

# Combo Tester X3 with Turnstile Installation, Operation and Maintenance

Made in the  
United States of America

Figure 1. EMIT Combo Tester X3 with Turnstile

## Description

The [Desco Combo Tester X3](#) with [Alvarado EDC Waist High Turnstile](#) verifies the functionality of an operator's wrist strap and footwear and controls access to the ESD Protected Area. The turnstile activates after the operator's wrist strap and/or footwear is determined to act as a path-to-ground. Green lights indicate that the wrist strap and footwear are passing. Red lights and an audible alarm indicate when the wrist strap and/or footwear (left or right) are failing. If failure occurs, the tester will also display if the grounding device's resistance is too low or too high.

The factory test ranges are set to:

Wrist Straps: 750 kilohms and 10 megohms  
Footwear: 750 kilohms and 35 megohms

Each Combo Tester X3 is calibrated with accepted procedures and standards traceable to the National Institute of Standards and Technology (NIST) and includes a NIST certificate.

The [Alvarado EDC Waist High Turnstile](#) features a rugged industrial grade controller, optical rotation detection (no mechanical microswitches to break or continually adjust), and adjustable time out functionality (turnstile relocks if there is no passage through the unlocked turnstile). An adjustable dampener slows and cushions the rotation and self-centers the turnstile arms to the home position. Stainless steel internal and external components make the turnstile durable and easy to maintain.

The turnstile is configured to Fail-Safe Loss-of-Power Operation. Should loss of power occur, the turnstile's arms will unlock and rotate freely in both directions to allow operators to pass through.

The Combo Tester X3 with Turnstile is available as the following item numbers:

Item	Input Voltage
50779	100 VAC
50774	120 VAC
50775	220 VAC

## ESD Association Information

"Compliance verification should be performed prior to each use (daily, shift change, etc.). The accumulation of insulative materials may increase the foot grounder system resistance. If foot grounders are worn outside the ESD protected area testing for functionality before reentry to the ESD protected area should be considered." ESD SP9.2 APPENDIX B - Foot Grounder Usage Guidance

"Process monitoring (measurements) shall be conducted in accordance with a Compliance Verification Plan that identifies the technical requirements to be verified, the measurements limits and the frequency at which those verifications shall occur...Compliance verification records shall be established and maintained to provide evidence of conformity to the technical requirements.

The test equipment selected shall be capable of making the measurements defined in the Compliance Verification Plan." (ANSI/ESD S20.20) section 7.3

ANSI/ESD S20.20 Table 1 Flooring-Footwear Systems Technical Requirements Recommended Range "less than  $3.5 \times 10^7$  ohms measured per ANSI/ESD STM 97.1."

"Typical test programs recommend that wrist straps that are used daily should be tested daily. However, if the products that are being produced are of such value that knowledge of a continuous, reliable ground is needed, and then continuous monitoring should be considered or even required." (ESD Handbook ESD TR 20.20 section 5.3.2.4.4)

## Packaging

- 1 Combo Tester X3 with Turnstile
- 1 Dual Foot Plate
- 1 Foot Plate Cord, 6'
- 1 Power Adapter, 12VDC 1.25A center pos.
- 8 Turnstile Keys
- 1 Certificate of Calibration

## Installation

### Installing the Turnstile

110 VAC / 220 VAC electrical access is needed at the installation location of every Combo Tester X3 with Turnstile. Be sure to route these lines to the installation site prior to anchoring your turnstile.

[Click here](#) to download the Alvarado EDC Installation and Maintenance Manual and see instructions on anchoring and wiring the turnstile.

Once the turnstile is anchored and powered, connect the foot plate cord to the dual foot plate. The foot plate cord is located in a routing hole located at the base of the turnstile. Place the foot plate at the base of the turnstile's entrance so operators can place their feet on it while performing tests.



Figure 2. Installing the Dual Independent Foot Plate

### Tester Configuration

The resistance limits for footwear and wrist strap tests are controlled by the DIP switches located on the left side of the Combo Tester X3. See pages 2 and 3 of [TB-3066](#) for more information.

The factory test ranges are set to:

Wrist Straps: 750 kilohms and 10 megohms  
Footwear: 750 kilohms and 35 megohms

## Operation

1. A circling light around the test switch indicates when the Combo Tester X3 is on standby and ready to perform a test.



Figure 3. Steady-State Test Switch features and components

2. While wearing a wrist strap and/or ESD footwear, plug the wrist cord into its corresponding jack located on the face of the Combo Tester X3. Place one foot on each foot plate.
3. To begin the test, use your finger to bridge the test switch's inner and outer contacts. The blue standby LED will become solid to indicate that the test has been initiated. Hold your finger down until the test results are displayed.

If your finger is removed too early, the tester's LEDs will blink three times to indicate that the test was not completed.



Figure 4. Bridging the test switch's contacts to initiate the test

4. A "PASS" test result is indicated by illumination of the green LEDs. The turnstile will also unlock and its access lights will change from red to green. A "FAIL LOW" test result is indicated by illumination of the red LEDs. A "FAIL HIGH" test result is indicated by illumination of the yellow LEDs.

If your ESD test fails, check your wrist strap and footwear to ensure that they are being worn correctly and/or need to be replaced.

NOTE: Failures may be caused by dry skin or minimal sweat layer. For wrist straps, try using an approved dissipative hand lotion such as [Menda Reztore™ ESD Hand Lotion](#) to your wrist prior to use. Footwear test results can be improved by taking a short walk to build a sweat layer for better conductivity.

The Combo Tester X3 may also be used to test [smocks](#) or garments that feature a grounding mechanism for operators using a coil cord connection.

