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› ECO-WORTHY 600W Pure Sine Wave Inverter Charger User Manual

ECO-WORTHY 25A

ECO-WORTHY 600W Pure Sine Wave Inverter Charger User Manual

Model: 25A | Brand: ECO-WORTHY

1. INTRODUCTION

The ECO-WORTHY 600W Pure Sine Wave Inverter Charger is a versatile 2-in-1 unit designed to provide efficient power conversion and intelligent battery charging. It combines a powerful 600W inverter (1200W peak) with a 25A LiFePO4 battery charger, making it ideal for various applications including UPS backup power, RVs, boats, and home use.

This device is specifically engineered for LiFePO4 batteries, offering features like 0V charging capability to activate BMS-protected batteries and smart 3-level plus trickle charging to optimize battery health. Its Uninterrupted Power Supply (UPS) function ensures a seamless transition to battery power within 20ms during grid failures, safeguarding connected devices.



Figure 1: ECO-WORTHY 600W Pure Sine Wave Inverter Charger.

2. SAFETY INSTRUCTIONS

Please read all safety instructions carefully before installing, operating, or maintaining the ECO-WORTHY Inverter Charger. Failure to follow these instructions may result in electric shock, fire, severe injury, or death.

- **Electrical Safety:** Ensure all wiring is performed by qualified personnel and complies with local electrical codes. Disconnect all power sources before making any connections or performing maintenance.
- **Battery Safety:** This unit is designed for LiFePO₄ batteries. Do not attempt to charge other battery types. Ensure proper ventilation when charging batteries. Avoid short-circuiting battery terminals.
- **Installation Environment:** Install the inverter charger in a dry, well-ventilated area, away from flammable materials, direct sunlight, and excessive heat or moisture.
- **Overload Protection:** Do not exceed the rated output power of 600W. Overloading can damage the unit and connected appliances.
- **Children and Pets:** Keep the device out of reach of children and pets.

3. PRODUCT OVERVIEW

3.1 Key Features

- **600W Inverter & 25A Charger 2-in-1:** Combines both an inverter and battery charger in one unit, delivering a powerful 25A charging capability for 12V LiFePO4 batteries and 600W output (peak power 1200W) to efficiently power appliances.
- **Uninterrupted Power Supply (UPS):** Features an automatic switch to battery power within 20ms during grid failures, ensuring a reliable and uninterrupted power supply to your device while protecting it from damage.
- **Full System Protection:** Utilizes pure sine wave technology for stable and efficient output. Includes multiple protections such as high/low voltage, overload, overcurrent, overtemperature, and output short circuit, enhancing safety.
- **Intelligent LiFePO4 Charger:** Equipped with 0V charging capability to effectively activate BMS-protected lithium batteries, along with smart 3-level and trickle charging to maintain optimal battery health.
- **LED Indicators and Cooling Fan:** Includes error LED indicators and a buzzer for real-time alarms. An internal cooling fan activates automatically when the temperature is $>45^{\circ}\text{C}$ or the RMS value of the AC current is $>2.5\text{A}$, ensuring stable output performance.

3.2 Dimensions and Weight

The ECO-WORTHY 600W Inverter Charger has compact dimensions and a lightweight design for portability and ease of installation.

Product Dimensions: 11.02 x 5.71 x 2.72 inches (28 x 14.5 x 6.9 cm)

Item Weight: 3.86 pounds (1.75 kg)

WHAT'S IN THE BOX

Dimension 11.02*5.71*2.72 in

Weight 3.86 lbs



- 1 Double-ended copper terminal connector cable: 39in
- 2 Utility end connection cable: 59in

Figure 2: Product dimensions and included accessories.

3.3 What's in the Box

Upon opening the package, you will find the following items:

- 1 x ECO-WORTHY 600W Pure Sine Wave Inverter Charger

- 1 x Double-ended copper terminal connector cable (39 inches)
- 1 x Utility end connection cable (59 inches)
- 1 x User Manual (this document)

3.4 Product Components

Familiarize yourself with the various ports and indicators on the inverter charger:



Figure 3: Front and rear view of the inverter charger with labeled components.

