PowMr POW-SunSmart 6.5KP-1

PowMr 6500W Hybrid Solar Inverter (POW-SunSmart 6.5KP-1) Instruction Manual

Model: POW-SunSmart 6.5KP-1

1. Introduction

This manual provides detailed instructions for the installation, operation, maintenance, and troubleshooting of your PowMr 6500W Hybrid Solar Inverter. Please read this manual thoroughly before installation and operation to ensure proper use and safety. This inverter is designed for reliable performance in various solar power applications, offering advanced features for efficient energy management.

2. Safety Information

WARNING: Electrical shock hazard. Installation must be performed by qualified personnel.

- Ensure all power sources are disconnected before installation or maintenance.
- Do not connect or disconnect wires when the inverter is operating.
- Proper grounding is essential for safety.
- Avoid exposing the inverter to rain, snow, or liquids.
- Do not disassemble the inverter. There are no user-serviceable parts inside.
- Verify correct polarity for all DC connections (battery and PV).
- Install appropriate circuit breakers for AC input, AC output, and battery lines.

3. Product Features

- **Split-phase Parallel Solar Inverter:** Supports split-phase and single-phase pure sine wave output. One 6500W inverter can output 120V and 240V simultaneously. Expandable up to 39kW with up to 6 units in parallel.
- **Dual MPPT Controller:** Built-in 140A (70*2) MPPT controller with 99.9% efficiency. Supports two solar inputs and simultaneous tracking of two solar maximum power charging/carrying capacity functions.
- **Multiple Charging Modes:** 4 optional charging modes: PV only, Mains first, PV first, and Mains + PV.
- **Dual Output Modes:** Mains bypass output and inverter output for uninterrupted power supply.

- **Comprehensive Protection:** 360° protection including short circuit, over-current, over-under voltage, overload, backfill, and over-temperature protection.
- **Battery Compatibility:** Compatible with AGM, Gel, Lead-acid, Lithium-ion, and LiFePO4 batteries. Supports batteryless operation.
- **Dual Activation Function:** For Li-ion batteries, activation can be triggered by mains or photovoltaic power supply.
- **Communication:** Supports CAN, USB, and RS485 communication.

4. Package Contents

The PowMr 6500W Hybrid Solar Inverter package includes:

- 1 x 6500W Solar Inverter

5. Setup and Installation

Proper installation is crucial for the safe and efficient operation of your inverter. Follow these steps carefully.

5.1 Mounting the Inverter

Mount the inverter on a wall, ensuring adequate spacing for heat dissipation and stable electrical performance. For parallel installations, align the heights of multiple inverters.



Image: PowMr 6500W Hybrid Solar Inverter mounted on a wall, showing its compact design and display screen.

5.2 Wiring Connections

Before making any connections, ensure all power sources are disconnected. Remove the terminal cover by loosening the four screws.



Image: PowMr 6500W Hybrid Solar Inverter with its orange terminal cover removed, revealing the internal wiring terminals for battery, AC input/output, generator, and PV.

5.2.1 Battery Connection

Connect the battery cables to the inverter's battery terminals. Ensure correct polarity (positive to positive, negative to negative). If your battery does not have a built-in low-voltage switch, install a DC circuit breaker (e.g., 160A) between the battery and the inverter. Keep the breaker in the OFF position during wiring. It is crucial to ensure that the cable lengths from each inverter to the busbars are identical to avoid current imbalance, which can affect system efficiency and reliability.

5.2.2 AC Input/Output and Generator Connection

Connect the utility's L1, L2, and N wires to the AC input terminal of the inverter through an AC input breaker. Connect the inverter's AC output to the output breaker and from there to the AC load. For generator input, connect to the designated GEN terminals. Ensure all wiring polarity matches correctly. Do not fully tighten the screws on the inverter side until all connections are made.

5.2.3 PV Input Connection

Connect the photovoltaic (PV) arrays to the inverter's PV input terminals. The inverter supports two PV arrays. Ensure correct polarity for PV connections.

5.2.4 Grounding

Proceed to ground the inverter chassis to ensure safety.

5.2.5 CT Installation (for Self-Consumption)

Mount the CT (Current Transformer) labeled "L1" on the L1 wire between the utility meter and the AC input breaker. Do the same with the CT labeled "L2" on the L2 wire. Make sure the arrow on the CT is pointing toward the inverter. Then plug the CT communication cable into the CT port at the bottom of the inverter. This setup allows excess solar power to be fed into the AC input line to power devices connected to it, while effectively preventing power from feeding back into the grid, avoiding unnecessary risks or violations.

Your browser does not support the video tag.

Video: This video demonstrates the AC input load and CT installation for the 6.5KP inverter, showing how to connect the current transformers and integrate them into the system for self-consumption.

