



Veraizen Earthing

Earthing Solutions

**Everything about lightning
and lightning protection systems**



CONTENT

1. INTRODUCTION TO VERAIZEN EARTHING

2. ESSENTIALS OF LIGHTNING PROTECTION

3. HOW TO INSTALL ?

4. APPLICATION FIELDS

5. LIGHTNING STRIKE COUNTERS & TESTERS



Introduction to **Veraizen Earthing**

ESE LIGHTNING ARRESTER DIGITAL LIGHTNING STRIKE COUNTER

ABOUT US

This is Veraizen Earthing Pvt. Ltd., It makes us proud that the success we have earned over the years has grown exponentially. We owe this success to our products that blend high quality materials with the most advanced technologies and write about the industry. Keep reading to learn more and contact us if you have questions about what we can offer you.

Lightning Protection Systems Installation and Commitments, - Active Lightning Rod Manufacturing, - Chemical Earthing Electrode - Grounding Systems Earthing Pit Cover, G.I. Earthing Strip, Copper Earthing Strip, of Special Productions.

Veraizen is a trust brand that has transferred its 5 years of experience to its products and has been able to protect its friends until today with lightning protection systems products without compromising its quality.

Our main goal is to provide and supply the product you need at a more affordable cost under all conditions, and to provide conscious choices by analyzing the material alloy and size with an academic understanding. In this context, we fulfill all options and requirements within the awareness of its expertise and the responsibility of this information. In this direction, Veraizen has found its place in the market with a new understanding with its expert staff, despite existing lightning rod suppliers. We work based on information for you and offer alternatives suitable for the hyper-competitive environment.

Where Do We Get Our Power? As Veraizen family, we know that the quality and original service we provide has turned into a power for us with the satisfaction of our customer's. We see the trust and satisfaction of our friends as the greatest gateway to gain new friends, and we are resolutely advancing our work in this direction. Loving people and serving people is an art.

We want to share this art with you, to be a business that offers the most reliable products in this industry, at the best quality, at the lowest cost and with the highest service.



Our Business Philosophy

Our Business Philosophy

CUSTOMER CARE

Veraizen cares and always works to create solutions about our customers' needs and providing perfect solutions to their problems, taking into account respect, kindness, quality, opportunity and excellence.

R&D

According to our R&D policy we put a particular and significant amount of investment for research and development. Our R&D department consists of a multi-disciplinary team of engineers, physicists, installers and chemists.

Environment commitment and responsibility

As a company, registered ISO 9001: 2015 and all our products and services are completely provided according to this Environmental Management System. We care about the environment and sustainability as well as our customers' needs.

DESTRUCTIVE EFFECTS OF LIGHTNING STRIKES



01

Electrical effects: equipment destruction

Surpluses in ground voltage and surges can damage all the equipment connected to the electrical network.

02

Electrodynamical effects: damage to buildings

Deformation and breakages may occur in the structure due to the force generated by the high magnetic field produced.

03

Thermal effects: fires

Sparks and heat dissipation produced by the Joule effect can even cause fires.

