

# **MPS-P Series High Power Programmable DC Power Supply User Manual**

**MATRIX TECHNOLOGY INC.**



## **Preface**

Respected user:

Hello! Thank you for purchasing a brand-new MATRIX instrument. In order to use this instrument correctly, please read this manual carefully before using the instrument, especially the section on "Safety Precautions". If you have read the full text of this manual, it is recommended that you keep this manual in a safe place, and place it with the instrument or in a place where you can read it at any time for future reference.

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## Verification and Correction Statement

The company specifically declares that the instruments and equipment listed in this manual fully conform to the specifications and characteristics stated in the company's technical specifications. This instrument has passed the factory calibration of the company before leaving the factory, and the calibration procedures and steps are in line with the specifications and standards of the electronic inspection center.

### Product quality assurance

The company guarantees that the new instruments produced and manufactured have undergone strict quality confirmation, and at the same time guarantees that within one year of leaving the factory, if any construction defects or parts failures are found, the company is responsible for repairing them free of charge. However, if the user changes the circuit, function, or repairs the instrument and parts or the outer box is damaged, the company does not provide free warranty service. If all ground wires are not properly connected in accordance with regulations or the machine is not operated in accordance with safety regulations and abnormal conditions occur, our company will not provide free warranty services.

This warranty does not include accessories that are not produced by our company, such as accessories for this instrument.

During the one-year warranty period, please return the faulty unit to our maintenance center or the dealer designated by our company, and our company will properly repair it.

If the unit fails under abnormal use, human negligence, or under human control, such as earthquakes, floods, riots, or fires and other factors beyond human control, the company will not provide free warranty services.

**(The company follows the sustainable development strategy and reserves the right to improve the contents of this manual without prior notice)**

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# Chapter 1 Product Introduction

This series of programmable DC power supply is a new generation of high-quality programmable linear DC power supply. It can display voltage, current, power and other parameters in multiple windows at the same time. This series of products is equipped with RS232 communication interface. It can be combined with other instruments arbitrarily and integrated into a test system with special functions to meet the measurement requirements in different occasions. The host computer program can be edited through the communication protocol, which brings great convenience to the user's use. It is a replacement product of ordinary programmable power supplies. , has a very high cost-effective advantage.

This series of power supplies has the following characteristics:

- Smart fan cooling system
- Multi-group data storage function
- Standard 19-inch 3U instrument architecture design
- Support RS-232 communication
- 1mV, 1mA high resolution
- OCP, OVP, OTP and other protection functions
- Internal temperature detection function

# Chapter 2 Technical Specifications

## 2.1 Main technical specifications

### Technical Specification Sheet:

model		MPS-3030P	MPS-3040P	MPS-3050P	MPS-5030P	MPS-6020P
Input voltage		AC 220V/110V±10% 50Hz/60Hz				
Rated output voltage	Voltage	0~30V	0~30V	0~30V	0~30V	0~60V
	current	0~30A	0~40A	0~50A	0~30A	0~20A
Load Regulation	Voltage	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV
	current	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA
Power Regulation	Voltage	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV	≤0.02%+15mV
	current	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA	≤0.2%+10mA
set resolution	Voltage	1mV	1mV	1mV	1mV	1mV
	current	1mA	1mA	1mA	1mA	1mA
set precision	Voltage	≤0.05%+10mV	≤0.05%+10mV	≤0.05%+10mV	≤0.05%+10mV	≤0.05%+10mV
	current	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
readback resolution	Voltage	1mV	1mV	1mV	1mV	1mV
	current	1mA	1mA	1mA	1mA	1mA
readback accuracy	Voltage	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV
	current	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+50mA	≤0.1%+5mA
Ripple and Noise	Voltage	≤10mV(rms)				
	current	≤10mA(rms)				
working environment		0~40℃ ≤80%RH				
size (WxHxD)	cm	480*142*370				
weight	kg	22	24	25	22	25

## 2.2 Supplementary Features

State memory capacity: 99 groups of operating states

Recommended calibration frequency: 1 year/1 time

Cooling method: forced air cooling

Operating ambient temperature: 0 to 40 °C

Storage ambient temperature: -20 to 70 °C

Use environment: indoor use design, pollution level 2, maximum humidity 80%

# Chapter 3 Quick start

This chapter will briefly introduce the appearance and basic functions of this series of programmable DC power supplies, so that you can quickly understand the four-channel programmable DC power supply. At the same time, it will tell you the basic inspections to be done after getting the power supply to ensure the normal operation of this product.

