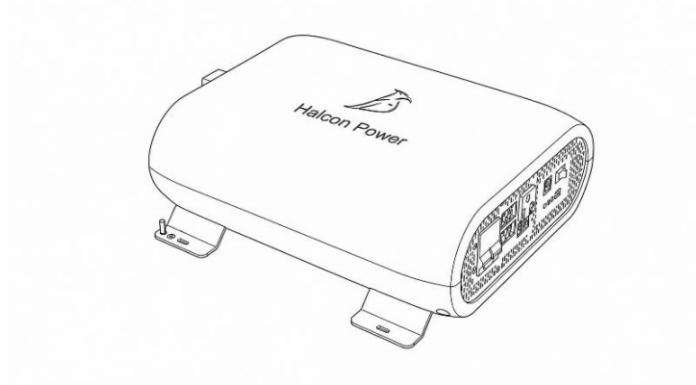
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HALIC123KW

Pure Sine Wave High-frequency Inverter Charger User Manual



Version:V1.11

Contents are subject to changes without prior notice.

Dear Customer:

Thank you for choosing our Halcon Power products!

Important Safety Instructions

Please keep this manual for future reference!

- This product is specifically designed for low-voltage, high-current batteries. The maximum voltage must not be exceeded at either the battery terminals or the AC input.
- **This product does not feature reverse connection protection. The manufacturer assumes no liability for any safety incidents resulting from over-voltage or reverse connection. To protect your interests, please verify that the wiring and input voltage are correct before powering on the device to avoid any danger or loss.**
- The manufacturer assumes no liability for any damage to the equipment resulting from use outside the specified parameters.

This manual contains all safety, installation, and operating instructions for the HALIC series of pure sine wave high frequency inverter/charger (here in after referred to as "the inverter charger"). Please read all instructions and precautions in the manual carefully before installation and use.

⚠ IMPORTANT SAFETY WARNINGS

Electric Shock Hazard

- This equipment contains **high voltages** that can cause serious injury or death.
- Do not open the enclosure. No user-serviceable parts inside.
- Disconnect all power sources (AC and DC) before servicing.
- Only qualified personnel should install or service this equipment.

Fire Hazard

- Improper installation may result in **fire or overheating**.
- Ensure correct cable sizing and secure connections.
- Do not install near flammable materials.
- Never block ventilation openings.

Battery Safety

- Batteries can produce **explosive gases**.
- Do not install in sealed or poorly ventilated spaces.
- Avoid sparks, flames, or smoking near batteries.
- Use proper personal protective equipment (PPE).

⚠ Installation Requirements

- Install according to all **local electrical codes and regulations**.
- Ensure proper grounding of this product at all times.
- Use only recommended wiring and protection devices (fuses, breakers).
- Mount securely to prevent vibration or movement.

Environmental Conditions

- Do not expose the unit to **water, moisture, or extreme temperatures**.
- Operate only within specified temperature and humidity ranges.

Proper Use

- Use only for intended applications as described in this manual.
- Do not connect incompatible devices or exceed rated capacity.
- Incorrect configuration may damage the unit or connected equipment.

Do Not Modify

- Unauthorized modifications will **void warranty** and may create unsafe conditions.

Keep Out of Reach of Children

- This device is not intended for use by children or untrained persons.

⚠ Emergency Procedures

- In case of smoke, unusual smell, or noise:
  - Disconnect power immediately
  - Do not touch the device until it has cooled
  - Contact qualified service personnel

➢ These symbols in the manual indicate that you should read the relevant safety precautions very carefully



This means that an electrical shock is possible.



Caution: Potential dangers that may damage devices if they are not avoided.

Qualified Personnel

The installation and service of the inverter charger must be carried out by qualified personnel. Qualified personnel refer to trained and licensed electricians or installers with all the following skills and expertise:

- ◆Knowledge of the functional principles and operation of on-grid and off-grid energy storage system;
- ◆Knowledge of the risks and dangers associated with the installation and service of electrical devices and acceptable mitigation methods;
- ◆Knowledge of the installation and service of electrical devices;
- ◆Knowledge of and adherence to the user manual and all safety precautions and best practices;
- ◆Knowledge of local installation regulations;
- ◆Electrical license for the installation and service of energy storage system required by the county or state;

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1. Introduction

1.1 Overview

The HALIC series of pure sine wave high frequency inverter charger integrates a pure sine wave inverter, battery charger, and utility bypass switch into one intelligent device. he inverter charger utilizes advanced full-digital intelligent control technology combined with a dual closed-loop voltage and current control algorithm. This enables fast dynamic response, high conversion efficiency, low harmonic distortion, and stable operation.

The HALIC Series is an integrated mobile power solution designed for standard North American 50AA, 120/240VAC split-phase systems. When connected to a utility grid or generator, the unit can bypass both lines of a 120/240V input, allowing full 50A capacity for simultaneous battery charging and load support.

When operating from a single-phase 120V source, the HALIC accepts power through the L1 input to support both charging and bypass load operation.

High power-density components and long-life design ensure continuous, full-power output over extended periods. Comprehensive electronic protection features further enhance system safety and reliability.

The HALIC Series inverter charger is specifically engineered for RV applications, combining inverter and charger functionality in a single unit. Its high surge and continuous load capacity supports a wide range of household appliances, including air conditioners, electric kettles, hair dryers, induction cooktops, and coffee machines—providing the convenience of home-style power while on the road.

12 Features

Key Features

- **Stable and fast performance**
  Uses advanced digital control to provide quick response and reliable operation.
- **Pure sine wave output**
  Delivers clean, stable power that is safe for sensitive electronics.
- **Handles heavy startup loads**
  Designed to support appliances with high starting currents, such as motors and compressors.
- **Multiple outlet options**
  Available with different socket types to suit various countries and regions.
- **Supports multiple battery types**
  Compatible with sealed, gel, and lithium batteries for flexible use.
- **Automatic lithium battery activation**
  Can automatically wake up and start charging lithium batteries.
- **Smart 6-stage charging**
  Charges batteries efficiently while helping extend battery life.
- **Adjustable charging settings**
  Charging current and cut-off levels can be set to match your battery.
- **Automatic power sharing**
  Adjusts charging power based on the connected load.
- **Comprehensive protection**
  Includes protection against over/under voltage, overload, short circuit, overheating, and fan faults.
- **UPS (Uninterruptible Power Supply) function**
  Automatically switches between grid power and inverter power without interruption.

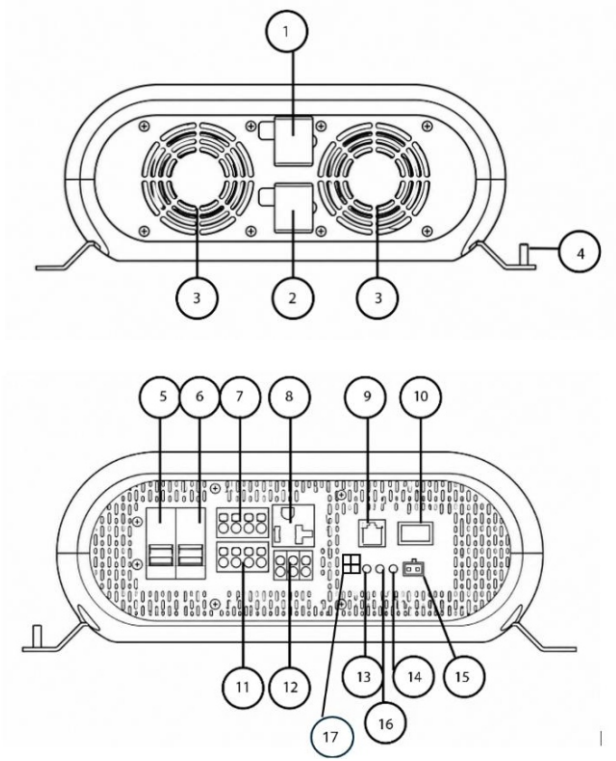
Additional Features

- **Energy efficient design**

Low power consumption in standby mode and high overall efficiency.

