

PowMr POW-SunSmart 12KPL3

PowMr 12 kW Hybrid Inverter POW-SunSmart 12KPL3 Instruction Manual

Model: POW-SunSmart 12KPL3

1. SAFETY INFORMATION

Please read and understand all safety instructions before installing, operating, or maintaining this hybrid inverter. Failure to follow these instructions may result in electric shock, fire, serious injury, or death. Keep this manual for future reference.

- Installation must be performed by qualified personnel in accordance with all local electrical codes.
- Ensure the inverter is disconnected from all power sources (PV, battery, utility) before performing any maintenance or wiring.
- Do not disassemble the inverter. There are no user-serviceable parts inside.
- Avoid contact with live terminals.
- Ensure proper grounding of the inverter.
- Do not operate the inverter in wet conditions or near flammable materials.

2. INTRODUCTION

The PowMr POW-SunSmart L3 series is a 48V hybrid solar inverter designed for both single-phase and three-phase applications. This advanced inverter integrates solar energy storage, AC power charging, energy storage, and pure sine wave AC output functionalities. It is engineered to provide reliable power for residential and commercial renewable energy systems, offering flexibility and high efficiency.

12KW 48V HYBRID INVERTER

SINGLE-PHASE AND THREE-PHASE

- Pure Sine Wave Hybrid Inverter Built-in Dual MPPT
- Support Single-phase and Three-phase Output 230/400VAC
- Compatible with Lead-acid, Lithium Batteries or Batteryless
- Can work in parallel(Max. 6 units)

12KW Rated Output Power	260A Max.Hybrid Charging Current
9KW Max.PV Input Power	260A Max.PV Charging Current
> 150VDC PV Starting Voltage	800VDC Max.Open-circuit Voltage
22A Max.PV Input Current	



Figure 2.1: Front view of the PowMr 12 kW Hybrid Inverter, highlighting its 12 kW rated output, 260A hybrid charging current, 9 kW max PV input, and dual MPPT capabilities.

3. FEATURES

The PowMr 12 kW Hybrid Inverter offers a comprehensive set of features for advanced solar power management:

- **High Power Output:** Rated output power of 12000 W continuous, with a surge capacity of 24000 W.
- **Flexible Output:** Supports both single-phase and three-phase output at 230/400 V AC.
- **Advanced Charging:** Integrated dual MPPT charge controller with a maximum charging current of 260 A.
- **Wide Battery Compatibility:** Compatible with AGM, Gel, Lead-acid, Lithium, and LiFePO4 batteries. Also supports batteryless operation.
- **Scalable System:** Supports parallel operation of up to 6 inverters, allowing for a total system output of up to 72 kW.
- **High PV Input:** Maximum PV input power of 9 kW, with a maximum PV input voltage of 650 Vdc and maximum input current of 22 A per MPPT.
- **Communication Interfaces:** Equipped with CAN, USB, and RS485 communication ports for monitoring

and control.

- **Multiple Operating Modes:** Features four charging modes (Solar First, Utility First, Solar and Utility, Only Solar) and three load output working modes (Utility First, Solar First, SBU First).
- **Comprehensive Protection:** Includes 360° protection against short circuits, over current, over voltage, under voltage, overload, backfill, over-temperature, and overcharge.

