STEPPERONLINE 5-17HS19-2004S1

STEPPERONLINE Nema 17 Bipolar Stepper Motor Instruction Manual

Model: **5-17HS19-2004S1**

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of your STEPPERONLINE Nema 17 Bipolar Stepper Motor. This motor is designed for precision motion control applications, commonly found in 3D printers, CNC machines, and other automated systems. Please read this manual thoroughly before use to ensure optimal performance and longevity of the product.

Figure 1.1: A set of five STEPPERONLINE Nema 17 bipolar stepper motors.

2. Product Specifications

The STEPPERONLINE Nema 17 Bipolar Stepper Motor (Model 5-17HS19-2004S1) features the following technical specifications:

- **Holding Torque:** 59 Ncm (83.6 oz.in)
- **Step Angle:** 1.8 degrees (200 steps per revolution)
- **Rated Current:** 2.0A per phase
- **Resistance:** 1.4 ohms per phase
- **Frame Size:** NEMA 17 (1.65" x 1.65" / 42mm x 42mm)
- **Body Length:** 48mm (1.85")
- **Number of Leads:** 4-wire
- **Item Weight:** 390 Grams
- **UPC:** 701056520176

Figure 2.1: Product label on the motor indicating model and serial number.

3. Physical Dimensions

Accurate physical dimensions are crucial for integration into your system. Refer to the diagram below for detailed measurements.

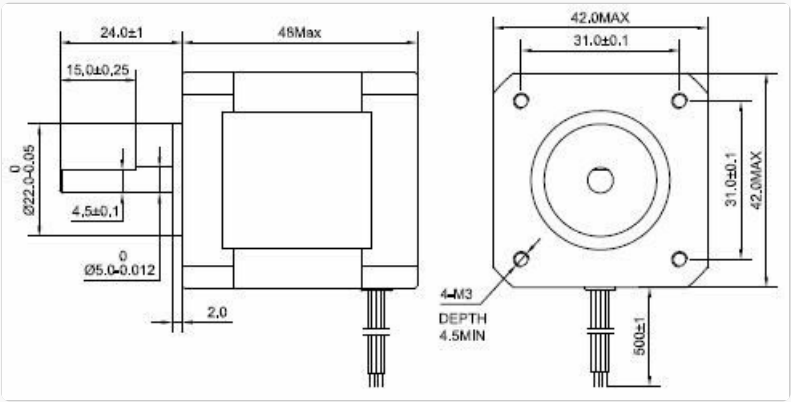

Figure 3.1: Dimensional drawing of the Nema 17 stepper motor.

Key dimensions include a 42mm x 42mm (NEMA 17) face, a 48mm body length, and a 5mm diameter shaft. Mounting holes are M3 with a 31mm x 31mm spacing.

4. Setup and Wiring

Proper wiring is essential for correct motor operation. This motor is a 4-lead bipolar stepper motor.

4.1 Wiring Diagram

The motor features four color-coded wires for connection to a stepper motor driver. The typical coil assignments are as follows:

- **Black:** Coil A+
- **Green:** Coil A-
- **Red:** Coil B+
- **Blue:** Coil B-

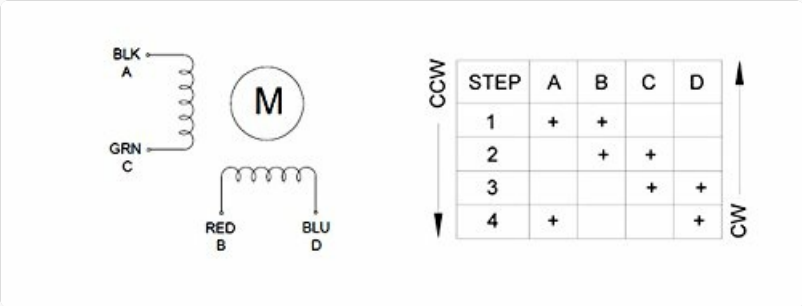

Figure 4.1: Wiring diagram and step sequence for the bipolar stepper motor.

Ensure that the motor driver's output terminals are correctly matched to the motor's coil phases. Incorrect wiring can lead to erratic movement or damage to the motor/driver.

4.2 Connector Details

The motor comes with a 4-pin connector. Verify compatibility with your stepper driver's input.

Figure 4.2: 4-pin connector for the stepper motor.

