LAPOND HC800 2S 11R0GB

LAPOND HC800 2S 11R0GB Variable Frequency Drive Inverter User Manual

Model: HC800 2S 11R0GB

1. Introduction

This manual provides essential information for the safe and efficient operation of your LAPOND HC800 2S 11R0GB Variable Frequency Drive (VFD) Inverter. This VFD is designed for motor speed control applications, offering high performance and stability. Please read this manual thoroughly before installation and operation to ensure proper use and to prevent damage to the unit or connected equipment.

2. Safety Information

WARNING: High voltage inside. Risk of electric shock.

- Always read the user's manual and follow all safety instructions before use.
- Do not connect output terminals (U, V, W) to the AC power supply.
- Do not open the cover while power is applied. Wait at least 10 minutes after power is turned off or discharge is finished before touching internal components.
- Do not reset while the motor is rotating.
- Ensure proper grounding of the VFD and the motor.
- Only qualified personnel should perform installation, wiring, and maintenance.

Figure 2.1: Front view of the LAPOND VFD showing dimensions and the safety warning label. The label clearly states "High voltage inside, risk of electric shock" and provides critical safety instructions regarding power disconnection and waiting periods before servicing.

3. Product Features

The LAPOND HC800 2S 11R0GB VFD offers a range of features designed for robust motor control:

- Adjustable V/F curve and Sensorless Vector Control (SVC) for precise motor management.
- Automatic torque boost and slip compensation for enhanced performance.
- Fast acceleration and deceleration capabilities.
- Provides 150% torque at 0.5Hz for demanding applications.
- Thickened coating for durability in harsh environments.
- Built-in RS-485 MODBUS communication for integration into control systems.
- Simplified parameter setting and user-friendly keyboard with digital display for easy operation.
- Detachable design for convenient remote control.
- Comprehensive protection features including motor short-circuit detection, output phase loss, over-current, over-voltage, under-voltage, overheat, and overload protection.
- Constructed with high-quality core capacitors, chips, and IGBT modules for stable performance.

4. Technical Specifications

Parameter	Value
Model Number	HC800 2S 11R0GB
Input Voltage	220VAC (+/-15%)
Input Phase	1 Phase
Input Frequency	50/60 Hz
Output Voltage	220VAC (+/-15%)
Output Phase	3 Phase
Output Current	45A
Output Frequency	0-400 Hz
Suitable Motor Power	Up to 11KW (15HP)
Product Dimensions (L x W x H)	10.24 x 7.52 x 14.76 inches (26 x 19.1 x 37.5 cm)
Item Weight	23.4 pounds

Note: For heavy load motors, it is recommended to select a VFD with a higher horsepower rating than the motor's nominal rating to ensure optimal performance and longevity.

5. Setup & Installation

5.1 Unpacking and Inspection

Upon receiving the VFD, carefully unpack it and inspect for any signs of damage during transit. Ensure all components are present as per the packing list. If any damage or missing parts are found, contact your supplier immediately.

5.2 Mounting

Mount the VFD in a clean, dry, and well-ventilated area, away from direct sunlight, excessive dust, corrosive gases, or flammable materials. Ensure sufficient space around the unit for proper heat dissipation. The VFD is designed with porous heat dissipation, requiring adequate airflow.

Figure 5.1: Bottom view of the VFD, illustrating the cooling fans essential for maintaining optimal operating temperature. Ensure these fans are not obstructed.

5.3 Wiring Connections

All wiring must be performed by a qualified electrician in accordance with local and national electrical codes. Ensure power is disconnected before making any connections.

- **Input Power (L, N):** Connect the single-phase 220VAC power supply to the designated input terminals.
- **Output Power (U, V, W):** Connect the three-phase motor to the output terminals. *Do not connect these terminals to the AC power supply.*
- **Grounding (E):** Connect the VFD to a reliable earth ground. Proper grounding is critical for safety and performance.
- **Control Terminals:** The VFD features rich digital and analog control terminals for versatile control options, including optional MODBUS (RS485) extension. Refer to the detailed wiring diagram in the complete user manual for specific control terminal connections (e.g., for external start/stop, speed reference).

Figure 5.2: Internal view of the VFD, showing the main circuit board, power components, and terminal blocks for input, output, and control wiring. Note the clear separation of power and control sections.

Figure 5.3: Side view of the VFD, highlighting the cable entry points for power and control wiring, along with the external grounding screw for safety.

6. Operation

6.1 Control Panel Overview

The VFD is equipped with a user-friendly keyboard and a digital display for easy parameter setting and monitoring. The detachable design allows for remote control if desired.

