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> Mophorn 48V DC 500W Electric Motor and Controller User Manual

Mophorn 500W

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Model: 500W

1. INTRODUCTION

Thank you for choosing the Mophorn 48V DC 500W Electric Motor with Controller. This brushless motor is designed for various applications, including electric tricycles, e-bikes, e-scooters, golf carts, and other similar electric vehicles. This manual provides essential information for the safe and efficient installation, operation, and maintenance of your new motor system. Please read these instructions carefully before use and retain them for future reference.

2. SAFETY INSTRUCTIONS

Always observe the following safety precautions to prevent injury or damage to the product:

- **Electrical Safety:** Ensure all power is disconnected before performing any installation, maintenance, or troubleshooting. Work with electrical components only if you are qualified or under the supervision of a qualified professional.
- **Voltage Compatibility:** Only connect the motor and controller to a 48V DC power source. Using an incorrect voltage can cause severe damage to the components and pose a safety risk.
- **Wiring:** Follow all wiring diagrams and instructions precisely. Incorrect wiring can lead to malfunction, overheating, or electrical shock.
- **Secure Mounting:** Ensure the motor is securely mounted to prevent movement or vibration during operation, which could lead to mechanical failure or injury.
- **Environmental Conditions:** Avoid exposing the motor and controller to excessive moisture, dust, or extreme temperatures.
- **Moving Parts:** Keep hands, clothing, and tools clear of moving parts (e.g., chain, sprocket) when the motor is in operation.
- **Overload Protection:** Do not exceed the rated power (500W) or current (13A) of the motor to prevent overheating and damage.

3. PACKAGE CONTENTS

Verify that all items are present and undamaged upon opening the package:

- 1 x 48V 500W Brushless DC Motor
- 1 x Brushless Controller (matching 48V 500W motor)



Figure 3.1: Mophorn 48V DC 500W Electric Motor and Controller Kit. This image shows the Mophorn 48V DC 500W electric motor and its accompanying brushless controller, ready for installation.

4. PRODUCT OVERVIEW

The Mophorn 48V DC 500W motor system is designed for high efficiency and reliable performance. Key features include:

- **Brushless Design:** Offers excellent efficiency, controllability, and longevity with low electrical noise.
- **High Power Output:** 500W provides substantial power for various electric vehicle applications.
- **Constant Speed:** Delivers a rated speed of 600 RPM for consistent performance.
- **Forward and Reverse Rotation:** The motor can operate in both clockwise and counter-clockwise directions by simply reversing the power supply wires.
- **Durable Construction:** Features quality metal gears internally to enhance motor lifespan.
- **Integrated Controller:** Comes with a dedicated brushless controller for optimal performance and protection.

5. SPECIFICATIONS

Motor Specifications:

Rated Voltage	48V DC
Output Power	500W

Rated Speed	600 RPM
Drive Sprocket	420-14T
Rated Current	13A
Gear Reduction Ratio	6:1
No-Load Current	Less than 4.0A
Rated Torque	1.7 N.m
Efficiency	Greater than 75%

Controller Specifications:

Matching Motor	48V 500W
Rated Voltage	48V DC
Under-Voltage Protection	42 ± 0.5 V
Speed Regulator (Throttle)	1-4 V

Physical Specifications:

- **Package Dimensions:** 31 x 25 x 23 cm
- **Item Weight:** 5.47 kg

6. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of your motor system. If you are unsure about any steps, consult a qualified technician.

