

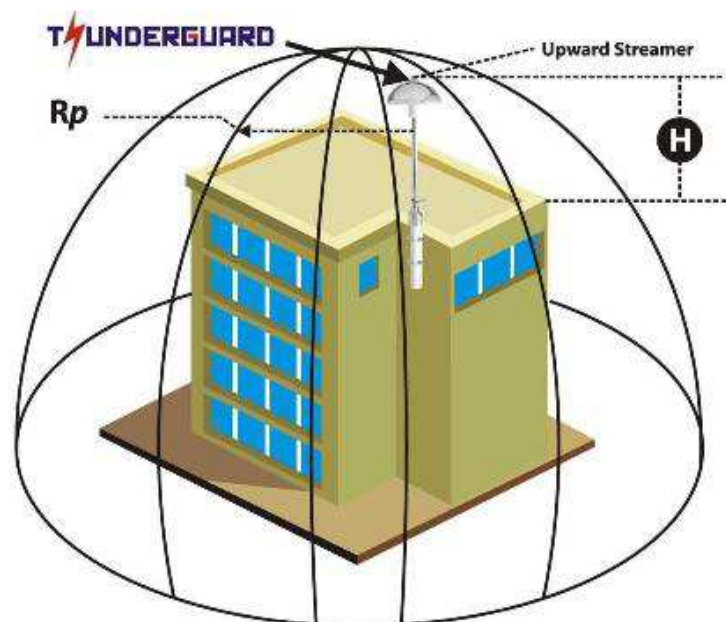
## The ESE Principle

The Principle of operation for ESE terminals is to create an upward propagating streamer earlier than conventional air terminals or other objects on the earth. Thunderguard does this by collecting and storing ground charge during the initial phase of a thunderstorm development.

Once a thunderstorm begins creating downward step leaders, the ambient electric field intensity in the area of the ESE terminal increases. When this electric field intensifies, it triggers the terminal to release the stored ground charge, forming an upward streamer microseconds earlier than other objects in the immediate area.

This development of an upward streamer earlier in time and space ensures that the Thunderguard ESE Terminal will be target of the developing lightning strike. The selection of the Thunderguard model, placement, and mounting height above the protected area all factor into formulas calculating the dimensions of the protection area.

The standard protection radius  $R$  of the Thunderguard is linked (according to NF C 17-102 standard) to  $\Delta T$ , to the protection levels I, II, III or IV and to the height of the Thunderguard above the protected structure ( $H$ , defined by NF C 17-102 as a minimum of 2 m). The NF C 17-102 standard includes four levels of protection. The protection radii of different models of Thunderguard are given in the table. Our experts will suggest the most suitable model after conducting a site survey.



## Lightning Event Counter

The lightning event counter is designed to keep a record of all direct lightning strikes on the external lightning protection system. The digital display (6 digits) allows a direct and comfortable reading of the number of lightning events. It requires no external power supply and functions on a lithium battery. Suitable for use with both ESE terminals and conventional lightning protection systems.

### Specifications

- Current Sensitivity : 3kA nom. for 8/20us impulse.
- Operating range : 3kA min, >150kA max
- Display : Resettable 6 digit LCD counter 8mm numerals.
- Power source : Lithium battery 10 years life.
- Dimensions : 110mm (w) x 80mm (h) x 66.5mm (d).
- Mounting : 90mm x 60mm x M4.
- Weight : 0.2kg.

