

# User Manual: NexBot Robotics 421-005 Automatic Tool Changer 50 kg Payload

SKU: NXB-GEN-421-005 | 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.

**DANGER:** Isolate all hazardous energy before servicing NexBot Robotics 421-005 Automatic Tool Changer 50 kg Payload; stored electrical or mechanical energy may remain present after shutdown.

**WARNING:** Operate NXB-GEN-421-005 only within its intended End-of-Arm Tooling > Tool Changers > Automatic Tool Changers duty profile and published specification limits.

**CAUTION:** Use only approved tools, mating parts, and installation hardware to prevent premature wear or unsafe operation.

**NOTICE:** Protect the product from contamination, impact, and environmental exposure beyond IP65 during installation and service.

## 2. Product Overview

The NexBot Robotics 421-005 Automatic Tool Changer is a high-performance robotic peripheral designed to enable a single robot arm to perform multiple tasks by automatically swapping between different end-of-arm tools (EOAT). This changer empowers manufacturers to maximize robot utilization and adapt production lines with minimal downtime. Its core function is to provide a secure and highly repeatable mechanical and utility connection between the robot arm and various end effectors, such as grippers, welders, or material removal tools. The 421-005 features a robust, cam-driven locking mechanism that ensures a high-rigidity connection, critical for applications requiring precision. This design delivers an exceptional tool-side repeatability of  $\pm 0.02$  mm, ensuring that processes like intricate assembly or precise part placement are consistent after every tool change. With a substantial payload capacity of 50 kg and a static bending moment capacity of 500 Nm, it is well-suited for a wide range of medium-duty industrial applications. Integrated utility pass-throughs simplify EOAT integration by routing essential services directly through the changer body. This model includes eight 2A electrical contacts and four 1/4" pneumatic ports, eliminating the need for external cabling and hosing that can snag or wear over time. This streamlined design reduces points of failure and simplifies programming of robot movements. Constructed from hard-anodized 7075-T6 aluminum, the changer offers an excellent balance of strength, low weight, and corrosion resistance for demanding factory environments. Installation is straightforward, utilizing a standard ISO 9409-1-50-4-M6 mounting flange for direct attachment to compatible NexBot Robotics arms. The 24VDC operation for the lock/unlock mechanism integrates easily with standard robot I/O systems. This automatic tool changer is an essential component for creating flexible and efficient robotic cells in assembly, machine tending, and material handling operations.

## 3. Getting Started

### 1. Confirm product identity

Verify the installed item is NexBot Robotics 421-005 Automatic Tool Changer 50 kg Payload with SKU NXB-GEN-421-005. Cross-check the unit against project documentation before applying power or connecting it to the host system.

### 2. Review operating context

Understand how the product is used within the End-of-Arm Tooling > Tool Changers > Automatic Tool Changers workflow, including any upstream and downstream dependencies, service intervals, and operator responsibilities.

### 3. Complete initial startup

Power up the unit under controlled conditions, observe indicator states, and verify the product initializes cleanly with the expected 24VDC operating setup.

## 4. Operation

### Normal operation

Run NexBot Robotics 421-005 Automatic Tool Changer 50 kg Payload within the documented workload, environmental, and service conditions. Track alarms, unusual noise, heat, or vibration so corrective action can be scheduled before unplanned downtime occurs.

## Interface and controls

Use the supported electrical and control interfaces to commission, monitor, and troubleshoot the device. Validate all signal mappings and control behavior after maintenance or part replacement.

**Tip:** Capture a baseline of healthy status indicators after commissioning so later diagnostics can be compared quickly.

## Load and application limits

Keep the product within the published ratings for speed, force, load, and environmental exposure. Where applicable, confirm mounting, routing, and attached tooling do not compromise access, cooling, or serviceability; rated payload reference: 50 kg.

## Change management

Whenever hardware, firmware, wiring, or connected tooling changes, repeat the relevant verification and commissioning checks before returning the equipment to production service.

**Tip:** Update maintenance records immediately after any wiring, parameter, or parts change.

## 5. Maintenance Schedule

Interval	Task	Notes
Daily	Inspect NexBot Robotics 421-005 Automatic Tool Changer 50 kg Payload for visible wear, damage, contamination, loose hardware, and abnormal status indicators.	Record any abnormalities before the next production cycle begins.
Monthly	Verify mounting integrity, connector condition, and cable routing or strain relief points.	Retorque or reseal hardware only to the documented service specification.
Quarterly	Review diagnostic logs, event history, and operational trends for early signs of degradation.	Escalate recurring warnings before they develop into hard faults.
Annually	Perform a full service inspection covering mechanical condition, electrical connections, and functional verification.	Coordinate annual service with planned downtime to minimize production disruption.

## 6. Troubleshooting

Symptom	Possible Cause	Solution
	Incoming supply, controls wiring, or commissioning parameters do not match	Verify power quality, wiring continuity, protective devices, and

Symptom	Possible Cause	Solution
Unit does not initialize or remain ready	the documented 24VDC configuration.	startup parameters before restarting the unit.
Intermittent communication or status loss	Loose connectors, damaged cabling, or interface mismatch.	Inspect physical connections, confirm interface settings, and replace damaged cables or connectors as needed.
Unexpected wear, vibration, or overheating	Mechanical loading, contamination, misalignment, or duty cycle exceeds the intended application conditions.	Inspect the installation, restore proper alignment and cooling, and verify the product is being used within its published operating limits.
Connected equipment performance is inconsistent	The installed product is not configured correctly for the host system or compatible robot series (R-20, R-50, R-100).	Validate the configuration, confirm compatibility, and rerun the functional verification procedure after any corrections.

## 7. Technical Specifications

Parameter	Value	Unit
Weight	4.8	kg
Material	Hard-Anodized Aluminum 7075-T6	
Voltage	24VDC	
IP Rating	IP65	
Country of Origin	DE	
Dimensions	150 x 150 x 95 mm	
Payload	50 kg	
Repeatability	±0.02 mm	
Torque	500 Nm (Static Bending Moment)	