Aninerel ANJ-3KW-24V-LV-WIFI

Aninerel ANJ-3KW-24V-LV-WIFI 3000W Hybrid Solar Inverter User Manual

Model: ANJ-3KW-24V-LV-WIFI

1. Introduction

The Aninerel ANJ-3KW-24V-LV-WIFI is a 3000W hybrid solar inverter designed to convert 24V DC power to 110V AC pure sine wave power. It provides a continuous output of 3,000W and a peak output of 6,000W. This unit features a built-in 100A MPPT solar charging controller, supporting up to 4,000W PV input with a maximum DC voltage of 500V. It is suitable for off-grid solar systems in various applications, including RVs, homes, cabins, and workshops.

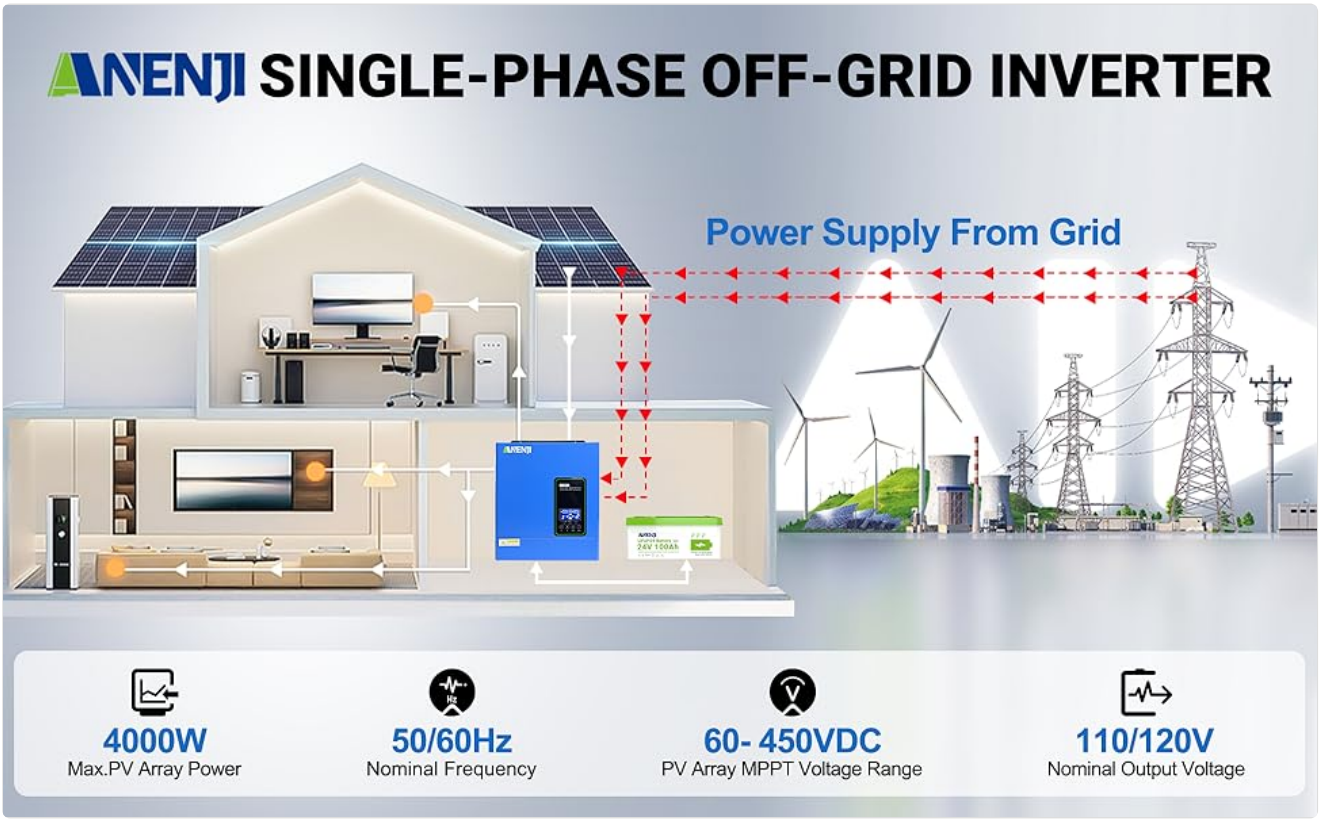

Figure 1: Aninerel 3000W Hybrid Solar Inverter Overview.