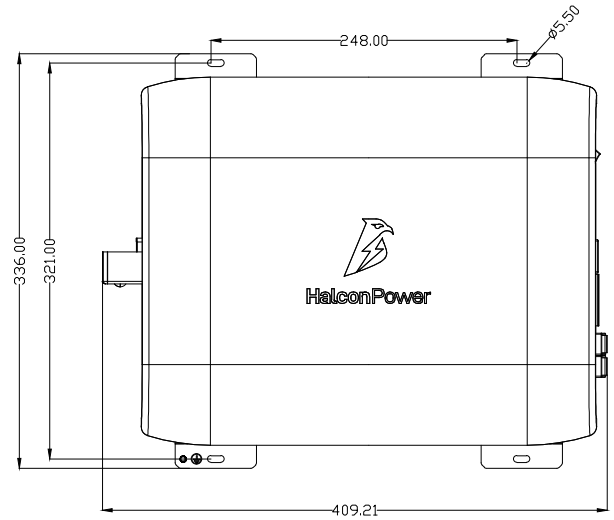
- **Smart cooling system**
  Automatically controls the cooling fan and detects if airflow is blocked.
- **Adjustable output settings**
  Output voltage (100–127VAC) and frequency (50/60Hz) can be configured.
- **Flexible AC bypass capability**
  Supports dual-line bypass to handle complex power situations.
- **Built-in leakage protection (RCD)**
  Enhances safety during operation.
- **High electromagnetic compatibility (EMC)**
  Works reliably in environments with strict power quality requirements.
- **Wireless monitoring (Bluetooth)**
  Check system status, real-time data, and faults using a mobile app.
- **Communication interfaces**
  Supports RS485 and CAN (RV-C) communication for system integration.
- **Remote control capability**
  Can be turned on/off remotely using an external switch or relay.
- **Advanced protection system**
  Hardware and software protections ensure safe and stable operation.
- **Flexible input options**
  Supports both single-phase and split-phase power inputs for different applications.

1.3 Appearance and interface description



NO.	Name	NO.	Name
1	Battery input positive terminal	10	Operating mode switch
2	Battery input negative terminal	11	240V AC output terminal
3	Cooling fans	12	120V AC output terminal
4	Input ground terminal	13	Inverter indicator light
5	Output 120V breaker	14	Charging indicator light
6	Output 240V breaker	15	Fault indicator light
7	AC input terminal	16	External On/Off switch contact interface
8	120V output standard socket	17	CAN Terminal
9	RS485 communication interface		

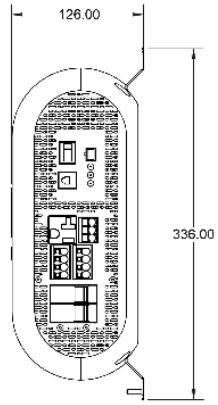
1.4 Dimensional drawing



Product size： 409*336*126mm

Installation size：248*321mm

Hole size： φ5.5mm



2. Technical Parameters

Product model	HALIC123KW
Inverter mode:	
Output Power rating	3000W
Surge Power Rating	6000W
Output power factor	1.0
Output voltage	100/110/115/120VAC(default)/127VAC(±3%)
Output frequency	50HZ/60HZ(default)(±0.1%)
Output wave	Pure sine wave
Output harmonic component	THDV<4%(pure resistance load)
Rated input voltage	12VDC
Input voltage range	10.8~15.5V
Rated output efficiency	>87.0%
Maximum output efficiency	>92%
No-load loss	<19.5W
ECO energy-saving mode loss	<6W
ECO starting power	<30W,30~100W adjustable
ECO interval time	1min,30s~30min adjustable
N-G grounding	Supported, enabled by default
Charger mode:	
AC input voltage	90~140VAC(Single phase)/180~280VAC(Phase separation)
AC input frequency	45~65HZ
Rated charging current	200A
Maximum charging current	The default is 200A, and 0~200A is adjustable.
Full cut-off current	The default 0A, 0~20A adjustable
Battery type	USE/FLD/GEL/LI/SLD
Other parameters:	
AC in rated input current	52A
AC in maximum input current	The default is 50A,0 ~50A adjustable
AC out1 rated current	25A
AC out2 rated current	50A
120/240VAC output terminal rated load current	50A

AC output priority	Mains priority (default)-access to mains for charging and bypass loading; Inverter priority-when the battery voltage is greater than a certain value, the access to the mains will give priority to inverter load; When the battery voltage is less than A certain value will be switched to mains charging and bypass loading, and then it will be converted to inverter output when the battery meets the requirement of constant voltage charging for 2 hours
Battery voltage of inverter to bypass when inverter takes precedence	<13.2V(12.0~14.0V adjustable)
Inverter priority switching back conditions	Bypass output mode only (battery voltage >14.2*N (where N denotes the system voltage level) maintained for 3 minutes)/ Bypass with charging mode (constant voltage charging for 2 hours)
UPS switching time	<10ms
RCD switch	240V/50A_30mA RCBO switch
Communication function	Bluetooth, RS485, and CAN (RV-C)
Remote power ON/OFF interface	Supported
RTC real-time clock	Supported
Power assist	Supported
Indicator Lights	Green-inverter indication; Yellow-charging indication; Red-Fault indication
Protection functions	DC input over-voltage/ over-discharge protection, AC output overload/short-circuit protection, AC input over-voltage/ under-voltage protection, device over-temperature protection, fan stall protection
Operating ambient temperature	-20℃~60℃
Storage ambient temperature	-35℃~80℃
Relative humidity	5%~95%
Protection level	IP20
Heat-dissipating method	Natural heat dissipation + intelligent air cooling
Noise	≤60dB
Product dimensions	400x336x116mm, 15.8”x11.9”x4.6”
Installation dimension	230x284,φ5mm, 9.06”x11.18”xdia,0.2”
Net weight	8.7kg (19.2lb)

3. Product Functions Introduction

3.1 Charging curve

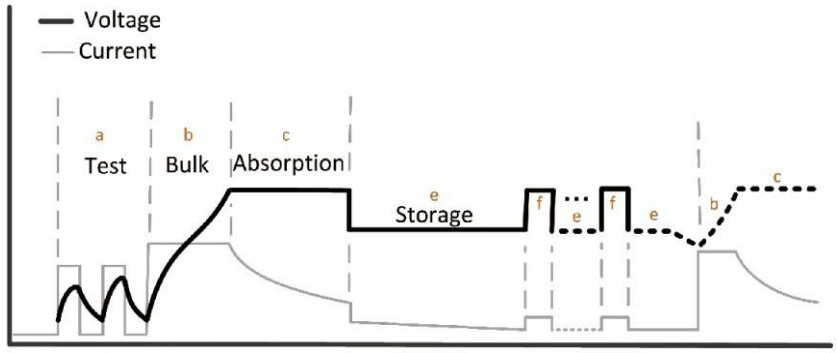


Figure 1 Charging curve of lithium battery

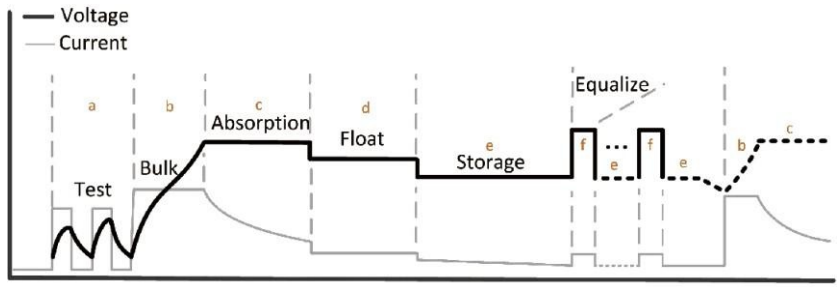


Figure 2 Charging curve of lead-acid battery

3.2 Charging Stages Explained

The charger uses several stages to safely and efficiently charge the battery:

Stage A – Precharge (Test)

Lead-acid batteries or lithium batteries are deeply discharged or not charged for a long time, resulting in a very low battery voltage, even down to 0V. After the charger is connected, the charging current will be limited to 8% of the set charging current and the battery will be pre-charged by pulse voltage. When the battery voltage is charged above 11.0V*N, it will enter "Bulk" charging.

