User Manual: NexBot Robotics 813-001 Tool Adapter Plate ISO 9409-1-50-4-M6

SKU: NXB-MNT-813-001 | 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: LOCKOUT/TAGOUT REQUIRED. Always de-energize and lock out all power sources to the robot before installing, adjusting, or removing the tool adapter plate. Unexpected robot movement can cause fatal injury.

WARNING: PINCH HAZARD. Keep hands and fingers clear of the mounting surfaces between the robot flange, the adapter plate, and the tool during installation. The weight of the tooling can create powerful pinch points.

WARNING: IMPROPER TORQUE HAZARD. Failure to use a calibrated torque wrench and follow manufacturer torque specifications can result in the tool detaching from the robot during operation, creating a high-speed projectile risk.

> **CAUTION:** LIFTING HAZARD. While the adapter plate itself weighs only 0.75 kg, the combined weight of the plate and the attached end-of-arm-tooling may require mechanical assistance for safe handling. Follow facility guidelines for lifting.

> **NOTICE:** The hard-coat anodized surface of the Aluminum 6061-T6 plate provides corrosion resistance. However, using incompatible fasteners or operating in highly caustic environments can compromise this coating and lead to material degradation.

2. Product Overview

NexBot Robotics 813-001 Tool Adapter Plate ISO 9409-1-50-4-M6 (NXB-MNT-813-001) is a tool adapter plates 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 813-001 is a precision-machined tool adapter plate designed to create a secure, standardized mechanical interface between a robot arm and its end-of-arm-tooling (EOAT). Manufactured from high-strength, lightweight Aluminum 6061-T6, it provides a robust mounting solution for dynamic applications.

2. ISO 9409-1-50-4-M6 Standard

This plate conforms to the ISO 9409-1-50-4-M6 international standard. This ensures mechanical compatibility with any robot arm flange that also adheres to this standard, which specifies a 50 mm bolt circle diameter with four M6 threaded holes and a centering feature.

3. Material and Coating

The plate is made from Aluminum 6061-T6, chosen for its excellent strength-to-weight ratio. The entire component is finished with a hard-coat anodization process, which creates a durable, corrosion-resistant, and electrically non-conductive surface ideal for industrial environments.

4. Operation

Payload Considerations

The 0.75 kg weight of the NXB-MNT-813-001 adapter plate must be included in the robot's total payload calculation. Failure to update payload settings in the robot controller can lead to inaccurate movements, increased motor strain, and excessive wear on robot joints.

> **Tip:** Always re-calculate and update the robot's Tool Center Point (TCP) after installing or changing any component on the robot flange, including this adapter plate.

Maintaining Rigidity

The primary function of this plate is to provide a rigid connection. The flat, machined surfaces and proper fastener torque are critical for preventing micro-movements (fretting) that can degrade positioning accuracy over time. Regularly inspect for any signs of movement or wear at the interfaces.

Environmental Compatibility

The hard-coat anodized aluminum is resistant to many industrial chemicals and moisture. However, avoid prolonged exposure to strong acids or alkalis, which can damage the coating. In washdown environments, ensure fasteners are of a compatible material (e.g., stainless steel) to prevent galvanic corrosion.

Thermal Expansion

In applications with significant temperature fluctuations, the aluminum plate will expand and contract at a different rate than steel robot flanges or tools. For high-precision applications, allow the system to reach thermal stability before performing critical operations. This effect is minimal in most standard operating environments.

5. Maintenance Schedule

Interval	Task	Notes
Weekly	Perform a torque check on all mounting fasteners (robot-side and tool-side). Re-torque to specification if any have loosened.	Use a calibrated torque wrench. Mark fasteners with a torque stripe to make visual checks faster.
Monthly	Clean the exterior surfaces of the adapter plate with a lint-free cloth and an approved cleaning agent to remove dust, oil, and other contaminants.	Do not use abrasive pads or harsh solvents that could damage the anodized coating.
Quarterly	Visually inspect the plate for any signs of physical damage, such as deep scratches, gouges, or deformation. Pay close attention to the mounting hole chamfers and contact surfaces.	Minor surface scuffs are cosmetic, but deep scratches can be stress points.
	Remove the plate and inspect the mating surfaces	

Interval	Task	Notes
Annually (or during tool changeover)	for signs of fretting corrosion (a reddish-brown or black powder). Fretting indicates micro-movement and may require fastener replacement or surface re-evaluation.	Clean surfaces thoroughly before reassembly.
As Needed	Replace any mounting fasteners that show signs of thread damage, stretching, or corrosion.	Always use new fasteners of the same grade and specification.

6. Troubleshooting

Symptom	Possible Cause	Solution
Inconsistent tool positioning or poor repeatability.	One or more mounting fasteners have loosened, allowing for slight movement of the plate.	Power down and lock out the robot. Check the torque on all robot-side and tool-side fasteners and tighten to the manufacturer's specification.
Visible vibration at the end-of-arm-tool during high-speed movements.	Uneven fastener torque or a foreign object (e.g., metal chip, debris) trapped between a mating surface.	Lock out the robot. Loosen all fasteners, then re-torque them in the correct star pattern and sequence. If vibration persists, dismount the plate and tool to inspect and clean all mating surfaces.
The adapter plate does not sit flush against the robot flange.	A burr on the plate or flange, damaged dowel pin, incorrect fastener length (bottoming out), or debris on a mating surface.	Dismount the plate. Carefully inspect and clean both mounting surfaces. Check for and gently remove any burrs with a fine file. Verify you are using the correct fasteners.
Difficulty threading mounting fasteners into the robot flange.	Cross-threading, damaged threads in the flange, or incorrect fasteners (wrong pitch or diameter).	Immediately stop. Back out the fastener and inspect the threads. Try threading the fastener by hand without the plate to verify fit. Use a thread chaser if necessary and authorized.
Powdery residue (red or black) is visible around the edges of the	This is evidence of fretting corrosion, caused by micro-movements at the	Schedule maintenance to remove, clean, and inspect the components. Re-install using the

Symptom	Possible Cause	Solution
plate after a period of use.	interface due to insufficient clamping force.	proper torque procedure. If the problem reoccurs, evaluate if the application's vibration or load is exceeding system limits.
Corrosion or pitting is visible on the surface of the adapter plate.	The hard-coat anodized layer has been compromised by mechanical damage or exposure to a harsh chemical.	Clean the area and assess the depth of the corrosion. If it is minor, it may be cosmetic. If it is severe, especially on a mating surface, the plate should be replaced to ensure structural integrity and proper fit.

7. Technical Specifications

Parameter	Value	Unit
Weight	0.75	kg
Material	Aluminum 6061-T6, Hard-Coat Anodized	
Country of Origin	SE	
Dimensions	120 x 120 x 15 mm	