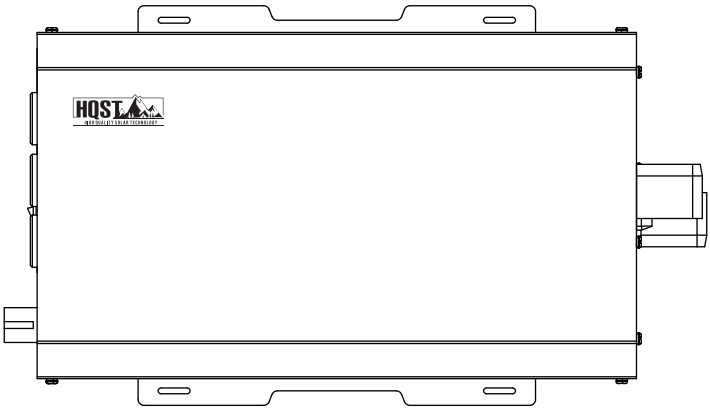
Pure Sine Wave Inverter

12V | 2000W
12V | 3000W

Model: SGPE-2000W / SGPE3000W-12V-A
SKU: HI1220PG1 / HI1230PG1



This manual includes product overview, safety guidance, and warranty details. Please read before use and keep for reference.

For assistance, email us at **sales@myhqsolar.com.**

User Guide

CUSTOMER SUPPORT

If you encounter any issues or need assistance, please reach out to us with:

a. Your purchase order number
b. A detailed description of the defect or performance issue
c. Clear photos or videos showing the issue
d. An email to **sales@myhqsolar.com**
e. Or scan the QR code below to submit a contact form (Please make sure to enter a valid, contactable email address)

BRAND INFORMATION

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IMPORTANT SAFETY GUIDELINES

Please read and follow these safety instructions before using the inverter. **Damage to the inverter or any connected equipment caused by improper installation or operation is not covered under warranty.**

⚠ Safety Precautions Before Installation

- Wear proper **protective gear,** including safety goggles, insulated gloves, and a protective mask.
- The **AC output carries high voltage.** Ensure proper insulation and avoid contact with metal parts.
- Keep the inverter away from water and moisture, and out of reach of children.
- This inverter is designed only for use with a **12V battery** (LiFePO4, AGM, SLA, etc.). Do not use 24V, 36V, or 48V batteries.

⚠ Safety During Connection

- Always **turn off** the inverter and **disconnect** it from the battery before making any connections or adjustments. This prevents injury from high-voltage output due to operational errors.
- When connecting to the battery, a small spark may occur - this is normal. **Do NOT touch terminals** during connection to avoid burns or electric shock.
- Ensure all screws are **fully tightened.** Loose screws may cause short circuits or fire.
- For mobile applications (e.g., RVs or vehicles), **use spring washers to prevent screws from loosening due to vibration.**
- Make sure all plugs are fully inserted into outlets, and that terminals and plugs are secure. Loose connections can cause poor contact, short circuits, or fire.

⚠ Usage Safety

- NEVER connect the inverter's AC output to a device also powered by another AC source (battery charger, solar controller, or DC-DC converter). Doing so may damage the inverter or other devices and void the warranty.

- Not for use by minors.
- Keep hands dry when handling the inverter. Wet hands may cause electric shock.
- Do not twist, tangle, or bundle cables together. Excess heat may cause equipment to melt, short-circuit, or catch fire.
- Do not use cables with damaged insulation.
- Do not disassemble or modify the inverter. Unauthorized changes may result in malfunction, fire, or electric shock.
- Keep the inverter dry. Exposure to water may cause short circuits, fire, or electric shock.
- **Do not place any metal objects,** especially rods or stick-like items, near the inverter, particularly by the air vents or output terminals.
    - If metal objects enter the inverter or simultaneously touch both positive and negative output terminals, it may cause short circuits or fire.
- Keep the inverter away from open flames and flammable materials.
- Do not damage the output sockets or wires. Do not cut, modify, over-bend, reverse, or pull wires. Do not place heavy objects on the wires or sockets, and keep wires away from heat sources.
- Do not use the inverter in a common-grounded power system. Connecting to a grounded system may introduce high voltage into the vehicle or equipment, creating a serious hazard.
- **Do not reverse** the positive and negative connections of the **inverter and battery.**
- **Do not reverse** the positive and negative connections of the **inverter and load devices.**
- Do not install the inverter in hot or humid environments. Exposure to heat or moisture may cause leakage, electric shock, or fire.
- Do not use the inverter to power **medical devices.**

