

Installation Guide: NexBot Vision STP113-003 Stepper Motor 3.0 Nm

SKU: NXB-SRV-STP113-003 | Revision: 1.0 | Category: Drive Systems > Servo Motors > Stepper Motors

DANGER: Disconnect all power sources before beginning installation. Follow lockout/tagout (LOTO) procedures per OSHA 1910.147.

1. Required Tools & Materials

- Metric Allen key set (3mm, 4mm, 5mm)
- Torque wrench with hex bit sockets
- Digital multimeter
- Wire stripper and crimping tool
- M5 mounting screws (length appropriate for bracket)
- Flexible shaft coupling (e.g., jaw or beam type)
- Small flathead screwdriver for terminals
- Safety glasses

2. Pre-Installation Checks

1. Verify the product SKU on the motor label matches NXB-SRV-STP113-003.
2. Inspect the motor's anodized aluminum housing for any cracks, dents, or damage from shipping.
3. Manually rotate the motor shaft to confirm it moves smoothly without any grinding or binding.
4. Ensure the mounting surface is clean, flat, and rigid enough to handle the motor's 3.0 Nm torque reactions.
5. Confirm the stepper motor driver's output is compatible with the motor's 24-48VDC voltage rating.
6. Verify that the main power supply to the motor driver is de-energized and locked out before beginning.

3. Installation Procedure

Step 1: Mechanical Mounting

Align the motor's 57 x 57 mm mounting face with the mounting bracket. Secure the motor using four M5 screws in a star pattern to ensure even pressure.

Warning: Do not overtighten mounting screws. Use a torque wrench to tighten to the recommended specification in the datasheet to avoid distorting the motor frame.

Step 2: Shaft Alignment and Coupling

Carefully align the motor shaft with the load shaft. Install a flexible coupling to connect the two shafts, which will compensate for minor misalignment and reduce bearing load.

Step 3: Securing the Coupling

Tighten the set screws or clamps on the shaft coupling. Ensure the coupling is securely fastened to both the motor and load shafts to prevent slippage during operation.

Warning: An improperly secured coupling can lead to lost motion, inaccurate positioning, and potential damage to the shafts.

Step 4: Preparing Phase Wires

Identify the four motor phase wires (typically labeled A+, A-, B+, B-) using the wiring diagram. Strip approximately 6-8mm of insulation from the end of each wire.

Step 5: Connecting Wires to Driver

Connect the four motor phase wires to the corresponding output terminals on the stepper motor driver. Ensure the screw terminals are tightened firmly for a reliable electrical connection.

Warning: Incorrectly wiring the phases will cause the motor to vibrate erratically or fail to rotate. Always double-check connections against the driver's manual.

Step 6: Grounding the Motor

Connect a dedicated ground wire from the motor's metal housing to the system's central earth ground point. This is essential for safety and helps minimize electromagnetic interference (EMI).

Warning: Failure to properly ground the motor can create an electrical shock hazard and may degrade system performance due to noise.

Step 7: Configuring the Driver

Set the current limit and microstepping resolution on the stepper driver using its DIP switches or configuration software. The current setting should match the STP113-003's rating to achieve 3.0 Nm of torque without overheating.

Warning: Setting the driver current significantly higher than the motor's rating can cause permanent damage to the motor windings.

4. Post-Installation Verification

1. Visually re-inspect all wiring connections to ensure they are correct and secure.
2. Use a multimeter to check for continuity on each phase winding and to ensure there are no shorts to the motor ground.
3. Clear all tools, loose screws, and debris from the installation area.
4. Before connecting the load, apply power and send a slow jog command to verify the motor spins freely and in the expected direction.
5. Listen for any unusual acoustic noise, such as grinding, which could indicate a mechanical issue.
6. After a brief test run, check the motor temperature to ensure it is not overheating.

Note: For technical support, contact your authorized service provider or visit <https://robotics.barca.group/support>.