MPS-H-1 series DC Power Supply

User Manual

MATRIX TECHNOLOGY INC.

Preface

Respected users:

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

Copyright Information

Calibration and calibration statement

The company specifically declares that the equipment listed in this manual fully complies with the specifications and characteristics stated in the company's technical specifications. This instrument has been verified by our company before leaving the factory. The verification procedures and steps are in compliance with the specifications and standards of the Electronic Inspection Center.

Product quality assurance

The company guarantees that the new products manufactured by the company have undergone strict quality confirmation. At the same time, it is guaranteed that within one year of leaving the factory, if there is any construction defect or part failure of the product, the company is responsible for repairing it for free. However, if the user changes the circuit, function, or repairs the instrument and parts or the outer box is damaged, the company will not provide free warranty service. If all the ground wires are not properly connected in accordance with the regulations or the machine is not operated in accordance with safety regulations and abnormal conditions occur, our company will not provide free warranty service. This warranty does not include accessories that are not produced by our company, such as the accessories of this instrument. During the one-year warranty period, please return the faulty unit to the maintenance center of our company or the dealer designated by our company, and the company will repair it properly. If the unit fails under abnormal use, human negligence, or non-human control, such as earthquake, flood, riot, or fire and other non-human control factors, the company will not provide free warranty service. (The company follows the sustainable development strategy and reserves the right to improve the contents of this manual without prior notice)

Contents

Chapter 1 Product Introduction

MPS-H-1 series DC power supply is a new generation of high-quality linear DC power supply, with remote voltage compensation function, automatic conversion of voltage stabilization and current, high stability, high reliability, high precision, and display output voltage and current at the same time. Very high cost-effective advantage.

This series of power supplies have the following characteristics:

- Infinite servo, intelligent fan system,
- With voltage and current preset function,
- Independently control output ON/OFF,
- Over temperature protection function,
- High resolution up to 1mV, 1mA,
- Voltage and current range limit function,
- Two sets of voltage and current storage functions,

Chapter 2 Technical Specifications

2.1 Main technical specifications

MPS-H-1 series DC power supply technical specification table (ambient temperature: 23℃±5℃):

Model		MPS-3010H-1	MPS-3020H-1	MPS-6005H-1	MPS-6010H-1	MPS-10003H-1	MPS-20002H-1	MPS-30001H-1
Input voltage		AC 220V/110V±10% 50Hz/60Hz						
Rated output	Voltage	0~30V	0~30V	0~60V	0~60V	0~100V	0~200V	0~300V
	Current	0~10A	0~20A	0~5A	0~10A	0~3A	0~2A	0~1A
Load regulation	Voltage	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+5mV	≤0.01%+5mV	≤0.01%+8mV	≤0.01%+12mV	≤0.01%+15mV
	Current	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA
Line regulation	Voltage	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+5mV	≤0.01%+5mV	≤0.01%+8mV	≤0.01%+12mV	≤0.01%+15mV
	Current	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA	≤0.2%+5mA
Setting resolution	Voltage	1mV	1mV	1mV	1mV	10mV	10mV	10mV
	Current	1mA	1mA	1mA	1mA	1mA	1mA	1mA
Setting accuracy	Voltage	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+80mV	≤0.01%+80mV	≤0.01%+80mV
	Current	≤0.1%+5mA	≤0.1%+10mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Readback resolution	Voltage	1mV	1mV	1mV	1mV	10mV	10mV	10mV
	Current	1mA	1mA	1mA	1mA	1mA	1mA	1mA
Readback accuracy	Voltage	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+10mV	≤0.01%+80mV	≤0.01%+80mV	≤0.01%+80mV
	Current	≤0.1%+5mA	≤0.1%+10mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Ripple and noise	Voltage	≤3mV(rms)						
	Current	≤5mA(rms)						
Working environment		0~40℃ ≤80%RH						
Size (WxHxD)	cm	250*150*330						
Weight	kg	8	13	8	13	12	12	

2.2 Supplementary features

Recommended calibration frequency: 1 year/1 time
Cooling method: forced air cooling
Operating environment temperature: 0 to 40 ℃
Storage temperature: -15 to 80 ℃
Use environment: indoor use design, pollution level 2, maximum humidity 80%RH

Chapter 3 Quick Start

This chapter will briefly introduce the appearance and basic functions of the MPS-H-1 series DC power supply, so that you can quickly get to know the MPS-H-1 series 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 the product.

