

***POWERTECH* PLUS**



0.3 to 30V, 0 to 3.75A Portable Laboratory Power Supply MP-3844 User Manual



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INTRODUCTION

Thank you for selecting this Switching DC Power Supply, please read this user guide before operation.

SAFETY

This manual contains important safety and operation instructions for correct use of the power supply. Read through the manual and pay attention to the markings and labels of this unit, especially regarding connections.

Do not use substitute spare parts or modify without permission, please contact nearest store for further advice.

Pay special attention to **WARNINGS** or **CAUTIONS** to avoid damaging the power supply or connected equipment, and to avoid injury.

Please contact authorised technicians for repair services.





SAFETY MARKS

WARNING:

Failure to observe this warning may cause injury to persons and damage to power supply or connected equipment.

CAUTION:

Failure to observe this warning may result in damage to equipment and improper functioning of power supply.



Grounding



High Voltage



Attention on the Warning or Caution





SPECIFICATION COMPLIANCE

Switch mode DC Power Supply is in compliance with the specification described in this manual.

The content or specification of this manual is subject to change, without prior notice.

PRODUCT FEATURES

MP-3844 is a single output switch mode DC power supply with max. 30V output voltage, 3.75A output current and max. output power of 50W.

MP-3844 integrates AC/DC and DC/DC 2nd level voltage regulator technology, the AC/DC input adapts worldwide voltage range. DC/DC uses synchronous buck mode, providing high efficiency and high speed dynamic response performance.

Voltage and current can be set though the keypad on the front panel and settings can be saved for future quick access.

MP-3844 also features a 4-digit voltage and current LCD read out; and is gifted with a fantastic hand-held size. MP-3844 is perfect for solving a variety of loading conditions and applications.





Below are the main features of MP-3844:

- Hand-held design
- Fanless and noiseless
- 4 digits LCD display
- Output short circuit protection
- High speed dynamic response
- Once power is cut-off, automatic protection under power off status
- The USB output has automatic recognition of connected device

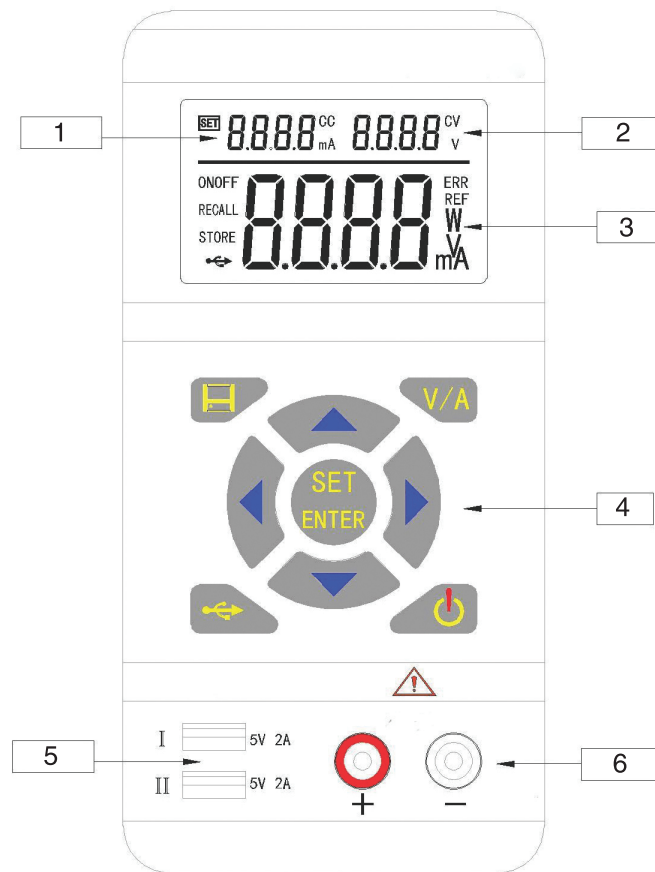
1. QUICK START

This chapter describes various check points on MP-3844 ensuring proper operation and functionality.

1.1 FRONT PANEL DESCRIPTION

1. Current Setting Indicator
2. Voltage Setting Indicator
3. Measured Value Display
4. Keypad
5. USB Charging Ports
6. DC Output Terminals







1.2 PRE-CHECKING

Before the operation, please check the accessories are fully included, if found missing, please contact the local distributor or retailer.

