

# User Manual: NexBot Robotics LA013-009 6-Axis Robot Arm 120kg Payload

SKU: NXB-ROB-LA013-009 | Version: 1.0 | Brand: NexBot Robotics

## Table of Contents

1. Safety Information
2. Product Overview
3. Getting Started
4. Operation
5. Maintenance
6. Troubleshooting
7. Technical Specifications

## 1. Safety Information

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

**DANGER: HIGH VOLTAGE.** Disconnect and lock out main power before opening any control cabinet or robot connection panel. Failure to do so will result in severe injury or death by electrocution.

**WARNING:** The robot can move unexpectedly at high speed and with great force. Always remain outside of the robot's designated work envelope during automatic operation.

**WARNING:** Improperly configured payload data can lead to inaccurate movements, excessive vibration, and premature component wear. Always set the payload and center of gravity accurately for any attached tooling.

**CAUTION:** Moving axes create powerful pinch points. Keep hands and tools clear of all joints during manual or automatic operation to prevent crushing injuries.

**NOTICE:** The LA013-009 robot arm is rated to IP67, but the base and controller are rated to IP54. Do not expose the robot base or controller to direct high-pressure washing or submersion.

## 2. Product Overview

The NexBot Robotics LA013-009 is a powerful 6-axis articulated robot arm designed for high-payload industrial automation tasks. Engineered for reliability and performance, this robot provides the strength and dexterity required for the most demanding manufacturing environments. Its primary use case involves the manipulation of heavy objects with high precision across a large operational area. The standout feature of the LA013-009 is its substantial 120 kg payload capacity. This enables the arm to handle heavy workpieces, large fixtures, or multiple parts simultaneously, significantly increasing throughput in applications like CNC machine tending, injection molding machine unloading, and large-scale assembly. The six axes of motion provide exceptional flexibility, allowing the robot to execute complex paths and reorient tools to access difficult-to-reach points, which is critical for tasks such as spot welding or applying sealants around complex geometries. With a horizontal reach of 2550 mm, the robot arm commands a large, versatile work envelope. This extended reach allows it to service multiple machines, load and unload wide conveyors, or build tall pallet stacks without requiring auxiliary linear tracks, simplifying cell design and reducing footprint. The robot maintains a position repeatability of  $\pm 0.05$  mm, ensuring that every cycle is performed with consistent accuracy. This level of precision is essential for achieving high-quality results in processes like material deposition, parts inspection, and intricate assembly operations. The robust cast iron and aluminum alloy construction, coupled with an IP67 rating for the arm, ensures long-term durability even in environments with dust, debris, and fluids. The streamlined design integrates internal routing for utilities, protecting them from wear and reducing the risk of snagging during operation.

## 3. Getting Started

### 1. Power-On Procedure

Before powering on, ensure all emergency stop buttons are disengaged. Turn on the main disconnect switch for the robot controller. The controller will initialize, and after a brief startup sequence, the teach pendant will become active.

### 2. Understanding the Teach Pendant

The teach pendant is the primary human-machine interface for the LA013-009. It allows for manual jogging of the robot's 6 axes, program creation and editing, system configuration, and viewing diagnostic information. Familiarize yourself with the enable switch, emergency stop, and coordinate system selection keys.

### 3. Homing and Mastering

Homing, or mastering, is the process of establishing a known reference position for each robot axis. The robot must be homed after initial setup or if it loses its position due to a battery failure. This is typically done by running the 'Mastering' routine from the teach pendant.

## 4. Operation

### Manual Jogging

Manual jogging allows for direct control of the robot's position. Select the desired coordinate system (e.g., Joint, World, Tool) on the teach pendant, hold the enable

switch, and use the directional keys to move the robot. Always use a slow override speed when jogging near obstacles.

**Tip:** Use 'Joint' mode for large, sweeping movements and 'Tool' mode for precise positioning of the end-effector relative to a workpiece.

## Defining a Tool Center Point (TCP)

The TCP is the focal point of your end-of-arm tooling. Accurately defining the TCP is critical for precise path programming. Use the built-in 4-point or 6-point definition wizard on the teach pendant to teach the system the exact location and orientation of your tool's working point.

## Setting Payload Data

To ensure optimal performance and longevity, the robot's control system must know the mass and center of gravity of its payload. Input the mass of your end-of-arm tooling and the maximum workpiece weight into the payload schedule settings. The LA013-009 supports up to a 120 kg payload.

