



Made in the
United States of America

Combo Tester X3 Plus Installation, Operation and Maintenance



Figure 1. Desco 19265 Combo Tester X3 Plus

The factory test limits are set to:
Wrist Straps: 750 kilohms and 10 megohms
Footwear: 750 kilohms and 35 megohms

(See page 5 for alternate test limit settings)

The Combo Tester X3 Plus and its accessories are available as the following item numbers:

Item	Description
19265	Combo Tester X3 Plus
50416	Stand
50755	ESD Glove Test Fixture
50756	Contactless Test Switch
50424	Limit Comparator
50784	5-Pound Electrode for Limit Comparator
50785	Power Adapter, 100-240 VAC Input, 5 VDC 3.0 A Output, All Plugs
50757	Replacement Dual Foot Plate
50787	Replacement Foot Plate Cord

Description

The Desco 19265 Combo Tester X3 Plus verifies the functionality of personnel grounding devices (wrist straps¹, foot grounders, ESD shoes, smocks²). Three independent tests are performed simultaneously on the wrist strap and each foot. Test prompts and test results with resistance measurements are displayed on the 5 inch color touchscreen display. The administrator menu in the tester's software may be accessed for test limit preferences. Access control to an ESD Protected Area can be further enforced by using the relay terminal on the Combo Tester X3 Plus and connecting it to an electronic door lock or turnstile to grant access only to those who have passed their personal grounding device tests. The Combo Tester X3 Plus is calibrated to NIST standards and includes a certificate.

Desco Combo Tester X3 Plus Technology

- 5 inch color touchscreen displays test prompts and test results with resistance measurements
- The solid-state touch test switch maintains test accuracy and extends the lifetime of the tester
- The 30 volt test signal increases test reliability
- Pairs with the EMIT 50755 ESD Glove Test Fixture to test operators that wear ESD gloves or finger cots per Compliance Verification required by ESD TR53

Packaging

- 1 Combo Tester X3 Plus
- 1 Mounting Bracket
- 1 Dual Independent Foot Plate
- 1 Power Adapter, 5VDC, with interchangeable plugs (North America, UK/Asia, Europe)
- 1 Foot Plate Cable, 6.5 feet
- 1 Ground Cord
- 1 Thumb Screw
- 2 Mounting Anchors
- 2 Mounting Screws
- 2 Zip Ties
- 1 Plunger and Spring Assembly for 10mm Wrist Cord Adapter
- 1 Certificate of Calibration

1. The Combo Tester X3 Plus can verify single-wire and dual-wire wrist straps.
2. The Combo Tester X3 Plus will also test a Groundable Static Control Garment System. The Groundable Static Control Garment System must have an RTG of $< 3.5 \times 10^7$ ohms to meet the required limit of ANSI/ESD S20.20 tested per ANSI/ESD STM2.1 and ESD TR53.

