

Operating Manual

# Midi Plus™ Electronic Pipetting Controller



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# 1. General Information

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](http://www.sartorius.com). A paper printout may be ordered by e-mail from [linfo.finland@sartorius.com](mailto:linfo.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 ml and 10 ml 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 ml and 10 ml Sartorius Optifit Tips.



### 2.1 Midi Plus™

1. Nose-cone, silicone adapter and hydrofobic filter
2. Adapter locking button
3. Operating buttons
  - a. Aspiration
  - b. 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 ml (not included in Midi Plus™ package)
10. Adapter set for Optifit Tip 10 ml (not included in Midi Plus™ package)

\*Not available in units sold in the United States



## 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 3 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.

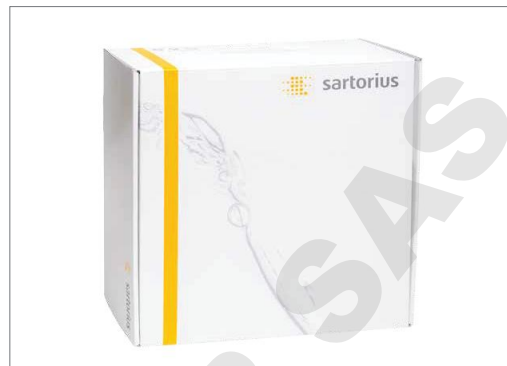
**NOTE!** Before connecting the AC-adaptor to the electrical outlet, make sure the voltage setting corresponds with the local electricity supply. Use of incorrect power supplies may damage the device. Only use power supplies recommended by the manufacturer.

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 charge is low and the Midi Plus™ needs to be charged, or that the Midi Plus™ is charging while connected to the charger.

Charging from empty lasts about 3 hours.

**NOTE!** the Midi Plus™ can be used while it is charging.





## 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
  - To activate the blow-out press the dispensing button completely

#### 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.\*

\*Fold out stand is not available in units sold in the United States of America



## 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 re-assembled by an unauthorized person.

### 5.1 Cleaning and decontamination

#### 5.1.1 Cleaning the outer surface

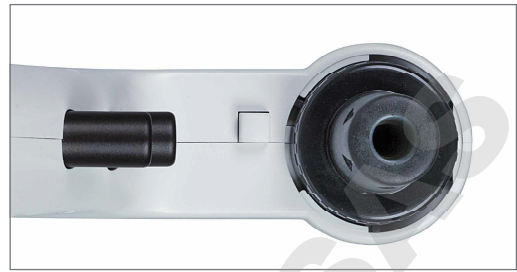
Wipe the outer surface of the Midi Plus™ with a moist cloth.

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.





Nose-cone, silicone adapter and filter

## 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 manufactured with UV resistant materials.

The UV-resistance has been tested under continuous UV-light under the following conditions:

- Wave length: shortwave ultraviolet (UVC)
- Tested UV dosage: 33000 mJ/cm<sup>2</sup>



### 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.
- Place the adapter set into its position and make sure the adapter set is locked to its position by turning it clockwise.

**NOTE!** Use only filters provided by the manufacturer.



### 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 the manufacturer.



## 6. Storage

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

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

\*Not available in the United States



## 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

Problem	Cause	Solution
Pipette drips	Filter or silicone adapter not inserted correctly	Assemble the silicone adapter and/or filter again
	Silicone adapter or filter is damaged	Replace the silicone adapter or filter
	Pipette inserted incorrectly	Insert the pipette carefully again
	Midi Plus™ is damaged	Replace the Midi Plus™
Midi Plus™ is not aspirating the liquid	Battery discharged	Charge the Midi Plus™
	Filter is wet or contaminated	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: 700 mAh / 1.2 V Charging time for empty battery: ~3h
Number of pipetting cycles with fully charged battery (with 25 ml pipette)	~2000
AC-adapter	Input voltage: 100 - 240 VAC, 50 - 60 Hz, 150 mA Output voltage: 9 VAC, 600 mA
Operating and storage temperature	+10°C - +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 ml Optifit Tip for Midi Plus™ 10 ml
Filters	Hydrofobic filter, 0.45 µm, autoclavable (included in the package)
	Hydrofobic filter, 0.25 µm, pre-sterile (order separately)
Gravity dispensing	Slight pressing of the dispense button

## 11. Ordering Information and Accessories

Cat. no.	Item	Qty / Unit
710931	Midi Plus™	1
710929	Midi Plus™ (order no. for North America)	1
LH-7129120	Replacement filter, 0.45 µm, non-sterile, autoclavable	5
LH-7129130	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 ml pipette tip, autoclavable, including nose-cone and the silicone adapter	1
LH-711018	Adapter set for 10 ml pipette tip, autoclavable, including nose-cone and the silicone adapter	1
LH-712146	Nose-cone (standard)	1
LH-712144	Nose-cone for 5 ml Optifit Tip	1
LH-712145	Nose-cone for 10 ml Optifit Tip	1
LH-712153	Silicone adapter (standard)	1
LH-712151	Silicone adapter for 5 ml Optifit Tip	1
LH-712152	Silicone adapter for 10 ml Optifit Tip	1
780300	Optifit Tip 5 ml	100
780308	Optifit Tip 5ml	1000
780310	Optifit Tip 10 ml (Extra long tip for Midi Plus™)	100

## 12. Declaration of Conformity



sartorius



### EC Declaration of Conformity

I, the undersigned, hereby declare that the Product(s)

#### **Midi Plus™ Pipette Controller**

conforms to the protection requirements of Council Directive EMC Directive 2004/108/EC, relating to Electromagnetic Compatibility, by the Competent Body Technical Report/Certificate No. 02-00924 dated 28/06/2013 issued by: Elefors Oy, Wahreninkatu 11B, 30100 Forssa.

This declaration is supported by EC quality system approval certificates:

ISO 9001 / ISO 13485 Certificate No.108129-2011-AQ-FIN-FINAS issued by DNV on 20. December 2011

ISO 17025 Certificate No. K041 issued by FINAS on 16. December 2011

ISO 14001 Certificate No.108133-2011-AE-HEL-FINAS issued by DNV on 20 December 2011

Signed:

Date: 04<sup>th</sup> September 2013

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