## ECO-WORTHY US-L02NK50USL400CNZH-1

# ECO-WORTHY 5120Wh Home Backup Power System User Manual

Model: US-L02NK50USL400CNZH-1

## 1. Introduction

The ECO-WORTHY 5120Wh Home Backup Power System is a compact and efficient solution designed to provide reliable energy for your home. It stores energy from solar or the grid, ensuring power during outages or for off-grid living. This system features a 5000W hybrid inverter with UPS function, offering four charging modes and three automatic output modes. It is equipped with two 48V 50Ah LiFePO4 batteries, providing a total capacity of 5120Wh.
Key features include a lightweight design, durable metal case, and a stable built-in 50A BMS for comprehensive protection against overcharge, over-discharge, and short-circuits. The system also supports remote monitoring via a dedicated application.


Figure 1.1: Overview of the ECO-WORTHY 5120Wh Home Backup Power System, showing the hybrid inverter and two 48V 50Ah LiFePO4 batteries.

## 2. Safety Information

Always adhere to local electrical codes and safety regulations during installation and operation. Ensure proper grounding and ventilation. Do not attempt to open or modify the battery or inverter components, as this may void the warranty and pose safety risks. Keep the system away from flammable materials and sources of moisture.

The LiFePO4 batteries are designed with a robust metal case and a built-in 50A Battery Management System (BMS) to enhance safety. This BMS protects against overcharge, over-discharge, over-current, short-circuit, and manages cell voltage balance and high-temperature discharge cut-off.


Figure 2.1: The durable metal case of the LiFePO4 battery, highlighting its fireproof, explosion-proof, and anti-collision properties, along with dimensions and M8 screw details.

## 3. Product Components

The ECO-WORTHY Home Backup Power System typically includes the following main components:

- **Hybrid Inverter Charger:** A 5000W 48V DC-110V AC pure sine wave inverter with a 100A MPPT controller.
- **LiFePO4 Batteries:** Two 48V 50Ah (51.2V 50Ah) LiFePO4 batteries with metal cases, providing a total of 5120Wh energy storage.
- **Connection Cables:** Necessary cables for connecting the batteries to the inverter and for charging.