5. Pass through the turnstile. The turnstile will re-lock after one rotation.

NOTE: By default, the turnstile will remain unlocked until either the operator passes through or 20 seconds expire. See page 8 in the attached Alvarado EDC Installation and Maintenance Manual for instructions on setting the turnstile's Timed Delay Reset Timer to 5, 10, 15 or 20 seconds.



## Calibration

Frequency of recalibration should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, EMIT recommends that calibration be performed annually.

Use the [EMIT 50424 Limit Comparator](#) to perform periodic testing (once every 6-12 months) of the Combo Tester X3. The Limit Comparator can be used on the shop floor within a few minutes virtually eliminating downtime, verifying that the tester is operating within tolerances.

See [TB-6581](#) for more information.



Figure 5. EMIT 50424 Limit Comparator

# Specifications

## COMBO TESTER X3 WITH TURNSTILE

Operating Voltage	100 VAC, 50/60 Hz (50779) 110 VAC, 50/60 Hz (50774) 220 VAC, 50/60 Hz (50775)
Operating Temperature	32°F to 104°F (0 to 40°C)
Dimensions (Crated)	42" x 40" x 49" (107cm x 102cm x 124cm)
Dimensions (Uncrated)	See Figure 6
Weight (Crated)	385 lbs (175 kg)
Weight (Uncrated)	285 lbs (129 kg)

## DUAL INDEPENDENT FOOT PLATE

Dimensions	14.0" x 16.0" x 0.9" (35.6cm x 40.1cm x 2.3cm)
Weight	7.5 lbs (3.4 kg)

## TURNSTILE CERTIFICATIONS

- LA-ETL
- CE
- UL (internal power transformer)

Certificates are available upon request to EMIT Customer Service.

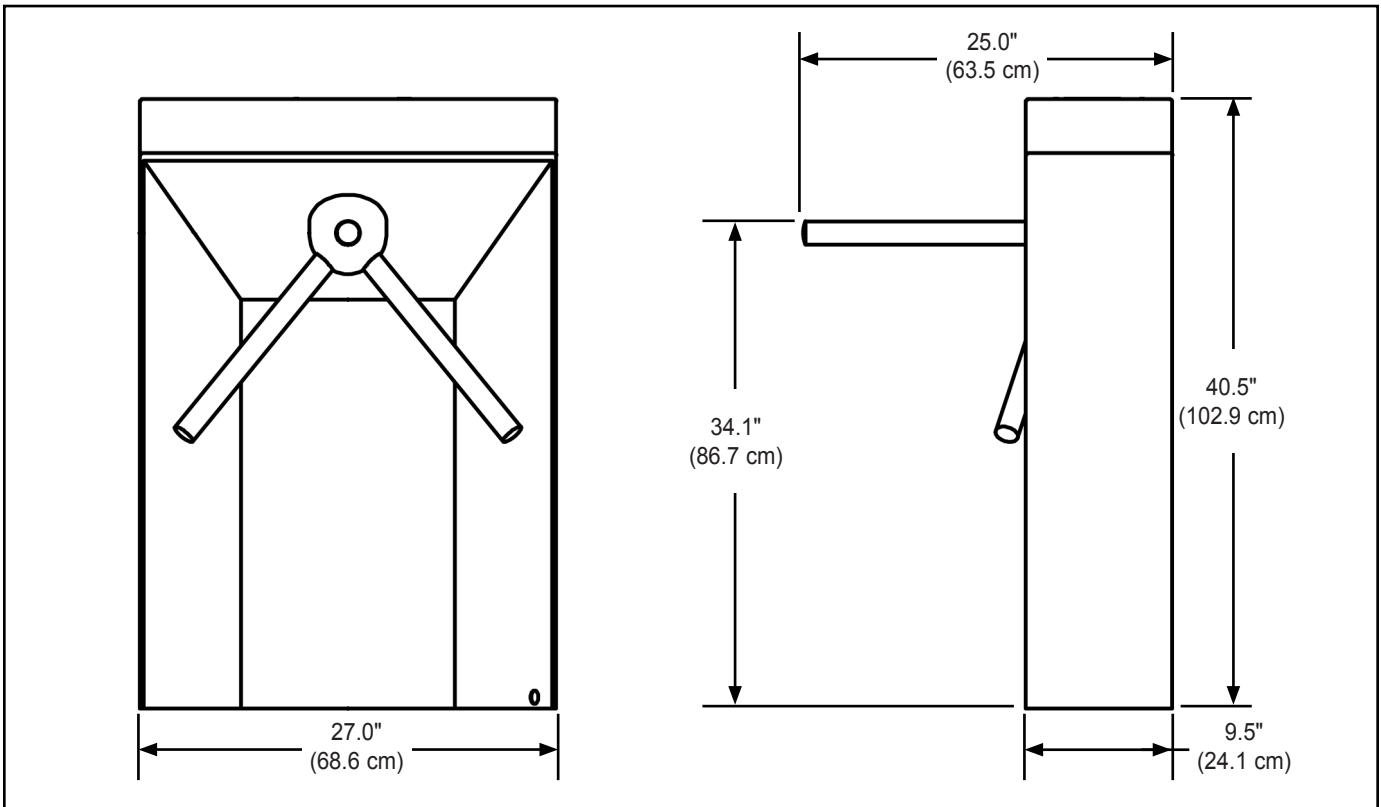


Figure 6. Dimensions of the [Alvarado EDC Waist High Turnstile](#)

### Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions

See EMIT's Warranty -

<http://EMIT.descoindustries.com/Warranty.aspx>