This image displays the Aninerel 3000W Single-Phase Hybrid Inverter, highlighting its 3000W rated power, 4000W maximum input power, 50/60Hz rated frequency, 60-500VDC MPPT operating voltage range, and 120V rated output voltage.

Figure 2: Product Application Scenarios.

This image illustrates various application scenarios for the Aninerel hybrid solar inverter, including solar home systems, solar RV systems, solar street light systems, solar power plant systems, solar vessels (boats), and hybrid energy systems.

Figure 3: Single-Phase Off-Grid Inverter System Diagram.

This diagram shows the Aninerel single-phase off-grid inverter integrated into a home solar system, demonstrating how it manages power supply from the grid, solar panels, and battery to power household loads.

2. Important Safety Instructions

Please read all instructions and warnings 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.

- **Qualified Personnel:** Installation and maintenance must be performed by qualified personnel.
- **Ventilation:** Ensure adequate ventilation around the inverter. Do not install in a sealed enclosure.
- **Flammable Materials:** Do not install near flammable materials.
- **Water Exposure:** Avoid exposure to water, rain, or excessive humidity.
- **Grounding:** The inverter must be properly grounded.
- **Battery Safety:** Work with batteries carefully. Wear eye protection and remove metal jewelry.
- **Disconnect Power:** Always disconnect all power sources (PV, AC, Battery) before performing any maintenance or wiring.
- **No Parallel Operation:** This inverter does not support parallel operation.

3. Product Features

- **3000W Hybrid Solar Inverter:** Converts DC 24V to pure sine wave AC 110V, delivering 3,000W continuous and 6,000W peak output. Supports up to 4,000W PV input with 100A MPPT solar charging, maximum DC voltage 500V. Features 60A max AC input, 50/60Hz output frequency, starting voltage above 125VDC, and 100A maximum PV charging current.
- **Built-in 100A MPPT Solar Charging Controller:** Maximizes solar energy harvesting, boosting charging efficiency by up to 30%. Compatible with high-voltage PV arrays (up to 500VDC) for faster charging.
- **Smart LCD Screen with Real-Time Monitoring:** Responsive LCD screen and indicator LEDs for monitoring power input/output, battery status, and system alerts. Configure settings like charging current, voltage thresholds, and priority modes.
- **Flexible Charging & Output Modes:** Three charging modes (Solar Only, AC Priority, Hybrid Charging) and three output modes (Mains Priority, PV Priority, Hybrid Output) ensure stable power.
- **Supports 24V Batteries:** Compatible with AGM, GEL, Lead-acid, Li-ion, and LiFePO4 24V batteries. Includes protections against overvoltage, undervoltage, reverse polarity, and short circuits.
- **Durable & Dustproof Design:** Aluminum casing for enhanced durability, suitable for indoor or semi-outdoor use. Features smart cooling with a variable speed fan.
- **Wide Application Compatibility:** Ideal for running essential appliances. Works with municipal power or generators. Note: Does not support parallel operation.

Figure 4: Built-in 100A MPPT with Protection Features.

This image highlights the inverter's built-in 100A MPPT controller and its comprehensive protection features, including overcharge, overload, overcurrent, overvoltage, short circuit, overheat, overspeed, and undervoltage protection, which contribute to extended battery life.

4. Product Components and Overview

Familiarize yourself with the various components and indicators of your Aninerel hybrid solar inverter.

Figure 5: Front and Rear View of the Inverter with Labeled Ports.

This image displays the front and rear panels of the Aninerel 3000W Hybrid Solar Inverter. Key components labeled include the LCD display, charging indicator, status indicator, fault indicator, function buttons on the front. On the rear, labels point to the RS485 communication port, grounding terminal, battery input, dry contact port, built-in WiFi, AC input, AC output, PV input, and the power on/off switch.

Figure 6: Detailed Component Diagram of the Inverter.

