Lightning
Protection
Systems

PROINEX
LIGHTNING PROTECTION

ESE Lightning Rod

EOS-34®

A unique and effective system for protection against lightning in all types of environments.

PROINEX
LIGHTNING PROTECTION

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At Proinex we design, manufacture and sale products for integral lightning protection, earthing systems and protection against transient voltage spikes

EOS-34 ESE Lightning Rod (EARLY STREAMER EMISSION) offers protection to structures within fire and explosion risk environments (ATEX) and/or located in high lightning risk areas such as telecommunication towers, radar, structures in mountain areas, etc.

It’s equipped with an ion emitter and a polarizes particle accelerator.

NO MAINTENANCE REQUIRED

Patented

Test Certificate Nº 8532

100% Stainless Steel

Without electronic components

10-Year Warranty

Coverage Radius Table According To Level Of Protection

NPCR I		NPCR II		NPCR III		NPCR IV	
ΔH (feet)	Rp (feet)	ΔH (feet)	Rp (feet)	ΔH (feet)	Rp (feet)	ΔH (feet)	Rp (feet)
16.4	190.3	16.4	213.2	16.4	246.1	16.4	275.6
32.8	193.6	32.8	219.8	32.8	255.9	32.8	285.4
49.2	196.8	49.2	223.1	49.2	262.5	49.2	291.9
65.6	196.8	65.6	226.4	65.6	265.7	65.6	301.8
82.0	196.8	82.0	229.7	82.0	272.3	82.0	308.4
98.4	193.6	98.4	229.7	98.4	275.6	98.4	311.7
114.8	190.3	114.8	229.7	114.8	275.6	114.8	318.2
131.2	187.0	131.2	226.4	131.2	278.9	131.2	321.5
147.6	173.9	147.6	223.1	147.6	278.9	147.6	324.8
164.0	170.6	164.0	219.8	164.0	278.9	164.0	328.1
180.4	157.5	180.4	213.3	180.4	275.6	180.4	328.1
196.9	147.6	196.9	200.1	196.9	275.6	196.9	328.1