## 3.1 Introduction of front and rear panels

**The front panel is shown below.**

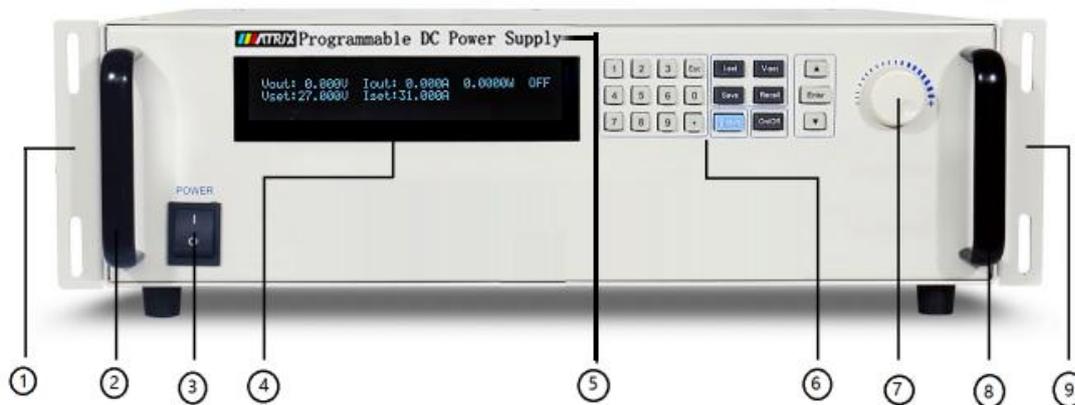


Figure 3.1

- ①, ⑨ standard 19-inch cabinet fixing ears
- ②, ⑧ Programmable DC power supply handle
- ③ Power switch
- ④ LCD display
- ⑤ Power supply model specifications,
- ⑥ From left to right are 0-9 number keys and ESC escape key, function keys, up and down movement keys and Enter key,
- ⑦ Adjustment knob

The rear panel layout of the programmable DC power supply is shown in the following figure.

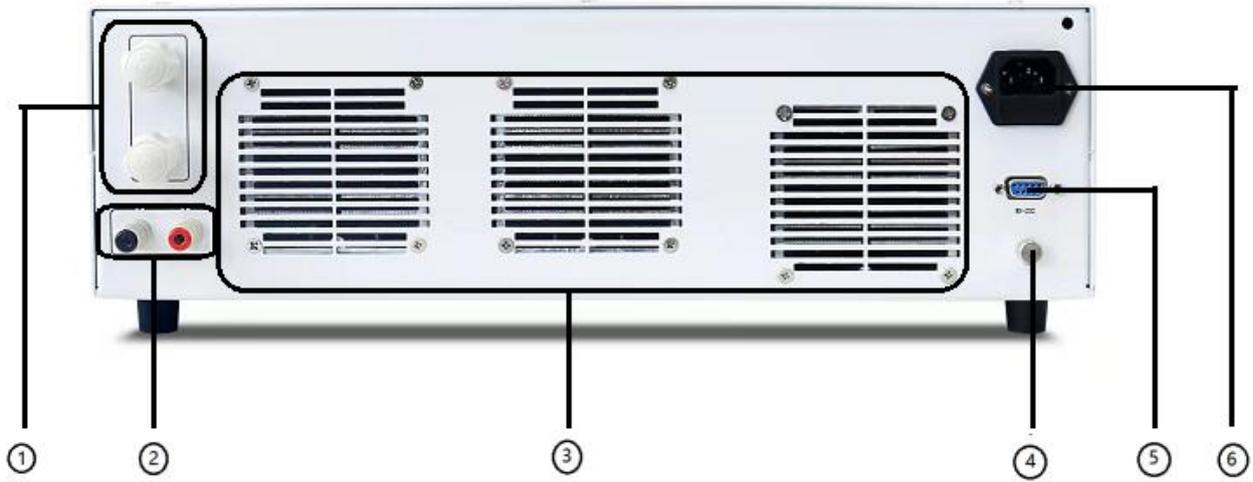


Figure 3.2 Programmable DC Power Rear Panel

- ① Output terminal,
- ② Voltage compensation terminal
- ③ Heat dissipation hole
- ④ Ground terminal
- ⑤ RS-232 communication interface
- ⑥ Power input socket

## 3.2 Pre-check

Please follow the steps below to check the power supply to make sure the power supply is working properly.

### 1. Inspection

Please check whether you have received the following accessories when you receive the power supply. If there is any missing, please contact your nearest dealer.

- A power cord (conforming to the voltage standard used in the region)
- An operation manual (standard)
- One communication cable (standard)

### 2. Connect the power cord and turn on the power

After power-on, the power supply first performs a system self-test, and then enters the standby state.



Warning: The power supply ships with a three-conductor power cord, and your power supply should be connected to the three-conductor terminal block. Before operating this power supply, you should first make sure that the power supply is well grounded.

### 3.3 If the power supply does not turn on

Use the methods below to resolve problems you may have when turning on the power.