This diagram provides a detailed view of the inverter's components and their functions. It highlights the LCD display, charging indicator, status indicator, fault indicator, and function buttons on the front. The rear panel shows the RS485 communication port, grounding point, battery input terminals, dry contact port, built-in WiFi module, AC input, AC output, PV input terminals, and the main power on/off switch.

5. Setup and Installation

Proper installation is crucial for the safe and efficient operation of your hybrid solar inverter. Refer to the wiring diagram below and follow all local electrical codes.

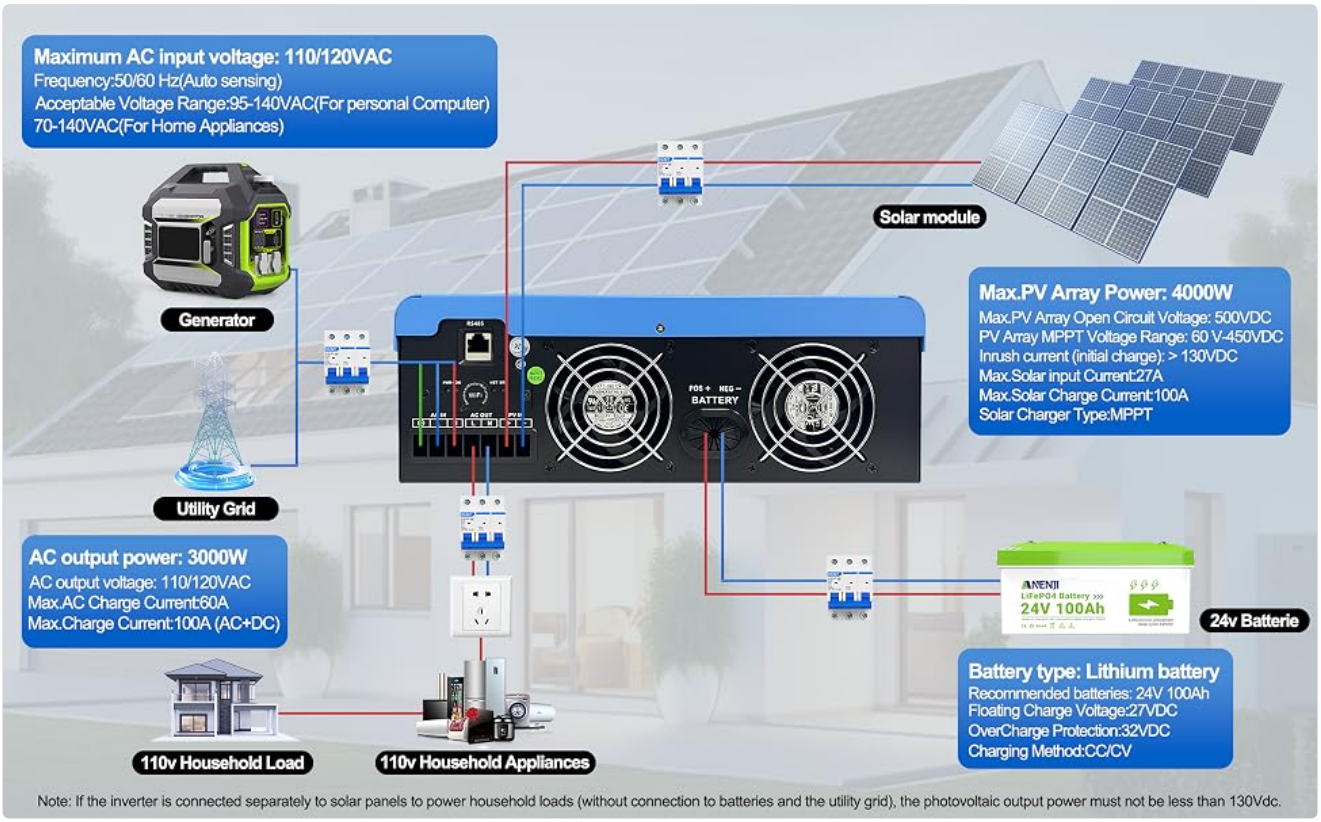

Figure 7: Typical Solar System Connection Diagram.