⚠ Inverter Placement & Working Environment

- **Flat, stable surface:** Place the inverter on a solid, level surface such as the ground, car floor, or other stable area. Secure the power cord to prevent movement.
- **Dry environment:** Keep the inverter away from water, moisture, or other liquids.
- **Temperature:** Operate in a cool environment between 32°F (0°C) and 122°F (50°C) (no condensation). Do not place near heat vents, heaters, or in direct sunlight.
- **Ventilation:** Ensure airflow around the inverter. Do not block vents or place objects on top of it during operation.
- **Safety:** Keep away from combustible materials or flammable gases.
- **Battery requirements:** Use a fully charged, high-quality 12V lead-acid or lithium battery that can supply sufficient current for your loads.

⚠ Using the Inverter with Electric Tools and Household Appliances

1. Startup Current Surge:

Many electric tools, household appliances, and audio-visual equipment require a higher current than their rated power at the moment of startup. Using the inverter improperly may trigger overcurrent protection.

- Example: A 1000W water pump may require a 2000W inverter to start safely.

2. Standard Household Loads:

For devices without motors, such as lights, TVs, fans, computers, and other typical appliances, ensure the inverter's rated power is slightly higher than the device's rated power.

- Example: An 800W microwave can be powered by a 1000W inverter.

3. Avoid Frequent On/Off Switching:

Continuously or repeatedly turning the inverter on and off while connected to loads, or frequently triggering overcurrent protection, can damage the inverter.

4. Motor-Driven Devices (High Surge Loads):

Devices with electric motors often require 2~6 times their rated operating current at startup. Use an inverter with sufficient capacity to handle this surge.

Examples include:

- Drill machines, electric tools, compressors, water pumps, asynchronous motors
- Electric irons, washing machines, and other appliances with built-in motors
- Certain devices with high inrush current, such as CRT TVs or large audio amplifiers

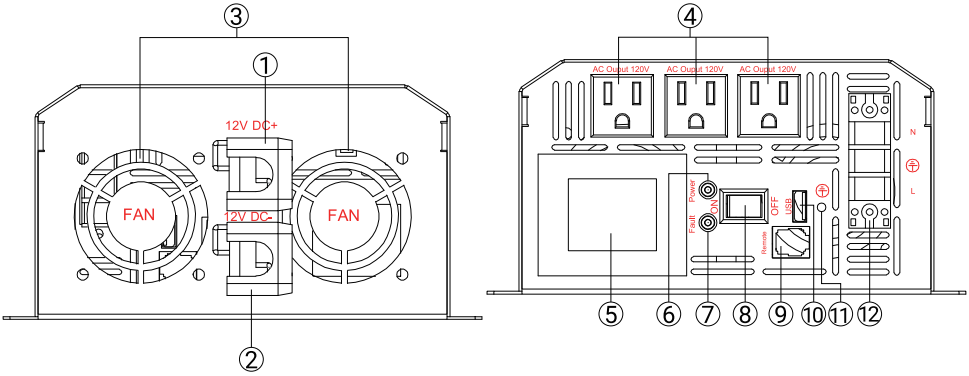
5. Non-Motor Devices (Standard Loads):

For appliances without motors, the inverter's rated power just needs to exceed the device's rated power.

