

AMEHRU HGX 4KW

AMEHRU Hybrid Solar Inverter 4000W 24V 110-120V User Manual

Model: HGX 4KW

1. INTRODUCTION AND OVERVIEW

This manual provides detailed instructions for the installation, operation, and maintenance of your AMEHRU HGX 4KW Hybrid Solar Inverter. This advanced inverter is designed to provide reliable power by integrating solar energy, utility power, and battery power. It features a pure sine wave output, ensuring compatibility with sensitive electronics, and offers multiple protection functions for safe and stable operation.

Please read this manual thoroughly before installation and use to ensure optimal performance and safety.

MODEL	HGX (110V) 4KW
Rated power	4000W
INPUT	
Voltage	100/110/120VAC
Selectable Voltage Range	90-140VAC
Frequancy Range	50Hz/60Hz (Autosensing)
OUTPUT	
AC Voltage Regulation	120VAC \pm 5%
Surgepower	2* rated power for 5 seconds
Efficiency(Peak)PV to INV	97%
Efficiency(Peak)BAT to INV	94%
Transfer Time	10ms(for personal computers) 20ms(for home appliances)
Wave form	Pure Sine Wave

BATTERY & AC CHARGER	
Battery Voltage	24VDC
Bulk Charging Voltage	Flooded Battery: 29.2VDC
	AGM/GEL Battery : 28.2VDC
Floating Charge Voltage	27.6VDC
Overcharge Protection	32VDC
Maximum charge current	110A
SOLAR CHARGER	
PV INPUT(DC)	55-350Vdc
Nominal DC Voltage/MAXimum Dc volatge	280VDC/350VDC
Start-up Voltage/Initial Feeding Voltage	55Vdc
MPPT Voltage Range	55Vdc-280vdc
GRID OUTPUT(AC)	
Nominal Output Voltage	120Vac
Output Voltage Range	95V-135V
Nominal Output Current	33A
EFFICIENCY	
Maximum Conversion Efficiency (DC/AC)	98%
MPPTE ficiency	99.90%
PHYSICAL	

Figure 1: AMEHRU HGX 4KW Hybrid Solar Inverter. This image shows the front view of the inverter unit, highlighting its compact design and connection points.

2. SAFETY INSTRUCTIONS

WARNING: Failure to follow these safety instructions may result in electric shock, fire, serious injury, or death.

- Installation must be performed by qualified personnel in accordance with all local electrical codes and regulations.
- Do not attempt to open or disassemble the inverter. There are no user-serviceable parts inside.
- Ensure the inverter is installed in a well-ventilated area, away from flammable materials, moisture, and direct sunlight.
- Always disconnect all power sources (solar, battery, and AC utility) before performing any maintenance or wiring.
- Use appropriate personal protective equipment (PPE) during installation and maintenance.
- Verify correct polarity when connecting batteries and solar panels. Incorrect connections can cause severe damage.
- Keep children and unauthorized persons away from the inverter and battery system.

3. PRODUCT FEATURES

The AMEHRU HGX 4KW Hybrid Solar Inverter offers a range of features designed for efficient and reliable power management:

- **High Stability:** Engineered for stable and long-term operation, ensuring consistent power delivery.
- **Multi-Battery Compatibility:** Supports charging from solar, utility grid, or a generator. Flexible programming allows for optimized charge and discharge times.
- **Versatile Application:** Ideal for use as a reliable backup power source during utility outages, suitable for various residential and commercial applications.
- **Integrated LCD Display:** Provides easy access to critical operating parameters, including battery status, charging information, and operating temperature.
- **Comprehensive Protections:** Equipped with multiple safety features:
 - Temperature-controlled cooling fan for optimal thermal management.
 - Protection against low and high voltage conditions.
 - Overload protection.
 - Short circuit protection.
 - Internal fuse for enhanced safety.
 - Reverse battery connection protection.
- **Pure Sine Wave Output:** Delivers clean and stable AC power, safe for all types of electronic devices, including sensitive equipment.

4. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of your hybrid solar inverter. It is highly recommended that installation be performed by a certified electrician or solar professional.

4.1 Unpacking and Inspection

- Carefully unpack the inverter and inspect it for any shipping damage. Report any damage to your supplier immediately.
- Ensure all accessories are present according to the packing list.

4.2 Mounting the Inverter

- Choose a suitable mounting location that is dry, well-ventilated, and protected from direct sunlight, rain, and dust.
- Ensure adequate clearance around the inverter for proper airflow and cooling.
- Mount the inverter securely to a vertical surface using appropriate fasteners.

4.3 Electrical Connections

All electrical connections must comply with local wiring regulations.

1. **Battery Connection:** Connect the 24VDC battery bank to the inverter's battery terminals. Observe correct polarity (+ to + and - to -). Ensure battery cables are adequately sized for the current.
2. **Solar PV Input:** Connect the solar panel array to the PV input terminals. Ensure the PV voltage and current are within the inverter's specifications (refer to Section 8: Specifications).
3. **AC Input (Utility/Generator):** Connect the AC utility grid or a generator to the AC input terminals.
4. **AC Output (Loads):** Connect your AC loads (appliances, electronics) to the AC output terminals.

5. **Grounding:** Ensure the inverter is properly grounded according to local electrical codes.

After all connections are made, double-check all wiring for correctness and tightness before powering on the system.

5. OPERATING INSTRUCTIONS

Once installed and connected, the AMEHRU HGX 4KW inverter is ready for operation.

