

## User Guide

# mA400 Basic Power Supply

### mA400

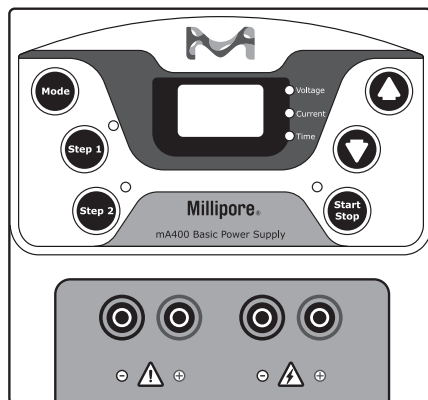
## Introduction

Combining small size and versatility, the mA400 Basic Power Supply is an ideal choice for any researcher. Capable of providing constant current or constant voltage in 1 mA or 1 V steps, the unit is perfectly suited to run both vertical polyacrylamide and horizontal agarose electrophoresis experiments. Continuous or timed operations are easily performed using the simple and user-friendly interface. The mA400 Basic Power Supply features two electrode pairs, allowing for two gel tanks to be ran simultaneously, saving both time and valuable bench space. With a universal voltage rating, the mA400 Basic Power Supply is also designed and constructed to the most rigorous safety standards.

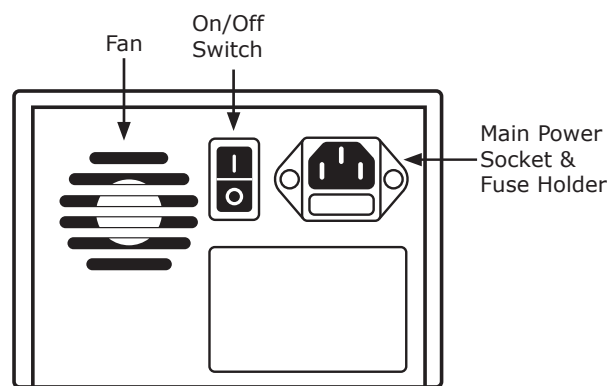
### Features of mA400 Basic Power Supply:

- Compact size
- Constant Voltage or Constant Current operation
- 1V step voltage selection; 1 mA step current selection
- Timer
- No load detection
- Shrouded plugs and sockets
- Two pairs of outlet terminals
- Output voltage stability

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Front View






Back View

## Equipment Operation

### Symbols Used on Device

The following symbols are used on this device, throughout this user guide and/or on product labels, and the user shall abide by indicated requirements.

Symbol	Definition
	Warning alerts you to actions that may cause personal injury or pose a physical threat.
	Indicates an area where a potential shock hazard may exist. Consult the user guide to avoid possible personal injury or instrument damage.
	Do not discard with common solid waste at end of life. Segregate with other waste electrical and electronic equipment (WEEE) and send to an appropriate facility for recycling. For information on recycling electrical and electronic products in the European Union, please visit <a href="http://SigmaAldrich.com/weee">SigmaAldrich.com/weee</a> .

### Regulatory

The mA400 Basic Power Supply has been CE marked to reflect compliance to the necessary European Directives and NRTL (Nationally Recognized Testing Laboratory) marked under the requirements of OSHA (Occupational Safety and Health Organization) for North America. For additional details into our compliance claims, please refer to the product's web page online at [SigmaAldrich.com](http://SigmaAldrich.com). Search for the product page, which shows the Declaration of Conformity.

### Warnings

The power supply unit generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the user guide, may cause harmful interference to radio communications. Operation of the mA400 Basic Power Supply in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended for the user to read the following points carefully before operating this equipment.

- Do not alter the equipment. Failure to follow these directions could result in personal and/or laboratory hazards, as well as invalidate equipment warranty.
- Use a properly grounded electrical outlet with correct voltage and current handling capacity.
- Disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel.
- Never use this instrument series without having the safety cover correctly in position.

- Do not use the unit if there is any sign of damage to the external tank or cover. Replace damaged parts.
- Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components which may ignite such materials.
- Refer maintenance and servicing to qualified personnel.
- Ensure that the system is connected to electrical service according to local and national electrical codes. Failure to make a proper connection may create fire or shock hazard.