Stage B--High current charging--Bulk

When the battery voltage is less than the constant charging voltage, the charger charges the battery quickly with the set charging current. When the battery voltage is charged to the constant-voltage charging voltage, it will enter "Absorption" charging.

Stage C--Absorption charging--Absorption

At the end of "Bulk" charging, the battery voltage rises to the "Absorption" voltage, and the charger will maintain the "Absorption"voltage to charge the battery at constant voltage.
In the lead-acid battery mode, keep the "Absorption" voltage for 2 hours (or a user-defined time), and then enter the "Float" charging;
In the lithium battery mode, if the charging current is less than 5% of the set charging current after charging at the "Absorption" voltage for 2 hours (or a user-defined time), it will enter the "Storage" charging; If the charging current is greater than 5% of the set charging current, it will continue to be charged in "Absorption", and after more than 48 hours, it will also be charged in "Storage" to further reduce the charging voltage.

Stage D – Float Charging (Lead-Acid Only)

This stage applies only to lead-acid batteries.

- After the Absorption stage (about 2 hours), the charger reduces the voltage to a lower level.
- This helps keep the battery fully charged without overcharging.
- The charger stays in Float mode for about 2 hours.
- If the charging current is still above 5% of the set current, it will continue in Float mode.
- After 48 hours, the charger will switch to Storage mode to further protect the battery.

Note: Lithium batteries do not use Float charging.

Stage E – Storage Charging

Once the battery is fully charged, the charger enters Storage mode.
The charging voltage is reduced further. This maintains the battery at full charge while minimizing wear and energy use.
It also compensates for natural self-discharge of the battery.
The charger will exit Storage mode and restart charging if any of the following happens:

i) Charging current rises above 5% of the set current for about 10 seconds.
ii) Battery voltage drops below (Storage voltage – 0.3V) for about 10 seconds.

When either condition is met, a new charging cycle begins.

Stage F – Equalization (Balance Charging)

This stage mainly applies to lead-acid batteries.
If the battery stays in Storage mode for a long time, the charger will perform an equalization charge every 7 days.
This helps:

- Balance the voltage across battery cells.
- Improve chemical reactions inside the battery.
- Extend battery life.

During this stage:
Lead-acid batteries are charged at a higher equalization voltage.
Lithium batteries use the Absorption voltage instead.

Full

During the constant voltage stage (Stages C/D), the charger monitors the charging current.

- When the charging current drops below the full cut-off current for 1 minute, the charger will stop charging
- At this point, the battery is considered fully charged

If the battery voltage later drops below (Storage voltage – 0.3V):
The charger will restart a new charging cycle to recharge the battery

3.3 Battery parameter table

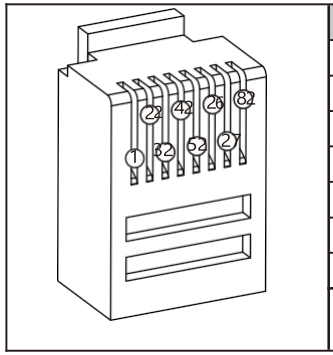
Battery type / Parameter item	Sealed lead-acid (SLD) (default)	Gel battery (GEL)	Flooded battery (FLD)	Lithium battery (LI)	Customized (USE)
Over-voltage disconnect voltage	15.5V	15.5V	15.5V	15.5V	10.8~15.5V
Over-voltage Recovery Voltage	14.5V	14.5V	14.5V	14.5V	10.8-14.5V
Limited charging voltage	15.2V	15.2V	15.2V		10.8~15.2V
Equalizing voltage	14.6V	——	14.8V	——	10.8~15.2V
Absorption voltage	14.4V	14.2V	14.6V	14.4V	10.8~15.2V
Float voltage	13.8V	13.8V	13.8V	——	10.8~15.2V
Storage voltage	13.2V	13.2V	13.2V	13.5V	10.8~15.2V
Over-discharge voltage	11.1V	11.1V	11.1V	12.3V	10.8~15.2V
Over-discharge restoring voltage	12.6V	12.6V	12.6V	12.6V	10.8~15.2V
Equalizing charging interval	7days	--	7days	——	0~60days (0 indicates off)
Equalizing charging time	60min	60min	60min	——	0~60min
Absorption voltage time	120min	120min	120min	120min	10~600min
Float voltage time	120min	120min	120min	——	Equal to increasing charging time

Note: The above parameters apply at 25°C/12V. For system voltages of 12V/24V/36V/48V, the corresponding voltage points are automatically multiplied by N= 1/2/3/4,N association full text.

4. Description of Communication Interface Function

4.1 RS485 communication interface

- Default baud rate: 9,600 bps, check bit: none, data bit: 8 bit, stop bit: 1 bit.
- Interface type: RJ45.
- The RS485 communication line sequence is defined as follows, with RS485 interface integrating to CAN communication interface.



No.	Definition
①	CAN_L
②	CAN_H
③	NC
④	NC
⑤	GND
⑥	B/D-
⑦	A/D+
⑧	Power Supply Positive

4.2 CAN communication

The built-in CAN communication function supports: RV-C protocol, real-time monitoring of inverter charger operating data, fault status reporting, adjustment of inverter charger operating data, and adjustment of inverter charger operational settings.

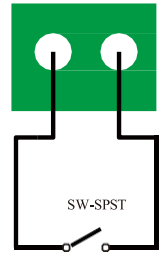
4.3 Bluetooth communication

The built-in Bluetooth communication functionality supports real-time monitoring of inverter charger operating data, fault status reporting and adjustment of inverter charger operational parameters through the Halcon Power smart phone APP.

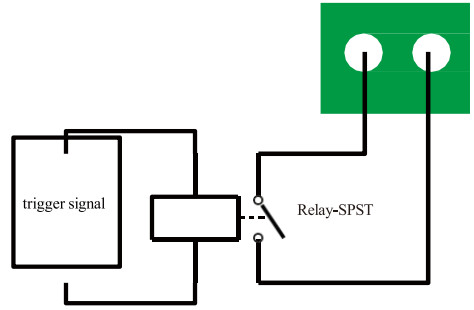
Scan the following QR code to download the Halcon Power APP:

4.4 Setting up Remote ON/OFF Switch Interface

2 Pole switch interface setup: Inverter charger can work when the interface is short-circuited; inverter charger fails to work when the interface is open. The interface can be connected to a mechanical on/off switch or relay to control the inverter charger to start/stop (this application requires keeping the inverter charger power supply in the I position) in practical application.



Application drawing 1: external mechanical switch



Application drawing 2: external relay switch

4.5 Operating mode power switch

When using the 3-position rocker switch, with the Remote ON/OFF interface in the closed state, the inverter has three operating modes: OFF, Ⅰ, and Ⅱ.

