User Manual: NexBot Robotics CYC123-001 Cycloidal Gearbox 121:1 Ratio

SKU: NXB-GBX-CYC123-001 | Version: 1.0 | Brand: NexBot Robotics

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1. Safety Information

> **READ ALL SAFETY INSTRUCTIONS BEFORE OPERATION.** Failure to follow safety procedures may result in serious injury or equipment damage.

2. Product Overview

The NexBot Robotics CYC123-001 is a high-performance cycloidal gearbox designed to provide precise motion control and high torque transmission in industrial robotic systems. Engineered for applications where accuracy is paramount, this gearbox features exceptionally low backlash of less than 1 arcminute. This minimal lost motion ensures that the robot's movements are precise and repeatable, which is critical for tasks such as intricate assembly, laser cutting, and welding. The high torsional stiffness of the unit prevents wind-up under load, translating motor commands into exact output motion without positional error, directly contributing to higher quality production and reduced cycle times. The core of the CYC123-001 is its robust cycloidal reduction mechanism. Unlike traditional gear trains, this design utilizes rolling contact to distribute forces across a large number of teeth simultaneously. This results in a superior shock load capacity, capable of withstanding momentary impacts up to five times its rated torque without damage. This durability makes it an ideal choice for demanding material handling and machine tending operations where unexpected collisions or overloads can occur. The housing is machined from high-

strength Aluminum 6061-T6 and sealed to an IP65 rating, protecting internal components from dust and water ingress in harsh factory environments. With a compact form factor and a high reduction ratio of 121:1, the gearbox delivers significant torque multiplication in a small package. It achieves a rated output torque of 150 Nm, providing the power needed for the wrist joints of medium-payload articulated robots. The design is optimized for high efficiency, typically exceeding 90%, which minimizes energy loss as heat and reduces operational power consumption. The gearbox includes standardized mounting flanges and a hollow-shaft option for simplified integration with servo motors and routing of cables or airlines through the joint axis. The CYC123-001 gearbox is a reliable, high-precision component for building or maintaining advanced robotic automation systems.

3. Getting Started

4. Operation

5. Maintenance Schedule

Interval	Task	Notes

6. Troubleshooting

Symptom	Possible Cause	Solution

7. Technical Specifications

Parameter	Value	Unit
Weight	3.5	kg
Material	Aluminum 6061-T6	
IP Rating	IP65	
Country of Origin	CH	
Dimensions	123 x 123 x 95 mm	
Torque	150 Nm (Rated)	