SARTORIUS

User Manual

# Midi Plus Electronic Pipetting Controller



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# 1. Introduction

Before using the Sartorius Midi Plus for the first time, please review this operating manual carefully. This manual can be downloaded from the Sartorius website, www.sartorius.com. A paper printout may be ordered by e-mail from Ihinfo.finland@sartorius.com.

## 1.1. Intended Use

Midi Plus is intended to be used for large-volume dispensing with commonly used glass or plastic pipettes and 5,000 µl Sartorius Optifit Tips. This liquid handling device is designed and manufactured to be used as a piece of general purpose laboratory equipment.

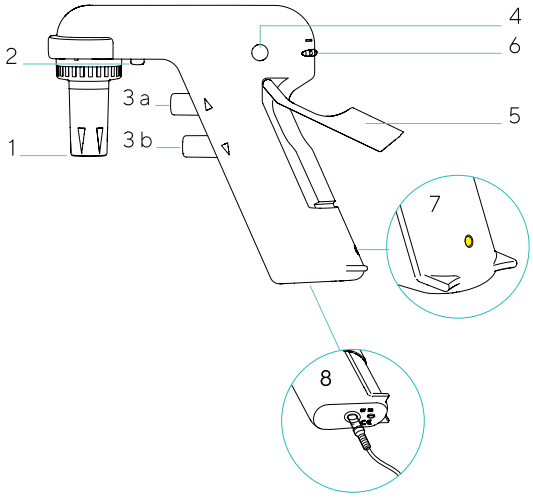
# 2. Product Overview

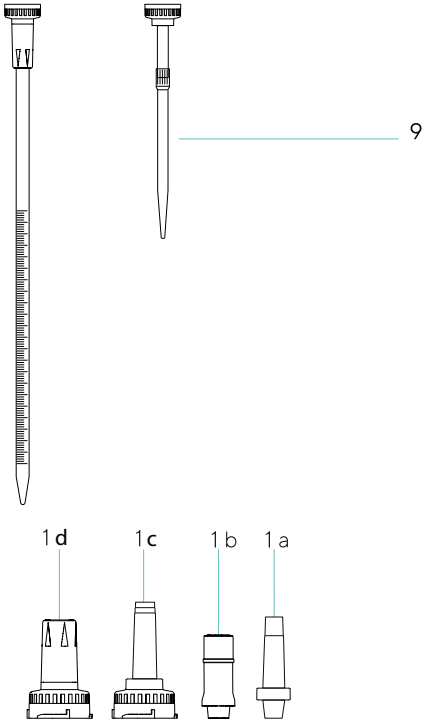
Midi Plus is a light-weight battery-operated pipetting controller that is rechargeable. Its light weight and ergonomic design reduce fatigue, and help to prevent pipetting caused strain, in the user's hand, arm and shoulder.

Midi Plus can be used with commonly used glass or plastic pipettes in the 1 ml – 100 ml volume range, but also with 5,000 µl Sartorius Optifit Tips.

## 2.1. Midi Plus

1. Nose-cone, silicone adapter and hydrophobic filter
   a. Silicone adapter 5ml
   b. Silicone adapter (standard)
   c. Nose-con 5ml
   d. Nose-con (standard)
2. Adapter locking button
3. Operating buttons
   e. Aspiration
   f. Dispensing
4. Handle cover release buttons
5. Fold-out stand
6. Speed adjustment wheel
7. LED battery indicator
8. Charging socket
9. Adapter set for Optifit Tip 5,000 µl
   (not included in Midi Plus package)



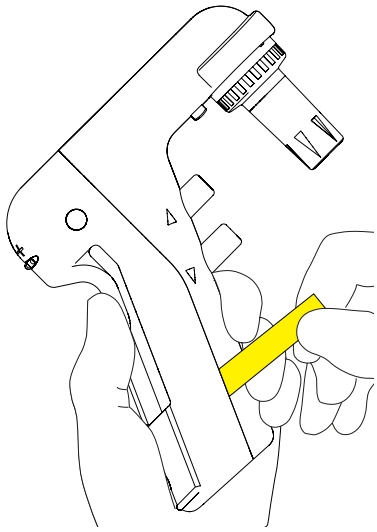



## 2.2. Contents of delivery package

Midi Plus is delivered ready for use in a package containing:

- Midi Plus pipette controller
- Universal AC-adaptor
- 0.45 µm hydrophobic filters (2 pcs)
- Quick Start Guide
- QC-certificate