Features and Components

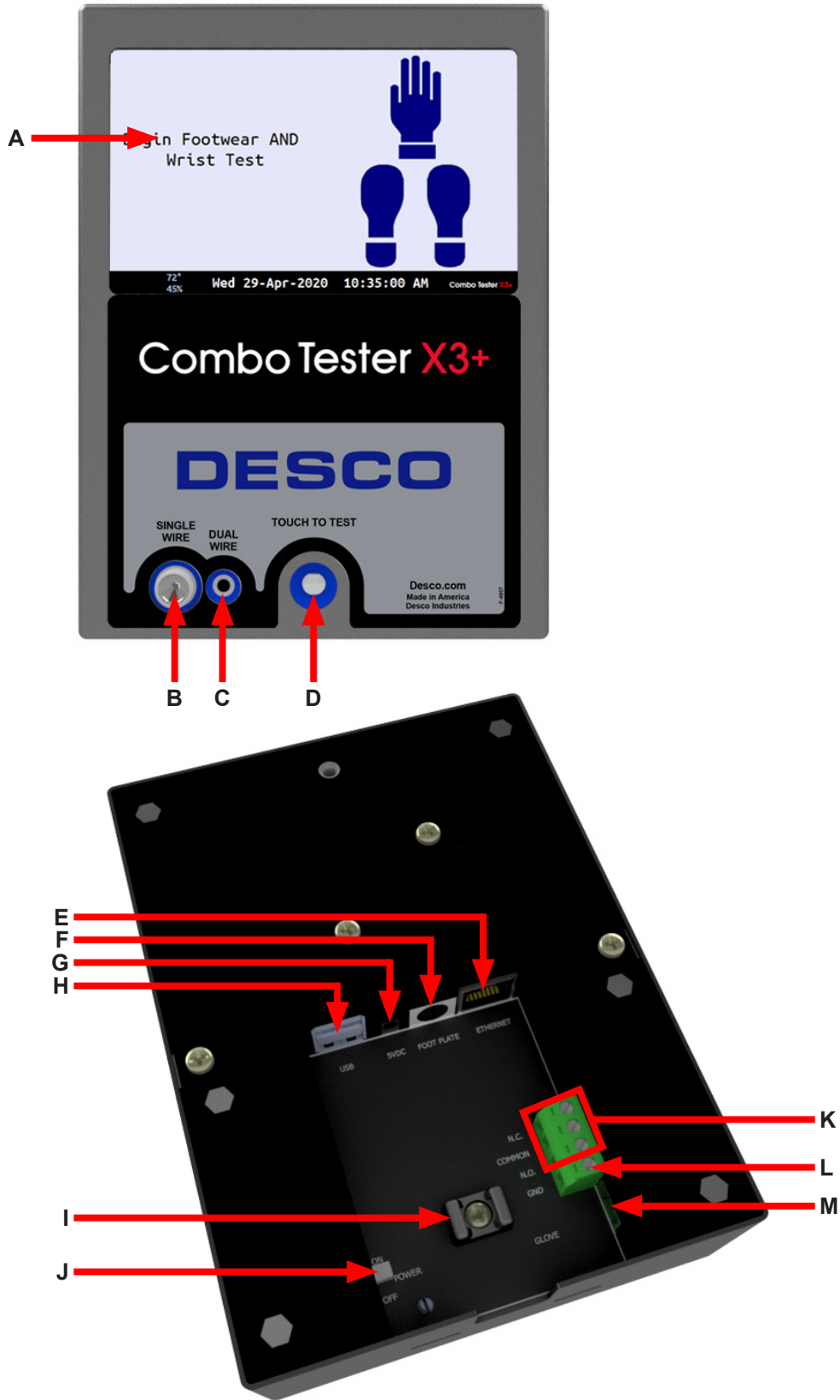


Figure 2. Combo Tester X3 Plus features and components

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 DESCO EAST - One Colgate Way, Canton, MA 02021-1407 • (781) 821-8370 • Website: Desco.com

A. Touchscreen Display: Displays the time, date, temperature, humidity, command prompts, test results and settings.

B. Single-Wire Wrist Strap Jack: Connect the single-wire wrist cord here to test.

See “10mm Wrist Cord Adapter” on page 7 if using single-wire wrist cords with a 10mm snap termination.

C. Dual-Wire Wrist Strap Jack: Connect the dual-wire wrist cord here to test.

D. Solid-State Test Switch: Place and hold your finger here to begin the test.

E. Ethernet Jack: For manufacturer use only. Not to be used with a local area network (LAN).

F. Foot Plate Jack: Connect one end of the foot plate cable here and the other end to the dual foot plate.

G. 5VDC Power Jack: Connect the included power adapter here to power the Combo Tester X3 Plus.

H. Dual USB Ports: For manufacturer use only.

I. Cable Tie Mount: Use the included zip ties to secure all cables and cords connected to the Combo Tester X3 Plus.

J. Power Switch: Slide the switch to the top position to turn ON the Combo Tester X3 Plus. Slide the switch to the bottom position to turn OFF the Combo Tester X3 Plus.

