OHM-STAT¥ CT-8700
OWNERS MANUAL & OPERATION GUIDE

WRIST AND FOOT STRAP COMBO TESTER KIT

**Includes meter, NIST certificate, battery, manual, power cord.
Stand, and plate are optional.**

For OHM-STAT CT-8700 Wrist and Foot Strap Combo Tester Kit

SERIAL NUMBER:

COMPANY:

PRICE: $25.00 US

Email: contactus@staticsolutions.com
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Marlboro, Massachusetts 01752
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Congratulations on purchasing your CT-8700 wrist and foot strap testing kit. This is the finest tester available on the market.

Features/ Benefits

- Reads actual resistance of the strap from 50 megohms to 100 megohms and up to 1000megohms for (new optional) 1000M unit. Limits can be changed with DIP switches. One press of button test both feet and wrist simultaneously and independently. Adjustable limits, AC/DC powered. NIST certificate. One year limited warranty. Made in USA

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- Easy to use-available with stand or wall mounted
- Employees step on the footpads,
  Plug in their wrist strap, select switch- both feet, wrist or both feet or wrist strap
  And push a button
- Is able to open a door if straps are in tolerance. (optional)

SPECIFICATIONS:

Testing Range: 10^4-10^8 ohms. (10^9 ohms optional and can be specially ordered)

High Range: 2M, 5M, 10M, 25M, 35M, 50M, 75 M, 100M ohms. (1000M can be specially ordered)

Low Range: 500k, 750k ohms.

Display: Red, yellow and green LED buzzer

Accuracy: +/- 10%

Weight: Approx 1.0 lb. (454 grams) Meter alone with battery

Battery type/Life: Typically over 20,000 measurements with a 9-volt alkaline battery

Continuous power may be run with an external 9-15 VDC power supply. **(Remove alkaline battery before running with an external power supply).**

CE, listed

NIST certificate included

Environment: 32^0F to 100^0F (0^0C to 38^0C); 15% to 95% RH.

Stand: Powder coated industrial grade steel. Color: Black

Footplate: heavy-duty board with plastic laminate and two stainless steel plates. Can be wall mounted

EQUIPMENT PROVIDED

1 – CT-8700 meter unit
1 – AC power adapter
1 – 9 volt battery-alkaline
1 – FP-8755HD-Foot Plate-(If ordered)
1 – FS-8900 Foot Stand- (If ordered)

* Hook/Loop strips (For use with meter) Found on bottom of foot stand –Allen head bolts and Allen head wrench.

OPTIONAL- Thin plate FP-8789LP, FS-8900 foot stand, door open relay, 1000 meg upper limit

INTRODUCTION

Static fields can build up on humans as they walk along an insulative surface such as a carpet. A person with a high voltage static charge can destroy or damage an integrated circuit or FET device either by touching or coming close to it. Thus most electronic assemblers wear wrist straps or heel grounders to keep the wearers at the same voltage potential as the parts they are assembling. Wrist straps and heel grounders may also be worn at chemical plants, explosive materials factories and storage areas. A wrist strap is simply a resistorized conductive cord that connects the wearer's wrist to a grounded conductive mat that covers the assembly bench. The resistor protects the static sensitive device as well as the worker.

A heel grounder is a small resistorized strap that connects the wearer to their special conductive floor surface. This requires that the floor be covered with a grounded conductive carpet, tile, mat or dissipative floor wax or paint (available through Static Solutions). It is important that two heel grounders be worn to achieve proper static discharge.

Wrist straps and heel grounders simply act as a wire to drain off charges. However, to prevent accidental electrocution of the wearer (should the wearer inadvertently touch an external high voltage source) a high resistance is built into the strap. The resistance is typically between .5 to 2 megohms.

Thus straps and heel grounders have to be tested for two different malfunction conditions. If there is an open circuit (too high a resistance), and does not function, then it will fail to prevent high voltage build up. If there is a short circuit (too low a resistance), then it will fail to prevent electrocution.

The Wrist Strap and Dual Heel Tester is a small handheld or wall mounted instrument that checks the conductive integrity of wrist straps and heel grounders. This prevents faulty straps from allowing high voltage buildup on the wearer, and prevents short-circuited straps from enabling electrocution of the wearer.