5.2.6 Parallel Connection

For parallel operation, connect the positive and negative terminals of each inverter to respective busbars. It is crucial to ensure that the cable lengths from each inverter to the busbars are identical to avoid current imbalance, which can affect system efficiency and reliability. Different cable lengths can lead to varying voltage drops, affecting system efficiency and reliability, potentially damaging the inverters. Use communication cables provided in the inverter packaging to establish communication between the inverters.

Your browser does not support the video tag.

Video: This video provides a parallel wiring guide for the POW SunSmart 6.5KP solar inverter, detailing the steps for connecting multiple units.

5.2.7 Automatic Transfer Switch (ATS) Connection

The ATS serves as a backup protection mechanism, ensuring your loads can still receive power when the inverter's output and bypass are both unavailable. Connect the inverter's AC output to the main power input of the ATS. Connect the utility grid to the backup power input of the ATS. The grounding wire should connect directly to the load's grounding line and not pass through the ATS. Most ATS units support both automatic and manual modes. When set to automatic switching, if both the main and backup power sources meet the required voltage, the ATS will prioritize the main power source. When the main source becomes unavailable, the ATS automatically switches to the backup source. When the main power source recovers, it switches back to the main source again.

Your browser does not support the video tag.

Video: This video explains how to boost 6.5KP reliability via ATS, demonstrating the connection and functionality of an Automatic Transfer Switch.

6. Operating Instructions

After completing all wiring connections, close the battery circuit breaker and start the inverter. Once the inverter begins normal output, you will see the main power indicator on the ATS light up, and the light bulb will turn on. Then, turn on the utility power. The backup power indicator on the ATS will light up.

6.1 Display Overview

The inverter features an LCD HD display screen for real-time monitoring of photovoltaic system operating data. Use the buttons below the screen to navigate through settings.



Image: Close-up of the PowMr 6500W Hybrid Solar Inverter's LCD display, showing various system parameters and navigation buttons.

6.2 Setting Parameters

To begin, press the SET button to enter the settings menu. Settings can only be configured in standby mode and cannot be adjusted once in inverter mode. It's best to configure parameter 68 first, as selecting "180" for parameter 68 will prevent you from choosing 2P or 3P in parameter 31.

Your browser does not support the video tag.

Video: This video provides a standalone setup guide for the 6.5KP Solar Inverter, detailing the configuration process for various settings.

Key Settings:

- **#01 Output Power Priority:** Configures the output power priority (SUB, SOL, UTI, SBU).
- **#02 AC Output Frequency:** Sets the AC output frequency (50Hz or 60Hz).
- **#03 AC Input Voltage Range:** Sets the AC input voltage range (UPS: 90-140V, APL: 85-140V).
- **#04 Battery Low Voltage Switchover Value:** Configures the threshold for switching output power from battery to utility.
- **#05 Battery Voltage Recovery Value:** Configures the threshold for switching output power from utility to battery.
- **#06 Charging Mode:** Configures the charging mode (SNU, OSO, SNL).
- **#07 Max. Battery Charging Current:** Configures the battery charging current (max 140A).
- **#08 Battery Type:** Selects the battery type (GEL, L14, L15, L16, N13, N14, NO BAT, USER, SLD, FLD).
- **#09 Boost Charging Voltage:** Configures the battery boost charge voltage.
- **#10 Boost Charging Duration:** Configures the duration of the boost charge.
- **#11 Float Charging Voltage:** Configures the float charge voltage.
- **#12 Battery Over-Discharge Voltage:** Configures the battery over-discharge voltage.
- **#13 Battery Over Discharge Delay Time:** Configures the delay time for automatic shutdown after over-discharge.