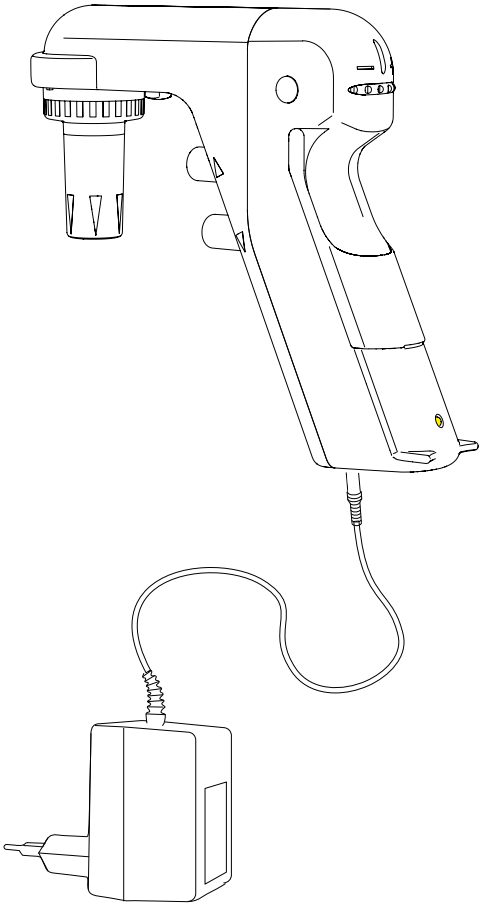
If any item in this delivery package is missing or damaged, please contact your local Sartorius representative.



# 3. Getting Started

1. The Midi Plus is delivered with a battery inserted. The battery poles are covered by a plastic protective film. Before first use, remove the plastic film by pulling it gently from below the battery cover.
2. Charge the Midi Plus for at least 4 hours before first use.
3. To charge with AC-adaptor: connect the Midi Plus to the charger cable and plug the charger into the mains power outlet.
4. The battery status is indicated by a LED. When the battery is fully charged the LED emits a green light, and the Midi Plus is ready for use.

Midi Plus is equipped with an adapter set (nose-cone and silicone adapter) that fits all commonly used serological or volumetric pipettes.



## 3.1. Charging

Connect the Midi Plus to the charger cable and plug the charger into the mains outlet.

**Note:** Before connecting the AC-adaptor to the electrical outlet, make sure the voltage setting corresponds with the local electricity supply. Use of incorrect power supplies may damage the device. Only use power supplies recommended by the manufacturer.

The LED battery indicator is at the bottom of the handle.

- Solid green light: the Midi Plus is fully charged and ready for use
- Blinking green light: The Midi Plus is charging while connected to the charger.
- Blinking red light: The charge is low. The Midi Plus should be connected to the charger immediately.

Charging from empty lasts about 3 hours.

**Note:** The Midi Plus can be used while it is charging.

**Note:** When the charge is low, the Midi plus will play a warning sound.

# 4. Operation

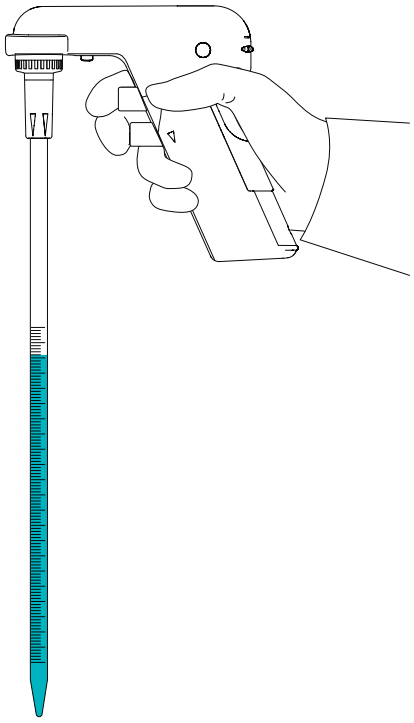
## 4.1. Principles of operation

Pipetting functions are controlled by using the operating buttons, located at the front, and the speed adjustment wheel, located above the handle.

Aspiration is done by pressing the upper button. As long as the button is held down, the Midi Plus aspirates the liquid into the pipette.

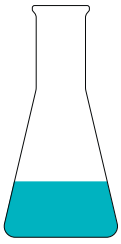
Dispensing is done by pressing the lower button.

**Note:** Aspiration and dispensing speeds can be fine-tuned during operation by adjusting finger pressure on the operating buttons.