3.1 Introduction to the front and rear panels

The front panel of MPS-H-1 series DC power supply is shown in the figure below.

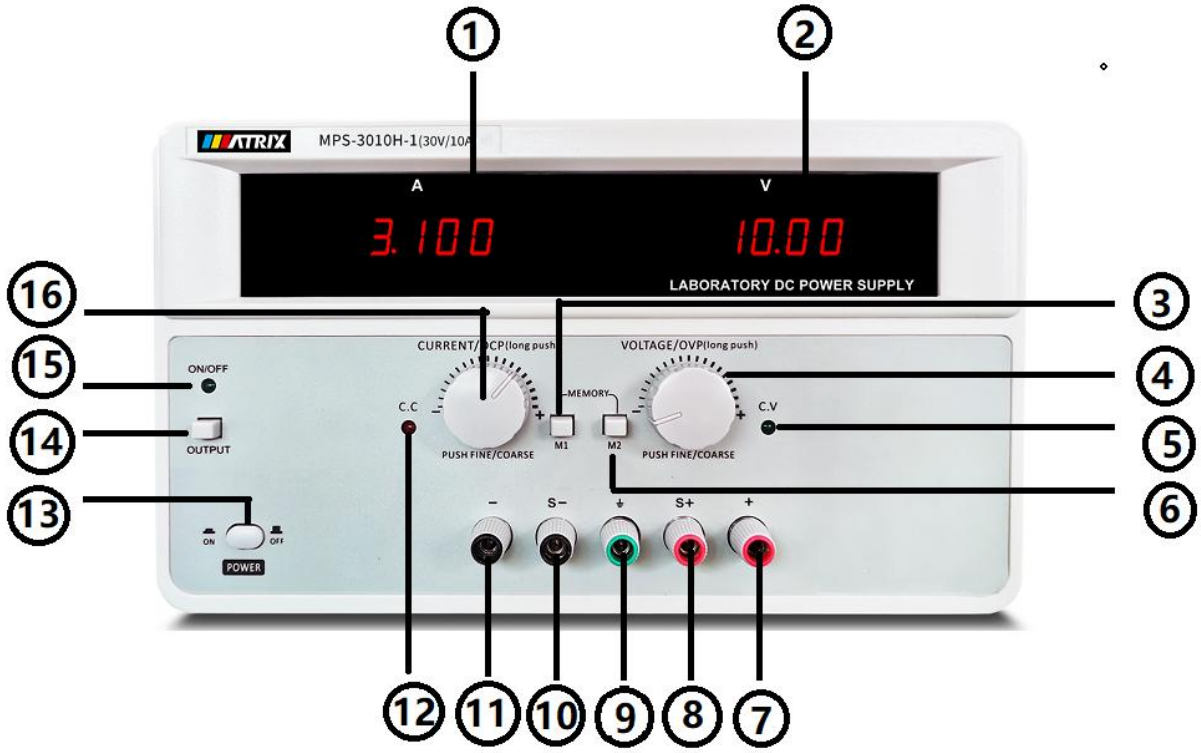


Figure 3.1

① Current display window,
② Voltage display window
③ Store/call button 1
④ Voltage adjustment knob/OVP setting knob
⑤ Constant pressure indicator
⑥ Store/call button 2
⑦ Positive end of output terminal
⑧ Positive end of remote compensation terminal
⑨ Ground terminal
⑩ Negative end of remote compensation terminal
⑪ Negative end of output terminal
⑫ Constant current indicator
⑬ Instrument power switch
⑭ Output switch/menu function button
⑮ Output switch indicator
⑯ Current adjustment knob/OCP setting knob

The rear panel of MPS-H-1 series DC power supply is as shown in the figure below:

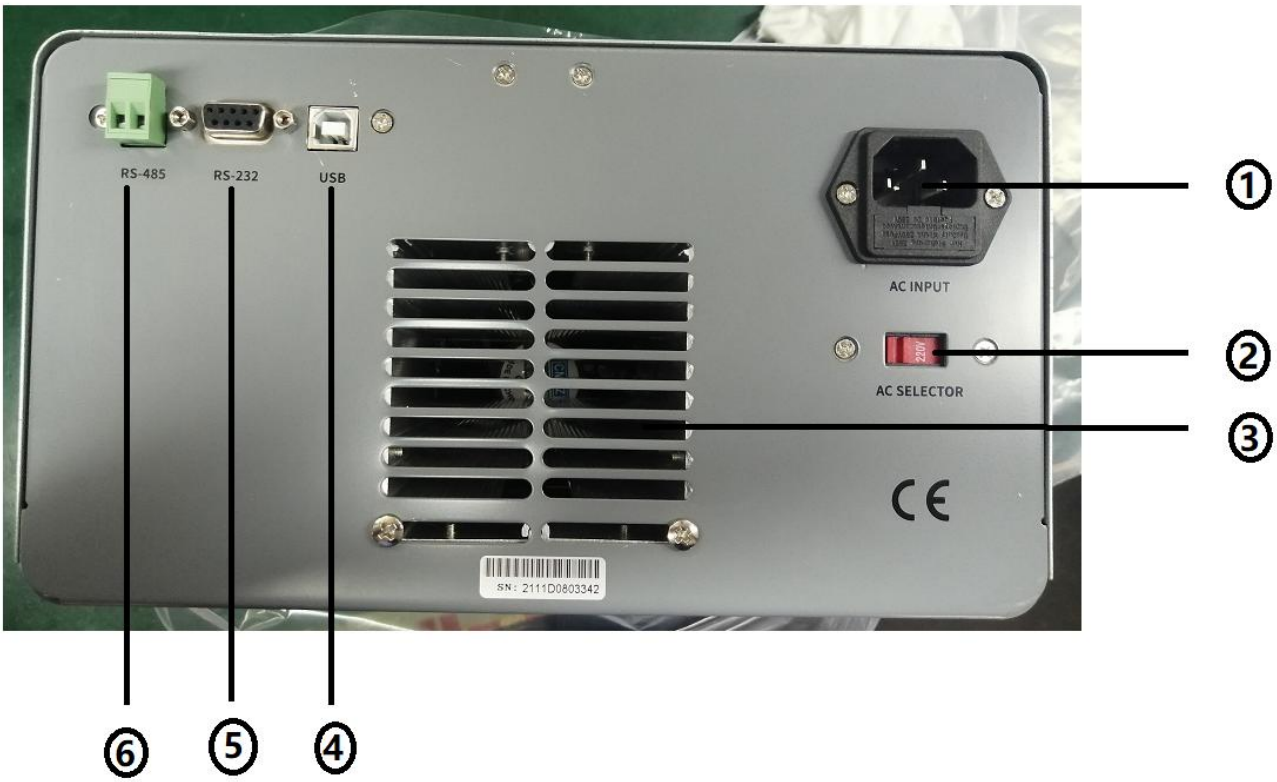


Figure 3.2 Rear panel of MPS-H-1 series DC power suppl

① Instrument power input socket

② Instrument power input switch

③ Heat dissipation hole

④ USB interface(optional)

⑤ RS-232 interface(optional)

⑥ RS-485 interface(optional)

3.2 Pre-check

Please follow the steps below to check the power supply to ensure that the power supply can be used normally.

1. Inspection

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

☐ A power cord (conforms to the voltage standard used in the region)
☐ An operation manual (standard configuration)
☐ A warranty card (standard configuration)

2. Connect the power cord and turn on the power

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

⚠**Warning**: A three-core power cord is provided when the power supply is shipped from the factory. Your power supply should be connected to a three-core junction box. Before operating this power supply, make sure that the power supply is well grounded.

3.3 If the power fails to start

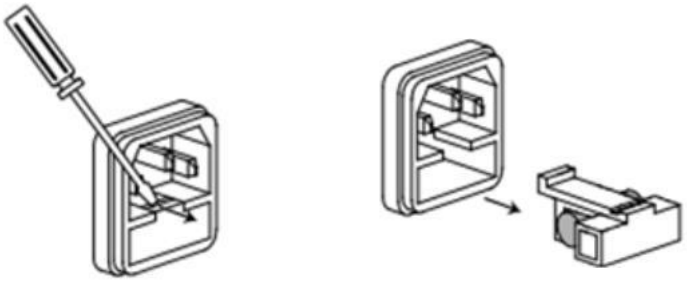
Use the following methods to solve the problems you may encounter when turning on the power.