1. **Mount the Motor:** Securely attach the 48V 500W DC motor to your vehicle's frame using appropriate mounting hardware. Ensure the motor is stable and aligned with the drive chain/belt system.
2. **Install the Sprocket:** Attach the 420-14T sprocket to the motor shaft. Ensure it is tightened correctly and aligned with your vehicle's chain.
3. **Mount the Controller:** Find a suitable, protected location for the brushless controller, away from direct moisture and excessive heat. Secure it firmly.
4. **Connect Power Wires:** Connect the main power wires from your 48V DC battery to the controller's power input terminals. Pay close attention to polarity (+ to + and - to -).
5. **Connect Motor Wires:** Connect the motor's phase wires to the corresponding output terminals on the controller. Brushless motors typically have three phase wires.
6. **Connect Throttle/Speed Regulator:** Connect the speed regulator (throttle) to the designated input on the controller. The controller supports a 1-4V throttle input.
7. **Connect Other Accessories (Optional):** If your system includes brakes, ignition, or other accessories, connect them to the appropriate terminals on the controller as per the controller's specific wiring diagram (not provided in this manual, refer to controller documentation if available).
8. **Initial Test:** Before full operation, perform a brief test. Ensure the vehicle is safely supported with the drive wheel off the ground. Apply power and gently engage the throttle to check for proper motor rotation and function.

Note: The motor's direction of rotation (clockwise or counter-clockwise) can be changed by reversing the main power supply wires to the motor. Always ensure power is off before making any wiring changes.

7. OPERATING INSTRUCTIONS

Once installed, operating the Mophorn 48V DC 500W motor system is straightforward:

- Power On:** Turn on the main power switch for your 48V DC battery system.
- Engage Throttle:** Slowly and smoothly apply the throttle (speed regulator) to begin motor operation. The motor speed will increase proportionally with the throttle input (1-4V).
- Monitor Performance:** Pay attention to any unusual noises, vibrations, or smells during operation. If anything seems abnormal, immediately power off the system and investigate.
- Power Off:** When finished, release the throttle and turn off the main power switch.

Important: Avoid sudden acceleration or deceleration, especially with heavy loads, to prolong the life of the motor and controller.

8. MAINTENANCE

Regular maintenance helps ensure the longevity and optimal performance of your motor system:

- Keep Clean:** Periodically clean the motor and controller to remove dust, dirt, and debris. Use a dry cloth or compressed air. Do not use water or harsh chemicals.
- Inspect Wiring:** Regularly check all electrical connections for tightness and signs of wear, corrosion, or damage. Repair or replace any faulty wiring immediately.
- Check Mounting:** Ensure the motor and controller remain securely mounted. Tighten any loose bolts or fasteners.
- Lubrication:** The motor's internal gears are designed for long life. Consult specific motor documentation for any external lubrication requirements, if applicable.
- Battery Health:** Maintain your 48V DC battery according to its manufacturer's instructions to ensure a stable power supply to the motor system.

9. TROUBLESHOOTING

If you encounter issues, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Motor does not run	- No power to controller - Loose or incorrect wiring - Faulty throttle - Controller error - Motor damage	- Check battery connection and main power switch. - Verify all wiring connections are secure and correct. - Test throttle functionality (e.g., with a multimeter if possible). - Check controller indicator lights (if any) for error codes. - Inspect motor for visible damage or blockages.

Motor runs slowly or with low power	◦ Low battery voltage ◦ Overload condition ◦ Partial wiring fault ◦ Motor or controller overheating	◦ Charge battery or check battery health. ◦ Reduce load on the motor. ◦ Inspect wiring for loose connections or corrosion. ◦ Allow components to cool down. Ensure adequate ventilation.
Motor makes unusual noise	◦ Mechanical obstruction ◦ Worn bearings or gears ◦ Loose mounting	◦ Check for anything interfering with the motor or chain/sprocket. ◦ If noise persists, professional inspection may be required. ◦ Tighten motor mounting bolts.

If the problem persists after attempting these solutions, contact customer support or a qualified technician.

10. WARRANTY AND SUPPORT

Mophorn products are manufactured to high-quality standards. For information regarding warranty coverage, technical support, or replacement parts, please refer to the warranty card included with your purchase or visit the official Mophorn website. Keep your purchase receipt as proof of purchase for warranty claims.

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