K. Relay Terminal: Integrates with electronic door locks, lights, buzzers, etc. See “Relay Terminal” on page 8 for more information.

L. Ground Terminal: Secure the tinned wire termination of the included ground cord to this terminal. Connect the ring terminal termination of the cord to equipment ground. This connection will remove any static charge from the user before the test.

NOTE: Failure to correctly ground the Combo Tester X3 Plus may result in damage not covered under warranty.

M. ESD Glove Test Fixture Port: Used for connecting the EMIT 50755 ESD Glove Test Fixture. See [TB-6586](#) for more information.

Installation

Hardware Setup

If the Combo Tester X3 Plus is located near a restroom, sink or other water source, operators will need to be instructed to thoroughly dry their hands before testing. Wet hands may cause inaccurate test results and damage to the tester.

1. Connect the ground cord, foot plate cable, and power adapter to the Combo Tester X3 Plus.
2. Route all cables through the U-shaped opening located at the bottom of the Combo Tester X3 Plus and secure them to the cable tie mount with the included zip tie.
3. Connect the ground cord’s ring terminal to a known ground point. Connect the foot plate cable to the foot plate.
4. Connect the power adapter to an appropriate power outlet, and power the Combo Tester X3 Plus by sliding its power switch to the ON position. The display will turn on, and the boot sequence will initiate. “Begin Footwear Test Wrist Optional” will display on the Combo Tester X3 Plus after the boot sequence has completed. The blue LEDs will continuously cycle around the test switch when the ESD tester is on standby.
5. Use the included screws and anchors to secure the mounting bracket to the desired location. The screws may be used in any of the four holes shown below. Be sure to locate the bracket where users can read the display and use the tester.

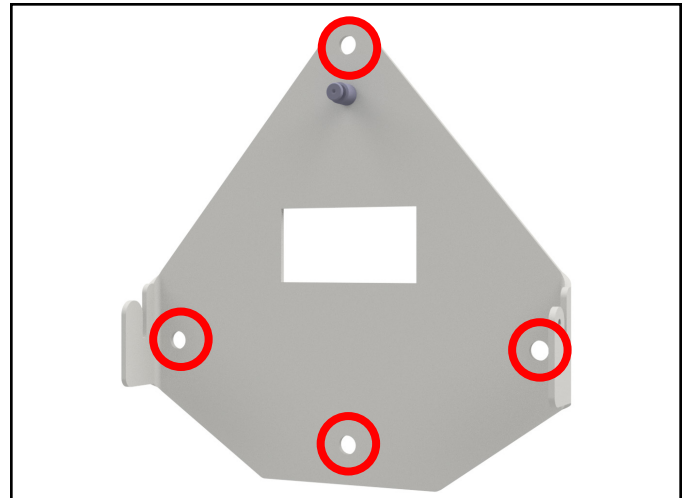


Figure 3. Mounting holes on the Combo Tester X3 Plus mounting bracket

- Connect the Combo Tester X3 Plus to the bracket. Use the included thumbscrew to secure the tester as shown below.



Figure 4. Securing the Combo Tester X3 Plus to the mounting bracket



Figure 5. Use the EMIT 50416 Stand as a mounting alternative

10mm Wrist Cord Adapter

A plunger and spring assembly is included with every Combo Tester X3 Plus. Use this assembly to retrofit the single-wire jack on the Combo Tester X3 Plus to test wrist cords with a 10mm termination instead of a banana plug. NOTE: This assembly cannot be removed once installed.

- Insert the plunger assembly into the single-wire jack on the face of the Combo Tester X3 Plus. Be sure to clear the clip at the base of the plunger's shaft when inserting into the jack.



