Anern AN-SCI-ECO-4200W

Anern 4200W Hybrid Solar Inverter

Model: AN-SCI-ECO-4200W User Manual

1. Introduction

This user manual provides essential information for the safe and efficient operation of your Anern 4200W Hybrid Solar Inverter. This all-in-one pure sine wave inverter integrates solar energy storage and charging, capable of producing stable AC sine waves. It features a 120A MPPT solar charge controller with optimized MPPT technology for up to 98% efficiency. Please read this manual thoroughly before installation and use.

Figure 1: Anern 4.2KW Hybrid Solar Inverter, showing the main unit and included Wi-Fi module.

2. Key Features

- **All-in-One Design:** Integrates solar energy storage, charging, and AC output functions.
- **High-Efficiency MPPT Controller:** Features a 120A MPPT solar charge controller with up to 98% efficiency.
- **Pure Sine Wave Output:** Provides stable and high-quality AC power suitable for various household and office loads, including sensitive electronics.
- **Remote Monitoring:** Equipped with an LCD screen and 4 LED indicators for dynamic system data display. Supports Wi-Fi/GPRS remote monitoring (Wi-Fi module included).
- **Multiple Charging Modes:** Offers 4 optional charging modes: Solar, Solar & Utility, Solar First.
- **Flexible Output Modes:** Provides 3 output modes: Solar First, Utility First, SBU mode.
- **Smart Battery Charger:** Designed with an intelligent battery charger to optimize battery performance and extend

battery life.

- **Comprehensive Protection:** Includes protection against overcharge, overheating, short circuits, overcurrent, low voltage, and overload.
- **Wide Compatibility:** Compatible with various battery types and generator power.

Figure 2: Illustration of the inverter's multiple protection features, including overcurrent, low voltage, short circuit, overheating, and overload protection.