AC Output: Standard AC outlets for connecting appliances.

LED Indicators: Display operational status and error codes.

Inverter Switch: Toggles the inverter function on/off.

AC Input: Port for connecting to grid power for charging and UPS function.

Cooling Fan: Automatically activates to dissipate heat.

Battery Positive (+): Terminal for connecting the positive battery cable.

Battery Negative (-): Terminal for connecting the negative battery cable.

4. SETUP

Proper setup is crucial for the safe and efficient operation of your ECO-WORTHY Inverter Charger. Ensure all connections are secure before powering on the unit.

4.1 Connecting as a Battery Charger

To use the unit primarily for charging your LiFePO4 battery:

1. Connect the M8 ring end of the double-ended copper terminal connector cable to the battery terminals (+ to +, - to -).
2. Connect the M6 ring end of the double-ended copper terminal connector cable to the inverter charger's battery terminals (+ to +, - to -).
3. Connect the utility end connection cable to the AC input port on the inverter charger and then to the grid power outlet.

PRODUCT DETAILS

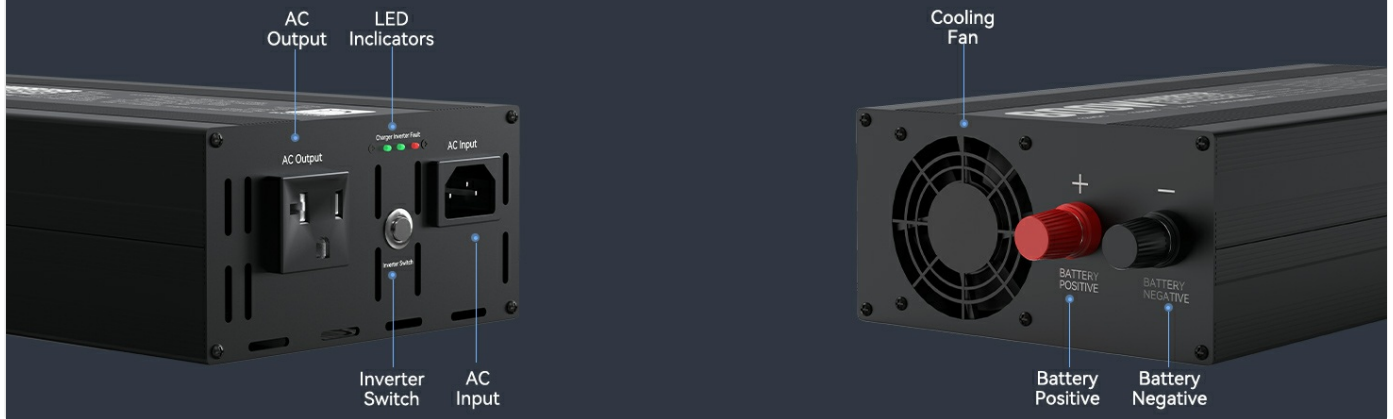


Figure 4: Connection diagram for charging mode.

4.2 Connecting as an Inverter

To use the unit to power AC appliances from your LiFePO4 battery:

1. Connect the M8 ring end of the double-ended copper terminal connector cable to the battery terminals (+ to +, - to -).
2. Connect the M6 ring end of the double-ended copper terminal connector cable to the inverter charger's battery terminals (+ to +, - to -).
3. Connect the AC cable of your appliance to the AC output port of the inverter charger.
4. Long press the "Inverter" button for 1 second to activate the inverter function.



Figure 5: Connection diagram for inverter mode.

5. OPERATING INSTRUCTIONS

5.1 Charging Operation

When connected to grid power and a battery, the inverter charger automatically begins charging. It employs an intelligent 3-level charging strategy (Bulk, Absorption, Float) and trickle charging to ensure optimal battery health and longevity.