### Safety Precautions

Use high level of precaution against any electrical device. Before connecting the electrical supply, check to see if the supply voltage is within the range stated at the rating label, and see to it that the device be seated firmly. Place the unit in a safe and dry location; it must NOT touch the surrounding. Follow the safety precautions for chemicals / dangerous materials.

1. **NEVER** access dangerous chemicals or other materials to prevent possible hazard of explosion and damage.
2. Do not operate the unit without lids or covers to prevent possible hazards.
3. A temporary conductivity caused by condensation might occur even though this series is rated Pollution Degree 2 in accordance with IEC 664.

### Environmental Operating Conditions

Ensure the instrument is installed and operated strictly under the following conditions:

1. Indoor use only
2. < 95% Relative Humidity
3. 75 - 106 kPa
4. Altitude must not exceed 2000 meters
5. 4 - 40 °C operating temperature
6. Pollution degree: 2
7. Mains supply voltage must not fluctuate more than  $\pm 10\%$  of the normal voltage



## Avoiding Electrical Shock

Follow the guidelines below to ensure safe operation of the unit.

The mA400 Basic Power Supply has been designed to utilize shielded wires thus minimizing any potential shock hazard to the user. We recommend against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution spilling on the instrument, it must be dried out for at least 2 hours and restored to **NORMAL CONDITION** before each operation.
2. Never connect or disconnect wires loading from the power jacks when the red indicator light of power switch is on.
3. **WAIT** at least 5 seconds after stopping a run before handling output leads or any connected apparatus.
4. **ALWAYS** make sure that your hands, work area, and instruments are clean and dry before making any connections or operating the power supply.
5. **ONLY** connect the power cord to a properly grounded AC outlet.



## Avoiding Damage to the Instrument

1. Do not attempt to operate the device if damage is suspected.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.).
3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Use high level of precaution against potential damage on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. Do not operate the power supplies in high humidity environments (> 95%), or where condensation may occur.
7. To avoid condensation after operating the power supply in a cold room, wrap the unit in a plastic bag and allow at least 2 hours for the unit to equilibrate to room temperature before removing the bag and operating the unit.
8. Prior to applying any cleaning or decontamination methods other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the equipment.

## Technical Specifications

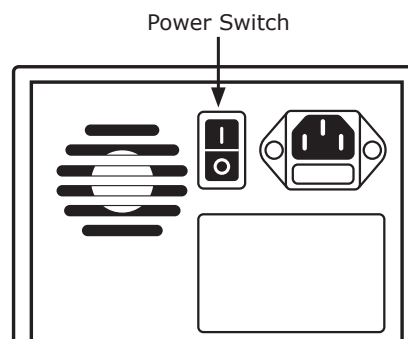
	mA400
<b>Output Voltage/ Inc.</b>	<b>Step 1</b> 10-300 V / 1V <b>Step 2</b> 10-300 V / 1V
<b>Output Current/ Inc.</b>	<b>Step 1</b> 10-400 mA / 1mA <b>Step 2</b> 10-400 mA / 1mA
<b>Max. Output Watt</b>	60 W
<b>Output Type</b>	Constant Voltage or Constant Current
<b>Control</b>	Microprocessor controller
<b>Terminal Pairs</b>	2 Pairs
<b>Timer</b>	999 (min) with alarm / Continuous
<b>Safety Device</b>	No load detection; shrouded plugs and sockets
<b>Operation Temperature</b>	4-40 °C
<b>Material</b>	Polycarbonate housing and aluminum base plates
<b>Rated Voltage</b>	100-240 Vac, 50/60 Hz, 2 A
<b>Program</b>	2-step program
<b>Preset Value</b>	<b>Step 1</b> V: 0 V A: 400 mA-T: 0 min <b>Step 2</b> V: 0 V A: 400 mA-T: 0 min
<b>Dimensions</b>	140 x 191 x 84 mm (W x L x H)
<b>Weight</b>	Approx. 1 kg
<b>Certification</b>	ETL, CE, FCC

\* If voltage or current is set to "0" in Step 2, system will not proceed to Step 2.