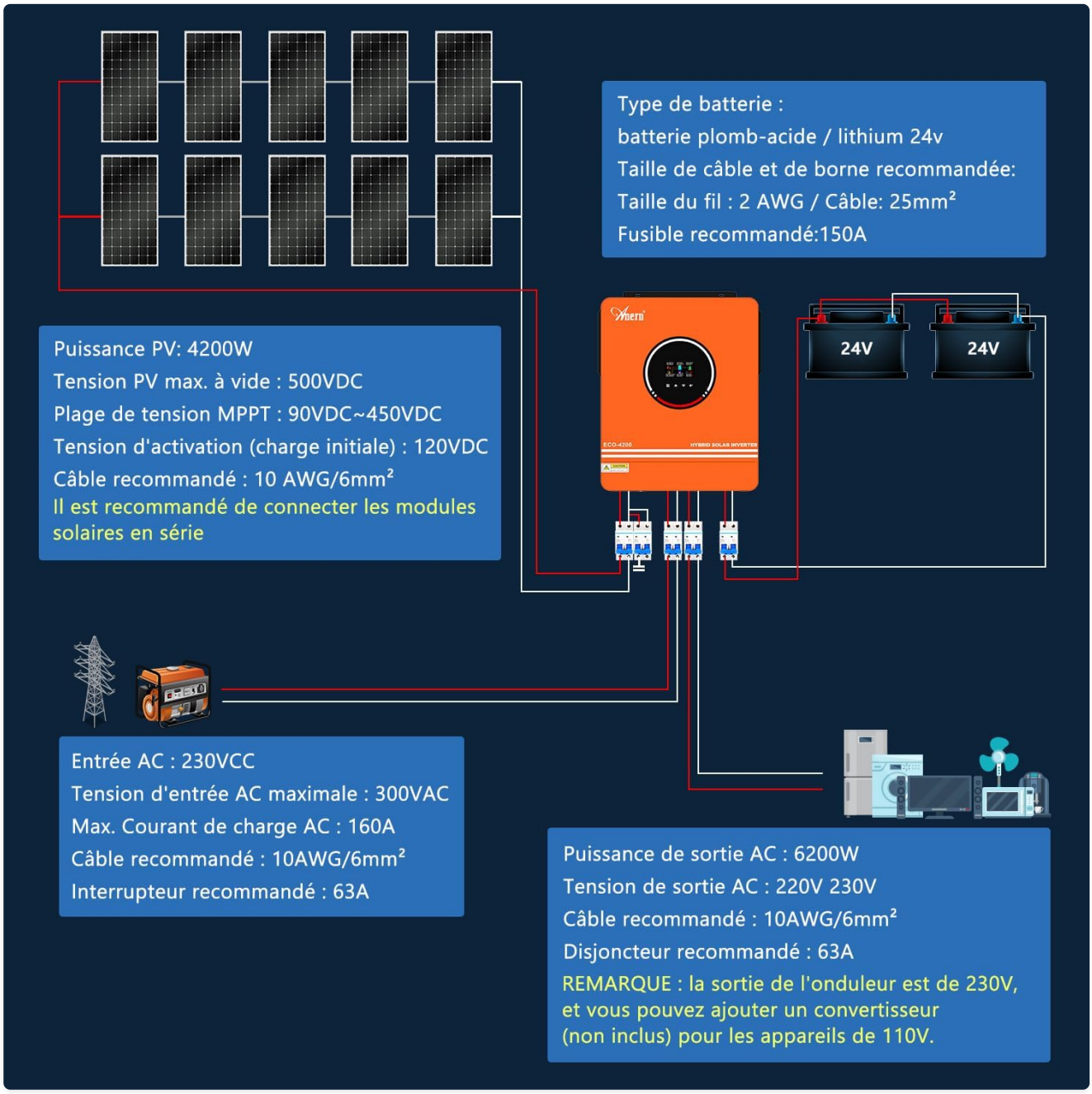

Figure 3: The inverter supports Wi-Fi monitoring, allowing system operation to be controlled and viewed via a mobile phone (iOS/Android).

Figure 4: The inverter supports various battery types including GEL, AGM, FLD, and Lithium. Note: The inverter can be used without batteries. If using a lithium battery, ensure it is configured as "User-defined" in program 05. It can only connect to a BMS PACE, not BMS from other manufacturers. The inverter cannot communicate with other battery brands.

Figure 5: The inverter offers three charge modes (Solar Priority, Solar + Utility, Solar-Battery) and two output modes (Solar First, Utility First) to meet diverse user application requirements.

3. Setup and Installation

3.1 Safety Precautions

- Ensure all connections are secure and correct before powering on the unit.
- Installation should be performed by qualified personnel.
- Do not expose the inverter to rain, snow, spray, or any liquids.
- Ensure adequate ventilation around the inverter to prevent overheating.
- Always disconnect all power sources (PV, battery, AC) before performing any maintenance or wiring.

3.2 Product Overview and Connections

Familiarize yourself with the inverter's components and connection points.

Figure 6: Product overview showing the front and rear panels with labeled components:

1. LCD Display
2. Status display
3. Load indicator
4. Error indicator
5. Function keys
6. On/Off Switch
7. AC input
8. Main output
9. Second output
10. Battery input
11. PV input
12. Anti-dust kit
13. RS-232 communication Connection / Wi-Fi connection

3.3 Wiring Diagram

The following diagrams illustrate the recommended wiring for the inverter with solar panels, batteries, and AC loads.

Figure 7: Detailed connection diagram for the hybrid solar inverter. This diagram shows connections for solar panels (PV input), battery bank (24V), AC input (230V), and AC output (230V) to household appliances. Recommended cable sizes and fuse ratings are indicated.

Battery Type: Lead-acid / Lithium 24V

Recommended Cable & Terminal Size: 2 AWG / Cable: 25mm²

Recommended Fuse: 150A

PV Power: 4200W

Max PV Open Circuit Voltage: 500VDC

MPPT Voltage Range: 90VDC~450VDC

Start-up Voltage (Initial Charging): 120VDC

Recommended PV Cable: 10 AWG / 6mm² (It is recommended to connect solar modules in series.)

AC Input: 230V AC

Max AC Input Voltage: 300V AC

Max AC Charging Current: 160A

Recommended AC Input Cable: 10 AWG / 6mm²

Recommended AC Input Breaker: 63A

AC Output Power: 4200W

AC Output Voltage: 220V / 230V

Recommended AC Output Cable: 10 AWG / 6mm²

Recommended AC Output Breaker: 63A

NOTE: The output of the inverter is 230V. You can add a converter (not included) for 110V devices.

