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SolarEpic UP3000-HM5041

SolarEpic UPower-HI Series Inverter/Charger User Manual

Model: UP3000-HM5041

1. Introduction

This manual provides essential information for the safe and efficient operation of your SolarEpic UPower-HI Series Hybrid Inverter Charger. Please read this manual thoroughly before installation and use, and keep it for future reference.

The SolarEpic UPower-HI Series Inverter/Charger is a versatile power solution designed for various applications, offering reliable power conversion and charging capabilities. This model, UP3000-HM5041, provides 3000W continuous power with a 6000W surge capacity, converting 48VDC to 110VAC/120VAC pure sine wave output.

Key Features:

- **High Power Output:** 3000W continuous, 6000W surge power (3 seconds) from 48VDC to 110VAC/120VAC.
- **Configurable Settings:** Adjustable battery charging current, discharging current, and grid charging current.
- **Advanced MPPT Technology:** High tracking efficiency of MPPT no less than 99.5%, with self-learning SOC function.
- **Flexible Operation Modes:** Supports both battery mode and non-battery mode. In non-battery mode, it can charge simultaneously from solar (main) and utility (assist).
- **Comprehensive Protections:** Includes surge current, reverse connection, PV reverse polarity, utility input over/under-voltage, battery over-voltage, over-discharge, output overload, and short circuit protections.
- **Multiple Charging Modes:** Offers Solar only, Solar priority, and Utility & Solar charging modes.
- **Dual AC Output Modes:** Utility priority and Inverter priority.
- **Pure Sine Wave Output:** Utilizes advanced SPWM technology for clean and stable power.
- **PFC Technology:** Achieves a high power factor for AC to DC charging, reducing power grid capacity usage.
- **User Interface:** Features a 4.2-inch LCD display for monitoring and modifying system parameters.
- **Communication Options:** Optional WiFi or GPRS remote control via RS485 isolated communication port.
- **Battery Compatibility:** Supports various battery types including AGM, GEL, FLD, LFP8/LFP15/LFP16, LNCM7/LNCM14, and includes an optional BMS-Link port for charging and discharging control from BMS.



Figure 1.1: Angled view of the SolarEpic UPower-HI Series Inverter/Charger.

2. Safety Instructions

Please observe the following safety precautions during installation, operation, and maintenance of the inverter/charger. Failure to comply may result in serious injury, death, or damage to the equipment.

- **Qualified Personnel:** All electrical work must be performed by qualified personnel familiar with electrical systems and safety procedures.
- **Disconnect Power:** Before performing any installation or maintenance, ensure all power sources (PV, utility, and battery) are disconnected.
- **Proper Grounding:** The inverter/charger must be properly grounded to prevent electrical shock.
- **Ventilation:** Ensure adequate ventilation around the unit to prevent overheating. Do not block ventilation openings.
- **Environment:** Install the unit in a dry, well-ventilated area, away from flammable materials, corrosive gases, and excessive dust. Avoid direct sunlight and high humidity.
- **Battery Safety:** Work with batteries carefully. Wear eye protection and protective clothing. Batteries can produce explosive gases.
- **Correct Wiring:** Use appropriate wire gauges and ensure all connections are tight and secure to prevent loose connections and overheating.
- **Overcurrent Protection:** Install appropriate circuit breakers or fuses as recommended to protect against overcurrent.
- **No Disassembly:** Do not attempt to disassemble or repair the unit yourself. Refer all servicing to qualified service personnel.

3. Product Overview and Features Identification

This section details the physical components and key features of the SolarEpic UPower-HI Series Inverter/Charger.

