

HARVOK - BUILD BETTER RVs



# HARVOK®

48V-100Ah, Lithium-Ion Phosphate Battery

**Model: ES-48V 100Ah-HA**

**IEC 62619: 2022 Test Report Number: CMC240103002**

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## Declaration before reading:



**The Bold font in the text is crucial and should be implemented as needed.**

The use of underline requires attention or emphasis.

## Important Instructions:

Our energy storage lithium battery utilizes lithium-ion technology with lithium iron phosphate (LiFePO<sub>4</sub>) as the positive electrode. Prior to utilizing lithium batteries, it is imperative to thoroughly review this manual and adhere to the provided instructions for correct installation and operation. Should you encounter any unfamiliar issues, we encourage you to promptly seek guidance from us (Support@harvok.com.au). Unless otherwise specified, please ensure compliance with these guidelines.

Our products undergo rigorous inspection prior to shipment. Should you observe any unusual occurrences with the purchased product, kindly contact us for assistance.

It is crucial to carefully assess the impact of environmental factors and storage methods on the service life and reliability of this product before installation, ensuring operation within suitable conditions.

## Disclaimer:

Specifications and information pertaining to the product provided in this manual are subject to change without prior notice. While every effort has been made to ensure accuracy, all statements, information, and recommendations within this manual are not guaranteed to be entirely precise. The user bears sole responsibility for the application of any product and shall not hold us liable for any damage resulting from the use of this manual.

## General Safety Instructions

Before utilizing the battery, carefully review all instructions and cautionary markings provided in this manual.

- Do not expose the battery to fire or intentionally submerge into water to prevent the risk of explosion or other life-threatening situations.
  - **This battery is IP67 certified:**
    - **Dust-tight: Completely protected against dust ingress.**
    - **Water-resistant: Protected against temporary immersion in water up to 1 meter deep for up to 30 minutes. This ensures durability during exposure to rain or shallow water crossings but does not permit prolonged or deep-water immersion.**
- Avoid stabbing, hitting, trampling, or striking the battery in any manner.
- Ensure complete power shutdown when removing the device or reconnecting wires during daily use to prevent the risk of electric shock.
- It is recommended that all wiring be conducted by a certified technician or electrician to comply with local and national electrical codes applicable to your application.
- Regularly inspect existing wiring to ensure it is in good condition and that wire gauge meets appropriate standards. Do not operate batteries with damaged or substandard wiring.
- In the event of a fire hazard, use a dry powder extinguisher to extinguish the flame. Using a liquid extinguisher may lead to the risk of secondary disaster.
- **Series connection and the use of lithium batteries from different manufacturers, models, capacities, and types in parallel are strictly prohibited.**
- **Use cables of at least 35 mm to connect the positive and negative electrodes; do not use damaged cables.**

| Item                     | Parameters             | Comments                                   |
|--------------------------|------------------------|--------------------------------------------|
| Material type            | Lithium Iron Phosphate | LiFePO4                                    |
| Nominal Capacity         | 100Ah                  |                                            |
| Voltage Range            | 41.60V - 57.6V         |                                            |
| Charging Voltage         | 57.6V                  |                                            |
| Charging Current         | ≤50A                   | Heat dissipation above 0.5C                |
| Discharge Current        | ≤100A                  | Heat dissipation above 0.5C                |
| Max Discharge Current    | ≤200A                  | 3 seconds                                  |
| Short Circuit Protection | ≤400A                  | 500uS                                      |
| Communication Interface  | 3-Pin 485A/4-pin 485B  |                                            |
| Reset Switch             | Press 5~ 8S            | To Active                                  |
| Cycle Life               | > 2500 Cycles          | + 25 °C, 0.5C charge and discharge, 90%DOD |
| Self-Discharge Rate      | ≤2%                    | (+25°C , SOC100%                           |
| IP protection level      | IP67                   |                                            |
| Storage temperature      | -20°C~+45°C            |                                            |

