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JRAHK CON009-6G-RED

JRAHK 36V-60V 2000W Dual Drive Square Wave Controller Instruction Manual

Model: CON009-6G-RED

1. INTRODUCTION AND OVERVIEW

This manual provides essential information for the installation, operation, and maintenance of your JRAHK 36V-60V 2000W Dual Drive Square Wave Controller. This controller is designed to enhance the performance of electric bikes and scooters by providing robust power delivery and versatile compatibility.

The JRAHK controller supports both single and dual drive modes, offering a maximum power output of 2000W and a peak current of 40A. Its wide voltage compatibility (36V, 48V, 60V) makes it suitable for various battery systems. The durable aluminum alloy housing ensures efficient heat dissipation and long-term reliability.

Brushless DC Dual Drive Controller

~More power

~Driving stability

~Flexibility



Figure 1: JRAHK Brushless DC Dual Drive Controller installed on an electric bike, illustrating its application.

2. PRODUCT FEATURES

- **Dual Drive & High Power Output:** Supports up to 2000W maximum power and 40A peak current for strong acceleration and hill-climbing.
- **Wide Voltage Compatibility:** Universally compatible with 36V, 48V, and 60V battery systems.
- **Rugged Aluminum Alloy Construction:** Durable red aluminum alloy shell provides efficient heat dissipation and protects internal components.
- **Versatile Setups:** Features square wave mode and Hall-less mode options, allowing operation even with damaged or disconnected Hall sensors.
- **Easy Installation:** Designed as a plug-and-play solution for most brushless DC motors, with necessary components included.

3. SPECIFICATIONS

Parameter	Value
Brand	JRAHK
Model Name	CON009-6G-RED
Voltage Compatibility	36V / 48V / 60V
Rated Power (Single Drive)	350W - 500W (Calculated Max 1000W)
Rated Power (Dual Drive)	500W - 1000W (Calculated Max 2000W)
Current Limit (Single Drive)	18A (Max 20A)
Current Limit (Dual Drive)	36A (Max 40A)
Drive Mode	Dual Drive
Wave Type	Square Wave
Housing Material	Aluminum Alloy
Color	Red
Product Dimensions (L x W x H)	175mm x 55mm x 32mm (approx. 6.89" x 2.17" x 1.26")
Item Weight	11.36 ounces (approx. 322g)