5.1 Powering On the Inverter

1. Ensure all external circuit breakers for solar, battery, and AC input/output are in the OFF position.
2. Turn on the battery breaker first. The inverter's LCD display should illuminate.
3. Turn on the solar PV breaker. The inverter will begin to detect solar input.
4. Turn on the AC input breaker (if connected to utility/generator).
5. Finally, turn on the AC output breaker to supply power to your loads.

5.2 LCD Display and Settings

The integrated LCD display provides real-time information about the inverter's status and allows for configuration of various parameters.

- **Monitoring:** View input/output voltage, current, frequency, battery voltage, charging status, and operating temperature.
- **Configuration:** Adjust settings such as battery type (Flooded, AGM/GEL), charging current, output voltage range, and priority of power sources (solar, utility, battery). Refer to the detailed programming section in the full user manual for specific parameter adjustments.
- **Frequency Autosensing:** The inverter automatically detects and operates at 50Hz or 60Hz.

5.3 Powering Off the Inverter

1. Turn off the AC output breaker to disconnect loads.
2. Turn off the AC input breaker (if connected).
3. Turn off the solar PV breaker.
4. Finally, turn off the battery breaker. The LCD display will power down.

6. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your AMEHRU Hybrid Solar Inverter.

- **Cleaning:** Periodically clean the exterior of the inverter with a dry, soft cloth. Ensure ventilation openings are free from dust and debris. Do not use liquid cleaners.
- **Connection Checks:** Annually, or as needed, inspect all electrical connections (battery, solar, AC input/output) for tightness and signs of corrosion. Tighten any loose connections.
- **Battery Maintenance:** Follow the manufacturer's recommendations for your specific battery type (Flooded, AGM, GEL) regarding watering (for flooded batteries), terminal cleaning, and periodic voltage checks.
- **Cooling Fan:** Ensure the cooling fan operates freely and is not obstructed. The fan is temperature-controlled and will activate as needed.
- **Environmental Check:** Verify that the installation environment remains within specified temperature and humidity ranges.

Always power down the inverter completely before performing any maintenance.

7. TROUBLESHOOTING

If the inverter is not operating as expected, refer to the LCD display for error codes or status indicators. Below are some common issues and their potential solutions.

- **No Power Output:**
 - Check all circuit breakers (battery, solar, AC input/output) to ensure they are ON.
 - Verify battery voltage is within the operating range (24VDC nominal).
 - Check for any error codes on the LCD display.
- **Overload Protection Triggered:**
 - Reduce the total load connected to the inverter. The inverter can handle 2 times its rated power for 5 seconds (surge power).
 - Disconnect some appliances and restart the inverter.
- **High/Low Voltage Alarm:**
 - Check the battery voltage. Ensure it is not too high or too low.
 - Verify the AC input voltage is within the specified range (100-120VAC).
 - Inspect solar panel connections and voltage.
- **Short Circuit Protection:**
 - Immediately disconnect all loads.
 - Inspect AC output wiring for any short circuits.
 - Once the short is resolved, restart the inverter.
- **Inverter Overheating:**
 - Ensure the inverter is in a well-ventilated area.
 - Clear any obstructions from the cooling fan and ventilation openings.
 - Reduce the load if operating continuously at high power.

For persistent issues or error codes not listed, please contact AMEHRU customer support.

8. SPECIFICATIONS

The following table details the technical specifications for the AMEHRU HGX 4KW Hybrid Solar Inverter.

Category	Parameter	HGX (110V) 4KW
MODEL	Rated power	4000W
INPUT	Voltage	100/110/120VAC
	Selectable Voltage Range	90-140VAC
	Frequency Range	50Hz/60Hz (Autosensing)
OUTPUT	AC Voltage Regulation	120VAC±5%
	Surge Power	2* rated power for 5 seconds
	Efficiency (Peak) PV to INV	97%
	Efficiency (Peak) BAT to INV	94%
	Transfer Time	10ms(for personal computers) 20ms(for home appliances)
	Waveform	Pure Sine Wave
BATTERY & AC CHARGER	Battery Voltage	24VDC
	Bulk Charging Voltage (Flooded Battery)	29.2VDC
	Bulk Charging Voltage (AGM/GEL Battery)	28.2VDC
	Floating Charge Voltage	27.6VDC
	Overcharge Protection	32VDC
	Maximum charge current	110A
SOLAR CHARGER	PV INPUT(DC)	55-350Vdc
	Nominal DC Voltage/Maximum DC Voltage	280VDC/350VDC
	Start-up Voltage/Initial Feeding Voltage	55Vdc
	MPPT Voltage Range	55Vdc-280Vdc
GRID OUTPUT(AC)	Nominal Output Voltage	120Vac
	Output Voltage Range	95V-135V
	Nominal Output Current	33A
EFFICIENCY	Maximum Conversion Efficiency (DC/AC)	98%
	MPPT Efficiency	99.90%
PHYSICAL	Dimensions (L*W*H)	Approx. 50 x 41.5 x 18 cm
	Weight	Approx. 9-10 kg

Note: Specifications are subject to change without prior notice.

9. WARRANTY AND SUPPORT

For warranty information, please refer to the documentation provided with your purchase or contact your retailer.

If you encounter any issues or have questions regarding the AMEHRU HGX 4KW Hybrid Solar Inverter, please contact AMEHRU customer support for assistance. Provide your model number (HGX 4KW) and purchase details when contacting support.

Manufacturer: AMEHRU