To use it, the wearer simply inserts their wrist strap plug into the instrument, and stands on the foot plates (if wearing heel grounders or shoes), and presses the button. An LED display shows the results of the test (OK, low or high), and an alarm sounds if the resistance is not within its preset limits..

BEFORE YOU BEGIN

1. Read the manual, help files, and other files on the C:\EsdTest directory.
2. Install the meter in view, so employees that are testing can view the test results.
3. Take a deep breath, and know that with the innovative product line of Static Solutions there is instant peace of mind.
4. At anytime, please contact Static Solutions technical staff or refer to ***www.StaticSolutions.com*** for technical support literature. Technical questions should be directed to **info@StaticSolutions.com**.

METER ASSEMBLY INSTRUCTIONS

1. Fasten the foot stand to the footplate. Place the foot stand on top of the footplate. Insert the small Allen head bolts through the

2. holes in the circular plate on the bottom of the stand. Position these bolts into the T nuts located in the bottom of the footplate using the enclosed Allen head wrench. Tighten with Allen head wrench. **DO NOT OVER TIGHTEN.**

3. Insert the cords and wires inside the back of the foot stand allowing wire slack. Place the enclosed plastic shroud over the wire enclosure.
4. **Do not install an alkaline battery if the power supply is used.** IT MIGHT OVERHEAT AND RUPTURE. Use only the power supply **OR** the alkaline battery. You may use a rechargeable battery if desired.
5. Plug the footplate lead completely into the tester socket "Heel Plate"
   Plug in the power supply.
6. Remove the protective film from both the metal plates on the footplate. Clean the plates with only alcohol and NOT a antistatic cleaner

BEFORE YOU BEGIN

1. Read the manual, help files..
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4. At anytime, please contact Static Solutions technical staff or refer to ***www.StaticSolutions.com*** for technical support literature. Technical questions should be directed to **contactus@StaticSolutions.com**. Fasten the foot stand to the footplate. Place the foot stand on top of the footplate. Insert the small Allen head bolts through the holes in the circular plate on the bottom of the stand. Position these bolts into the T nuts located in the bottom of the footplate using the enclosed Allen head wrench. Tighten with Allen head wrench. **DO NOT OVER TIGHTEN.**

5. Insert the cords and wires inside the back of the foot stand allowing wire slack. Place the enclosed plastic shroud over the wire enclosure.
6. **Do not install an alkaline battery if the power supply is used.** IT MIGHT OVERHEAT AND RUPTURE. Use only the power supply **OR** the alkaline battery. You may use a rechargeable battery if desired.
7. Plug the footplate lead completely into the tester socket "Heel Plate"
   Plug in the power supply.
8. Remove the protective film from both the metal plates on the footplate.
9. Fasten the foot stand to the footplate. Place the foot stand on top of the footplate. Insert the small Allen head bolts through the holes in the circular plate on the bottom of the stand. Position these bolts into the T nuts located in the bottom of the footplate using the enclosed Allen head wrench. Tighten with Allen head wrench. **DO NOT OVER TIGHTEN.**
10. Insert the cords and wires inside the back of the foot stand allowing wire slack. Place the enclosed plastic shroud over the wire enclosure.
11. **Do not install an alkaline battery if the power supply is used.** IT MIGHT OVERHEAT AND RUPTURE. Use only the power supply **OR** the alkaline battery. You may use a rechargeable battery if desired.
12. Plug the footplate lead completely into the tester socket "Heel Plate"
    Plug in the power supply.
13. Remove the protective film from both the metal plates on the footplate.

TESTING OF WRISTSTRAPS AND FOOTWEAR

Daily testing of wrist straps and footwear is mandatory to ensure the grounding devices function properly and to minimize charge generation on the human body, which may cause damage to integrated circuits. Partially conductive footwear and wrist straps are the primary techniques used to drain and minimize electrical charges from the body. The wrist and foot straps typically have a 1 megohm resistor built into them. Too low a resistance can cause rapid discharge resulting in sparking and failures. Low resistance wrist or foot straps can also cause an electrical shock to the operator if he touches a high voltage circuit. On the other hand, open circuit or broken straps can cause high electrical resistant paths that result in static buildup, arcing, and integrated circuit damage.

