Installation Guide: NexBot Robotics CLR032-001 SCARA Robot 5kg Payload 450mm Reach

SKU: NXB-ROB-CLR032-001 | Revision: 1.0 | Category: Robots > SCARA Robots > Cleanroom SCARA

> **DANGER:** Disconnect all power sources before beginning installation. Follow lockout/tagout (LOTO) procedures per OSHA 1910.147.

1. Required Tools & Materials

- Metric Allen key set (2mm - 10mm)
- Torque wrench (20-100 Nm range)
- Precision machinist level or laser level
- Wire stripper and ferrule crimping tool
- Digital multimeter
- Laptop with NexBot Studio software installed
- M8 Grade 12.9 mounting bolts (4x)
- Safety glasses and cut-resistant gloves

2. Pre-Installation Checks

1. Verify the mounting surface is rigid, flat to within 0.05mm, and can support a dynamic load of at least 150 kg.
2. Confirm the installation area provides an unobstructed 450mm reach in all required directions.
3. Ensure the 220VAC single-phase power source is stable, properly grounded, and protected by a 15A circuit breaker.
4. Inspect the robot (SKU: NXB-ROB-CLR032-001) for any signs of shipping damage before uncrating.
5. Confirm ambient cleanroom conditions (temperature, humidity, particle count) are within the robot's specified operating range.

6. Verify all components listed on the packing slip are present, including power, encoder, and EtherCAT cables.

3. Installation Procedure

Step 1: Uncrating and Positioning

Carefully uncrate the robot and use a certified lifting device to place it onto the prepared mounting surface. Ensure the robot base is oriented correctly according to the system layout diagram.

> **Warning:** The robot weighs 25.5 kg. Use proper lifting techniques or mechanical assistance to prevent injury.

Step 2: Mounting and Leveling Robot Base

Align the mounting holes on the robot base with the holes on the mounting surface. Insert four M8 bolts and torque them in a star pattern to the value specified in the engineering drawings. Use a precision level to verify the base is perfectly level, using shims if necessary.

Step 3: Connecting Controller Power

With the main power source de-energized and locked out, connect the main power cable from the 220VAC source to the robot controller's power input terminal. Ensure the ground connection is secure.

> **Warning:** Failure to de-energize the power source before making connections can result in electric shock and equipment damage.

Step 4: Connecting Robot and Controller Cables

Connect the main robot harness (power and encoder signals) from the robot base to the corresponding port on the controller. Connect the EtherCAT cable from your PLC or master device to the EtherCAT

IN port on the controller. Ensure all connectors are fully seated and locked to maintain the IP65 rating.

Step 5: Connecting Cleanroom Vacuum System

Attach the facility's vacuum exhaust hose to the designated port on the robot's base. This internal vacuum is critical for maintaining ISO Class 4 compliance by preventing particle shedding.

Step 6: Installing End-of-Arm Tooling (EOAT)

Mount the user-provided gripper or tool to the J4 axis flange. Carefully route any pneumatic or electrical lines for the EOAT along the arm, using the provided mounting points to prevent interference or snagging during operation.

> **Warning:** Ensure the combined weight of the EOAT and workpiece does not exceed the 5 kg maximum payload.

Step 7: Initial Power-On and Software Connection

Remove the lockout/tagout device and energize the main power source. Power on the robot controller and wait for it to initialize. Connect a laptop running NexBot Studio to the controller's service port via Ethernet to establish communication.

Step 8: System Configuration and Homing

Within the NexBot Studio software, configure the robot's payload parameters to match your EOAT. Define the safe work envelope and any restricted zones. Execute the homing routine to establish the robot's absolute position.

> **Warning:** Incorrectly defined work envelopes can lead to collisions. Always perform the first movements at very low speed.

4. Post-Installation Verification

1. Verify the robot can move freely to the extents of its defined work envelope without any binding or collision.
2. Run the homing sequence multiple times and confirm it completes successfully without errors each time.
3. Manually jog each of the 4 axes and listen for any abnormal noises or vibrations.
4. Test all integrated safety systems, including emergency stop buttons, light curtains, and door interlocks.
5. Execute a test program to verify the robot achieves its specified repeatability of ±0.01 mm.
6. Confirm that the controller software shows a 'Nominal' status for the internal cleanroom vacuum system.

> **Note:** For technical support, contact your authorized service provider or visit https://robotics.barca.group/support.