Calculation Of Protected Areas

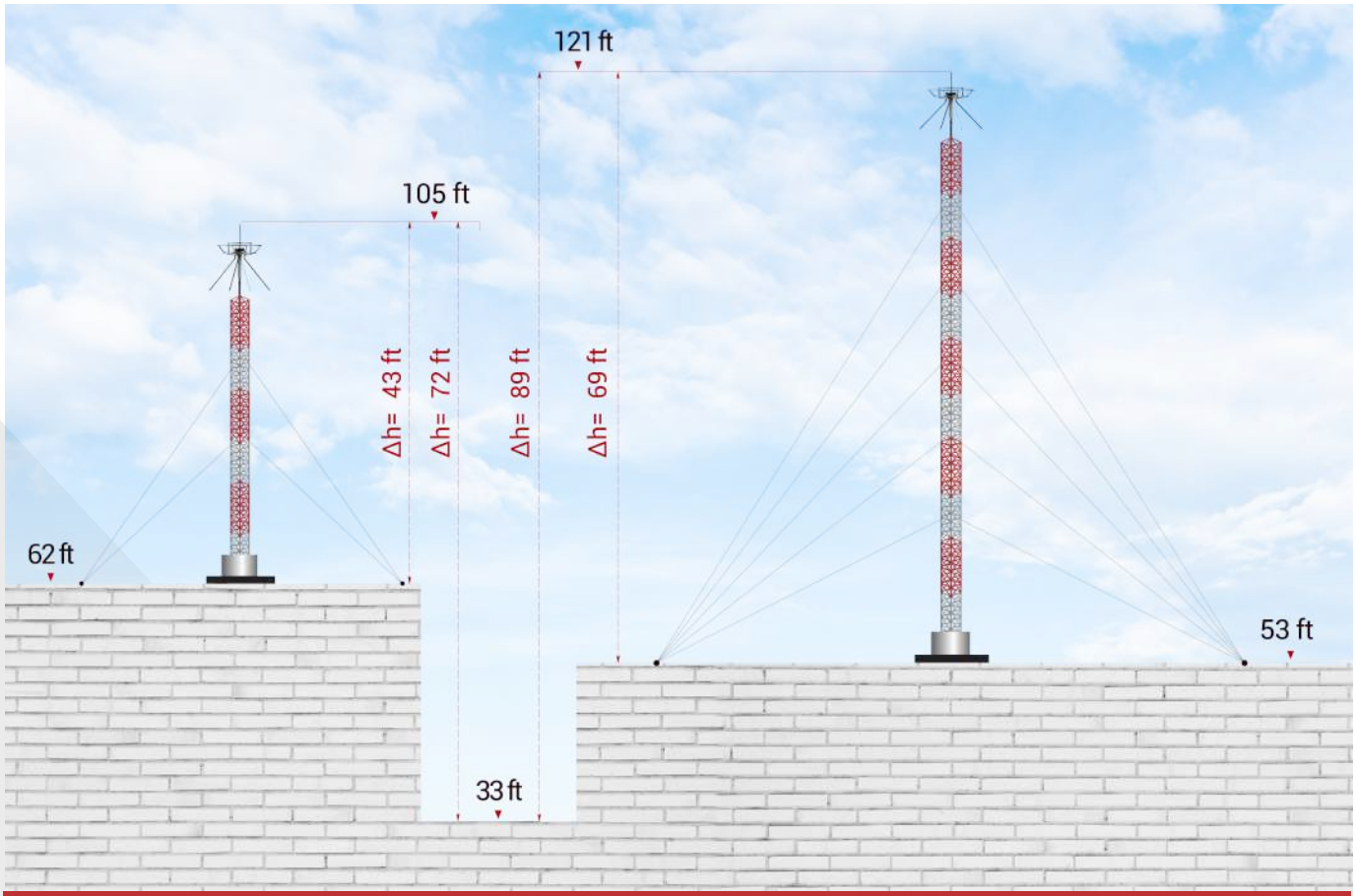
Stage 1

1. Determine the different heights based on cuts in the area to be protected.
2. Adopt a tentative height for the lightning rod.
3. Calculate the different values of Delta H between the lightning rod and the area to be protected.

Stage 2

1. Based on the differences in heights and the Coverage Radius Table, the last step would be to determine the protected areas on a floor plan.

Important: consider raising or relocating the already located lightning rod for unprotected areas before deciding to place a second lightning rod.

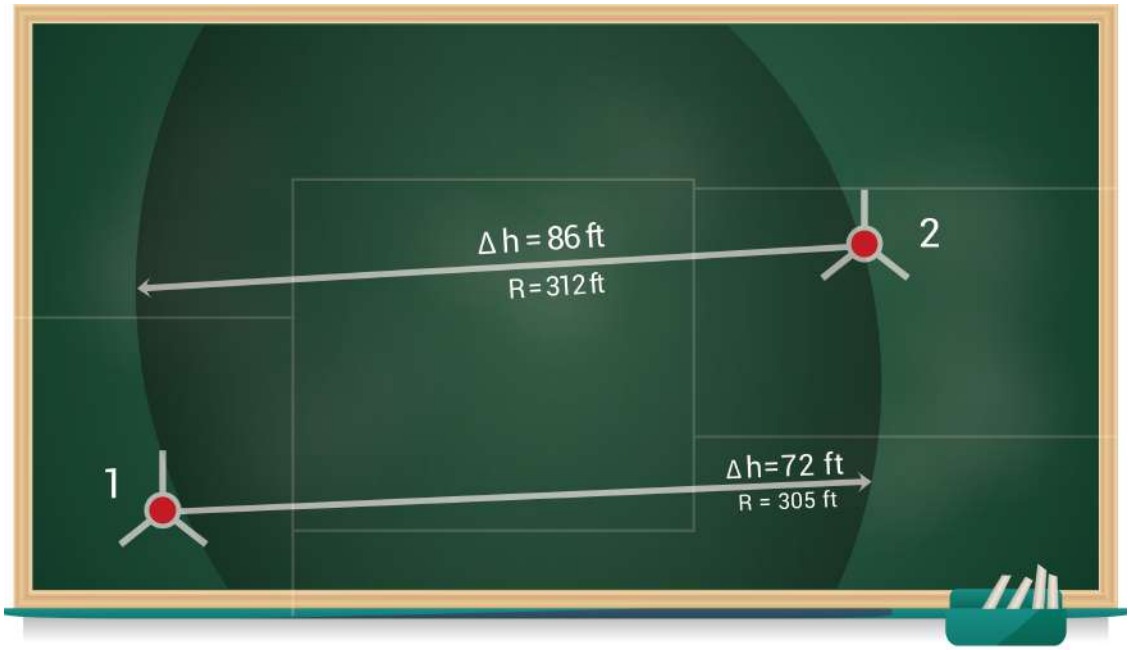


Delta H: is the height from the tip of the EOS-34® ESE Lightning Rod to the upper horizontal surface of the plane to be protected, (see protection radius in the attached graph).

How Can Security Be Increased?

Risk is a probability.

When two areas overlap in the case of the same level of risk, as in the figure below, the risk of both being pierced by lightning is obtained as a product of both probabilities.



If the risk of each area is 1%, then the risk of both areas overlapping is 0.01 x 0.01= 0.0001.

SECURITY IS INCREASED

Rp: protection radius according to the height delta "Δh" and the NPCR.

NOTE: Rp values rounded to the nearest 3.3 ft.

Constituent Parts Of The EOS-34® ESE Lightning Rod

FRANKLIN TIP

It is the classic captor invented by Benjamin Franklin.