- **#14 Battery Under-voltage Alarm Threshold:** Configures the battery low voltage alarm.
- **#15 Battery Discharge Limit Voltage:** Configures the discharge limit voltage.
- **#16 Battery Equalization Charging Function:** Enables or disables the battery equalization charging function.
- **#17 Equalization Charging Voltage:** Configures the equalization charge voltage.
- **#18 Equalization Charging Duration:** Configures the equalization charging duration.
- **#19 Equalization Charging Delay Time:** Configures the equalization delay time.
- **#20 Equalization Interval:** Configures the equalization interval (default: once every 30 days).
- **#21 Equalizing Charge Enable/Disable:** Enables or disables the immediate equalization charging function.
- **#22 Power Saving Mode:** Enables or disables the power-saving mode function.
- **#23 Overload Auto Restart:** Enables or disables the automatic restart function after an overload.
- **#25 Buzzer Alarm Function:** Enables or disables the buzzer alarm.
- **#26 Mode Switch Prompt:** Configures the output mode switchover prompt.
- **#27 Inverter to Bypass Switch:** Enables or disables the automatic switchover to bypass mode during an overload.
- **#28 Utility charge current:** Configures the utility charging current (max 80A).
- **#30 RS485 Communication Address:** Configures the RS485 communication code.
- **#31 Parallel Mode:** Configures parallel operation mode (SIG for single, PAL for parallel).
- **#32 BMS Communication:** Enables or disables the RS485 communication function.
- **#33 BMS Communication Protocol:** Configures the BMS communication protocol.
- **#35 Battery Undervoltage Recovery Threshold:** Configures the battery undervoltage recovery voltage.
- **#37 Recharge Voltage Threshold for Fully Charged Battery:** Configures the voltage level at which the battery will resume charging after reaching a fully charged stage.
- **#38 AC Output Voltage:** Sets the AC output voltage.
- **#39 Charge current limit:** Sets the charging current limit.
- **#40~45 Battery Charging Periods:** Configure three battery charging periods.
- **#46 Time-slot Charging Function:** Enables or disables time-of-use charging.
- **#47~52 Battery Discharging Periods:** Configure three battery discharging periods.
- **#53 Time-slot Discharging Function:** Enables or disables time-of-use discharging.
- **#54 Current Date:** Sets the current date.
- **#55 Current Time:** Sets the current time.
- **#56 Leakage Protection Function:** Enables or disables the leakage protection function.
- **#57 Charging Termination Current:** Configures the charging termination current.
- **#58 Discharging Warning SOC:** Configures the discharge warning SOC.
- **#59 Discharging Cutoff SOC:** Configures the discharge cutoff SOC.
- **#60 Charging Cutoff SOC:** Configures the charge cutoff SOC.
- **#61 SOC Setting for Switching to Mains:** Configures the SOC at which the charging output source switches from battery power to utility power.
- **#62 SOC Setting for Switching to Inverter Output:** Configures the SOC at which the charging output source switches from utility power to battery power.
- **#63 N-PE Connection Switch Function:** Configures the automatic switching of the N-PE bonding function.
- **#68 AC Output Phase Mode:** Configures the AC output phase mode (0 for single-phase, 180 for split-phase).
- **#73 Max Charging Current by Generator:** Configures the generator's maximum charging current.
- **#74 Generator Input Power:** Configures the generator input power (max 10kW).
- **#76 CT Ratio:** Configures the CT ratio.
- **#77 Anti-reflux Error Calibration Power:** Calibrates the anti-backflow error power.

7. Maintenance

Regular maintenance ensures the longevity and optimal performance of your PowMr Hybrid Solar Inverter.

- Keep the inverter clean and free from dust and debris.
- Ensure proper ventilation around the unit to prevent overheating.
- Periodically check all wiring connections for tightness and signs of wear or damage.
- Inspect the battery terminals for corrosion and clean if necessary.
- Monitor the inverter's display for any error codes or unusual behavior.
- Consult a qualified technician for any complex repairs or internal issues.

8. Troubleshooting

If you encounter any issues with your inverter, refer to the following common troubleshooting steps:

Problem	Possible Cause	Solution
Inverter not turning on	No battery connection or low battery voltage	Check battery connections and voltage. Charge battery if low.
No AC output	AC output breaker tripped or inverter fault	Check AC output breaker. Refer to display for fault codes.
PV input not charging	PV array not connected or insufficient sunlight	Check PV connections. Ensure adequate sunlight.
Overload warning	Too many loads connected	Reduce connected loads.
Inverter shutting down unexpectedly	Over-temperature, over-voltage, or other protection triggered	Check ventilation, input/output voltages. Refer to manual for specific fault codes.

9. Technical Specifications

Feature	Specification
Rated Output Power	6500W (continuous), 13000W (surge)
Rated Output Voltage	120/240Vac (split phase/single phase)
Switch Time	10ms
Max. PV Input Power	10KW (5000W*2)
Max. PV Input Voltage	550Vdc
Max. PV Input Current	18A

Feature	Specification
PV Starting Voltage	> 150V
PV Wire Gauge	12~10AWG
Battery Voltage	48Vdc (40V-60V)
Max Battery Discharge Current	160Adc
Max Battery Charge Current	140Adc
Communication	CAN, USB, RS485
Item Weight	41.6 pounds
Package Dimensions	23.23 x 16.54 x 5.51 inches

10. Warranty and Support

Your PowMr 6500W Hybrid Solar Inverter comes with a standard manufacturer's warranty. For specific warranty details, please refer to the product's official warranty card or contact PowMr customer support.
For technical support, troubleshooting assistance, or any questions regarding your inverter, please visit the official PowMr Store on Amazon or contact their customer service directly. You may also find helpful resources and FAQs on the PowMr website.
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