Body Voltage Meter
Installation, Operation and Maintenance



Figure 1. Desco 19431 Body Voltage Meter

Description

The Desco 19431 Body Voltage Meter is a portable measuring system that allows analysis of charge levels accumulated on the human body according to ANSI/ESD STM97.2. The Body Voltage Meter measurement may be logged using internal memory. Logged measurements can be exported and further reviewed on a PC. Graphs of measurements can be displayed on the LCD display for quick evaluation.

Each Body Voltage Meter is calibrated with accepted procedures and standards traceable to the National Institute of Standards and Technology (NIST).

"A compliance verification plan shall be established to ensure the organization's fulfilment of the requirements of the 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 used for process monitoring and measurements. If the organization uses different test methods to replace those of this standard, the organization shall be able to show that the results achieved correlate with the referenced standards. Where test methods are devised for testing items not covered in this standard, these shall be adequately documented including corresponding test limits. Compliance verification records shall be established and maintained to provide evidence of conformity to the technical requirements. The test equipment selected shall be capable of making the measurements defined in the compliance verification plan." (EN 61340-5-1 clause 5.2.4)

Packaging

1 Body Voltage Meter
1 Walking Test Probe
1 Black 8-Pin DIN to USB Cable, 1.8 m long
1 Black Ground Cord with Crocodile Clip, 5 m long
1 Lanyard with Hook
6 AA Alkaline Batteries

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Features and Components



Figure 2. Body Voltage Meter features and components

A. Settings Button: Press to enter SETTINGS mode.

B. Left and Right Buttons: Press to cycle through the menus.

C. Cursor Button: Press to advance the cursor.

D. Exit Button: Press to power the meter ON and OFF. This button is also used to exit SETTINGS and MENU modes.

E. Start/Stop Button: Press to start and stop a measurement. This button is also used to increase the value of settings when in SETTINGS mode.

F. Ground Jack: Common point ground for the meter. Connect the included black ground cord here.

G. Probe / PC Connector: Connect the included test probe when taking measurements. Connect the included DIN to USB cable when exporting data onto a PC.

H. Ground Jack: Common point ground for the meter. Connect the included black ground cord here.

I. Ground Touch Plate: Touch to ground the operator and zero the meter prior to taking body voltage measurements.

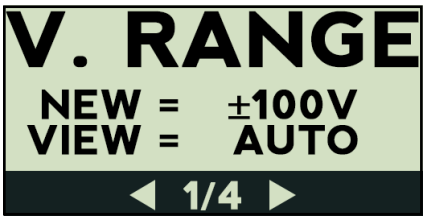
Settings Mode

Press and hold the Settings button for 1 second to enter the SETTINGS mode. There are 4 menus available:

1. V RANGE
2. CLOCK
3. DISPLAY
4. °C/°F

Press the Left button to move to the previous menu.
Press the Right button to move to the next menu.
Press the Exit button to exit from SETTINGS mode.

V. Range Menu



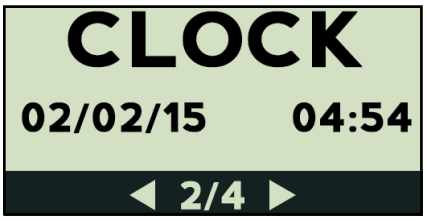
Adjust the voltage range for new and saved graphs. Press the Cursor button to advance the cursor, and press the Start / Stop button to increase the value.

NOTE: AUTO range is only available for saved graphs.

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Clock Menu



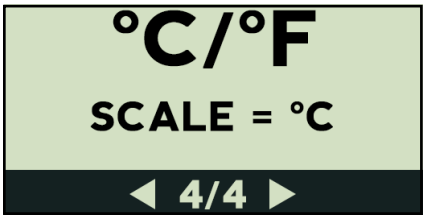
Adjust the date and time settings. Press the Cursor button to advance the cursor, and press the Start / Stop button to increase the value.

Display Menu



Adjust the contrast of the LCD display (0 to 9). The default contrast setting is 5. Press the Start / Stop button to increase the value.