| Item                          | Parameters                                  | Comments                                                                                                                                                                                                                                                                          |
|-------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discharge temperature range   | -20°C~+55°C                                 |                                                                                                                                                                                                                                                                                   |
| Charging temperature range    | 0°C~+50°C                                   |                                                                                                                                                                                                                                                                                   |
| Battery temperature detection | 4 channels $\pm 1$ °C                       | NTC                                                                                                                                                                                                                                                                               |
| Charging Voltage              | 57.6V                                       |                                                                                                                                                                                                                                                                                   |
| Battery management system     | BMS(RS485 communication Baud rate 9600bps ) | Battery status monitoring includes voltage, current, temperature, SOC information, etc.; battery safety management, including overcharging, overdischarging, overcurrent, overtemperature, short circuit, and limited viewing of protection. Battery Balancing, 485 Communication |
| Cell Certification            | IEC 62619-2022/MSDS/UN38.3                  | A-Grade                                                                                                                                                                                                                                                                           |
| IP protection level           | IP67                                        | <ul style="list-style-type: none"> <li>• Dust-tight: Completely protected against dust ingress.</li> <li>• Water-resistant: Protected against temporary immersion in water up to 1 meter deep for up to 30 minutes."</li> </ul>                                                   |

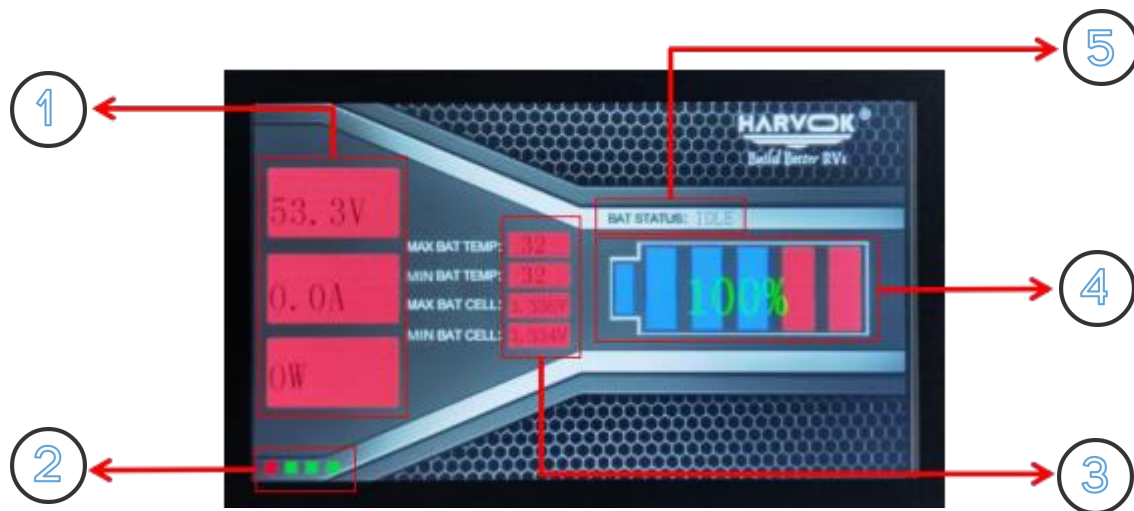
## Requirements for Use - **Read Carefully**

- Follow the charging and discharging guidelines outlined in the first parameter table.
- When charging the lithium battery pack using alternator, solar energy, mains power, mobile generators, micro wind turbines, etc., utilize a constant current followed by constant voltage charging mode according to specified voltage levels. Avoid using lead-acid battery chargers, especially those with pulse charging functions.
- **If the battery remains unused for more than 1 month, fully charge it before storage; for periods exceeding 2 months of inactivity, perform charge-discharge activation every 2 months: discharge to 50% State of Charge (SOC), then boost charge to 100% SOC. Ensure the main switch on the lithium battery is turned off to prevent irreversible capacity loss or battery bulging due to self-discharge.**
- **Avoid prolonged use in environments with temperatures exceeding 40°C or falling below -20°C, high humidity (>90%), dust, strong magnetic fields, or prolonged exposure to sunlight. Optimal use occurs below 3000 meters above sea level, between 10°C and 35°C, with humidity ranging from 5% to 80%.**
- Do not disassemble or alter the internal structure of the battery pack without authorization from the company. Both manufacturer and user must take timely measures to prevent losses in case of product quality issues. Failure to take timely action may absolve the supplier of responsibility for subsequent losses.
- Avoid short-circuiting the 1st and 2nd pins of the communication port "SD20-4" to prevent internal circuit damage. **Connect to the power supply of the Harvok display screen first, confirm correct connection, and then insert into the communication port.**
- **Please unplug the charger promptly upon reaching full charge, and avoid leaving it unattended for extended periods, such as when storing the van while charging. During camping trips where charging is necessary, consistently monitor the battery and charging equipment status.**
- **Charge the battery within 12 hours if the charge falls below 5%. Failure to charge for more than 24 hours after depletion to below 35V may result in difficulty restoring charging, swelling, and permanent capacity loss.**
- The battery pack dissipates heat naturally. Expect temperature rises and heat generation with changes in power consumption.

