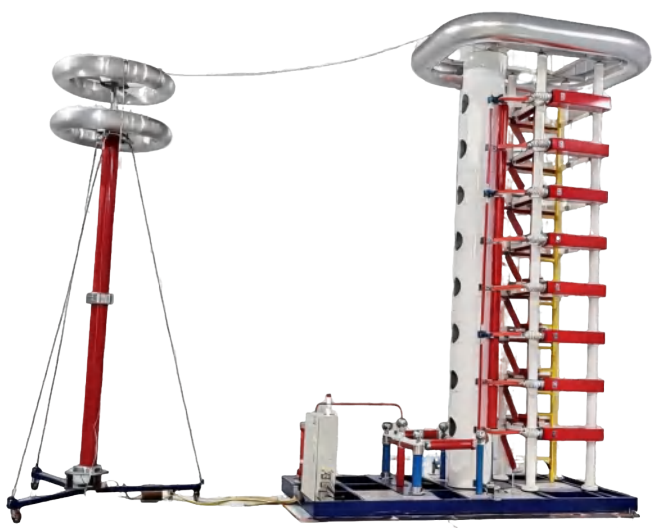
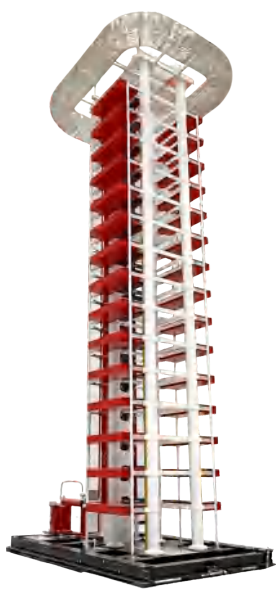
HV Lightning Test System (ABCD)

Introduction

The HV Lightning Test System can perform the below High Voltage Strike Attachment Testing for lightning direct effects as per RTCA DO- 160 Section 23, SAE ARP5416B Section 5, MIL-STD- 464D and SAE- ARP- 5412C Section 6.

- Swept Channel Attachment Test (voltage waveform A).
- High Voltage Streamer Test (voltage waveform B): The test can be used to evaluate possible hazards from corona and streamers which might occur in regions exposed to strong electric fields that can result in antenna degradation, dielectric puncture, or fuel vapor ignition at vent outlets or within non- conductive fuel tanks.
- High Voltage Strike Attachment Test on Models (voltage waveform C and D).
- Initial Leader Attachment Test (voltage waveform D) for wing tips fabricated of nonconducting materials, radomes and large antenna fairings. The purpose of this test is to demonstrate the effectiveness of the lightning protection of exposed dielectric structures, such as radomes. Therefore, this test is normally applicable to parts of aircraft that are located in initial leader attachment regions within Zones 1A and 1B, as described in the ARP5414/ED- 91.





Features

1) Reliable and precise triggering unit by pulse amplifier;
2) Automatic polarity change;
3) Liquid insulation in the impulse capacitors offers optimal environmental compatibility (no PCBs). The impulse capacitors have very low inductance, high quality and long service life;
4) Overvoltage protection, overcurrent protection and fast voltage transients protection;
5) Protective earthing system, earthing rod and emergency button, gate interlock for personnel and equipment safety;
6) Wave shaping resistors are designed for low inductance and connected with handy plugs;
7) Stable and precise communication between the measuring system and control system;
8) The automatic control system is very user- friendly with touch panel;
9) The measuring system can measure the test data, generate and analyse waveforms in the LCD screen;

