

# **MS 300V**

## **Power Supply**

### **Instruction Manual**

Catalog No. MP-300V



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## Packing list

### **MP-300V:**

- 1x MP-300V
- 1x Power Cord
- 1x Instruction Manual

Signed by:

Date:

**Major Science is liable for all missing or damaged parts / accessories within 7 days after customer receives this instrument package. Please contact Major Science immediately regarding this issue. If no response is received within such a time period from consignee party, it will be the consignee party's whole responsibility.**

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## Section 1 Warning

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Major Science MS 300V has been tested and found to comply with the limits for the CE regulation. Also, MS 300V is RoHS compliant to deliver confident product which meets the environmental directive. These limits are designed to provide reasonable protection against harmful interference when the instrument series is operated in a commercial environment. This instrument series used together with power supply unit generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this instrument series 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.

1. Read and follow the manual instructions carefully.
2. Do not alter the equipment. Failure to follow these directions could result in personal and/or laboratory hazards, as well as invalidate equipment warranty.
3. Use a properly grounded electrical outlet with correct voltage and current handling capacity.
4. Disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel.
5. Never use this instrument series without having the safety cover correctly in position.
6. Do not use the unit if there is any sign of damage to the external tank or cover. Replace damaged parts.
7. 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.
8. Refer maintenance and servicing to qualified personnel.
9. 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.
10. Use appropriate materials and operate correctly to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from

overheated materials.

11. The unit shall be operated only by qualified personnel.

## Safety Information

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. If needed, please contact qualified service representative or [service@majorsci.com](mailto:service@majorsci.com)

## Environmental Conditions

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

1. Indoor use only
2.  $\leq 95\%$  RH
3. 75 kPa – 106 kPa
4. Altitude must not exceed 2000 meters
5.  $4^{\circ}\text{C} \sim 40^{\circ}\text{C}$  operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to  $\pm 10\%$  of the normal voltage

## Avoiding Electrical Shock

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

To avoid electrical shock:

1. In the event of solution accidentally spilling into the instrument, it must be dried out for a period of time (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 the damages on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. 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.
7. Do not operate the power supplies in high humidity environments (> 95%), or where condensation may occur.
8. 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.

## Equipment Operation

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

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.

## Symbol

The symbol used on MS 300V power supply is explained below.



Indicates an area where a potential shock hazard may exist.

Consult the manual to avoid possible personal injury or instrument damage.

Indicates disposal instruction.



DO NOT throw this unit into a municipal trash bin when this unit has reached the end of its lifetime. To ensure utmost protection of the global environment and minimize pollution, please recycle this unit.



This product has been tested to the requirements of  
CAN/CSA-C22.2 No. 61010-1,  
second edition, including Amendment 1, or a later version of the  
same standard incorporating the same level of testing  
requirements

## Section 2 Introduction

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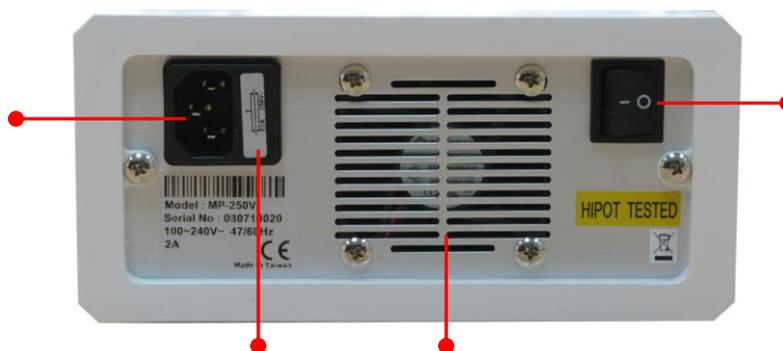
### 2.1 Overview

The Major Science 300V Power Supplies are recognized as one of the most advanced power supplies equipped with outstanding specifications to cover the majority of electrophoresis applications on the market. Their sufficient and accurate output voltages, four terminal pairs, compact size, as well as compliance CE to RoHS and CE safety concerns makes the MS 300V capable of delivering accurate and reliable experimental results one experiment after another.

