

User Manual: NexBot Robotics MAG414-005 Magnetic Gripper 140N

SKU: NXB-GEN-MAG414-005 | 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 MAG414-005 Magnetic Gripper 140N; stored electrical or mechanical energy may remain present after shutdown.

WARNING: Operate NXB-GEN-MAG414-005 only within its intended End-of-Arm Tooling > Grippers > Magnetic Grippers 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 IP67 during installation and service.

2. Product Overview

The NexBot Robotics MAG414-005 is an electromagnet-based gripper designed for secure and efficient handling of ferrous workpieces in demanding industrial

environments. This end-of-arm tool is engineered for applications requiring rapid pick-and-place cycles, such as machine tending, CNC loading/unloading, sheet metal handling, and automated assembly. Its primary function is to provide a reliable grip on components without the mechanical complexity of traditional jaw grippers, making it ideal for parts with uneven surfaces or those where surface marking must be avoided. Key to its performance is the powerful electromagnet core, which generates a consistent holding force of 140 N, ensuring a secure grip on parts even during high-speed robot movements. The gripper features fast activation and deactivation times, minimizing cycle times and maximizing throughput. Unlike permanent magnet grippers, the MAG414-005 consumes power only when energized, and its residual magnetism is minimal, ensuring clean part release. The gripper's robust construction features a hard-anodized aluminum body, providing excellent durability and heat dissipation. With an IP67 rating, this magnetic gripper is fully protected against dust ingress and can withstand immersion in water, making it suitable for use in harsh conditions involving coolants, lubricants, or washdown procedures. Integration is simplified through its standard ISO 9409-1 mounting pattern and integrated IO-Link connectivity. The IO-Link interface provides real-time diagnostic feedback on gripper status, temperature, and switching cycles, enabling predictive maintenance and advanced process control. Weighing only 1.2 kg and featuring a compact form factor of 80 x 80 x 55 mm, the MAG414-005 minimizes its impact on the robot's payload capacity and inertia, allowing for faster and more precise movements. It operates on a standard 24VDC power supply, common in industrial control cabinets, simplifying electrical installation. The combination of high holding force, rugged design, and intelligent communication makes this magnetic gripper a versatile and reliable solution for a wide range of automation tasks.

3. Getting Started

1. Confirm product identity

Verify the installed item is NexBot Robotics MAG414-005 Magnetic Gripper 140N with SKU NXB-GEN-MAG414-005. 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 > Grippers > Magnetic Grippers 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 MAG414-005 Magnetic Gripper 140N 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, especially where IO-Link communication is required.

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.

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 MAG414-005 Magnetic Gripper 140N 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
Unit does not initialize or remain ready	Incoming supply, controls wiring, or commissioning parameters do not match the documented 24VDC configuration.	Verify power quality, wiring continuity, protective devices, and startup parameters before restarting the unit.
Intermittent communication or status loss	Loose connectors, damaged cabling, or	Inspect physical connections, confirm interface settings, and

Symptom	Possible Cause	Solution
	interface mismatch on IO-Link.	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, C-5).	Validate the configuration, confirm compatibility, and rerun the functional verification procedure after any corrections.

7. Technical Specifications

Parameter	Value	Unit
Weight	1.2	kg
Material	Anodized Aluminum 6061-T6	
Voltage	24VDC	
IP Rating	IP67	
Country of Origin	US	
Protocol	IO-Link	
Dimensions	80 x 80 x 55 mm	
Torque	5 Nm	