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NoiseKen_®

ELECTROSTATIC DISCHARGE SIMULATOR

ESS-2000

with Discharge gun TC-815P

CONFORMING TO IEC 61000-4-2



TC-815P ESS-2000 (Gun stand in the photo is an optional accessory Model: PS-806.)

GENERAL

Among the causes of equipment malfunction, problems caused by ESD (electrostatic discharge) are the most difficult events against which to incorporate protective measures, since the causal relation generally cannot be found easily.

Air discharge testing, which is affected by numerous variable factors, is a widely adopted test method, since the actual ESD events in the field are air discharges.

On the other hand, contact discharges are preferably applied since the following two benefits are obtained: high repeatability and evaluation of ESD susceptibility in terms of discharge voltage. In the contact discharge method, the very fast but stable rise time of discharge current does not vary with charge voltage prior to discharge and the waveforms are proportional to charge voltages, which allows the engineer to define the ESD susceptibility of the equipment under test in terms of charge voltage. This simulator is designed to conduct both contact and air discharge testing.

FEATURES

- This simulator meets and far exceeds the testing requirements in the IEC 61000-4-2, generating discharges up to 30kV. In addition, various waveforms can be generated by changing the energy storage capacitor and discharge resistor.
- Since the energy storage capacitor, discharge resistor and discharge relay are incorporated in the gun, ESS-2000 is capable of generating current with a stable rise independent of applied voltage, making it possible to conduct a reproducible test.
- This simulator provides four operation modes, allowing the operator to conduct a single step testing for the IEC specified test voltages and for a series of stored test settings.
- Controllable from an external computer using various communication interfaces.

SPECIFICATIONS

Output voltage: 0.20 ~ 30.0kV ±5% **Polarity:** Positive or negative

Manual

Charging resistance: 53 M Ω (for combination with TC-815P discharge gun)

Air discharge and contact discharge Discharge mode: Operation mode: IEC severity level Level setting 1, 2, 3, 4

> Discharge interval $0.05 \sim 600.0s$ $1 \sim 60000$ times No. of times of discharge Discharge interval $0.05 \sim 600.0s$

 $1 \sim 60000$ times No. of times of discharge

Setting storage function Up to 10 conditions storable

 $\pm 0.20 \sim 30.0 kV$ Sweep Starting voltage

> $\pm 0.20 \sim 30.0 \text{kV}$ **Ending voltage** Step voltage $0.00 \sim 30.0 \text{kV}$ $0.05 \sim 600.0 \text{ S}$ Discharge interval No. of times of discharge $1 \sim 60000$ times

Setting storage function Up to 10 conditions storable

Program Voltage setting $\pm 0.20 \sim 30.0 kV$

> $0.05 \sim 600.0s$ Discharge interval No. of times of discharge $1 \sim 60000 \text{ times}$ No. of steps 30 steps maximum

No. of programs Up to 50 conditions storable Up to 100 conditions can be set. No. of program units

Temp. and humidity measurement: Current values are displayed

Display element: LCD with back light **Character display:** English or Japanese

Setting method: Ten-key pad, Rotary control, Function keys **Auxiliary function:**

◆Upper limit voltage setting function

◆Trigger switch select function

♦ Auto stop function

♦ Inversion on the screen function

Clock function: Year, month, day, hour, minute (Battery backup)

Memory function: Clock work, contents of each setting and last operation

display are backed up for more than 3 months with battery

full charged.

External interface functions: ◆GP-IB connecting I/F ◆Warning light connecting I/F

◆External trigger input I/F ◆Elimination probe connecting I/F

Printer I/F: Conforming to simple CENTRONIX I/F

Contents of print: ◆ Currently applied voltage/ Current date/ Current temp.

and humidity

♦ Contents of various settings

90 ~ 120 / 200 ~ 240V AC 50/60 Hz **Power supply:**

Operating temperature and humidity: $0 \sim 40^{\circ}C$ 20 ~ 70% (No dewing shall occur.)

Dimensions and weight: ESS-2000 250(W) X 324(H) X 320(D) Approx. 8.0 kg TC-815P 75(W) X 220(H) X 255 (D) Approx. 0.9 kg

(Except a cable)

+22

50%

DISPLAY EXAMPLE

MENU DISPLAY

*MODE DATE 99-02-24 TIME 12:34:56

- 1 **IEC SEVERITY MODE**
- MANUAL MODE
- 3 SWEEP MODE
- 4 PROGRAM MODE

UTILITY

After pressing the main switch, press the mode button. This places the simulator in the initial menu, which displays the four operational modes and utility mode.

The optional temperature/humidity sensor shows the current measured values.

MANUAL MODE

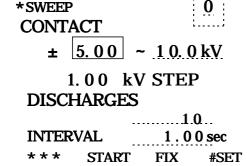
*MANUAL CONTACT +1 0. 0 0 kV DISCHARGES 10 **INTERVAL** 1.00 sec

* * * **START** FIX #SET If you desire to operate the unit in the manual mode, press the corresponding ten-key, 2. Items to be set by the operator will Discharge method (contact/air discharge), discharge voltage, number of discharges and interval can be set. The item in the cursor can be varied by using the ten-key or rotary knob.