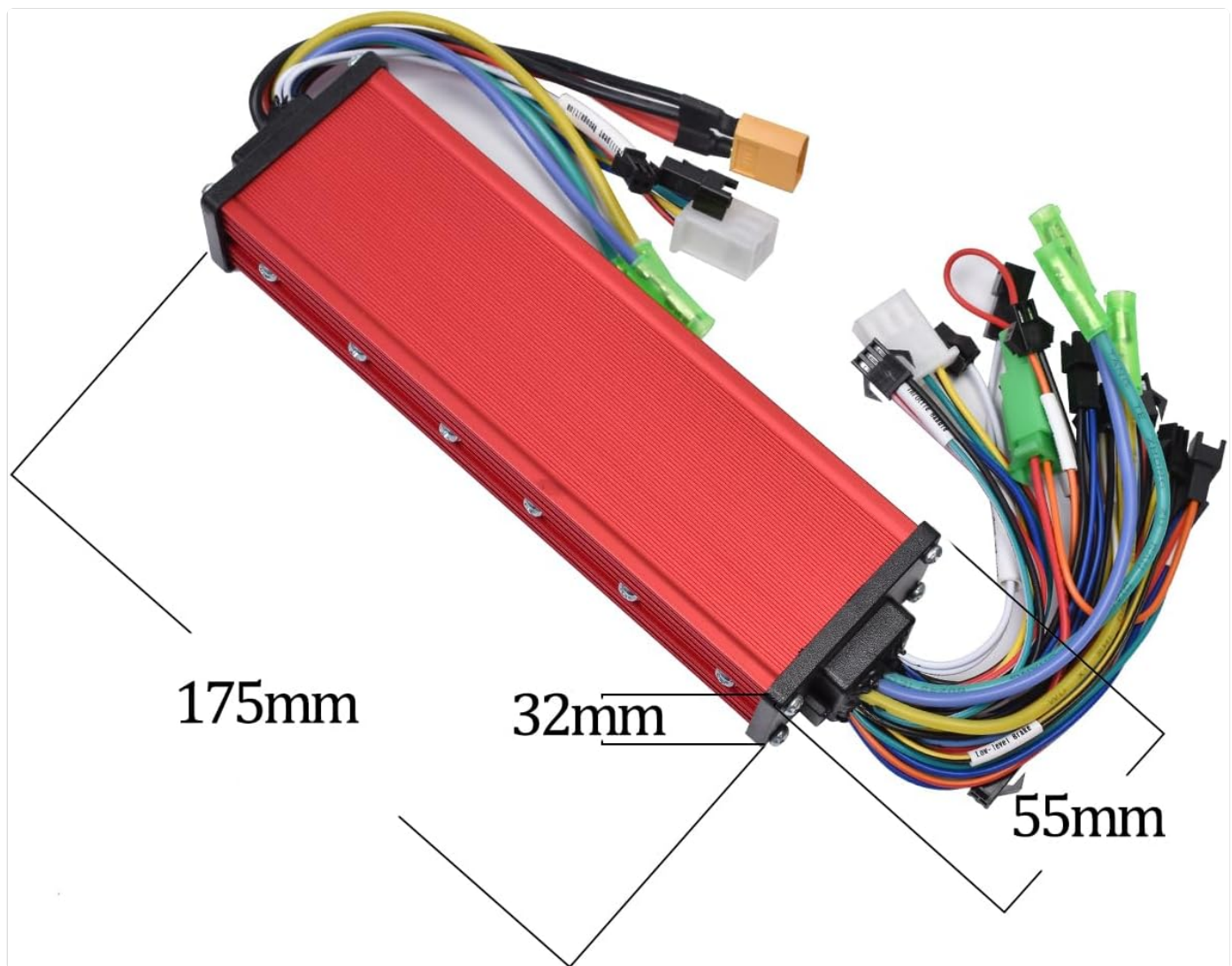


Figure 2: Physical dimensions of the JRAHK Dual Drive Square Wave Controller.

4. SETUP AND INSTALLATION

Before installation, ensure the power to your electric bike or scooter is completely disconnected. Refer to the wiring diagrams below for correct connections. Incorrect wiring can damage the controller or other components.

4.1. Wiring Diagram A: Power and Motor Connections

Line connection A

1. Intelligent identification
2. Hall sensor
3. Motor phase line
4. Power line



Figure 3: Wiring Diagram A - Essential Power and Motor Connections.

1. **Intelligent Identification (1):** Connect this pair of wires for automatic motor phase and Hall sensor identification. Once identified, these wires can be disconnected.
2. **Hall Sensor (2):** Connect to the motor's Hall sensor wires. This connection provides precise motor position feedback. The controller can operate without Hall sensors if needed.
3. **Motor Phase Line (3):** Connect these three thick wires (typically green, yellow, blue) to the corresponding motor phase wires. Ensure correct color matching.

4. **Power Line (4):** Connect the thick red wire to the positive (+) terminal of your battery and the thick black wire to the negative (-) terminal. The XT60 connector is typically used here.