**Tip:** If the center of gravity is unknown, use the system's payload identification routine to automatically estimate it.

## Creating a Basic Program

Programs are created by recording a series of points. Jog the robot to a desired position, record the point, define its motion type (e.g., Joint, Linear), and repeat for all points in the path. You can then add logic, such as wait instructions or digital outputs, to complete the program.

## Running in Automatic Mode

Before running in automatic mode, ensure the work cell is clear of all personnel and safety systems are active. Select the desired program, move the mode switch to 'AUTO', and initiate the cycle from the PLC or master controller via PROFINET. It is recommended to run the first cycle at a low speed override to verify the path is correct.

# 5. Maintenance Schedule

Interval	Task	Notes
Daily	Visually inspect the robot arm and cables for any signs of damage, wear, or fluid leaks. Check the area for debris that could interfere with robot motion.	Perform this check before the start of the first shift.
Weekly	Clean the exterior surfaces of the robot arm and controller. Verify that all safety equipment (E-stops, safety gates) is functioning correctly.	Use only approved cleaning agents that will not damage seals or paint.
Quarterly	Check the grease levels for axes 1, 2, and 3 via the sight glasses. Add grease if necessary, using only the specified NexBot lubricant.	Do not mix different types of grease.

Interval	Task	Notes
Annually	Replace the encoder backup batteries located in the robot base. This prevents the loss of mastering data during a power outage.	The robot will need to be re-mastered if power is lost while the batteries are removed.
Annually	Perform a comprehensive lubrication service, replacing the grease in all 6 axis gearboxes.	This task should be performed by a NexBot-certified service technician.
Annually	Check the torque of the main base mounting bolts to ensure the robot remains securely fastened to the foundation.	Re-torque to the value specified in the installation guide.
Every 2 Years	Inspect and replace the main data and power cabling between the arm and controller if any signs of wear, cracking, or abrasion are found.	Cable wear is highly dependent on the robot's specific motion paths.

## 6. Troubleshooting

Symptom	Possible Cause	Solution
Positioning Accuracy Degraded (not meeting $\pm 0.05$ mm repeatability)	Incorrect TCP or payload data; loose end-of-arm tooling; robot base has become unlevel.	Verify TCP and payload settings are accurate. Check torque on EOAT mounting bolts. Re-verify that the robot base is level and re-torque mounting bolts if necessary.
Robot stops with 'Axis Limit' error	The robot was programmed to move beyond its physical or software-defined range of motion for a specific axis.	Jog the robot away from the limit in the opposite direction. Modify the program point to be within the allowable working envelope.
PROFINET communication fault	Network cable is disconnected, damaged, or the device name/IP address is incorrect.	Check the physical connection of the PROFINET cable at the controller and network switch. Use a diagnostic tool to verify the device name and IP configuration match the PLC project.
Overload alarm on Axis 2 or 3	The payload exceeds the 120 kg limit, the center of gravity is too far from the flange, or acceleration/ deceleration values are too aggressive.	Reduce the weight of the payload. Re-design the EOAT to move the center of gravity closer to the robot. Reduce acceleration parameters in the program's motion settings.

Symptom	Possible Cause	Solution
Robot does not power on, no lights on controller	Main 400-480VAC power is off, a main fuse is blown, or an external E-stop is activated.	Verify the main disconnect breaker is ON. Check and reset all external E-stop circuits. Check the main fuses inside the controller cabinet after locking out power.
Robot loses mastering/position after main power is cycled	The encoder backup batteries are dead or failing.	Replace the encoder backup batteries as per the annual maintenance schedule. The robot will need to be re-mastered after replacement.
Excessive noise or vibration during movement	Internal gearbox wear, unbalanced payload, or loose mounting bolts.	Check payload balance and secure it. Verify torque on base and EOAT mounting bolts. If noise persists, contact NexBot Robotics service for an internal inspection.

## 7. Technical Specifications

Parameter	Value	Unit
Weight	1350.0	kg
Material	Cast Iron and Aluminum Alloy	
Voltage	400-480VAC 3-Phase	
IP Rating	IP67 (Arm) / IP54 (Base)	
Country of Origin	CH	
Protocol	PROFINET	
Dimensions	850 x 700 mm (Footprint)	
Reach	2550 mm	
Payload	120 kg	
Axes	6	
Repeatability	±0.05 mm	