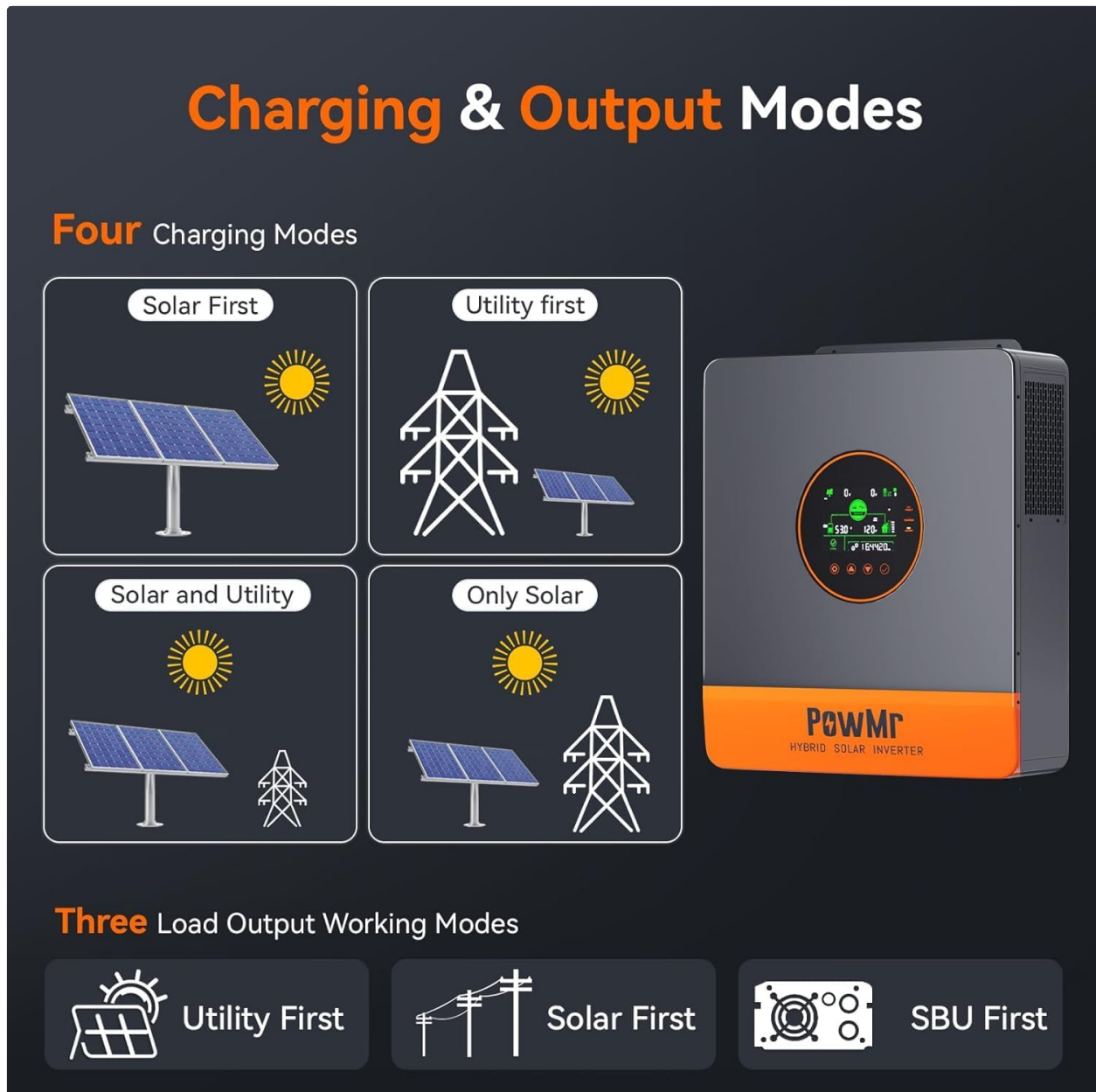


Figure 3.1: Overview of the inverter's comprehensive protection features, including short circuit, over current, over voltage, under voltage, overload, backfill, over-temperature, and overcharge protection.

4. SETUP AND INSTALLATION

This section provides an overview of the installation process. For detailed step-by-step instructions, wiring diagrams, and safety precautions, please refer to the complete PDF user manual available in English, German, Italian, French, and Spanish.

4.1 Unpacking and Inspection

- Carefully unpack the inverter and inspect it for any shipping damage.
- Verify that all included components, such as the parallel communication cable, are present.

4.2 Mounting the Inverter

Choose a suitable mounting location that is dry, well-ventilated, and protected from direct sunlight and extreme temperatures. Ensure adequate clearance around the inverter for proper airflow.

