VariForma 5000W Split Phase Hybrid Solar Inverter

VariForma 5000W Split Phase Hybrid Solar Inverter User Manual

Model: 5000W Split Phase Hybrid Solar Inverter

1. Introduction

This manual provides essential information for the safe and efficient operation of your VariForma 5000W Split Phase Hybrid Solar Inverter. This device integrates a 5000W pure sine wave inverter, a 120A MPPT solar charge controller, and a battery charger into one unit. It is designed to provide reliable power for various applications, including home, RV, and truck installations, supporting both 110V and 240VAC output from a 48V battery system.

Image 1.1: The VariForma 5000W Split Phase Hybrid Solar Inverter, showcasing its 5000W rated output, 120A MPPT charge controller, 110V/220VAC output, 6400W max PV array power, and 150VDC max PV open circuit voltage.

2. Safety Instructions

Please read all instructions and warnings in this manual carefully before installation and operation. Failure to follow these instructions may result in electric shock, fire, severe injury, or death. Keep this manual for future reference.

- Installation must be performed by qualified personnel.
- Ensure all wiring is correctly sized and properly insulated.
- Do not disassemble the inverter. There are no user-serviceable parts inside.
- Disconnect all power sources (PV, battery, AC input) before performing any maintenance or wiring.
- Ensure proper ventilation around the inverter to prevent overheating.
- Do not expose the inverter to rain, snow, spray, or any liquids.
- Wear appropriate personal protective equipment (PPE) during installation and maintenance.

3. Product Appearance and Components

Familiarize yourself with the physical layout and connections of the inverter.