°C/°F Menu



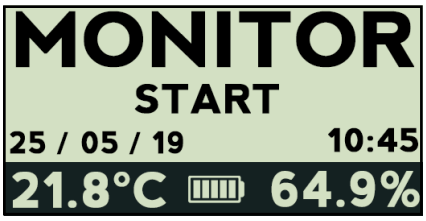
Choose Celsius (° C) or Fahrenheit (° F) for the temperature unit of measurement. Press the Start / Stop button to toggle the setting.

Operation Modes

There are 5 operation modes available:
1. MONITOR
2. NEW
3. VIEW
4. CLEAR
5. COM

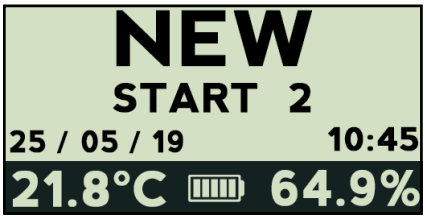
Press the Left button to move to the previous mode.
Press the Right button to move to the next mode.
Press the Start / Stop button to enter the selected mode.
Press the Exit button to exit the selected mode.

Monitor Mode



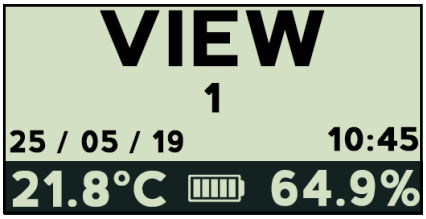
Allows on-the-go measurements without saving any data.

New Mode



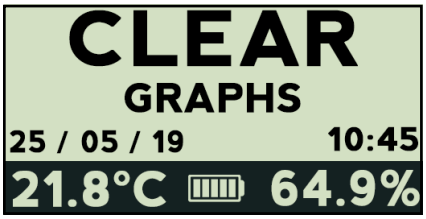
Records new graph.

View Mode



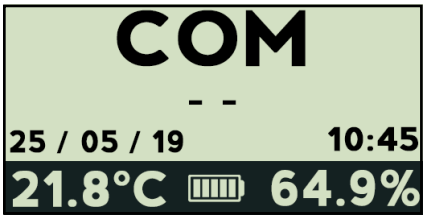
Views saved graphs.

Clear Mode



Deletes last or all saved graphs.

COM Mode



Exports data to PC using supplied 8-Pin DIN to USB cable.

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Installation



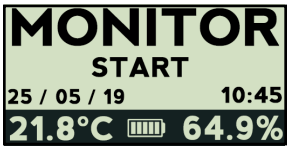
Figure 3. Setup of the Body Voltage Meter

1. Remove the meter from the carton.
2. Connect the included ground cord to one of the two ground jacks located at the top of the meter. Connect the opposite end of the ground cord to equipment ground.
3. Connect the test probe to the probe connector located at the top of the meter.
4. Press the EXIT button to power the meter.

Operation

Using the Meter

1. Press the EXIT button to power the meter.
2. Toggle to MONITOR mode on the meter, and press the Start/Stop button.



3. Hold the test probe and touch the ground touch plate located on the back of the unit to ground the operator and zero the meter. Verify that the monitor displays 0 V ± 5 V.

   NOTE: The ground touch plate should only be touched when zeroing the meter. It must not be touched when attempting to measure body voltage.

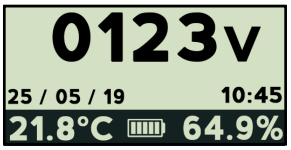


Figure 4. Touching the ground touch plate to ground the operator and zero the meter

Monitor Mode

1. Toggle to MONITOR mode on the meter, and press the Start/Stop button.
2. The display will show the electrical potential present on the probe.





3. A beeping sound (every second) indicates that the meter is measuring. This is to ensure the unit is not left in measuring mode unintentionally and cause the battery to drain.
4. To stop the measuring process, press the Start / Stop or Exit buttons.

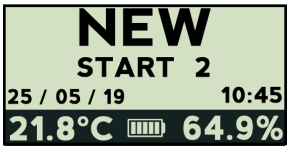
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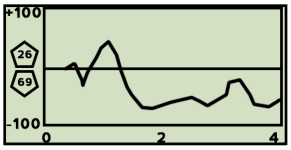


Figure 5. Using the Body Voltage Monitor

Datalogger Mode

1. Toggle to NEW mode on the meter and press the Start / Stop button.
2. After a 3 second count-down, the Body Voltage Monitor will log a graph of the walking test.
3. The graph will show the positive and negative peak voltages measured during the test.