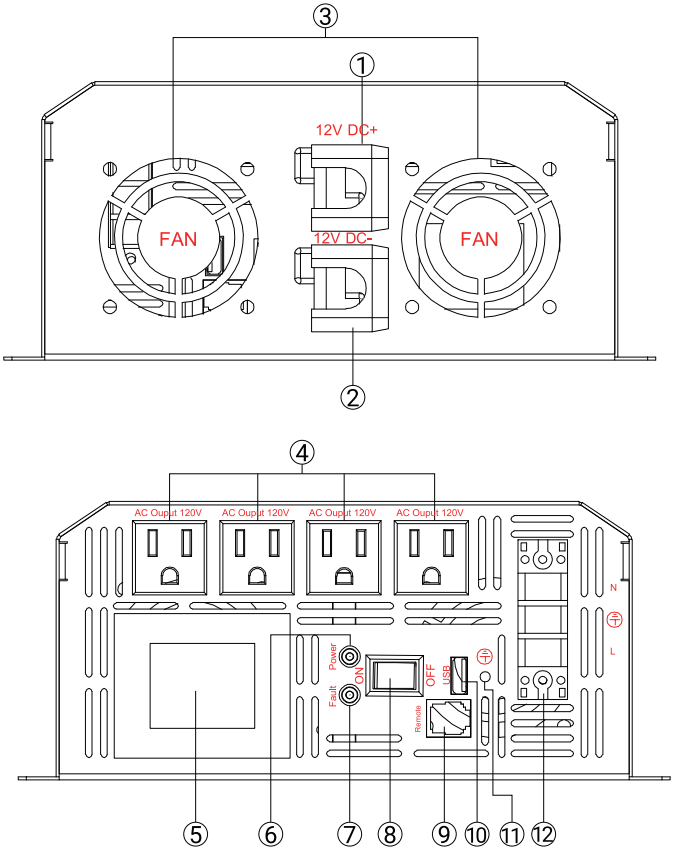
Examples include:

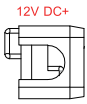
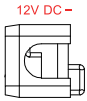
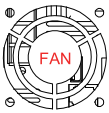
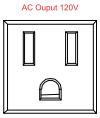
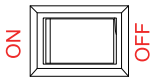
- Electric stoves, rice cookers, lamps
- Desktop computers, laptops, monitors, and printers
- Fans, TVs, and audio systems

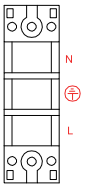
12V 2000W



12V 3000W



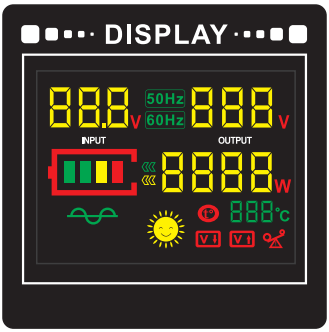
No.	Port	Description
1		Positive (+), 12V DC Input, M8
2		Negative (-), 12V DC Input, M8
3		Cooling Fans
4		**110/120V (Default) AC Outlets** AC Load: ≤ 3000W
5		LCD Display
6		**Power LED Indicator** Illuminates blue when the inverter is powered on and operating normally.
7		**Fault LED Indicator** The Fault LED lights up in red when the inverter shuts down due to overheating, overload, undervoltage, or overvoltage. **Solution:** 1. Immediately turn off all connected AC appliances. 2. Allow the inverter to cool down completely before restarting. 3. Check that the cooling fans and air vents are not blocked. 4. Ensure that all cables are properly sized, securely connected, and not excessively long, which may cause voltage drop or overheating.
8		**ON / OFF Switch** Turns the inverter ON or OFF.

No.	Port	Description
9	Remote 	**Remote Control Terminal** Connects to the wired remote control.
10	USB 	**USB Power Port** QC 3.0, 18W (5V/3.4A, 9V/2A, 12V/1.5A). Charges tablet, smartphone, and other small appliance.
11		**Grounding Terminal**
12		**High Output AC Terminals** Use these terminals to connect 110V/120V AC devices or distribute power to multiple AC outlets. AC Load: ≤ 3000W To access the terminals, remove the two screws on the protective cover. • L: Line (Hot) • N: Neutral • Ground **AC Wiring Connection Order (U.S. Standard)** • Connect: Ground (G) → Neutral (N) → Line (L) • Disconnect: Line (L) → Neutral (N) → Ground (G)

The inverter supports a maximum combined AC output of 3000W from both the AC outlets and the high-output AC terminals.

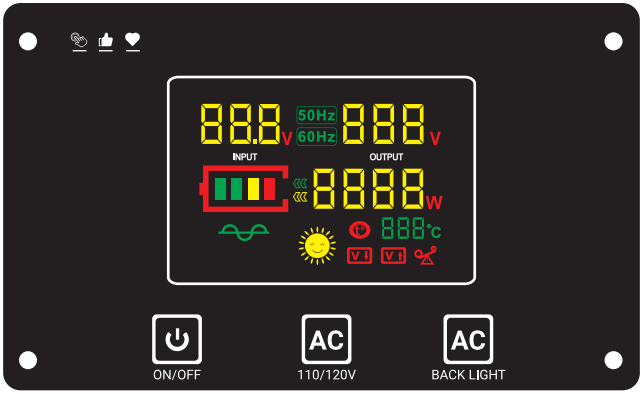
Connecting AC appliances with a total load exceeding 3000W will trigger overload protection and cause the inverter to shut down.

