



Made in America

# Combo Tester X<sup>3</sup> Installation, Operation and Maintenance



Figure 1. Desco Combo Tester X<sup>3</sup> and Dual Foot Plate

## Description

The Desco Combo Tester X<sup>3</sup> is designed to test personnel grounding devices, wrist strap and ESD footwear, to satisfy the compliance verification requirements of ANSI/ESD S20.20.

Per ANSI/ESD S20.20 section 7.3 "A Compliance Verification Plan shall be established to ensure the Organization's fulfillment of the technical requirements of the ESD Control Program Plan. Process monitoring (measurements) shall be conducted in accordance with a Compliance Verification Plan that identifies the technical requirements to be verified, the measurement limits and the frequency at which those verifications shall occur. The Compliance Verification Plan shall document the test methods and equipment used for process monitoring and measurements. ... The test equipment selected shall be capable of making the measurements defined in the Compliance Verification Plan."

Per ANSI/ESD- S1.1 Section 6.1.3 Frequency of Functional Testing "The wrist strap system should be tested daily to ensure proper electrical value."

Per ESD Handbook ESD TR20.20 Section 5.3.2.4.2 Additional User Wrist Strap Testing "Proper testing of the wrist strap includes the resistance of the groundable point on the end of the cord, the cord itself, the resistor, the cord-to cuff snap connector, the resistance of the interface of the cuff, the cuff/wrist interface, and the resistance of the person between the wrist and the hand that contacts the test electrode."

Per ESD Handbook ESD TR20.20 Section 5.3.2.2.2 Wrist Strap Ground Cord "At first glance, the ground cord appears to be a relatively simple assembly. However, the design requirements are considerable, given the wide range of user applications and the durability requirements of constant tugging, flexing, and dragging over the edge of workstation tops and equipment chassis."

"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)

"A log should be maintained which verifies that personnel have tested their personal grounding devices. (Wrist Straps and ESD Footwear)" (ANSI/ESD S20.20 Section 6.2.2.2 Personnel Grounding Guidance)

## Packaging

- 1 Combo Tester X<sup>3</sup>
- 1 Dual Foot Plate
- 1 Power Adapter
- 1 Stereo Plug to Stereo Plug Cord
- 1 Banana Plug to Ring Terminal Cord
- 1 19255 Dual Foot Plate Stand (19277 only)
- 2 Pedestal Bolts (19277 only)
- 2 Nuts for Pedestal Bolts (19277 only)
- 2 Tester Backplate Screws (19277 only)
- 2 Nuts for Backplate Screws (19277 only)
- 4 Footplate Screws (19277 only)
- 1 Certificate of Calibration



Item 19276



Item 19277

## Installation

The resistance limits for footwear and wrist strap tests are factory set to the following limits:

### FOOTWEAR RESISTANCE

LOW Limit Resistance	HIGH Limit Resistance
750 kilohms (7.5 X 10E5)	35 megohms (3.5 X 10E7)

### WRIST STRAP RESISTANCE

LOW Limit Resistance	HIGH Limit Resistance
750 kilohms (7.5 X 10E5)	10 megohms (1 X 10E7)

\*Custom settings are available. Contact customer service for more information.

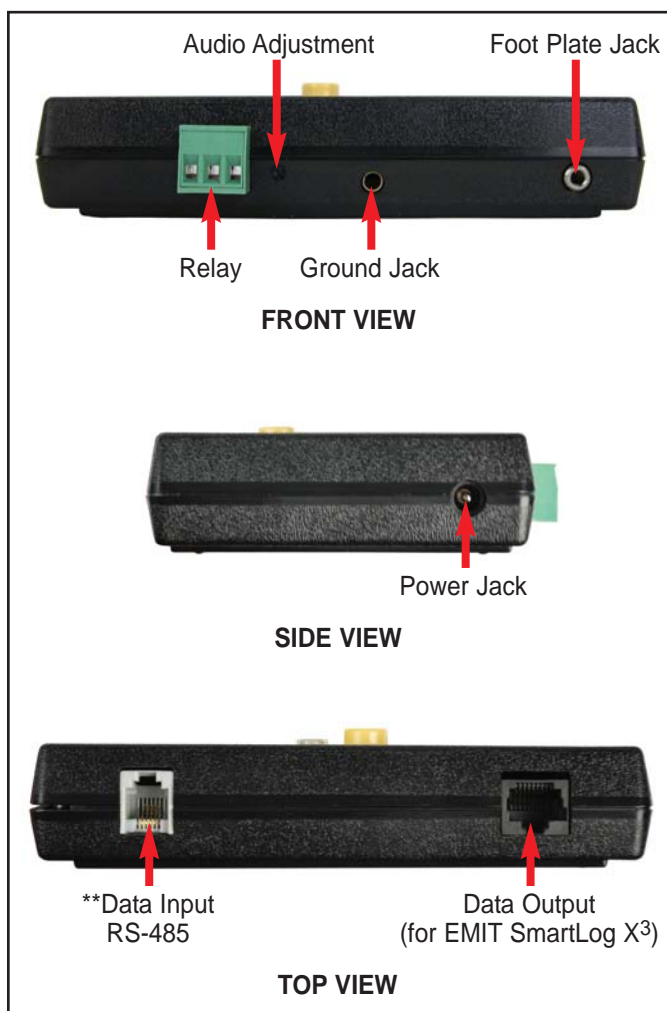


Figure 2. Combo Tester X<sup>3</sup> side views

\*\*For future accessories. Contact customer service for more information.