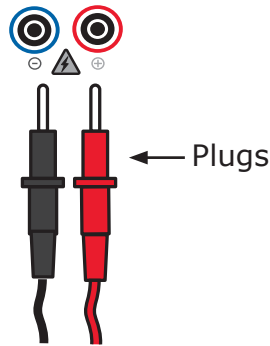
\* If time is set to "0," system will keep running until user manually stops.

## Installation Instructions

1. Place the unit on a sturdy and level surface in a safe dry place away from laboratory traffic.
2. Ensure that the power switch is OFF, and then plug one end of the three-pronged power cord into a grounded three-prong AC outlet with appropriate voltage (100 V to 240 V, as indicated on the rating sticker near the AC cord on the back of the unit) and plug the other end into the main power socket.



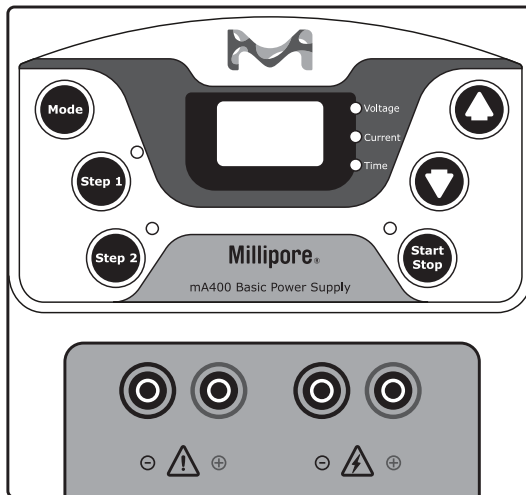
- Connect the DC output jacks from the electrophoresis unit; insert the red lead (+) into the red output jack, and the black lead (-) into the blue output jack.



- Power ON the unit by pressing the ON / Off switch on the back.

## Operating Instructions

### Control Interface



### Button Functions

	Two step buttons are available. Press the <b>Step 1</b> or <b>Step 2</b> button to switch between the two options.
	Press the <b>Mode</b> button to switch the setting mode between Voltage, Current, or Time. The LED light indicates your current status selection.
	Press the <b>UP</b> or <b>DOWN</b> arrow buttons to set each selected parameter.
	Start or stop the operation.

## General Operating Instructions

- Power on the unit by pressing the **ON / OFF** switch.
- Press **Step 1** or **Step 2** to select the desired Step.
- Press the **Mode** button to switch between Voltage, Current, and Time.
- Adjust the output value by using the **Up** or **Down** arrow buttons.

### Note

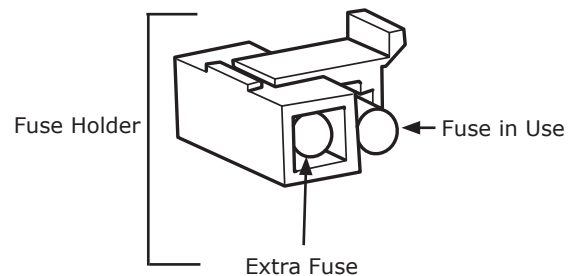
- When timer is set as "0", it means constant operation mode.
  - To operate under constant voltage or constant current modes, adjust the other parameter to the maximum value.
  - If you need only one Step, set parameters of Step 2 to zero. System will run Step 1 without proceeding to Step 2.
- Press the **Start / Stop** button to begin the run. The LED light will illuminate to indicate the system is running.
  - Press the **Start / Stop** button at any point within the run to stop the device.
  - When the run is completed, press the **Start / Stop** button to terminate the timed run. Turn off the AC power using the **ON / OFF** switch on the rear of the unit.

### Replacing the Fuse

- Turn off the main power switch at the rear of Power Supply and detach the power cord.
- Open the fuse compartment located at the Main Power Socket by inserting a small flat blade screwdriver into the slot below the ON / OFF switch. Turn the screwdriver to gently pry open the fuse compartment.

**Note** The fuse compartment will not open with the power cord in place.

- Pull the fuse holder out of the compartment and inspect the fuse. If the fuse is burned or there is a break in the fuse element, replace the fuse with an identical type of fuse (T2AH250V) as provided in the fuse holder (see figure below).



