

User Manual: NexBot Safety

PNU411-012 Pneumatic Gripper 30mm Stroke

SKU: NXB-GEN-PNU411-012 | 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 Safety PNU411-012 Pneumatic Gripper 30mm Stroke; stored electrical or mechanical energy may remain present after shutdown.

WARNING: Operate NXB-GEN-PNU411-012 only within its intended End-of-Arm Tooling > Grippers > Pneumatic 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 IP65 during installation and service.

2. Product Overview

The NexBot Safety PNU411-012 is a parallel pneumatic gripper engineered for precision and durability in demanding industrial automation applications. This end-of-arm tool provides reliable material handling for tasks such as machine tending, assembly, and packaging. Its robust, double-acting mechanism ensures consistent performance and rapid cycle times, which is critical for maintaining high throughput in production environments. Key features include a high gripping force-to-weight ratio, allowing smaller robots to handle heavier parts without sacrificing speed or accuracy. The gripper delivers a total gripping force of 410 N, suitable for securely handling a wide variety of component sizes and materials. The housing is constructed from a hard-coated aluminum alloy, providing excellent resistance to wear and corrosion in typical factory settings. With a total stroke of 30 mm (15 mm per jaw), it offers flexibility for parts with slight dimensional variations. The PNU411-012's design also incorporates T-slots for easy mounting of custom fingers and proximity sensors to verify part presence. Designed for seamless integration, the gripper features a standard ISO 9409-1 mounting pattern, making it compatible with a broad range of NexBot Robotics arms. Its compact dimensions allow for operation in confined spaces, a common requirement in complex assembly cells. The gripper is rated IP65, ensuring protection against dust ingress and low-pressure water jets, making it suitable for environments with moderate exposure to contaminants. Installation is straightforward, requiring a connection to a standard 24VDC solenoid valve and a regulated air supply. The combination of high repeatability (± 0.02 mm) and strong gripping force makes the PNU411-012 an effective solution for applications requiring both precision and strength.

3. Getting Started

1. Confirm product identity

Verify the installed item is NexBot Safety PNU411-012 Pneumatic Gripper 30mm Stroke with SKU NXB-GEN-PNU411-012. 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 > Pneumatic 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 Safety PNU411-012 Pneumatic Gripper 30mm Stroke 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.

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 Safety PNU411-012 Pneumatic Gripper 30mm Stroke 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 interface mismatch.	Inspect physical connections, confirm interface settings, and

Symptom	Possible Cause	Solution
		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-10, R-20, 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 Alloy	
Voltage	24VDC	
IP Rating	IP65	
Country of Origin	US	
Dimensions	155 x 90 x 75 mm	
Repeatability	±0.02 mm	
Torque	12 Nm	