteries and batteries to over 80 °C and do not throw them into fire.

Disposing of accumulators and batteries
Do not dispose of accumulators and batteries as household waste. Dispose of accumulators and batteries according to the locally applicable legal regulations.

10 Ordering information

10.0.1 Multipette M4/Repeater M4

Order no. (International)	Order no. (North America)	Description
4982 000.012	–	**Multipette M4**
–	4982000020	**Repeater M4**
4982 000.314	–	**Multipette M4 Starter Kit** Multipette M4, Combitip Rack, Combitip Assortmentpack
4982 000.322	4982000322	**Repeater M4 Starter Kit** Repeater M4, Combitip Rack, Combitip Assortmentpack

10.0.2 Accessories

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.

Order no. (International)	Order no. (North America)	Description
3115 000.003	022444905	**Pipette carousel** with 6 holders Research plus, Biomaster
4982 602.004	4982602004	**Holder** for pipette carousel or wall mounting Multipette M4
4982 603.000	4982603000	**Velcro tape** for holder
4980 215.003	022269119	**Battery** CR2032
4982 604.007	4982604007	**Battery holder**

10.1 Combitips advanced

Order no. (International)	Order no. (North America)	Description
		Combitips advanced 0.1 mL 100 pieces
0030 089.405	0030089405	Eppendorf Quality
–	0030089510	Sterile, individually wrapped
0030 089.618	0030089618	Biopur, individually wrapped
0030 089.766	–	PCR clean
		Combitips advanced 0.2 mL 100 pieces
0030 089.413	0030089413	Eppendorf Quality
–	0030089529	Sterile, individually wrapped
0030 089.626	0030089626	Biopur, individually wrapped
0030 089.774	–	PCR clean
		Combitips advanced 0.5 mL 100 pieces
0030 089.421	0030089421	Eppendorf Quality
–	0030089537	Sterile, individually wrapped
0030 089.634	0030089634	Biopur, individually wrapped
0030 089.782	–	PCR clean
		Combitips advanced 1.0 mL 100 pieces
0030 089.430	0030089430	Eppendorf Quality
–	0030089545	Sterile, individually wrapped
0030 089.642	0030089642	Biopur, individually wrapped
0030 089.790	–	PCR clean
		Combitips advanced 2.5 mL 100 pieces
0030 089.448	0030089448	Eppendorf Quality
–	0030089553	Sterile, individually wrapped
0030 089.650	0030089650	Biopur, individually wrapped
0030 089.804	–	PCR clean
		Combitips advanced 5.0 mL 100 pieces
0030 089.456	0030089456	Eppendorf Quality
–	0030089561	Sterile, individually wrapped
0030 089.669	0030089669	Biopur, individually wrapped
0030 089.812	–	PCR clean

Order no. (International)	Order no. (North America)	Description
		Combitips advanced 10 mL 100 pieces
0030 089.464	0030089464	Eppendorf Quality
–	0030089570	Sterile, individually wrapped
0030 089.677	0030089677	Biopur, individually wrapped
0030 089.820	–	PCR clean
		Combitips advanced 25 mL 100 pieces + 4 Adapter
0030 089.472	0030089472	Eppendorf Quality
–	0030089588	Sterile, individually wrapped
0030 089.685	0030089685	Biopur, individually wrapped
0030 089.839	–	PCR clean
		Combitips advanced 50 mL 100 pieces + 4 Adapter
0030 089.480	0030089480	Eppendorf Quality
–	0030089596	Sterile, individually wrapped
0030 089.693	0030089693	Biopur, individually wrapped
0030 089.847	–	PCR clean

10.1.1 Adapter advanced

Order no. (International)	Order no. (North America)	Description
		Adapter advanced 25 mL 1 piece
0030 089.715	0030089715	Eppendorf Quality
		Adapter advanced 50 mL 1 piece
0030 089.723	0030089723	Eppendorf Quality
		Adapter advanced 25 mL 7 pieces
0030 089.731	0030089731	Biopur, individually wrapped
		Adapter advanced 50 mL 7 pieces
0030 089.740	0030089740	Biopur, individually wrapped

10.2 Accessories

Order no. (International)	Order no. (North America)	Description
		Combitips advanced Rack 1 piece
0030 089.758	0030089758	Eppendorf Quality

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Declaration of Conformity

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

Product name:

Multipette® M4 / Repeater® M4

Product type:

Manual dispenser

Relevant directives / standards:

2014/35/EU	EN 61010-1
2014/30/EU	EN 55011, EN 61326-1
2011/65/EU	EN 50581
EN ISO 8655-1, EN ISO 8655-5, EN ISO 8655-6	

Date: February 16, 2016

Management Board

Portfolio Management

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