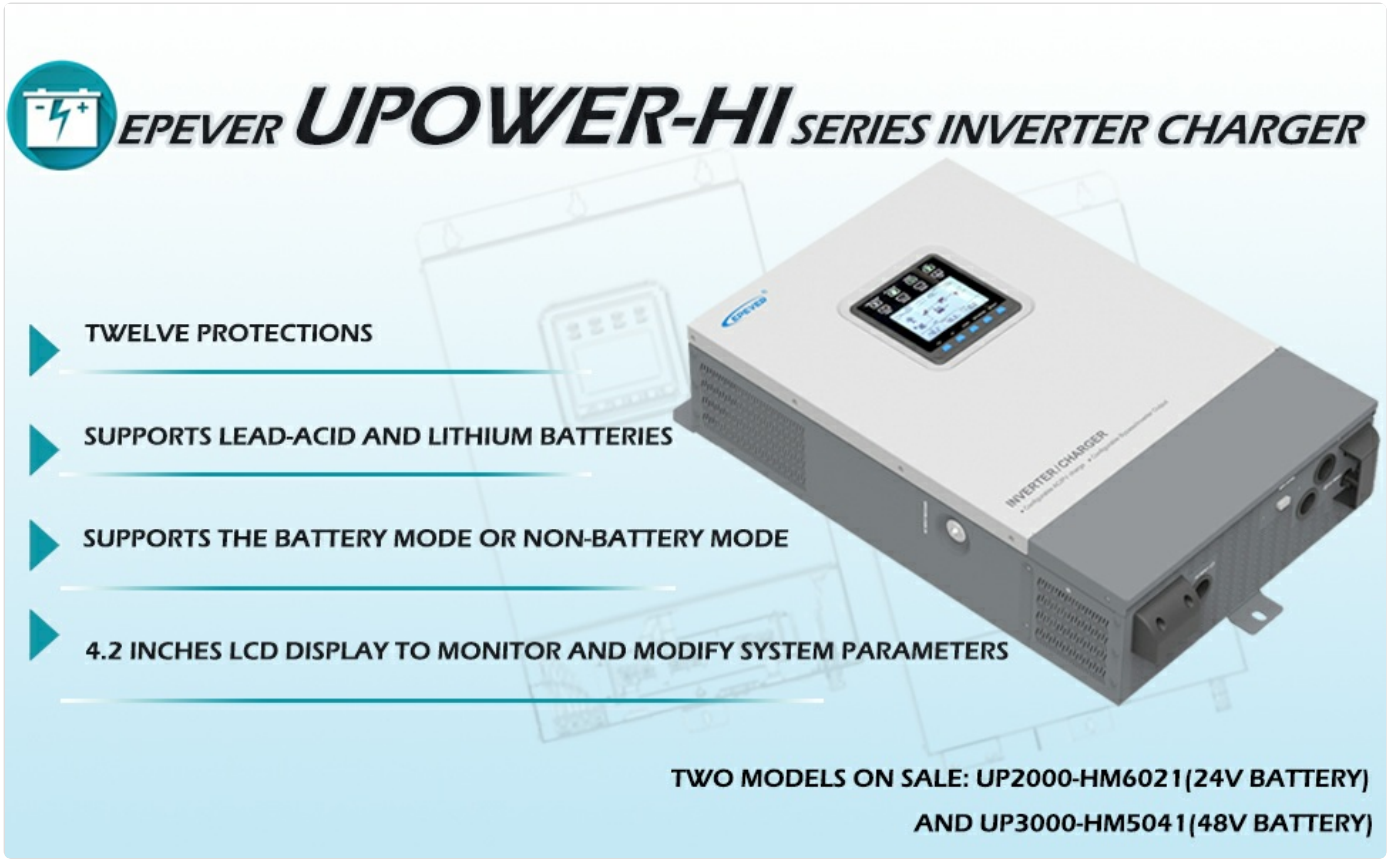


Figure 3.1: Overview of the UPower-HI Series Inverter Charger highlighting key features.

3.1 External Components



Figure 3.2: Front view of the inverter/charger, featuring the LCD display and control panel.



Figure 3.3: Side view of the inverter/charger, indicating the main ON/OFF switch.



Figure 3.4: Side view of the inverter/charger, showing the AC input recover button.

3.2 LCD Display and Control Panel

The 4.2-inch LCD display provides real-time monitoring of system parameters and allows for configuration adjustments. The control panel consists of several buttons for navigation and setting changes.



Figure 3.5: Close-up view of the LCD display and control buttons.