This diagram illustrates the connection of the Aninerel hybrid inverter within a solar power system. It shows connections for solar modules (PV input), a 24V battery bank, utility grid input, a generator input, and AC output to household loads. Key specifications for AC input, PV array, and battery type are also indicated.

5.1 Wiring Connections

1. **PV Input Connection:** Connect your solar modules to the PV input terminals. Ensure the total PV array power does not exceed 4000W and the open circuit voltage is within the 60-500VDC range.
2. **Battery Connection:** Connect the 24V battery bank to the battery input terminals. Observe correct polarity (positive to positive, negative to negative). The inverter supports various 24V battery types including Lithium, AGM, GEL, and Lead-acid.
3. **AC Input Connection:** Connect the utility grid or a generator to the AC input terminals. The maximum AC input current is 60A.
4. **AC Output Connection:** Connect your household loads (appliances) to the AC output terminals. The inverter provides 3000W AC output at 110/120VAC.
5. **Grounding:** Ensure the inverter is properly grounded using the designated grounding terminal.

5.2 Initial Power-Up

1. After all connections are secure, turn on the battery breaker first.
2. Next, turn on the PV array breaker (if applicable).
3. Finally, turn on the AC input breaker (if applicable).
4. Switch the inverter's power on/off switch to the 'ON' position.
5. Observe the LCD display and indicator LEDs for normal operation.

6. Operating Modes

The Aninerel hybrid inverter offers flexible charging and output priority settings to optimize power management based on your needs.

