

Switch Mode DC Power Supply



Introduction

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

Safety

This manual contains important safety and operation instructions for correct use of this power supply. Read through the manual and pay close attention to the labels of this unit to be connected.

Do not install substituted parts or operate the modification without permission, please contact your distributor repair, questions, or for warranty replacements to guaranty of the stability of the unit.

Pay special attention to the information of WARNINGS or CAUTIONS to avoid the damage to power supply or connected equipment—which could lead to human injury.

Safety Marks

WARNING:

Failure to observe these warnings may cause injury to users and damage to power supply or connected equipment.

CAUTION:

Failure to observe these warnings may result in damage to equipment and improper functioning of power supply.



Ground



High Voltage



Attention on the Warning or Caution

Specification Compliance

72-2660 Switch Mode DC Power Supply is compliance with the specification described in this manual.

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

Product Features

The 72-2660 is the single output switch mode DC power supply with a maximum 30V output voltage, 3.75A output current and maximum output power of 50W.

72-2660 integrates the AC/DC and DC/DC 2nd level voltage regulator technology, the AC/DC input is adapts to a worldwide voltage range. The DC/DC uses a buck converter, which is highly efficient and high speed dynamic response performance.

72-2660 can set the voltage and current through the keypad of front panel and save the setting groups for efficient and functional usage.

72-2660 also features a four-digit voltage and current meter, as well as the compact handheld size. The 72-2660 is perfect for solving a variety of loading conditions and applications.

The main features of the 72-2660 include:

- Handheld design
- Fanless cooling for silent operation
- Four digit LCD display
- Output short circuit protection
- High speed dynamic response
- Automatic protection under power off status
- Automatic output recognition of USB charging port

1. Quick Start

This chapter describes the basic check points on 72-2660 for proper operation, as well as the functions of 72-2660.

1.1 Front Panel Description

Current Setting Indicator

Voltage Setting Indicator

Measured Value Display

Keypad

USB Charging Ports

DC Output Terminals



Current Setting Indicator

1.2 Pre-Check

Before the operation, please check the included accessories; if any are missing, please contact the local distributor.

Power Cord – 1PC

User Guide – 1PC

Connect the power cord to the unit and to a properly grounded outlet, and switch on 72-2660. The unit starts the self-system checking, the LCD displays 0.5s, date of manufacturing, production lot, model number version number in turn.

1.3 Quick Start

OUT Button

Press the **OUT** button to begin outputting the selected voltage and current. The unit will display the voltage or current on the screen. Press again **OUT** button to exit output function.

UP Arrow Key + DOWN Arrow Key

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

Press **DOWN** arrow key to exit the LCD backlight

LEFT Arrow Key + RIGHT Arrow Key

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

Press **RIGHT** arrow key to increase the contrast of 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 current measurement and read the current value from the display

USB Button

Push the **USB** button and adjust voltage to 5.2V and the current as 3A to enter USB power mode; then, push the **OUT** button to output the selected 5.2V at 3A.

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, and press the direction arrow keys to adjust the voltage value setting, Push the **V/A** button to switch to the current value setting, and press the direction arrow keys to measured current value.

1.4 Output Check

1.4.1 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 the **OUT** button, the CV indicator is shown on the LCD display.
3. Setting the voltage of power supply:
Push the **V/A** button and shift to voltage display mode. Then adjust voltage values, and the voltage value displayed on the LCD is approaches 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.

1.4.2 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 off.
2. Adjust voltage value to 30V.
3. Connect the resistance (3Ω/50W) between output terminals.
4. Push the **OUT** button, the indicator of CC also displays on the LCD.
5. Setting the current of power supply:
Push **V/A** button and shift to current display mode. Then adjust current values, and check that 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 maximum value.

1.4.3 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 the **OUT** button.
4. Connect the output terminals by wire for short circuit, the light of **OUT** button is off and output off.

1.4.4 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 the **USB** button. Adjust the voltage as 5.2V and current as 2.5A.
3. Push the **OUT** button.
4. Make sure the power supply under CV mode, the CV indicator is light in LCD.
5. Set the current value and make sure the current value can be adjusted from 0A to the maximum value of measuring range.
You cannot adjust voltage.