1. Check if the power cord is connected

Model	Fuse specification	
	230V	115V
MPS-6005H-1	5A	8A
MPS-6010H-1	8A	15A
MPS-3010H-1	5A	8A
MPS-3020H-1	8A	15A
MPS-10003H-1	5A	8A
MPS-20002H-1	6A	10A
MPS-30001H-1	5A	8A

2. How to replace the fuse

Use a screwdriver to open the small plastic cover under the power input socket on the rear panel of the power supply (as shown in the figure below), and you can see the fuse. Please use a fuse with the same specifications.



Chapter 4 Operation Instructions

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

- Voltage/current setting
- Output on/off operation
- Introduction to storage/call function
- Menu setting operation
- OCP/OVP function introduction
- Introduction of initialization function

4.1 Voltage/current setting

When the power supply is in standby or output state, lightly press the voltage/current knob, the corresponding setting position on the screen will flash. At this time, you can turn the knob left and right to change the setting value, clockwise to increase the value, counterclockwise to decrease When the setting value is flashing, press the knob again to change the setting position. If no operation is performed on the knob within 5 seconds, the system will automatically exit the setting state.

4.2 Output on/off operation

1. When the power is on, the ON/OFF button can be used to control the on/off working status of the power output.

Remark:

1. The ON/OFF indicator light is on and the power supply is in the output working state.
2. When the ON/OFF indicator is off, the power output is off.

4.3 Introduction to Store/Call Function

1. Storage: When the power supply is in standby or output state, press and hold "M1" or "M2" for about 5 seconds. The buzzer will beep twice, and the current set value of voltage and current will be stored in the current channel.
2. Call: When the power is in standby or output state, tap "M1" or "M2" and the buzzer will beep once, and the pre-stored voltage and current settings will be recalled.

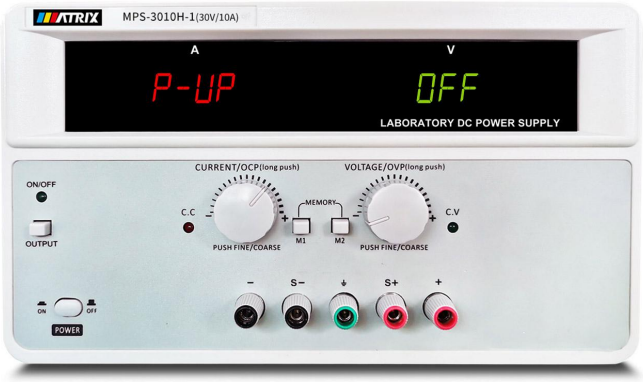
4.4 Menu setting operation

Long press the "output switch/menu function button" power supply will enter the menu setting mode, the setting content is as follows:

1. Power-on parameter retention settings: P-ST ON/OFF (ON is to retain the data at the last power-off, OFF is to retain the factory default value, the current knob switch menu steps, use the voltage knob to switch the

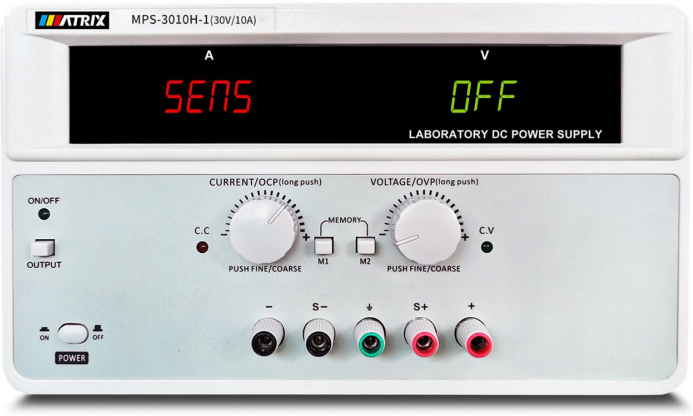
ON/OFF state, lightly press "Output switch/menu function button" to exit the menu.)