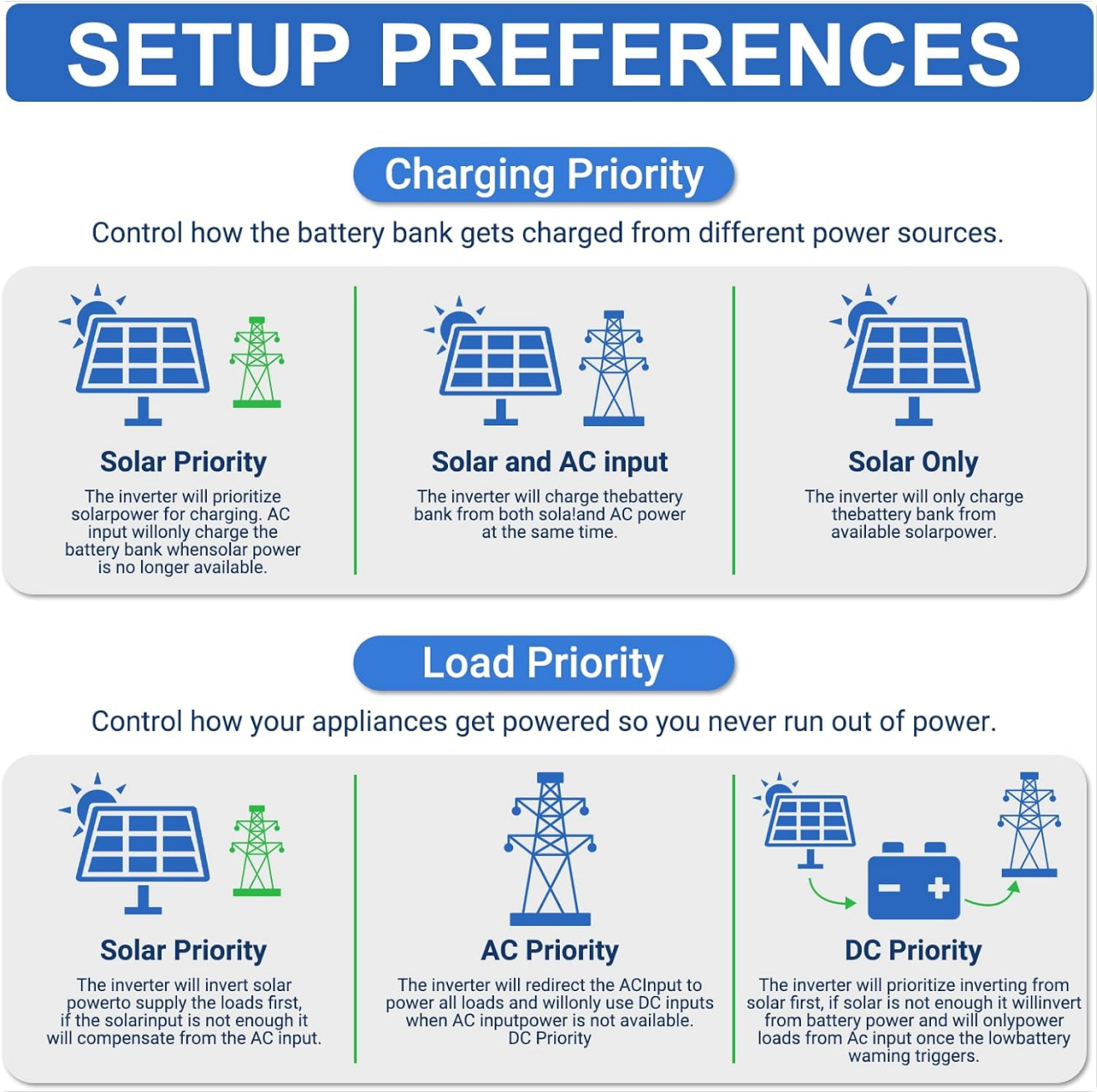

Figure 8: Charging and Load Priority Settings.

This diagram illustrates the configurable charging and load priority settings. Charging priority options include Solar Priority, Solar and AC Input, and Solar Only. Load priority options are Solar Priority, AC Priority, and DC Priority (Battery Priority).

6.1 Charging Priority Modes

These settings control how the battery bank is charged from different power sources.

- **Solar Priority:** The inverter prioritizes solar power for charging. AC input will only charge the battery bank when solar power is insufficient or unavailable.
- **Solar and AC Input (Hybrid Charging):** The inverter charges the battery bank from both solar and AC power simultaneously.
- **Solar Only:** The inverter will only charge the battery bank from available solar power.

6.2 Output Priority Modes (Load Priority)

These settings control how your appliances receive power.

- **Solar Priority (PV Priority):** The inverter will supply the load first from solar power. If solar power is not enough, it will compensate from the AC input or battery.

- **AC Priority (Mains Priority):** The inverter will redirect the AC input to power all loads. DC power (battery/solar) is used only when AC input is not available.
- **DC Priority (Hybrid Output):** The inverter prioritizes drawing power from the battery/solar. It will only switch to AC input when the battery voltage drops below a set threshold.

7. Battery Compatibility

The Aninerel hybrid inverter is designed to be compatible with a wide range of 24V battery types, offering flexibility for various energy storage solutions.

Figure 9: Multi-Battery Compatibility.
This image highlights the inverter's compatibility with various 24V battery types, including AGM, GEL, FLD (Flooded), LI (Lithium-ion), and LiFePO4 batteries. It also mentions a maximum battery charging current of 100A (AC+DC).

The inverter fully supports the following 24V battery chemistries:

- AGM (Absorbent Glass Mat)
- GEL
- Lead-acid (Flooded)

- Li-ion (Lithium-ion)
- LiFePO4 (Lithium Iron Phosphate)

It also supports direct solar-to-load applications without a battery, if configured appropriately. Built-in protections against overvoltage, undervoltage, reverse polarity, and short circuits help extend battery lifespan and ensure system safety.

8. Maintenance

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

- **Cleaning:** Periodically clean the exterior of the inverter and ensure ventilation openings are free from dust and debris. Use a dry, soft cloth.
- **Connections:** Annually inspect all wiring connections (PV, battery, AC input/output) for tightness and signs of corrosion. Tighten any loose connections.
- **Battery Inspection:** If using lead-acid batteries, check electrolyte levels and terminal conditions as per battery manufacturer guidelines.
- **Environment:** Ensure the installation environment remains within the specified temperature and humidity ranges.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates for improved performance or new features.

9. Troubleshooting

This section provides basic troubleshooting steps for common issues. For more complex problems, contact technical support.