LCD DISPLAY



- Input Voltage
- AC Output Voltage
- Loads Power
- Battery Level
- Frequency
- Working Temperature
- Low Voltage Protection
- Over Voltage Protection
- Over Temperature Protection
- Overload Protection

WIRED REMOTE CONTROL



Power Switch

AC Voltage Switch

Backlight Switch

Power Switch: Turns the inverter ON or OFF.

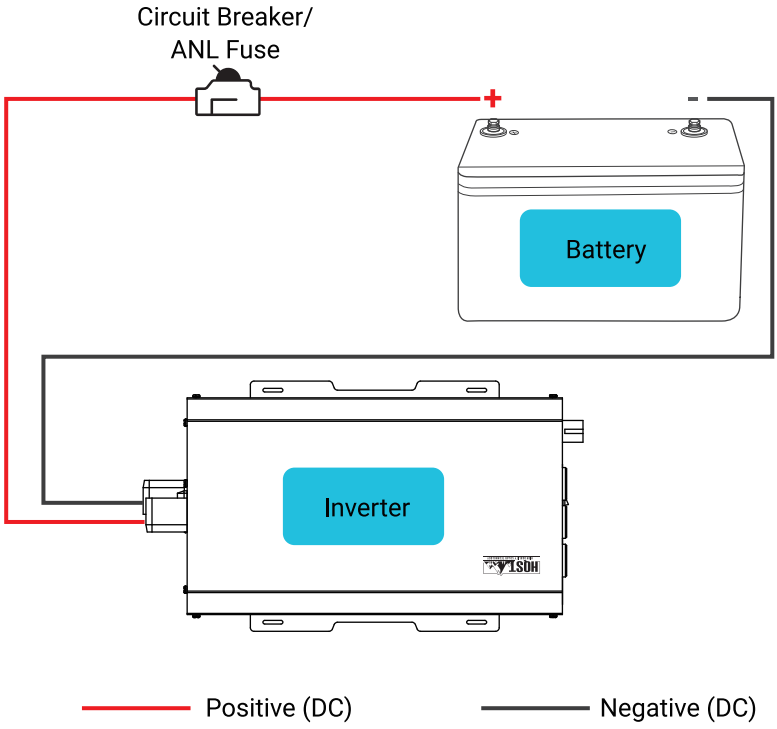
AC Voltage Switch: Allows you to switch the output voltage between 110V and 120V (Default), depending on your needs.

Backlight Switch: Turns the remote display backlight ON or OFF.

⚠ **Note:**

1. To use the remote control, the inverter must first be turned ON.
2. If the inverter is powered off, the remote control cannot be used to turn the unit on or off.
3. This remote control panel is wired, not app-based.

CONNECTION DIAGRAM



INSTALLATION

Step 1. Wear Insulating Gloves

Always wear insulated gloves when handling wiring or making electrical connections to ensure personal safety.

Step 2. Plan the Mounting Location

Choose a cool, dry, and well-ventilated location that meets the following requirements:

- Maintain at least 4 inches (10 cm) of clearance around the inverter for proper airflow.
- Install the inverter close to the battery bank to minimize voltage drop. The shorter the distance, the less energy loss. A cable length of about 20 inches (50 cm) is recommended.
- Select appropriately sized cables to handle the current between the battery and the inverter safely.

Step 3. Ground the Inverter

Connect the inverter's ground terminal securely to a proper earth ground.

⚠ Grounding cable not included. Please use a UL-rated grounding wire of adequate size.

Step 4. Connect the Inverter to the Battery

1. On the AC side, make sure the Power Switch is set to OFF.
2. On the DC side, remove the negative terminal cap (black).
   - Use a black cable to connect the inverter's Negative (-) DC Input Terminal to the negative terminal of the battery.
3. Remove the positive terminal cap (red).
   - Use a red cable to connect the inverter's Positive (+) DC Input Terminal to the positive terminal of the battery.