Switch position	Definition of mode	Description of mode
OFF	OFF mode	The device is in off state, not working, and has no power loss
Ⅰ	Normal mode	The device is in normal operating condition and can provide inverter output or battery charged based on the battery and AC input conditions
Ⅱ	Charging mode only	The device is only used for battery charging or bypass mode and will not operate in inverter mode

4.6 LED indicator lights

- Inverter mode indicator light -green; Charging indicator light -yellow; Fault indicator light -red.
- Indicator lights are defined as follows:

Mode	Indicator Light Color	State	State description
Inverter	Green	Normally on	Inverter output
		Slow flash	Inverter ECO output
		OFF	Inoperative inverter
Charger	Yellow	Normally on	Battery is fully charged or AC in access is not charged/or only bypass output
		Slow flash	Absorption charge
		Single flash	Float charging/float or storage charging/storage
		Fast flash	Equalizing charging/equalize
		Double flash	Current-limited charging/bulk/test
		OFF	No AC in connected
Fault	Red	Normally on	System fault
		Single flash	Stand-by, no inverter or not charging
		OFF	Normal system
Definition of indicator flashing:			
Slow flash	1s ON, 1s OFF in 2s		
Single flash	0.1s ON, 1.9s OFF in 2s		
Double flash	0.1s ON, 0.1s OFF, 0.1s ON and 1.7s OFF in 2s		
Fast flash	1s ON, 0.1s OFF in 0.2s		

5. Installation Instructions

5.1 Installation precautions

Please read this manual carefully before installation to ensure full understanding of the procedures and requirements.

- **Battery Safety** (exercise caution when installing batteries)
  - When working with lead-acid batteries, always wear appropriate personal protective equipment, including safety goggles.
  - In case of contact with battery acid, rinse immediately with clean water and seek medical attention if necessary.
- **Short-Circuit Prevention**
  - Keep metal objects away from battery terminals to prevent short circuits.
- **Ventilation Requirements**
  - Batteries may emit flammable and corrosive gases during charging.
  - Ensure the installation area is well-ventilated at all times.
- **Installation Environment**
  - Do not install the inverter/charger and lead-acid batteries in the same enclosed cabinet, as gases emitted from the batteries may cause corrosion and damage.
- **Wiring and Connections**
  - Incorrect or loose connections, as well as corroded cables, can generate excessive heat, potentially leading to insulation failure, fire hazards, or equipment damage.
  - Ensure all electrical connections are properly tightened.
  - Secure cables using appropriate ties or clamps to prevent movement and loosening during operation.

- **Cable Sizing**
  - Select system connection cables with a current density of **≤ 5 A/mm²** to ensure safe and efficient operation.
- **Outdoor Installation**
  - When installed outdoors, protect the inverter/charger from direct sunlight and rain exposure. Use appropriate enclosures or shielding where necessary.
- **Electrical Safety**
  - Even after the power switch is turned off, hazardous voltages may remain inside the inverter/charger. Do not open the unit or touch internal components until sufficient time has passed for internal capacitors to fully discharge.
- **Installation Environment**
  - Do not install the inverter/charger in harsh environments, including areas that are: damp or humid, oily or contaminated, flammable, explosive or excessively dusty
- **Battery Connection Polarity**
  - Ensure correct polarity when connecting the battery terminals.
  - Reversed polarity may cause equipment damage or create serious safety hazards and void your warranty.
- **High Voltage Warning**
  - The AC output terminals carry high voltage. Do not touch exposed wiring during operation.
- **Moving Parts**
  - Do not touch the cooling fan while the unit is operating to avoid

5.2 Wiring specifications and circuit breaker selection

Wiring and installation must comply with national and local electrical codes.

- Battery input wiring specifications and circuit breaker selection:

Model	Rated input current	Battery input wiring specifications	Circuit breaker selection
HALIC123KW	291A	80mm²/(1AWG*2)	DC-2P-350A

- **System Configuration**
  - Ensure the inverter/charger is the **sole power source** connected to the load.
  - Do not connect or operate it in parallel with other AC input power sources, as this may result in equipment damage or unsafe conditions.
  - AC output wiring specifications and circuit breaker selection:

Model	Rated output current	AC output wiring specifications	Circuit breaker selection
HALIC123KW	50A	13mm²/6AWG	AC-50A

- AC input wiring specifications and circuit breaker selection:

Model	Rated input current	AC output wiring specifications	Circuit breaker selection
HALIC123KW	50A	13 mm²/6AWG	AC-50A

Attention: The above are reference specifications. Please select the appropriate specification and model according to actual situation.

Attention: The wiring diameter is for reference only. If the distance between the inverter charger and improve system performance.

Attention: The above only recommended wiring diameter and circuit breaker. Please select the appropriate wiring and diameter and circuit breaker to actual situations.

5.3 Check the AC Loads (Appliances)

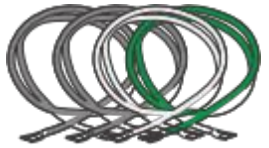
It works seamlessly with both 120V and 240V grid power systems and outputs of 120V or 240V AC voltage.
In accordance with the AC input voltage, hoose proper accessories and cables based on the rated voltage of the connected AC Loads (Appliances)

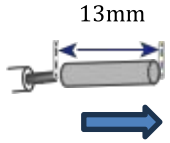
AC Input Voltage	AC Output Voltage
Split-phase 120V/240V	120V/240V
Single-phase 120V	120V
0V (when grid power is unavailable)	120V

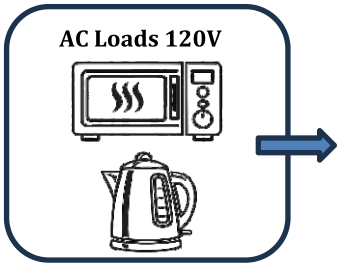
- **Recommended Components & Accessories**

Recommended Cable Size

Cable Length	Cable Size
0ft to 10ft	6 AWG
11ft to 20ft	4 – 6 AWG
21ft to 30ft	4 AWG

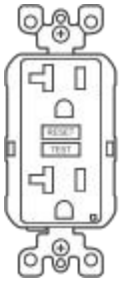






Total Load Power

Grid Power	Ratings
Unavailable	<=3000W @120V
Available	<+600W @120V/240V



Recommended GFCI Spec

Grid Power	Ratings
Unavailable	≥25A@120V
Available	≥50A@120V
	≥50A@240V

5.4 Installation and wiring

Installation steps:

Step 1: Please read the user manual carefully.

Step 2: Determine the installation position and the space for heat dissipation before installing the inverter/charger.

Wall-mounted or horizontal installation is supported: when installing the inverter/ charger, confirm that there is at least 200mm (7.9") of space available between the air exhaust vent and air intake of the inverter/charge to facilitate air circulation and device cooling. Do not install any other device or hardware within 200mm of the air intake and exhaust vents.



Step 3: Wiring

Warning: The AC device loads power by the inverter charger shall be determined based on the inverter charger's continuous output power. Exceeding the output power of the inverter/charger may cause the inverter/charger to be damaged.

Attention: Before connecting any wiring, switch the inverter charger to the OFF.

Attention: Do not close the circuit breaker or fuse during wiring, and check if the electrode leads of each component are properly connected.

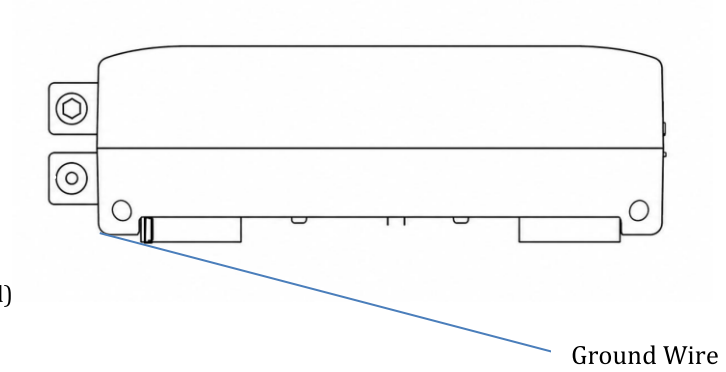
Attention: A fuse must be installed at the battery terminal, selected at 2 to 5 times the rated input current of the inverter charger, and the fuse position should be no more than 150mm from the battery terminal.