4.3 Electrical Connections

All electrical connections must be made by a certified electrician. Ensure all circuit breakers are off before making any connections.

- **Battery Connection:** Connect the 48V DC battery bank to the inverter's battery terminals. Observe correct polarity.
- **PV Input Connection:** Connect the solar panel arrays to the PV input terminals. The dual MPPT allows for two independent PV inputs. Ensure PV input voltage and current are within specified limits.
- **AC Input/Output Connection:** Connect the utility grid (if applicable) to the AC input and your loads to the AC output terminals. The inverter supports both single-phase and three-phase configurations.
- **Grounding:** Connect the inverter to a reliable earth ground.

Built-in Dual MPPT
PV1 and PV2 can be connected to solar panels of different orientations, quantities, and specifications

Received PV Watt = 4500W + 3000W

12000W Solar Inverter

PV Out 4500W

PV Out 3000W

PowMr

PowMr

48V 200Ah Battery Pack

Due to shadowing obstruction

Benefits of Dual MPPT:

- Improved Efficiency:** Dual MPPT allows simultaneous tracking of the maximum power points (MPPs) of two solar PV arrays. This enhances generation efficiency by optimizing output even in shaded or partially shaded conditions.
- Flexibility:** It provides flexibility by independently controlling different orientations or sections of solar panels within the same inverter. This versatility optimizes performance across varying installation conditions.
- Reduced Impact:** Dual MPPT reduces the impact of shading or other issues affecting one part of the array, as the other MPPT can continue maximizing output from unaffected sections.
- Enhanced System Reliability:** It increases system reliability and stability. In case of issues with one MPPT, the system can still partially operate, minimizing downtime and maximizing overall energy production.

Figure 4.1: Side view of the inverter, illustrating the various connection ports for PV input, battery, AC input, and AC output.

4.4 Parallel Operation (Optional)

For increased power output, up to 6 units of the PowMr 12 kW Hybrid Inverter can be connected in parallel. Use the provided parallel communication cable to link the inverters. Refer to the detailed manual for specific wiring diagrams and configuration steps for parallel systems.