Tip: For added safety, install a circuit breaker (recommended) or ANL fuse between the inverter and the battery's positive terminal. Then use a fuse cable to connect the circuit breaker or ANL fuse to the battery's positive terminal.

⚠ **Note:**

1. This inverter is designed for **12V battery bank systems only.**
2. **Ensure correct polarity:** The positive and negative terminals of the inverter and battery must be connected properly. Do not reverse the connections, as this may cause severe damage.
3. **Tighten all screws** securely to prevent short circuits or fire. For mobile installations (such as RVs or vehicles), **use spring washers to prevent screws from loosening due to vibration.**

Step 5. Connect AC Appliances

1. Plug your AC appliances into the output socket of the inverter.
2. Once all connections are secure, turn on the inverter to start operation.
3. When the Power Indicator lights up blue, the inverter is powered on and ready for use. Switch on connected loads one at a time. The inverter will operate normally as long as the total load does not exceed its rated capacity.
4. If the Fault Indicator lights up red, the inverter is overloaded. Turn off some connected devices, then restart the inverter before resuming operation.

⚠ **Note:** Do not touch the inverter's terminals or cables while the unit is operating to avoid electric shock.

SIZING BATTERY

1. Battery Voltage: This inverter must be used with a 12V battery (LiFePO4, AGM, SLA, etc.). Do not use 24V, 36V, or 48V batteries.
2. Battery Capacity: To select an appropriate battery, divide the inverter's load power by the battery voltage.

Example:

For a 12V 2000W inverter powering a 2000W load:

$$\text{Required current} = \frac{\text{Load Power}}{\text{Battery Voltage}} = \frac{2000\text{W}}{12\text{V}} \approx 167\text{A}$$

Recommendation: Choose a battery with a higher current rating than calculated to ensure safe and reliable operation.

For this example, a battery rated for at least 200A output is recommended.

⚠ **Notes:**

Using an under-rated battery may cause overheating, voltage drops, or inverter shutdown. Always ensure the battery can supply enough current for your load.

SIZING BATTERY-TO-INVERTER CABLES

Note:

1. Using cables that are too thin or too long can cause excessive heat buildup and major power loss. This may also lead to a significant voltage drop at the battery, easily triggering the inverter's low-voltage (over-discharge) protection.
2. Always use well-insulated, waterproof cables - preferably UL-certified - to ensure safety and performance.

Maximum Current Ratings (Short, Ideal Conditions)

The table below lists maximum current capacities under short-run, ideal conditions. Use these figures as a general reference and adjust based on your actual setup, especially for 12V systems.

Cable Gauge (AWG)	Copper Diameter (inch)	Max Current (Ideal Conditions)
6 AWG	0.20	115A
4 AWG	0.23	150A
2 AWG	0.30	205A
1/0 AWG	0.37	285A
2/0 AWG	0.43	325A
4/0 AWG	0.56	440A

⚠ Important: These values assume cable runs under 5 feet (1.5 m) in ideal conditions. For longer cables or high-power inverters, always use thicker cables to minimize voltage drop and overheating risk.

Recommended Cable Sizes (Up to 5 ft / 1.5 m Cable Run)

Inverter Power (W)	System Voltage	Est. Amps	Recommended Cable
1000W	12V	~ 83A	2 AWG
1500W	12V	~ 125A	1/0 AWG
2000W	12V	~ 167A	**2/0 AWG**
3000W	12V	~ 250A	**4/0 AWG**

Example:

- Scenario: A 12V 2000W inverter is connected to a 12V LiFePO4 battery bank.
- Current Draw: 2000W / 12V ≈ 167A
- Recommended Cable: While 2 AWG can technically carry up to 205A, it's Safer to use 2/0 AWG due to high current draw, potential cable length, and startup surges.
- For a 3000W inverter, use 4/0 AWG or connect two 2/0 AWG cables in parallel for better safety and efficiency.

SIZING CIRCUIT BREAKERS OR ANL FUSES

To protect your system from overcurrent, it's recommended to install a circuit breaker or ANL fuse:

- Between the inverter and the battery
- Between the inverter and the AC loads

Choose a breaker or fuse rated at about **1.5 times** the expected current.

