Y&H SP-2200W-12V-M80A

Y&H 2200W 12V Solar Hybrid Inverter User Manual

Model: SP-2200W-12V-M80A

1. Introduction

This manual provides essential information for the safe and efficient operation of your Y&H 2200W 12V Solar Hybrid Inverter. This device integrates a pure sine wave inverter, an 80A MPPT solar charge controller, and an AC battery charger into a single unit. It is designed to provide uninterrupted power to various loads, supporting both solar and utility power sources. Please read this manual thoroughly before installation and use.

Image 1.1: Front view of the Y&H 2200W 12V Solar Hybrid Inverter.

2. Safety Instructions

Adherence to these safety guidelines is crucial to prevent injury and damage to the inverter or connected equipment.

- **Qualified Personnel:** Installation and maintenance must be performed by qualified personnel.
- **Electrical Hazard:** This unit contains high voltage. Do not attempt to disassemble or repair the inverter yourself.
- **Proper Grounding:** Ensure the inverter is properly grounded according to local electrical codes.
- **Ventilation:** Install the inverter in a well-ventilated area to prevent overheating. Avoid installing near bedrooms due to fan noise (50-70 dB).
- **Battery Safety:** Always connect batteries with correct polarity. Use appropriate circuit breakers between

the battery and the inverter.

- **Environmental Conditions:** Avoid exposure to rain, snow, spray, or any liquids. Do not operate in environments with flammable gases or corrosive substances.
- **Load Compatibility:** Do not overload the inverter. Ensure connected appliances do not exceed the inverter's rated output power.

3. Product Overview

The Y&H Solar Hybrid Inverter is an all-in-one solution for off-grid and backup power systems. It features a 2200W pure sine wave output, an 80A MPPT solar charge controller, and an AC charger, making it compatible with various 12V battery types including lead-acid (sealed, AGM, gel, flooded) and lithium batteries.

3.1 Key Features

- **Pure Sine Wave Output:** Provides clean and stable power suitable for sensitive electronics.
- **Integrated MPPT Charge Controller:** Maximizes solar power harvesting with an 80A MPPT controller.
- **AC Charger:** Allows charging from the utility grid or a generator.
- **Multiple Operating Modes:** Configurable charging and output priority modes to optimize energy usage.
- **Comprehensive Protection:** Includes short circuit, overload, over current, over voltage, under voltage, backfill, over temperature, and over charge protection.
- **LCD Display and LED Indicators:** Provides real-time system data and operational status.
- **Optional Wi-Fi Monitoring:** Remote monitoring capability via mobile app or website (Wi-Fi module not included).

Image 3.1: Overview of key features including pure sine wave output, intelligent temperature control, multiple protection mechanisms, and the LCD screen with LED indicators.

4. Setup and Installation

Careful installation is essential for the inverter's performance and safety. Follow these steps for proper setup.

4.1 System Connection Diagram

The diagram below illustrates the typical connections for solar panels, battery, AC input (utility/generator), and AC loads.