Figure 6. Inserting the plunger and spring assembly into the single-wire jack

- The plunger will slightly protrude out of the single-wire jack when installed. Test its installation by pushing down on the plunger. It should dip and then spring back up when released.

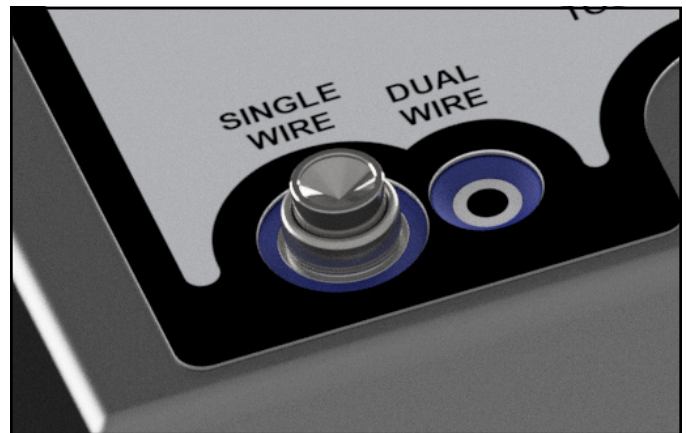


Figure 7. Completed installation of the plunger and spring assembly

Relay Terminal

The Combo Tester X3 Plus features a relay terminal that can be integrated with electronic door locks, lights, buzzers, etc. to control access to an area.

The relay open and close (activation) time may be modified in the Admin menu of the tester's software.

Contact Rating	1A @ 30VDC, .5A @ 125VAC
Maximum Switching Power	30W
Maximum Switching Voltage	250VAC, 220VDC
Maximum Switching Current	1A

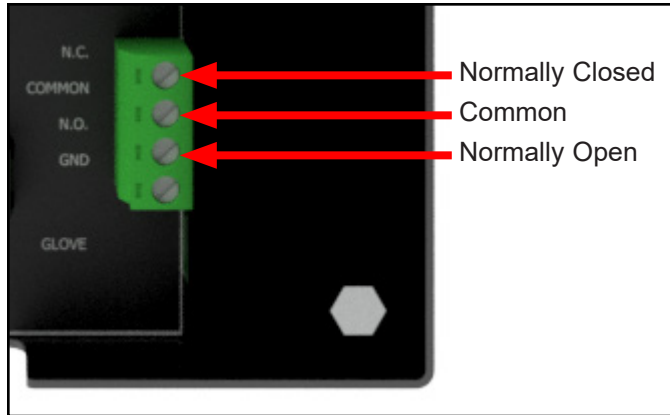


Figure 8. Relay terminal contacts located on the back of the Combo Tester X3 Plus

Test Limit Configuration

The following footwear and wrist strap resistance limits are available in the Combo Tester X3 Plus:

Footwear	Wrist Strap
LOW Limit Resistance	LOW Limit Resistance
100 Kilohms (1.0×10^5)	100 Kilohms (1.0×10^5)
750 Kilohms (7.5×10^5)	750 Kilohms (7.5×10^5)
HIGH Limit Resistance	HIGH Limit Resistance
10 Megohms (1.0×10^7)	10 Megohms (1.0×10^7)
35 Megohms (3.5×10^7)	35 Megohms (3.5×10^7)
100 Megohms (1.0×10^8)	
1 Gigohm (1.0×10^9)**	

Default Settings

**A dirty foot plate could result in a false pass when the footwear limit is set to 1 Gigohm. Be sure to keep the foot plate clean with 99% isopropyl alcohol when using this setting. This setting is not recommended for relative humidity greater than 50%.

