Jef Techno Solutions Private Limited.

Lightning Protection

JEF FLASH ESE AIR TERMINAL

Our Vision

To provide a cost effective and technically superior lightning protection for all kinds of structures , buildings etc.

Lightning Phenomena

While the actual wave shape of the lightning current varies from event to event, research shows that a statistical probability can be determined for occurrence of a given wave shape. It is generally designed by a 10 / 350 µs wave. The front time (also known as rise time) is 10 µs duration and the time to decay to 50% is 350 µs.

To design an air-terminal, the main consideration is the minimum value of expected current and the ability of the lightning protection system to intercept these low intensity lightning discharges. As the lightning downward leader approaches the ground or structure, the electric field increases to the point that the ground or structure launches an upward leader that may eventually intercept the downward leader. This is termed the "striking distance". The larger the amount of charge carried by the lightning leader, the greater will be the distance at which this happens. Larger the charge of the leader, larger the resulting lightning current. It is generally accepted that the striking distance r is given by:

$r = 10 I^{2/3}$ Where I is the peak current of the resulting stroke

The above formula shows that it is challenging for an air-terminal to intercept a low intensity lightning discharge than a higher intensity lightning discharge, as the low intensity lightning discharge must approach closer to the air-terminal before the upward leader is launched. To protect the structure against low intensity lightning discharges, generally lightning protection system is designed with Level I protection.

Lightning Protection Methods

The probability of lightning striking the structure to be protected is considerably reduced by the presence of a properly designed capturing device. The capturing devices may consist of any combination of following components:

A) Rods (including free-standing mast) b) Catenary wires C) Meshed conductors D) Early Streamer Emission Air Terminal (ESEAT).

For cases a, b and c, the main disadvantages are, the cost of installation and the total area of protection which is much smaller compared to an Early Streamer Emission Air Terminal (an average of eight to ten times).

Therefore, the most efficient Lightning Protection System is JEF FLASH ESEAT system.

JEF FLASH ESEAT Working Principle

JEF FLASH Early Streamer Emission Air Terminal (ESEAT) Consists of one striking point, emission device, and a connection to the earth electrode through the down-conductors. The area protected by an JEF FLASH ESEAT is determined according to its efficiency . The JEF FLASH ESEAT should be installed at the highest point of the structure to be protected.

A new generation of active lightning protection rod which works based on the principle of electrostatic field and is regarded as the most effective lighting protection system. This new generation (ESE) Early Streamer Emission type Lightning rod works with the principle of increasing the electrostatic field intensity surrounding the rod. JEF FLASH ESEAT becomes active only during an impending lightning strike.

JEF FLASH ESEATs are in accordance to the new NFC 17-102 : 2011 and the UNE 21186 : 2011 standards.

JEF FLASH ESEAT Salient Features

JEF FLASH ESEAT has a corrosion resistant stainless chrome body capable of working in corrosive / hazardous atmosphere. JEF FLASH ESEAT is fully autonomous (no external power supply is required).

Healthiness of JEF FLASH ESEAT can be verified on site, post installation with a dedicated FLASH TESTER which tests the integrity of the electronic circuitry housed inside the stainless steel body.

The JEF FLASH ESEAT has been tested at the Middle East Technical University, one of the reputed institution in Middle east Asia.

JEF FLASH ESEAT comes with a default warranty for 2 years.

It is recommended for all Residential & Commercial Buildings, Schools, Hospitals, Factory structures, base stations, Fuel stations, Airports, Stadiums, Cottages, monuments, solar farms. Even open spaces between the structures / buildings can be protected with JEF FLASH ESEAT.

Radius of Protection

The protection radius of an ESEAT is related to its height (h) relative to the surface to be protected, to its efficiency and to the selected protection level.

$R(h) = \sqrt{2rh - h2 + \Delta(2r + \Delta)}$ for $h \geq 5$ m

Where:
Rp (h) (m) is the protection radius at a given height h;
h (m) is the height of the ESEAT tip over the horizontal plane through the Farthest point of the object to be protected;
r (m) : 20 m for protection level I
30 m for protection level II
45 m for protection level III
60 m for protection level IV

Δ (m) : $\Delta = \Delta t \times 10^6$
Field experience has proved that Δt is equal to the efficiency obtained during the ESEAT evaluation tests

Rp: Protection radius in Mtrs.

Level I	h (m)	2	3	4	5	10
	JEF FLASH-L	31	47	63	79	79
	JEF FLASH-S	23	35	46	58	59

Level II	h (m)	2	3	4	5	10
	JEF FLASH-L	34	52	68	86	88
	JEF FLASH-S	26	39	52	65	67

Level III	h (m)	2	3	4	5	10
	JEF FLASH-L	39	58	78	97	99
	JEF FLASH-S	30	45	60	75	77

Level IV	h (m)	2	3	4	5	10
	JEF FLASH-L	43	64	84	107	109
	JEF FLASH-S	33	50	67	84	87

Model	Capturing End			Anticipated Emission Time
	Diameter	Length	Weight	
JEF FLASH - L	22 mm	600 mm	5.20 Kg	60 µs
JEF FLASH - S	22 mm	420 mm	4.30 Kg	28 (40 µs)

JEF ECO SAFE

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21 Years Service to the industry

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