#### 1. Check whether the power cord is connected

Model	Fuse Specifications
	230V
MPS-3030P	15A
MPS-3040P	15A
MPS-3050P	15A
MPS-5030P	15A
MPS-6020P	15A

#### 2. How to replace the fuse

Use a screwdriver to open the small plastic cover below the power input socket on the rear panel of the power supply, and you can see the fuse. Please use a fuse that matches the specification.



# Chapter 4 Panel Operation

This chapter will introduce the operation of the front panel of the power supply in detail, divided into the following parts:

- Keyboard arrangement
- Front panel operation introduction
- Voltage setting operation
- Current setting operation
- Storage operations
- Output on/off operation
- Menu operation

## 4.1 Keyboard arrangement



### Key Description

key position	Button function description
0-9:	number key
Esc:	Escape key
I-Set	Set the maximum output current of the power supply
V-Set	Set the power supply output voltage
Save	Store the current related parameters of the power supply to the specified storage location
Recall	Recalling the power-related setting parameters from the specified memory location
Shift	Composite keys, used in combination with multi-function keys
On/off	Control power output status
▲	Up key (select a menu item in the menu operation, and the output voltage can be increased in the working interface)
▼	Down key (select a menu item in the menu operation, and the output voltage can be reduced in the working interface)
Enter	Enter
knob	Used to change the power supply voltage, current setting

## 4.2 Basic Front Panel Operations

Turn on the power, the LCD displays data such as voltage, current, power and output status,



1. **Uout: 0.000V** output voltage value.
2. **Uset: 27.000V** Set the voltage value.
3. **Iout: 0.000A** output current value.
4. **Iset: 31.000A** Set the current value.
5. **0.0000W** Output Power.
6. **OFF** output status.

## 4.3 Voltage setting operation

The voltage setting range is between 0V and the maximum voltage setting value. You can use the following two methods to set the output voltage value through the front panel.

Method 1: Press the V-Set key, then press the number keys 0 to 9 to input the voltage value, and then press the Enter key to confirm the voltage value.

Method 2: Press the V-Set key, and then turn the knob left and right to change the voltage setting value. (When the screen flashes, you can turn the knob left and right to set the voltage. Press the knob to move the setting cursor position, and press the "Enter" key. to confirm and exit setting mode).

## 4.4 Current setting operation

The setting range of the current is between 0A and the full rated output current. You can use the following two methods to set the output current value through the front panel.

Method 1: Press the I-Set key, then press the number keys 0 to 9 to input the current value, and then press the Enter key to confirm the current value.

Method 2: Press the I-Set key, and then turn the knob left and right to change the current setting value.

(When the screen flashes, you can turn the knob left and right to set the current value, and press the knob to move the setting cursor position, and press "Enter" key to confirm and exit the setting mode).

## 4.5 Access operation

The power supply can save some commonly used parameters in 99 groups of non-volatile memory for users to quickly recall. You can use the Save and Recall keys on the front panel to access (0~99) group memory areas.

The storage contents include: 1. Voltage setting value. 2. Current setting value. 3.OVP. 4.OCP.

You can press the Save key, then press the number keys 1 to 9, and press the Enter key to store the parameters of the power supply in the designated storage area.

You can press the Recall key, then press the number keys 1 to 9, and press the Enter key to retrieve the parameters from the specified storage area for use.

## 4.6 OVP/OCP function settings

### OVP function settings

Press the "shift" key and then press the "V-set" key to enter the OVP setting. You can switch between the set value and the state setting by pressing the ▲ and ▼ keys.



1.  The OVP setting value can be changed by the numeric keys and knob, the method is the same as the voltage setting.
2.  OVP state setting, OFF means the function is closed, ON means the function is open.

### OCP function settings

Press the "shift" key and then press the "I-set" key to enter the OCP setting. You can switch between the set value and the state setting by pressing the ▲ and ▼ keys.



1.  The OCP setting value can be changed by the numeric keys and knob, the method is the same as the current setting.

2.  OCP state setting, OFF means the function is closed, ON means the function is open.

**Remarks:**

1. Press "ESC" to exit after setting.
2. When the power supply enters the OVP, OCP or OTP protection state, the output will be automatically turned off, and the display screen will display relevant prompt information. At this time, we can press the ON/OFF key to clear the screen prompt information after clearing the error.