Figure 8: System diagram illustrating the integration of the Anern AN-SCI-ECO-4200 hybrid inverter with solar panels, external battery packs, utility grid/generator, and various home appliances. The diagram also shows the Wi-Fi monitoring capability via the PVguarder APP or Web interface.

4. Operating Instructions

4.1 Powering On/Off

- To power on, ensure all connections are correct, then switch on the AC input breaker (if connected), followed by the battery breaker, and finally the inverter's ON/OFF switch.
- To power off, reverse the sequence: turn off the inverter's ON/OFF switch, then the battery breaker, and finally the AC input breaker.

4.2 LCD Display and Function Keys

The LCD display provides real-time operational data. Use the function keys (refer to Figure 6, item 5) to navigate through menus and adjust settings.

- **LCD Display:** Shows system parameters such as input voltage, output voltage, battery status, load percentage, and error codes.
- **Status Indicators (LEDs):** Provide quick visual cues for operational status.
- **Function Keys:** Used for menu navigation, setting adjustments, and confirming selections.

4.3 Operating Modes Configuration

The inverter supports various charging and output modes, configurable via the LCD display settings.

- **Charge Modes:**
  - *Solar Priority:* Solar power is prioritized for charging batteries and powering loads.
  - *Solar + Utility:* Both solar and utility power are used for charging and powering loads.
  - *Solar-Battery:* Solar power charges the battery, and the battery powers the loads.
- **Output Modes:**
  - *Solar First:* Solar power is prioritized for loads.
  - *Utility First:* Utility power is prioritized for loads.
  - *SBU Mode (Solar-Battery-Utility):* Solar power is prioritized, then battery, then utility.

4.4 Wi-Fi Monitoring Setup

The included Wi-Fi module allows for remote monitoring and control. Refer to the separate Wi-Fi module manual for detailed setup instructions, including connecting to the PVguarder APP or Web interface.

5. Maintenance

- **Regular Cleaning:** Keep the inverter clean and free from dust. Use a dry cloth to wipe the exterior. Ensure ventilation openings are not blocked.
- **Connection Inspection:** Periodically check all electrical connections for tightness and signs of corrosion.
- **Battery Health:** Monitor battery voltage and performance regularly. Follow battery manufacturer's guidelines for maintenance.
- **Environmental Conditions:** Ensure the inverter operates within its specified temperature and humidity ranges.

6. Troubleshooting

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

Problem	Possible Cause	Solution
Inverter not powering on.	No battery connection, low battery voltage, AC input not connected, or ON/OFF switch off.	Check battery connections and voltage. Ensure AC input is connected and breakers are on. Turn on the inverter's ON/OFF switch.
No AC output.	Overload, short circuit, low battery, or incorrect output mode setting.	Reduce load. Check for short circuits in wiring. Recharge battery. Verify output mode settings on LCD.
PV charging not working.	Insufficient solar input, PV connection error, or MPPT controller fault.	Check solar panel connections and ensure adequate sunlight. Verify PV input voltage on LCD.
Inverter making unusual noise.	Normal fan operation under load, or potential internal fault.	Some fan noise is normal. If noise is excessive or unusual, power off the unit and contact support.

7. Technical Specifications

Parameter	Value
Brand	Anern
Model Name	AN-SCI-ECO-4200W with WIFI
Color	Orange
Power	4.2 KW
Battery Capacity	120 Amp-hours (Charge Controller)
Power Source	Solar and Battery Powered
Recommended Uses	Home
Included Components	Wi-Fi Module
Product Dimensions (L x W x H)	52L x 45W x 21.5H cm (approx. 20.5L x 17.7W x 8.5H inches)
Total Power Outlets	1
Max PV Open Circuit Voltage	450VDC
Max PV Power	6200W
Max PV No-Load Voltage	500VDC

Parameter	Value
Max PV Charging Current	120A
Rated Output Current	44.3A

Figure 9: Product dimensions, showing height (420mm / 16.5"), width (350mm / 13.77"), and depth (110mm / 4.33").

8. Warranty and Support

This product comes with a**1 Year Warranty Against Manufacturer Defects**. For any issues, technical support, or warranty claims, please contact the seller directly. Ensure you have your purchase details and product model number ready when contacting support.

For further assistance, you may also visit theAnern Store on Amazon.