# Portable Ionization Test Kit Operation and Maintenance

Made in America

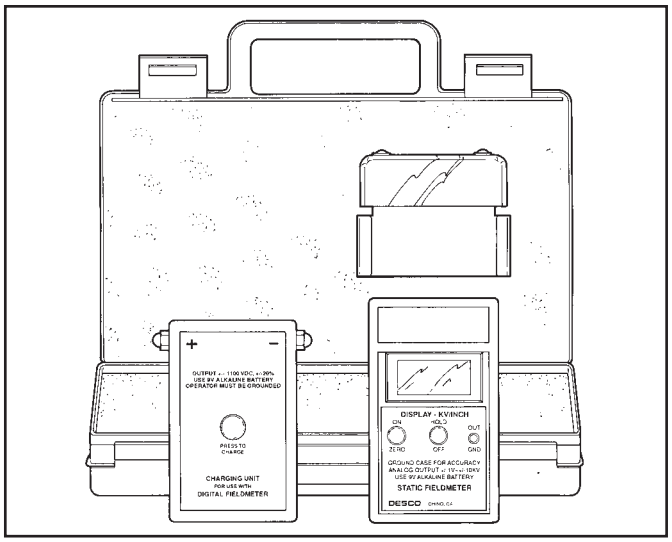


*Figure 1. 19445 Digital Fieldmeter and 19447 Portable Ionization Test Kit*

## Description

The Desco Portable Ionization Test Kit allows the 19445 Digital Fieldmeter to be used to monitor the balance of ionization equipment. The test kit also includes a Charger used to place a 1000V charge on the isolated adapter plate assembly, making it possible to also measure the neutralization performance of air ionization equipment. The 19447 Test Kit was designed to be used in conjunction with the 19445 Digital Fieldmeter, providing a highly portable and cost effective means of verifying the performance of a wide variety of ionization equipment.

**NOTE:** The 19447 Digital Fieldmeter is designed to operate only with the 19447 Portable Ionization Test Kit. It is not compatible with other brands.

Currently there are no established standards describing a periodic verification device or procedure for air ionizers. The Desco Portable Ionization Test Kit has been designed to make measurements that correspond to those made by using a charged plate analyzer and ESD Association's Standard 3.1. While the Ionization Test Kit provides convenience and portability, it does not meet all of the requirements of the ESD Association Standard. We recommend our Charged Plate Analyzer if precise measurements are required.

The Portable Ionization Test Kit includes a slide-on isolated plate assembly, a ±1000 volt charging unit and a durable thermoplastic carrying case with custom cut-outs for all of the above components along with the model 19445 fieldmeter. The 19445 digital fieldmeter is sold separately.

## Inspection

Remove the kit from the carton and inspect for damage. Each kit includes:

1 19445 Digital Field Meter
1 Isolated Plate Assembly
1 ±1000 Volt Charger
1 9 Volt alkaline battery (installed)
1 Carrying case

## Taking Balance Measurements

The Portable Ionization Test Kit has been designed to match the compact size and hand held convenience of the 19445 Digital Field Meter. Use the following procedure to verify the balance of air ionization equipment. This quick and easy procedure will help determine if the piece of ionization equipment is working within the manufacturer's specifications or user requirements. ***It is extremely important that ionizers be checked regularly for balance. An ionizer operating in an out-of-balance state can damage sensitive electronic componets or assemblies.***

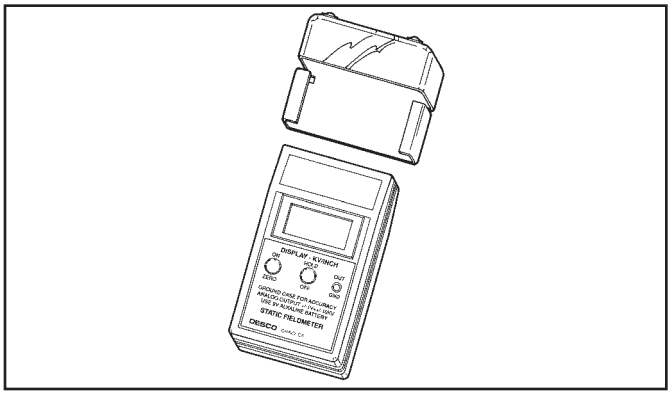


*Figure 2. Installing the isolated plate assembly on the 19445 Digital Fieldmeter*

**1. INSTALLING THE ISOLATED PLATE ASSEMBLY -** The case of the Model 19445 Fieldmeter has two slots along its slides. The top slot is closest to the front of the instrument. Slide the tabs of the adapter Plate ground plate into the top slot of the meter case as far as they go.