- Place the fuse holder back into the compartment.
- Snap the cover closed.

## Troubleshooting and Maintenance

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, call Technical Service ((800) 325-5832) or visit the Technical Service page on our web site at [SigmaAldrich.com/techservice](http://SigmaAldrich.com/techservice). If troubleshooting service is required, please include a full description of the problem.

Problem	Possible Causes	Solution
No display or lights.	No AC power.	Check if power supply is unplugged, or AC power source has problem.
	AC power cord is not connected.	Check the AC power cord connections at both ends. Use the correct cords.
	The fuse has blown.	Replace the fuse.
Fuse broken repeatedly.	Hardware failure.	Contact our Technical Service Department.
Operation stops.	Electrophoresis leads are not connected to the power supply or to the electrophoresis unit(s), or there is a broken circuit in the electrophoresis cell.	Check the connections to the power supply and on your electrophoresis cell to make sure the connection is intact; check condition of wires in electrophoresis unit. Close the circuit by reconnecting the cables. Press the START / STOP button to restart the run.
	High resistance due to tape left on a pre-cast gel, incorrect buffer concentration, or incorrect buffer volumes in the electrophoresis cell.	Correct the condition by making sure the tape is removed from the pre-cast gel, buffers are prepared correctly, and the recommended volume of buffer is added to the electrophoresis unit.
Er 1 Error message	Over current (400 mA limitation reached).	Check if the buffer concentration is appropriate. Excessive buffer concentration may cause over current issue. To clear the error message, press the START / STOP button again.
Er 2 Error message	Over voltage (300 V limitation reached).	Press the START / STOP button to clear the error message. Contact Technical Service if the problem persists.
Er 3 Error message	Thermal limitation reached (Output voltage < 10 V).	(1) Check the connections. (2) If Er3 error message persists, the problem may be caused by internal fan failure. Contact Technical Service.
nLd Message	No load is detected.	(1) Check the connections. (2) Check the buffer condition / buffer level.
AL 1 Alarm message	Max. watts (60 W) of power reached.	Warning message for reference. It reminds user that the machine has reached its maximum watts. The machine would keep running and adjust the balance between voltage and current automatically.

## Product Ordering Information

The mA700 can be purchased with different power supply cords to accommodate a variety of locations. Purchase products online at [SigmaAldrich.com/products](https://SigmaAldrich.com/products).

Model	Description	Catalogue Number
mA400 Basic Power Supply	mA400 Power Supply with cord for the US, Canada, and locations using NEMA 5-15P (YP12) plugs	MA400-US
	mA400 Power Supply with cord for France, Germany, and locations using CEE 7/7 (YP22) plugs	MA400-EU
	mA400 Power Supply with cord for the UK, Ireland, and locations using type G (YP61) plugs	MA400-UK
	mA400 Power Supply with cord for Japan and locations using YP18 plugs	MA400-NI
	mA400 Power Supply with cord for China and locations using Type 1 (YP03) plugs	MA400-ZH

Also available

mA700 Essential Power Supply	mA700 Power Supply with cord for the US, Canada, and locations using NEMA 5-15P (YP12) plugs	MA700-US
	mA700 Power Supply with cord for France, Germany, and locations using CEE 7/7 (YP22) plugs	MA700-EU
	mA700 Power Supply with cord for the UK, Ireland and locations using type G (YP61) plugs	MA700-UK
	mA700 Power Supply with cord for Japan and locations using YP18 plugs	MA700-NI
	mA700 Power Supply with cord for China and locations using Type I (YP03) plugs	MA700-ZH

## Support

### Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

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### Contact Information

For the location of the office nearest you, go to [SigmaAldrich.com/offices](https://SigmaAldrich.com/offices).

### Legal Manufacturer

EMD Millipore Corporation  
400 Summit Drive, Burlington, MA, USA

### Technical Assistance

Visit the tech service page on our web site at [SigmaAldrich.com/techservice](https://SigmaAldrich.com/techservice).

### Standard Warranty

The applicable warranty for the products listed in this publication may be found at [SigmaAldrich.com/terms](https://SigmaAldrich.com/terms).

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