The display shows information such as Utility Charge, PV Charge, Inverter status, Load status, Relay, Remote, Bypass, and Fault indicators. It also presents input and output priorities, and real-time values for Utility PV, Battery, and Load.

3.3 Parts Identification Diagram

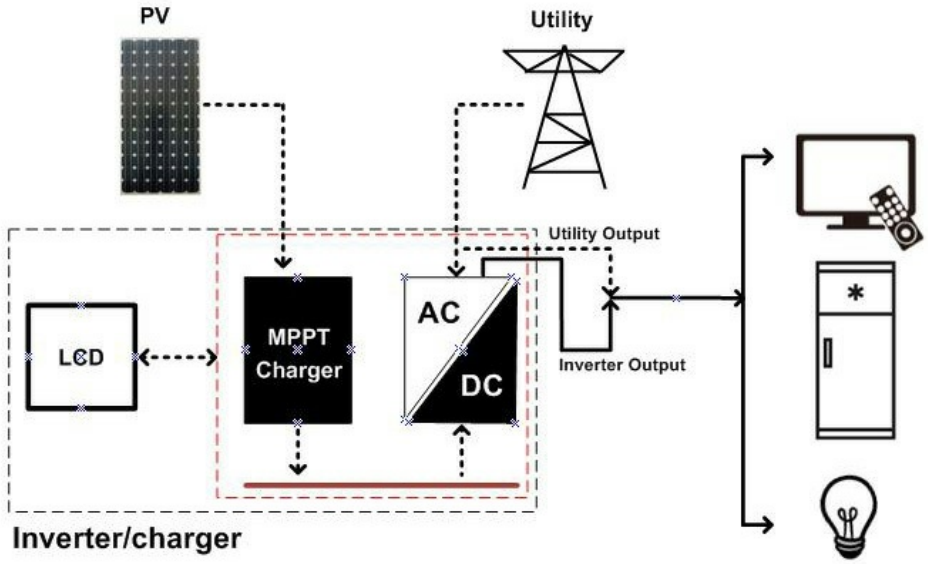


Figure 3.6: Detailed parts identification diagram of the inverter/charger.

Note: Refer to the full product manual for a complete legend of numbered parts.

4. Setup and Installation

Proper installation is crucial for the safe and efficient operation of the inverter/charger. Follow these guidelines carefully.

4.1 Mounting

- The unit dimensions are approximately 25.3 x 15.02 x 5.87 inches (642.5 x 381.6 x 149 mm).
- Mounting hole size: 10mm (0.39 inch).
- Mounting hole distance: 620mm x 244mm (24.41 x 11.81 inches).
- Ensure the mounting surface is strong enough to support the unit's weight of 41.8 pounds (19 kg).
- Allow sufficient clearance around the unit for proper ventilation and heat dissipation.

4.2 Wiring Connections

All wiring must comply with local electrical codes and regulations. Use appropriate wire sizes and ensure secure connections.

- **Recommended Battery Wire Size:** 16mm² / 5AWG.
- **Recommended Circuit Breaker:** 2P—100A for the battery circuit.
- Ensure correct polarity when connecting batteries and PV arrays.

4.3 Connection Diagrams

The inverter/charger supports both battery and non-battery operating modes. Refer to the diagrams below for typical connection setups.