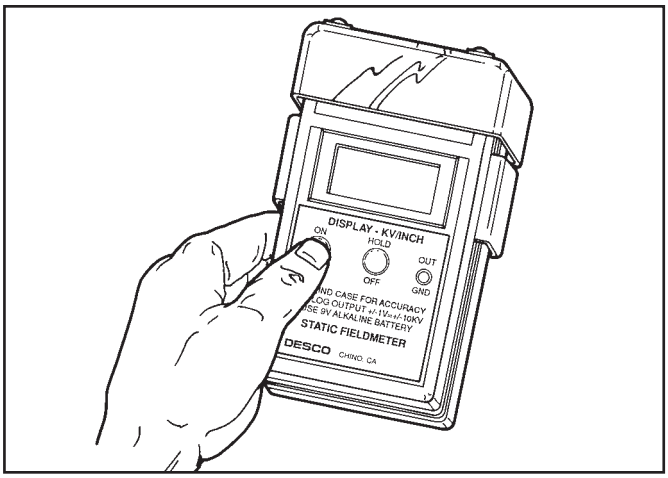


*Figure 3. Zeroing the Fieldmeter*

**DESCO WEST** - 3651 Walnut Avenue, Chino, CA 91710 • (909) 627-8178 • Fax (909) 627-7449
**DESCO EAST** - 90 Hudson Road, Canton, MA 02021-1407 • (781) 821-8370 • Fax (781) 575-0172 • Web Site: http://www.desco.com



© 2005 DESCO INDUSTRIES INC.
Employee Owned

**2. ZERO THE INSTRUMENT -** Make connection between the Adapter Plate and the meter case either through your finger or a test lead. Face the Fieldmeter away from charged objects and press the ON/ZERO button. Hold until the display reads zero. The instrument may also be zeroed by pointing it toward a known grounded surface (such as the palm of the opposite hand) and depressing the ON/ZERO button. Although you must be careful not to contact the recessed sensor plate, the amount of spacing between the instrument and the target is not critical when zeroing the instrument. *NOTE: The 19445 has a conductive case that provides a ground reference for the measuring circuit. For accurate measurements it is necessary that the person holding the meter be properly grounded.*

**AUTO SHUTDOWN TIMER** During normal operation (not during ZERO) a blinking decimal point indicates the AUTO SHUTDOWN TIMER is enabled. If the AUTO SHUTDOWN TIMER is disabled the decimal point will be on continuously.

Holding down the ZERO button, while unit is ON, for less than 3 seconds resets the AUTO SHUTDOWN TIMER (if enabled). The AUTO SHUTDOWN TIMER is enabled or disabled by turning on the unit and keeping the ON/ZERO button pressed then toggling the HOLD/OFF button. Enable/disable of the AUTO SHUTDOWN TIMER is indicated by the decimal point: DP on = timer on, DP off = timer off.

AUTO SHUTDOWN TIMER state is maintained during power off. AUTO SHUTDOWN TIMER can be continually toggled as long as the ON/ZERO button remains pressed, up to 20 seconds, after which the unit will turn off. A blinking decimal point indicates the AUTO SHUTDOWN TIMER is active. During the last minute before power off ALL annunicators will blink at a fast rate. Pressing any button will reset the timer. Timeout is nominally 15 minutes.

