MOBYAT 17HD48002-22B

MOBYAT Nema 17 Stepper Motor

Model: 17HD48002-22B - User Manual

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of your MOBYAT Nema 17 Stepper Motor, model 17HD48002-22B. This 2-phase stepper motor is designed for applications requiring precise rotational control, such as 3D printers, CNC machines, and various robotics projects. Please read this manual thoroughly before using the product to ensure safe and efficient operation.

2. Safety Information

- **Electrical Safety:** Ensure all power connections are made correctly and securely. Disconnect power before making any wiring changes or performing maintenance.
- **Overheating:** Stepper motors can generate heat during operation. Ensure adequate ventilation to prevent overheating, which can damage the motor or connected components.
- **Mechanical Hazards:** Moving parts can cause injury. Keep hands and loose clothing away from the motor shaft during operation.
- **Environmental Conditions:** Operate the motor within its specified temperature and humidity ranges. Avoid exposure to dust, moisture, and corrosive substances.
- **Proper Use:** Use the motor only for its intended purpose. Modifications to the motor or its components are not recommended and may void any warranty.

3. Package Contents

Verify that all items are present in the package:

- 1 x MOBYAT Nema 17 Stepper Motor (Model: 17HD48002-22B)



Image 1: The MOBYAT Nema 17 Stepper Motor (17HD48002-22B) with its 4-pin connector cable.

4. Setup

4.1. Mounting the Motor

The Nema 17 motor features standard mounting holes on its front face. Secure the motor to a stable surface or frame using appropriate screws. Ensure the motor is mounted firmly to prevent vibrations and misalignment during operation.



Image 2: Dimensional drawing showing the motor's physical specifications, including shaft length and diameter, and mounting hole positions.

4.2. Wiring

This Nema 17 stepper motor is a 2-phase, 4-wire bipolar motor. Connect the motor to a compatible stepper motor driver. The typical wiring color code for 4-wire stepper motors is as follows, though it's always best to verify with your driver's documentation:

- **Red:** A+
- **Green:** A-
- **Yellow:** B+
- **Blue:** B-

Ensure correct polarity to avoid damage to the motor or driver. Incorrect wiring can lead to erratic movement or motor failure.

5. Operating Instructions

Stepper motors operate by receiving a sequence of electrical pulses from a motor driver, which causes the motor to rotate in discrete steps. The direction and speed of rotation are controlled by the sequence and frequency of these pulses.

- **Step Pulse:** Each pulse sent to the driver causes the motor to move one step (1.8° for this motor in full-step mode).
- **Direction Signal:** A separate signal controls the direction of rotation (clockwise or counter-clockwise).
- **Microstepping:** Most modern stepper drivers support microstepping, which divides each full step into smaller increments, resulting in smoother motion and reduced resonance. Refer to your stepper driver's manual for microstepping configuration.
- **Current Setting:** Set the current limit on your stepper driver according to the motor's rated current (1.7A). Setting the current too high can cause overheating, while setting it too low can result in reduced torque and missed steps.



Image 3: Key operational characteristics of the stepper motor, emphasizing precision and stability.

6. Maintenance

The MOBYAT Nema 17 Stepper Motor is designed for durability and requires minimal maintenance. However, periodic checks can extend its lifespan and ensure optimal performance.

- **Cleaning:** Keep the motor free from dust and debris. Use a soft, dry cloth or compressed air to clean the exterior. Do not use liquid cleaners.
- **Connection Check:** Periodically inspect all wiring connections for looseness or damage. Secure any loose connections.
- **Temperature Monitoring:** Ensure the motor operates within acceptable temperature limits. Excessive heat can indicate an issue with current settings, load, or ventilation.
- **Shaft Inspection:** Check the motor shaft for any signs of wear or damage, especially if a pulley or coupling is attached.



Image 4: Illustration of the motor's internal construction, featuring pure copper wire for efficient power delivery.

7. Troubleshooting

If you encounter issues with your stepper motor, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Motor does not move or moves erratically.	Incorrect wiring; insufficient current; driver fault; mechanical obstruction.	Verify wiring connections and polarity. Check driver current settings. Inspect for mechanical binding. Test with a known good driver.
Motor overheats.	Current setting too high; insufficient cooling; excessive load.	Reduce driver current. Ensure adequate ventilation. Reduce mechanical load if possible.
Motor makes noise but does not rotate.	Incorrect step pulse frequency; motor stalled due to overload.	Adjust step pulse frequency. Reduce load. Check for mechanical obstruction.
Motor loses steps.	Insufficient torque; high acceleration/deceleration rates; vibration.	Increase driver current (within limits). Reduce acceleration/deceleration. Ensure stable mounting.

8. Specifications

Technical specifications for the MOBYAT Nema 17 Stepper Motor (Model: 17HD48002-22B):

Parameter	Value
Model Number	17HD48002-22B
Step Angle	1.8°
Phase	2
Rated Voltage	3 V
Rated Current	1.7 A
Phase Resistance	1.8 Ohms
Phase Inductance	3.8 mH
Holding Torque	560 mN.m (0.55 Nm)
Detent Torque	24 mN.m
Rotor Inertia	82 g.cm²
Rated Power	19 W
Rated Speed	500 rpm
Lead Wires	4

Parameter	Value
Efficiency	99%
Motor Body Dimensions (L x W x H)	42 x 42 x 48 mm
Product Weight	358 g
Certifications	CCC, CE

9. Warranty and Support

Information regarding warranty and customer support for this product is not available in the provided data. Please refer to your purchase documentation or contact the seller directly for details on warranty coverage and technical assistance.

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