Front view



Rear view



## **2.2 Product Description**

Major Science MS 300V (Cat. No. MP-300V) power supplies are designed to meet most electrophoresis needs. This manual describes the setup and operation of the MS 300V Power Supply, including important information on the safety and maintenance of the unit. The MS 300V power supplies are capable of running horizontal & vertical electrophoresis, and two-dimensional electrophoresis SDS-PAGE applications. In addition, a Timer with alarm function is also equipped in the unit, and so is a Pause function. Furthermore, the powerful specifications plus four terminal pairs can be used for multiple electrophoresis units simultaneously. The stackable case design is another feature to save bench top space.

The Major Science MS 300V power supplies provide both Constant Voltage or Constant Current to instruments used in electrophoresis. Equipped with four terminal pairs and powerful specification, the MS 300V Power Supply series offer maximum capability compared with other similar products on the market.

### **Features**

- Compact size
- Advanced capacity: 150W, 700mA, 300V
- Microprocessor controller
- Constant voltage and current
- Four terminal pairs
- Timer with alarm function
- Advanced safety devices
- Stackable case
- Wide applications for DNA, RNA and protein electrophoresis

### Section 3 Product Specifications

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<b>Output Voltage / Inc</b>	2 - 300V / 1V
<b>Output Current / Inc</b>	1 - 700mA / 1mA
<b>Max. Watt</b>	150W
<b>Operating Constants</b>	Voltage or Current
<b>Control</b>	Microprocessor Controller
<b>Terminal Pairs</b>	4 pairs
<b>Timer</b>	1 - 999 min with alarm, continuous
<b>Safety Device</b>	No Load detection Leakage detection Over temperature protection Over load protection Shrouded plugs and sockets Sudden load change detection
<b>Crossover</b>	Yes
<b>Operating Temperature</b>	4°C ~ 40°C
<b>Unit Dimension</b>	190 x 305 x 95 mm (W x L x H)
<b>Construction Material</b>	Flame retardant ABS faceplate and aluminum
<b>Rated Voltages</b>	100 - 240 Volt; 47-60Hz
<b>Stackable</b>	Yes
<b>Weight</b>	Approx. 2.5 kg

## Section 4 Installation Instructions

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The Major Science MS 300V Power Supply series is actually a pre-installed instrument. As long as it is placed on a sturdy and level surface in a safe and dry place, and is further connected with a well-prepared electrophoresis system, it is ready for operation.

## Section 5 Operation Instructions

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### 5.1 Controls and Features



**Front Control Panel**

1.  **Key** – to increase either Voltage or Current or Time value
2.  **Key** – to decrease either Voltage or Current or Time value
3.  **Key** – to activate or stop the unit

4.  **Key** – to temporarily interrupt power to an operation in progress without terminating electrophoresis and to resume power after pausing without resetting the timer.
  
5.  **Key** – to select Voltage value
  
6.  **Key** – to select Current value
  
7.  **Key** – to set or select Timer mode

## 5.2 Start the operation

*\*Note: To operate under constant voltage or constant current modes, adjust the other parameter to the maximum value. For example, to operate under constant voltage, adjust current to max before running using constant voltage, and vice versa.*

1. Place the MS 300V Power Supply series on a sturdy and level surface in a safe and dry place, away from laboratory traffic.
  
2. Ensure that the AC power switch is OFF, and then plug the three-pronged power cord into a grounded three-prong AC outlet of the appropriate voltage (110V to 240V as indicated on the rating sticker near the AC cord on the back of the unit).
  
3. Turn the AC power ON using the switch on the back side.
  
4. Connect the DC output jacks from the electrophoresis unit; insert the red lead (+) into the red output jack, and the black lead (-) into the black output jack.

5. Press  Key, and then press  Key or  Key to select the

suitable voltage.

6. Press  Key, and then press  Key or  Key to select the suitable current, alternatively.

7. Press  Key, and then press  Key or  Key to adjust timer in minute format as desired if setting time is required. It will automatically stop while timer is done (counting down).

Note: When timer is set as “0”, it means continuous operation.

8. Press  Key to start the run.  , the LED will light up.

9. After pressing  Key to start the run, if it is Constant Voltage,  , the LED will flash. Also, if it is Constant Current,  , the LED will flash.

10. Press  Key to temporarily interrupt the run if necessary.  (the LED will flash). Press  Key to restart the run.

11. Press  Key again to stop the unit at any time if necessary.

12. When the run is completed, operation stops with the alarm and the screen shows **End**. Press  Key to terminate a timed run, and turn the AC power OFF using the switch on the backside.