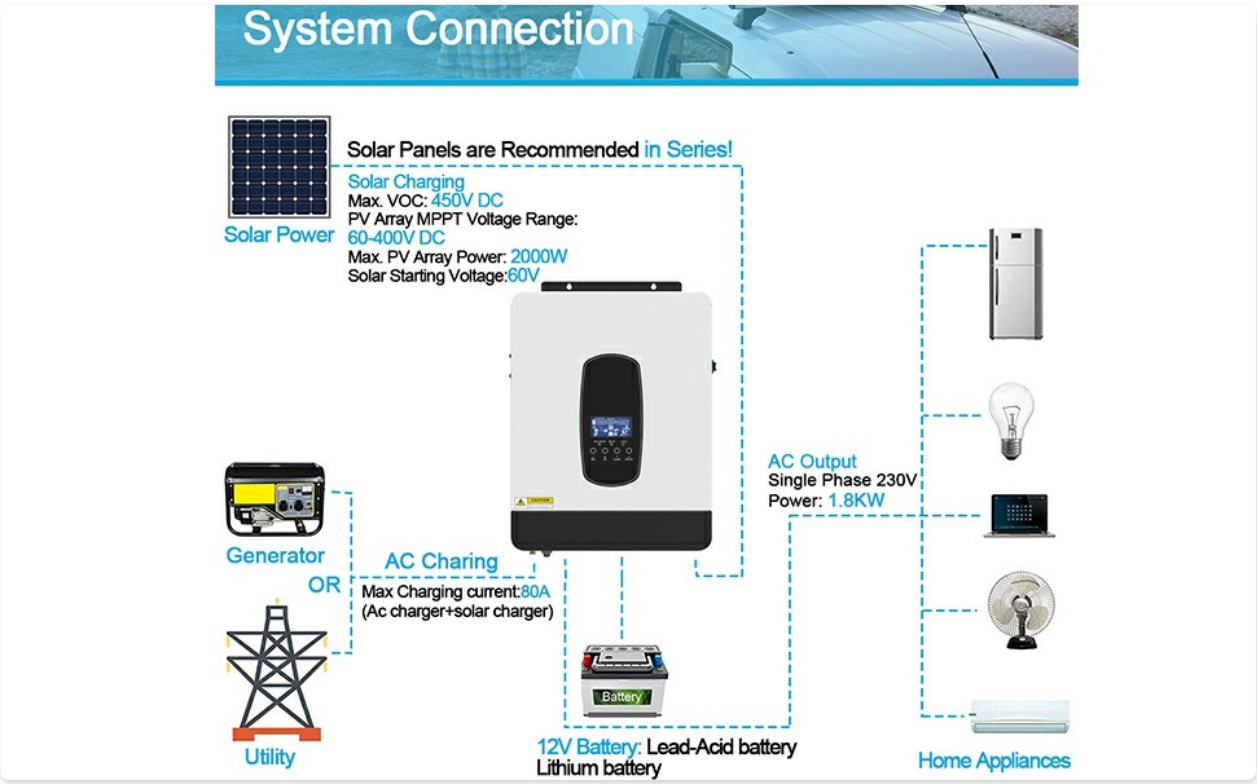

Image 4.1: Comprehensive system connection diagram. Solar panels are recommended to be connected in series. Max PV input: 2000W, 55-450V DC. AC output: 230V, 1.8KW. Max charging current: 80A. Battery type: 12V Lead-acid or Lithium.

4.2 Battery Connection

The inverter is compatible with 12V lead-acid (Seal, AGM, Gel, Flooded) and lithium batteries. Ensure the correct battery type is selected in the inverter settings. Always use a circuit breaker between the battery and the inverter.

Image 4.2: Battery compatibility and recommended cable sizes. For 2.2KVA-12V, use 1 x 4AWG cable (22 mm²) with a maximum torque value of 2 Nm.

4.3 Solar Panel Connection

Connect solar panels to the PV input terminals. The maximum PV input power is 2000W, with a voltage range of 55-450V DC. The maximum PV open circuit voltage (VOC) is 450V DC. The recommended PV cable size is 16AWG.

4.4 AC Input and Output

The inverter accepts a maximum AC input voltage of 300Vac. The nominal AC output is 230V with a power of

1800W. Ensure all AC wiring is done with appropriate cable gauges and circuit breakers.

5. Operating Modes

The inverter offers various configurable modes to optimize power usage based on your specific needs.

5.1 Charging Modes

There are four optional charging modes:

- **CSO (Solar First):** Prioritizes solar power for charging.
- **Utility First:** Prioritizes utility power for charging.
- **SNU (Solar and Utility Hybrid):** Uses both solar and utility power for charging (default).
- **OSO (Only Solar):** Charges only from solar power.

5.2 Output Modes

There are three available output modes:

- **SUB (Solar First):** Prioritizes solar power for supplying loads (default).
- **Utility First:** Prioritizes utility power for supplying loads.
- **SBU Priority:** Solar power is used first, then battery, then utility.

