

USER MANUAL

Triple Output Programmable DC Power Supply

Model MPS-6003LP-3 and MPS-
3006LP-3



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CHAPTER 1 INSPECTION AND INSTALLATION.....	6
1.1 INSPECTION.....	6
1.2 DIMENSION.....	7
CHAPTER 2 QUICK REFERENCE.....	9
2.1 THE FRONT PANEL AND REAR PANEL DESCRIPTION	9
2.1.1 Front panel	9
2.1.2 The Rear Panel	9
2.2 PRELIMINARY CHECKOUT.....	10
2.2.1 Check the list of supplied items	10
2.2.2 Power on Pre-check.....	10
2.2.3 Checkout procedure	11
2.2.5 If the power supply does not turn on	13
2.2.6 How to exchange the fuse.....	14
2.2.7 Adjust the carrying handle.....	14
CHAPTER 3 SPECIFICATION	15
3.1 SPECIFICATION.....	15
2.2 ADDITIONAL FEATURES	17
CHAPTER 4 FRONT-PANEL OPERATION	18
4.1 FRONT-PANEL OPERATION OVERVIEW.....	18
4.2 PANEL DESCRIPTION	19
4.3 VFD DESCRIPTION	20
4.4 MENU DESCRIPTION	20
4.5 PANEL OPERATION	23
4.5.1 Channel Operation	23
4.5.2 OUT ON/OFF	24
4.5.3 Timer operation.....	24
4.5.4 Set Voltage	24
4.5.5 Current Operation.....	25
4.5.6 Save and Recall Operation.....	25
4.5.7 OVP operation	25
4.5.8 Key Lock Set.....	26
4.5.9 Protections.....	26
4.6 MENU DESCRIPTION	26
CHAPTER 5 COMMUNICATION WITH PC	32
5.1 RS232 INTERFACE.....	32
5.2 USB INTERFACE.....	34
5.3 GPIB INTERFACE	34
5.4 STANDARD SOFTWARE AND SCPI COMMAND.....	34

About your safety

Please do not install replacement parts in the instrument, or perform any unauthorized modification. Please send the instrument to our company's maintenance department for maintenance, to ensure its security features.

Please refer to the manual for specific information warning or precautions to avoid personal injury or equipment damage.

There is no part that the operators can maintenance. If maintenance service is required, please contact trained service personnel.

Security regulation

To prevent electric shock, a non-authorized personnel is strictly not allowed to open the machine.

This equipment is strictly prohibited for use in life support systems or any other device with security requirements.

We can't accept responsibility for any direct or indirect financial damage or loss of profit that might occur when using the electronic load.

Safety symbols

Warning

It reminds the user, note some operating procedures, practices, conditions and other matters that may lead to human casualties.

Notes:

It reminds the user of some operating procedures, practices, conditions and other matters that may result in instrument damage or data lose forever.



Connect it to safety earth ground using the wire recommended in the user manual.



The symbol on an instrument indicates that the user should refer to the operating instructions located in the manual.



High voltage danger

Certification and Quality Assurance

programmable DC power supply fully meets all of the technical specification in the manual.

Warranty

Our Company gives one year warranty for the materials and manufacturing of the product since the date of shipment.

Warranty Service

For the warranty service or repair the product, the product must be returned to the designated maintenance units. Return the product to us for warranty service, the customer should pre-pay the one-way Freight to the maintenance department, and our company is responsible for the return shipping cost.

If products are returned from other countries for maintenance service, then the customer should pay all freight, duties and other taxes.

Guarantee limit

The guarantee does not apply to the damage caused by the following conditions:

Improper or inadequate maintenance to the products by customer;

Customers use their own software or interface;

Unauthorized modification or misuse;

Operate this product not in the specified environment, or at the wrong place configuration and maintenance;

Damage from Customer self-installation of circuit, or defects due to customers use their products;

Product model or serial number of the fuselage has been altered, deleted, removed or made illegible;

Damage caused by accidents including but not limited to lightning, water, fire, abuse or neglect.

Notice

If the content of this manual is subject to change, we will not notice additionally

MPS-XXXXLP-3 DC programmable power supply

Introduction

MPS-XXXXLP-3 triple output programmable DC power supply, the output voltage or current of each channel can be set from 0 to max rated value.

The triple output power supply provides you with high-resolution, high accuracy and high stability, and supports over voltage, over temperature protection; Provides a serial or parallel mode, used to extend the voltage or current output capacity. Resolution reaches up to 1mV/1mA that it can meet the needs of a variety of applications, and is a great choice for University or R & D department and the manufacturer. The main features and advantages are as follows:

- ✦ Triple output voltage, all are adjustable.
- ✦ CH1 and CH2 can set to serial/parallel/track mode.
- ✦ The voltage and current for the three channels can be displayed at the same time
- ✦ Small size of 1/2 2U
- ✦ VFD display
- ✦ Function keys with LED light
- ✦ Remote measurement function, compensation online pressure drop
- ✦ High accuracy 、 resolution and stability
- ✦ Switch to control the output status
- ✦ Limited voltage and over heat protection
- ✦ Intelligent fan control, energy conservation, noise reduction
- ✦ Built-in RS232/USB/GPIB communication interface
- ✦ Low ripple and low noise
- ✦ Shut off memory function
- ✦ Can be monitored by computer software
- ✦ Can calibrate through software
- ✦ Memory capacity of 36 groups, for save and recall
- ✦ Can adjust the voltage or current by knob
- ✦ Can adjust the stepping by Left/right arrow button
- ✦ Output timer function (0.1 ~ 99999.9 seconds)

Model	Channel	Voltage	Current
MPS-6003LP-3	CH1	60V	3A
	CH2	60V	3A
	CH3	5V	3A
MPS-3006LP-3	CH1	30V	6A
	CH2	30V	6A
	CH3	5V	3A

Chapter 1 Inspection and Installation

Power supply is a kind of high level safety equipment with a protected ground terminal. Before Installation or operation, please read the safety signs and instructions in this manual

1.1 Inspection

After receive the power supply, follow these steps to check:

1. Damage

When you receive your AC source, inspect it for any obvious damage that may have occurred during shipment. If there is damage, notify the shipping carrier and the nearest Matrix Sales and Support Office immediately.