- **0V Charging Capability:** This feature allows the charger to activate LiFePO4 batteries that have been protected by their Battery Management System (BMS) due to low voltage.

PROTECT YOUR APPLIANCE WITH PURE SINE WAVE

ECO-WORTHY's pure sine wave inverter produces a seamless and grid-like power output, maximizing appliance performance while ensuring the safety of your appliance

≥90%
conversion efficiency



Figure 7: Battery charging stages for optimal maintenance.

5.2 Inverter Operation

With the inverter function activated, the unit converts 12V DC battery power to 110V AC pure sine wave output, suitable for sensitive electronics.

- **Pure Sine Wave Output:** Provides clean, stable power that is identical to grid power, protecting your sensitive electronic devices from damage.
- **High Conversion Efficiency:** Achieves $\geq 90\%$ conversion efficiency, minimizing energy loss.
- **Versatile Power Source:** Capable of powering various appliances up to 600W continuously, such as laptops, smartphones, audio speakers, projectors, and small kitchen appliances.

ENJOY YOUR CAMPING TRIP

Stable 600W inverter output



Smartphone
12W



Audio Speakers
50W



Laptop
60W



Projector
60W



Ham Radio
100W-200W



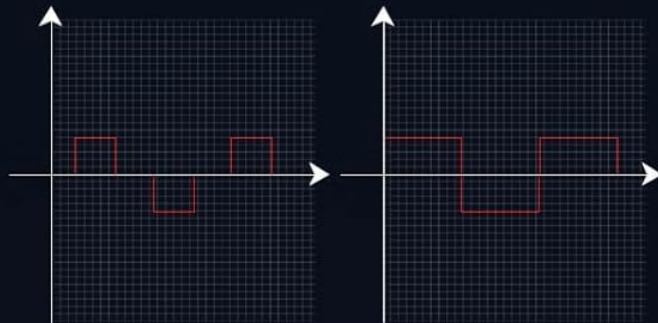
Portable
Electric Kettle
300W



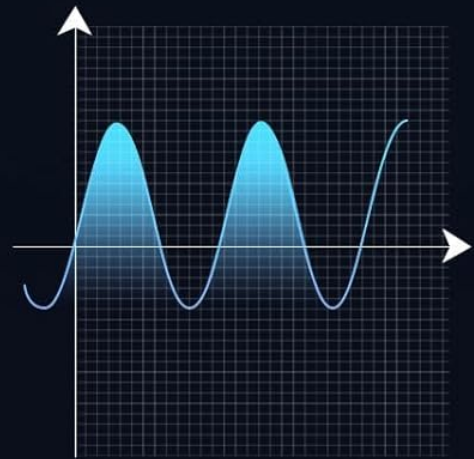
Figure 8: Inverter in use for outdoor power needs.

PROTECT YOUR APPLIANCE WITH PURE SINE WAVE

More efficient and stable output



Others



Ours



≥90% conversion efficiency

Figure 9: Pure Sine Wave output ensures appliance protection.

5.3 Uninterrupted Power Supply (UPS) Function

The UPS function provides seamless power backup. When the inverter function is enabled and the unit is connected to both grid power and a battery, it will automatically switch to battery power in less than 20 milliseconds upon a grid power failure.

UNINTERRUPTIBLE POWER SUPPLY

Instantaneous power backup
in less than **20ms**



Note: The UPS is supported only
when the inverter mode is enabled

Figure 10: UPS functionality for continuous power.

Note: The UPS function is supported only when the inverter mode is enabled.

5.4 LED Indicators and Buzzer

The inverter charger is equipped with LED indicators and an audible buzzer to provide real-time status and fault alerts.

BUILT-IN A BUZZER FOR SAFER USE

Quickly detect and respond to faults



When the inverter charger fails, the buzzer alarms for 2S and the fault indicator lights up

Figure 11: LED indicators and buzzer for system status.