4.2. Wiring Diagram B: Control and Accessory Connections

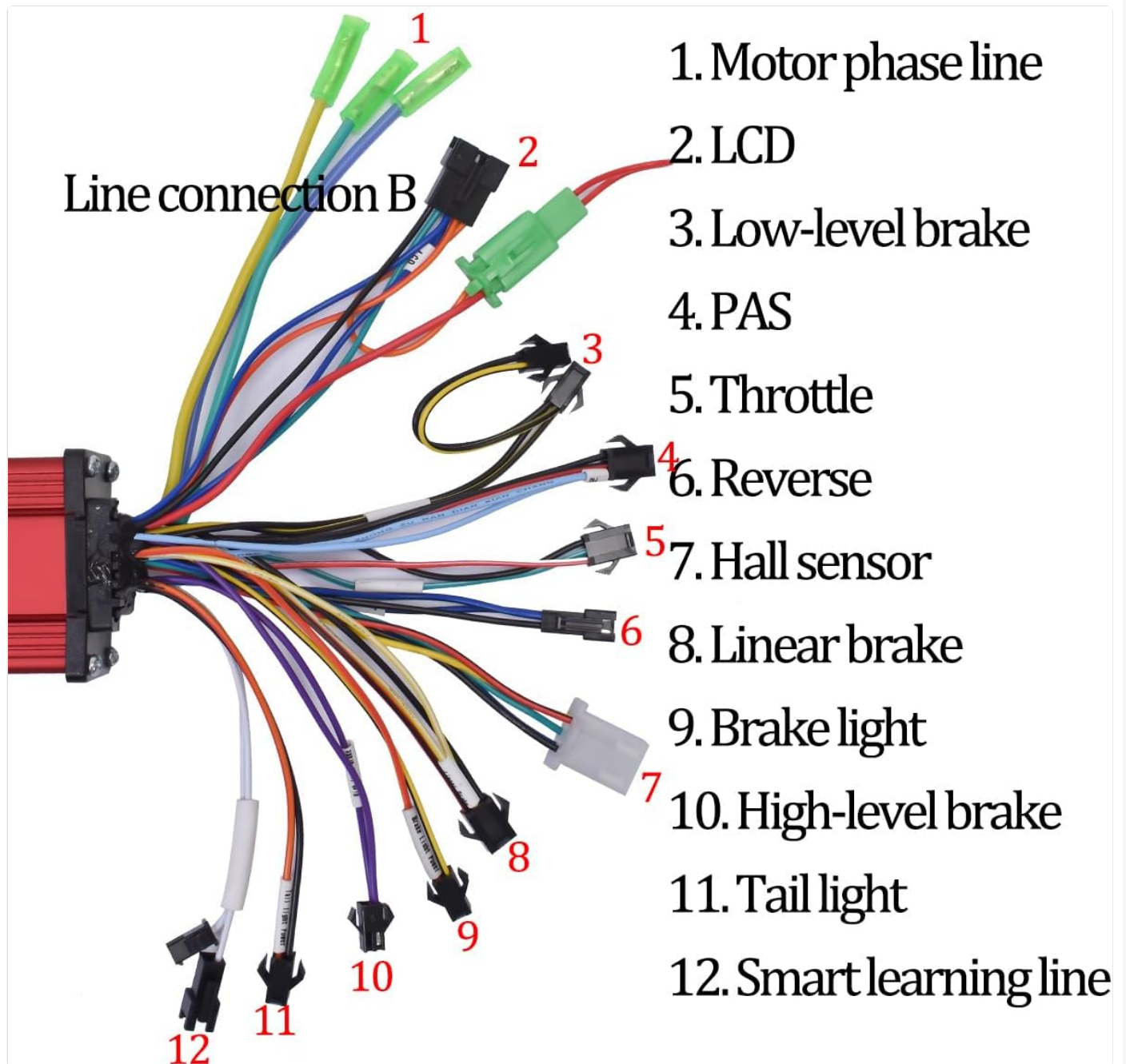


Figure 4: Wiring Diagram B - Control and Accessory Connections.

1. **Motor Phase Line (1):** These are the same motor phase lines as in Diagram A, shown here for completeness.
2. **LCD (2):** Connect to your LCD display unit. This provides speed, battery level, and other operational data.
3. **Low-level Brake (3):** Connect to brake levers that provide a low-level signal when activated. This cuts motor power.
4. **PAS (Pedal Assist System) (4):** Connect to the pedal assist sensor. This allows the motor to provide assistance when pedaling.
5. **Throttle (5):** Connect to the throttle grip. This controls motor speed directly.
6. **Reverse (6):** Connect if a reverse function is desired. Typically used for scooters or specific e-bike setups.
7. **Hall Sensor (7):** Same as Hall Sensor connection in Diagram A.
8. **Linear Brake (8):** Connect to brake levers that provide a linear signal, often for regenerative braking or more nuanced control.