SETTING THE RESISTANCE LIMITS

1. Access the Administrator Menu by tapping the Combo Tester X3+ logo on the bottom right corner of the touchscreen.

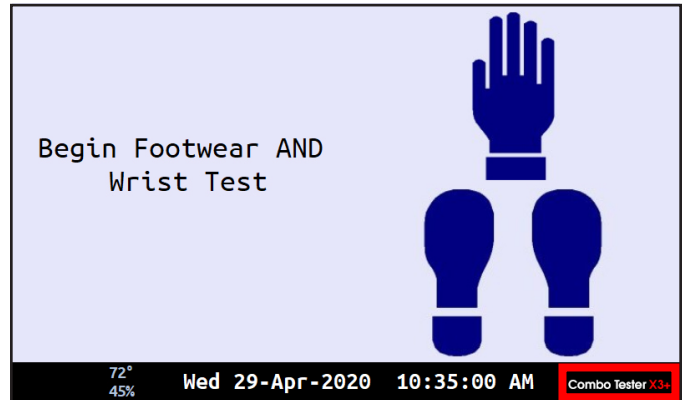


Figure 9. Locating the Combo Tester X3+ logo

2. The tester will prompt to enter a PIN. Enter 0.

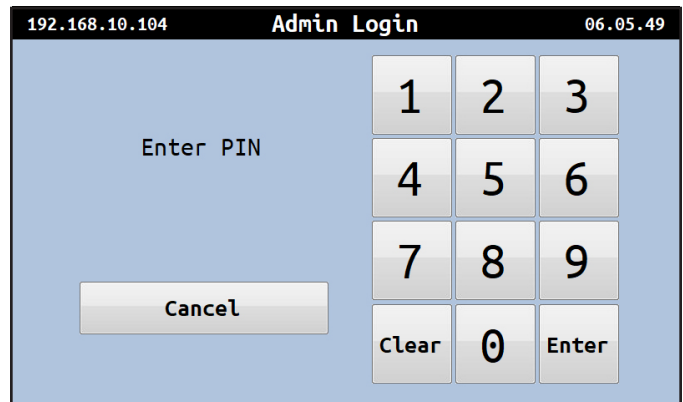


Figure 10. Admin Login page

3. The Administrator Menu will open. Tap the Preferences button.

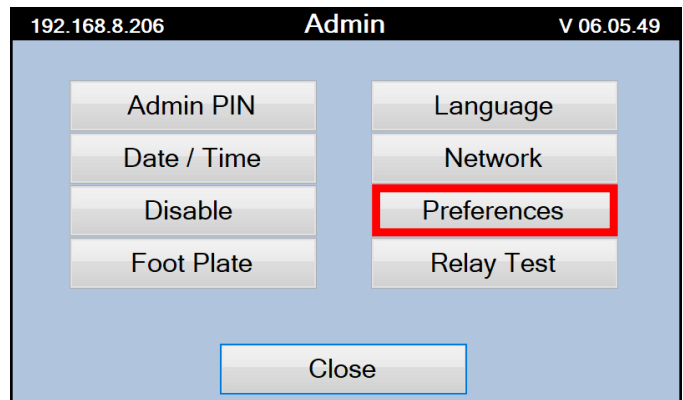


Figure 11. Locating the Preferences button in the Admin Menu

- Adjust the Wrist Strap and Footwear Limits by tapping the < and > buttons. Tap the Save button when complete.

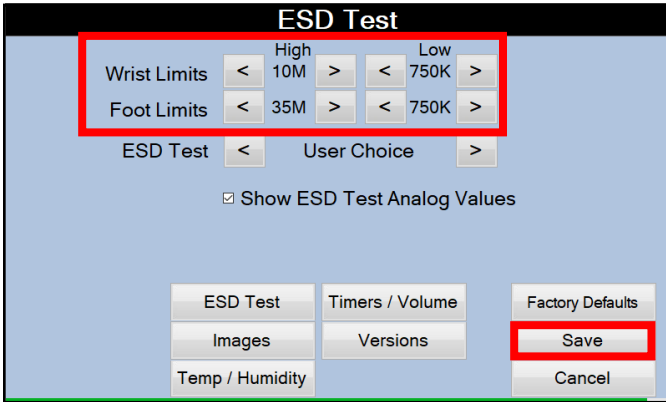


Figure 12. Locating the Wrist and Foot Limits in the ESD Test Menu

Operation

NOTE: If the Combo Tester X3 Plus is located near a restroom, sink or other water source, operators will need to be instructed to thoroughly dry their hands before testing. Wet hands may cause inaccurate test results and damage to the tester.