2. Output status setting at power-on: P-UP ON/OFF (ON means power-on keeps the last output status when power-off, OFF means power-on keeps off, current knob switches menu steps, voltage knob switches ON/OFF status , Tap the "output switch/menu function button" to exit the menu.)



3. Buzzer sound setting: BEEP ON/OFF (ON means the buzzer sound is turned on, OFF means the buzzer sound is turned off, the current knob is used to switch the menu steps, and the voltage knob is used to switch the ON/OFF state, and lightly press the "output switch" /Menu function button" to exit the menu.)

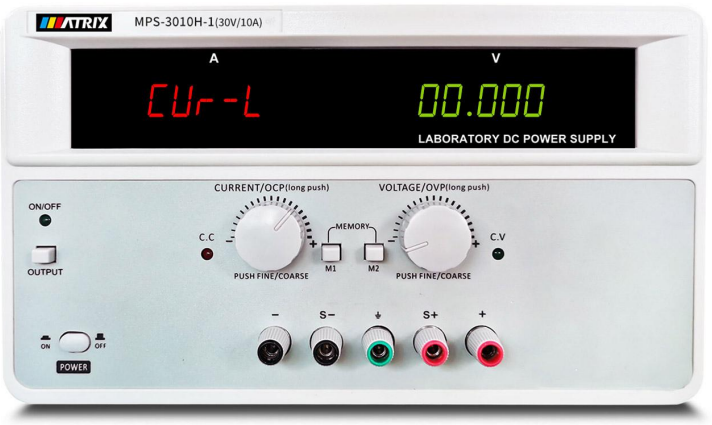
4. Remote compensation function: SENSE ON/OFF (ON means remote compensation is turned on, OFF means remote compensation is turned off, the current knob is used to switch the menu steps, the voltage knob is used to switch the ON/OFF state, and lightly press the "output switch/menu function button" "Exit the menu.)



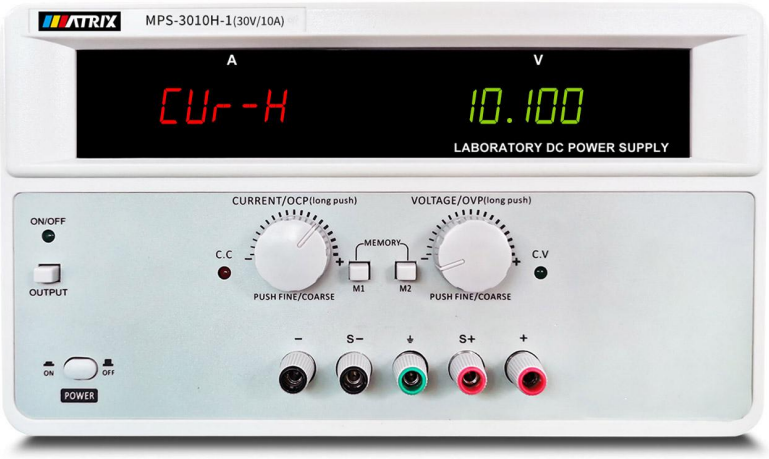
5. Voltage lower limit setting: VOL-L 0.000 (The voltage display window is the lower voltage limit. Use the current knob to switch the menu steps. Press the voltage knob and the voltage window value flashes. At this time, you can turn the knob left and right to change the lower voltage limit. Tap the knob to change the setting position, tap the "output switch/menu function button" to exit the menu.)

6.Voltage upper limit setting: VOL-H 31.000 (The voltage display window is the voltage upper limit. Use the current knob to switch the menu steps. Press the voltage knob and the voltage window value flashes. At this time, you can turn the knob left and right to change the voltage upper limit, and press Turn the knob to change the setting position, and lightly press the "output switch/menu function button" to exit the menu.)

7.Current lower limit setting: CUR-L 0.000 (The voltage display window is the lower current limit. Use the current knob to switch the menu steps. Press the voltage knob and the voltage window value flashes. At this time, you can turn the knob left and right to change the lower limit of current, press Turn the knob to change the setting position, and lightly press the "output switch/menu function button" to exit the menu.)