9. **Brake Light (9):** Connect to the brake light for activation when brakes are applied.
10. **High-level Brake (10):** Connect to brake levers that provide a high-level signal when activated. This also cuts motor power.
11. **Tail Light (11):** Connect to the tail light for continuous illumination.
12. **Smart Learning Line (12):** Used for automatic motor parameter learning. Connect these two wires, turn on power, and the motor will rotate. If it rotates in the wrong direction, disconnect and reconnect. Once the motor rotates correctly, disconnect these wires.

Important: Always double-check all connections before applying power. Ensure all connectors are securely seated.

5. OPERATING INSTRUCTIONS

Once the controller is correctly installed and all connections are secure, follow these steps to operate your electric bike or scooter:

1. **Power On:** Turn on the main power switch of your electric vehicle. The LCD display (if connected) should illuminate.
2. **Smart Learning (Initial Setup):** If not already performed, connect the "Smart Learning Line" wires (12 in Diagram B). The motor will automatically detect its phase and rotation direction. If the motor spins in the wrong direction, disconnect and reconnect the learning wires. Once the motor spins correctly, disconnect the learning wires. This process only needs to be done once or if motor/controller components are changed.
3. **Throttle Control:** Gently twist the throttle (5 in Diagram B) to accelerate. The motor will respond with direct and swift power feedback due to the square wave control.
4. **Pedal Assist (PAS):** If a PAS sensor (4 in Diagram B) is installed, pedaling will activate motor assistance, providing a boost to your effort.
5. **Braking:** Applying the brake levers (connected to 3, 8, or 10 in Diagram B) will cut motor power, ensuring safe stopping.
6. **Dual Drive Operation:** The controller is designed for dual drive systems, providing power to two motors simultaneously for enhanced performance.
7. **Hall-less Operation:** The controller can operate normally even if the Hall sensors are damaged or disconnected, providing a reliable backup mode.

6. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your JRAHK controller:

- **Regular Inspection:** Periodically check all wiring connections for looseness, corrosion, or damage. Ensure connectors are securely seated.
- **Cleanliness:** Keep the controller housing clean and free from dust, dirt, and moisture. Use a dry, soft cloth for cleaning. Avoid using harsh chemicals or abrasive materials.
- **Heat Dissipation:** Ensure the controller's aluminum housing has adequate airflow for heat dissipation. Do not obstruct cooling fins.
- **Avoid Water Exposure:** While the aluminum housing offers some protection, avoid submerging the controller in water or exposing it to heavy rain for extended periods.
- **Battery Health:** Maintain your battery system according to its manufacturer's guidelines. A healthy battery contributes to stable controller operation.

7. TROUBLESHOOTING

If you encounter issues with your JRAHK controller, refer to the following troubleshooting tips:

Problem	Possible Cause / Solution
Motor not responding	◦ Check battery connection and charge level. ◦ Verify throttle connection (5) and functionality. ◦ Ensure motor phase lines (3) are correctly connected. ◦ Perform "Smart Learning" procedure (12) if motor or controller was recently installed/changed. ◦ Check brake lever connections (3, 8, 10); a faulty brake switch can cut power.
Motor runs intermittently or with reduced power	◦ Check for loose or corroded connections, especially motor phase lines and Hall sensor wires (if used). ◦ Ensure battery voltage is within the controller's operating range (36V-60V). ◦ Inspect motor for damage or obstruction.
Motor makes unusual noise or vibrates	◦ Incorrect motor phase line connection (3). Recheck color coding. ◦ Hall sensor issue (2, 7). The controller can operate without Hall sensors, but if they are connected and faulty, it can cause issues. Try disconnecting Hall sensors to see if operation improves (controller will run in Hall-less mode). ◦ Motor internal damage.
Controller gets excessively hot	◦ Ensure adequate airflow around the controller. ◦ Operating under sustained high load or steep inclines. ◦ Possible short circuit or motor issue drawing excessive current.

If these steps do not resolve the issue, please contact JRAHK customer support for further assistance.

8. WARRANTY AND SUPPORT

JRAHK products are manufactured to high-quality standards. For warranty information and technical support, please refer to the documentation provided with your purchase or visit the official JRAHK website. Keep your purchase receipt as proof of purchase for warranty claims.

For direct support, you may contact JRAHK customer service through the retailer where the product was purchased or via the contact information available on the [JRAHK Store on Amazon](#).

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