2. Accessories

Make sure you receive the AC source and the following accessories at the same time, if any is missing, please contact your nearest support office.

- ☐ a power cord (a power cord appropriate for your location)
- ☐ a User's manual.
- ☐ a factory calibration report

3. AC input

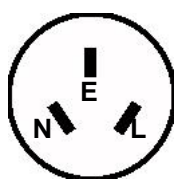
There are two kinds of mains input of MPS-XXXXLP-3(110Vac and 220Vac).

AC input level

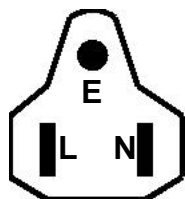
110VAC \pm 10%, 47 to 63 Hz

220VAC \pm 10%, 47 to 63 Hz

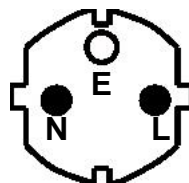
Power cord type



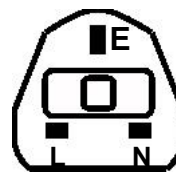
China
IT-E171



America, Canada
IT-E172



Europe
IT-E173



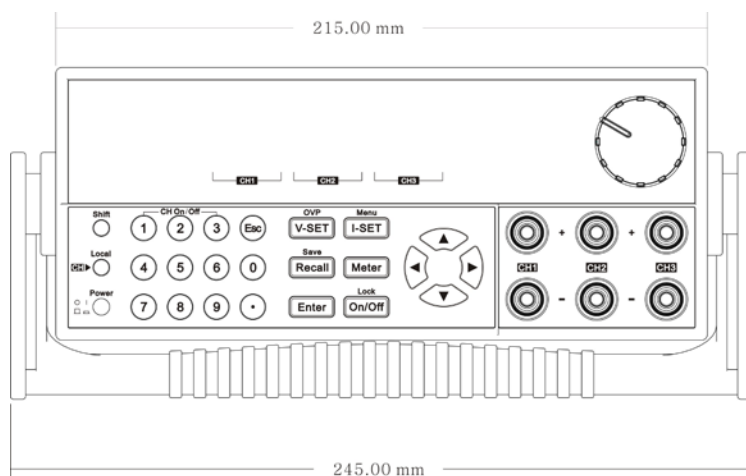
England
IT-E174

1.2 Dimension

1. MPS-XXXXLP-3 power supply's dimension:

Dimension: 215mmW×90mmH×452.m12mmD (W:width H:height D:depth)

* refer to the Dimension below:



Front view for MPS-6003LP-3/MPS-3006LP-3

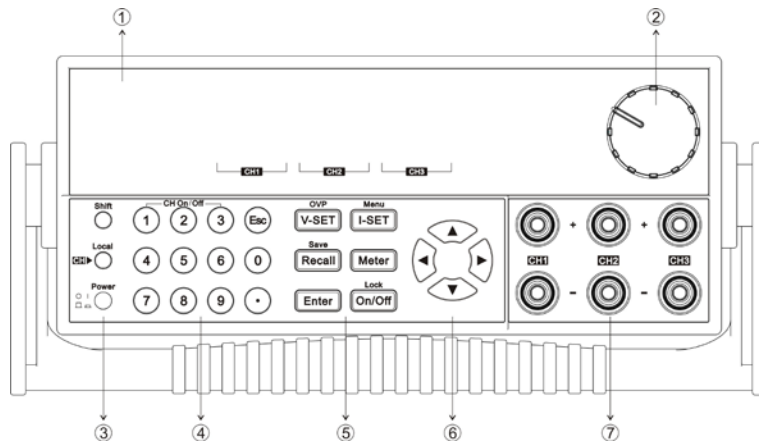


Lateral view for MPS-6003LP-3/MPS-3006LP-3

Chapter 2 Quick Reference

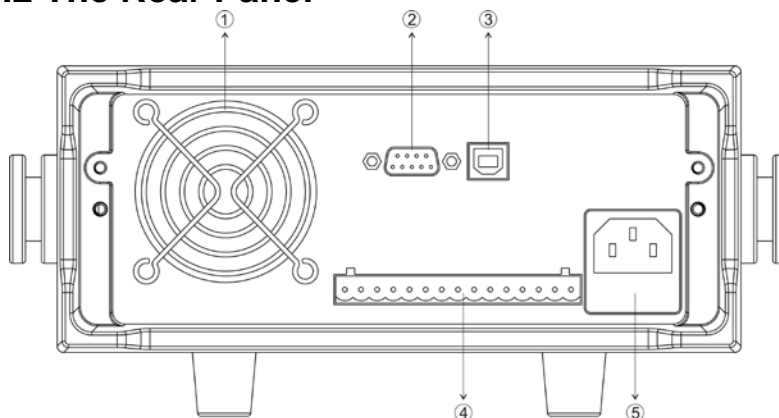
2.1 The front panel and rear panel description

2.1.1 Front panel



- 1** VFD display
- 2** Rotary knob
- 3** Power switch, Local and Shift key
- 4** Numeric keys and ESC escape key
- 5** Function keys
- 6** Up/Down/Left/Right keys
- 7** Output terminal

2.1.2 The Rear Panel



- 1** Cooling window
- 2** RS232 communication interface
- 3** USB communication interface
- 4** Remote measurement terminal
- 5** 110V/220V AC power selection switch and Fuse

2.2 Preliminary Checkout

The following steps help you verify that the power supply is ready for use.