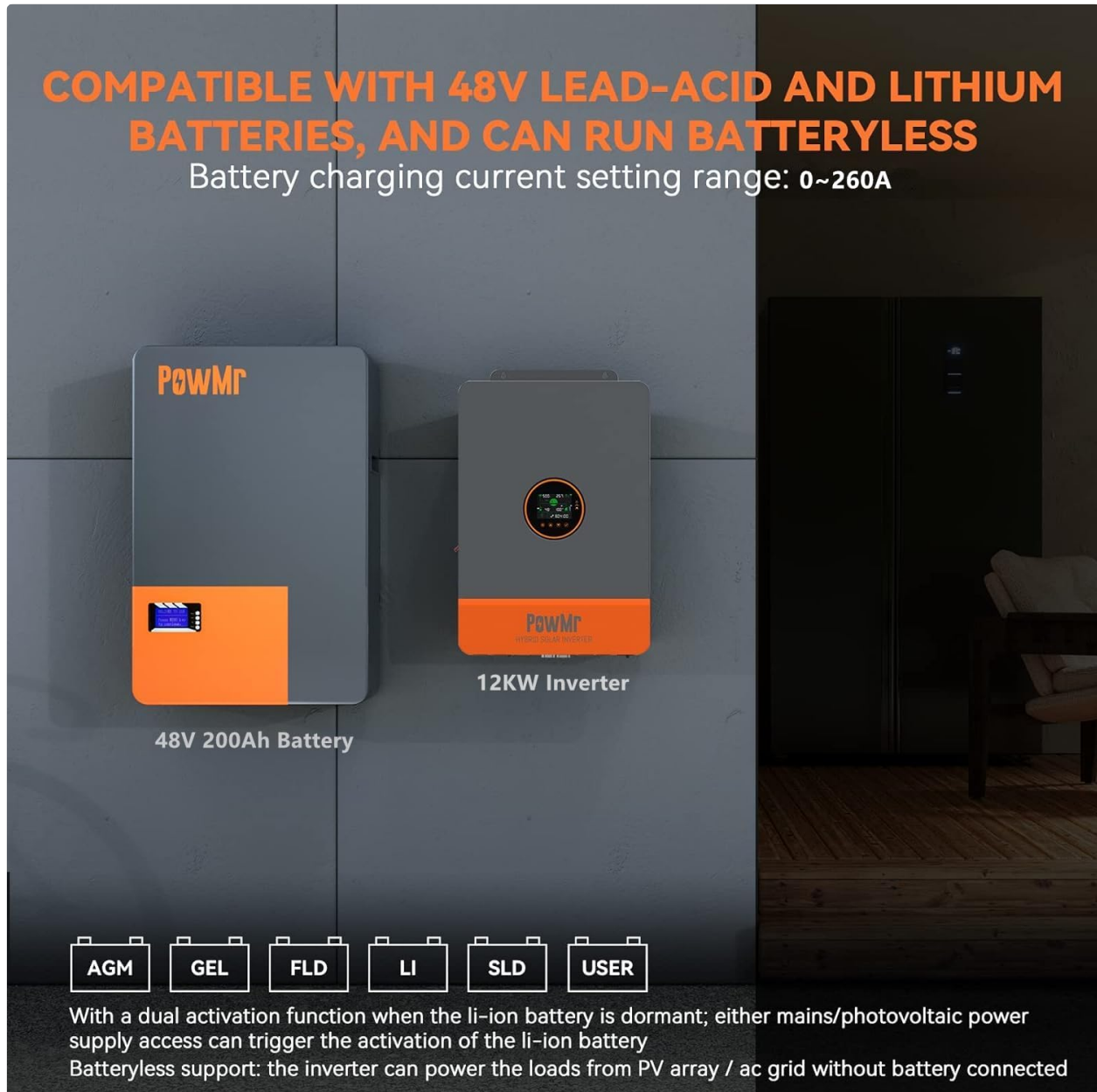


Figure 4.2: Schematic diagram demonstrating how multiple PowMr inverters can be connected in parallel to increase total system capacity.

5. OPERATING INSTRUCTIONS

Once installed, the inverter can be configured and operated via its integrated display and control buttons. The inverter supports various charging and output modes to optimize energy management.

5.1 Initial Power-Up

- Ensure all connections are secure and correct.
- Switch on the battery breaker, then the PV breaker, and finally the AC input breaker (if connected to utility).
- The inverter will perform a self-test and the display will illuminate.