4. To stop the test, press the Start / Stop button.
5. Press the Left or Right buttons to scroll through the graph for quick evaluation.
6. Press the Start / Stop button again to save or discard the graph. Press Start / Stop button to save or the Cursor button and Start / Stop button to discard the graph.

Connecting the Body Voltage Meter to a PC

1. Download the Windows RS232 Driver.
2. Open the folder with the correct operating system being used on the PC.
3. Run the **CDM21226_Setup**.
4. Once installation is complete, restart the PC.
5. Download and install the WT Manager software.
6. Connect the Body Voltage Meter to a PC using the included Black 8-Pin DIN to USB Cable.
7. Toggle to COM mode on the Body Voltage Meter.
8. Run **WTManager1.6.0**.
9. Click on **Datalogger**.
10. Click on **Com Port select**.
11. Click on **Port**. The COM selection for the Body Voltage Monitor will become visible.
12. When selected, the unit will be highlighted.
13. Click **OK**.

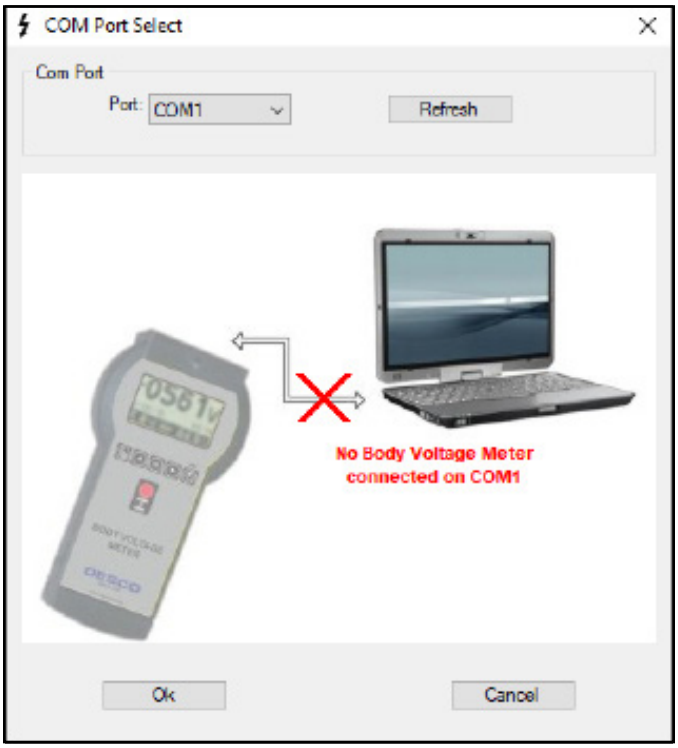


Figure 6. Selecting a COM port using the WT Manager software

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Importing Data into a PC

1. Click on the **Datalogger** option
2. Select **Import Graph**. A progess bar will appear at the bottom of the screen.
3. Data can either be saved or exported in Excel format.

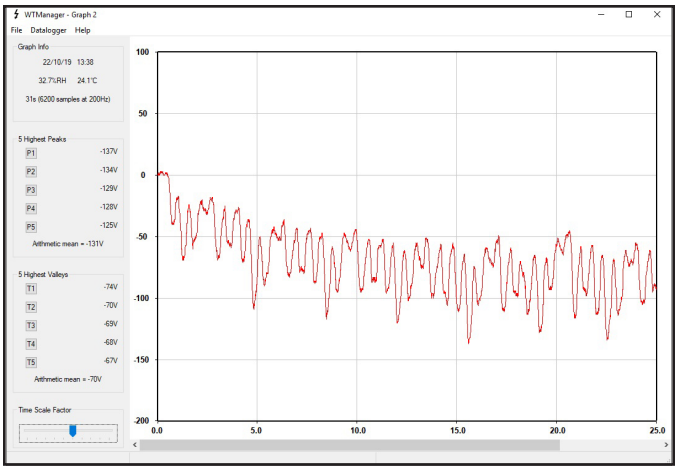


Figure 7. Viewing the body voltage of an ungrounded operator in the WT Manager software