2.2.1 Check the list of supplied items

Verify that you have received the following items with your power supply, if anything is missing, contact your authorized supplier.

1. Power cord
2. User manual
3. Calibration report
4. Certificate

2.2.2 Power on Pre-check

Before operation the power supply, please read the following safety guide:



Warning: The AC input voltage is 110V or 220V; please check the switching at the bottom of the power supply, to make sure it matches the voltage in your city. Otherwise, the power supply may be damaged.



Warning: The power supply provides a three-wire power cord; you should plug it to a three cord junction box. You should also make sure the power supply is well grounded.



Warning: The connection wire should have enough current capacity that it can bear the max rated current/short current of the power supply and not get

too hot.



Warning: To avoid any fire or electric shock, please ensure the AC input voltage fluctuation not exceed 10% of the working voltage range.

Note: In some situation, use the mis-configured main voltage for the instrument may cause the main fuse blew.

Note: If the power supply is used to charge a battery, please pay attention to the positive and negative polarity to avoid any damage.

After power up, the instrument will automatically perform a self test routine. If the power supply doesn't work, then refer to section 1.2.5.

2.2.3 Checkout procedure

After power on, during the self test, the following should be displayed on the VFD:



BIOS ver1.10



Init.....



Scan System

Picture 3

About 1S later, if EEPROM was damaged, then the VFD will display (about 2S):



EEPROM Fail

Picture 4

If the latest operation state of the power supply was lost, then the VFD will display (about 2S):



System Lost

Picture 5

If send channel data, the channel response failure, the VFD display the tooltip information (about 2 s)



Model Fail

Picture 6

If calibration data read failure, the VFD display the tooltip information (about 2 s):



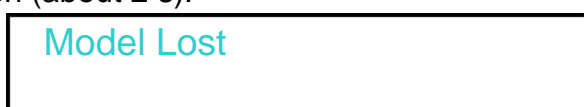
Picture 7

If the factory calibration data loss, restoring default data, the VFD display the tooltip information (about 2 s):



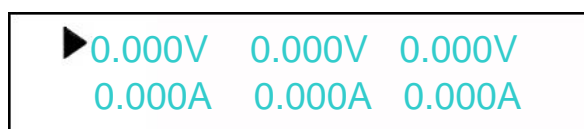
Picture 8

If the channel to send data loss, channel initialization failed, the VFD display the tooltip information (about 2 s):



Picture 9

VFD display information as follows, the first row displays the voltage, the second row displays the output state or the current . From left to right, as the first, second, third channel voltage current display area.



Picture 10

Note: the figure 10 is configuration menu (Config) for the factory set up on display, the different OutState and OutParam setting in the menu will affect on the final state of the display.


2.2.4 Output verification

The following procedure verify that the power supply outputs the correct voltage and current levels and properly responds to entries from the front panel.

Voltage Output Check

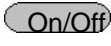
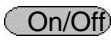
The following steps verify basic voltage function without load.

- 1) Press Power key to turn on the power supply
- 2) Press **On/Off** key to enable the output
- 3) Set the voltage value
Adjust the voltage, then press **Meter** to lit the key (indicates it is in the METER mode), make sure that the set value and output value are same, and if the current displayed on the VFD is nearly 0A.
- 4) Make sure the voltage can be adjusted from zero to the maximum rated value.
- 5) Check the other two channels by the same method.

Note: when  key is gray, the power supply is in SET mode, then the VFD displays the set voltage and current; when the key is lit, then the power supply is in METER mode, the actual voltage and current display on the VFD. When the output is OFF, the “OFF” indicator will display at the current display area.

● Current output Check

The following steps check the basic current functionality by shorting the power supply's output.

- 1) Press Power key to turn on the power supply
- 2) Press  to disable the output, ensure the output is OFF.
- 3) Connect a short across (+) and (-) output terminals with an insulated test lead, use a wire sufficient to handle the maximum current.
- 4) Adjust the voltage value to 1V
- 5) Press  to enable the output
- 6) Adjust the current
Set some different current values, in METER mode, check whether the voltage value on VFD is near 0v, and the current on it is close to the value you set.
- 7) Make sure that the current can be adjusted from 0 to full rated value.
- 8) Disable the output and then remove the short wire
- 9) Check the other two channels by the same method.

2.2.5 If the power supply does not turn on

Use the following steps to help resolve the problems you might encounter when turn on the instrument:

- 1) Verify that there is AC power applied to the power supply
First, verify that the power cord is firmly plugged into the power receptacle on the rear panel of the power supply. You should also make sure that the power source you plugged the power supply into is energized. Then, verify that the power supply is turned on.
- 2) Verify the power-line voltage setting
Make sure the voltage selector switch is set according to the present line voltage (110VAC or 220VAC) when the power supply is shipped from the factory. Change the voltage setting if it's not correct.
- 3) Verify the correct power-line fuse is installed
If the fuse was damaged, please see the table below to replace the fuse for your power supply.

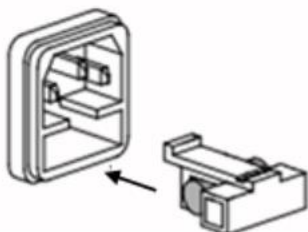
Model	Fuse (220V AC)	Fuse (110V AC)
MPS-6003LP-3	5A T250V	10A T250V
MPS-3006LP-3	5A T250V	10A T250V

2.2.6 How to exchange the fuse

Open the small plastic cover below the power supply input socket on the back panel with a screwdriver, and you can see the fuse in it, please use the specifications in line fuse. Remove the power cord and then use a screwdriver to remove the fuse box.