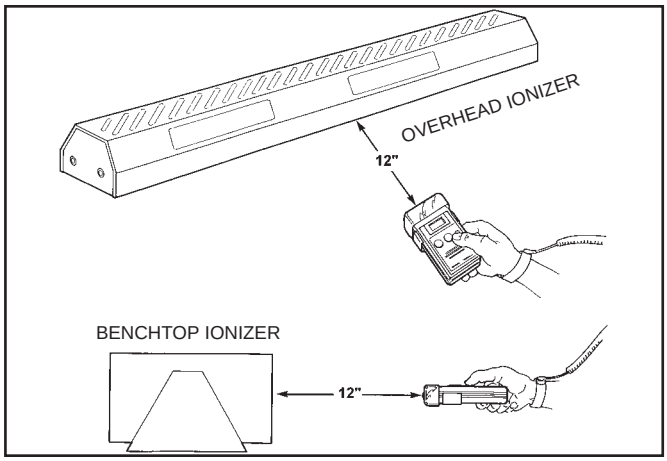


*Figure 4. Taking a balance measurement.*

**3. TAKE A MEASUREMENT -** Locate the meter in an ionized environment at the appropriate distance from the device under test. The static field displayed is the actual balance of the ionizer or voltage offset. NOTE: When testing pulsed ionizer systems, the voltage displayed is constantly changing. *This pulse rate may be faster than the display update rate of the fieldmeter, therefore the displayed voltage is an average of the actual voltage. The output of the fieldmeter is useful in this situation for more accurate measurements.*

## Taking Discharge Measurements

In order to verify that an ionizer is operating properly it is also important that its ability to neutralize or discharge static electricity is measured. The following procedure will measure an ionizer's discharge time.

**1. OPERATING THE CHARGING UNIT -** The Model 19447 has a momentary push-button that turns on the power to the unit. Holding the button down supplies power to the output terminals.

**2. OUTPUT CONTACTS -** Two output contacts are provided. They are connected to an internal power source. When one contact is connected to ground the other contact will provide a charge of the indicated polarity. The charger is designed so that an operator can press the power button and touch an output contact, simultaneously with the fingers of the same hand.

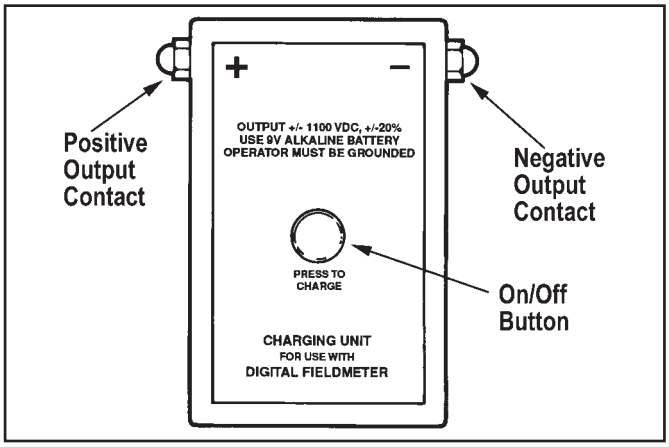


*Figure 5. Charging unit controls.*

**3. POLARITY SELECTION -** The terminals are labeled (+) and (-). To provide a POSITIVE voltage output, connect the negative (-) terminal to ground. Press and hold the power switch. To provide a NEGATIVE voltage output, connect the positive (+) terminal to ground. Press and hold the power switch.

**4. GROUNDING - *IMPORTANT!*** For the charging unit to work correctly, the operator or the fieldmeter must be properly grounded. A ground path between an output contact must exist.

**5. IONIZER DISCHARGE TIME MEASUREMENTS -** Locate the 19445 and the Adapter Plate in the appropriate location for measurements.

**6. POSITIVE DISCHARGE MEASUREMENT -** For positive discharge measurement, touch the negative (-) terminal of the charger while pressing the charging button on the charger. Momentarily touch the positive terminal to the adapter plate. The 19445 reads approximately +1.10kV. By using a stop watch or other timing device, determine the time needed for the voltages to decrease from +1.10kV to +.01kV. This is the positive discharge time.

**7. NEGATIVE DISCHARGE MEASUREMENTS -** For negative discharge measurements, touch the (+) output terminal while pressing the charging button on the charger. Momentarily touch the negative terminal to the adapter plate. Follow the instructions for the positive discharge measurement above.