Contact discharges: For contact discharge testing, after completion of required settings, press the START button and pull the trigger. The simulator will then generate the required number of pulses at the required interval. Pulling the trigger again will pause the unit. Pulling again will restart the unit.

Air discharges: For air discharge testing, after completion of setting, press the START key. To carry out air discharges, keep pulling the trigger and approach the discharge tip to the EUT. Keep pulling the trigger to maintain the HV relay in the on status.

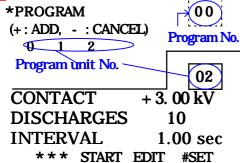
SWEEP MODE



In this mode, the simulator generates discharges in an automatic ramp. Starting, ending and step voltages can be freely set. In this mode, the number of discharges set is that in each step. For example, when the simulator is set to 5kV for start voltage. 10kV for end voltage, 1kV for step voltage, in a way of 10 discharges at an interval of 1 second, it produces 10 pulses at 5kV at an interval of 1 second and proceeds to 6kV pulses, also 10 discharges. These steps continue until the simulator has completed 10 pulses of 10kV.

Two different ways of pulling the trigger: When the trigger is pulled and then released quickly, the simulator operates in a way that it pauses before it proceeds to next step voltage. For continuous operation, pull the trigger for more than 2 seconds. The message of "CONTINUOUS" is indicated on the upper right side of the screen.

PROGRAM MODE



Test settings can be stored for 100 program units. combination of units selected from those 100 units can consist of one test sequence, the longest is up to 30 units. Here we call one test sequence a program. 50 programs can be stored.

For program unit setting, press EDIT button. Settings of voltage, etc. can be done in the same way as the other operation modes. The trigger functions in the same ways as in the sweep mode. When pulled once and released instantly, the simulator operation pauses before it goes to the next program unit. If pulled for than 2 seconds, the simulator operates continuously.

STANDARD ACCESSORIES

♦ Discharge gun Model: TC-815P

◆Discharge electrode Model: 12-00001A and 12-00002A

◆Capacitor unit Model: 06-00014A (150pF)

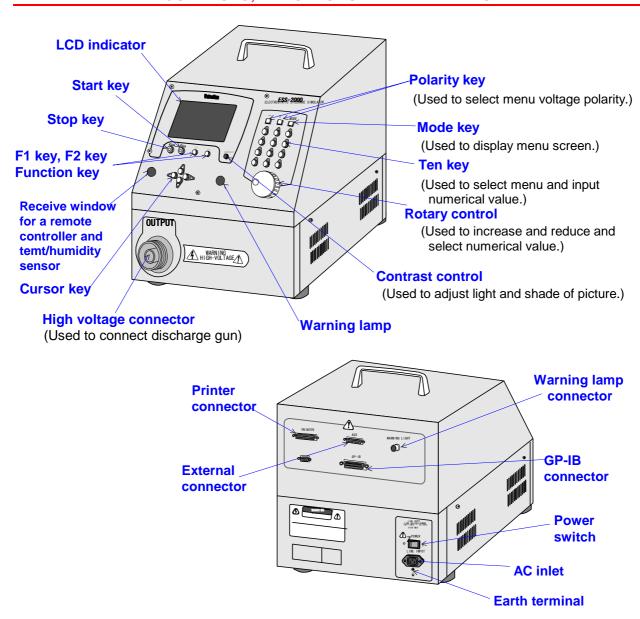
♦AC cord

♦ Discharge resistor (330Ω)

♦ Instruction manual

♦ Accessory bag

CONTROLS, INDICATORS AND TERMINALS



OPTIONS

Options for ESS-2000

◆Tem./humidity sensor Model:07-00016A



◆ Automatic ESD eliminator Model: 01-00013A



♦ Wireless remote controller Model: 08-0006B



◆Gun Holder Model: 03-00040A



The gun holder can be screwed to the left-side panel of the ESS-2000.

♦ Printer Model:16-00001A



Printer cable Model: 05-00005A



Options for TC-815P

◆ Free arm gun stand Model: 03-00022B

Dimensions: (W)18x(H)76x(D)7cm

Weight: Approx.5kg

♦ Gun stand
Model:PS-806
Dimensions:(H)30cm (Diameter)16cm

Weight: Approx. 1.6kg

*) Included accessories for TC-815P

◆Capacitor unit

100pF: Model 06-00013A

150pF: Model 06-00014A*

200pF: Model 06-00015A

250pF: Model 06-00016A

300pF: Model 06-00017A

330pF: Model 06-00032A

400pF: Model 06-00018A

500pF: Model 06-00019A

◆ Discharge resistor 100,150,200,250,300,330*,

400,500, 1k, 1.5k, 2k, 5k, 10k Ω

◆ Discharge electrode

Model:12-00001A*



◆ Fast rise time adapter Model:12-00003A



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