Attention: There is no reverse connection protection for the input, check if the Positive and Negative are connected correctly before connecting

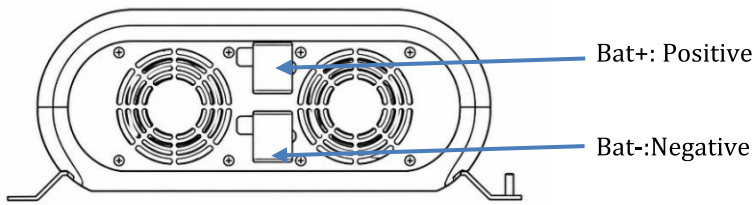
Attention: If the device is installed in a closed box, ensure that heat dissipation is allowed by way of vent or fan in the box. Otherwise, heat will accumulate and increase the operating temperature of the inverter/charger such that the output power will derate.

Wiring Sequence:

3.1 Ground Wire Installation (install on grounding stud)



3.2Positive/Negative Battery Wire Installation



Attention: There is no reverse polarity connection protection for the battery input. Check if the Positive and Negative wires are correct before connecting, or the inverter charger may be damaged and your warranty is void!

3.3 AC equipment

For a split-phase 120V/240V AC input system with L1, L2, and neutral (N) :

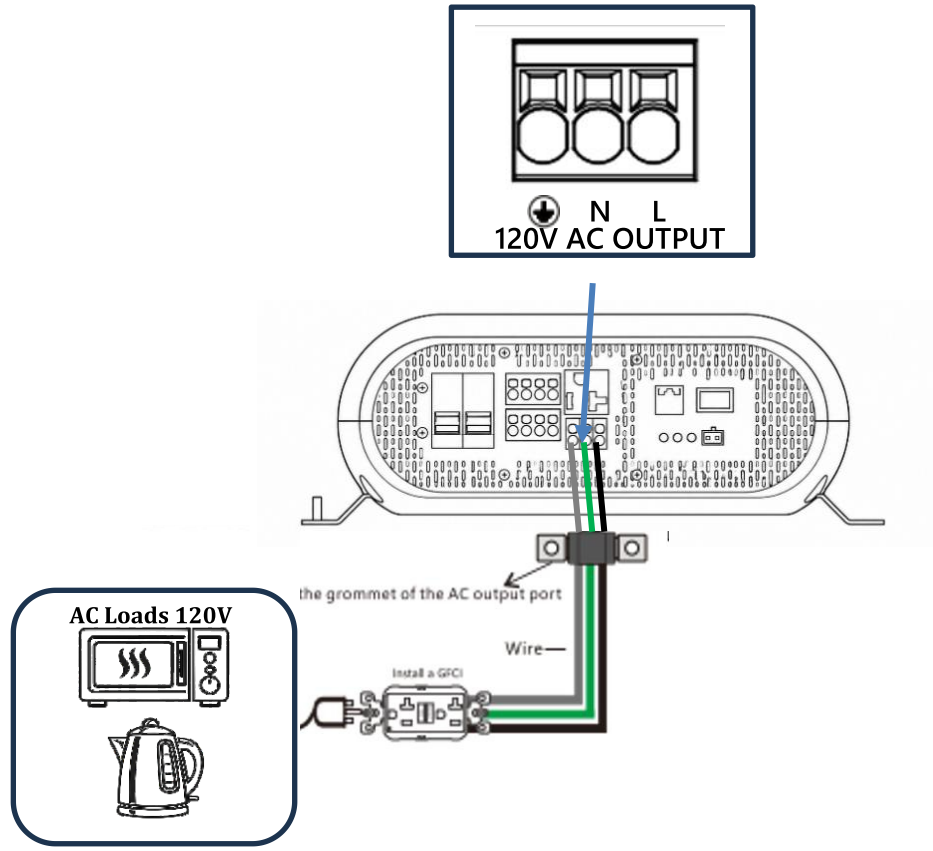
- When the AC output is connected to L1, L2, and neutral (N), the inverter charger outputs 240V.
- When the AC output is connected to L1 and neutral (N), the inverter charger outputs 120V.
- For a single-phase 120V grid system or when no grid power is available, the inverter charger outputs 120V.
- Single-phase output 120V

Step 1: Strip some insulation (0 .39 in/10 mm) off each of the three bare wires with a wire stripper, and run the three bare wires through the grommet of the AC Output Port on the inverter charger.

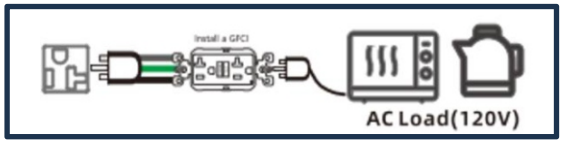
Step 2 : Connect the bare wires to the live (L1), neutral (N) and ground ( ) terminals respectively on the inverter charger.

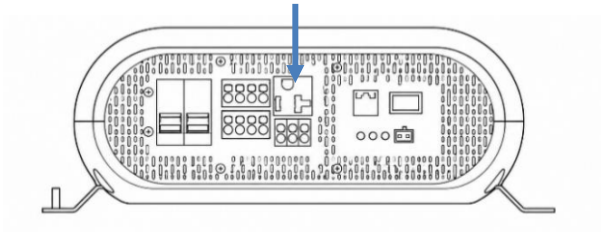
Step 3: Locate the live, neutral, and ground terminals on the GFCI, and connect the bare ends of the respective terminas on the GFCI. The L1 terminal of the inverter charger should be connected to the live terminal on the GFCI. The same rules apply to the neutral and ground terminals.

Step 4: To ensure optimal performance of the inverter charger, it is recommended that the GFCI should be connected to the AC loads after the inverter charger is securely powered on with necessary with necessary wiring completed.



- The inverter is equipped with a standard AC output terminal as shown in the figure. The terminal has a maximum current rating of 16A, and an internal fuse is provided to the protect the terminal from damage due to over current. Follow the connection terminal steps shown on the next page.





Split-Phase 120V/240V

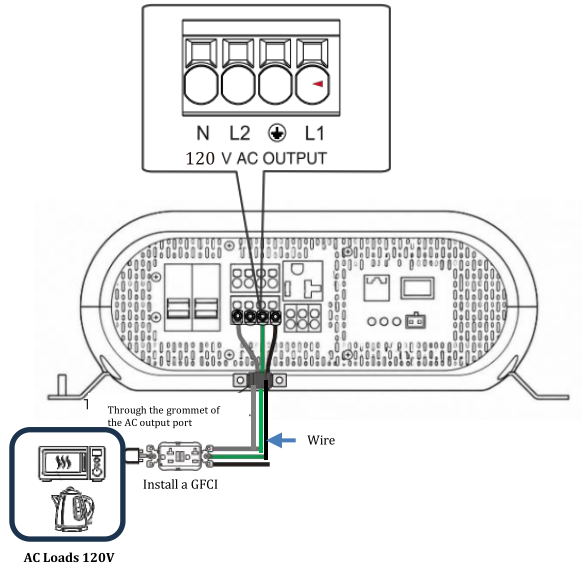
- 120V Output Wiring

Step 1: Strip some insultiaon (0.39 in/100mm) off each of the three bare wires with a wire stripper.

Step 2: Connect the bare wires to the live (L1), neutral (N) and ground (⏚) terminals respectively on the AC output port of the inverter charger.

Step 3 : Locate the live, neutral, and ground terminals on the GFCI, and connect the other ends of the bare wires to the respective terminals on the GFCI. The L1 terminal of the inverter charger should be connected to the live terminal on the GFCI. The same rules apply to the neutral and ground terminals .

Step 4 : To ensure optimal performance of the inverter charger, it is recommended that the GFCI should be connected to AC loads after the inverter charger is securely powered on with necessary wiring completed.