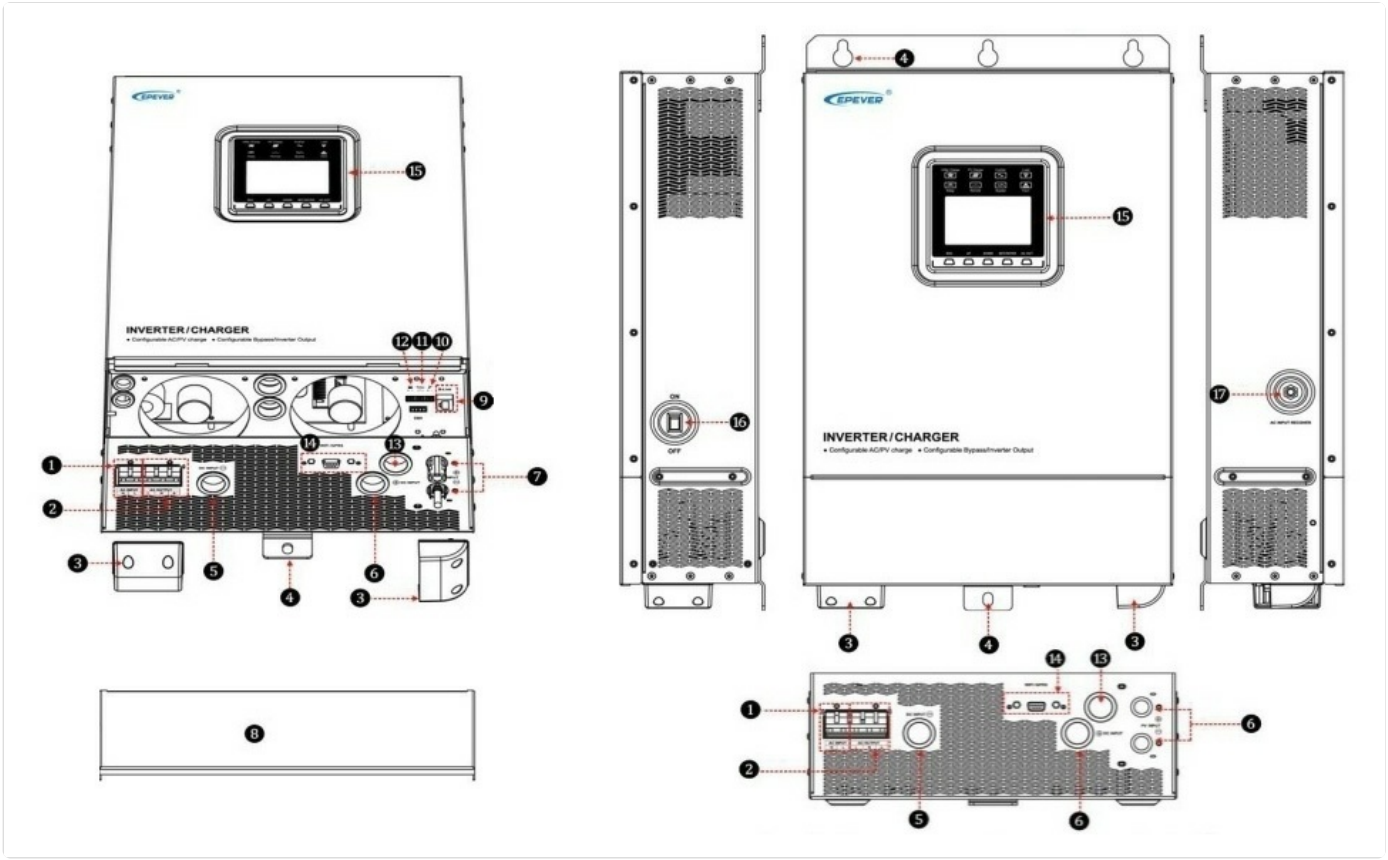


Figure 4.1: Connection diagram for Non-Battery Mode. In this mode, the unit primarily uses solar power, supplemented by utility power, to supply the load.