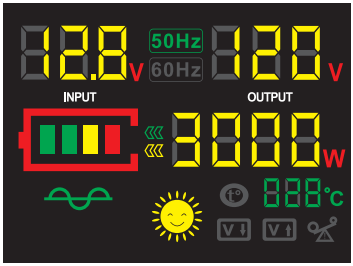
Examples:

- For a 12V 300Ah battery with a 12V 2000W inverter, use a breaker rated at: (2000W / 12V) × 1.5 = 250A
- For a 12V 2000W inverter with 110V output and 1500W load, use a breaker rated at: (1500W / 110V) × 1.5 = 20A

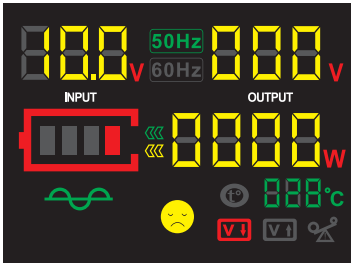
PROTECTION MODE

Our inverter features a comprehensive protection system, including high-voltage and low-voltage protection, short-circuit protection, overload protection, and anti-interference technology to safeguard both the battery and connected devices.

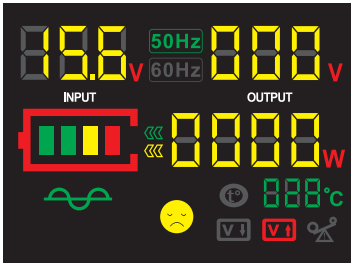
The inverter also includes a soft start function, which gradually increases output voltage during startup to reduce high inrush current and improve performance under heavy loads.



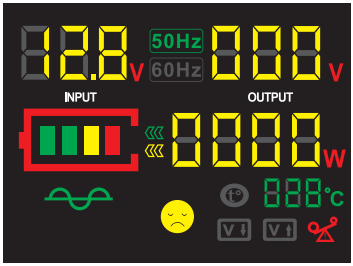
Normal working



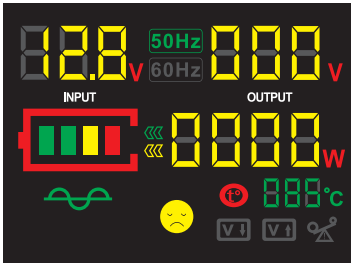
Low-volt protection



High-volt protection



Overload protection



High-temp protection

INVERTER FAULT / STATUS INDICATORS

Fault / Status	LED Indication	Beep Alarm	Action / Notes
Low Voltage Alarm	Blue LED steady, Red LED off	Yes	Warning only; inverter continues to operate
Low Voltage Protection	Blue & Red LEDs steady	Yes	Output shuts down to protect inverter and battery
Low Voltage Recovery	Blue LED steady, Red LED off	Yes	Output resumes normal operation
Overvoltage Protection	Blue & Red LEDs steady	Yes	Output shuts down to protect inverter and load
Overvoltage Recovery	Blue LED steady, Red LED off	No sound	Output resumes normal operation
Short-Circuit Protection	Blue & Red LEDs steady	Yes	Output shuts down immedi-ately
Overload Protection	Blue & Red LEDs steady	Yes	Output shuts down to prevent damage

FAULT / ERROR CODES DISPLAY

Note:

1. All fault codes are accompanied by a **Beep Alarm** and the **Corresponding Code** displayed on the screen.
2. If the following troubleshooting steps do not resolve your issue, please contact our Customer Support team at **sales@myhqsolar.com.**

Code Display	Reason	Solution
F01	Parameter configuration error.	Restart the inverter.
F02	Sampling circuit fault detected during power-on.	Restart the inverter.
F03	Low DC bus voltage.	1. Check that the input voltage is sufficient and stable. 2. If the fault persists, turn off the inverter and contact our Customer Support team.
F04	The inverter output is connected to another power source.	1. Check that no other power sources are connected to the inverter output. 2. Disconnect any external power sources before restarting.
F05	Output short circuit.	1. Check that the inverter's AC output terminals are properly connected. 2. Inspect all connected loads for damage and replace them if necessary.
F06	Output overcurrent detected.	Reduce the connected load; restart the inverter if necessary.
F07	Output overload detected (delayed protection).	Reduce the connected load; restart the inverter if necessary.
F08	Over-temperature protection activated.	Check that the cooling fan and air vents are unobstructed, and lower the ambient temperature if necessary.
F10	Battery high voltage.	Check the input power source or charger. If the error persists, contact Customer Support.

