

# Digital Static Field Meter Operation and Maintenance



Made in the  
United States of America



Figure 1. VER-29206 Digital Static Field Meter

## Description

The Vermason Digital Static Field Meter is a high quality, portable non-contacting static field meter which consistently produces accurate readings with ease and provides years of trouble-free operation.

The Digital Static Field Meter indicates surface voltage and polarity on objects up to  $\pm 19.99$  kV at a distance of 1 inch with an accuracy of  $\pm 5\%$  of the displayed value. It is chopper-stabilised for use under almost any condition including ionised environments. The conductive case and ground snap facilitate grounding for accurate measurement. Also featured are a zero button and a display hold function. A unique LED rangefinder system provides accurate positioning of the Meter from the target.

Its accuracy is dependent upon three factors:

- Grounding of the Meter via a ground cord (not included) (Meter is also grounded when held by a grounded operator).
- The instrument must be properly zeroed.
- The distance from the front edge of the case to the target or surface under examination must be accurately defined.

Charged insulators in the ESD protected area can adversely impact quality, productivity, and reliability. In the Introduction of the CLC/TR 61340-5-2 User guide

“Avoid a discharge from any charged ESD sensitive device (the charging can result from direct contact and separation or can be field induced): Necessary insulators in the environment cannot lose their electrostatic charge by attachment to ground. Ionisation systems provide neutralisation of charges on these necessary insulators (circuit board materials and some device packages are examples of necessary insulators). Assessment of the ESD hazard created by electrostatic charges on the necessary insulators in the work place is required to ensure that appropriate actions are implemented, according to the risk.”

All packaging and other materials that may be electrostatic generative to 2,000 volts must be kept a minimum of 12” from ESD sensitive items at all times. It is proper to rub an item and measure that it can charge.

“The ESD threat associated with process essential Insulators shall be evaluated to ensure that:

- the electrostatic field at the position where the ESDS [ESD sensitive items] are handled shall not exceed 10000 V/m;
- if the electrostatic potential measured at the surface of the process required insulator exceeds 2000 V, the item shall be kept a minimum of 30 cm from the ESDS.

If the measured electrostatic field or surface potential exceeds the stated limits, ionisation or other charge mitigating techniques shall be used.”

[EN 61340-5-1 Edition 1 clause 5.3.3 ESD protected areas (EPA)]

Other steps that can be taken are to remove the item from the ESD protected area, periodically coat with a topical antistat, or replace with a static control protective version of the item.

## Packaging

- 1 Digital Static Field Meter
- 1 9V Alkaline Battery
- 1 Ground Coil Cord
- 1 Data Output Cord
- 1 Certificate of Calibration