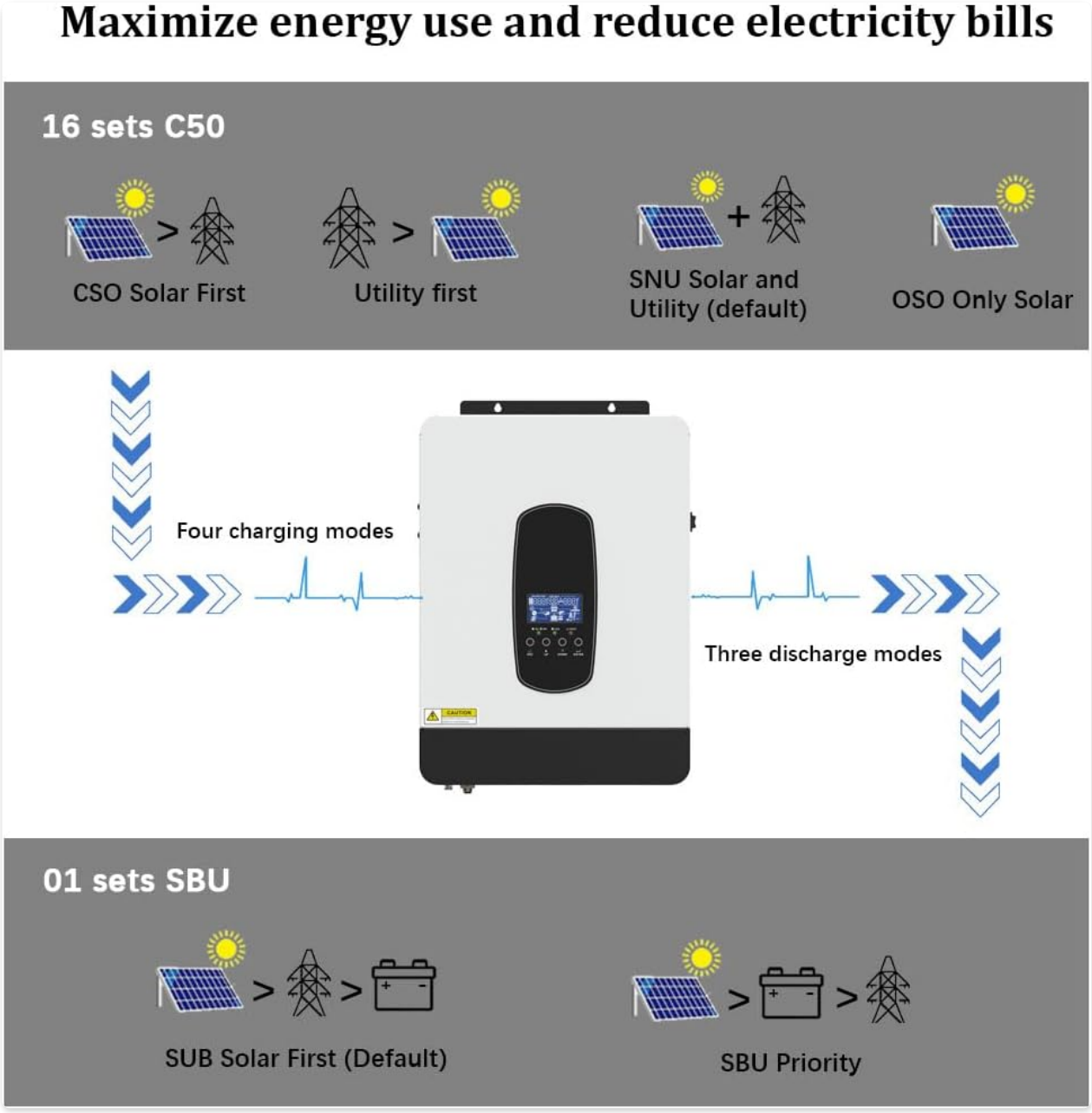

Image 5.1: Visual representation of the four charging modes and three discharge modes to maximize energy use.

6. Display and Controls

The inverter features an LCD screen and three LED indicators for dynamic display of system data and operational status. The control buttons allow for configuration of various parameters.

6.1 LCD Screen and LED Indicators

The LCD screen displays real-time information such as input voltage, output voltage, battery status, and charging/discharging power. The LED indicators provide quick status updates:

- **Green LED:** Indicates normal operation.
- **Yellow LED:** Indicates a warning or fault.
- **Red LED:** Indicates a critical error or shutdown.

6.2 Control Buttons

The control panel typically includes buttons for navigation (ESC, UP, DOWN, ENTER) to access and modify

settings such as battery charge current, AC/solar charger priority, and power source priority.

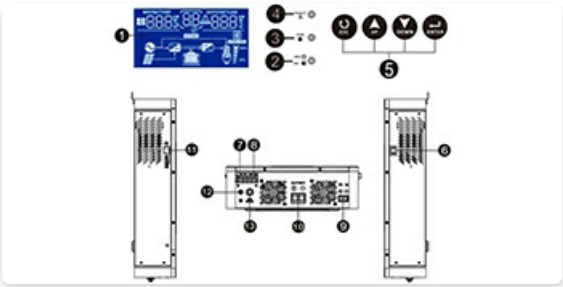

Image 6.1: Detailed view of the inverter's LCD display and control buttons for system configuration.

6.3 Wi-Fi Communication (Optional)

The inverter supports remote monitoring via an optional Wi-Fi module. This allows users to check the system's performance and status from a mobile phone or web browser anytime, anywhere.

Image 6.2: The inverter is Wi-Fi monitoring ready, allowing users to check performance remotely.