04

Effects on people and animals: electrocution and burns

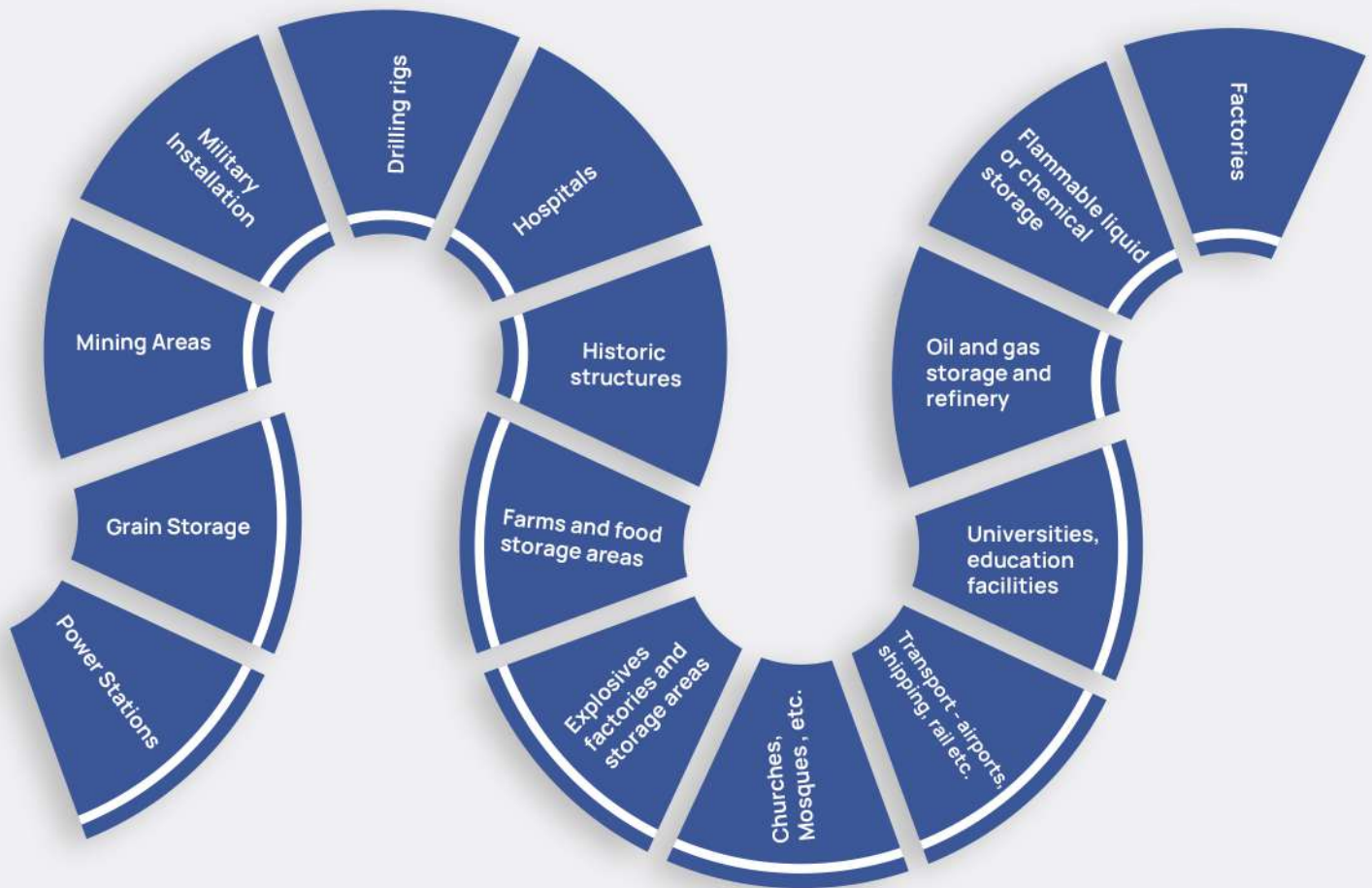
Current of a certain intensity passing through the body for a short duration is enough to cause the risk of electrocution due to cardiac or respiratory arrest as well as burning risks.

05

Inductive effects

Within a variable electromagnetic field, induced currents appear in every conductor. If these conductors reach computers or other electronic equipment, irreversible damage.

Where are the Highest Risks?



Following areas and buildings are highly recommended to install a proper Lightning protection installations:



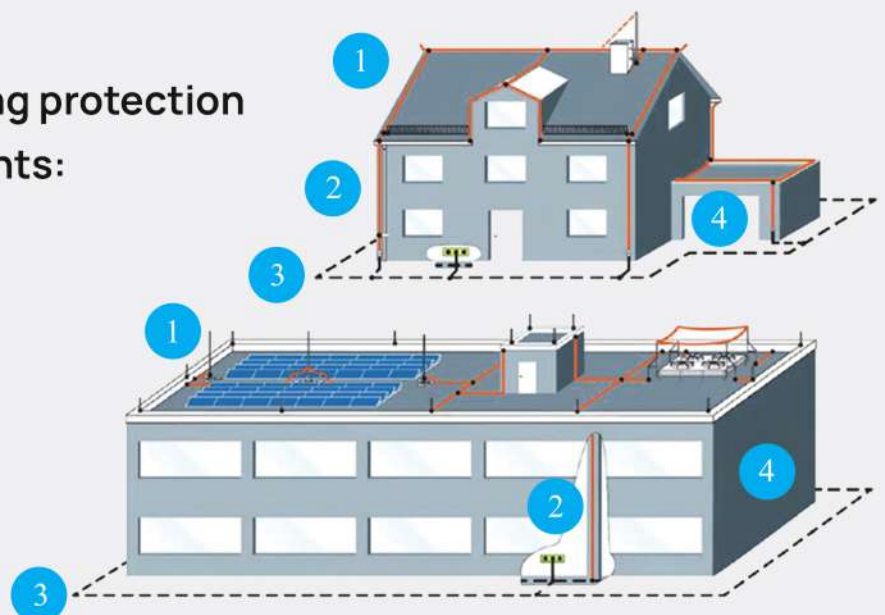
A complete lightning protection system has four basic objectives:

- 01 To capture the lightning strike at the earliest time.
- 02 To conduct lightning current safely into the earth.
- 03 To dissipate the lightning current in the ground.
- 04 To provide protection against the secondary effects of lightning

In a world where buildings and equipment are getting more and more complex every day, lightning is getting become a more constant hazard as well. Only one discharge can damage buildings and cause failures in electronical equipments. It can even provoke fire, health problems, casualties and lead to serious economical losses.

A standard external lightning protection system consists of 4 elements:

- 1 Air termination system
- 2 Earthing/Bonding
- 3 Earth termination system
- 4 Complementary care



ESE Lightning Terminals

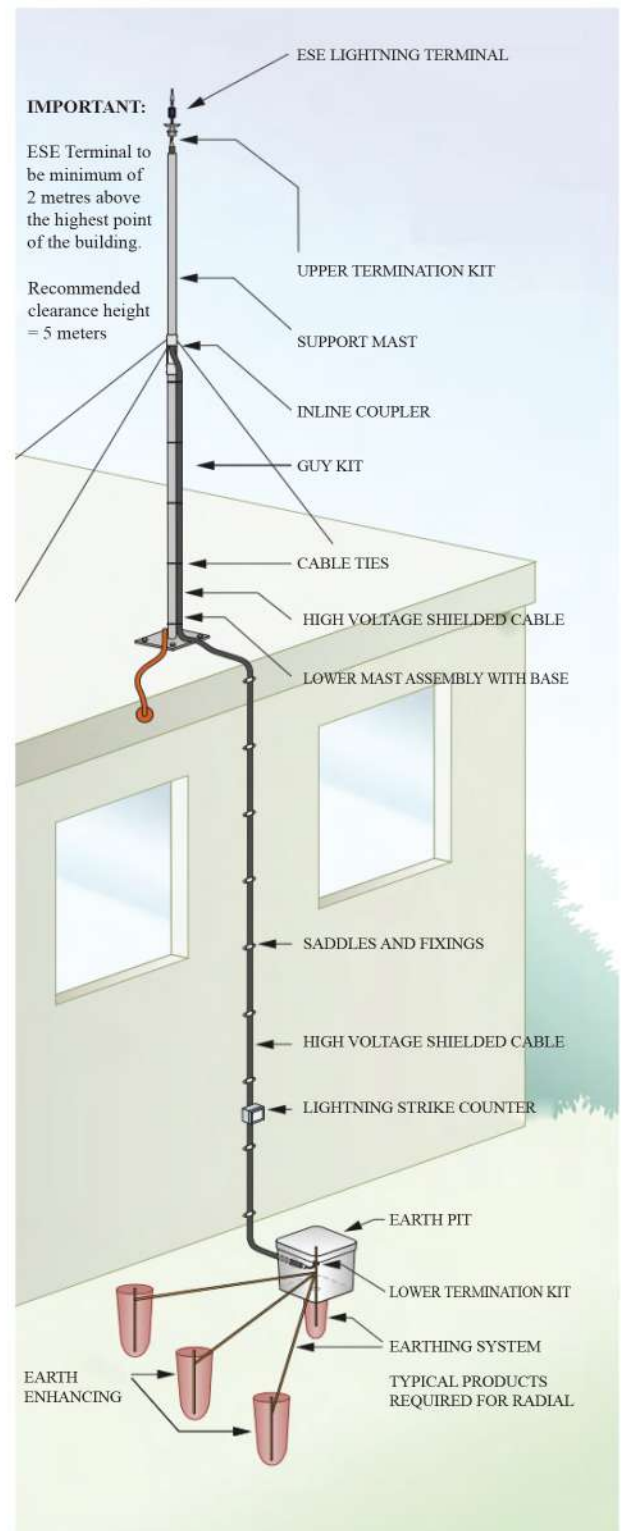
The main feature of Early Streamer Emission (ESE) lightning terminals is the generation of the constant upward IONs spreading before any other object within its protected area. Regarded standards define this characteristics using a parameter called Advance time (ΔT): "Difference expressed in microseconds between the emission time of an Early Streamer Emission lightning terminal and a simple rod; lightning terminal measured in a laboratory under the conditions defined in the reference standard such as NFC 17-102/2011.