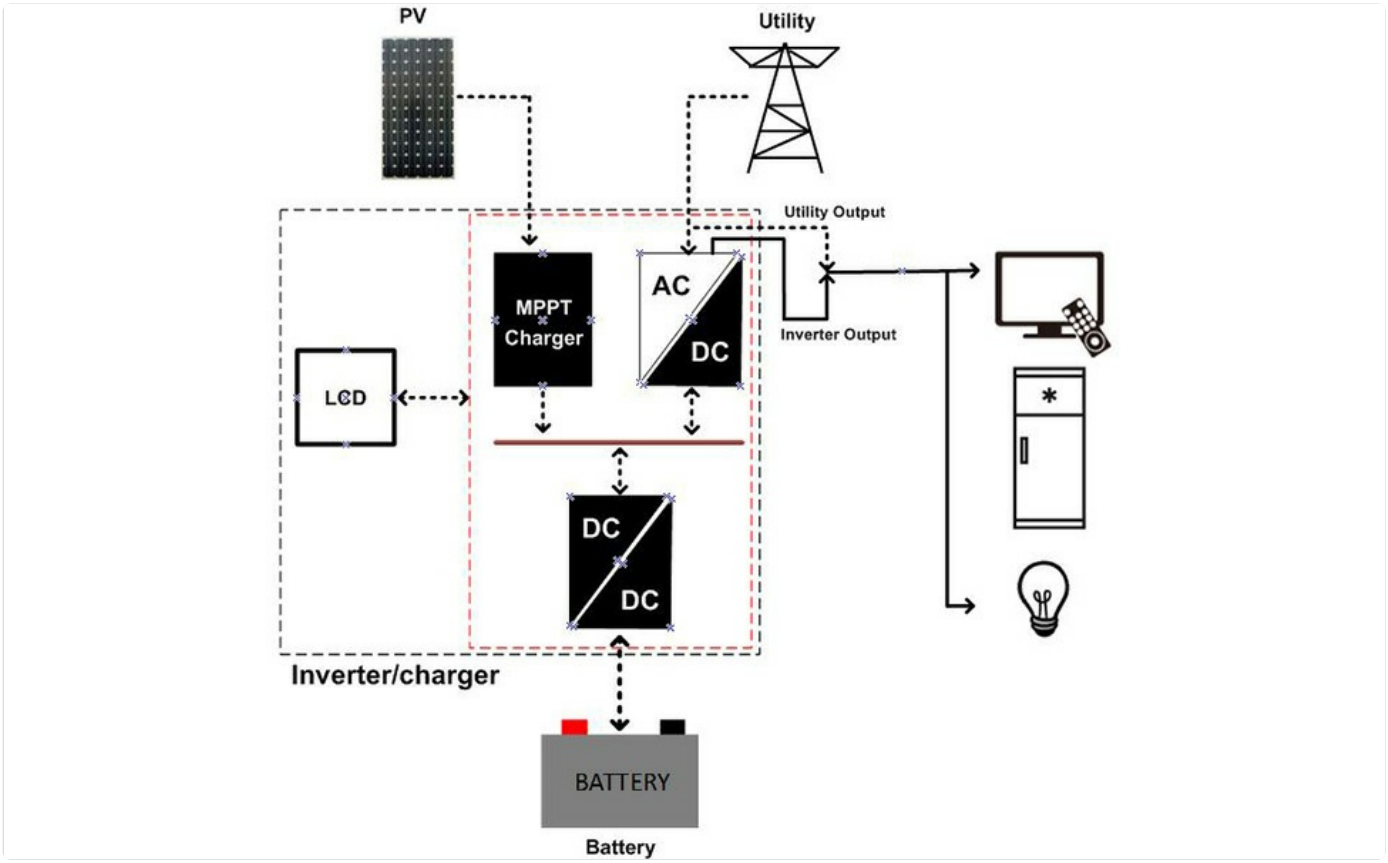


Figure 4.2: Connection diagram for Battery Mode. This setup includes a battery bank for energy storage, allowing for power supply during outages or low solar production.

5. Operating Instructions

This section outlines the various operating modes and how to configure the inverter/charger using its LCD display.

5.1 Powering On/Off

1. Ensure all connections are secure and correct.
2. Turn on the battery circuit breaker first.
3. Switch the main ON/OFF button on the side of the inverter/charger to the "ON" position.
4. If applicable, connect the PV array and utility input.
5. To power off, reverse the sequence: disconnect PV, then utility, then switch the inverter/charger OFF, and finally turn off the battery breaker.

5.2 Charging Modes

The inverter/charger offers three distinct charging modes:

- **Solar Only:** Prioritizes solar power for charging.
- **Solar Priority:** Uses solar power as the primary source, supplementing with utility power if solar is insufficient.
- **Utility & Solar:** Charges from both utility and solar sources simultaneously.