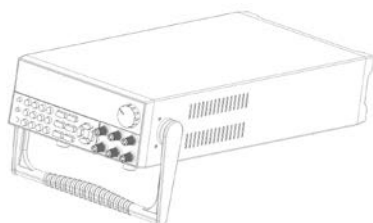
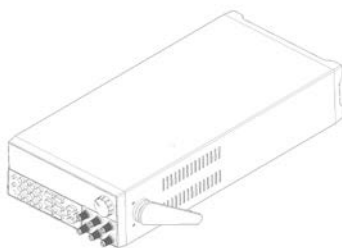


Use the same specification of fuse to replace the old one, install it to the fuse box and then insert.



2.2.7 Adjust the carrying handle

To adjust the position, grasp the handle by the sides and pull outward. Then rotate the handle to the desired position.



Bench operation



Handle

Chapter 3 Specification

3.1 Specification




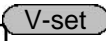

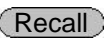
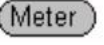
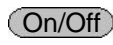


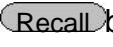
Parameters		MPS-3006LP-3
Rated voltage (0 °C - 40 °C)	Voltage	0~30V×2, 0~5V×1
	Current	0~6A×2, 0~3A×1
Load regulation (% of output+offset)	Voltage	≤0.01%+3mV
	Current	≤0.1%+3mA
Line regulation (% of output+offset)	Voltage	≤0.01%+3mV
	Current	≤0.1%+3mA
Setting resolution	Voltage	1mV
	Current	1mA
Readback resolution	Voltage	1mV
	Current	1mA
Setting accuracy (Within 12 months) (25 °C ± 5 °C) (% of output+offset)	Voltage	≤0.03%+10mV
	Current	≤0.1%+8mA
Readback accuracy (25 °C ± 5 °C) (% of output+offset)	Voltage	≤0.03%+10mV
	Current	≤0.1%+8mA
Ripple and noise (20Hz-20MHz)	Normal mode voltage	≤4mVp-p/≤1mVrms
	Normal mode current	≤5mA _{rms}
TEMP coefficient (0 °C ~ 40 °C) (% of output+offset)	Voltage	≤0.03%+10mV
	Current	≤0.1%+5mA
Readback Temp. coefficient (% of output+offset)	Voltage	≤0.03%+10mV
	Current	≤0.1%+5mA
Series synchronous operation	Series synchronous error	≤0.05%+10mA
Parallel accuracy	Voltage	≤0.02%+5mV
	Current	≤0.1%+30mA
Memory	Save/recall	40 groups
Timer	Time set	0.1~99999.9second
	Resolution	0.1second
	Function	Output timer

Parameters		MPS-6003LP-3	
Rated voltage (0 °C - 40 °C)	Voltage	0~60V×2, 0~5V×1	
	Current	0~3A×2, 0~3A×1	
Load regulation (%of output+offset)	Voltage	≤0.01%+3mV	
	Current	≤0.01%+3mA	
Line regulation (%of output+offset)	Voltage	≤0.01%+3mV	
	Current	≤0.01%+3mA	
Setting resolution	Voltage	1mV	
	Current	1mA	
Readback resolution	Voltage	1mV	
	Current	1mA	
Setting accuracy (Within 12 months) (25 °C ± 5 °C) (%of output+offset)	Voltage	≤0.03%+10mV	
	Current	≤0.1%+5mA	
Readback accuracy (25 °C ± 5 °C) (%of output+offset)	Voltage	≤0.03%+10mV	
	Current	≤0.1%+5mA	
Ripple and noise (20Hz-20MHz)	Normal mode voltage	≤4mVp-p(60V)	≤3mVp-p(5V)
	Normal mode current	≤4mArms(3A)	≤4mArms(3A)
TEMP coefficient (0 °C ~ 40 °C) (%of output+offset)	Voltage	≤0.03%+10mV	
	Current	≤0.1%+5mA	
Readback Temp. coefficient (%of output+offset)	Voltage	≤0.03%+10mV	
	Current	≤0.1%+5mA	
Parallel accuracy	Voltage	≤0.02%+10mV	
	Current	≤0.1%+30mA	
Memory	Save/recall	40 groups	
Timer	Time set	0.1~99999.9second	
	Resolution	0.1second	
	Function	Output timer	
Working temperature	0-40°C		
Dimension	214.5mm X 88.2mm X 453.1mm (W x H x D)		
Weight	15kgs		

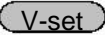



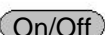
Chapter 4 Front-panel Operation

So far we have covered the quick start chapter which briefly introduced the front panel operation and how to check basic voltage and current functionality. This chapter describes in detail how to operate the instrument manually via the front-panel keys.

4.1 Front-panel Operation Overview

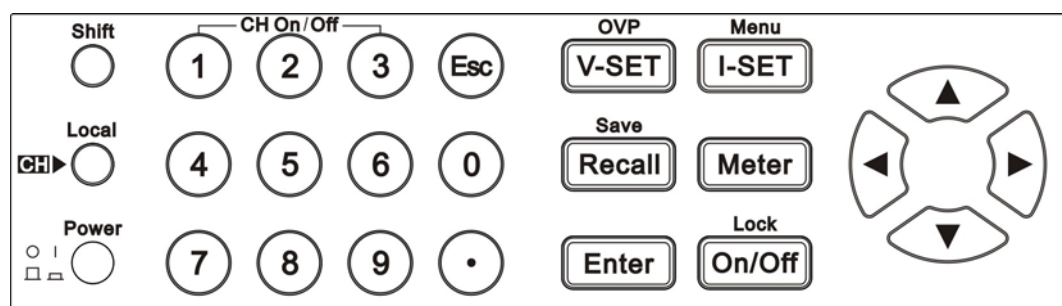
- ✦ The power supply is shipped from the factory ready for front-panel operation mode. At power-on, the power supply will automatically enter the front-panel operation mode and the instrument can be controlled via the front panel keys and knob.
- ✦ The power supply is in Set mode when it is powered on. In this mode, the VFD will display the setting voltage and current.
- ✦ The output of power supply can be enabled/disabled from the front panel by pressing the On/Off button. When turn on the output, the VFD will display the state and voltage/current of each channel. "CC" represents constant current mode. "CV" represents constant voltage mode. **When output is in OFF mode, VFD will have no any indicators of CC or CV.**
- ✦ The VFD also displays operation states or error information.  means the power supply is in remote mode. When front-panel keys are locked,  button will be lit.
"  " means the power supply keyboard locked. For more details, please refer to chapter of "Descriptions about VFD marks"
- ✦ If the power supply is in set mode, you can modify parameters using the knob. If the power supply is in menu operation, the knob is used for menu selection.
- ✦ When , , ,  or  buttons are lit, means they are selected and under corresponding state now. If pressing  (Shift)+  (Save),  button will keep lighting and waiting for a number to be entered to specify the memory location.