Code Display	Reason	Solution
F11	DC bus overvoltage.	1. Check the input power supply for abnormal high voltage. 2. If the input is normal, the inverter may have internal damage — contact customer support.
F12	Battery low voltage.	Charge the battery or replace it if necessary.
F13	Data read error.	Restart the inverter.

TECHNICAL SPECIFICATIONS

	12V 2000W	12V 3000W
Continuous Output Power	2000W	3000W
Peak Power Rating	4000W (< 1s)	6000W (< 1s)
Output Waveform	Pure Sine Wave	
Input Voltage	DC 10.0V-15.5V ± 0.3V	
Output Voltage	110V/120V ± 3V	
Output Frequency	60 Hz ± 0.5 Hz	
Low Voltage Alarm	10.5V ± 0.3V	
Low Voltage Protection	10V ± 0.3V	
Low Voltage Recovery	12V ± 0.3V	
Overvoltage Protection	15.5V ± 0.3V	
Overvoltage Recovery	15V ± 0.3V	
No Load Current Draw	0.7A ± 0.3A	0.8A ± 0.3A
Overload Protection	2150W - 2350W	3150W - 3300W
Output Short-Circuit Protection (L–N Short Circuit)	Inverter stops outputting	
Compression Protection	3500W ~ 4000W	4500W - 6000W
Conversion Efficiency	Half Load＞92% Full Load＞88%	Half Load＞91% Full Load＞87%
Cooling Fan Start-Up	Temp ≥ 113°F (45°C) or Load＞50%	
Overheating Protection	≥185°F (85°C)	≥203°F (95°C)
Overheating Recovery	≤140°F (60°C)	≤140°F (60°C)
Output Total Harmonic Distortion (THD)	≤ 3.5% (1000W) ≤ 6% (2000W) (Input Voltage: 13V)	≤ 3.5% (1000W) ≤ 4.8% (2000W) ≤ 7% (3000W) (Input Voltage: 13V)

	12V 2000W	12V 3000W
AC Output Sockets	3	4
USB Port (QC 3.0)	18W: 5V/3.4A, 9V/2A, 12V/ 1.5A	
Operating Temperature	14°F to 131°F (−10°C to 55°C)	14°F to 131°F (−10°C to 55°C)
Dimensions	14.4 × 8.2 × 4.0 in (365 × 207 × 102 mm)	15.8 × 9.4 × 4.1 in (400 × 238 × 104 mm)
Net Weight	8.82 lb / 4 kg	11.9 lb / 5.4 kg
Package List	1 x Inverter 2 x 1 AWG (40 mm²) Cables (19.7 in/50 cm Each) 3 x 40A Fuses 1 x Wired Remote Control (19.69 ft Cable) 1 x Manual	1 x Inverter 2 x 1/0 AWG (50 mm²) Cables (19.7 in/50 cm Each) 5 x 40A Fuses 1 x Wired Remote Control (19.69 ft Cable) 1 x Manual

LIMITED WARRANTY TERMS AND CONDITIONS

HQST warrants this product to the original purchaser to be free from defects in materials and workmanship under normal use and conditions, for a period of **18 months** from the date of original purchase.

What This Warranty Does Not Cover

This limited warranty does not cover damages or failures resulting from:
(a) Transportation or storage issues, (b) Misuse or improper operation, (c) Failure to follow the product's instructions or perform routine maintenance, (d) Modifications or unauthorized repairs, (e) Normal wear and tear, (f) Commercial or rental use, or any use outside the intended scope, (g) External causes such as accidents, abuse, natural disasters, or other events beyond our control.

Warranty Period

The warranty begins on the date your purchase is shipped and remains valid for 18 month The coverage period does not reset or extend if the product is repaired or replaced.
HQST reserves the right to change or modify this warranty at its sole discretion. However, any such changes will not apply retroactively to products already purchased.

Eligibility

This warranty applies only to products sold and shipped by HQST or by authorized retailers and distributors.

hqsolarpower.com/pages/contact-us
Support: sales@myhqsolar.com

FC CE RoHS