Installation Guide: NexBot Vision CLR032-003 SCARA Robot 5kg Payload

SKU: NXB-ROB-CLR032-003 | 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

- M8 Allen key set
- Torque wrench (10-50 Nm range)
- Precision machine level
- Digital multimeter
- Wire stripper and ferrule crimper
- Laptop with NexBot Studio software installed
- Anti-static wrist strap
- ISO Class 3 compliant cleanroom wipes and isopropyl alcohol

2. Pre-Installation Checks

1. Verify the mounting surface is rigid, flat to within 0.05 mm, and can support a minimum dynamic load of 120 kg.
2. Confirm that a dedicated, grounded 200-240VAC single-phase power source is available within 3 meters of the controller location.
3. Inspect the full contents of the shipping crate against the packing list, checking the CLR032-003 robot for any signs of transit damage.
4. Ensure the installation area meets ISO 14644-1 Class 3 environmental conditions for particulate, temperature, and humidity.
5. Confirm availability of required EtherCAT network connections and compressed air supply if pneumatic tooling is to be used.
6. Clear the intended work envelope of all personnel, tools, and temporary obstructions before moving the robot into place.

3. Installation Procedure

Step 1: Positioning and Mounting the Robot

Using appropriate lifting equipment, carefully position the 22.5 kg robot on the prepared mounting surface. Align the base mounting holes and loosely install four M8 bolts.

> **Warning:** The robot has a high center of gravity. Use two personnel or a certified lifting device to prevent tipping during placement.

Step 2: Leveling and Securing the Base

Place a precision level on the machined mounting surface of the robot base. Adjust leveling feet or shims as needed, then tighten the M8 mounting bolts in a star pattern to the specified torque.

Step 3: Connecting Main Power and Signal Cables

Connect the primary robot power and signal cables from the robot base to the corresponding ports on the robot controller. Ensure the connectors are fully seated and the locking mechanisms are engaged.

> **Warning:** Ensure the main circuit breaker supplying power to the controller is in the OFF position and locked out before making any electrical connections.

Step 4: Establishing a Protective Earth Ground

Connect the chassis ground terminal on the robot base directly to the facility's verified earth ground point using a low-impedance conductor. This is a critical step for personnel safety and electrical noise reduction.

Step 5: Installing End-of-Arm Tooling (EOAT)

Mount the custom or pre-built end effector to the robot's J4 axis flange. Ensure the total mass of the tooling and maximum workpiece does not exceed the 5 kg payload limit.

Step 6: Routing Tooling Lines

Route any required pneumatic or electrical lines for the EOAT through the internally routed passages in the robot arm. This preserves the smooth exterior profile required for cleanroom operation and prevents cable snagging.

Step 7: Initial Power-Up and Communication Check

After a final verification of all connections, apply power to the robot controller. Connect a laptop running NexBot Studio software to the controller's service port and establish a communication link.

> **Warning:** Stand clear of the robot during the initial power-up sequence as the axes may perform a slight initialization movement.

Step 8: Homing and Axis Calibration Verification

Using the software or teach pendant, initiate the robot's homing sequence. Observe each of the 4 axes to ensure they move smoothly to their hard stops or home sensors and establish a correct zero position.

Step 9: Defining the Safety Workspace

Configure the robot's soft limits in the NexBot Studio software to define the safe, allowable work envelope. This prevents the robot arm from colliding with peripheral equipment or the cell structure during operation.

> **Warning:** Incorrectly configured safety limits can lead to severe equipment damage. Double-check all defined boundaries before enabling high-speed motion.

4. Post-Installation Verification

1. Execute a slow-speed test program to verify movement throughout the entire defined work envelope.
2. Listen for any abnormal noises such as grinding or excessive whining from the motors or gearboxes.
3. Verify that the robot's reported TCP (Tool Center Point) position in the software is accurate.
4. Test the functionality of the end-of-arm tooling by actuating it manually via the software I/O screen.
5. Perform a repeatability test by commanding the robot to a precise point from various angles, confirming it lands within the ±0.01 mm specification.
6. Check the controller log for any errors or warnings generated during the initial motion tests.

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