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Product
Introduction

Early Streamer Emission (ESE) Lightning Protection System

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EARLY STREAMER EMISSION (ESE) LIGHTNING PROTECTION SYSTEM

The ASLA range of Early Streamer Emission (ESE) Lightning Arresters offer a safe and reliable system to protect your building or solar project from direct lightning strikes. The ESE Lightning Arresters, also known as Active Lightning Arresters, provide an enhanced Radius of Protection, reducing the number of Lightning Arresters and down conductors needed for your building or solar project while still providing complete protection.

Axis Smart Lightning Arrester (ASLA)

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Why use Axis Smart Lightning Arrester?

1. ASLA complies with International Standards (NFC 17–102 and IEC 62305), ensuring safety for your structure.

2. Using a single Smart Lightning Arrester, your protection radius is extended in comparison to conventional systems.

3. Installation is simple since one ASLA replaces multiple conventional lightning arresters.

How does an Early Streamer Emission (ESE) Lightning Arrester work?

The objective of the ASLA range of Lightning Arresters is to become the point of discharge for the lightning bolt, instead of the bolt hitting a random object such as a solar panel or the side of the building. By becoming the point of discharge, the electricity can be safely conducted into the ground using the entire lightning protection system, protecting the structure or solar park.

The ASLA system is based on the time difference (ΔT) between the emission time of a conventional lightning arrester and an early streamer emission lightning arrester, as demonstrated in high voltage testing laboratories. This emission from the ESE is generated by storing energy from the ambient electromagnetic field. In normal conditions, the air terminal stays in standby mode. However, there is a spike in the ambient electrical field when a storm approaches the site. This spike causes the timely release of the stored energy, generating an upward leader from the tip of the ESE lightning arrester. This upward leader moves toward the downward leader from the storm clouds, creating a path for discharge. The bolt then passes safely through the conductive body of the ESE Lightning Arrester to the down conductors and finally safely into the ground, protecting the building or solar project. This working principle allows for an enhanced radius of production provided by Early Streamer Emission Lightning Arrester than by a conventional lightning rod.

As per NFC 17-102, the ΔT for an ESE Lightning Arrester should be at least 10µs - this means that the emission time of the ASLA ESE is at least 10µs faster than those from a Franklin Rod. Our range of ASLA ESE products range from a ΔT of 10µs to 60µs, depending on the requirements of the project.

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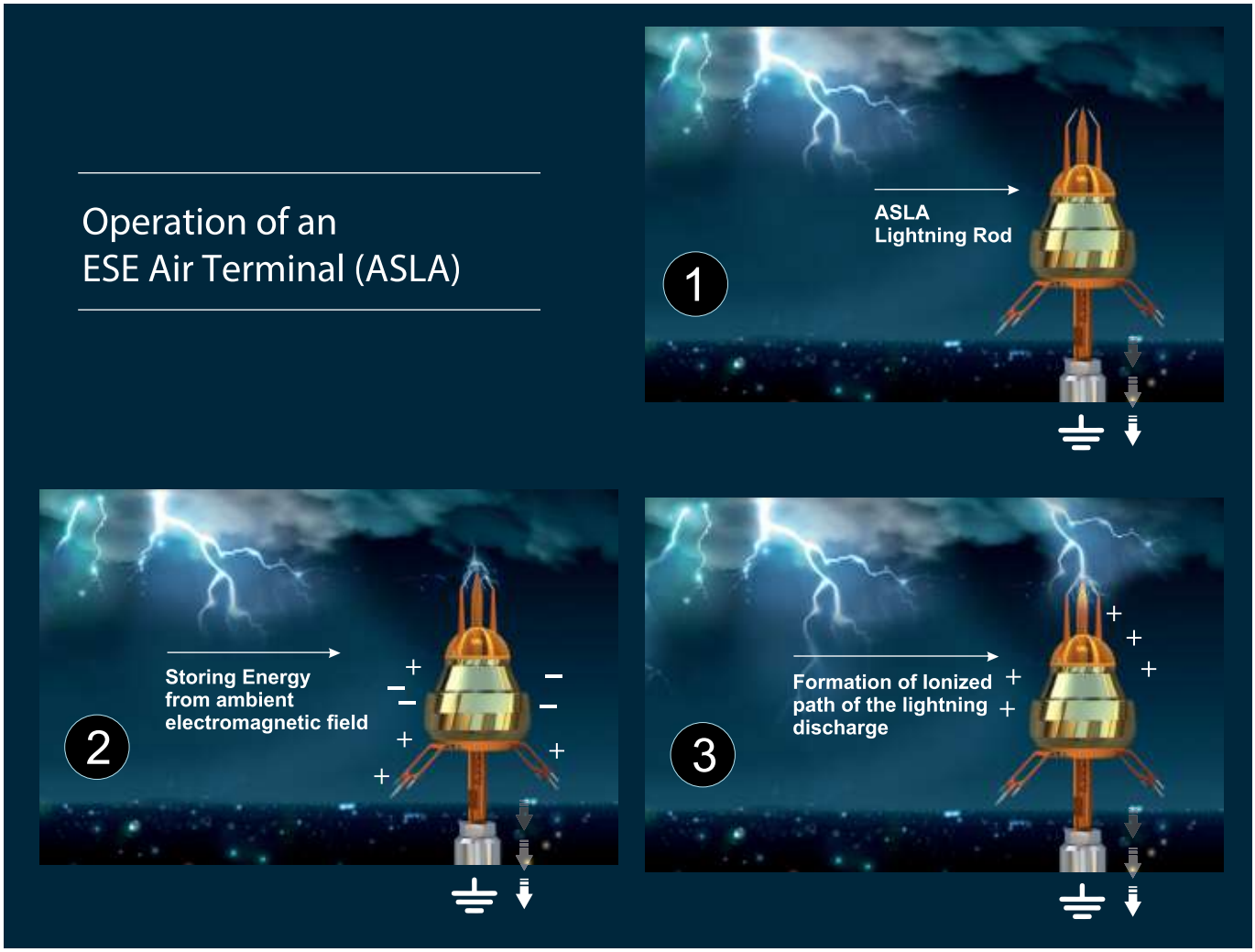