MAX 6 INVERTER PARALLEL

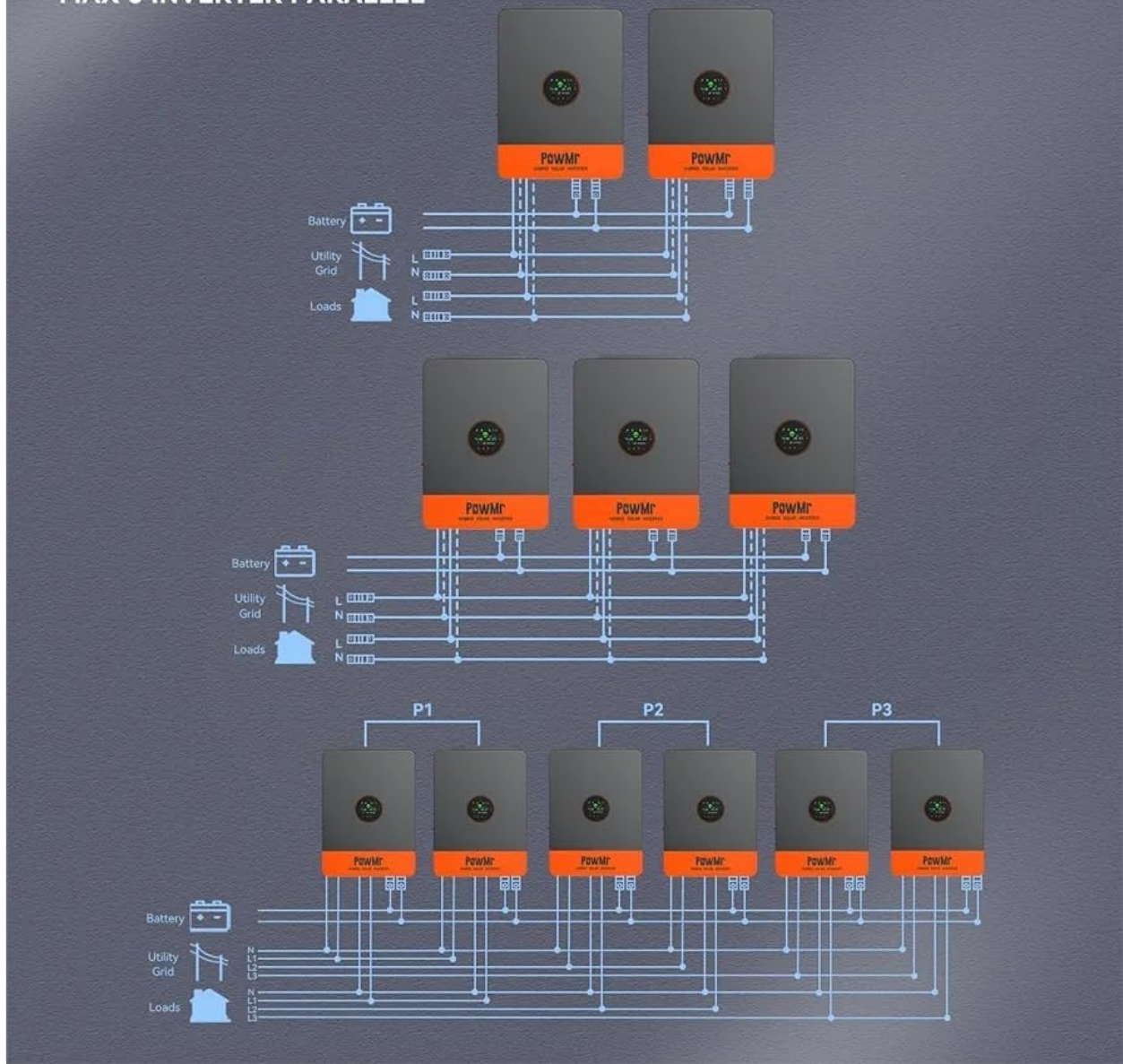


Figure 5.1: The inverter's front display, providing real-time operational data and access to settings.

5.2 Configuration Settings

Navigate through the display menu using the control buttons to set parameters such as:

- **Battery Type:** Select the type of battery connected (AGM, Gel, Lead-acid, Lithium, LiFePO4, or User-defined). The inverter also supports batteryless operation.
- **Charging Current:** Adjust the battery charging current within the 0-260A range.
- **Charging Source Priority:** Choose one of the four charging modes:
 - **Solar First:** Prioritizes solar power for charging.
 - **Utility First:** Prioritizes utility grid for charging.
 - **Solar and Utility:** Uses both solar and utility for charging.
 - **Only Solar:** Charges exclusively from solar power.
- **Output Source Priority:** Select one of the three load output working modes:
 - **Utility First:** Prioritizes utility grid for powering loads.
 - **Solar First:** Prioritizes solar power for powering loads.
 - **SBU First (Solar-Battery-Utility):** Prioritizes solar, then battery, then utility for powering loads.

- **Output Voltage:** Adjust the AC output voltage (200, 208, 220, 230, 240 V AC).