To adapt to ISO-9000 certification the results should be printed to in a log book..

WRIST STRAPS

When using the meter for wrist strap testing or monitoring, position the three position switch up for testing wrists only, down for heal grounders only and in the middle for testing both wrist straps and heal grounders simultaneously.

1. Position the switch located on the front of the meter to the wrist strap position
2. Attach the wrist strap to the ground cord attached. Be sure the strap is in snug contact with the wrist. Dry skin, hair or foreign contaminants may cause failures for in-specification, well functioning wrist straps. ESD hand lotions will improve skin contact with wrist straps.
3. Insert the end of the ground cord into the appropriate banana jack located on the front of the Combo-Tester meter. The US female jack is on the left side and the constant monitoring 3.5 mm stereo plug is on the right side. Depress and hold the metal test plate until an LED illuminates. The CT-8700 will test both the wrist straps and foot grounders simultaneously if the switch is in the dual position.If the green “OK” LED illuminates, the wrist strap is functioning within the resistance specification range and therefore may be used to handle static sensitive devices. If the monitor screen turns green, the test was also a “pass.” Make sure the toggle switch is in the correct testing position.
4. If either the red “Too High” or red “Too Low” LED illuminates and the buzzer activates or the computer screen turns red, the worker must adjust and re-test the wrist strap cord immediately. To test a faulty cord, leave the cord plugged into the meter and detach the wrist cord from the strap. Press the wrist strap metal snap-end of the cord against the stainless steel test plate avoiding skin contact. If the cord tests "FAIL" replace the cord.
5. Replace a low battery immediately in order to assure accurate readings.
   Do not install an alkaline battery if power supply is used.

FOOTWEAR

Testing shoes or heel/toe grounders require the unique dual stainless steel footplate.

1. Plug the footplate plug **all the way** into the tester socket “Heel Plate.” Low results will appear if plug not fully inserted.
2. Position the switch in the front of the meter to the dual heel footplate position.
3. Stand on the footplate making sure that each foot is aligned in the left and right stainless steel pad and not touching both foot plates.
4. Depress and **hold** the metal test plate switch or button until an LED light illuminates or monitor screen displays readings.
5. If the green “OK” LED lights or the monitor displays green, then the foot grounders are functioning within the specifications.
6. If either of the “FAIL LOW” or “FAIL HIGH” red LED’s illuminate along with the activation of the buzzer for either foot, or the display turns red, the user should check their shoe or heel/toe grounders and re-test. If both feet fail only one foot will display “FAIL” on the tester. When that foot is corrected the other foot will display “fail” until it is corrected.

TESTING OF THE FOOT WEAR AND WRIST STRAP SIMULTANEOUSLY

1. Position the selector switch in the middle in order to test both the feet and wrist strap independently and simultaneously. Step on plate and insert the wrist strap. Press button and if green light appears sign the test log book. If a fail red light and buzzer appears retest and or see supervisor.

The ESD foot-grounding device may be out of specification for the following reasons: poor skin-tab contact, dirt contamination, broken internal resistor,
broken leads, etc

CALIBRATION VERIFICATION

The CT-8700 meter is calibrated to NIST traceable standards. The meter self calibrates itself with each use by comparing the surface mounted 1-megohm resistor value and capacitor against the unknown value. After one year of use, the meter can be sent to Static Solutions, Inc. to be re-calibrated and be issued a new NIST traceable certificate. Please call Static Solutions for the cost of this service.

TESTER ADJUSTMENTS

The CT-8900 can be adjusted to various electrical resistance specifications by opening the meter case and pressing the dipswitches corresponding to the desired test ranges (see chart below). The resistance ranges depend on what test standard, i.e. (EOS-CECC) the user follows. The user must know what resistance range values are acceptable for their floors, shoes, and heel/toe grounders and according to either EOS or European standards. The 750 Meter is preset to the EOS ESD standard based on the 2020 specification (represented in **bold** under “Dip Switch Settings” on page

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DIP SWITCH SETTINGS

The following resistance alarm values may be set inside the combo meter.
The factory settings are represented in **bold.**

