

Installation Guide: NexBot Robotics CYC123-004 Cycloidal Gearbox 100:1 Ratio

SKU: NXB-GBX-CYC123-004 | 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 500 Nm)
- Metric Hex Key Set (sizes M6-M12)
- Feeler Gauges (0.05mm - 1.0mm)
- Digital Calipers
- Lifting Straps or Hoist (for 7.5 kg unit)
- High-Tack Gasket Sealant
- ISO VG 220 Synthetic Gear Oil
- Class 12.9 Mounting Bolts (as specified by motor and machine frame)

2. Pre-Installation Checks

1. Verify the SKU on the packaging matches NXB-GBX-CYC123-004.
2. Inspect the gearbox for any signs of shipping damage, such as cracks or dents in the housing.
3. Confirm the motor shaft diameter and keyway match the gearbox input specifications.
4. Ensure the machine mounting surface is clean, flat, and free of burrs or debris.
5. Check that the provided motor adapter plate and shaft coupling are the correct models for your motor.
6. Review the robot arm's structural drawings to confirm bolt patterns and clearance for the 180x180x95 mm housing.

3. Installation Procedure

Step 1: Prepare Mounting Surfaces

Thoroughly clean the gearbox mounting flange and the machine frame surface. Apply a thin, even layer of high-tack gasket sealant to the machine frame surface to ensure an IP65-rated seal.

Step 2: Mount Motor to Adapter Plate

Secure the servo motor to the provided adapter plate. Use the specified bolts and torque them to the motor manufacturer's recommendation. Ensure the motor shaft is clean and free of imperfections.

Warning: Do not operate the motor before it is fully coupled to the gearbox to prevent unexpected rotation.

Step 3: Install Shaft Coupling

Slide the input shaft coupling onto the motor shaft, aligning it with the keyway. Do not fully tighten the coupling's set screws at this stage.

Step 4: Position the Gearbox

Using appropriate lifting equipment, carefully lift the 7.5 kg gearbox into position. Align the gearbox input shaft with the motor coupling and the mounting holes with the machine frame.

Warning: Improper lifting can cause personal injury or damage to the unit. Always use a hoist or have assistance for units over 5 kg.

Step 5: Secure Gearbox to Frame

Loosely insert all mounting bolts through the gearbox flange into the machine frame. Tighten the bolts in a star pattern to ensure even pressure, then torque them to the specification listed in the robot's service manual.

Warning: Under-torqued bolts can lead to vibration and misalignment. Over-torquing can damage the gearbox housing or threads.

Step 6: Couple Motor and Gearbox

Slide the motor and adapter plate assembly towards the gearbox, engaging the motor shaft coupling with the gearbox input. Secure the motor assembly to the gearbox flange and torque the bolts to specification.

Step 7: Finalize Shaft Alignment and Coupling

Use feeler gauges to ensure the gap between the motor and gearbox is uniform. Once aligned, tighten the shaft coupling set screws to the recommended torque value.

Warning: Poor alignment is a primary cause of premature bearing failure and increased operational noise.

Step 8: Connect Output Load

Attach the robot arm link or other load to the output flange of the gearbox. Ensure all fasteners are of the correct grade and are torqued to the proper specification.

4. Post-Installation Verification

1. Manually rotate the input shaft (with motor de-energized) to feel for any binding or roughness.
2. Perform a low-speed, no-load test run and listen for any abnormal noises like grinding or whining.
3. Check for any lubricant leakage around the seals and mounting flange after the initial test run.
4. Verify that the operational temperature of the gearbox housing remains within acceptable limits.
5. Run a homing sequence and check that the reported position is accurate and repeatable, confirming the <1 arc-min specification.
6. Re-torque all mounting fasteners after the first 8 hours of operation to account for initial settling.

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