SINGE-PHASE OR THREE-PHASE PURE SINE WAVE SOLAR HYBRID INVERTER

PowMr's 12KW Solar Inverter



- ✓ Hybrid Solar Inverter
- ✓ DUAL MPPT PV Input
- ✓ Max.MPPT Charging Current up to 260A
- ✓ Only need 1 unit can output 230/400VAC
- ✓ Can works without batteries
- ✓ Support parallel operation
- ✓ Equipped with 4 cooling fans
- ✓ Demountable insect screen for cleaning

others



- ✓ off-grid Solar Inverter
- ✓ Only ONE PV Input
- ✓ Max.MPPT Charging Current up 80-120A
- ✓ At least need 3 units to output 400VAC
- ✓ Battery must be connected
- ✓ Can't work in parallel
- ✓ Equipped with 2 cooling fans
- ✓ Fixed insect screen

Figure 5.2: Visual representation of the four available charging modes and three load output working modes for flexible energy management.



Figure 5.3: The inverter's compatibility with different battery chemistries (AGM, GEL, FLD, LI, SLD) and its ability to operate without batteries.

6. MAINTENANCE

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

- **Cleaning:** Periodically clean the inverter's exterior with a dry cloth. Ensure ventilation openings are free from dust and debris.
- **Connection Checks:** Annually inspect all electrical connections for tightness and signs of corrosion.
- **Environmental Check:** Ensure the operating environment remains within specified temperature and humidity ranges.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates to improve performance or address known issues.

7. TROUBLESHOOTING

This section provides guidance on common issues. For detailed troubleshooting steps and error codes, refer to the comprehensive user manual.

Problem	Possible Cause / Action
Inverter not powering on	Check battery connections, battery voltage, and all input breakers (PV, utility). Ensure the inverter's power switch is ON.
No AC output	Verify AC output breaker, load connections, and inverter's operating mode. Check for overload conditions.
Display anomalies or incorrect readings	Consult the detailed manual for display error codes. A firmware update might be required.
Unusual noises or immediate load shedding under high load	This could indicate an internal component issue or an excessive surge from the connected load. Reduce load or consult technical support.
MPPT charging issues (e.g., voltage collapse, frequent restarts)	Ensure PV array sizing is appropriate for the MPPT. Check for shading or panel issues. Verify MPPT settings.
Inability to deactivate the built-in battery charger	Some models may not allow full deactivation. Refer to the manual for available charging source priority settings, such as 'Only Solar' mode.

8. SPECIFICATIONS

Technical specifications for the PowMr 12 kW Hybrid Inverter POW-SunSmart 12KPL3:

Specification	Value
Brand	PowMr
Model Name	POW-SunSmart 12KPL3
Recommended Uses	Residential, Commercial, Renewable Energy, Generator, Backup
Power Source	Solar Power
Input Voltage	48 V (DC)
Output Power	12000 Watts
Peak Output Power	24000 Watts
Output Voltage	230 V (AC) / 400 V (AC)
Electrical Waveform	Pure Sine Wave
Efficiency	99.9%
Max. PV Input Power	9 kW
Max. PV Input Voltage	650 Vdc
Max. PV Input Current	22 A

Specification	Value
Max. Hybrid Charging Current	260 A
Switching Time	10 ms
Product Dimensions (L x W x H)	62 cm x 44.5 cm x 13 cm
Product Weight	27 Kilograms
Included Components	1 x Parallel Communication Cable
Specification Met	CE

9. WARRANTY AND SUPPORT

9.1 Warranty Information

The PowMr 12 kW Hybrid Inverter POW-SunSmart 12KPL3 comes with a **2-year warranty** from the date of purchase. This warranty covers defects in materials and workmanship under normal use. Please retain your proof of purchase for warranty claims.

9.2 Technical Support

For technical assistance, troubleshooting beyond this manual, or warranty claims, please contact PowMr customer support. Refer to the official PowMr website for the most up-to-date contact information and support resources.

- **Online Resources:** Visit the PowMr official website for FAQs, updated manuals, and support forums.
- **Contact Information:** Find email addresses or phone numbers for customer service on the PowMr website.