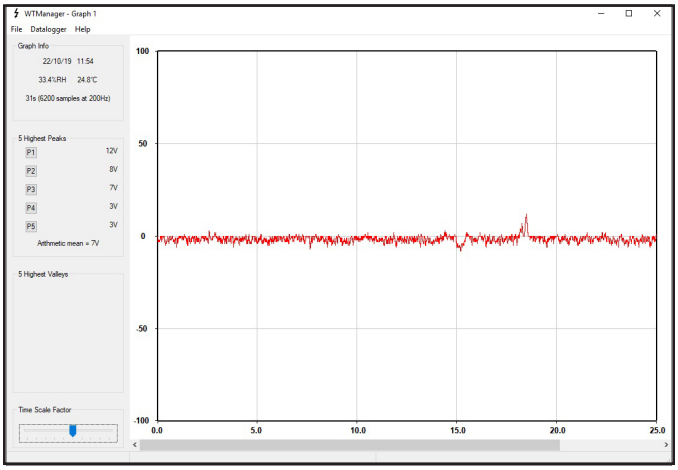


Figure 8. Viewing the body voltage of a grounded operator in the WT Manager software

Maintenance

Battery Replacement

Replace the batteries if the battery indicator on the Body Voltage Meter begins blinking. Open the battery cover, replace the 6 alkaline batteries, and close the battery compartment.



Figure 9. Replacing the batteries

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.

Required Equipment

- Stable high-voltage DC power supply capable of ±1,000 VDC output
- Digital multimeter
- High voltage probe or divider
- Conductive plate on a highly insulated base

Calibration Verification Procedure

1. Connect the DC power supply's high voltage output to the Body Voltage Meter's test probe.
2. Connect the DC power supply's ground output to the Body Voltage Meter's ground jack.

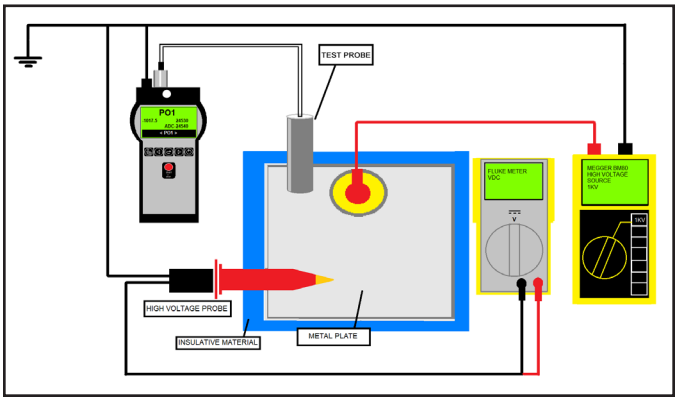


Figure 10. Calibration verification setup

3. Set the Body Voltage Meter to Monitor mode. Older models will require a 5 minute warm up time.
4. Apply each high voltage listed below onto the test probe for 5 seconds, and verify that the Body Voltage Meter displays values within the tolerances listed below.

Voltage	Tolerance
±50 VDC	±5 VDC
±500 VDC	±5%
±1,000 VDC	±5%

5. Exchange the DC power supply's ground output and verify the negative polarity voltage values.

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Specifications

Voltage Range	±1050 V
Accuracy	±5 V for values below 100 V ±5 % for values 100 V and above
Resolution	1 V
Input Resistance	10^{14} ohms
System Capacitance	10 pF
Power Supply	6 AA alkaline batteries
Battery Auto-Shut Off Timer	10 minutes
Display	Graphic LCD 128 x 64 pixel, 68 mm x 51 mm
Memory Capacity	10 graphs
Sample Rate	200 Hz
Max Total Graphs Duration	2 minutes and 30 seconds
PC Interface	USB
Operating Temperature	41 ºF to 85 ºF (5 ºC to 30 ºC)
Environmental Requirements	Indoor use only at altitudes less than 6500 ft. (2 km) Maximum relative humidity of 80 % up to 85 °F (30 °C)
Dimensions (meter)	9.6" x 5.1" x 2.4" (243 mm x 130 mm x 60 mm)
Dimensions (probe)	Ø 1.4" x 5.1" (Ø35 mm x 130 mm)
Weight (meter with batteries)	1.4 lbs (650 g)
Weight (probe)	0.6 lbs (0.27 kg)
Country of Origin	Italy

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

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

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