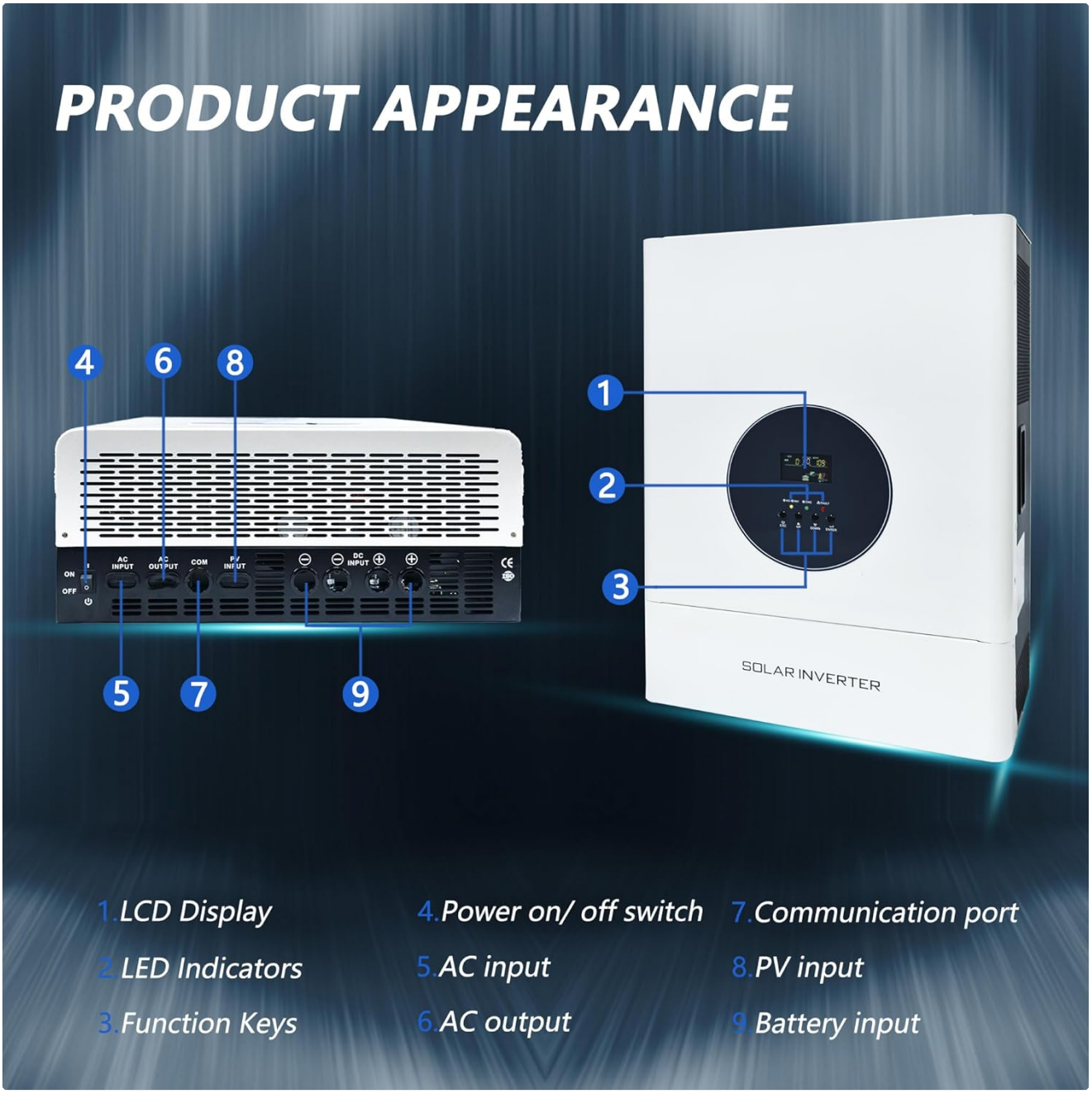

Image 3.1: Front and bottom view of the inverter, highlighting key components. 1. LCD Display, 2. LED Indicators, 3. Function Keys, 4. Power on/off switch, 5. AC input, 6. AC output, 7. Communication port, 8. PV input, 9. Battery input.

4. Installation and Setup

4.1 Wiring Diagram

Proper wiring is crucial for safe and efficient operation. Refer to the diagrams below for AC and overall system connections.