Figure 6.1: The detachable control panel, showing the digital display and control buttons for programming and operation. This panel can be mounted remotely for convenience.

6.2 Basic Start-up

1. Ensure all wiring connections are secure and correct.
2. Apply power to the VFD. The digital display will illuminate.
3. Use the control panel buttons (e.g., RUN, STOP, UP/DOWN arrows, ENTER) to navigate menus and set basic parameters such as maximum frequency, acceleration/deceleration times, and motor parameters.
4. Press the RUN button to start the motor. The VFD will gradually ramp up the motor speed according to the set acceleration time.
5. To stop the motor, press the STOP button.

Important Tip: One key function of the VFD is to start the motor softly, avoiding huge electrical current impact to the mains system and mechanical shock to the machine system. It is strongly recommended NOT to turn on the motor after the VFD has already started (i.e., do not switch the motor on/off directly while the VFD is running).

6.3 Parameter Setting

The VFD offers extensive parameter settings to optimize performance for various applications. These

include:

- **Frequency Control:** Adjust output frequency (0-400Hz) to control motor speed.
- **V/F Curve:** Select or customize the voltage-to-frequency ratio for different load characteristics.
- **Acceleration/Deceleration Time:** Set the ramp-up and ramp-down times for smooth motor starts and stops.
- **Motor Parameters:** Input motor nominal voltage, current, frequency, and RPM for accurate control.
- **Control Mode:** Choose between V/F control or Sensorless Vector Control (SVC) based on application requirements.

For a complete list of parameters and detailed instructions on how to set them, please refer to the comprehensive programming guide in the full user manual.

7. Maintenance

Regular maintenance helps ensure the longevity and reliable operation of your LAPOND VFD.

- **Cleaning:** Keep the VFD clean and free from dust and debris. Use a soft, dry cloth for external cleaning. For internal cleaning, ensure power is disconnected and wait for capacitors to discharge before using compressed air to clear dust from cooling fins and circuit boards.
- **Ventilation:** Ensure that the cooling fans (Figure 5.1) are unobstructed and functioning correctly. Check for any unusual noises or vibrations from the fans.
- **Connections:** Periodically check all wiring connections for tightness. Loose connections can lead to overheating or intermittent operation.
- **Environment:** Maintain the VFD in an environment within its specified operating temperature and humidity ranges. The thickened coating provides resistance to harsh environments, but extreme conditions should still be avoided.

WARNING: Always disconnect power and wait for the discharge period before performing any internal maintenance.

8. Troubleshooting

This section provides guidance on common issues you might encounter. For detailed error codes and advanced troubleshooting, refer to the complete user manual.

Problem	Possible Cause	Solution
VFD does not power on	No input power; Blown fuse; Internal fault.	Check power supply and fuses. Ensure connections are secure. If problem persists, contact support.
Motor does not start	Incorrect wiring; Parameter settings incorrect; Emergency stop active.	Verify motor and control wiring. Check motor parameters and control settings. Ensure no emergency stop is engaged.
Over-current error (e.g., Error 40)	Motor overload; Short circuit in motor or output wiring; Rapid acceleration/deceleration; Incorrect motor parameters.	Reduce motor load. Check motor and output wiring for shorts. Increase acceleration/deceleration times. Verify motor parameters are correctly set. Consider a higher HP VFD for heavy loads.

Problem	Possible Cause	Solution
Over-voltage/Under-voltage error	Input voltage outside specified range; Regenerative braking.	Check input power supply voltage. If over-voltage occurs during deceleration, increase deceleration time or consider a braking resistor.
Overheat error	Insufficient ventilation; High ambient temperature; Blocked cooling fans.	Ensure adequate clearance around VFD. Check cooling fans for obstructions and proper operation. Reduce ambient temperature if possible.
Motor sounds abnormal or "misses"	Motor parameters incorrect; VFD sizing issue for load; Faulty motor.	Double-check all motor parameters in VFD settings. Ensure the VFD is appropriately sized for the motor and its load. Test motor independently if possible.

The VFD incorporates various protection mechanisms including motor short-circuit detection at power-on, output phase loss protection, over-current protection, over-voltage protection, under-voltage protection, overheat protection, and overload protection. These features are designed to safeguard both the VFD and the connected motor.

9. Warranty & Support

For warranty information, technical support, or service inquiries regarding your LAPOND HC800 2S 11R0GB VFD, please contact LAPOND customer service or your authorized dealer. Keep your purchase receipt and product serial number readily available when contacting support.
LAPOND is committed to providing reliable products and support. For the most up-to-date information, please visit the official LAPOND website or refer to the documentation provided with your purchase.