5.3 AC Output Modes

Two AC output modes are available to manage power delivery to your loads:

- **Utility Priority:** The load is primarily powered by the utility grid. The inverter will only supply power if the utility grid is unavailable.
- **Inverter Priority:** The load is primarily powered by the inverter (from solar or battery). The utility grid acts as a backup.

5.4 LCD Display Operation

Use the buttons below the LCD display (ESC, UP, DOWN, SET/ENTER, AC OUT) to navigate menus and modify parameters. The display provides real-time data on input/output status, battery voltage, load power, and more. Refer to the detailed manual for specific menu structures and parameter settings.

5.5 Communication and Remote Control

The inverter/charger features an RS485 isolated communication port, allowing for optional WiFi or GPRS remote control modules. These modules enable remote monitoring and parameter adjustment via a dedicated application or platform.

5.6 BMS-Link Port

For advanced battery management, the optional BMS-Link port allows the inverter/charger to receive charging and discharging control signals directly from a compatible Battery Management System (BMS), optimizing battery health and performance.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your SolarEpic Inverter/Charger. Always disconnect all power sources before performing any maintenance.

- **Regular Cleaning:** Keep the unit clean and free from dust and debris. Use a soft, dry cloth. Do not use liquid cleaners.
- **Ventilation Check:** Ensure that the ventilation openings are clear and not obstructed. Clean any dust buildup from the vents using compressed air or a soft brush.
- **Connection Inspection:** Periodically check all electrical connections (battery, PV, utility, load) for tightness and signs of corrosion. Tighten any loose connections.

- **Environmental Check:** Verify that the installation environment remains within specified temperature and humidity ranges.
- **Battery Health:** If using lead-acid batteries, regularly check electrolyte levels and specific gravity. For all battery types, monitor voltage and temperature.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates that may improve performance or add features.

7. Troubleshooting

This section provides guidance on common issues and their potential solutions. For problems not listed here, or if issues persist, contact technical support.

7.1 Common Protections and Indicators

The inverter/charger is equipped with multiple protection features. If a fault occurs, the LCD display will show an error code or indicator. Common protections include:

- **PV Reverse Polarity Protection:** Prevents damage if PV array is connected with incorrect polarity.
- **Utility Input Over-voltage & Under-voltage Protection:** Safeguards the unit from unstable grid power.
- **Battery Over-voltage Protection:** Prevents battery overcharging.
- **Over-discharge Protection:** Protects batteries from deep discharge.
- **Output Overload & Short Circuit Protection:** Prevents damage to the inverter and connected loads from excessive current.
- **Surge Current Protection:** Handles sudden high current demands.
- **Reverse Connection Protection:** Specifically for lithium battery systems.

7.2 General Troubleshooting Steps

- **No Power/Display Off:**
  - Check battery connections and voltage.
  - Ensure the main ON/OFF switch is in the "ON" position.
  - Verify battery circuit breaker is closed.
- **No AC Output:**
  - Check for overload or short circuit on the output. Reduce load or clear short.
  - Verify utility input is present and within acceptable voltage range if in utility priority mode.
  - Check inverter status on LCD for fault indicators.
- **Battery Not Charging:**
  - Check PV input voltage and current. Ensure PV array is producing power.
  - Verify utility input is present if charging from utility.
  - Check charging mode settings on the LCD.
  - Ensure battery type setting matches the connected battery.
- **Overheating:**
  - Ensure adequate ventilation around the unit. Clear any obstructions from vents.
  - Reduce load if operating continuously at high power.
  - Check ambient temperature.

8. SPECIFICATIONS

The following table provides detailed technical specifications for the SolarEpic UPower-HI Series Inverter/Charger Model UP3000-HM5041.