With the lowering and dispersing of the earth, it constitutes the external protection subsystem of a modern system.

THE ISSUERS

They capture the field voltage in the air in a state below the Franklin tip by means of four probes directed downwards and outwards, in order to take a significant potential with respect to the Franklin's tip which is at ground potential.

Each probe is equipped with an insulator that separates it from the Franklin tip to limit the corona effect and to polarize the metal plate with several tips arranged around the same plate.

In this way, the tips of the metal plate are polarized at different potential with respect to the Franklin tip: the equipotential curve at the distance between both and the field generated by the advancing tracer.

In addition, the tips of the metal plate are polarized at different potential with respect to the tip of the probe: if we work under the electrogeometric model, it differs from the previous one by a positive amount due to the difference in height of the field, say 15kv since it is 5 feet high and, say 100kv since the separation of the downstream is about 1 foot, if we assume that the lightning rod is at a height of 98 feet.

The result is that the tips have, at the time we are considering it, about 80-85 kv electropositive with respect to the air around them.

This voltage causes currents to be released from some microamperes (as Scholand elegantly proved in his cut tree experiment) delivering the supply of ions that, in other devices, is sought with external sources of energy limited by the potential of the source.

In the case of the EOS-34® ESE Lightning Rod, the potential difference increases as the step tracer advances and the ion supply increases proportionally or exponentially, i.e. it depends solely on the electric field, which has no limits.

THE ION ACCELERATOR

It consists of a concentric ring with a Franklin tip that has two purposes:

1. To accelerate the ions delivered by the emitter so that they acquire such a speed that they are deflected by the wind that circulates around the Franklin point in times of storm.

If this was to happen, as the ions used to reduce the dielectric strength of the air are swept away, we would have a simple Franklin tip, without the increase in firing speed needed to extend its protection zone.

2. To achieve such an acceleration of the speed of the ions that the limit of the Townsend zone is exceeded, multiplying exponentially the amount of ions surrounding the Franklin tip.

OVERALL FUNCTIONING

The existence of a cloud that is between six and ten thousand feet high above the ground generates by induction in the ground an image charge of opposite polarity to that of its base.

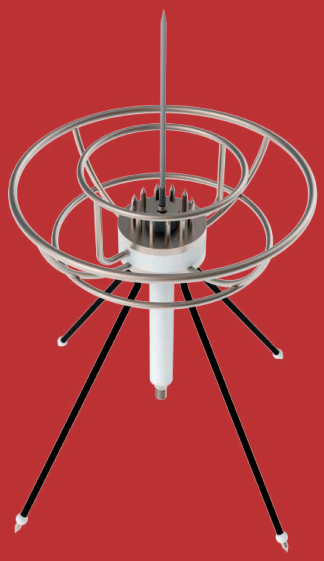
Between both charges there is a potential difference that varies between 100 and 1000 megavolts which produces an electrostatic field in which the lightning rod is immersed.

In the electrogeometric model (to which most rays respond) the base of the cloud has negative polarity and the ground positive.

This generates a field called "bad weather field" (which reaches a gradient of 30kv/m) which is the one that puts the device we have just described into operation.

When the downward step tracer is produced from the cloud, since its heart (or core) is a perfect conductor and at its tip it carries the cloud's potential, as it approaches the ground it increases the gradient around the EOS-34® ESE Lightning Rod.

What Makes The EOS-34® ESE Lightning Rod Different?



01 ENERGY

Our patent is based on taking energy from the electrostatic field generated by the storm cloud and the step tracer.

The electrostatic field is generated downwards from the cloud.

As it advances towards the earth it generates an increase in the gradient of the environment in which our EOS-34® ESE Lightning Rod is located.

02 NO LIMITS

As the ionization (priming) of the EOS-34® ESE Lightning Rod depends on the electric field formed at the time of the storm, this system has no limits to act, unlike other sensors that have priming electronics and need to reach a certain value for their performance.

It does not need maintenance because it does NOT have any electronic components (semiconductors, transistors, diodes, etc.) and this makes the lightning rod the most reliable on the market.

Tests According to IRAM 2426 y 2226 Norm, French NFC17-102 Norm & Spanish AENOR UNE 21186:1996 Norm

Proinex EOS-34® ESE Lightning Rod is manufactured according to IRAM (Argentine Central Organization for the technical and scientific study of standards) 2426:2002 and its international predecesor: French AFNOR:NFC 17-102:1995 Norm and Spanish AENOR UNE 21186:1996 (all currently in force).

The EOS-34® ESE Lightning Rods have their test certificates in high voltage laboratories accrediting that this type of tests were performed, according to IRAM 2426:2002/2016 standards.

Technical Specifications

- **Material: 100% Stainless Steel**
- **Length: 27.5 in**
- **Crown diameter: 16.1 in**
- **Probe length: 25.6 in**
- **Diameter with mounted electrodes: 22.4 in**

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CALL US NOW!

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