5. Operating Principles

Bipolar stepper motors operate by energizing two coils in a specific sequence to create a rotating magnetic field, causing the rotor to move in discrete steps. The 1.8-degree step angle means 200 steps are required for one full revolution (360 degrees).

5.1 Step Sequence

The table in Figure 4.1 illustrates a full-step sequence. Modern stepper drivers often utilize microstepping, which divides each full step into smaller increments, resulting in smoother motion and reduced resonance.

5.2 Power Supply and Driver Selection

Select a stepper motor driver capable of supplying the rated current (2.0A) to each phase. The power supply voltage should be chosen based on the driver's recommendations and the desired motor speed. Higher voltages can achieve higher speeds, but must be within the driver's limits.

6. Maintenance

Stepper motors are generally low-maintenance devices. Adhere to the following guidelines to ensure reliable operation:

- **Keep Clean:** Ensure the motor and its surroundings are free from dust, debris, and moisture.
- **Temperature:** Operate the motor within its specified temperature range. Excessive heat can reduce motor life. Ensure adequate ventilation if operating at high currents or speeds.
- **Connections:** Periodically check all electrical connections for tightness and integrity. Loose connections can cause intermittent operation or damage.
- **Shaft Load:** Avoid applying excessive radial or axial loads to the motor shaft, as this can damage the bearings.

7. Troubleshooting

If you encounter issues with your stepper motor, consider the following common troubleshooting steps:

Problem	Possible Cause	Solution
Motor does not move or vibrates erratically	Incorrect wiring, insufficient current, driver fault, mechanical binding	Verify wiring against Figure 4.1. Check driver current settings. Inspect for mechanical obstructions. Test with a known-good driver.
Motor loses steps or stalls	Overload, insufficient current, excessive speed, overheating	Reduce mechanical load. Increase driver current (within motor limits). Decrease acceleration/speed settings. Ensure adequate cooling.
Motor is excessively noisy	Resonance, microstepping not enabled, loose mounting	Enable microstepping on the driver. Check motor mounting for secure attachment. Adjust motor tuning parameters if available.
Motor runs hot	Excessive current, high ambient temperature, continuous high load	Reduce driver current if possible. Ensure proper ventilation or add a heatsink. Reduce duty cycle or load.

8. Warranty and Support

For specific warranty information regarding your STEPPERONLINE Nema 17 Stepper Motor, please refer to the documentation provided at the time of purchase or contact your seller directly. For technical support, product inquiries, or further assistance, please visit the official STEPPERONLINE website or contact their customer service department.

STEPPERONLINE Official Website: www.omc-stepperonline.com

Related Documents - 5-17HS19-2004S1

	[STEPPERONLINE DM320T User Manual: 2-Phase Digital Stepper Drive] Comprehensive user manual for the STEPPERONLINE DM320T 2-Phase Digital Stepper Drive, covering specifications, connections, DIP switch configurations, troubleshooting, and applications for NEMA11-17 stepper motors.
	[STEPPERONLINE CL57Y Closed Loop Stepper Driver User Manual] Comprehensive user manual for the STEPPERONLINE CL57Y Closed Loop Stepper Driver, detailing product introduction, specifications, installation, wiring diagrams, port definitions, status indicators, and troubleshooting.
	[DM542T Full Digital Stepper Drive User's Manual] User's manual for the DM542T Full Digital Stepper Drive by StepperOnline. This manual provides detailed information on features, specifications, wiring, setup, and troubleshooting for the DM542T.
	[STEPPERONLINE ST-C01 Single Axis Stepping Motor Controller User Manual] This user manual provides detailed information on the STEPPERONLINE ST-C01 Single Axis Stepping Motor Controller, including product introduction, parameters, functions, wiring, interface details, operating instructions, product size, and communication protocol.
	[DM860T Fully Digital Stepper Drive User Manual] Comprehensive user manual for the StepperOnline DM860T Fully Digital Stepper Drive. Covers features, electrical and mechanical specifications, wiring, power supply selection, microstep resolution, current settings, protection functions, and troubleshooting for optimal performance.
	[EV200 Series Variable Frequency Drive User Manual | StepperOnline] Comprehensive user manual for the StepperOnline EV200 Series Variable Frequency Drive, detailing specifications, wiring, parameter settings, monitoring, and fault diagnostics.