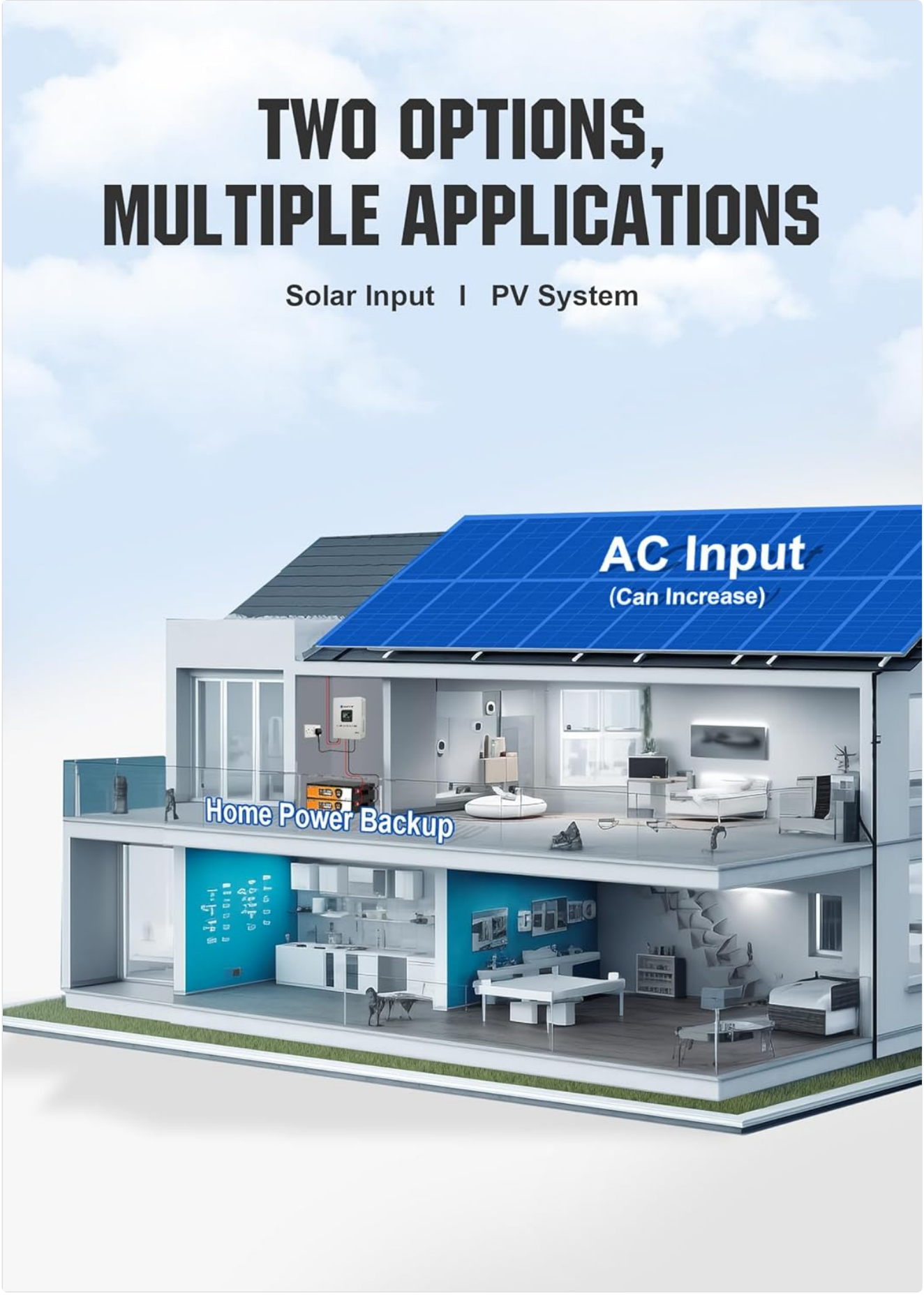


Figure 3.1: Illustration of the system's versatility, supporting both solar input (PV system) and AC input for home power backup applications.

## 4. Setup

The system is designed for straightforward installation. Ensure all components are securely placed in a well-ventilated area,

away from direct sunlight and moisture. The batteries are stackable, allowing for efficient use of space. Refer to the detailed wiring diagrams provided in the separate installation guide for specific connection procedures.
The batteries are designed to be stacked for placement, reducing space requirements. Their flat shape with side-mounted screws facilitates this configuration.


Figure 4.1: System dimensions and power output, illustrating how the 5000W inverter and 5120Wh battery storage can power various

household appliances.


Figure 4.2: The LiFePO4 battery's performance in cold temperatures, highlighting its ability to discharge at -4°F (-20°C) without damage, and its extended lifetime.

# 5. Operating Instructions

The ECO-WORTHY system offers flexible operation with multiple charging and output modes.

## 5.1 Charging Methods

The system supports various charging methods:

- **AC Mains Power:** Charge your batteries directly from the grid. Maximum AC charge current is 40A, allowing for a full charge in approximately 2.5 hours.
- **Solar Photovoltaic (PV) System:** Prioritize charging from your solar panels. Maximum PV charge current is 80A, achieving a full charge in about 1.5 hours.