Item	UP2000-HM6021	UP3000-HM5041
Rated battery voltage	24VDC	48VDC
Battery input voltage	21.6~32VDC	43.2~64VDC
Max. battery charging current	60A	50A
Inverter output		
Continuous output power	2000W	3000W
Max. surge power(3S)	4000W	6000W
Output voltage range	110VAC(-3%~+3%), 120VAC(-10%~+3%)	
Output frequency	50/60±0.2%	
Output wave	Pure Sine Wave	
Load power factor	0.2-1(Load power ≤ Continuous output power)	
Distortion THD	THD≤5%(Resistive load)	
80% rated output efficiency	89%	91%
Max. Rated output efficiency	88%	90%
Max. output efficiency	90%	92%
Switch time	10ms(Switch from the utility output to the inverter output), 15ms(Switch from the inverter output to the utility output)	
Utility charging		
Utility input voltage	88VAC~132VAC (Default), 80VAC~140VAC(Programmable)	
Utility input frequency	40~65Hz	
Max. utility charge current	60A	40A
Solar charging		
Max. PV open circuit voltage	250V①, 220V②	
MPPT voltage range	60~200V	
Max. PV input power	2000W	3000W
	(Note: For the curve of Max. PV input power Vs. PV open-circuit voltage, see chapter Appendix1 for details.)	
Max. PV charging power	1725W	2875W
Max. PV charging current	60A	50A
Equalize charging voltage	29.2V(AGM default)	58.4V(AGM default)
Boost charging voltage	28.8V(AGM default)	57.6V(AGM default)
Float charging voltage	27.6V(AGM default)	55.2V(AGM default)
Low voltage disconnect voltage	21.6V(AGM default)	43.2V(AGM default)
Tracking efficiency	≥99.5%	
Temp. compensate coefficient	-3mV/℃/2V(Default)	
General		
Surge current	50A	56A
Zero load consumption	<1.6A	<1.2A
	(without PV and utility connection, turn on the load output)	
Standby current	<1.2A	<0.7A
	(without PV and utility connection, turn off the load output)	
Mechanical Parameters		
Dimension(H x W x D)	607.5x381.6x127mm（23.92 x 15.02 x 5.00 inches）	642.5x381.6x149mm（25.30 x 15.02 x 5.87 inches）
Mounting size	585*300mm（23.03 x 11.81 inches）	620*300mm（24.41 x 11.81 inches）
Mounting hole size	Φ10mm（Φ0.39 inch）	
Net Weight	15kg（33.07 pounds）	19kg（41.89 pounds）

Figure 8.1: Detailed Technical Specifications for UPower-HI Series Inverter/Chargers.

SolarEpic UPower-HI Series Inverter/Charger (UP3000-HM5041) Specifications

Parameter	Value (UP3000-HM5041)

Parameter	Value (UP3000-HM5041)
Rated Battery Voltage	48VDC
Max. Battery Charging Current	50A
Recommended Battery Wire Size	16mm² / 5AWG
Recommended Circuit Breaker	2P—100A
Supported Battery Types	AGM, GEL, FLD, LFP8/LFP15/LFP16, LNCM7/LNCM14
Continuous Output Power	3000W
Max. Surge Power (3S)	6000W
Output Voltage Range	110VAC(-3%~+3%), 120VAC(-10%~+3%)
Output Wave	Pure Sine Wave
Switch Time	10ms (Utility to Inverter), 15ms (Inverter to Utility)
Utility Input Voltage	88VAC~132VAC (Default), 80VAC~140VAC (Programmable)
Max. Utility Charging Current	40A
Max. PV Open Circuit Voltage	250V / 220V (At 25℃)
Max. PV Input Power	3000W
Max. PV Charging Current	50A
MPPT Tracking Efficiency	≥99.5%
Product Dimensions (L x W x H)	25.3 x 15.02 x 5.87 inches (642.5 x 381.6 x 149 mm)
Item Weight	41.8 pounds (19 kg)
Item Model Number	UP3000-HM5041

9. Warranty and Support

The SolarEpic UPower-HI Series Inverter/Charger is manufactured by BEIJING EPSOLAR TECHNOLOGY CO., LTD. For warranty information, technical support, or service inquiries, please refer to the warranty card included with your product or visit the official SolarEpic website.

It is recommended to register your product upon purchase to facilitate any future support needs.

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