Protection Areas

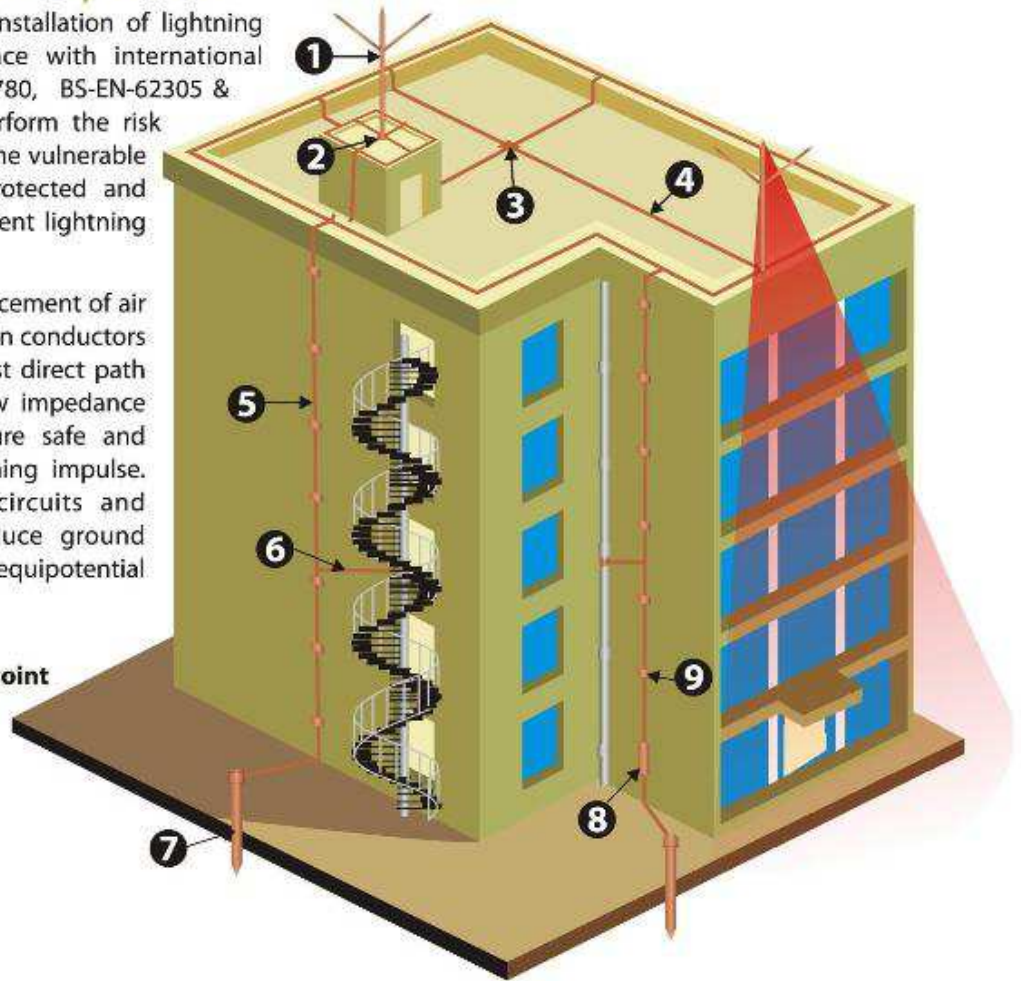
	H(m)	TG-100	TG-20	TG-300
Level I	2	15	25	32
	3	23	37	48
	4	31	50	65
	5	39	62	80
	6	40	62	80
	8	40	63	80
	10	41	63	80
Level II	2	18	28	38
	3	26	42	55
	4	36	55	74
	5	45	69	89
	6	47	69	90
	8	47	70	90
	10	48	71	91
Level III	2	21	32	42
	3	31	48	62
	4	42	63	82
	5	54	80	99
	6	54	80	99
	8	56	81	100
	10	57	82	100
Level IV	2	24	36	45
	3	35	52	65
	4	49	71	87
	5	61	88	108
	6	62	89	108
	8	63	90	109
	10	65	91	110

## Lightning Protection System

We undertake design, supply & installation of lightning protection systems in compliance with international standards like IEC-62305 & NFPA-780, BS-EN-62305 & IS-2309. Our team of experts perform the risk assessment studies to determine the vulnerable areas of the structure to be protected and accordingly design the most efficient lightning protection scheme.

This ensures the most effective placement of air terminations on the structure. Down conductors are positioned to provide the most direct path from the air termination to a low impedance grounding system, to help ensure safe and effective dissipation of the lightning impulse. Equipotential bonding of all circuits and conductors is necessary to reduce ground potential differences and to limit equipotential damage.

1. Air Terminal with multi-point
2. Air Terminal base
3. Square Clamp
4. Copper or G.I. Mesh
5. Downconductor
6. Bonding to staircase
7. Earthing Rod
8. Oblong test clamp
9. DC Tape Clip



### Material Specifications:

#### TAPER POINTED AIR RODS

Air termination network is the point of connection of Lightning Strike to the Protection System. These can be used with or without multipoint, however researches conducted in this regard suggest use of multiple points with taper air rods are more effective than only taper air rods.

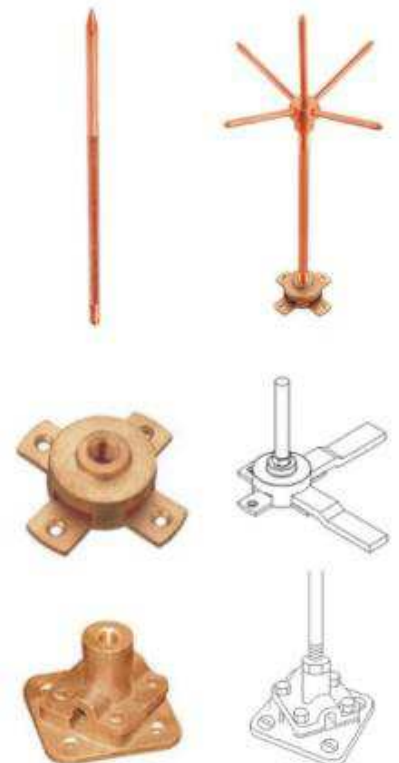
The Taper Pointed Air Rods on one side have taper of less than 5 deg. for a perfect taper fit with multiple and on the other side has suitable threads for fixing into terminal Base, Flat Saddle, Ridge Saddle, Air Rod Base, Rod Brackets and Air Rod Couplings.

