

User Manual: NexBot Robotics DC112-007 Dc Servo Motor

SKU: NXB-SRV-DC112-007 | 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: Risk of fatal electric shock. Disconnect and lock out all power sources before servicing the DC112-007 motor. This unit is powered by 24VDC, but may be part of a larger high-voltage system.

WARNING: Unexpected motion can cause serious injury. The motor can move with high torque (up to 7 Nm) without warning. Ensure all personnel are clear of the operational area before enabling the drive system.

CAUTION: The motor surface can reach high temperatures during operation, posing a burn risk. Allow the unit to cool completely before handling.

NOTICE: The DC112-007 contains sensitive electronic components. Observe proper electrostatic discharge (ESD) precautions when handling connectors and internal components to prevent damage.

2. Product Overview

NexBot Robotics DC112-007 Dc Servo Motor (NXB-SRV-DC112-007) is a dc servo motors used in industrial robotics equipment where category-specific fit, electrical or mechanical compatibility, and predictable serviceability are important to buyers. The product should be understood as the exact component named by its category path, not as a complete robot or a generic service item. It supports installation, replacement, and maintenance workflows in robotic production cells by giving procurement and maintenance teams a clearly defined part class, relevant engineering specifications, and application context that matches the actual hardware being purchased.

3. Getting Started

1. Product Overview

The NexBot Robotics DC112-007 (SKU: NXB-SRV-DC112-007) is a high-performance DC servo motor designed for industrial automation. It operates on 24VDC, delivers up to 7 Nm of torque, and communicates via the IO-Link protocol for advanced diagnostics and control. Its Stainless Steel 316 construction and IP67 rating ensure durability in demanding environments.

2. System Requirements

To operate this servo motor, you will need a stable 24VDC power supply capable of providing sufficient current under load. A programmable logic controller (PLC) or robot controller equipped with an IO-Link master is required for communication and control. The appropriate IODD (IO Device Description) file for the DC112-007 must be installed in your engineering software.

3. Initial IO-Link Configuration

Once connected to an IO-Link master, the DC112-007 will be automatically detected. Using your control system's software, you can access process data (position, velocity) and diagnostic data (temperature, voltage, error flags). Configuration of operational parameters such as acceleration ramps and current limits is performed through the IO-Link master interface.

4. Operation

Normal Operating Mode

In normal operation, the motor receives target position, velocity, or torque commands from the master controller via IO-Link. The internal controller drives the motor to the desired state and provides real-time feedback. Monitor the process data to ensure the motor is tracking the command signal accurately.

Tip: Regularly log diagnostic data via IO-Link to establish a baseline performance profile, which can help in predicting future maintenance needs.

Torque Handling

The DC112-007 is rated for a peak torque of 7 Nm. Continuously operating the motor at or near this limit can lead to overheating and reduced service life. Ensure your application's load profile is within the motor's specified continuous torque curve.

Environmental Protection (IP67)

The motor's IP67 rating indicates it is fully protected against dust ingress and can withstand temporary immersion in water up to 1 meter for 30 minutes. Ensure that all connectors are properly sealed to maintain this rating. Avoid using high-pressure jets for cleaning, as this can exceed the seal's pressure rating.

Tip: Although rated for immersion, it is best practice to shield the motor from direct and continuous exposure to liquids to maximize its lifespan.

Diagnostic Functions

Leverage the IO-Link protocol to access critical diagnostic information from the motor. Key parameters include internal temperature, bus voltage, total operating hours, and specific fault codes. Monitoring these values allows for proactive maintenance and rapid troubleshooting.

5. Maintenance Schedule

Interval	Task	Notes
Weekly	Visually inspect the motor housing, cables, and connectors for any signs of physical damage, wear, or corrosion.	Pay close attention to the cable insulation, especially near moving parts.
Monthly	Clean the exterior of the motor housing with a soft, dry cloth. Remove any accumulated dust or debris that could inhibit heat dissipation.	Do not use solvents or high-pressure cleaning methods.
Quarterly	Verify the torque of the motor's mounting bolts. Check that the shaft coupler set screws are secure and there is no slippage.	Perform this check only after the machine is safely locked out.
Annually	Inspect the integrity of the motor shaft seal. Look for signs of cracking, brittleness, or leakage that could compromise the IP67 rating.	This is especially important in environments with high exposure to fluids.
Annually	Check for motor firmware updates on the NexBot Robotics support portal. Update firmware via the IO-Link master as needed to implement performance improvements or bug fixes.	Always back up current parameters before performing a firmware update.

6. Troubleshooting

Symptom	Possible Cause	Solution
Motor is unresponsive and does not move.	Loss of power, disconnected IO-Link cable, or system enable signal is off.	Use a multimeter to verify 24VDC at the motor's power connector. Check that the IO-Link cable is securely

Symptom	Possible Cause	Solution
		connected at both ends. Confirm the master controller is commanding the motor to an enabled state.
Motor overheats (over-temperature fault).	Excessive load, high ambient temperature, or insufficient cooling.	Reduce the operational duty cycle or mechanical load. Ensure proper airflow around the motor. Verify the ambient temperature is within the specified operating range.
Erratic or jerky motor movement.	Poor PID tuning in the controller, mechanical binding in the load, or a loose shaft coupler.	Adjust the control loop parameters in the master controller. Disconnect the load and check for binding or obstructions. Inspect and tighten the shaft coupler.
IO-Link communication failure.	Faulty or damaged cable, incorrect port configuration on the IO-Link master, or electromagnetic interference.	Test with a known-good IO-Link cable. Verify the master port is configured for the DC112-007. Ensure motor cables are routed away from high-power AC lines.
Excessive audible noise or vibration.	Worn internal bearings, shaft misalignment, or an imbalanced load.	Verify the alignment of the motor shaft with the driven load. Check the load for imbalance. If noise persists, the motor's bearings may be failing and the unit may require replacement.
Motor faults on position error.	The motor is unable to reach the commanded position due to a physical obstruction or a load exceeding the 7 Nm torque limit.	Inspect the machine's path of travel for any obstructions. Verify that the load requirements have not changed and do not exceed the motor's torque capacity. Cycle power to reset the internal encoder.

7. Technical Specifications

Parameter	Value	Unit
Weight	0.45	kg
Material	Stainless Steel 316	
Voltage	24VDC	
IP Rating	IP67	
Country of Origin	IT	

Parameter	Value	Unit
Protocol	IO-Link	
Dimensions	50 x 50 x 25 mm	
Torque	7 Nm	