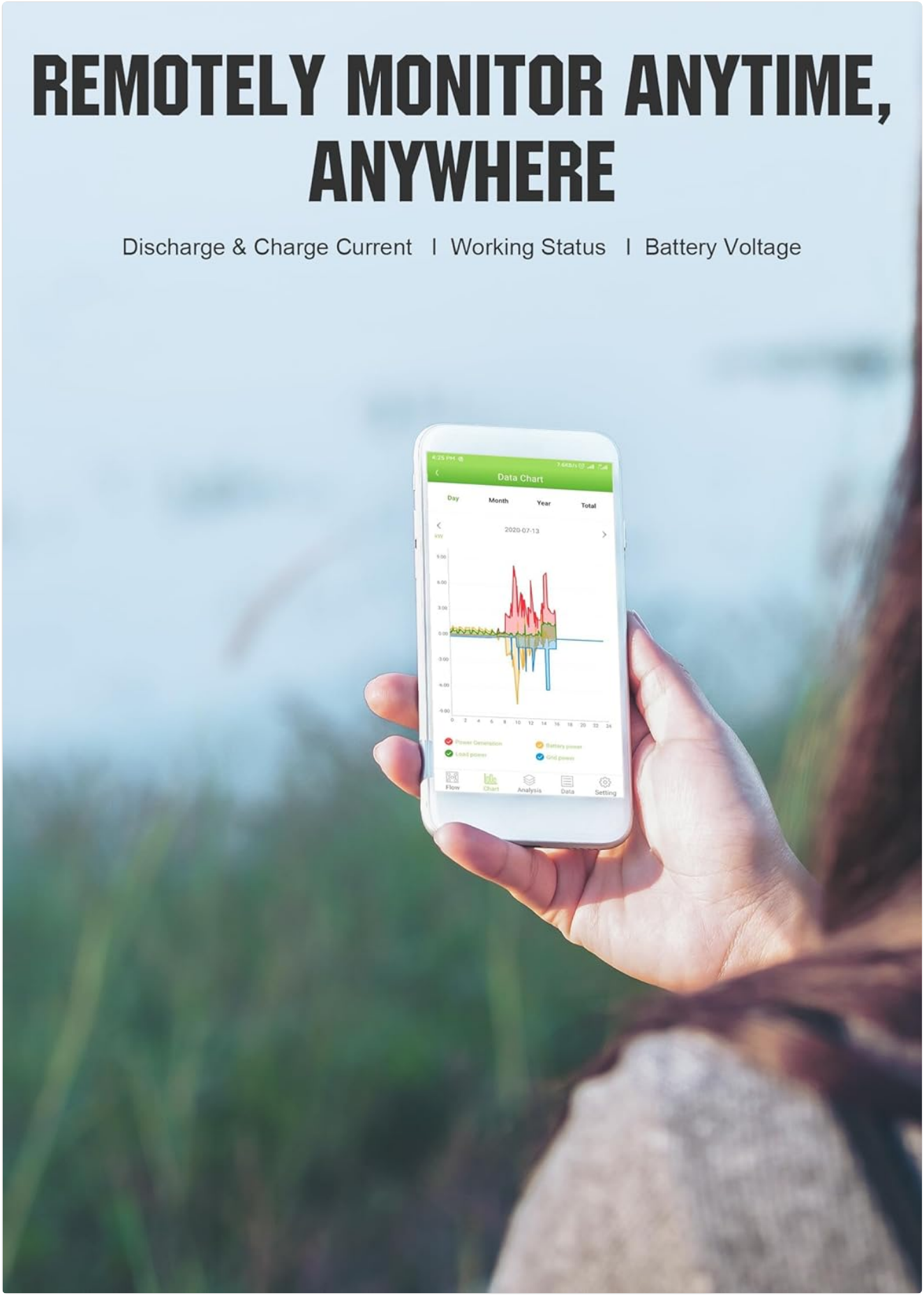


Figure 5.1: Fast charging capabilities of the system, demonstrating the rapid charge time for the batteries.

## 5.2 Hybrid Inverter Functions

The 5000W hybrid inverter acts as a 3-in-1 unit: inverter, controller, and charger. It can receive power from the grid for all-weather use and supports off-grid photovoltaic input. It automatically switches between utility and battery power based on

three output modes:

- Solar Only / Solar Priority
- Mains Priority / Hybrid Charge


Figure 5.2: The powerful 3-in-1 hybrid inverter, central to managing and controlling the power flow within the system.

## 5.3 Remote Monitoring

You can remotely monitor the system's operation status in real-time through a dedicated mobile application. This allows you to view discharge and charge current, working status, and battery voltage from anywhere.


Figure 5.3: Remote monitoring capabilities via the mobile application, providing real-time data on discharge, charge current, working status, and battery voltage.