Details about key buttons' state:


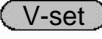










	When button is lit, means you can set voltage.
	When button is lit, means in current setting mode.
	When button is lit, means in recall mode When button keeps flickering, means in save mode and waiting for a number to be entered to specify the memory location.
	When button is lit, means current VFD displays actual voltage and current.
	When button is lit, means at least one channel output is on. Or all channels are in OFF mode.

Note: , ,  buttons will not be lit at the same time.

4.2 Panel Description







0~9	Numeric keys. Use keys 1~3 to control the output state of the 3 channels which should coordinate with Shift key. Note: In key lock mode, Shift key is not needed.
	Escape from the current setting or menu item.
 (Shift)	Compound key
 (Local)	Used to switch to local operation mode

 (Power)	Used to power on/off the DC source
 /OVP	Used to set the voltage or shift+V-set to set OVP value
 /Menu	Used to set the current or shift+I-set to enter the menu operation.
 /Save	Save or recall different operating parameters in memory locations
	Switch the display between setting value and actual value
 /Lock	Enter button to confirm the selection or Shift+Enter to lock the front keys
	Used to control the output state of all channels
	Right/Left key,use to move the cursor or scroll through the menu items
	Up/down key,used to increase or decrease the setting value
 (Shift)+1,  (Shift)+2,  (Shift)+3	Used to turn on the output of corresponding channel no matter in menu operation or Meter state

4.3 VFD Description

Explanation of enunciators on the display

C	In constant current mode
V	In constant voltage mode
	Keyboard operation for the lock mode
	open the remote sense function
	Indicates the shift button is pressed
	Indicates the channel currently selected
T	Enable tracking mode

4.4 Menu Description

Press  (Shift)+  (Menu) to indicate operation mode.View the menu on the

VFD, and use the right/left key to change the setup, and up/down key to scroll through the complete menu items. Press **Enter** to enter the selected menu function. Press **Esc** button to return to the previous menu. When the item keeps flickering indicates it is selected currently.

Power Menu...				
	System	System Menu		
		System Menu...		System Menu
		OutState	Power Out State Set	Power supply power on output state Settings
			Off	all along OFF
			Keep	Keep the last time state before the shutdown
		OutParam	Power Out Param Set	Set up the related parameters when power on
			Reset	default
			Keep	Restore the last time parameters
		Knob	Knob Function Set	Pulsating knob function Settings
			Unlock	Pulsating knob function open
			Lock	Pulsating knob function closed
		Buzzer	Power Key Beeper Set	Key sound establishment
			Off	Key sound closed
			On	Key sound open
		Communication	Communication Select	Communication interface choice
				RS232 Choose RS232 communication interface
				USB Choose USB communication interface

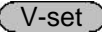


		BaudRate	Choose BaudRate	4800 9600 19200 38400 57600 115200
	MemoryGroup	Select Memory Group	Memory group set	
		GRP1	Group 1	
		GRP2	Group 2	
		GRP3	Group 3	
		GRP4	Group 4	
	Command	SCPI Version Select...	SCPI version select	
		MATRIX	ITECH SCPI command	
		EXT1	Extended SCPI command 1	
	Return Meter	Auto Return to Meter State	Auto return to meter state	
		Off	Function off	
		Wait5Sec	The front panel display will change from setting to meter state automatically after 5s.	
	Reset	Reset Menu Default	Reset to	
			No	
			Yes	
	Exit			

Config				
		Configuration Menu		
	CH1	System Menu	CH1 System Menu	
		Maxvolt	Maxvoltage Set	
			MaxVolt=31.000V	
		Outtimer	Out Timer State Set	
		Timer State	Disable	
			Enable	
		Exit		
	CH2	System Menu...		
		MaxVolt	MaxVoltage Set	
			MaxVolt=31.000V	
		OutTimer	Out Timer Set	Out Timer=
		Timer State	Disable	
			Enable	
		Exit		
	CH3	System Menu...		
		MaxVolt	MaxVoltage Set	
			MaxVolt=6.000v	
		Outtimer	Out Timer Set	Out Timer=
		Timer State	Disable	
			Enable	
	Comb	Power Combine Set...		
		Inde		
		Series	Series Choose...	Select serial connect mode
			CH1+CH2	Connect CH1 and CH2 in serial
		Parallel	Parallel Choose...	Select parallel connect mode
			CH1+CH2	Connect CH1 and CH2 in parallel
CH2+CH3			Connect CH2 and CH3 in parallel	
ALL			Connect three channels in parallel	
Track		Track Choose...	Enable tracking function	
		CH1+CH2		
		CH2+CH3		
		ALL		
Exit				


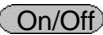
4.5 Panel Operation













Voltage operation should be taken before setting the voltage of the upper limit.

4.5.1 Channel Operation


When  or  button is lit, press  (Local) key can switch between the three channels.