2. Specification

2.1 Primary Specifications

Input Voltage	90V AC ~ 265V AC / 43Hz ~ 65Hz ±2Hz	
Input Current	1A	
Output Rating	Max. Voltage	0.3V~30V
	Max. Current	0~3.75A
Line Regulation ±% of output + offset	Voltage	CV≤0.01%+3mV
	Current	CC≤0.01%+3mA
Load Regulation ±% of output + offset	Voltage	CV≤0.02%+3mV
	Current	CC≤0.02%+3mA
Measurement Accuracy	Voltage	10mV
	Current	1mA
Measured Value Accuracy @ 25°C ±% of output + offset	Voltage	≤0.05%+5mV
	Current	≤0.05%+5mA
Measurement Speed	Voltage	100ms/ones
	Current	100ms/ones
Setting Value Accuracy @ 25°C ±% of output + offset	Voltage	≤0.05%+5mV
	Current	≤0.05%+5mV
Ripple and Noise 20HZ-20MHz	Voltage	≤10mVrms/100mVp-p
	Current	≤10mVrms/100mVp-p
Temperature Coefficient @ 0~40°C ±% of output + offset	Voltage	≤0.05%
	Current	≤0.1%
Dimensions	185mm × 88mm × 38mm	
Weight (Net)	370g	

2.2 Supplementary Specifications

Build-in EEPROM

Recommended Calibration Time: Annually

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

Operating Temperature: 0 to 40° C

Storage Temperature: -20 to 70° C

3. Operation

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

Connect the power supply to the AC outlet using the provided power cord.

3.1 Keypad Description

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

3.2 Front Panel

After powering on, the panel operation and all the functional buttons can be operated.

3.3 Voltage Setting

The voltage setting range is from 0.30V to 30V; follow the setting steps as below:

1. Switch on the power supply
2. Push the **OUT** button to stop power output
3. Push 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 to exit voltage setting mode

UP ENTER

OUT → SET → 0 0.0 0 V ----- >3 0.0 0 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 turn off the output before setting the voltage.
- II. Due to the total power limit, current settings will be decreased automatically as voltage setting increases.

3.4 Current Setting

The current setting range is from 0.000A to 3.750A, follow the setting steps as below:

1. Switch on the power supply
2. Push the **OUT** button to stop the output
3. Push and **SET/ENTER** button, the max value position flashes of 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, push **OUT** button to shift output status. Once **OUT** button is on and lit up, 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 current into the memory of power supply for future recall purpose.
2. Refer 3.3 or 3.4 for voltage or current setting mode.
3. Push **STORE** button to enter data saving mode, the minimum value position flashes and displays **STORE** icon on LCD.
4. Move **UP** or **DOWN** arrow keys to select storage group 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 Data Operation

Under normal operating mode, push the **RECALL** button for retrieving the saved data from memory; follow the setting steps as below:

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

UP
RECALL →→ 1 →→ 2 →→ **ENTER** -----> OK.

3.8 USB Power Charging

Push the **USB** button, the default setting is voltage @ 5.2V and current @ 2.5A, the LCD will display 5.2V, with current value as 0A. Connect the mobile phone via USB cable for power charging or to supply USB power to any compatible device.

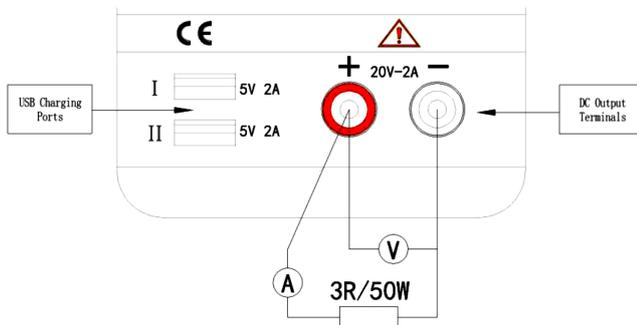
For battery charging, the USB ports are suitable for mobile phones. With automatic check function, the supply will set the proper charging current automatically.

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 Calibration

Following the image below, connect a 5 digit displayed volt meter and current meter, please resistance (10Ω/100W) into the output terminals. To calibrate, start from point of zero voltage - voltage coefficient –and zero current – current coefficient.



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

4.1 Voltage Calibration

The power supply displays **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.

The power supply displays **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 an external reference voltage meter, then press **ENTER** button to finish the voltage gain calibration.

4.2 Current Calibration

Push the **V/A** button and power supply displays **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 (5Ω/100W), 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 the **ENTER** button to finish the current bias calibration.

While the power supply displays **2.750A & 30.00V** in the setting area of LCD, hold the **LEFT** or **RIGHT** arrow keys to move the cursors 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.

Part Number

72-2660

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