What is the Radius of Protection for an ESE Lightning Arrester?

The Radius of Protection of the ASLA is based on the calculations of NFC 17-102 and is dependent on the ΔT for the ESE model and the height of the structure. The Radius of Protection required for your structure will be based on the level of protection (class I, II, III or IV) defined during the risk assessment done as per IEC 62305-2. The maximum permissible ΔT according to the standards is 60µs and thus the maximum Radius of Protection cannot exceed 120m for Class IV Protection.

Certified Lightning Protection

As a leading global name in Lightning Protection for the past 25 years, the Axis range of ESE Lightning Arresters are heavily tested using in-house facilities and third-party laboratories as per NFC 17-102 to ensure the highest levels of quality.

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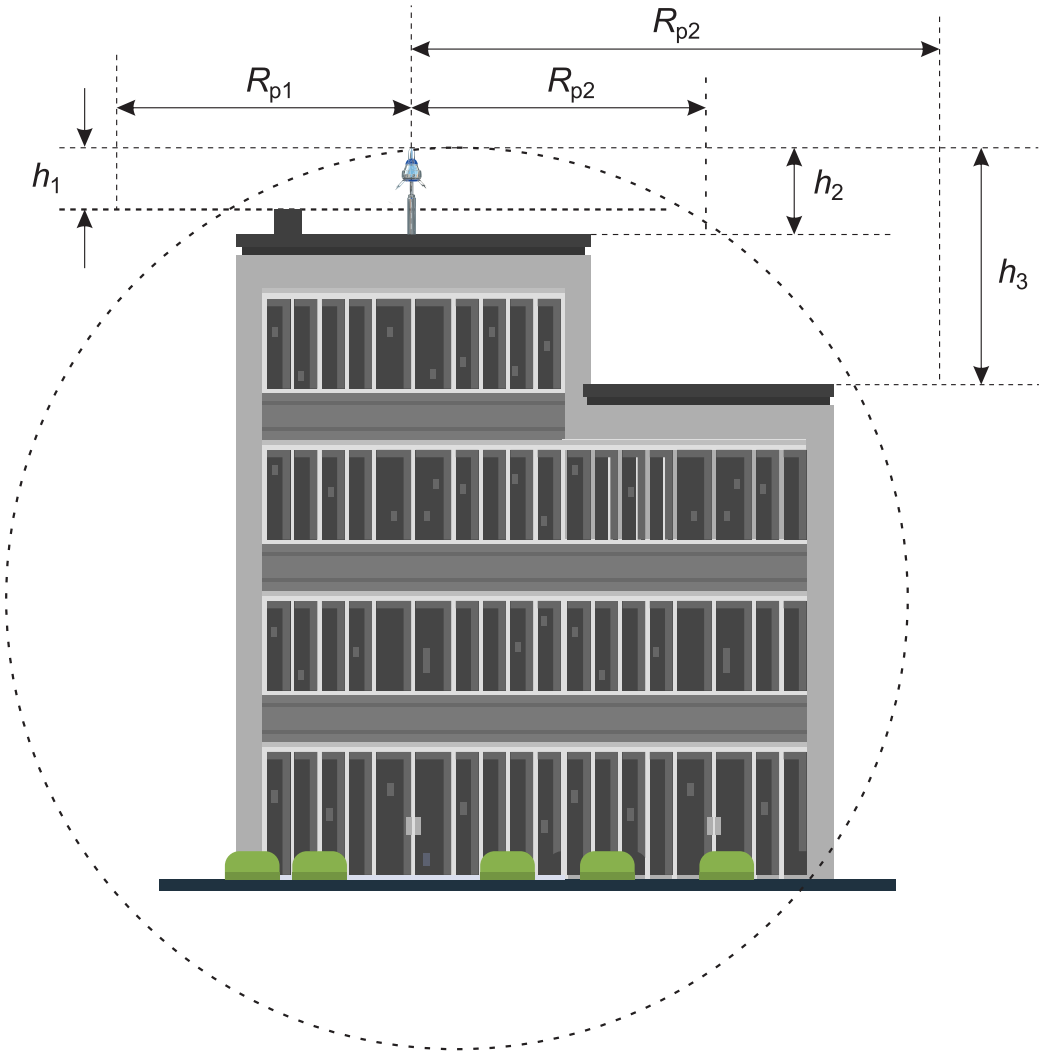
Technical Specification:

Axis Smart Lightning Arrester (ASLA) is composed of one main striking point, emission device, fixing element and a connection to the down conductor.

The area protected by ASLA is determined according to its efficiency, the ASLA should preferably be installed on highest part of the structure.

The protected area is delineated by a surface of revolution defined by the protection radii corresponding to the different considered height h and which axis is the same as the one of the air terminal as per below figure,



Where:

h_n is the height of the ASLA tip over the horizontal plane through the furthest point of the object to be protected

R_{pn} is the ASLA protection radius to be considered height h_n

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Protection Radius of Axis Smart Lightning Arrester:

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

$R_p(h) = \sqrt{2rh - h2 + \Delta(2r + \Delta)}$ for ≥ 5m $R_p = h \times R_p(5) / 5$ for 2m ≤ h ≤ 5m

where

Rp	=	Protection radius of ASLA at a given height h (m)
h	=	Height of ASLA tip over the area of reference plane considered
r	=	20m for protection Level-I 30m for protection Level-II 45m for protection Level-III 60M for protection Level-IV
Δ	=	Initiation advance equivalent to efficiency of ASLA as per below(m) ASLA-15: Δ=20 ASLA-30: Δ=30 ASLA-60: Δ=63

Protection Radius of ASLA ESE, Rp (m)

Height of ASLA terminal over the protection area h(m)	2	3	4	5	8	10	15	20	45	60
Protection Level 1										
ASLA 20	15	22	30	37	38	39	40	40	40	40
ASLA 30	19	29	38	48	49	49	50	50	50	50
ASLA 60	33	49	65	82	82	82	83	83	83	83
Protection Level 2										
ASLA 15	17	26	35	43	45	46	48	49	49	49
ASLA 30	22	33	44	55	56	57	58	59	59	59
ASLA 60	36	54	72	90	90	91	92	92	92	92
Protection Level 3										
ASLA 15	20	31	41	51	53	55	58	60	65	65
ASLA 30	25	38	51	63	65	66	69	71	75	75
ASLA 60	40	60	80	100	101	102	104	105	108	108
Protection Level 4										
ASLA 15	23	35	46	58	61	62	66	69	79	80
ASLA 30	28	43	57	71	73	75	78	81	89	90
ASLA 60	44	66	88	110	111	112	114	116	122	123

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Lightning Counter

DIGITAL COUNTER SIZE	NO. OF DIGITS	CODE
80X80X56 mm	2	ADLEC2
100X68X50 mm	6	ADLEC6

Step 1: Loosen the two screw nuts at the back of the lightning counter. Next, remove the spring washer and flat gasket.

Step 2: Remove the clamp, and put the ground wire of power SPD or the down conductor between the two screw nuts.

Step 3: Then place the pressing plate, flat gasket, spring washer, and screw nuts correctly and tighten the two screw nuts.