4.5.2 OUT ON/OFF

Pressing  button toggles the output state of all 3 channels of the power supply. If the output state is ON, press it to turn the output state to OFF. While the output state is OFF, press  and the power supply output will turn ON.

To control channels individually, press  (Shift)+ ,  (Shift)+ ,  (Shift)+  corresponding to each channel.  (Shift)+  controls the output state of the first channel,  (Shift)+  controls the output state of the second channel,  (Shift)+  controls the output state of the third channel.


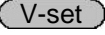

When the power supply is in remote mode, you can set the output state by sending SCPI command (OUTPut: ON | OFF). The output state operation does not affect any other parameter.






Note: The  key controls the output state of all 3 channels simultaneously. If you want to control the output state of individual channels, use the number keys 1-3 with shift button.

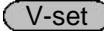






4.5.3 Timer operation



If the "Outtimer" is enabled for any channel in the menu, after the time set, the specified channel of the power supply will automatically switch to output off state. Please refer to Out Timer of chapter 3.6

4.5.4 Set Voltage




Solution 1: press  (Local) to select channel, press  then enter a numerical value followed by .






Solution 2: Press , then press   to move the cursor position and adjust the voltage value using the knob. Press  or  to exit.








Solution 3: Press , then press   to move the cursor position and adjust the voltage value using  . Press  or  to exit.

Note: When output in OFF mode and  button is dark, rotary knob and up/down keys can't be used to adjust voltage and current.
If rotary knob is enabled, then adjusting it will real-time change the current output setup without pressing  to confirm.

4.5.5 Current Operation

Solution 1: press  (Local) to select channel, press  then enter a numerical value followed by .



Solution 2: Press , then press   to move the cursor position and adjust the current value using the knob. Press  or  to exit.


Solution 3: Press , then press   to move the cursor position and adjust the current value using  . Press  or  to exit.

Esc

4.5.6 Save and Recall Operation

You can store up to 40 different operating states in memory locations 1 through 40. They are divided to four groups, each group includes nine different setups. Each operating state includes a constant voltage value, constant current value, maximum output voltage.

Press  (Shift) +  (Save) followed by a number key to save the current operating state to non volatile memory.

Press  + number 1 to 9 to recall operating state assigned to this location.

You can also use the SCPI command(*SAV、*RCL) to save and recall.

When Save operation is done, there will be a corresponding information to indicate the successful or failed operation. While for Recall operation, only information to indicate failed recall.

Note: The power supply doesn't support Save/Recall operation when in serial/parallel or tracking mode.

If in serial/parallel mode and do Save/Recall operation, the VFD will display INV OPER (invalid Operation) to remind the user of a wrong operation.




If parameters want to be recalled do not exist, the current value position on VFD will display ----, and then resume after 2S.




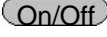




4.5.7 OVP operation

Select the channel-----press  (Shift)+  (OVP)-----select "ON" and continue to set

the OVP value. After set successfully, when the actual voltage is higher than OVP value, then VFD will display "OVER VOLT".

4.5.8 Key Lock Set

Press  (Shift) +  (Lock) can lock the front panel keys and label "  " will be lit on the lower left corner

In key lock mode, all keys are disabled, except , , , , ,  (Local) and  (Shift) +  keys.



4.5.9 Protections

Over Temperature Protection

If the internal temperature of the power supply exceeds 80°C, the instrument will protect itself by automatically turning power OFF. When this happens you will hear a buzzer and the display will indicate the following:

Over Temperature

4.6 Menu Description

In the menu, right/left arrow keys and rotary knob used for flow around the menu, change the options,  Used to identify the current menu commands or into the next layer menu. Press  can exit menu or enter a layer menu.

System

OutState

This parameter sets the output On/Off state at power up. If you select "**Keep**", the power supply will save the output state prior to power down and revert to that state at power up. If you select "**Off**", the output state is always "**OFF**" when the power supply is turned on. The recommend setting is "**OFF**".

OutParam

This menu item is used for set up power whether save the last output parameters. If you select "**Keep**", the power save the last time before the shutdown of the output parameters. The next time after startup power output parameter is still the last output parameters. If you select "**Reset**", the power output for factory default output parameters.

Knob

This item enables ("On") or disables ("Off") the knob.

Buzzer

This item turns the beep sound for key presses "On" or "Off".

Communication

This item set the communication mode, optional communication interfaces are RS232, USB, PortSelect interface, BaudRate .

RS232 Communication Set

This item configures the baud rate for serial communication. Possible values are 4800,9600,19200,38400,57600,115200. When operating the power supply in remote mode, make sure that you configure identical baud rate settings for the power supply and the computer.

USB

Select communication mode via USB interface.

MemoryGroup

You can store up to 40 different operating states in a nonvolatile memory space. All saved parameters are divided into four groups. They are Grp1, Grp2, Grp3 and Grp4. Each group can save 9 different operating states (1~9).

Command

This item set the communication protocol. Possible settings are SCPI, EXT1 and EXT2. Default setting is SCPI.

ReturnMeter

This item enable ("Wait5Sec") or disable (OFF) the function to turn back to meter state automatically. When select "Wait5Sec", the display on front panel will automatically change to meter state under the condition of no operation, within 5S.

Reset

If you enter this menu and select "YES", all parameters will be set to their default values.

Exit

Escape the menu.

Config

This item set the max voltage and outtimer of each channel.

Choose one channel and set the parameters.

MaxVolt

The max voltage you set should be within the range of 0V to the maximum rated voltage. You can edit this value using the ▲, ▼ keys or via numerical key pad followed by **Enter**. The default setting is the maximum rated voltage for each channel.