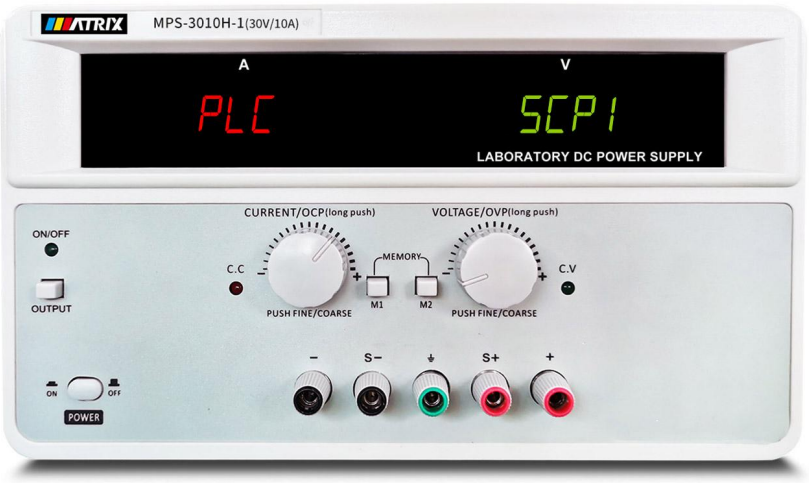
8.Current upper limit setting: CUR-H 1 0.100 (The voltage display window is the current upper limit value. Use the current knob to switch the menu steps. Press the voltage knob and the voltage window value flashes. At this time, you can turn the knob left and right to change the current upper limit. Press the knob to change the setting position, and lightly press the "output switch/menu function button" to exit the menu.)



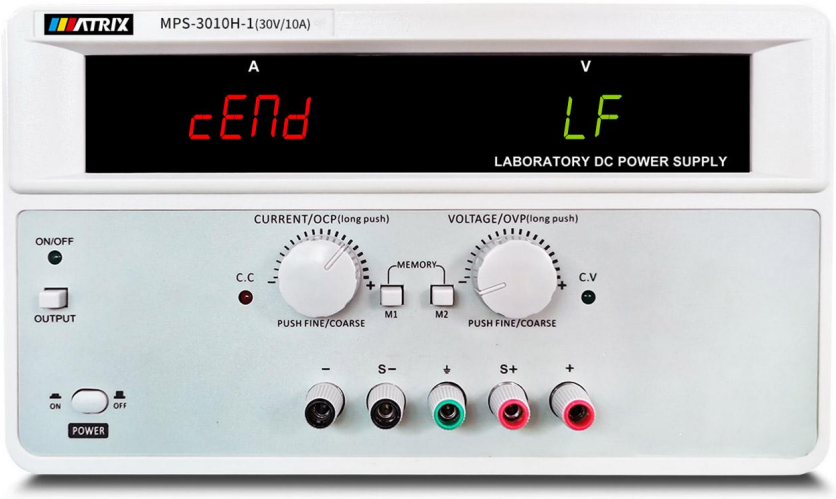
9. Communication address setting: SE8 ADDR 001 (the communication address can be selected from 1-254, use the CH2 voltage knob to turn left and right to modify)

10. Communication baud rate setting: SE9 BAUD 9600 (Baud rate is 4800, 9600, 19200, 38400, 57600, 115200 to choose from, use the CH2 voltage knob to turn left and right to modify)

11. Communication protocol selection: SE10 PLC SCPI (the communication protocol has two options, SCPI and MODBUS, use the CH2 voltage knob to turn left and right to modify).



12. Communication protocol end character selection: SE11 CEND LF (Communication protocol end character has CR, LF, CRLF, LFCR to choose from, use the CH2 voltage knob to turn left and right to modify).