- **Status LEDs:** Indicate normal operation, charging status, and inverter status.
- **Fault LEDs:** Illuminate to indicate specific errors (e.g., high/low voltage, overload, overtemperature).
- **Buzzer:** Emits an audible alarm for approximately 2 seconds when a fault occurs, or as a prompt when the inverter function is turned on/off.

6. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your ECO-WORTHY Inverter Charger.

- **Cleaning:** Keep the unit clean and free from dust and debris. Use a dry, soft cloth for cleaning. Do not use liquid cleaners or solvents.
- **Ventilation:** Ensure the cooling fan and ventilation openings are not blocked. Proper airflow is essential to prevent overheating.
- **Connections:** Periodically check all electrical connections (battery terminals, AC input/output) to ensure they are tight and free from corrosion.
- **Storage:** If storing the unit for an extended period, ensure the battery is fully charged and disconnect the inverter charger from both the battery and AC input. Store in a cool, dry place.
- **Battery Health:** Utilize the intelligent charging features, including trickle charging, to maintain your LiFePO4 battery's health during long-term storage or infrequent use.

7. TROUBLESHOOTING

This section provides solutions to common issues you might encounter. For problems not listed here, please contact ECO-WORTHY customer support.

Problem	Possible Cause	Solution
No power output from AC outlets.	Inverter switch off, low battery voltage, overload, short circuit.	Ensure inverter switch is ON. Check battery voltage and charge if low. Reduce load. Check for short circuits in connected appliances.
Buzzer alarming and fault LED illuminated.	Overload, overtemperature, high/low battery voltage, output short circuit.	Identify the specific fault LED. Reduce load (overload). Allow unit to cool (overtemperature). Check battery voltage (high/low voltage). Disconnect load and check for short circuit (output short circuit).
Battery not charging.	AC input not connected, AC input voltage too low/high, battery deeply discharged (0V), faulty connections.	Ensure AC input cable is securely connected to grid power. Verify grid voltage is within specified range. If battery is at 0V, the intelligent charger should attempt activation; ensure proper connection. Check all battery cable connections.
Unit shuts down unexpectedly.	Overload, overtemperature, low battery voltage, internal fault.	Reduce load. Ensure adequate ventilation. Charge battery. If problem persists, contact support.

ALL-ROUND SAFTY PROTECTIONS

From battery,inverter charger to loads



Low voltage protection



High voltage protection



Over current protection



Over temperature protection



Overload protection



Output short circuit protection

Figure 12: Built-in safety protections.

8. SPECIFICATIONS

Detailed technical specifications for the ECO-WORTHY 600W Pure Sine Wave Inverter Charger.

8.1 Inverter Parameters

Parameter	Value
Rated Power	600W
Peak Power	1200W
AC Output Voltage	110V±10%
AC Output Frequency	60Hz
Output Waveform	Pure Sine Wave
Battery Input Voltage Range	10-15V
Inverter Efficiency	≥90%
Suitable Battery Chemistry/Type	Lithium Iron Phosphate battery

8.2 Charging Parameters

Parameter	Value
AC Input Voltage	110V±10%
AC Input Frequency	60Hz
AC Charging Power	300W (Max.600W)
Charging Efficiency	≥93%
Rated Charging Current	25A
Rated Charging Voltage	14.6V

9. WARRANTY AND SUPPORT

ECO-WORTHY stands behind the quality of its products. For warranty information, technical support, or any inquiries regarding your Inverter Charger, please contact the manufacturer or authorized seller directly.

[Visit the ECO-WORTHY Store on Amazon](#)

10. PRODUCT VIDEO OVERVIEW

Watch the official product video for a visual guide on the features and functionality of the ECO-WORTHY 600W Inverter Charger.

Your browser does not support the video tag.

Video 1: ECO-WORTHY 600W Inverter Charger overview. This video demonstrates the key features including charging, inverting, and UPS functionality, and how it integrates with LiFePO4 batteries for various power needs.