Out Timer

This item sets the output timer for channel 1 Channel 2. The range is 0.1~99999.9S. If you enable this function, and the output state of all channels is on, the timer will start counting down immediately. Once the timer expires (count down from set value to zero) the output of the assigned channel will turn off. To disable the timer, set the output time to zero. Default setting is 0 seconds.

Comb

This item configures the instrument connection mode.

Off

"Off" means that each channel operates independently. When set successfully, front panel will display "Remove success!"

Series (Series mode)

This function configures the instrument for series operation of CH1 and CH2. Press **Enter** button to confirm your set. And press **Esc** to quit the operation.

When enable series connection mode, the front panel will indicate "Series success!" and escape this screen after 2S.

Front display as follows in condition of output off and meter state.



The image shows a digital display with two lines of cyan text. The top line reads "0.001V Series 0.001V" and the bottom line reads "0.000A CH1+2 0.000A". A small blue arrow points to the left of the top line.


Parallel (Parallel mode)

This function configures the instrument for parallel operations of CH1 and CH2.

. Press **Enter** button to confirm your set, and press **Esc** to quit the operation


Track (sync output setting)

This function configures the instrument for tracking operations of CH1 and CH2. Possible


Press  Button to confirm your set, and press ESC to quit the operation.

In tracking mode, once the parameters of any one channel are changed, other channels will change proportionally.

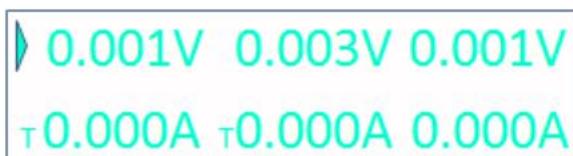
For example, set voltage and current of CH1 and CH2 as follows, CH1: 4V, 1A; CH2: 8V,

2A. Press  (Shift) +  (Menu) into Menu, and press  to select Comb, VFD will display as follows:

CH1+CH2

Select "CH1+CH2" and press  to confirm. The VFD will display "Track Set Success!" and escape this screen after 2S..

Front display as follows in condition of output off and meter state.



For example: In setting status, if voltage of CH1 is set as 2V, voltage of CH2 will automatically change to 4V proportionally.

Notice: Tacking function is disabled to the channel with 0V or 0A setting. In the former example, if CH2 setting is 0V or 0A, then when CH1 voltage is adjusted to 2V, CH2 will remain unchanged.

Parameters in Serial, Parallel or Tracking mode

Maximum voltage

Operate "CH1+CH2" in series, the max voltage is 62V the sum of the max voltage of CH1 and CH2.

Operate “CH1+CH2” in parallel,the max voltage is the smallest max voltage of the two channels. It is 31V.

Out timer



In serial,parallel and tracking mode,the out timer function will be disabled.

Save/Recall

In serial,parallel and tracking mode,the Save/Recall function will be disabled.

Notice: When changed to serial,parallel or tracking mode,all channels will be OFF and voltage will be reset to 0V.The channels configured to serial,parallel or tracking mode will be add a label of “[]” in the display.

Power Information

Press  (Shift) +  , VFD will display power information; the information includes the following parts:

Power Model

Display the model of power supply: MPS-6003LP-3 /MPS-3006LP-3

Soft Version

firmware version of power supply: Ver=1.XX-1.XX



Power SN

Display the serial number of the power supply: SN:XXXXXXXXXXXXXXXXXXXX

Calibration information

Display calibration information: 2005-8-26 17:46:13

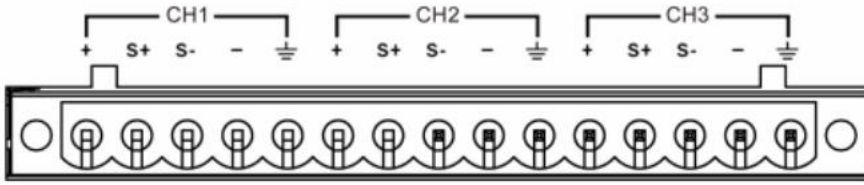
Error Information

If error, press  (Shift) +  , VFD will display error information, press any key to display the next error message, If not, then continue to display information on above (model, the software version, serial number, etc.)
Error message will be cleared in the display, but fault still exist.

4.7 Remote sense function

Remote voltage sensing is used to maintain good regulation at the load and reduce the

degradation of regulation that would occur due to the voltage drop in the leads between the power supply and the load. By connecting the supply for remote voltage sensing, voltage is sensed at the load rather than at the supply's output terminals. This will allow the supply to automatically compensate for the voltage drop in the load leads and improve regulation.



+, -: output terminal, the same as front panel output terminals

S+, S-: Remote sensing terminal

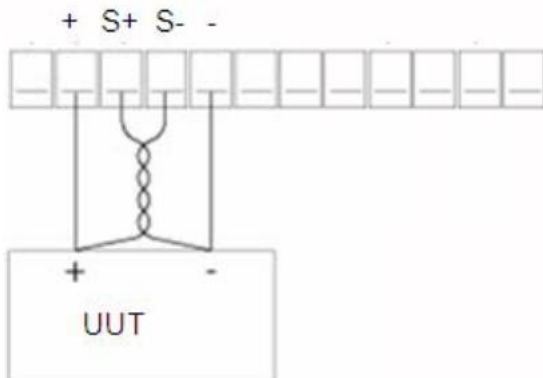
Disable remote sense function:

1. Use the standard shorting clip which has been installed before leave the factory. Or you can also use wires to short "S+" and "+", "S-" and "-".
2. Connect output "+" and "-" to the load input terminals "+" and "-".

Enable remote sense function:

1. Remove the shorting clip between "S+" and "+", "S-" and "-".
2. Connect output "+" and "-" (front panel) to the load input terminals "+" and "-".
3. Connect "S+" to "+" of the load, "S-" to the "-" of the load.



Note: To ensure the system stability, please use twisted-pair cables between sense terminal and load.