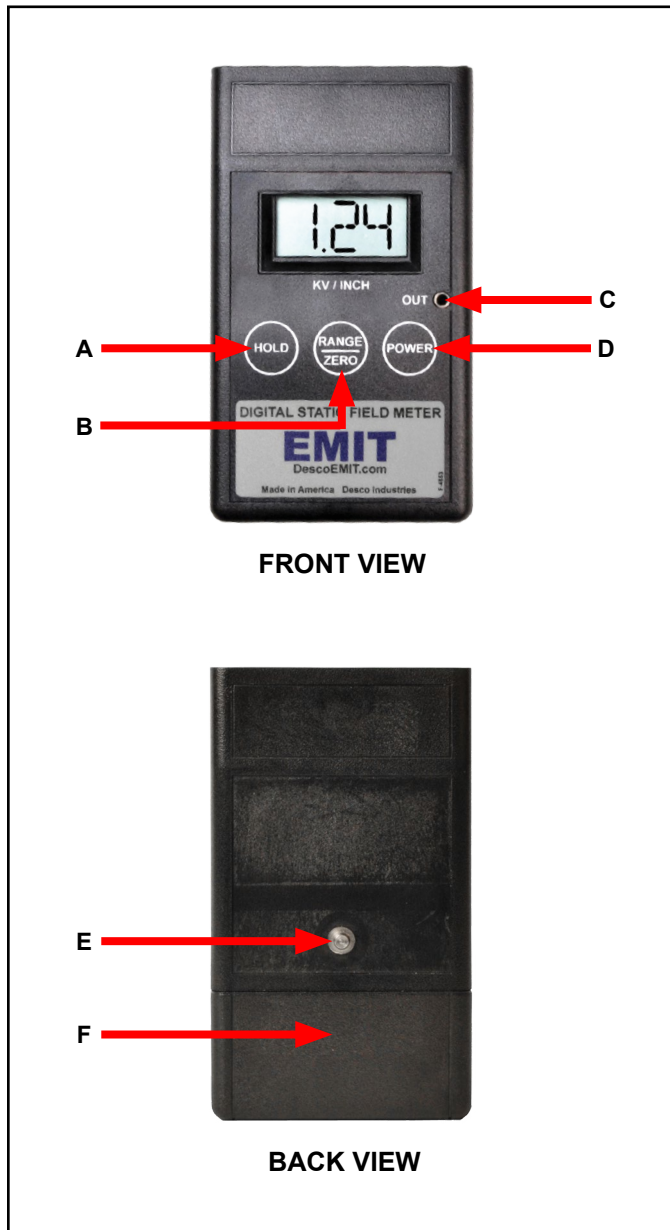


Figure 2. Digital Static Field Meter features and components

## Features and Components

- A. HOLD Button:** Press to freeze the reading on the display. Press again to return to normal measurement operation.
- B. RANGE / ZERO Button:** Press to select the measurement range. Press and hold to zero the meter.
- C. Analog Output Jack:** A low-voltage signal of the measured voltage is provided at this output. The voltage is 1/1000th ( $\pm 2$  kV range) or 1/10,000 ( $\pm 20$  kV range) of the measured voltage.

**D. POWER Button:** Press to turn the unit ON and OFF.

**E. 4mm Stud:** Use this stud to ground the Meter using the included Ground Coil Cord.

**F. Battery Cover:** Slide the cover down to open the 9V battery compartment.

## Operation

**Note:** The VER-29206 Digital Static Field Meter is built in a conductive case. The instrument senses the difference in potential between the case (and the person holding the case / ground connection) and the surface under test. Ensure that the person using the instrument is grounded or that the rear panel ground snap connection is used to achieve accurate measurements.

## BATTERY CHECK

The battery should be replaced when "BAT" is indicated on the display. Always replace the battery with a 9V alkaline or equivalent battery in order to remain CE compliant.

## ZERO THE METER

Turn the meter on by pressing the POWER button. Press the RANGE / ZERO button to set the meter to the 2 kV (3 decimal places) range. Point the top of the Meter approximately 1 inch away from a grounded metal surface. Use the red LED range guide. The Meter is properly positioned when the projected red bullseyes are centered on top of each other. Press and hold the RANGE / ZERO button until the meter displays ".000".

## MAKING A MEASUREMENT

Place the meter 1 inch from the object to be measured. This distance is measured from the front edge of the meter case to the surface of the object. The meter now displays a reading (from 0 to  $\pm 2.00$  or  $\pm 2.00$ ) of the electrostatic field in kilovolts per inch.

**Note:** The red ranging lights are provided to help place the meter at the correct distance from the object. The lights are set to produce a concentric red bullseye pattern on a flat opaque surface 1 inch from the front edge of the meter. This can be practiced by aiming the meter at a sheet of white paper.

The display will indicate "1" or "-1" when the meter is over-ranged. Change the range of the unit if necessary. If the measurement exceeds 20 kV, move the meter farther away from the object and multiply the reading by the distance (in inches) away from the object being measured. The measurement accuracy is dependent on a stable ground reference and the 1 inch measuring distance. It is also dependent on the "aspect ratio", relating the size of the object to be measured to the measurement distance.