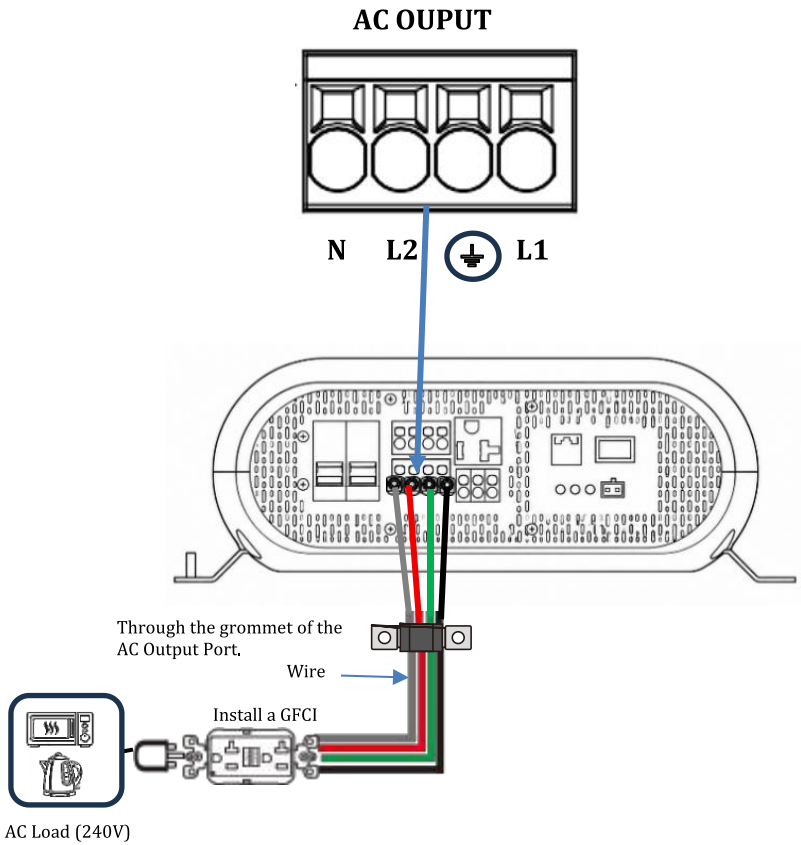
◆240V output wiring:

Step 1: Strip some insulation (0.39 in/10 mm) off each of the four bare wires with a wire stripper, and run the four bare wires through the grommet of the AC Output Port on the inverter charger.

Step 2 : Connect the bare wires to the live (L1 and L2), neutral (N) and ground (⏚) terminals respectively on the inverter charger.

Step 3 : Locate the live, neutral, and ground terminals on the GFCI, and connect the other ends of the bare wires to the respective terminals on the GFCI. The L1 and L2 terminals of the inverter charger should be connected to the live terminal on the GFCI. The same rules apply to the neutral and ground terminals .

Step 4 : To ensure optimal performance of the inverter charger, it is recommended that the GFCI should be connected to AC loads after the inverter charger is securely powered on with necessary wiring completed.



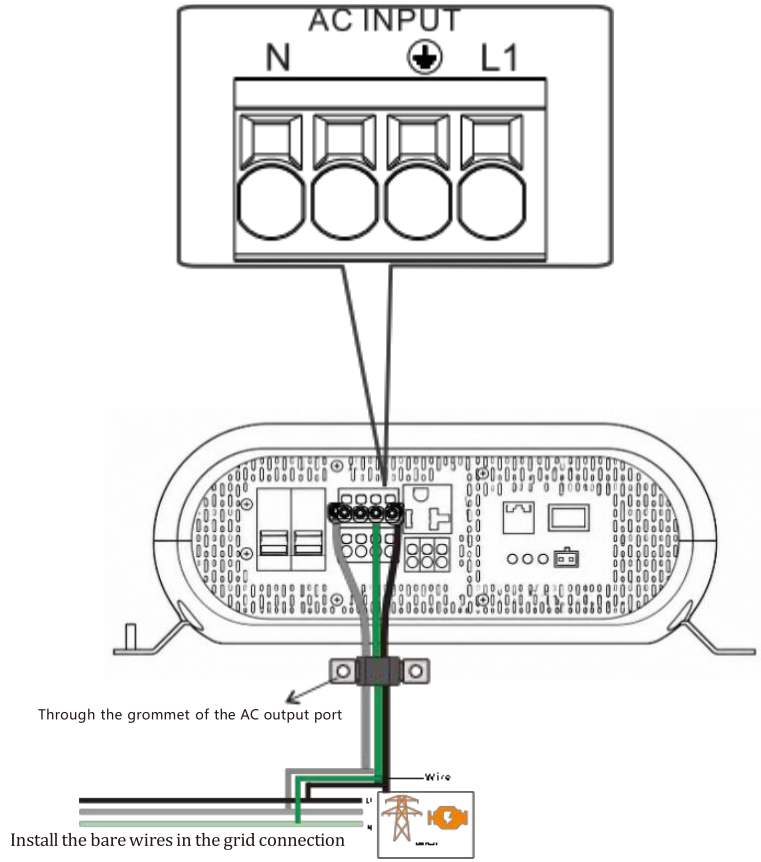
3.4 AC Input

◆Single-phase 120V

Step 1: Strip some insulation (0.39 in/10 mm) off each of the three bare wires with a wire stripper, and run the three bare wires through the grommet of the AC Input Port on the inverter charger.

Step 2 : Connect the bare wires to the live (L1), neutral (N) and ground (⏚) terminals respectively on the inverter charger.

Step3 : Locate the live, neutral, and ground terminals on the grid, and connect the other ends of the bare wires to the respective terminals on the grid. The L1 terminal of the inverter charger should be connected to the live terminal on the grid. The same rules apply to the neutral and the ground terminals.



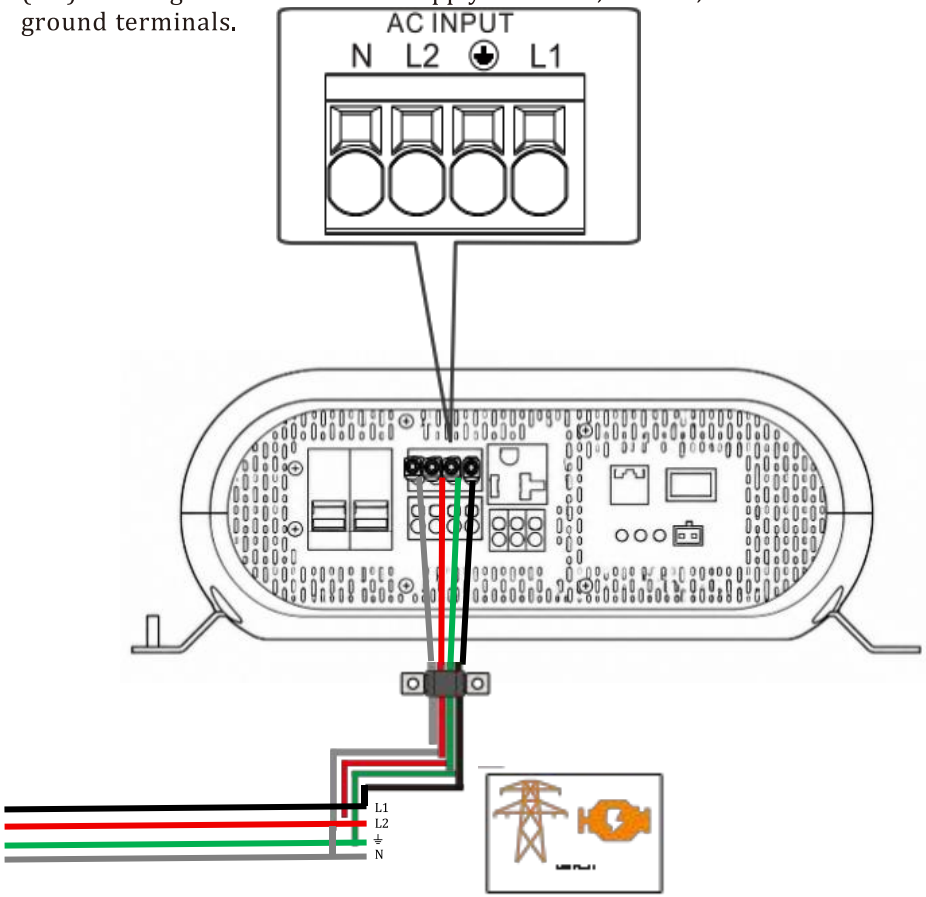
◆Split-phase 120V/240V

The 240VAC output is only available when the inverter charger is supplied by a split phase 120/240VAC source.