Chapter 5 Communication with PC



MPS-XXXXLP-3 Standard configuration have three communication interface: RS232, USB, The user can choose any one to realize the communication with the computer. The following content can help you understanding how to through the computer control power supply output.

5.1 RS232 interface



The power rear panel has a DB9 needle mouth. Using both for the COM (DB9) cable connect computer. Press  (Shift) +  (Menu), setting menu of configuration the same as the computer configuration before Activation connection. RS - 232 interface can use all of the SCPI command to programming.

Note: in the procedure ,the RS - 232 must be set consistently with the front panel system menu set .If you want to change,please press  (Shift)+  (Menu) and access to Config to change.

RS-232 data format

RS-232 data is a start bit and a stop bit 10 words. Start bit and the number of stop bits can not be edit. However, press  (Shift)+  (Menu) and you can choose the following parity item. Parity options are stored in nonvolatile memory.

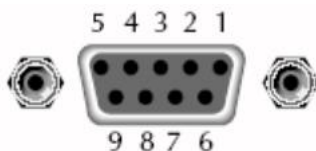
Baud rate

Press  (Shift)+  (Menu), under the system menu, you can select a baud rate which is stored in nonvolatile memory :

4800 9600 19200 38400 57600 115200

RS-232 connection

RS - 232 serial port can connect with controller serial port by using a piece of RS - 232 cable with DB - 9 interface.(such as PC). The following table shows the plug of the pin. If your computer connect with RS-232 interface with DB - 25 plug, you need a cable and a adapter which one aspect of the matter is DB - 25 plug the other end is DB - 9 plug.



RS - 232 plug pin

Pin number	Description
1	Connectionless
2	TXD, transmit data
3	RXD, receive data
4	Connectionless
5	GND
6	Connectionless
7	Connectionless
8	Connectionless
9	Connectionless

RS-232 troubleshooting

If the RS - 232 connection has a problem, check the following aspects:

The computer and power supply must be installed with the same baud rate, the same parity bit, the same data bit and the same flow control options. Pay attention to power configuration into a start bit and a stop bit. (These value is fixed.)

As the description of the RS - 232 connector ,you must use the correct interface cable or adapter. Attention even if cable have suitable plug, internal wiring also may be wrong.

Communication settings

You should first of all make power supply matching the PC of the following parameters before communication operation.

Baud rate: 9600(4800、9600、19200、38400、57600、115200). You can go through the panel into the system menu, setting communication baud rate.

Data bits: 8

Stop bit: 1

Parity: (none,even,odd)

EVEN Eight data bits have even check

ODD Eight data bits have odd check

NONE Eight data bits have no check

The machine address: (0 ~ 31, the factory a value of 0)

Start Bit	8 Data Bits	Parity=None	Stop Bit
-----------	-------------	-------------	----------

Frequently Asked Question

1. The conductor weight specifications

The following form lists the AWG copper wire to withstand maximum current value

AWG	10	12	14	16	18	20	22	24	26	28
maximum current value (A)	40	25	20	13	10	7	5	3.5	2.5	1.7

Note: AWG (American Wire Gage), that is X line (the mark is on conductor). The above list is the load flow of a single conductor when it works on temperature 30 °C

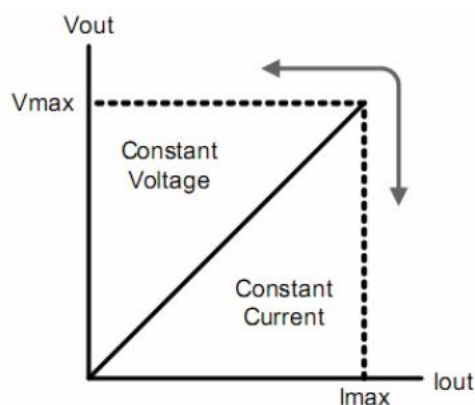
This is for your reference only.

2. Power supply can not be set as CC mode

Power supply with constant voltage/constant current can automatic switch. Through this function, the power can maintain uninterrupted operation while the load change and produces constant voltage mode to the constant current mode conversion.

In view of the current load, the power supply working in constant voltage mode, it will provide a controlled output voltage which output voltage drop constant along with the load resistance decreasing, until the current increase and limited to the default current value, and then conversions. By this time, the power supply into constant current output while the output voltage will scale reduce which is according to the load resistance get smaller.

When the current value is less than set value, power go back to constant voltage mode.

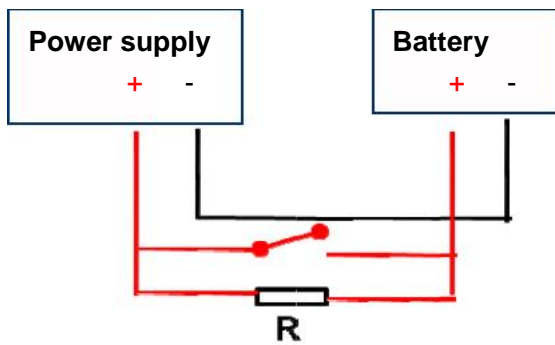


The power supply's work mode can be indicated by the mark area of VFD. If the VFD displays CV, the power supply IS in the constant voltage mode. If the VFD displays CC, the power supply is in the constant current mode.

3. Test battery , how to prevent flint when Joint battery?

when Joint battery, it strikes fire that is because power supply positive and negative terminal capacitance discharge. The method of avoiding flint as follows: Please connect a switch to the wire, and parallel a charging current limiting resistor to the

wire. When all the wire connection has no problem, please close the switch.



Support process

If you have a problem, follow these steps:

- 1 Check the documentation that come with the product
- 2 Visit the MATRIX online service Web site is www.szmatrix.com ,Matrix is available to all Customers
3. Contact us via email sales@szmatrix.com or call us at 0086-755-28364273