4.5 OCP/OVP function introduction

Long press the voltage/current adjustment knob to enter the OVP/OCP function setting, and lightly press the "one-key series/parallel/function menu button" to exit the setting. When the OVP/OCP value is set and the function is on, the output is now When the voltage or current exceeds the OVP/OCP setting value, the corresponding channel will prompt OVP/OCP and turn off the output. The setting content is as follows:

1. OCP setting:

Long press the current adjustment knob to enter the OCP function setting (as shown in the figure below), at this time, if you want to change the OCP setting value, you can lightly press the current adjustment knob. The current window number corresponding to the current adjustment knob will flash. Turn the knob left and right To change the setting value, lightly press the knob in the setting state to change the setting position. If you want to open or close the OCP function, you can lightly press the voltage adjustment knob and then turn the knob left and right to change the fixed value ON/OFF (ON is to open the OCP function, OFF is to close the OCP function)

2. OVP setting:

Long press the voltage adjustment knob to enter the OVP function setting (as shown in the figure below), at this time, if you want to change the OVP setting value, you can tap the voltage adjustment knob and the corresponding voltage window number will flash. Turn the knob left and right to change the setting Value, in the setting state, lightly press the knob to change the setting position. If you want to turn on or off the OVP function, you can lightly press the current adjustment knob and then turn the knob left and right to change the fixed value ON/OFF (ON is to open the OVP function, and OFF is to close the OVP function).

3. OCP protection:

When the output current exceeds the OCP setting value, the current window will prompt "OCP" and turn off the output (as shown below).

OCP protection tips

4. OVP protection:

When the output voltage exceeds the OVP setting value, the voltage window will prompt "OVP" and turn off the output (as shown in the figure below).

OVP protection tips

4.6 Introduction to Initialization Function

Long press the "output switch/menu function button" to turn on, the power supply will perform factory initialization of the "function menu", the power supply will beep after the initialization is successful, the settings after initialization are as follows:

1. The power-on parameter remains set to ON: P-ST ON
2. The output status is set to OFF when the power is on: P-UP OFF
3. Set the buzzer sound to ON: BEEP ON
4. Remote compensation is set to OFF: SENSE OFF
5. The lower limit of voltage is set to the minimum value: VOL-L 0.000
6. The voltage upper limit is set to the maximum value: VOL-H 31.00
7. Set the current lower limit to the minimum value: CUR-L 0.000
8. The current upper limit is set to the maximum value: CUR-H 10.100
9. Communication address set to 1：SE8 ADDR 001
10. Communication baund rate set to 9600：SE9 BAUD 9600
11. Communication protocol choose:SCPI：SE10 PLC SCPI
12. The end of the protocol communication protocol is selected as LF：SE11 CEND LF

Remark:
The initial setting value of the upper limit of voltage and current varies slightly depending on the model. After initialization, it is the maximum rated value of this model.

Safety

Do not install substitute parts on the instrument by yourself or perform any unauthorized modification. Please send the instrument to our company's maintenance department for repair to ensure that it can be used safely. Please refer to the specific warning or caution information in this manual to avoid personal injury or damage to the instrument.

Safety sign

WARNING It reminds the user of certain operations, practices or conditions that may cause personal injury.
ATTENTION It reminds the user of operational procedures, practices, conditions, etc. that may result in damage to the instrument or permanent loss of data.

 Grounding

 High voltage(Do not turn on the machine if you are not professional engineer)

 Read the warnings in the relevant files and pay attention to the tips. (High voltage, please wear gloves when operating, Beware of electric shock. Do not use the machine in safety occasions)

Certification and quality assurance

This series of programmable DC power supplies fully meet the technical indicators stated in the manual.
quality assurance
The company provides a one-year quality guarantee for the materials and manufacturing of this product from the date of shipment.

Maintenance service

If this product needs to be repaired, please return the product to the repair unit designated by our company. The customer shall bear the one-way freight for sending the repaired product to the maintenance department of the company, and the company will be responsible for paying the return freight. If the product is returned to the factory for repair from other countries, all freight, duties and other taxes must be borne by the customer.

Quality Assurance Limits

The above guarantee does not apply to damage caused by the following conditions:
Incorrect or inappropriate maintenance of the product by the customer;
Customers use other software or interfaces;
Unauthorized modification or misuse;
Operate this product outside the designated environment, or perform configuration and maintenance at a non-designated maintenance point.
Damage caused by the circuit installed by the customer.

Notice

The contents of this manual are subject to change without notice, and the right of interpretation belongs to our company.

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, 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	