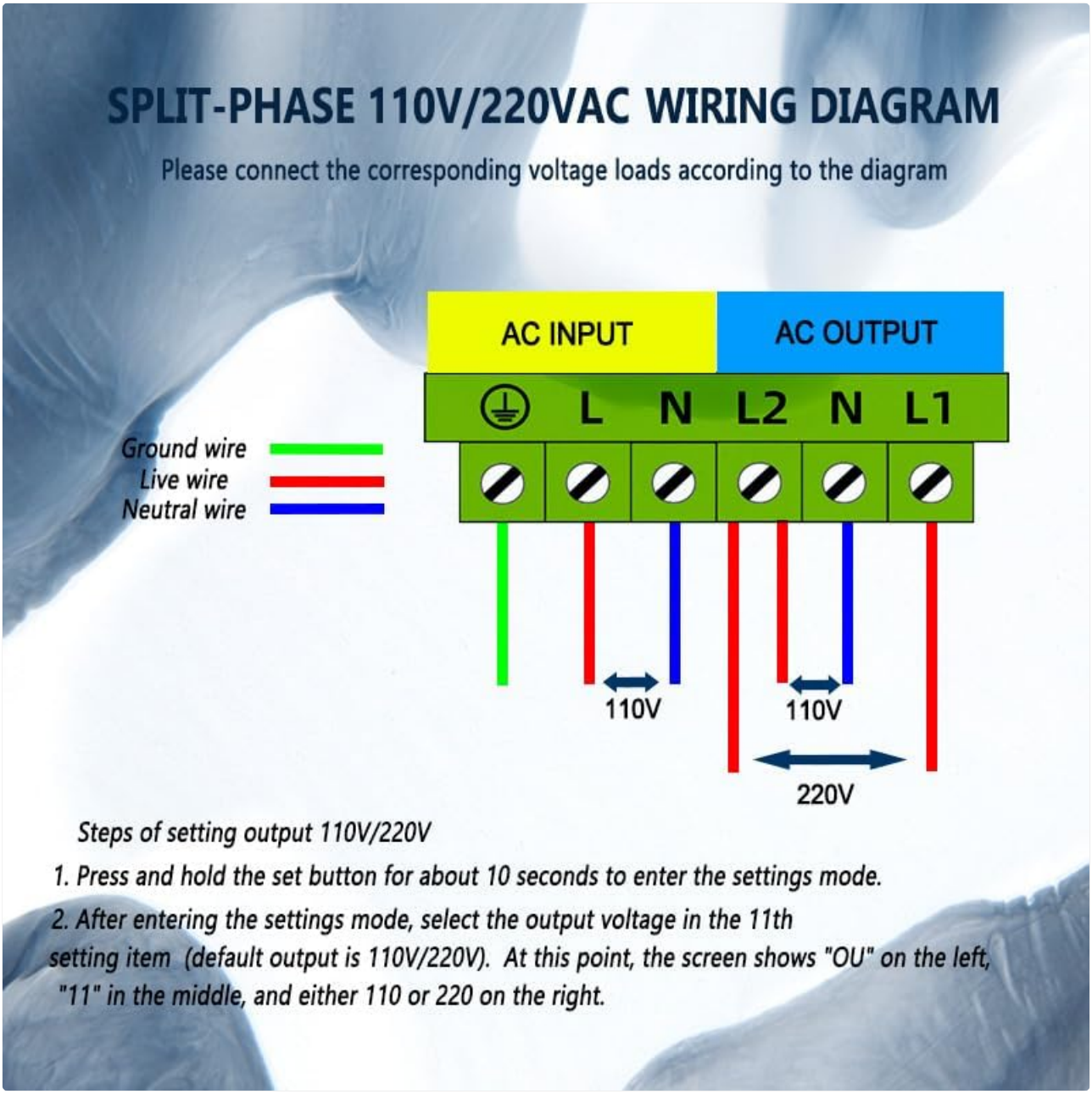

Image 4.1: Split-phase 110V/220VAC wiring diagram. Connect the ground wire (green), live wire (red), and neutral wire (blue) to the corresponding terminals for AC input and output. The diagram illustrates how 110V and 220V loads are connected.

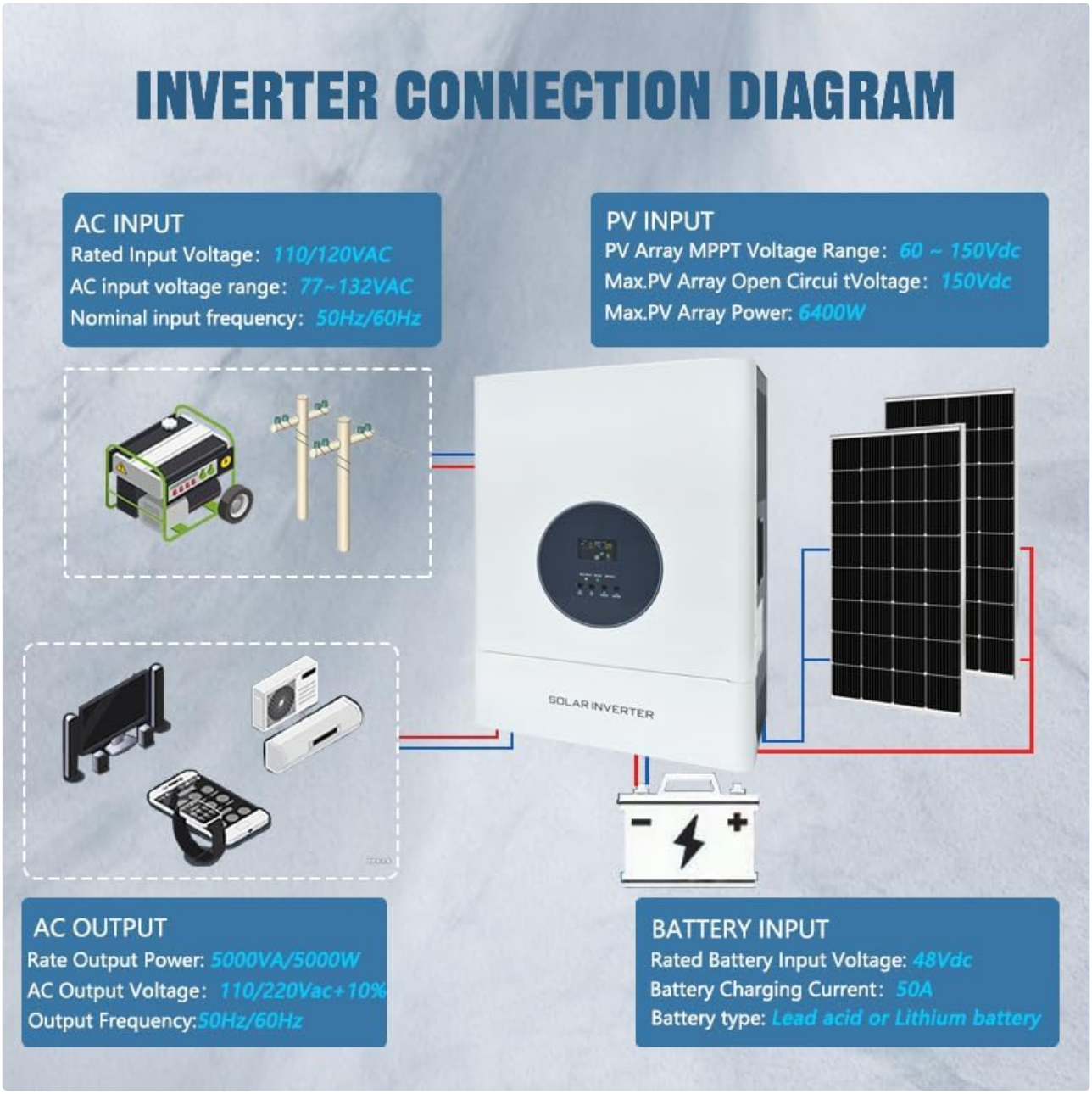

Image 4.2: Inverter connection diagram. This illustrates the connections for AC input (from grid or generator), PV input (from solar panels), AC output (to loads), and Battery input (to 48V battery bank).