Note: Ensure that the ground wire of the power SPD or the Down Conductor of the Lightning Rod is not disturbed during installation

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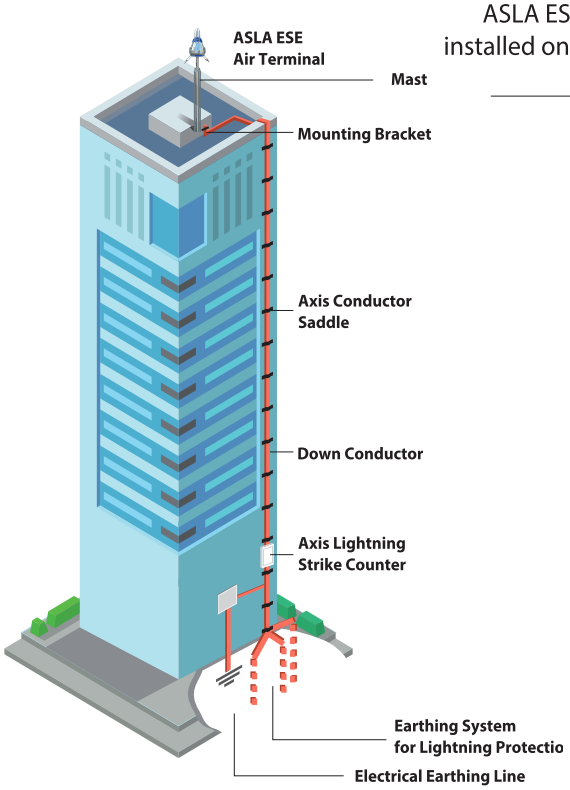
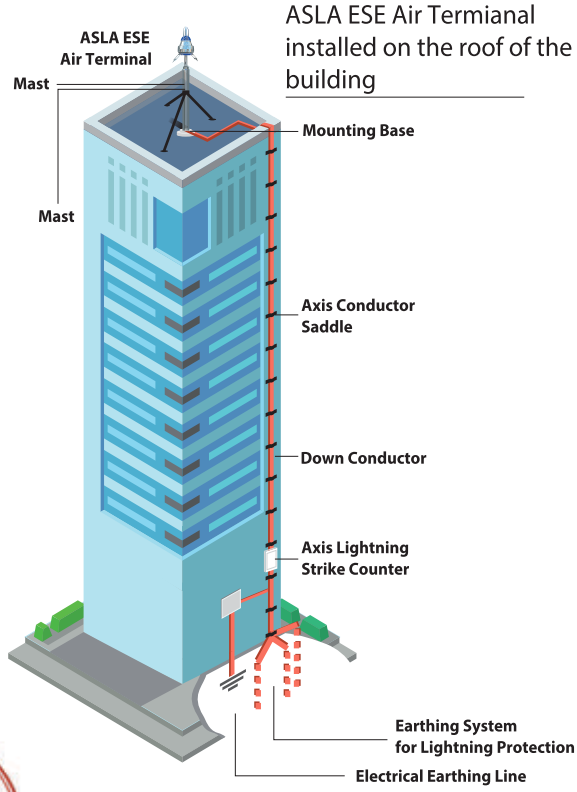
ASLA ESE Assembly

ASLA ESE Air Termianal installed on the side of the building



ASLA ESE Air Termianal installed on the roof of the building



Certification

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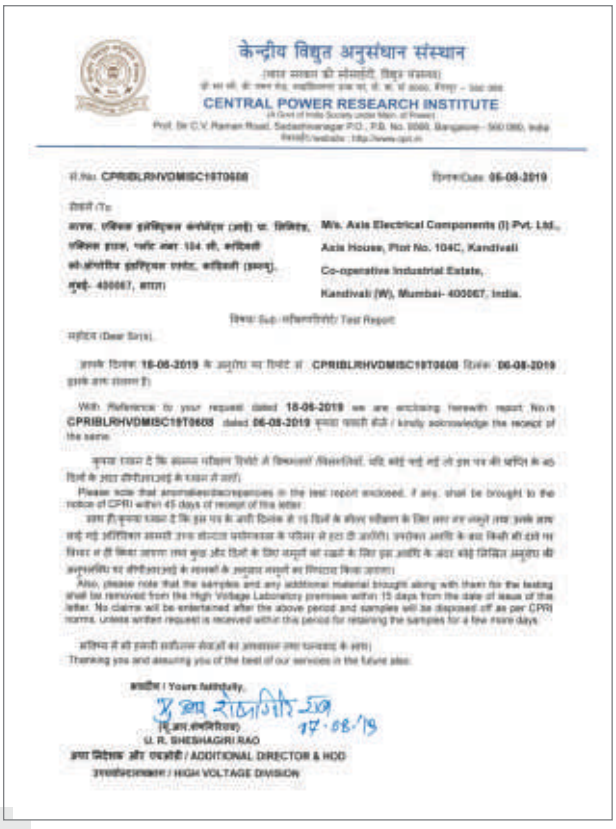
CENTRAL POWER RESEARCH INSTITUTE



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3rd Edition

2023

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