SXESD300
Electrostatic Discharge Generator

Introduction

When airplanes, launchers, or weapon systems fly at high speeds in space, friction with air or accumulation of charged particles in space may generate hundreds of kV of static electricity. During loading or transportation, high-voltage electrostatic discharge may be encountered. If these static electricity are released onto the exposed leads of the fuse's explosive device or onto the circuit connecting the manipulator or related equipment and ammunition, accidental detonation of the explosive device may occur, leading to a series of dangerous situations or weapon misfires. If the electronic components in the fuse are subjected to high voltage, the generator parameters may change or fail, which may affect the electrical performance such as signal processing, timing, arming, and firing.
This electrostatic discharge generator is a specialized generator designed to simulate whether an aircraft or transmitter system can operate safely, reliably, or be damaged after being subjected to very high static electricity in high-speed flight in the sky.
It has a discharge voltage of up to 300kV, in compliance with standards such as MIL-STD-464C, MIL-STD-331D, GJB1389A, GJB573A, etc.

Application

There are two types of ESD devices, one is SXESD30, the other one is SXESD300.
SXESD30 is used for Personnel-borne ESD test.
SXESD300 is used for Helicopter-borne ESD test and High Voltage Corona.

MIL-STD-331D
APPENDIX F

TABLE F1-I. Test Parameters.

Discharge Procedure	Voltage on C (kilovolts)	Capacitor C (picofarads)	Resistance R (ohms)	Discharge Inductance (microhenries)	Calibration Test Load (ohms)
Personnel	+25±5%	500±5%	5000±5%	< 5	1±5%
Personnel	-25±5%	500±5%	5000±5%	< 5	1±5%
Personnel	+25±5%	500±5%	500±5%	< 5	1±5%
Personnel	-25±5%	500±5%	500±5%	< 5	1±5%
Helicopter	+300±5%	1000±10%	1 max *	< 20	100±5%
Helicopter	-300±5%	1000±10%	1 max *	< 20	100±5%

* Total distributed discharge circuit resistance.

Standards

1) MiL-STD-464C Electromagnetic environmental effects requirements for systems
2) MIL-STD-331D Department of Defense Test Method Standard for Fuzes, Ignition Safety Devices and Other Related Components, Environmental and Performances Tests
3) GJB1389A Electromagnetic compatibility requirements for systems
4) GJB573A Fuze environmental and performance test methods

Sedimentation Electrostatic Test

Operation condition

Temperature: -20℃~50℃;
Relative humidity: ≤88%;
Operation: indoor;
Seismic resistance: Grade 8 strength;
No conductive dust, no fire or explosion hazards, and no gas that corrodes metals or insulation.
Requirement of test lab: 10m long *10m wide*10m high (test specimen is not included);

Features

Colorful touch panel for easy operation, user friendly and remote control;
Can perform human body electrostatic discharge test and control supply electrostatic test;
HV non-inductance impulse capacitors are adopted;
Considerate safety measures;
Separate mobile discharge unit;
Accurate and precise current monitor (coil) for measurement

Main Technical Parameters

Impulse capacitor	1000pF
Resistance of test circuit during test	＜1 Ohm
Voltage calibration	100Ω Calibration Test Load; Ratio:1000:1;
Voltage of capacitor	25~360KV
Power supply requirement	AC220V±10%，5kVA (current＞30A), use L1-N
Considerate Safety Measures	1) Automatic grounding system- after each test, the system will automatically be grounded to discharge the energy. 2) Manual earthing rod; 3) Door safety interlock; 4) Alarming system with red light flickering and alarming bell ringing during charging; 5) Emergency stop button- in case of emergency, press this button to stop the system, HV terminal will be grounded automatically.

实验室 300kV 静电试验

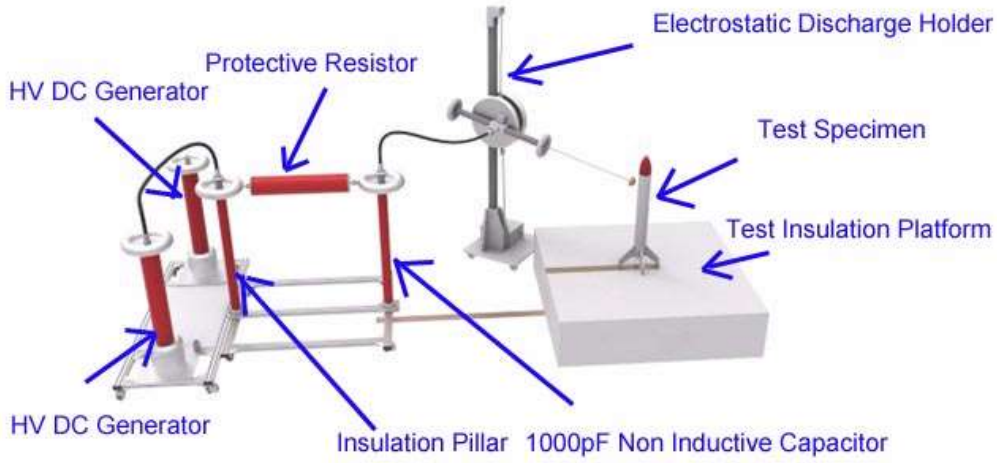
300kV Electrostatic Test

Scope of Supply

	Part Name	Technical Data	Quantity
1	HV DC generator	Output voltage:max.+360kV/-360kV; Output current:10mA continuous, max.15mA; Power:5kVA; Ripple factor:≤3%; Over current protection: max. 10A transient; Protection: over voltage protection, over current protection, voltage loss protection, discharge protection.	2
2	Protective resistor	Resistance:100k Ω; Inductance:30mH; Power:5kW; Function: protect the DC generator in case of over current and test specimen breakdown	1
3	Non-inductive capacitor	Impulse capacitor; Rated voltage:360kV; Rated capacitance:1nF; Structure: epoxy tube with corona ring at the top	1
4	Discharge resistor	Resistance:100 Ω; Non inductive	1
5	Electrostatic discharge	Max. 4m high; Discharge distance:3m;	1

	holder	Discharge sphere: copper; Adjustable range of discharge ball direction: ±60°	
6	Sedimentary charge test holder	Max. 4m high, adjustable height; Discharge distance:3m; Withstand 300kV; With sedimentary charge discharge; Discharge sphere: copper; Adjustable range of discharge ball direction: ±60°	1
7	Manual earthing rod	2m long, max. discharge voltage is 360kV, discharge resistor 100MΩ/0Ω	1
8	MCS2000	10' touch panel, control software, PLC controlled	1
9	iMas3000	Measurement software to analyze the output wave, test report	1
10	Oscilloscope	MDO32-350MHz, 2 channels	1
11	Voltage calibration	100Ω, Calibration Test Load, ratio:1000:1;	1
12	Current acquisition unit	0.01V/A, Max.10kA; With measurement transfer unit, measure and output current wave; With optical fiber transmission system, analog quantity optical acquisition module	1
13	HV DC Volt Meter	Leakage current:0.1mA; Used with 400kV resistive voltage divider for the calibration of charging voltage;	
14	HV DC resistive voltage divider (optional)	Rated voltage:400kV; Structure: epoxy tube with corona ring at the top; Resistance:5GΩ; Measuring accuracy:＜1%	1

Pictures of the Components



HV DC generator

Electrostatic discharge holder

Sedimentary charge test holder

Manual earthing rod with emergency stop button

Control and measurement desk