Step 1: Strip some insulation (0.39 in/10 mm) off each of the four bare wires with a wire stripper, and run the four bare wires through the grommet of the AC Input Port on the inverter charger.

Step 2 : Connect the bare wires to the live (L1 and L2), neutral (N) and ground (⏚) terminals respectively on the inverter charger.

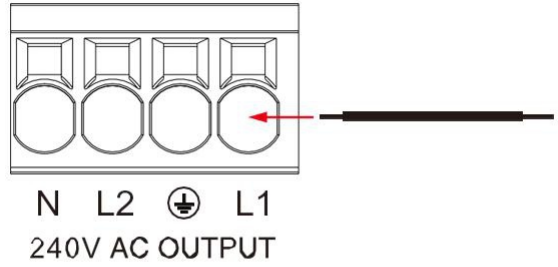
Step 3 : Locate the live, neutral, and ground terminals on the grid, and connect the other ends of the bare wires to the respective terminals on the grid. The L1 terminal of the inverter charger should be connected to the live terminal (L1) on the grid. The same rules apply to the L2, neutral, and ground terminals.

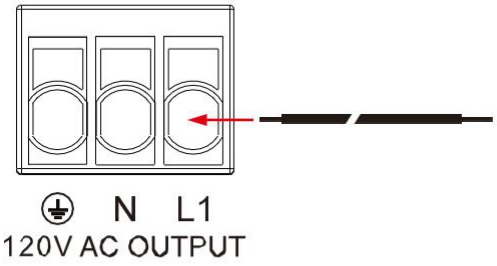


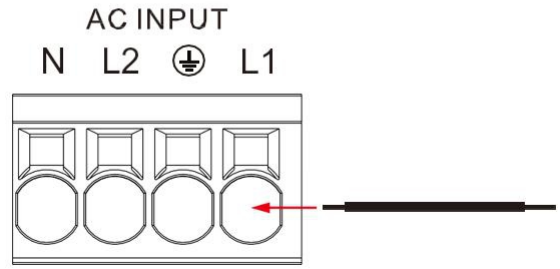
Attention: It is recommended to use 13 mm^2/6AWG copper wire or thicker. The
wire size can be increased as appropriate according to actual requirements .

Attention: If stranded wire is used , apply solder to the wire end to form a solid tip
before inserting it into the corresponding terminal hole .

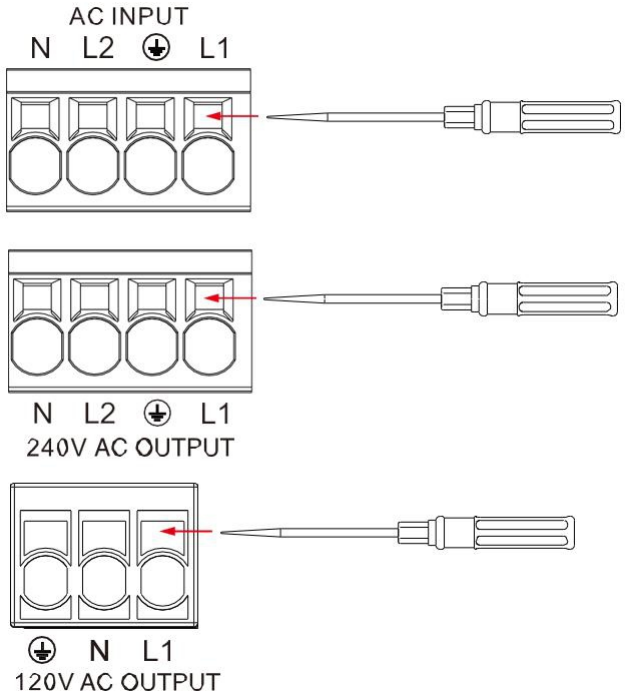
Attention: Connect the ground wire first , then connect the live wire (L) and the neutral wire (N) .



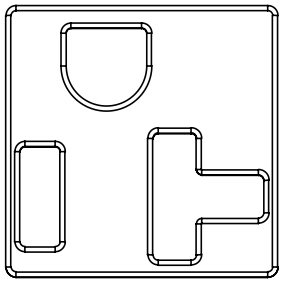




- When removing the wiring turn off the inverter first, then use a sharp tool to insert the small hole above the interface and pull out the connection wire forcefully.



The inverter is equipped with a standard U.S. terminal, as shown in the figure below. The terminal has a maximum current rating of 16 A.



Step 4: Start the inverter charger

4.1 Close the circuit breaker at the DC input end of the inverter charger or the fuse at the battery end;

4.2 Short-circuit the external on/off switch contact interface of the inverter charger (the factory default is short-circuited);

4.3 Set the inverter charger mode switch to the ON position to start the inverter charger output: the running indicator light is now green and the inverter charger outputs AC power normally;

4.4 Close the circuit breaker on the AC load line, turn on the AC loads one by one, and check the operating status of the inverter charger and loads to ensure they are normal;

4.5 If the fault indicator turns red and the buzzer sounds after starting the inverter charger, please turn off the load and the inverter charger and refer to "Common Problems and Solutions" for troubleshooting. After troubleshooting follow the above steps again.

6. Protection Function

6.1 DC input overvoltage protection

When the battery voltage is greater than the input over-voltage protection voltage, the inverter/charger will turn off the AC output, and the fault indicator will light up red and the buzzer will sound; When the battery voltage is less than the input over-voltage protection voltage by -1V, AC output will be restored from the inverter/charger.

Attention: Although the inverter charger has the function of DC input over-voltage protection, the input voltage of 12V system should not be higher than 20V.

6.2 AC input low voltage protection

When the battery voltage is less than the input low-voltage protection voltage, the AC output will stop, and the fault indicator light will turn red and the buzzer will sound; When the battery voltage becomes greater than the input low-voltage again, and reaches the low-voltage protection recovery voltage, AC output is restored from the inverter/charger.

6.3 AC Output overload protection

When the AC load is greater than the rated output power, corresponding protection shall occur corresponding to the different overload levels, as follows:

Load power	Possible duration
102%≤Po≤120%	1min
120%＜Po≤150%	30s
Po ﹥150%	10s

Attention: When the inverter charger is in overload protection, the AC output has three automatic recovery functions (the first delay is 5s, the second delay is 10s, and the third delay is 15s). It won't recover automatically for the fourth time, and the AC output can only be recovered after restarting the inverter charger after troubleshooting.

6.4 AC output short circuit protection

When the AC output L/N is short-circuited, the inverter/charger automatically turns off the AC output, and the fault indicator lamp turns red and the buzzer sounds.

Attention: When the inverter/charger is short-circuit protected, the AC output has three automatic recovery functions (the first delay of 5s, the second delay of 10s and the third delay of 15s). It won't recover automatically for the fourth time, and the AC output can only be recovered after restarting the inverter charger after troubleshooting.

6.5 AC input overcurrent protection

When the AC input current of AC in is greater than 52A, the inverter/ charger will automatically disconnect the AC input, the fault indicator light will turn red and the buzzer will sound.