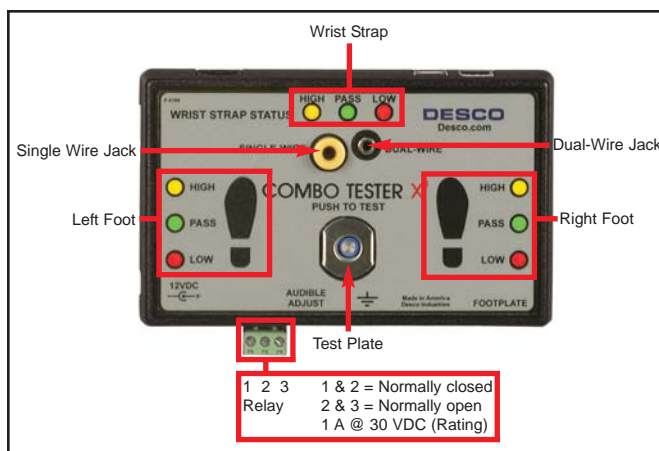


Figure 3. Combo Tester X<sup>3</sup> features and components

### INSTALLING THE MODEL 19276 TESTER

- I. Mount the tester at the desired location using the four mounting holes in the corners of the yellow mounting plate.
- II. Set the foot plate below the tester.
- III. Insert one end of the Stereo Plug to Stereo Plug cord into the stereo jack located at the bottom of the tester (see Figure 2). Insert the other end of the cord into the stereo jack at the back of the foot plate.
- IV. Insert the banana plug end of the Banana Plug to Ring Terminal cord into the ground jack located at the bottom of the tester (see Figure 2). Connect the ring terminal end of the cord to earth ground. This connection will remove any static charge from the user before the test.  
**NOTE: Failure to correctly ground the tester may result in damage not covered under warranty.**
- V. Insert the power supply plug into the power jack located on the left-side of the tester (see Figure 2). Plug the power supply into an appropriate power outlet.

### ASSEMBLING THE MODEL 19277 TESTER

- I. Insert the pedestal to the baseplate with the tester mounting bracket sloping towards the operator. Be sure to align the screw holes located at the base of the pedestal.
- II. Using the supplied allen wrench, install the two supplied socket cap screws and nuts (see Figure 4).
- III. Route the two included cords and power cord through the pedestal starting from the bottom to the top. All three cords should exit through the cut-out located at the top of the pedestal (see Figure 5).