## Section 6 Troubleshooting Guide

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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, contact our SERVICE DEPARTMENT or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Cause	Solution
No Display / lights	No AC power	Check if MS power supply is unplugged, or AC power source problem
	AC power cord is not connected	Check AC power cord connections at both ends. Use the correct cords.
	The fuse has blown	Replace the fuse
Repeated fuse broken	Hardware failure	Contact Major Science service department
Operation stops with alarm: The screen displays 	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 START/STOP 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.
Operation stops with alarm: Display shows 	Over Current	<ul style="list-style-type: none"> <li>- Verify that the running buffer is correct.</li> <li>- Verify that all cables are attached correctly</li> <li>- Turn the Power switch off and on again; restart application.</li> <li>- If you cannot restart the instrument, turn</li> </ul>

		off the power, disconnect the power cord from the outlet, and contact Technical Service.
Operation stops with alarm: Display shows <b>Er-2</b>	Over Voltage	<ul style="list-style-type: none"> <li>- Verify that the running buffer is correct.</li> <li>- Verify that all cables are attached correctly</li> <li>- Turn the Power switch off and on again; restart application.</li> <li>- If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.</li> </ul>
Operation stops with alarm: Display shows <b>Er-3</b>	Ground leak detected during run	Check the electrophoresis system for improper grounding. Restart the power supply by turning the Power switch off and on.
Operation stops with alarm: Display shows <b>Er-6</b>	Power supply is overheating	<ul style="list-style-type: none"> <li>- Turn off power supply. Check for sufficient airflow around the power supply fan. After cooling down, restart the power supply by turning the Power switch to the on position.</li> <li>- If you cannot restart the instrument, turn off the power, disconnect the power cord from the outlet, and contact Technical Service.</li> </ul>
Operation stops with alarm: Display shows <b>Er-7</b>	Bad connections for terminal connectors or damaged wires or damaged platinum wires	Check all the connections to terminators, cables, wires, and gel tanks
Operation stops with alarm: Display shows <b>AS9</b> and countdown	Power supply is restarting	<ul style="list-style-type: none"> <li>- Verify that the electrophoresis condition and system is correct.</li> <li>- Pay attention to your own safety.</li> </ul>

 Alarm message	Max. watts(150W) 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.
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### Encountering Problems

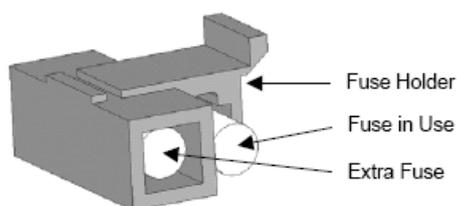
1. Check the troubleshooting section.
2. Call Technical Service or e-mail to [service@majorsci.com](mailto:service@majorsci.com)
3. If the unit must be shipped back for repair, contact Major Science or the distributor for a Return Authorization Number and shipping instructions. The unit will be repaired and returned to you as quickly as possible.

## Replacing the Fuse

For additional fuses, contact Major Science co. Ltd.

### To replace the fuse:

1. Turn off the main power switch on the rear of MS 300V Power Supply and detach the power cord from the rear of MS 300V Power Supply.
2. Open the fuse compartment located inside the Power Entry Module by inserting a small flathead 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.
3. 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 (2A/250V~) as provided in the fuse holder (see figure below).
4. Place the fuse holder back into the compartment.
5. Snap the cover closed.



## Maintenance

The MS 300V Power Supply series uses all solid-state components and should require no maintenance or recalibration under normal use. The casing may be cleaned with a dry cloth. If the unit must be returned for repair, contact our **SERVICE DEPARTMENT** or your local distributor for shipping instruction.

## Section 7 Ordering Information

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### MS 300V Power Supply

<b><i>Cat. No.</i></b>	<b><i>Description</i></b>
MP-300V	MS 300V Power Supply

## **Section 8 Warranty**

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Major Science warrants apparatus of its manufacture against defects in materials and workmanship, under normal service, for **one year from the shipping date to purchaser**. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect. Major Science's liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to Major Science within one year following the date of delivery of the product to the customer.

**Manufacturer:**

Major Science Co., Ltd.

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