- Test leads - 1 set
- Power Cord – 1 piece (Compliance with the standard voltage of the region)
- User Guide – 1 piece

Connect with power and switch on MP-3844, the unit enters self-system check, the LCD displays 0.5s, date of manufacturing, production lot, model number version number in turn.

1.3 QUICK START

OUT Button

Press and light **OUT** button, the power supply is under output status and reads the measuring value of voltage or current in the display. Press **OUT** button again to exit output function.

UP Arrow Key + DOWN Arrow Key

Press **UP** arrow key to activate the LCD backlight

Press **DOWN** arrow key to de-activate the LCD backlight

LEFT Arrow Key + RIGHT Arrow Key

Press **LEFT** arrow key to decrease the contrast of the LCD

Press **RIGHT** arrow key to increase the contrast of the LCD





V/A KEY

Press the **V/A** key to activate voltage measurement and read the voltage value from display.

Push the **V/A** key again to switch to current measurement and read the current value from the display.

USB Button

Push and light the **USB** button and adjust voltage to 5.2V and the current as 3A to enter USB power charging mode; then, push and light the **OUT** button, the MP-3844 is working as power charger.

Push the USB button again and USB button lights out to exit USB power charging mode.

SET Button + V/A Button + Direction Arrow Keys

Push the **SET** button, by pressing the direction arrow keys adjust the voltage value setting, Push the **V/A** button to switch to current value setting mode, by pressing the direction arrow keys to measured current value.

1.4 OUTPUT CHECKING

1.41 The output voltage regulation mode check

This is for checking the functions of power supply under non-load voltage stability.

- 1) Switch on the product, the power is off and the indicators of CC & CV are light off.
- 2) Push and light the **OUT** button, the indicator for CV comes up on LCD display.
- 3) Setting the voltage of power supply:
Push the **V/A** button and shift to voltage display mode, adjust various voltage values then, check the voltage value displayed at LCD is approaching the settled voltage value and within the tolerance, current value is showed as 0A.
- 4) Make sure the voltage can be adjusted from 0.3V to max. 30V.





1.42 The output constant current mode check

This is for checking the functions of power supply under constant current mode.

- 1) Switch on the product, the power is off and the indicators of CC & CV are light off.
- 2) Adjust voltage value as 30V.
- 3) Connect the resistance (3Ω/50W) between output terminals.
- 4) Push and light the OUT button, the indicator of CC is also displayed on LCD.
- 5) Setting the current of power supply
Push V/A button and shift to current display mode, adjust various current values, then, check the current value displayed at LCD is approaching the settled current value and within the tolerance.
- 6) Make sure the current can be adjusted from 0A to the max. value.

1.43 The output short circuit protection check

This is for checking the function of short circuit protection of output.

- 1) Switch on the product, the power is off and the indicators of CC & CV are light off.
- 2) Adjust voltage value is over 5V and current value is over 1A.
- 3) Push and light the **OUT** button.
- 4) Connect the output terminals by wire/ test leads for short circuit, the light of **OUT** button is off and output off.





1.44 The USB charging function check

This is for checking USB charging function.

- 1) Switch on the product, the power is off and the indicators of CC & CV are light off.
- 2) Push and light the USB button. Adjust the voltage as 5.2V and current as 2.5A.
- 3) Push and light **OUT** button.
- 4) Make sure the power supply is under CV mode, the CV indicator comes up on LCD.
- 5) Setting the current value; make sure the current value can be adjusted from 0A to the max. value of measuring range. Do not adjust voltage.





2. SPECIFICATIONS

2.1 MAJOR SPECIFICATIONS

Input Voltage: 90VAC~265VAC 43Hz~65Hz \pm 2Hz

Input Current: 1A

Output Rating:

Voltage Range: 0.3~30V

Current Range: 0~3.75A

Line Regulation \pm % of output + offset:

Voltage: CV \leq 0.01%+3mV

Current: CC \leq 0.01%+3mA

Load Regulation \pm %of output + offset:

Voltage: CV \leq 0.02%+3mV

Current: CC \leq 0.02%+3mA

Measurement Accuracy:

Voltage: 10mV

Current: 1mA

Measured Value Accuracy@25°C \pm %of output + offset:

Voltage: \leq 0.05%+5mV

Current: \leq 0.05%+5mA

Measurement Speed:

Voltage: 100ms/ones

Current: 100ms/ones

Setting Value Accuracy @ 25°C \pm %of output + offset:

Voltage: \leq 0.05%+5mV

Current: \leq 0.05%+5mV

Ripple & Noise 20Hz-20MHz:

Voltage: \leq 10mVrms/100mVp-p

Current: \leq 10mVrms/100mVp-p

Dimensions: 185 x 88 x 38mm

Weight (Net): 370g

2.2 SUPPLEMENTARY CHARACTERISTIC

Build-in EEPROM

Recommended Calibration Time: 1 Time/Year

AC Input Power: 90-265VAC, 43 to 65 Hz

Operating Temperature: 0°C to 40°C

Storage Temperature: -20°C to 70°C

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3. OPERATION

Check the rating label of the power supply and ensure that it complies with the AC mains voltage that is to be used. Connect the power supply to the AC mains using the provided power cord.

3.1 KEYPAD DESCRIPTION

OUT	Output check
V/A	Voltage & Current Shift
USB	5V Mobile Phone Charging
SET/ENTER	Voltage & Current Setting/Enter
STORE/RECALL	Data Saving/Recall
UP DOWN LEFT RIGHT	Direction Arrow Keys

3.2 FRONT PANEL

After power on, all the functional buttons can be operated.

3.3 VOLTAGE SETTING

The voltage setting range is from 0.3V to 30V; follow the steps as below:

1. Switch on the power supply
2. Push the **OUT** button
3. Push and light the **SET/ENTER** button, the max. value flashes in the voltage setting area
4. Push the **LEFT** or **RIGHT** arrow keys to move the cursors
5. Push the **UP** or **DOWN** arrow keys to change the settings
6. Push **SET/ENTER** button (and light off this button) to exit voltage setting mode





UP **ENTER**
OUT --> SET --> 00.03 V -----> 30.00 V -----> OK

Remark:

- I. It is possible to set voltage values once the outputs are valid. However, for protection of the load, it is recommended to stop output before voltage setting.
- II. Due to the total power limit, current settings might be decreased automatically once voltage setting increases.

3.4 CURRENT SETTING

The current setting range is from 0.000A to 3.75A, follow the setting steps as below:

1. Switch on the power supply
2. Push the **OUT** button to stop the output setting and light off **OUT** button
3. Push and light the **SET/ENTER** button, the max. value position flashes for voltage setting area.
4. Push the **V/A** button, the max. value position of current setting flashes and current setting is activated
5. Push the **LEFT** or **RIGHT** arrow keys to move the cursors
6. Push the **UP** or **DOWN** arrow keys to change the settings
7. Push **SET/ENTER** button and light off this button to exit current setting mode

UP **ENTER**
OUT > SET > V/A > 0. 000 A -----> 2.000 A -----> OK

Remark:

- I. It is possible to set current values once the outputs are valid. However, for protection of the load, it is recommended to stop output before current setting.





3.5 OUTPUT SWITCH

Under the panel operating mode, by pushing **OUT** button to shift output status. Once **OUT** button is lit, the measured values displayed at LCD; push **OUT** button again to exit output mode.

3.6 DATA SAVING OPERATION

1. Under the voltage setting or current setting mode, push the **STORE** button to save the values of voltage or currents into memory of power supply for future recall purpose. (follow below steps)
2. Refer 3.3 or 3.4 for voltage or current setting mode.
3. Push **STORE** button to enter data saving mode, the min. value position flashes and displays **STORE** icon on LCD.
4. Move **UP** or **DOWN** arrow keys to select storage group serial number.
5. Click **ENTER** button to confirm data saving, click **STORE** button to exit data saving mode.

UP

SET > STORE > 1 > 2 > ENTER -----> OK



3.7 RECALL SAVING OPERATION

Under the panel operating mode, push the **RECALL** button for getting the saved data from memory; follow the steps as follows:

1. Switch on the power supply
2. Push **RECALL** button to enter data recall mode, the min. value position flashes and displays **RECALL** icon on LCD.
3. Move **UP** or **DOWN** arrow keys to recall the stored group serial number, the default values from voltage or current setting mode is displayed on LCD.
4. Click **ENTER** button to confirm data recall, click **STORE** button to exit data recall mode.