9.1 Common Issues and Solutions

Problem	Possible Cause	Solution
Inverter not turning on	No battery connection, low battery voltage, power switch off, blown fuse.	Check battery connections and voltage. Ensure power switch is ON. Check and replace fuses if necessary.
No AC output	Overload, short circuit, low battery, AC output breaker tripped.	Reduce load. Check for short circuits. Recharge battery. Reset AC output breaker.
No solar charging	PV array disconnected, low solar irradiance, PV voltage too low/high, MPPT fault.	Check PV connections. Ensure sufficient sunlight. Verify PV voltage is within operating range.
Abnormal noise	Overload, loose components, fan issue.	Reduce load. Inspect for loose parts. Ensure fan is not obstructed.

10. Technical Specifications

Below are the detailed technical specifications for the Aninerel ANJ-3KW-24V-LV-WIFI Hybrid Solar Inverter.

MODEL	ANJ-3KW-LV-WIFI
Rated Output Power	3000W
Max.Peak Power	6000VA
Rated Output Voltage	120Vac±5%
Load Capacity of Motors	2HP
Rated AC Frequency	50Hz/60Hz
Parallel capacity	Paralleling is not supported
Output Voltage Waveform	Pure sine wave
Acceptable Voltage Range	95-140VAC(For personal Computer);70-140VAC(For Home Appliances)
Mains/Generator Input Range	(90Vac~140Vac)+2%
Battery Type	Lithium/lead-acid batteries
Rated Battery Voltage	24VDC
Floating Charge Voltage	27VDC
OverCharge Protection	32VDC
Charging Method	CC/CV
Max.PV array power	4000W
Max.MPPT Charging Current	60A
Max.Mains/Generator Charging Current	100A
Max.Hybrid Charging Current	100A
Num. of MPPT rackers	1
Max.input current	27A
Max.Voltage of Open Circuit	500Vdc
MPPT Voltage Range	60-450Vdc
MPPT Tracking Efficiency	95%
Support Communication	Dry contact+RS485+WIFI
Dimensions	18.7*15.35*7.08 IN
Weight	8.5KG/18.7LB

Figure 10: Detailed Technical Specifications.

This table provides comprehensive technical specifications for the ANJ-3KW-LV-WIFI model, including rated output power, peak power, rated output voltage, AC frequency, waveform, acceptable voltage range, battery type compatibility, charging parameters, PV array details, communication support, dimensions, and weight.

Parameter	Value
Model	ANJ-3KW-24V-LV-WIFI
Rated Output Power	3000W
Max. Peak Power	6000VA
Rated Output Voltage	120Vac ±5%
Rated AC Frequency	50Hz/60Hz (Auto sensing)
Output Waveform	Pure Sine Wave
Acceptable Voltage Range (Personal Computer)	95-140VAC
Acceptable Voltage Range (Home Appliances)	70-140VAC
Mains/Generator Input Range	(90VAC~140Vac) ±2%
Battery Type	Lithium/Lead-acid batteries
Rated Battery Voltage	24VDC
Floating Charge Voltage	27VDC
OverCharge Protection	32VDC
Charging Method	CC/CV
Max. PV Array Power	4000W

Parameter	Value
Max. MPPT Charging Current	100A
Max. Mains/Generator Charging Current	100A
Max. Hybrid Charging Current	100A
Num. of MPPT trackers	1
Max. Input Current	27A
Max. Voltage of Open Circuit	500Vdc
MPPT Voltage Range	60-450Vdc
MPPT Tracking Efficiency	95%
Support Communication	Dry contact + RS485 + WiFi
Dimensions	18.7" x 15.35" x 7.08"
Weight	8.5KG / 18.7LB

11. Warranty and Support

Your Aninerel ANJ-3KW-24V-LV-WIFI Hybrid Solar Inverter comes with an instruction manual and a WiFi antenna. For technical support, warranty claims, or any inquiries, please contact Aninerel customer service.

Customer Support Contact:

- **Email:** anenji168@outlook.com
- **Phone:** +86 188 0375 9233
- **Operating Hours (PDT):** 9 AM - 6 PM

Figure 11: Aninerel Customer Support Details.
This image provides contact information for Aninerel customer support, including an email address, phone number, and operating hours in PDT.