Attention: When the inverter charger has AC input over-current protection, the AC output has three automatic recovery functions (the first delay is 5s, the second delay is 10s, and the third delay is 15s). It will not recover automatically for the fourth time. The AC output can only be recovered after restarting the inverter charger after troubleshooting.

6.6 AC input overvoltage protection

When the AC input voltage is greater than 140VAC, the AC input will be automatically disconnected. The fault indicator light will turn red and the buzzer will sound.

6.7 AC input undervoltage protection

When the AC input voltage is less than 90VAC, the AC input will be automatically disconnected, the fault indicator light will turn red and the buzzer will sound.

6.8 Inverter N-G grounding protection

In the inverter mode, the relay inside the inverter charger controls the zero line to be connected with the ground line and the zero line of the analog mains transformer is grounded. At this time, the ground line and the zero line of the analog mains transformer is an external leakage protection and inverter can work normally and play a protective role in case of leakage.
When the mains bypass is loaded, the neutral line controlled by the relay inside the inverter charger is not connected with the ground line. Because the neutral line on the mains transformer side has been grounded, the leakage protection can work normally at this time, which plays a protective role in case of leakage. If the customer connects the zero line to the ground without authorization, it will cause the leakage protection to accidentally trigger the cut-off circuit.

Attention: It is forbidden for customers to connect the neutral wire and the ground wire by themselves, which may lead to mis-operation, danger and equipment damage.

6.9 Equipment over-temperature protection

Multi-channel temperature detection is provided inside the equipment, and any temperature greater than the over-temperature protection value of the equipment will automatically turn off the AC output, and the fault indicator lamp and buzzer will prompt; When the temperature is less the recovery value of equipment over-temperature protection, the AC output will be automatically than restored.

Attention: In order to ensure that the inverter charger can run reliably and stably at full power for a long time, please ensure a good ventilation environment.

6.10 Fan Fault Protection

When the fan is blocked or other conditions cause the fan not to run, the

i) AC output power of the inverter/ charger can only deliver 30% of the rated output power, and the AC output will be turned off when the load power is greater than 30% of the rated power.

ii) The inverter charger will support AC up to 70% of the the rated charging current. If this limit is exceeded, the AC output will shut down.

Attention: When the load power is greater than 30% of the rated power, the AC output will be turned off, and the AC output has the function of automatic recovery for three times (each delay is 60s). It will not recover automatically for the fourth time. Check the equipment and restart the inverter charger after troubleshooting to recover the AC output.

Attention: In order to ensure that the inverter charger can run reliably and stably at full power for a long time, please ensure a good installation environment, avoid oil stains, wires and other devices blocking fans, and check whether the fans are running regularly.

7 Common Problems And Solutions

No.	Phenomenon	Cause	Possible cause	Solutions
1	Red light always on, green/ yellow off, buzzer buzzing, light no AC output	Below-low battery input voltage	1.Excessive voltage drop due to small battery wiring diameter. 2. Battery wires are too long causing voltage drop. 3. Low battery power.	1.Choose the suitable wires with appropriate diameter. 2. Install the batteries closer to the inverter/charger to reduce battery wire runs. 3..Charge the battery until the low voltage recovery voltage can self-restore the output.
2	Red light always on, green/ yellow light off, buzzer buzzing, no AC output	Over-high battery input voltage	Mismatch between battery voltage and device system voltage	Measure the positive and negative terminal voltage of the battery with a voltmeter to determine whether they are higher than the over-voltage protection voltage, and recover by adjusting the input voltage on the inverter/charger.
3	Red/green light always on, yellow light off, buzzer buzzing, With AC output	Overload	Power of load device higher than rated output power	Check whether the AC load is within the rated power range of the inverter charger.

No.	Phenomenon	Cause	Possible cause	Solutions
4	Red light always on, green/ yellow light off, buzzer buzzing, no AC output	Overload	Power of load device higher than rated output power	Check whether the AC load is within the rated power range of the inverter charger; and eliminate the load overload fault and restart the inverter charger to restore normal operation.
5	Red light always on, green/ yellow light off, buzzer buzzing, no AC output	Load short-circuited	1. AC output of the inverter charger short-circuited. 2. AC device L/N short-circuited.	Check whether the AC load wiring is short-circuited. Clear the load short-circuit fault, and restart the inverter charger to restore normal operation.
6	Green light always on, yellow light off, mains connected but no charging, With AC output	AC input Over-voltage	Connected AC voltage exceeded the maximum input voltage of the device by 265V.	Check whether the connection voltage AC is within the range of 180~265V.
7	Green light always on, yellow light off, mains connected but no charging, with AC output	AC input Under-voltage	Connected AC voltage lower than the minimum input voltage of the device, 90V (single phase) and 180V (two phase).	Check whether the AC connection voltage is within the range of 180~265V in two phase or 90V to 140V in single phase operation.

No.	Phenomenon	Cause	Possible cause	Solutions
8	Red light always on, green/yellow light off, buzzer buzzing, no AC output, no charge	Over-Device high Temp. rating	Internal temperature of device higher than the set over-temperature protection.	Improve the quality of ventilation, clear the vent, reduce the temperature around the inverter charger, and restart the device after the temperature is reduced. Please derate the amount load if troubleshooting fails.
9	Red light always on, green/ yellow light off, buzzer buzzing, no AC output, no charge	Fan fault	The fan is not turning. The fan is blocked by foreign matter.	Check whether the fan works properly.
10	Red light Single flash, green/ yellow light off, no AC output, no charge	Wrong Operation Mode Setting or Wrong Battery type	1.AC-IN is not connected, but the equipment switch is in Ⅱ (Charge only) mode. 2. Lead-acid battery mode but battery is a different chemistry.	1.Turn the equipment switch to Ⅰ mode. 2.Set the correct battery type or the battery is damaged.

8 System Maintenance

To ensure reliable operation and long-term performance of your inverter/charger, it is recommended to perform the following checks **twice per year**:

- Ensure there is **adequate airflow** around the inverter/charger. Clean any dust, dirt, or debris from the heat sink and ventilation areas.
- Inspect all **exposed wiring** for damage caused by sunlight exposure, abrasion, dryness, or damage from insects or rodents. Repair or replace any damaged wires as needed.
- Verify that all **indicators and display readings** match the actual operation of the device. Check for any fault or error messages and take corrective action if required.
- Inspect all **wiring terminals** for corrosion, insulation damage, or signs of overheating (such as discoloration or burning). Tighten all terminal connections securely.
- Check for **dust buildup, insect nests, or corrosion** inside and around the unit. Clean as necessary.
- Inspect any **surge protection devices (arresters)**. Replace any failed units promptly to prevent damage from lightning or power surges to the inverter/charger and connected equipment.

Warning: Danger of electric shock! Make sure that the inverter charger power is disconnected and the power in the capacitor is discharged before carrying out the corresponding checks or operations!

Limitation of Liability

To the maximum extent permitted by applicable law, the Halcon Power Ltd. shall not be liable for any direct, indirect, incidental, consequential, or special damages, including but not limited to property damage, personal injury, loss of use, loss of data, or financial loss, arising from or related to the use of this product.

The Company assumes no liability for damages resulting from, but not limited to, the following:

- Improper installation, application, use, or maintenance of the product, including use in an unsuitable or non-compliant environment
- Operation of the inverter/charger outside its specified ratings, including exceeding current, voltage, or power limits
- Failure to follow the instructions, warnings, labels, or safety guidelines provided in this manual
- Unauthorized disassembly, modification, or repair of the product
- Damage caused by external factors, including but not limited to power surges, lightning, fire, water exposure, or other environmental conditions
- Events beyond the Hub Power Ltd.'s reasonable control, including acts of God (force majeure)
- Damage occurring during transportation, handling, storage, or installation after the product has been delivered
- Use of incompatible components, accessories, or batteries not approved or recommended by the Company

This product is intended for use only as described in this manual. Any other use may result in damage or injury and will void the warranty.