#### AIR TERMINAL BASE - TAPE

These are used for fixing air rods onto the flat roof surfaces and to accommodate tape for the protection system. The threads are suitable for air rods.

#### Flat Saddle - Type 'C'

These are used for fixing air rods onto the flat roof surfaces and to accommodate circular conductors and Cables to the protection system. The threads are suitable for air rods.



# Thunderguard

## Early Streamer Emission (ESE) System

The THUNDERGUARD, Early Streamer Emission Systems (ESE) has a larger protection radius when compared to a conventional Franklin rod. The THUNDERGUARD ESE TERMINAL produces an upward streamer quicker than conventional air terminals and attaches the downward leader of the lightning strike in mid air, before it strikes any other object in the vicinity and safely conducts the lightning current to the ground via the down-conductor and the earthing system.

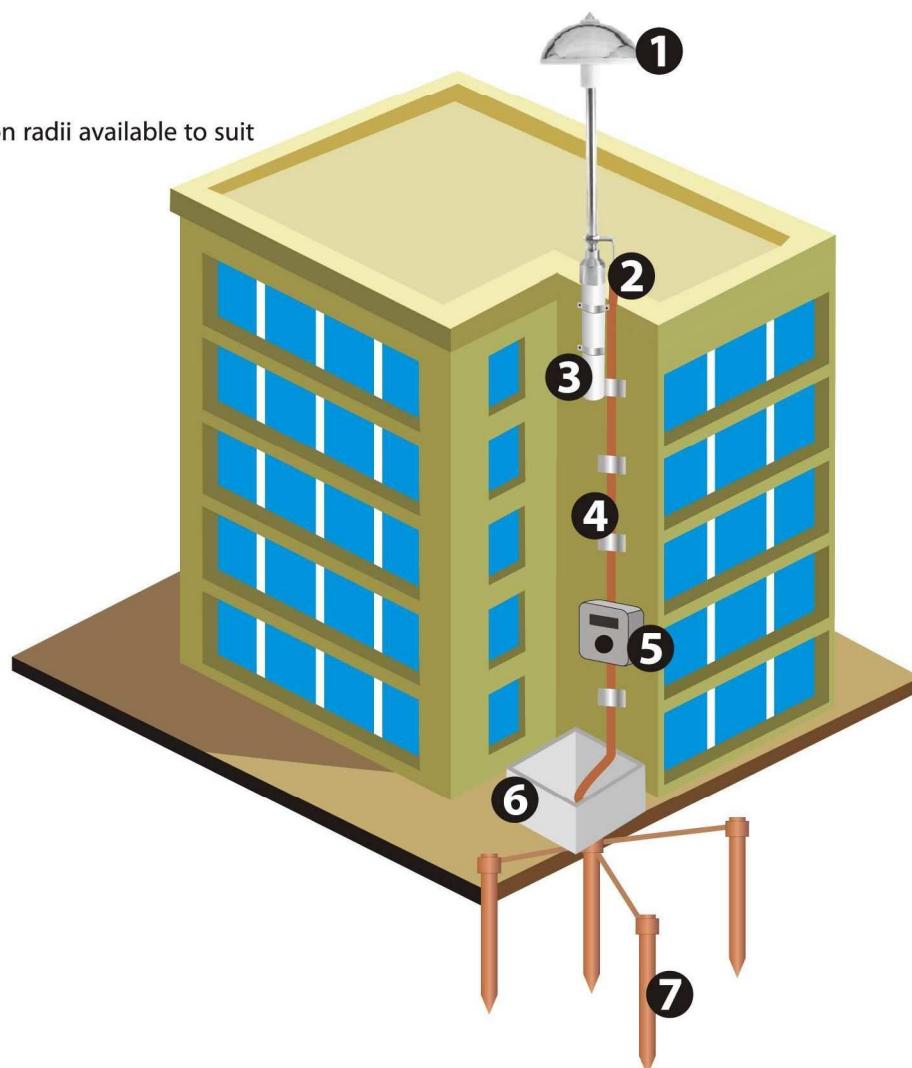
Just before the lightning strike, THUNDERGUARD senses the rapid change in the ambient electric field and produces high voltage pulses that ionises the air particles around the device, generating an upward streamer that intercepts the downward leader of the lightning strike.

### Specifications & Standards

- Full compliance with French Standard NF C17-102.
- Outer body made of non-corrosive XL 304 stainless steel making the system fully resistant to dynamic power surging and effects of acid rain caused by lightning discharge.
- Capturing rod diameter : 25mm
- Atmospheric Area Force : 5 – 200 Kv/m
- Lightning Conductor weight : 6.2 Kg
- Different models with various protection radii available to suit the application.



**THUNDERGUARD**



- 1 Thunderguard ESE Terminal
- 2 In-line Coupling
- 3 Metallic Lower Mast
- 4 Downconductor Saddle
- 5 Lightning Event Counter
- 6 Inspection Pit
- 7 Ground Rods