Down-Conducting

Down-conductors should have a cross-section of at least 50 mm². Since lightning current needs to be driven, flat conductors (tape) are preferable to round conductors as they have a larger exterior surface area for the same amount of material. Tin-plated copper is recommended due to its physical, mechanical and electrical characteristics (conductivity, malleability, corrosion resistance and so on). Down-conductors should be protected by installing guard tubes up to a height of 2 m above ground level.

Earthing

Each down-conductor must have an earth termination system. Earth termination systems should be located outside the building, except where this is absolutely impossible. The resistance of the earth termination system measured by conventional means must be lower than 10 Ω , when separated from other conductive elements.



Disclaimer

1. Application detail, illustrations and schematic drawings are representative only and should be used as guides.
2. It should be noted that 100% protection for direct strike lightning, lightning detection and surge and transient protection equipment is not possible and cannot be provided due to the lightning discharge process being a natural atmospheric event.



Telecommunications

Protecting metal and thus conductive structures is essential to prevent loss of service and loss of life.



Hotels & high rise buildings

Such buildings and high-rise structures must be prepared for the probable effects of lightning strikes and surges and to protect the people in them.



Solar panels

Solar panels are assumed as 100% vulnerable to any Lightning strikes. Investors and governments itself generally decide to protect their full plants under a reliable Lightning protection systems.



Wind Farms

Orbital advance systems help to minimise the risk of lightning surges on wind turbines.



Nuclear plants

At high-risk facilities such as nuclear plants, having strict safety standards and rules has to be adhered to prevent severe consequences to the environment and people.



Sports complexes

At a time, thousands of people gathering in a stadium needs a serious protection. Such a complex without a Lightning protection system may mean a loss of hundreds of people life.



Electricity manufacturing companies

To prevent possible incidents, wide open areas where large numbers of people to gather needs a specific safety systems.



Gas & petroleum facilities

Metal components structures make these facilities more dangerous to lightning strikes and surges. A lightning strike could be hazardous for the general public after such a possible accident.



Industrial areas

Protecting machinery and production equipments is vital for such buildings. Any Lightning accident may cause halt of production for long periods.



Electricity manufacturing companies

Delicate structures of such facilities endure a vast number of lightning strikes. Reducing the effects is key to maintaining the efficient service



Airports

Lightning protection system installation is essential to protect the safety of thousands passengers and flight safety.