UP

RECALL >1 > 2 >ENTER --> OK

3.8 USB POWER CHARGING

Push the **USB** button and light the green indicator, the default setting is voltage @ 5.2V and current @ 2.5A, the LCD will display 5.2V, current value as 2.5A. Connect the mobile phone via USB cable for power charging.

The USB ports are suitable for all kinds of mobile phones with automatic check function, the product can set the proper charging current automatically.

1. Push the **OUT** button to activate output mode.
2. Push the **USB** button and USB indicator will turn off to exit USB charging mode.

USB > OUT > OK

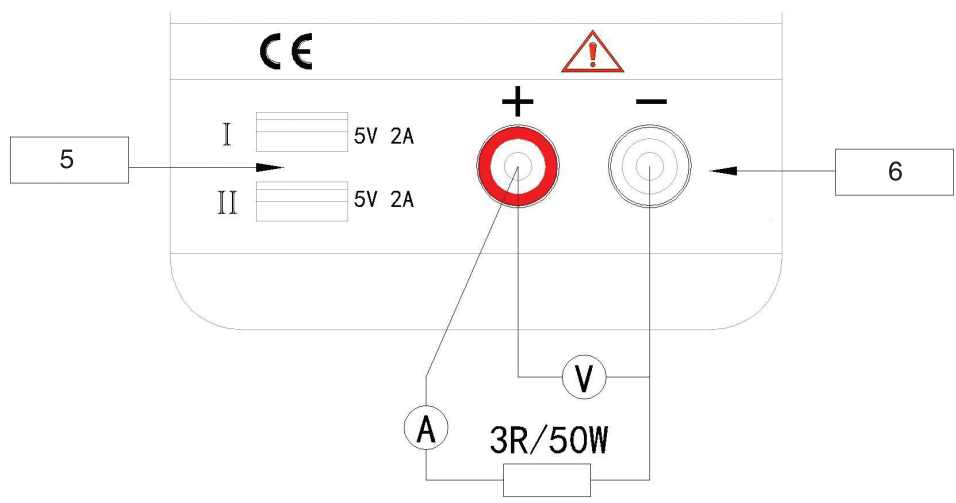




4.0 CALIBRATION

Follow the below chart, connect the 5 digit displayed volt meter, current meter, resistance ($3\Omega/50W$) into the output terminals. To calibrate, start from point of zero voltage - voltage coefficient – current zero – current coefficient.

Hold the **SET** button to switch on power supply till “REF” displayed in LCD to enter calibration mode.





4.1 VOLTAGE CALIBRATION

With power supply displaying 2.000A & 05.00V in setting area of LCD and **.**V displayed in main part of LCD. Connect the output terminal with an external reference voltage meter and shift to CV mode. Hold the **LEFT** or **RIGHT** arrow keys to move the cursors to left or right and push the **UP** or **DOWN** arrow keys to adjust the values same as readings of external reference voltage meter, then click **ENTER** button to finish the voltage bias calibration.

With power supply displaying 2.000A & 30.00V in setting area of LCD, hold the **LEFT** or **RIGHT** arrow keys to move the cursors to left or right and push the **UP** or **DOWN** arrow keys to adjust the values same as readings of external reference voltage meter, then click **ENTER** button to finish the voltage gain calibration.

4.2 CURRENT CALIBRATION

Push the **V/A** button and power supply displayed 0.500A & 30.00V in setting area of LCD and *.**A displayed in the main part of LCD. Connect the output terminals with the external reference current meter and the load (3 Ω /50W), shift to CC mode. Hold the **LEFT** or **RIGHT** arrow keys to move the cursors to left or right and push the **UP** or **DOWN** arrow keys to adjust the values same as readings of the external reference current meter, then click **ENTER** button to finish the current bias calibration.

With power supply displaying 2.750A & 30.00V in the setting area of LCD, hold the **LEFT** or **RIGHT** arrow keys to move the cursors to left or right and push the **UP** or **DOWN** arrow keys to adjust the values same as readings of external reference voltage meter, then click **ENTER** button to finish the current gain calibration.

Push **OUT** button to exit and restart the power supply to complete the calibration function.







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