**DESCO WEST** - 3651 Walnut Avenue, Chino, CA 91710 • (909) 627-8178 • Fax (909) 627-7449
**DESCO EAST** - 90 Hudson Road, Canton, MA 02021-1407 • (781) 821-8370 • Fax (781) 575-0172 • Web Site: http://www.desco.com



© 2005 DESCO INDUSTRIES INC.
Employee Owned

***IMPORTANT:*** *A ground path must be provided between one of the output terminals of the charging unit and the ground reference of the Fieldmeter and Adapter Plate. This is normally provided by holding the Charger in one hand and the Fieldmeter with Adapter Plate in the other. If this is not possible, you must use a test lead to connect one to the charger output terminals and the fieldmeter ground connection.*

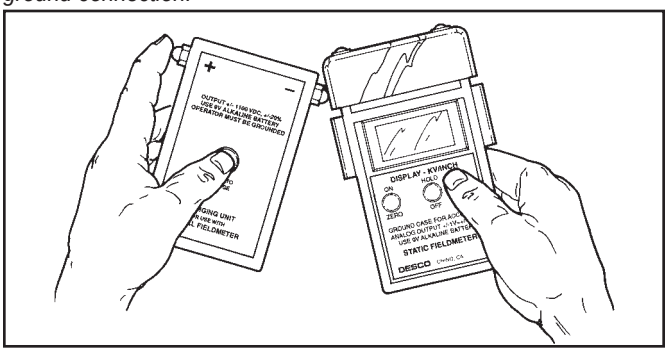


*Figure 6. Taking decay measurements.*

## Calibration

The overall accuracy of the 19447 Test Kit and the 19445 digital fieldmeter is +/- 5% nominal. Calibration of the meter and the Ionization Test Kit should only be performed by the factory. Both the 19447 and the 19445 are calibrated to NIST traceable standards. Contact our Customer Service Department for details.

## Maintenance

### BATTERY CARE

The battery in the Model 19447 and 19445 should be replaced annually and whenever you plan an extended period of unattended monitoring. See specifications for battery replacement type.

### CLEANING

It is important to keep the insulators on the adapter plate clean and free of contaminates that may cause surface leakage. To test the performance of the adapter plate, charge the plate and note the discharge rate in a non-ionized area. The self discharge rate to 10% of original voltage should not be less than five minutes.

The area around the aperture of the Model 19445 must be kept clean to ensure accurate, drift-free readings. Never touch the aperture with anything. To remove dust or other particulate matter, use low-pressure instrument-grade air. To remove more severe contamination, spray or flush with the smallest practical amount of clean technical-grade of isopropyl alcohol. Then allow the instrument to air dry for several hours.

## Specifications

### Isolated Plate Assembly

| | |
|---|---|
| Plate Capacitance: | 13 picofards ± 2 picofards |
| Range: | 0 to ± 2kV, higher voltages may be measured |
| Grounding: | Connection through conductive case of Model 19445 Field meter |
| Weight: | 1.5 oz. |

### Charging Unit

| | |
|---|---|
| Output: | 1100VDC monimal, <1:A Max. |
| Output Terminals: | Two acorn buttons labeled for "+" and "-" |
| Load Regulation: | Better than 8% NL to FL where FL = $10^9$ ohms |
| Battery Type: | 9 volt alkaline |
| Battery Life: | 40 hours |
| Temperature Range: | +10° to +30°C (+50° to +86°F) |
| Relative Humidity: | 10% to 80% non-condensing |
| Dimensions: | 3.75"L x 2.88"W x 1"D (9.53 x 7.32 x 2.54cm) |
| Weight: | 2.8 oz. (79 gm) |

## Limited Warranty

Desco expressly warrants that for a period of one (1) year from the date of purchase, Desco Ionization Test Kits 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 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.

**DESCO WEST** - 3651 Walnut Avenue, Chino, CA 91710 • (909) 627-8178 • Fax (909) 627-7449
**DESCO EAST** - 90 Hudson Road, Canton, MA 02021-1407 • (781) 821-8370 • Fax (781) 575-0172 • Web Site: http://www.desco.com



© 2005 DESCO INDUSTRIES INC.
Employee Owned