Foot Low	sw1	
.5M	off	
.75M	**ON**	(US & IEC default)

Wrist Low	sw2	
.5M	off	
.75M	**ON**	(US & IEC default)

Foot High	sw3	sw4	sw5	
2M	off	off	off	
5M	ON	off	off	
10M	off	ON	off	
25M	ON	ON	off	
35M	off	off	ON	(IEC & CECC default)
50M	ON	off	ON	
75M	off	ON	ON	
100M	**ON**	**ON**	**ON**	(US default)

Wrist High	sw6	sw7	sw8	
2M	off	off	off	
5M	ON	off	off	
10M	**off**	**ON**	**off**	(US default)
25M	ON	ON	off	
35M	off	off	ON	(IEC & CECC default)
50M	ON	off	ON	
75M	off	ON	ON	
100M	ON	ON	ON	

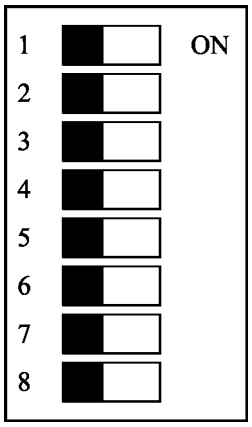


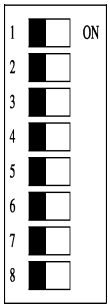
Figure 1 Dip switch - see table for settings

A special 1000 megohm unit and door opening mechanism is also available

Dip Switch Settings for 1000M unit special unit

The following resistance alarm values may be set inside the combo meter.
The factory settings are represented in **bold.**

Foot Low	sw 1	
0 (none)	off	
. **75M**	**ON**	



Wrist Low	sw2	
0 (none)	off	
. **75M**	**ON**	**(default)**

Foot High	sw3	sw4	sw5
20M	off	off	off
50M	ON	off	off
100M	off	ON	off
250M	ON	ON	off
350M	off	off	ON
500M	ON	off	ON
750M	off	ON	ON
1000M	**ON**	**ON**	**ON (default)**

Wrist High	sw6	sw7	sw8
20M	**off**	**off**	**off (default)**
50M	ON	off	off
100M	off	ON	off
250M	ON	ON	off
350M	off	off	ON
500M	ON	off	ON
750M	off	ON	ON
1000M	ON	ON	ON

Troubleshooting and Frequently Asked Questions

What are the major problems encountered when setting up a system?

1..If in doubt call Static Solutions and we will run through the system while you are on the keyboard.
2..Installing the footplate cable so it protrudes from the edge of the stand will cause problems because the plug will bend and become dislodged from the jack.
3.Low battery if not using the AC power supply.

How do I hook up the two pig tail wires which are on the "special" meter to open doors?
The relay circuit is normally open. When the test results are passed, the two leads will close because of the activation of the low voltage relay in the meter and allow the passage of a maximum of 24 volts at 500milliamps through the relay to the door. See the connection diagram listed above.

Why does the 9 volt battery get extremely hot ?

Do not use a alkaline battery when using the power supply. Us a rechargeable battery if the power supply is used.

What can be done if the readings for the foot wear are low?
Check the footplate wire. Insert the wire completely into the meter. Workers wearing leather shoes that are wet will produce low readings. **DO NOT CLEAN OFF THE FOOTPLATE WITH TOPICAL ANTISTAT CLEANERS.**

More troubleshooting tips are available through Static Solutions' customer service Meter Department. Special systems can be ordered from Static Solutions, which will open doors, or have an upper limit of 1000 megohms.

Limited Warranty:

Static Solutions warrants for a period of one year from the date of purchase the CT-8900 will be free of defect in material. Within the warranty period the meters will be replaced free of charge. Any meters returned shall be shipped prepaid to Static Solutions along with a return authorization number and proof of purchase.

Exclusions.

The above warranty will not apply to defects or damage due to accidents, misuse, design alterations, neglect, operator error, failure to clean or maintain the meters.

Limitations:

In no event shall Static Solutions be responsible for any loss, damage, injury, direct or consequential, arising out of the use of or the inability to use the meters. Before using, users shall determine the suitability of the product for their intended use. Users will assume all risk and liability what so ever in connection therewith.