## 5.4 Low Temperature Discharge Performance

The ECO-WORTHY LiFePO4 batteries are engineered for excellent performance even in cold environments. They can discharge at temperatures as low as -20°C (-4°F) without significant capacity attenuation. This ensures reliable power

delivery in diverse climates.

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Video 5.4: Demonstration of the ECO-WORTHY 48V 50Ah Metal Case LiFePO4 Battery's low-temperature discharge performance, showing its ability to operate effectively at -20°C (-4°F) with minimal capacity loss.

## 6. Maintenance

To ensure the longevity and optimal performance of your ECO-WORTHY Home Backup Power System, regular maintenance is recommended:

- **Regular Inspection:** Periodically check all cables and connections for any signs of wear, corrosion, or looseness. Ensure they are securely fastened.
- **Cleanliness:** Keep the inverter and battery surfaces clean and free from dust and debris. Use a dry, soft cloth for cleaning. Do not use liquid cleaners.
- **Ventilation:** Ensure that the system's ventilation openings are not obstructed to prevent overheating.
- **Battery Care:** While LiFePO4 batteries are low-maintenance, avoid prolonged periods of full discharge. For long-term storage, it is recommended to store the batteries at approximately 50% State of Charge (SOC) in a cool, dry place.
- **Software Updates:** Keep the mobile application and inverter firmware updated to benefit from the latest features and performance improvements.

The LiFePO4 cells are designed for over 4000 cycles, offering a long operational life, typically exceeding 10 years with proper care.

## 7. Troubleshooting

If you encounter any issues with your ECO-WORTHY Home Backup Power System, consider the following basic troubleshooting steps:

- **No Power Output:** Check all cable connections, ensure the inverter is turned on, and verify battery charge level.
- **Inverter Error Codes:** Refer to the inverter's display for any error codes and consult the inverter's specific manual for their meaning and resolution.
- **Charging Issues:** Verify that the AC input or solar panels are providing power. Check charging cable connections. Ensure charging temperature is within the recommended range (32°F to 131°F).
- **App Connectivity:** Ensure your smartphone's Bluetooth or Wi-Fi is enabled and the app is updated. Restart the app or the inverter if connection issues persist.

For complex issues or if troubleshooting steps do not resolve the problem, please contact the ECO-WORTHY support team for professional assistance.

## 8. Specifications

Detailed specifications for the ECO-WORTHY 5120Wh Home Backup Power System:

| Parameter | Value |
| --- | --- |
| Brand | ECO-WORTHY |
| Model Number | US-L02NK50USL400CNZH-1 |
| Battery Power (Total) | 5120Wh (2 Pack) |
| Battery Voltage | 51.2V |

| Parameter | Value |
| --- | --- |
| Max Charge/Discharge Current | 50A |
| Peak Point Current | 200A |
| Max Charge Voltage | 58.4V |
| Discharge Cut-off Voltage | 40V |
| Battery Size (L*W*H) | 17.21" x 13.1" x 4.92" |
| Battery Weight (Each) | 58.42 lbs (26.5 kg) |
| Charge Temperature Range | 32°F - 131°F (0°C - 55°C) |
| Discharge Temperature Range | -4°F - 131°F (-20°C - 55°C) |
| AC Output Rated Power | 5000VA/5000W |
| AC Output Voltage | 120Vac±5% |
| AC Output Rated Current | 41.7A |
| AC Input Voltage Range | 90-140Vac |
| AC Input Frequency | 50Hz/60Hz |
| AC Input Max. AC Charge Current | 40A |
| PV Output Max. Power | 5000W |
| PV Output Max. Charge Current | 100A |
| PV Input Max. Power | 5000W |
| PV Input Max. Open Voltage | 500V |


Figure 8.1: Comprehensive specifications for both the 5000W Hybrid Inverter and the 48V 50Ah LiFePO4 Battery components of the system.

## 9. Warranty and Support

ECO-WORTHY is a professional solar system manufacturer with 17 years of experience in the solar energy field. The ECO-WORTHY team is committed to actively providing professional off-grid system solutions and support for any problems you may encounter.

For support, please refer to the contact information provided with your product packaging or visit the official ECO-WORTHY website.