4.2 Setting Output Voltage (110V/220V)

To configure the output voltage:

1. Press and hold the set button for approximately 10 seconds to enter the settings mode.
2. After entering the settings mode, navigate to the 11th setting item to select the output voltage. The default output is 110V/220V.
3. At this point, the screen will display "OU" on the left, "11" in the middle, and either "110" or "220" on the right, indicating the selected output voltage.

5. Operating Instructions

5.1 Powering On/Off

Use the power on/off switch (component 4 in Image 3.1) to control the inverter's operation. Ensure all connections are secure before powering on.

5.2 LCD Display and LED Indicators

The LCD display (component 1) provides real-time operational data, including input/output voltage, current, power, and system status. The LED indicators (component 2) provide quick visual cues for the inverter's status (e.g., power, fault, charging).

5.3 Function Keys

The function keys (component 3) allow navigation through the LCD menu and adjustment of various settings, such as battery type, charging current, and output voltage. Refer to the detailed settings section in the full manual for specific key functions.

6. Protection Features

The VariForma inverter is equipped with multiple layers of protection to ensure stable and reliable power delivery, safeguarding both the inverter and connected equipment.

Image 6.1: Multiple layers of protection. The inverter includes protection against Over Current, Over Voltage, Over-Temperature, Under Voltage, Over Load, and Short Circuit conditions.

- **Over Current Protection:** Prevents damage from excessive current flow.
- **Over Voltage Protection:** Safeguards against input or output voltage exceeding safe limits.
- **Over-Temperature Protection:** Shuts down the unit if internal temperatures become too high.
- **Under Voltage Protection:** Protects batteries from deep discharge.
- **Over Load Protection:** Prevents damage when connected loads exceed the inverter's capacity.
- **Short Circuit Protection:** Automatically disconnects in case of a short circuit.

7. Battery Compatibility

This inverter is designed to work with various 48V battery types, offering flexibility for different energy storage solutions.

Image 7.1: Compatible with multiple battery types. The inverter supports AGM, GEL, FLD (Flooded), Lithium, and SLD (Sealed Lead Acid) batteries.

8. Applications

The VariForma 5000W Split Phase Hybrid Solar Inverter is suitable for a wide range of applications requiring reliable off-grid or hybrid power solutions.

Image 8.1: Application examples. The inverter can be integrated into rooftop solar systems for homes or used in mobile applications such as RVs and trucks.

9. Specifications

Parameter	Value
Rated Output Power	5000 Watts
Input Voltage (DC)	48 Volts
Output Voltage (AC)	110 Volts (AC) / 240 Volts (AC)
MPPT Solar Charge Controller	120A
Max. PV Input Power	6400W

Max. PV Open Circuit Voltage	150VDC
Battery Charging Current	60A
Item Weight	58 Pounds

10. Maintenance

Regular maintenance ensures the longevity and optimal performance of your inverter.

- **Cleaning:** Periodically clean the inverter's exterior with a dry, soft cloth. Ensure ventilation openings are free from dust and debris.
- **Connections:** Annually check all electrical connections for tightness and corrosion. Loose connections can cause overheating and damage.
- **Environment:** Ensure the operating environment remains within specified temperature and humidity ranges.
- **Battery Health:** Monitor battery voltage and health according to battery manufacturer guidelines.

11. Troubleshooting

This section provides solutions for common issues. For problems not listed here, contact customer support.

Problem	Possible Cause	Solution
Inverter not powering on	No battery connection or low battery voltage	Check battery connections and ensure battery voltage is above the minimum operating threshold.
No AC output	Overload, short circuit, or inverter fault	Reduce load, check for short circuits, or restart the inverter. Check error codes on the LCD.
PV not charging batteries	Insufficient PV input, incorrect PV wiring, or PV fault	Check PV panel connections, ensure adequate sunlight, and verify PV voltage/current.

12. Warranty and Support

For warranty information, technical support, or service inquiries, please refer to the contact details provided with your purchase documentation or visit the official VariForma website. Do not attempt to repair the inverter yourself, as this may void the warranty and pose safety risks.