

# SHIELDED BAG TEST SYSTEM

Model 431

Measures the shielding effectiveness of static shielding bags.

## Features

- ❑ Performs energy tests per ESD S11.31
- ❑ Performs voltage tests per EIA-541 & MIL-PRF-81705D
- ❑ Voltage adjust: 800 to 1200V
- ❑ 3½-digit LCD voltage readout
- ❑ Oscilloscope interface outputs
- ❑ 110/220 Volt operation
- ❑ Optional energy calculation program



ETS Model 431 shown with optional ETS Test Suite Manager program

Model 431

## Applications

Sensitive electronic devices are susceptible to damage or degradation by direct electrostatic discharge from personnel or equipment, or by a charged device discharge. The static shielding bag is designed to protect these components from ESD events.

Devices may be either voltage or energy sensitive. EIA-541 "Packaging Material Standards for ESD Sensitive Items" defines the measurement of the voltage inside the bag when a 1kV HBM discharge is applied to the outside of the bag. ANSI ESD S11.31 "Evaluating the Performance of Electrostatic Discharge Shielding Bags" defines the measurement of the energy inside the bag when a 1kV Human Body Model discharge is applied.

The Model 431 Shielded Bag Test System is a complete instrument that generates the specified ESD pulse across a test bag and detects either the voltage induced onto or the current across a capacitive sensor placed inside the bag.

The optional ETS Test Suite Manager Program controls the operation of the Model 431, calculates the energy inside the bag and processes the data in accordance with ESD S11.31.



## Description

The Model 431 Shielded Bag Test System is designed to perform both the EIA-541 and the ESD S11.31 tests when used in conjunction with the appropriate user supplied oscilloscope and computer. The System provides the correct discharge pulse and the resulting attenuated voltage output for direct connection to a 2 channel oscilloscope for the EIA-541 test, or current pulse for the ESD S11.31 test.

The Model 431 consists of a variable 800 to 1200 Volt power supply, 100 pf/1500 Ohm HBM network (200 pf/1500 Ohm for EIA-541), mercury wetted charge/discharge relay, capacitive sensor and a controlled force discharge electrode. Adjustable bag insertion stops enable the user to configure the System for different bag sizes per specification.

A Tektronix CT-1 current sensor with 500 Ohm resistor, and built-in 100:1 voltage attenuators are standard for interfacing the System with an appropriate user supplied oscilloscope. (50 MHz, 100 MS/s for EIA-541; 200 MHz, 1 GS/s with computer interface for ESD S11.31.)

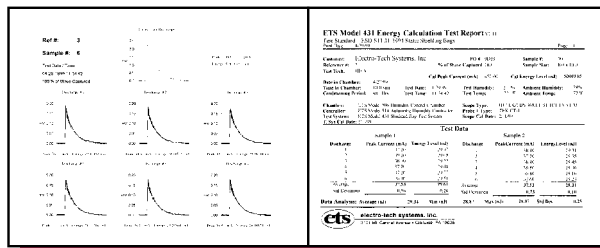
A 3½-digit LCD readout displays the discharge voltage. Multicolored LED point sources indicate CHARGE, DISCHARGE and TEST OVER functions. The FUNCTION switch is used to select either a voltage differential (EIA-541) or a current pulse (ESD S11.31) measurement. The discharge is initiated by either a front panel discharge switch or by a foot operated switch which is convenient when testing in a humidity chamber. A computer interface is also provided to enable the discharge sequence

specified in ESD S11.31 to be automatically controlled by the optional ETS Test Suite Manager Program.

The discharge waveform of the Model 431 meets the requirements of ESD S5.1 "Electrostatic Discharge Sensitivity Testing - Human Body Model." This waveform is specified in ESD S11.31 and, following present industry practice, replaces the 200pf/400 kOhm network specified in EIA-541 (1988). The use of plug-in R/C components allows other networks to be used.

Cables are provided for interfacing the Model 431, Tektronix TDS series oscilloscopes and the computer parallel port.

The optional ETS Test Suite Manager Program displays the waveforms, calculates the energy of the discharge pulse induced inside the test bag and processes the data in accordance with ESD S11.31. It also controls the AUTO nJ function of the Model 431 and programs the oscilloscope.



## Specifications

### H.V. Power Supply:

+800 to +1200 Volts

### Discharge Circuit:

ESD S11.31: 100 pf/1500 Ohms

EIA-541: 200 pf/1500 Ohms

Other R/C networks: Optional

### Discharge Waveform:

Rise time (0 Ohms): 6 ±2 nsec.

(500 Ohms): <20 nsec.

Fall time (0 Ohms): 150 ±15 nsec.

(500 Ohms): 200 ±20 nsec.

Ringing: <15%

Output Energy: 50 ± 5 uJ

### Switching Method:

Bounceless SPDT mercury wetted relay

### Discharge & Ground Probes:

1.5" diameter stainless steel

### Capacitive Sensor:

Electrodes: .875" diameter stainless steel

Dielectric: .5" acrylic

Capacitance: 6 pf

### Interface:

Oscilloscope:

Voltage Output: 100:1 attenuator into 1 Megohm

Current Output: 5 Volts/Amp, Tektronix CT-1 Current Sensor

Computer:

16 Megabytes of RAM (minimum) IBM Compatible,

486 processor or better with Windows 95®

Model 431 to Printer Output (Parallel Port) cable

Tektronix Communications to Data Input cable

### Power:

User selectable 115/230 VAC, 50/60 Hz

### Dimensions:

4"W x 4"H x 12"D

### Warranty:

One (1) year

In accordance with ETS policy to improve our product line, the specifications cited above are subject to change without notice.



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