Installation Guide: NexBot Robotics CYC123-017 Cycloidal Gearbox

SKU: NXB-GBX-CYC123-017 | Revision: 1.0 | Category: Drive Systems > Gearboxes > Cycloidal Gearboxes

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

1. Required Tools & Materials

- Calibrated torque wrench (up to 200 Nm)
- Metric hex key set (5mm to 14mm)
- Lifting straps or hoist rated for at least 50 kg
- Dial indicator with magnetic base
- Feeler gauge set
- High-strength thread-locking compound (e.g., Loctite 243)
- ISO Class 12.9 M12 mounting bolts
- Lint-free industrial wipes and isopropyl alcohol

2. Pre-Installation Checks

1. Verify the delivered product is SKU NXB-GBX-CYC123-017 and inspect for any shipping damage.
2. Ensure the motor mounting flange and robot mounting surface are perfectly clean, flat, and free of burrs or scratches.
3. Confirm the servo motor shaft diameter and keyway match the gearbox input specifications.
4. Check that the environmental conditions at the installation site are within the IP65 rating limits.
5. Have all required mounting bolts and tools readily available to minimize handling time.
6. Review the servo drive parameters to ensure initial settings are configured for low speed and torque for testing.

3. Installation Procedure

Step 1: Prepare Mounting Surfaces

Thoroughly clean the gearbox mounting flanges, the servo motor flange, and the machine frame mounting point using isopropyl alcohol and lint-free wipes. Verify flatness of all surfaces with a straight edge and feeler gauge to prevent stress on the housing.

> **Warning:** Uneven mounting surfaces can cause premature bearing failure and inaccurate operation.

Step 2: Position and Lift Gearbox

Using appropriate lifting equipment, carefully move the 17.5 kg gearbox into position. Never lift the unit by the output flange or any protruding features. Ensure a clear path and stable footing during the transfer.

> **Warning:** Improper lifting can result in personal injury or damage to the precision mating surfaces of the gearbox.

Step 3: Mount Servo Motor

Carefully align the servo motor shaft with the gearbox input bore. Slide the motor into place, ensuring the flange sits flush against the gearbox housing without being forced. Loosely install the motor mounting bolts.

Step 4: Secure Input Coupling

Secure the motor shaft to the gearbox input coupling mechanism as per the motor manufacturer's instructions. This typically involves tightening a compression ring or set screw assembly. Ensure concentricity to minimize vibration.

> **Warning:** An improperly secured motor shaft can lead to slippage, loss of position, and damage to both the motor and gearbox.

Step 5: Fasten Gearbox to Machine Frame

Align the gearbox housing with the mounting holes on the robot axis or machine frame. Apply thread-locking compound to the M12 mounting bolts and insert them. Hand-tighten all bolts initially to ensure proper seating.

Step 6: Torque All Fasteners

Using a calibrated torque wrench, tighten the motor mounting bolts and the gearbox-to-frame bolts in a star pattern to the specified torque values found in the NexBot integration manual. This ensures even clamping force and maintains alignment.

> **Warning:** Over-torquing or under-torquing bolts can lead to catastrophic failure, misalignment, or vibration.

Step 7: Attach Output Load

Mount the robot arm link, end-effector, or other mechanical load to the output flange. Use the correct size and grade of bolts and tighten them in a cross pattern to the recommended torque specification.

4. Post-Installation Verification

1. Manually rotate the output flange (with motor de-energized) to feel for any binding or roughness.
2. Power on the servo drive and command a slow, low-torque move to verify smooth operation.
3. Listen for any abnormal noises such as grinding, clicking, or excessive whining during the initial test run.
4. Execute a test program that moves the axis through its full range of motion, checking for any binding or motor current spikes.
5. After a 30-minute break-in cycle, re-check the temperature of the Anodized Aluminum Alloy Housing to ensure it is within normal operating limits.
6. Verify positional accuracy and repeatability using a dial indicator or other metrology tool to confirm the installation was successful.

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