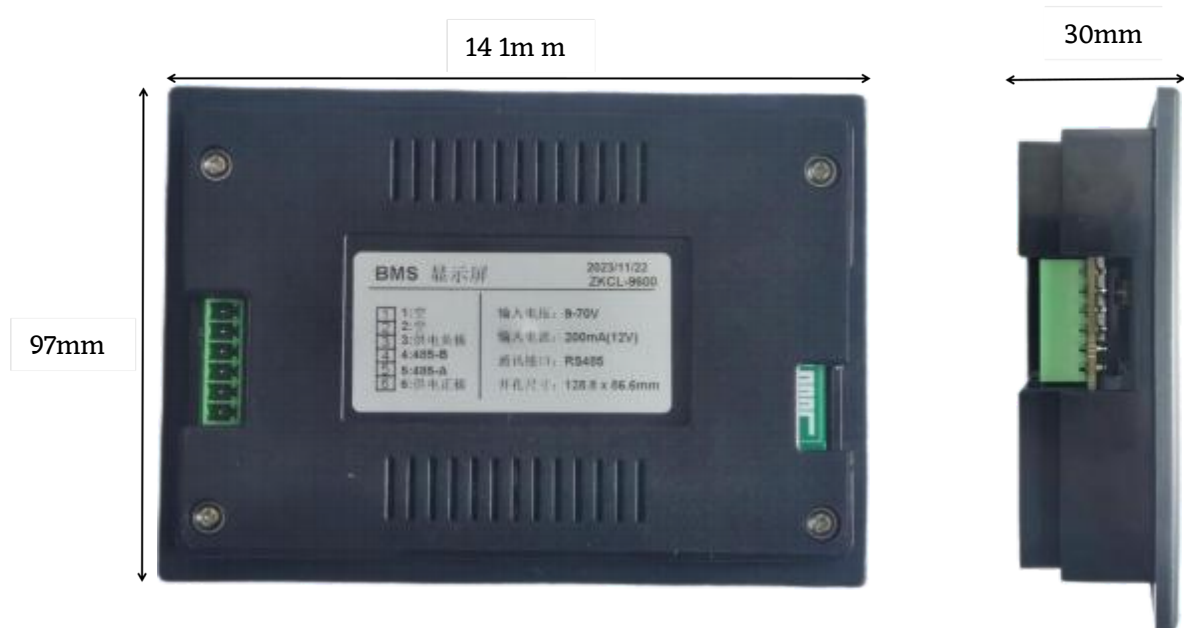
- **Maintain a distance of at least 15 centimeters between any heating equipment or device in a closed space and the battery. Install a strong exhaust fan, starting at an ambient temperature of  $\geq 35^{\circ}\text{C}$ , to ensure safe battery use.**
- **Avoid connecting the positive and negative load terminal electrodes to the same battery group in parallel connections of more than two sets (including two sets). Utilize Y-type wiring method or split-point wiring with same cable length to maintain consistent charging and discharging currents between battery groups.**
- Check the positive and negative installation and fixing nuts, as well as the series-connected overcurrent protection device every six months or during maintenance for reliability.
- Quality assurance does not cover faults or events caused by human or force majeure.
- Effective technical communication is essential to address any misunderstandings or ambiguities.

## Display

### Introduction to the display screen interface



- 1 Display the current total battery voltage, total current, and total power
- 2 Communication indicator light: The red light flashes when the communication connection with the battery is successful, and the green light is always on to indicate that there is no communication or the battery is not connected.
- 3 Display the current battery maximum cell temperature, minimum cell temperature, maximum cell voltage, and minimum cell voltage
- 4 SOC: current battery power remaining in percentage
- 5 Battery status: Idle, Charging Or Discharging



Display interface definition, wiring harness definition

| Pin | Allocation                 | Harness               |
|-----|----------------------------|-----------------------|
| 1   | Empty                      | N/A                   |
| 2   | Empty                      | N/A                   |
| 3   | Power supply negative pole | Black 0.25 mm2        |
| 4   | 485-B                      | Green 0.25 mm2        |
| 5   | 485-A                      | Yellow&Green 0.25 mm2 |
| 6   | Power supply positive pole | Red 0.25 mm2          |