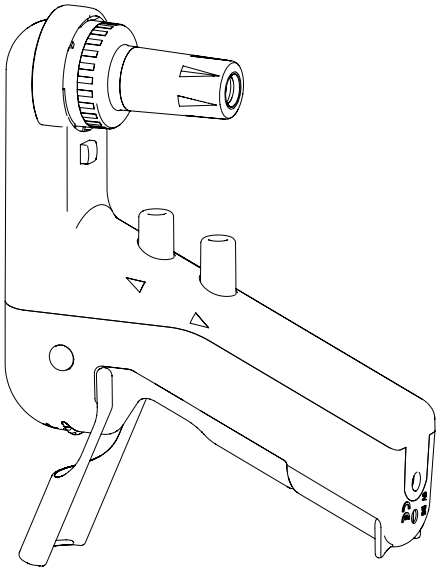


## 4.2. Operation

1. Make sure the hydrophobic filter is inserted
2. To insert the tip:
   - Gently push a pipette into the silicone adapter.
   - Make sure the tip is attached firmly and is airtight.
3. Adjust the speed by turning the speed adjustment wheel
4. Aspiration:
   - Immerse the pipette into the liquid.
   - Press the aspirating button until the pipette is filled just above the desired volume.
   - Remove the pipette from the liquid.
   - Press the dispensing button to slowly dispense the liquid until the level is exactly on the desired volume.
5. Dispensing:
   - Place the pipette against the receiving vessel wall.
   - Press the dispensing button until the pipette is empty.



**Note:**
- Press the dispensing button gently, to let the liquid flow out by the force of gravity.
- Fine-tune the speed by adjusting finger pressure, while dispensing
- When not in use, the Midi Plus should always be placed to rest on a table, using its fold-out stand.



# 5. Care and Maintenance

Functionality and performance can be ensured by a regular maintenance. Sartorius provides service and maintenance services through its global network of service centers. Please contact your nearest service center for assistance.

**Note:** Please note that the warranty will be voided in the event that the Midi Plus is disassembled and|or re-assembled by an unauthorized person.

## 5.1. Cleaning and decontamination

### 5.1.1. Cleaning the outer surface

Wipe the outer surface of the Midi Plus with a moist cloth.

To decontaminate the outer surface of the Midi Plus, wipe the surface with a disinfectant or decontaminant liquid such as 70% ethanol, 60% isopropanol, or a mild detergent.

### 5.1.2. Cleaning the adapter set

To clean or replace the parts of the adapter set (nose-cone, silicone adapter and filter) it is necessary to disassemble the adapter set.

1. Open the adapter set by pressing the locking button and turning the nose-cone counterclockwise.
2. Remove the silicone adapter and the filter.
3. Place the nose-cone and the silicone adapter in a container containing disinfectant or decontamination fluid for 30 minutes.
4. Rinse the parts with distilled water and let dry.
5. Insert the filter into the silicone adapter.
6. Place the silicone adapter and the filter into the nose-cone and make sure the adapter set is locked to its position by turning it clockwise.

## 5.2. Sterilising

### 5.2.1.Autoclaving

The autoclavable parts of the Midi Plus are the nose-cone, the silicone adapter and the filter. Place the parts into the autoclave and sterilize at 121°C for 20 minutes. Allow the parts to dry at room temperature before re-assembly.

**Note:** Never autoclave a Midi Plus, autoclaving will damage the device.

### 5.2.2.UV sterilizing

The Sartorius Midi Plus is made of UV-resistant materials. Sartorius electronic pipetting controllers tolerate temporary exposure to UV radiation. Take note that prolonged or frequent exposure to UV radiation may cause yellowing and brittling of the electronic pipetting controller.

## 5.3. Changing the filter

Never use Midi Plus without a filter. The filter should be replaced when over-aspiration or possible contamination has occurred.

To change the filter:
- Open the adapter set by pressing the locking button and turning the nose-cone counterclockwise.
- Remove the filter and the silicone adapter from the nose-cone.
- Remove the filter by pulling it from the silicone adapter.
- Place the new filter into the silicone adapter (text side down, wider end of the filter into the silicone adapter), make sure the filter is properly attached.
- Place the silicone adapter and the filter into the nose-cone.
- Replace the adapter set, and make sure the adapter set is locked into its position by turning it clockwise.

**Note:** Use only filters provided by Sartorius.

## 5.4. Replacing the battery

To change the rechargeable battery set:
- Open the battery cover by pressing the handle cover release button on both sides of Midi Plus.
- Pull out the cover and remove the old or damaged battery set.
- Insert the new battery set and close the cover by pressing it carefully to its position.
- Charge the Midi Plus.

**Note:** Always replace the complete set of the batteries. Use only the batteries provided by Sartorius.

# 6. Storage

When not in use, it is recommended that Midi Plus is placed on the bench-top on its fold-out stand.

During long storage periods, it is recommended to disconnect the Midi Plus from the power outlet.

# 7. Warranty

Sartorius products are meant to be used as described in this user manual. The Midi Plus pipette controller is covered by a warranty of two years for workmanship and defects in materials, excluding the battery.