7. Maintenance

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

- **Cleaning:** Keep the inverter clean and free from dust. Use a dry cloth to wipe the exterior.
- **Ventilation:** Ensure ventilation openings are not blocked. Periodically check for dust accumulation in cooling fans.
- **Connections:** Periodically inspect all electrical connections (solar, battery, AC input/output) for tightness and corrosion.
- **Battery Health:** Monitor battery voltage and health, especially for lead-acid batteries, to ensure optimal charging and discharge cycles.

8. Troubleshooting

If the inverter is not functioning as expected, refer to the LCD display for error codes or warning messages. Common issues and general troubleshooting steps are listed below.

- **No Power Output:** Check AC input, battery connections, and solar panel connections. Ensure the inverter is turned on.
- **Overload Warning:** Reduce the connected load. The inverter may shut down automatically to protect

itself.

- **Battery Low Voltage:** Check battery charge level. Ensure solar panels are receiving sufficient sunlight or AC input is connected for charging.
- **Overheating:** Ensure adequate ventilation around the inverter. Clear any obstructions from cooling vents.
- **Fault Indicator:** If a fault indicator is active, consult the full product manual (if available) for specific error code meanings or contact customer support.

9. Specifications

The following tables detail the technical specifications of the Y&H 2200W 12V Solar Hybrid Inverter (Model: SP-2200W-12V-M80A).

9.1 Inverter Specifications

Feature	Specification (2.2KVA-12V)
Rated Output Power	2200W / 1800W
Output Waveform	Pure Sine Wave
Output Voltage Regulation	230Vac ± 5%
Output Frequency	50Hz
Peak Efficiency	94%
Overload Protection	5s @ >150% load; 10s @ 110% ~ 150% load
Surge Capacity	3600W (2* rated power for 5 seconds)
Nominal DC Input Voltage	12Vdc
Low DC Warning Voltage (<50% load)	11.5Vdc
Low DC Warning Voltage (>50% load)	11.0Vdc
Low DC Warning Return Voltage (<50% load)	11.5Vdc
Low DC Warning Return Voltage (>50% load)	11.0Vdc
Low DC Cut-off Voltage (<50% load)	10.2Vdc
Low DC Cut-off Voltage (>50% load)	9.6Vdc
High DC Recovery Voltage	14.5Vdc
High DC Cut-off Voltage	15.5Vdc
No Load Power Consumption	<25W

Feature	Specification
Input Voltage Waveform	Sinusoidal (utility or generator)
Nominal Input Voltage	230Vac
Low Loss Voltage (UPS)	170Vac±7V
Low Loss Voltage (Appliances)	90Vac±7V
Low Loss Return Voltage (UPS)	180Vac±7V
Low Loss Return Voltage (Appliances)	100Vac±7V
High Loss Voltage	280Vac±7V
High Loss Return Voltage	270Vac±7V
Max AC Input Voltage	300Vac
Nominal Input Frequency	50/60Hz (Auto detection)
Low Loss Frequency	40 ± 1Hz
Low Loss Return Frequency	42 ± 1Hz
High Loss Frequency	65 ± 1Hz
High Loss Return Frequency	63 ± 1Hz
Output Short Circuit Protection	Circuit Breaker
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)
Transfer Time (UPS)	10ms typical
Transfer Time (Appliances)	20ms typical

9.2 Charging Specifications

Charging Mode	Feature	Specification (2.2KVA-12V)
Utility Charging Mode	Charging Algorithm	3-Step
	AC Charging Current (Max)	60Amp (@V_{in} 230Vac)
	Bulk Charging Voltage (Flooded Battery)	14.6V
	Bulk Charging Voltage (AGM / Gel Battery)	14.1V
	Floating Charging Voltage	13.5V
MPPT Solar Charging Mode	Max. PV Array Power	2000W
	Nominal PV Voltage	240Vdc
	PV Array MPPT Voltage Range	55-430Vdc
	Max. PV Open Circuit Voltage	450Vdc
	Max Charging Current (AC charger plus solar charger)	80Amp

9.3 General Specifications

Feature	Specification (2.2KVA-12V)
Safety Certification	CE
Operating Temperature Range	-10°C to 50°C
Storage Temperature	-15°C to 60°C
Humidity	5% to 95% Relative Humidity (Non-condensing)
Dimensions (D*W*H)	34L x 28W x 10H cm
Net Weight	5.0 kg

10. Warranty and Support

Warranty information for this product is not provided in the current documentation. For warranty claims, technical support, or service inquiries, please contact your retailer or the manufacturer directly. Ensure you have your product model number (SP-2200W-12V-M80A) and purchase details available when seeking support.