

Installation Guide: NexBot Robotics

631-007 Pressure Safety Mat

1000x1000mm

SKU: NXB-GEN-631-007 | Revision: 1.0 | Category: Safety Systems > Safety Mats & Bumpers > Pressure Safety Mats

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

1. Required Tools & Materials

- Drill with appropriate bits for floor material
- Torque screwdriver with insulated bits
- Digital Multimeter (DMM)
- Wire stripper and crimping tool
- Fish tape and conduit bender
- Spirit level
- Caulking gun with industrial sealant
- Personal Protective Equipment (Safety Glasses, Gloves)

2. Pre-Installation Checks

1. Verify the received product SKU is NXB-GEN-631-007 and inspect for any shipping damage.
2. Ensure the installation surface is clean, dry, and level. The floor must be free of debris, oils, and significant cracks.
3. Confirm the safety controller or safety relay is compatible with a 4-wire, normally open (NO) safety mat.
4. Review the overall system safety schematic to understand how the mat integrates with other safety devices.
5. De-energize and apply Lockout/Tagout (LOTO) procedures to the robot and associated machinery before beginning installation.
6. Measure the designated area to confirm the 1000 x 1000 mm mat provides adequate coverage for the hazard zone.

3. Installation Procedure

Step 1: Surface Preparation

Thoroughly clean the floor area where the mat will be placed. Remove all dust, grease, and moisture. Fill any significant cracks or holes to create a smooth, flat surface.

Step 2: Positioning the Mat

Carefully place the 631-007 mat in its designated location within the hazardous zone. Ensure the cable exit point is oriented towards the planned conduit run to the control cabinet.

Warning: Do not bend or fold the mat sharply, as this can damage the internal sensor grid.

Step 3: Installing Mounting Trim

Place the supplied aluminum mounting trim around the perimeter of the mat. Mark and drill pilot holes into the floor, then secure the trim using the appropriate floor anchors.

Warning: Ensure the trim provides a beveled, trip-free transition from the floor to the mat surface.

Step 4: Routing the Connection Cable

Route the mat's integrated cable to the safety controller cabinet, using protective conduit to prevent damage. Avoid running the cable near high-voltage power lines or sources of significant electromagnetic interference.

Step 5: Wiring to Safety Controller

Connect the four wires from the mat to the designated safety mat input terminals on the safety monitoring relay or safety PLC. Follow the wiring diagram provided with the safety controller precisely.

Warning: Incorrect wiring will cause the safety function to fail. Double-check all connections before applying power.

Step 6: Sealing and Securing

Apply a bead of industrial-grade, non-silicone sealant between the floor and the outer edge of the mounting trim. This prevents fluid ingress and helps secure the mat assembly.

Step 7: Final Electrical Checks

With the system still de-energized, use a multimeter to check for continuity on the sensor pairs and ensure there are no short circuits between the wiring and ground.

Warning: Do not apply high voltage from an insulation tester (megger) to the mat, as it will destroy the internal components.

4. Post-Installation Verification

1. Visually inspect the entire installation, checking for secure mounting, proper cable routing, and any potential trip hazards.
2. Remove LOTO and apply power to the safety controller. Verify that the controller indicates a 'Normal' or 'Safe' state for the mat circuit.
3. Perform a functional test by stepping carefully onto the center of the mat. Confirm that the machine immediately receives a stop signal and enters a safe state.
4. Test the entire active surface of the mat, including all four corners and edges, to ensure complete and reliable presence detection.
5. Test the system reset function. Step off the mat and actuate the system's reset button; the system should not restart until the mat is clear and the reset is activated.
6. Document the installation date, functional test results, and responsible personnel in the machine's permanent maintenance log.

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