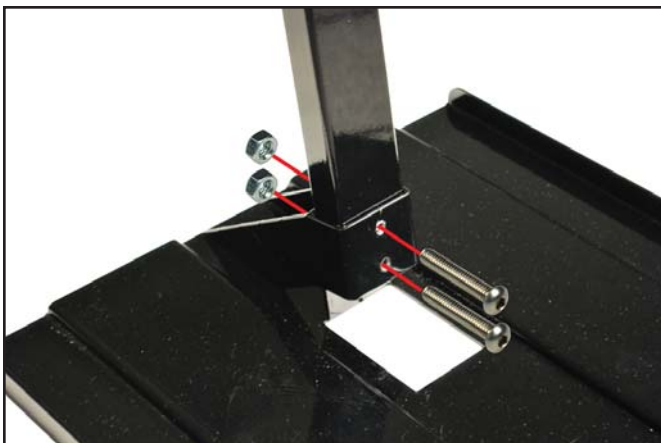


Figure 4. Securing the pedestal to the baseplate

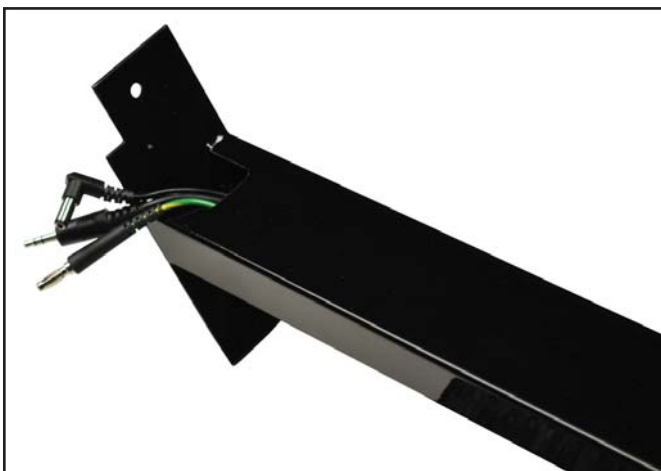


Figure 5. Routing the cords through the pedestal



Figure 6. Securing the Combo Tester X<sup>3</sup> to the pedestal

- IV. Align the two screw holes of the yellow backplate to the screw holes on the pedestal mounting bracket. Secure the backplate using the supplied screws and nuts (see Figure 6).
- V. Insert one end of the Stereo Plug to Stereo Plug cord into the stereo jack located at the bottom of the tester (see Figure 2). Insert the other end of the cord into the stereo jack at the back of the foot plate.
- VI. Insert the banana plug end of the Banana Plug to Ring Terminal cord into the ground jack located at the bottom of the tester (see Figure 2). Connect the ring terminal end of the cord to earth ground. This connection will remove any static charge from the user before the test.  
**NOTE: Failure to correctly ground the tester may result in damage not covered under warranty.**
- VII. Insert the power supply plug into the power jack located on the left-side of the tester (see Figure 2).
- VIII. Fit the the foot plate into position so that it is flush with the front and top of the baseplate. Secure the foot plate to the sides of the baseplate using the four supplied screws (see Figure 7).
- IX. Plug the power supply into an appropriate power outlet.



Figure 7. Securing the foot plate to the baseplate

#### RELAY TERMINAL

A relay with both "normally open" and "normally closed" contacts is included for your convenience. Going from left to right, the terminal block on the bottom of the tester has terminals for "normally closed," "common," and "normally open" (see Figure 3). The relay can be used for opening an electric lock to an ESD sensitive area. The maximum contact rating is: 1A@30VDC.

## General Instructions

Upon power up, the alarm will sound and all of the LEDs for the activated tests will be illuminated. The tester is now ready for use.

Touching the test plate on the front panel starts the test. **Contact must be made between both the metal stud and its surrounding plate.** During the test all LEDs will turn off to indicate that a test is in progress. Contact must be made with the test plate until the test results are displayed. Depending on the configuration of the tester, the test could require up to three (3) seconds.

The resistance is checked from the test plate to the corresponding foot plate for each foot and from the test plate to the wrist strap connector jacks through the operator. A wrist strap must be plugged into the appropriate jack before contact is made with the test plate if the wrist strap option is activated.

The Combo Tester X<sup>3</sup> can test both single and dual-wire wrist straps. Single-wire wrist straps are to be plugged into the banana jack labeled "SINGLE-WIRE" located on the front panel of the tester (see Figure 3). Dual-wire wrist straps are to be plugged into the phono jack labeled "DUAL-WIRE" located on the front panel of the tester (see Figure 3). The tester automatically determines what type of wrist strap is being tested.

The LEDs will turn off while the test is in progress. The test results for each foot and wrist strap will then be displayed for approximately three (3) seconds. If all tests result in a "PASS" condition, the internal relay will activate.

If any of the test results fail "HIGH" or "LOW," an audible alarm will sound. The LEDs indicating the failed test will be displayed for approximately three (3) seconds, and the internal relay will not activate.

## Specifications

### Rated tester voltage:

12 VDC, 600 mA, (2.5 mm connector - center positive)

### Relay contact rating:

1 A @ 30 VDC max

### Temperature range:

41°F - 104°F (5°C - 40°C)

### Operating conditions:

Indoor use only at altitudes less than 6500 ft. (2 km).  
Maximum relative humidity of 80% up to 88°F (31°C)  
decreasing linearly to 50% @ 104°F (40°C).  
Maximum relative humidity of 50% at 1 Gigohm setting.

### Pollution degree:

2 per IEC 644

## Calibration

The Desco Combo Tester X<sup>3</sup> is calibrated to standards traceable to NIST. 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, we recommend that calibration be performed annually.

The accuracy of the Combo Tester X<sup>3</sup> is specified as:

- $\pm 5\%$  for 1 Megohm and lower resistance ranges
- $\pm 10\%$  for 1 Megohm and higher resistance ranges

Please contact Desco Customer Service for more information on calibrating the Desco Combo Tester X<sup>3</sup>.

### Limited Warranty

Desco expressly warrants that for a period of one (1) year from the date of purchase, Desco Combo Tester X<sup>3</sup>s will be free of defects in material (parts) and workmanship (labor). Within the warranty period, the product will be tested, repaired, or replaced at Desco's option, free of charge. Call our Customer Service Department at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for a Return Material Authorization (RMA) and proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the Desco factory. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, call Customer Service at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for a Return Material Authorization (RMA) and proper shipping instructions and address. Desco will quote repair charges necessary to bring your unit up to factory standards.

### Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

### Limit of Liability

In no event will Desco or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.