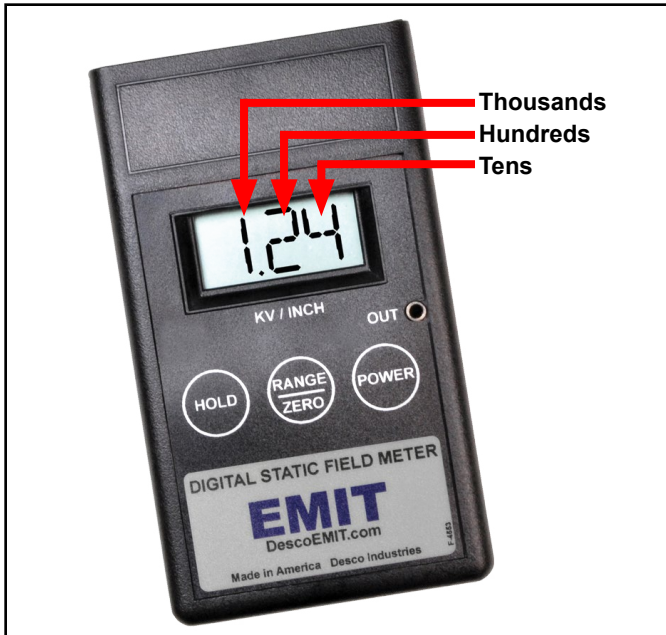


Figure 3. Reading the Digital Static Field Meter while in the  $\pm 20$  kV range

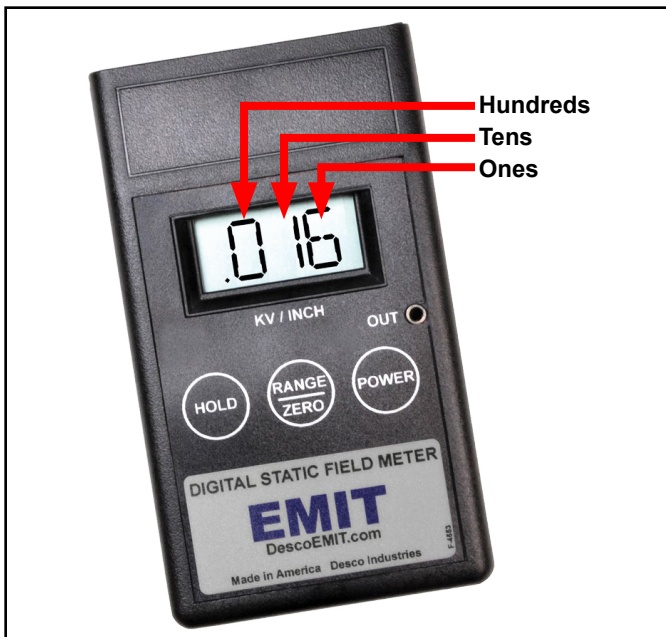


Figure 4. Reading the Digital Static Field Meter while in the  $\pm 2$  kV range

**Note:** This aspect ratio should be at least 3 for best accuracy, i.e. the object should be at least a 3 inch square when measuring at a 1 inch distance. Accurate measurements may be made at other measurement distances by scaling the meter range and observing the proper aspect ratio. For example, at a measurement distance of 3 inches, multiply the meter reading by 3 to give a range of 0 to 60 kilovolts. For accuracy, the object being measured at this distance should be at least a 9 inch square.

### HOLDING THE LAST READING

With the meter positioned 1 inch from the object being measured, press the HOLD button. This will freeze the reading from the object on the display and the analog output signal. This feature allows the operator to move the meter where it may be more easily read or saved for later reference.

**Note:** The red ranging lights will be off while the meter is in HOLD mode. It is advised to do this between measurements to prolong battery life.

### ANALOG OUTPUT

The analog output jack labeled “OUT” on the face of the meter accepts a standard 2.5 mm monaural phone plug and is provided so the output of the Digital Static Field Meter may be connected to an oscilloscope, strip chart recorder, external meter or other device. Use the included cord to achieve a connection between the field meter and alternate measuring instrument. The voltage at this output is 1/1000th ( $\pm 2$  kV range) or 1/10,000 ( $\pm 20$  kV range) of the measured voltage.

