User Manual: NexBot Robotics SD131-005 400V Single-Axis Servo Drive

SKU: NXB-SRV-SD131-005 | 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: Isolate all hazardous energy before servicing NexBot Robotics SD131-005 400V Single-Axis Servo Drive; stored electrical or mechanical energy may remain present after shutdown.

WARNING: Operate NXB-SRV-SD131-005 only within its intended Drive Systems > Servo Drives > Single-Axis Servo Drives 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 IP20 during installation and service.

2. Product Overview

The NexBot Robotics SD131-005 is a compact, high-performance single-axis servo drive engineered for precise motion control in demanding industrial automation applications. This drive translates commands from the robot controller into the high-power current required to actuate a servo motor, forming the core of the robot's motion system. Its primary function is to ensure accurate positioning, velocity, and torque for a single robot joint. The SD131-005 features advanced control algorithms, including real-time auto-tuning and vibration suppression, which significantly reduce commissioning time and improve the dynamic response of the robotic arm. This results in smoother paths, higher accuracy, and reduced cycle times for tasks such as assembly, welding, and material handling. The drive's compact design, with dimensions of 210 x 75 x 180 mm, allows for high-density mounting within control cabinets, saving valuable floor space. Engineered for versatility, this servo drive operates on a 400-480VAC (3-Phase) power supply, making it suitable for a wide range of industrial environments globally. Safety is paramount in modern robotics, and the SD131-005 includes an integrated Safe Torque Off (STO) function (SIL 3, PLe), which simplifies the implementation of emergency stop systems without requiring external contactors. Installation is streamlined through user-friendly configuration software and clear diagnostic LEDs on the front panel, which provide instant status feedback. The robust die-cast aluminum housing ensures effective heat dissipation for reliable operation under continuous load. This servo drive is a direct replacement component for specific joints on several NexBot Robotics platforms, ensuring seamless integration and restoration of original performance specifications.

3. Getting Started

1. Confirm product identity

Verify the installed item is NexBot Robotics SD131-005 400V Single-Axis Servo Drive with SKU NXB-SRV-SD131-005. 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 Drive Systems > Servo Drives > Single-Axis Servo Drives 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 400-480VAC (3-Phase) operating setup.

4. Operation

Normal operation

Run NexBot Robotics SD131-005 400V Single-Axis Servo Drive 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 EtherCAT 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 SD131-005 400V Single-Axis Servo Drive 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 reseat 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 400-480VAC (3-Phase) configuration.	Verify power quality, wiring continuity, protective devices, and startup parameters before restarting the unit.

Symptom	Possible Cause	Solution
Intermittent communication or status loss	Loose connectors, damaged cabling, or interface mismatch on EtherCAT.	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-50, R-100, C-10).	Validate the configuration, confirm compatibility, and rerun the functional verification procedure after any corrections.

7. Technical Specifications

Parameter	Value	Unit
Weight	2.1	kg
Material	Die-cast Aluminum	
Voltage	400-480VAC (3-Phase)	
IP Rating	IP20	
Country of Origin	IT	
Protocol	EtherCAT	
Dimensions	210 x 75 x 180 mm	
Torque	5 Nm	