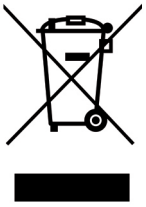
ANY WARRANTY WILL, HOWEVER, BE DEEMED AS VOID IF THE FAULT IS FOUND TO HAVE BEEN CAUSED BY MALTREATMENT, MISUSE, UNAUTHORIZED MAINTENANCE OR SERVICE, OR NEGLIGENCE OF REGULAR MAINTENANCE AND SERVICE, ACCIDENTAL DAMAGE, INCORRECT STORAGE OR USE OF THE PRODUCTS FOR OPERATIONS OUTSIDE THEIR SPECIFIED LIMITATIONS, OUTSIDE THEIR SPECIFICATIONS, OR CONTRARY TO THE INSTRUCTIONS GIVEN IN THIS MANUAL.

Every Midi Plus electronic pipetting controller is tested before shipping by the manufacturer.

The Sartorius Quality Assurance Procedure guarantees that the Midi Plus electronic pipetting controller that you have purchased is ready for use. Every Midi Plus electronic pipetting controller is CE marked, conforms to the protection requirements of Council Directive EMC Directive 2004|108|EC, relating to Electromagnetic Compatibility.

# 8. Disposal

In compliance with the European Directive WEEE (2002|96EC) on waste and reduction of hazardous substances in electronic equipment, this device must not be disposed of in unsorted municipal waste. Instead, this device must be collected separately in accordance to the local recycling regulations.



Batteries should be disposed of in accordance with local legal regulations. Do not dispose of batteries with domestic waste.

# 9. Troubleshooting

| Symptom | Possible cause | Solution |
|---|---|---|
| Pipette drips | ▪ Filter or silicone adapter not inserted correctly<br>▪ Silicone adapter or filter is damaged<br>▪ Pipette inserted incorrectly<br>▪ Midi Plus is damaged | ▪ Assemble the silicone adapter and | or filter again<br>▪ Replace the silicone adapter or filter<br>▪ Insert the pipette carefully again<br>▪ Replace the Midi Plus |
| Midi Plus is not aspirating liquid | ▪ Battery discharged<br>▪ Filter is wet or contaminated | ▪ Charge the Midi Plus<br>▪ Replace the filter |
| Reduced operation time | ▪ Batteries too old | ▪ Replace the battery set |
| Pipette is loose | ▪ Damaged silicone adapter | ▪ Replace the silicone adapter |

# 10. Technical Data

| | |
|---|---|
| **Battery** | Type: NiMH (set of 3 batteries, only for Midi Plus) |
| | Capacity: 750 mAH | 1.2 V |
| | Charging time for empty battery: ~4 hour |
| **Number of pipetting cycles with fully charged battery (with 25,000 µl pipette)** | ~2000 |
| **AC-adapter** | Input voltage: 100 – 240 VAC ~ 50 - 60 Hz, 160 mA |
| | Output voltage: 9 V, 800 - 2,000 mA |
| **Operating and storage temperature** | +10°C to +35°C |
| **Weight (with the battery inserted)** | 212 g |
| **Maximum pipetting speed** | ~10 ml/s |
| **Pipette compatibility** | Glass and plastic pipettes in volume range 1 - 100 ml |
| | Optifit Tip 5,000 µl |
| | Optifit Tip for Midi Plus 10,000 µl |
| **Filters** | Hydrophobic filter, 0.45 µm, autoclavable (included in the package) |
| | Hydrophobic filter, 0.2 µm, pre-sterile (order separately) |
| **Gravity dispensing** | Slight pressing of the dispense button |

# 11.Order Information and Accessories

| Order Code | Item | Qty \| Unit |
|---|---|---|
| 710931 | Midi Plus | 1 |
| LH-7129120 | Replacement filter, 0.45 µm, non-sterile, autoclavable | 5 |
| LH-7129131 | Replacement filter, 0.2 µm, sterile | 5 |
| LH-711019 | Adapter set (standard) including nose-cone and the silicone adapter | 1 |
| LH-711017 | Adapter set for 5,000 µl pipette tip, autoclavable, including nose-cone and the silicone adapter | 1 |
| LH-711018 | Adapter set for 10,000 µl pipette tip, autoclavable, including nose-cone and the silicone adapter | 1 |
| LH-712146 | Nose-cone (standard) | 1 |
| LH-712144 | Nose-cone for 5,000 µl Optifit Tip | 1 |
| LH-712145 | Nose-cone for 10,000 µl Optifit Tip | 1 |
| LH-712153 | Silicone adapter (standard) | 1 |
| LH-712151 | Silicone adapter for 5,000 µl Optifit Tip | 1 |
| LH-712152 | Silicone adapter for 10,000 µl Optifit Tip | 1 |
| 780300 | Optifit Tip 5,000 µl | 100 |
| 780308 | Optifit Tip 5,000 µl | 1,000 |
| 780310 | Optifit Tip 10,000 µl(Extra long tip for Midi Plus) | 100 |

# Sales and Service Contacts

## For further contacts, visit www.sartorius.com


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