### 4.7 Menu Settings

Press shift and then press the number key "1" to enter the menu setting function, press the ▲ and ▼ keys to switch menu options, press the "Enter" key to select this function option, the menu content is as follows:

Power Menu				
System	Out State	off (keep Off)		
		Keep (Keep last shutdown state)		
	Out Param	Reset (Factory default, Default is 5.000V/1.000A)		
		Keep (Keep last shutdown parameters)		
	Buzzer	Off		
		On		
	Communication	Adress	Adress=1(0-255)	
		Baud Rate	4800	
			9600	
			19200	
			38400	
			57600	
			115200	
	Command	Modbus		
		SCPI	CR	terminator selection
			LF	
			CR+LF	
			LF+CR	
	Sense	Off		
		On		
Reset	No			
	Yes			
	Exit			
Configure	Min Volt	Min Voltage=0.000V		
	Max Volt	Max Voltage=31.000V		
	Min Curr	Min Current=0.000A		
	Max Curr	Max Current=51.000A		

List test function	Load	List1			
		List2			
		List3			
		List4			
		List5			
	Edit	List1	Step Number=100	Mode:	Repeat
		List2			End Hold
		List3			End Reset
		List4			
		List5			
Exit					

### Factory default:

- 1.Out State : Off (keep Off)
- 2.Out Param : Keep (Keep last shutdown parameters)
- 3.Buzzer : ON
- 4.Address : 1
- 5.Baud Rate : 9600
- 6.Command : SCPI
7. communication terminator: LF
- 8.Sense : OFF

### 4.8 LIST (list test function)

In standby mode, press the "shift" key and then press the number key "1" to enter the menu setting function, press the ▲ and ▼ keys to switch to the "List" menu option, and press the "Enter" key to enter the "List" display as follows:



1. **Load** Load list test.
2. **Edit** Edit list test.



1.Step Number=5: There are 5 steps in total list steps (up to 100 steps can be edited)



After setting the total list steps, press the "Enter" key to automatically enter the list mode editing, the display is as follows:



- ① List test execution mode.
- ② Repeat the execution of the list parameter.
- ③ After the list parameter is executed, the output state is maintained.
- ④ After the list parameter is executed, keep it closed.

After selecting any list test execution mode, press the "Enter" key to automatically enter the list parameter editing display as follows:



- ① The currently edited list step can be switched by pressing the ▲ and ▼ keys.
- ② List the voltage parameters, use the numeric keyboard to modify the parameters, press "Enter" to confirm and enter the next parameter setting.
- ③ List the current parameters, use the numeric keyboard to modify the parameters, press "Enter" to confirm and enter the next parameter setting.
- ④ List step dwell time parameters, use the numeric keyboard to modify the parameters, press "Enter" to confirm and enter the next parameter setting.

# Chapter 5 Remote Operation Mode

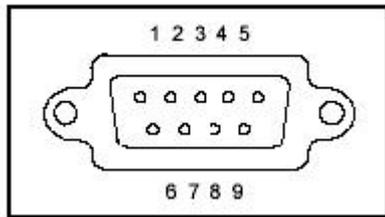
## 5.1 Communication between the power supply and the host

The power supply can be connected to the PC host interface through the DB9 plug on the rear panel. The following content can help you understand how to control the output of the power supply through the host computer.

### 1. Communication settings

Before performing communication operations, you should first match the power supply to the following parameters of the control panel:

- (1) Baud rate: 9600
- (2) Parity: NONE (3) Data bits: 8, Stop bits: 1 (fixed value)
- 2. DB9 serial interface



The DB9 interface on the rear panel of the power supply can be connected to the interface of the host.

### 3. Interface pin definition

1	NC
2	RXD (take over)
3	TXD (send)
4	NC
5	GND (land)
6	NC
7	NC
8	NC
9	NC

## Safety

Do not install substitute parts on the instrument yourself, or perform any unauthorized modifications. Please send the instrument to our company's maintenance department for maintenance to ensure that it can be used safely.

Refer to this manual for specific warning or caution information to avoid personal injury or damage to the instrument.

### Safety sign

#### Warning

It reminds users of certain operating procedures, practices, conditions, and other matters that may lead to personal injury.

#### Caution

It warns the user of procedures, practices, conditions, etc. that may cause damage to the instrument or permanent loss of data.



Grounding point today



High voltage hazard. (Do not open the machine for non-expert personnel)



Refer to the warnings in the related documents and pay attention to the tips. (High voltage, please wear gloves when operating, and do not use the machine for safety purposes).

## Warranty Card

### What the warranty covered:

If the machine break down due to its defectiveness, MATRIX will provide free maintenance during warranty period. If the machine break down due to wrong operation or carelessness, then Matrix provide paid service within warranty period.

### How long does this warranty last:

This warranty lasts for 3 years from the date of original purchase of all MATRIX branded products.

### Who is covered:

This warranty covers only the original purchaser of this product. This warranty is not transferable to subsequent owners or purchasers of this product.

### What do customers need to do to get repairs/service under the warranty policy?

If the machine get problem, please contact our local distributor. If you cannot find the local distributor, you can contact us directly, our email is [service@szmatrix.com](mailto:service@szmatrix.com), our telephone No. is 0086 755 2836 4276.

### What information do customers need to supply?

Model No.	
Serial No.	
Problem description	
Picture	
Video if necessary	