

Installation Guide: NexBot Robotics CLR032-004 Cleanroom SCARA Robot 5kg

SKU: NXB-ROB-CLR032-004 | 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

- Torque wrench set (10-50 Nm)
- Metric hex key set (2mm - 10mm)
- Precision bubble level or laser level
- Calibrated lifting hoist (rated for >50 kg)
- EtherCAT network cable tester
- Digital multimeter
- ESD wrist strap
- Cleanroom-compatible wipes and Isopropyl Alcohol (IPA) solution

2. Pre-Installation Checks

1. Verify shipment contents against the packing list for SKU NXB-ROB-CLR032-004, ensuring all cables and documentation are present.
2. Inspect the robot for any shipping damage, paying close attention to the anodized aluminum surfaces and sealed connectors.
3. Confirm the mounting surface is flat, rigid, and capable of supporting the robot's 22.0 kg static weight plus dynamic operational loads.
4. Ensure the installation area meets ISO 14644-1 Class 4 standards and that all personnel follow proper cleanroom gowning procedures.
5. Verify a stable 200-240VAC power source with appropriate overcurrent protection is available within reach of the power cable.
6. Confirm an EtherCAT master controller is available on the network and that the physical installation path for cabling is clear.

3. Installation Procedure

Step 1: Prepare Mounting Surface

Thoroughly clean the designated mounting surface using approved cleanroom wipes and IPA solution. Verify the mounting hole pattern on the surface matches the robot's 220 x 180 mm base footprint.

Step 2: Position and Mount Robot

Using a certified lifting hoist, carefully position the 22.0 kg robot onto the mounting surface, aligning the base holes with the mounting holes. Loosely install the required mounting bolts and washers.

Warning: Use a calibrated lifting device rated for at least 50 kg to account for dynamic factors. Never attempt to lift the robot manually without assistance.

Step 3: Level and Secure Robot Base

Place a precision level on the robot's base mounting flange. Adjust as necessary until the base is perfectly horizontal, then tighten the mounting bolts in a star pattern to the torque value specified in the service manual.

Step 4: Connect Power and Grounding

With the main power source locked out, connect the robot's power cable to the 200-240VAC supply. Securely connect the chassis grounding wire to the facility's verified earth ground point to ensure operator safety and electrical noise immunity.

Warning: Ensure all power is locked out and tagged out (LOTO) before making any electrical connections. All electrical work must be performed by qualified personnel.

Step 5: Connect Communication Cables

Connect the EtherCAT communication cable from the master controller to the 'ECAT IN' port on the robot base. If this robot is part of a chain, connect the

next device to the 'ECAT OUT' port. Ensure connectors are securely fastened to maintain the IP65 seal.

Step 6: Route EOAT Lines

Route any required pneumatic and electrical I/O lines for the end-of-arm-tooling (EOAT) through the robot's internal conduits. This internal routing is critical for minimizing particulate generation and maintaining the cleanroom classification.

Warning: Do not route cables externally, as this will compromise the cleanroom rating and may create a snag hazard.

Step 7: Initial Power On

Clear the area of all tools and personnel, then remove the LOTO device and apply power to the robot controller. Verify that the status LEDs on the robot base and controller indicate normal power and communication status.

Step 8: Verify Axis Movement

Using the teach pendant in T1 (manual low-speed) mode, jog each of the 4 axes individually through a small range of motion. Confirm smooth movement and listen for any unusual noises from the drive systems.

Warning: Ensure all personnel are clear of the robot's 400 mm reach envelope before enabling motor power for the first time.

4. Post-Installation Verification

1. Confirm the robot is correctly identified by the EtherCAT master controller and that no communication errors are present.
2. Execute a homing sequence and verify that all 4 axes successfully find their home positions without error.
3. Run a pre-written test program to verify the robot can move to several points within its work envelope with the expected ± 0.01 mm repeatability.
4. If pneumatic EOAT is installed, check all fittings and lines for air leaks using an appropriate method.

5. Test all integrated safety systems, including emergency stops and any connected light curtains or area scanners.
6. Perform a final wipe-down of the robot's exterior with approved cleanroom materials to remove any contaminants from the installation process.

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