### BATTERY REPLACEMENT

The Digital Static Field Meter operates from a standard 9 VDC alkaline battery. Battery life is in excess of 50 hours under normal use. When the battery voltage drops below 6.5 V, “BAT” will appear on the display. To change the battery, slide the battery cover down at the back of the Meter and remove the battery from the battery clip. Replace the battery with a fresh one and reinstall the battery cover. The battery should be removed from the Meter if its is to be stored for an extended period of time.

### Maintenance

The Digital Static Field Meter is factory calibrated and no maintenance is required. If for any reason you believe the Meter is not working correctly, please contact Vermason Customer Service. CAUTION - There are no user serviceable parts. Any unauthorised service will void the warranty and result in additional repair charges.

**Note:** This Meter is a precision instrument and should not be subjected to dropping as that would void the warranty.

## Specifications

### Measurement Range (switch selectable)

Low Range: 0 to  $\pm 1.99$  kV / inch  
High Range: 0 to  $\pm 19.99$  kV / inch

### Measurement Accuracy

Voltage Monitor Output:  $> \pm 5\%$  of reading  $\pm 10$  mV  
Voltage Display:  $> \pm 5\%$  of reading  $\pm 2$  counts

### Measurement Stability

$\pm 10$  counts

### Automatic Shutoff

Unit will shut off after 20 minutes after last switch activity

### Power Requirements

One (1) 9V alkaline battery

### Operating Time

Greater than 50 hours, with new battery at 21°C continuous usage

### Operating Conditions

Temperature: 10°C to 30°C  
Relative Humidity: Up to 80%, non-condensing  
Altitude: Up to 2,000 meters

### Dimensions

0.94" H x 2.75" W x 4.94" L  
(23.9mm H x 69.9mm W x 125.5mm L)

### Weight (with battery)

4.9 oz  
(140 g)

### Voltage Monitor Connection

2.5mm audio jack

### CE Certified

## Ionisation Test Kit Accessories

Vermason offers accessories for the Digital Static Field Meter designed to facilitate routine auditing and periodic testing of ionisation equipment (Ref: ANSI/ESD SP3.3). The Meter and accessories combination can be used to test an ioniser's overall performance. This highly portable test kit allows the user to make quick and accurate offset voltage balance level and neutralisation discharge time measurements (counting or using stopwatch).



Figure 5. Installing the Conductive Plate

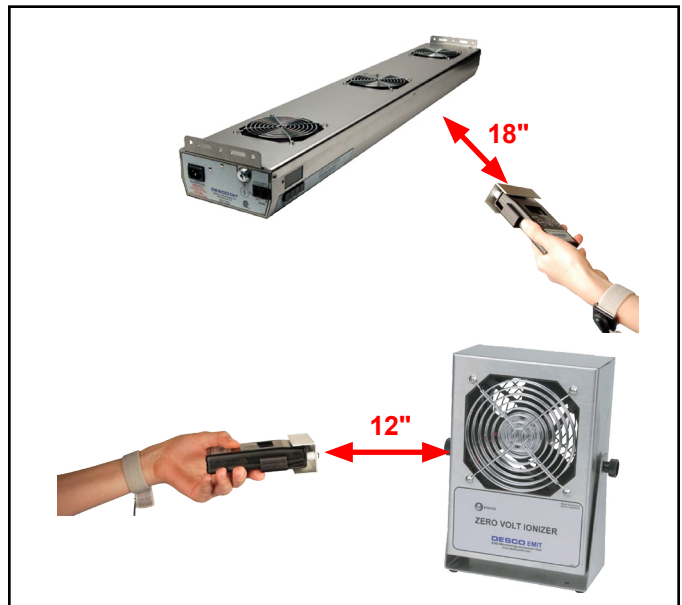


Figure 6. Auditing ionisation equipment with the Digital Static Field Meter and Conductive Plate (Ref: ANSI/ESD SP3.3)

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

See Vermason's Warranty -  
<http://www.vermason.co.uk/Warranty.aspx>



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