- A circling light around the test switch indicates when the Combo Tester X3 Plus is on standby and ready to perform a test.
- Follow the prompt on the tester's display.
- When performing a footwear test, be sure to place both feet on the dual foot plate (one foot per plate).

NOTE: Keep the foot plate clean with 99% isopropyl alcohol when using the 1 Gigohm high test limit. A dirty foot plate could yield a false pass.

When performing a wrist strap* test, be sure to completely plug in the wrist cord into the tester's jack.

- 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 on the touchscreen.

If your finger is removed too early, the tester's blue LEDs will blink three times to indicate that the test was not completed. DO NOT touch any other metal while performing your test as this will affect your results.

- The relay terminal will activate if the defined tests are passed (if applicable).

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](#) 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 Plus may also be used to test smocks or garments that feature a grounding mechanism for operators using a coiled cord connection.



Figure 13. Using the Combo Tester X3 Plus



Figure 14. Using the Combo Tester X3 Plus with [EMIT 50416](#) Stand

Maintenance

To maintain optimum performance, cleaning should be performed on a regular basis. Use 99% isopropyl alcohol to clean the foot plate and test switch. Other cleaners are susceptible to leaving residue on these surfaces.

NOTE: Avoid wetting or mopping the foot plate. This may yield false test results and cause damage to its internal circuitry.

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, Desco recommends that calibration be performed annually.

Use the EMIT 50424 Limit Comparator and EMIT 50784 5-Pound Electrode to perform periodic verification (once every 6-12 months) of the Combo Tester X3 Plus. The Limit Comparator can be used to check the test limits of the Combo Tester X3 Plus without removing it from the factory floor.

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

NOTE: Calibration is not required for the temperature and humidity sensor embedded within the Combo Tester X3 Plus.



Figure 15. EMIT 50424 Limit Comparator



Figure 16. EMIT 50784 5-Pound Electrode for Limit Comparator

Specifications

Combo Tester X3 Plus	
Input Voltage and Frequency (External Adapter)	AC/DC Power Adapter Power Input: 100-240VAC, 50/60 Hz Power Output: 5VDC, 3.0A Cable Length: 5 ft. (1.5 m)
Operating Temperature	70°F to 85°F (21°C to 30°C) for 1 gigohm test limit 41°F to 85°F (5°C to 30°C) for all other test limits
Environmental Requirements	Indoor use only at altitudes less than 6500 ft. (2 km) Maximum relative humidity of 80% up to 85°F (30°C) decreasing linearly to 50% @ 85°F (30°C) Maximum relative humidity of 50% at 1 gigohm setting
Dimensions	6.75" x 5.00" x 1.75" (17.1 cm x 12.7 cm x 4.4 cm)
Weight	1.8 lbs (0.8 kg)
Test Accuracy	±20% for 1 gigohm footwear test limit ±10% for all other test limits
Test Switch Voltage	5 VDC @ open circuit
Wrist Strap and Footwear Test Voltage	30 VDC @ open circuit Test current is limited by resistors and varies on the test range setting (100 kilohms - 1 gigohm)
Temperature Accuracy	±0.5°C
Humidity Accuracy	±5%
Dual Independent Foot Plate	
Dimensions	13.25" x 15.25" x 1.125" (337 mm x 387 mm x 29 mm)
Weight	5.5 lbs (2.5 kg)

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

See the Desco Warranty - Desco.com/Limited-Warranty.aspx