High Voltage Test Waveforms

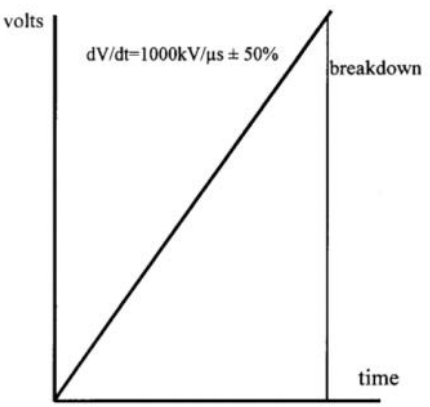


Figure 5 - Voltage Waveform A

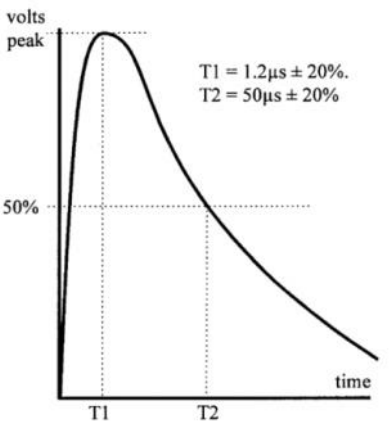


Figure 6 - Voltage Waveform B

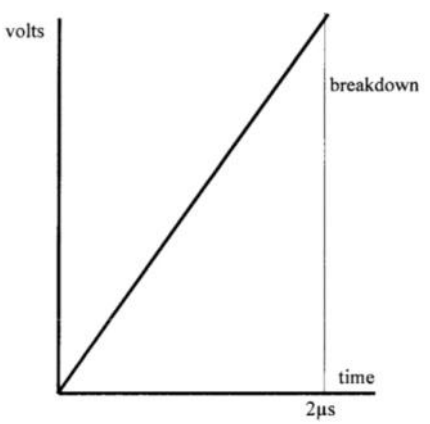


Figure 7 - Voltage Waveform C

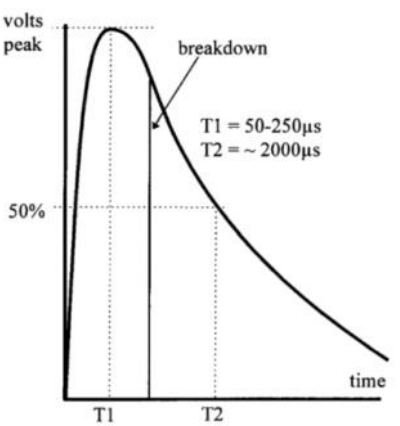


Figure 8 - Voltage Waveform D

• Voltage Waveform A rises at a rate of 1000 kV/μs (±50%) until its increase is interrupted by voltage breakdown of the intervening air gap, resulting in the puncture of, or flashover across, the object under test. At that time, the voltage collapses to zero.
The rate of voltage collapse or the decay time of the voltage if breakdown does not occur (open circuit voltage of a lightning voltage generator) is not specified.

• Voltage Waveform B is a 1.2μs x 50μs waveform, which is the electrical industry standard for impulse dielectric tests. It rises to crest in 1.2μs (±20%) and decays to half of crest amplitude in 50μs (±20%). Time to crest and decay time refer to the open circuit voltage of a lightning voltage generator and assume that the waveform is not limited by puncture or flashover of the object under test.

• Voltage Waveform C is a chopped voltage waveform in which breakdown of the gap between an object under test and the test electrodes occurs at 2μs (±50%). The amplitude of the voltage at time of breakdown and the rate-of-rise of voltage prior to breakdown are not specified.

• Voltage Waveform D is a voltage rising to peak in between 50μs and 250μs with a time to 50% of peak of approximately 2000μs.

Technical Parameters

Model	Rated Voltage (kV)	Total Energy (kJ)	Stage Voltage (kV)	Stage Number
SIVG600/30	600	30	150	4
SIVG800/40	800	40	200	4
SIVG900/45	900	45	150	6
SIVG1200/90	1200	90	200	6
SIVG1600/80	1600	80	200	8
SIVG2400/120	2400	120	200	12
SIVG3000/225	3000	225	200	15
SIVG3600/270	3600	270	200	18
SIVG4800/360	4800	360	200	24

Custom made is available.