Digital Lightning Strike Counter



ESE LIGHTNING ARESTER

General descriptions

Early Streamer Emission (ESE) lightning terminal can anticipate all other elements and items within its protectable range according to its protection level radius by intercepting the lightning strikes and conducting these strikes into the earth through the safest and projected ways. ESE Terminal work as to principle of creating IONS by its internal ION GENERATION channels. This structure itself allows the terminal to conduct the high voltage lightning strikes, even up to 200kA, to the earthing system then to the earth at the safest way.

Technical Characteristics

Model	Sigmantech
Weight	2.20 kg
Ext. Diameter	173mm
Lenght (h)	62cm
Box Lenght	64cm
Rod Diameter	20 mm
Adapter Diameter	66 mm Male
IP Code	IP 67
Working Temperature	-25°C / 90°C
Type of Terminal	Electroatmospheric
Internal Insulation	High Density Polyurethane Resin
Standard	NFC 17-102/2011
Grounding Method	Wire/Tape
Max. Current Withstand (10/350µs) / >2.5 MJ/Ω	200kA
Advance Time (ΔT)	60 µs.

High voltage impulse emitter
ION GENERATOR unit
Completely autonomous
Testable with Testers
30% more efficient than passive systems
Fully compatible with the standards
Electroatmospheric capacitor-inside
20 years manufacturer warranty

ESE Lightning Terminal is exclusively suitable to install for high-rise buildings, airports, naval bases, open areas, critical military zones, stadiums and highways.

Protection Level

Height(m)	Protection Radius(m)			
	Level 1	Level 2	Level 3	Level 4
2	32	34	39	43
3	47	52	58	64
4	63	69	78	86
5	79	86	97	107
7	79	87	98	108
9	79	88	99	109
10	79	88	99	109



for Drawing



for NFC Test Report



Lightning Protection Calculation Report

Dual Sigmatech ESE Arrester Coverage Analysis | Standard NFC 17-102

Equipment Model:	Sigmattech ESE Lightning Arrester ($\Delta T = 60 \mu s$)	Installation Height (h):	15 Meters
Configuration:	2 Arresters spaced 90 Meters apart	Compliance Standard:	NFC 17-102 / 2011

1. Calculation Methodology & Standard Formula

Per NFC 17-102 specifications, the protection radius R_p for an Early Streamer Emission (ESE) terminal installed at height $h \geq 5 \text{ m}$ is calculated as:

$$R_p = \sqrt{[h(2D - h) + \Delta L(2D + \Delta L)]}$$

Where:

- h = Installation height above the area to be protected = **15 m**
- D = Rolling sphere radius according to selected Protection Level (Level I: 20m, Level II: 30m, Level III: 45m, Level IV: 60m)
- ΔL = Gain in sparkover distance = $v \times \Delta T = 1 \text{ m}/\mu s \times 60 \mu s = 60 \text{ m}$

2. Protection Radius by Protection Level (at h = 15m)

Protection Level	Sphere Radius (D)	Single Arrester Radius (R_p)	Total Combined Span	Overlap Between Arresters	Coverage Status
Level 1 (Highest Risk)	20 m	79 m	248 m	68 m	100% Continuous
Level 2 (High Risk)	30 m	88 m	266 m	86 m	100% Continuous
Level 3 (Standard Risk)	45 m	99 m	288 m	108 m	100% Continuous
Level 4 (Basic Risk)	60 m	109 m	308 m	128 m	100% Continuous

3. Spatial Coverage & Redundancy Analysis

Key Technical Conclusions:

- Zero Gap Coverage:** Because the minimum single arrester protection radius (at Level 1) is **79 meters**, each arrester covers a total diameter of 158 meters. Fixed 90 meters apart, there is a minimum continuous overlap of **68 meters** between the two units.

- **Total Protected Corridor:** The dual-arrester setup covers a continuous linear corridor ranging from **248 meters** (Level 1) up to **308 meters** (Level 4).
- **Conclusion:** The proposed spacing of 90m at a height of 15m provides 100% continuous, overlap-protected coverage across all NFC 17-102 protection levels.