



TESTED PRODUCTS  
EFFICIENT SERVICE  
TRUSTED BRAND

Product  
Introduction



## Early Streamer Emission (ESE) Lightning Protection System

## 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)

## 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)

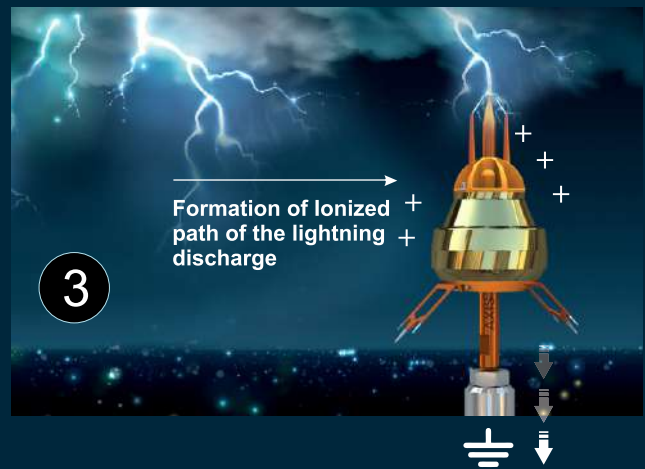
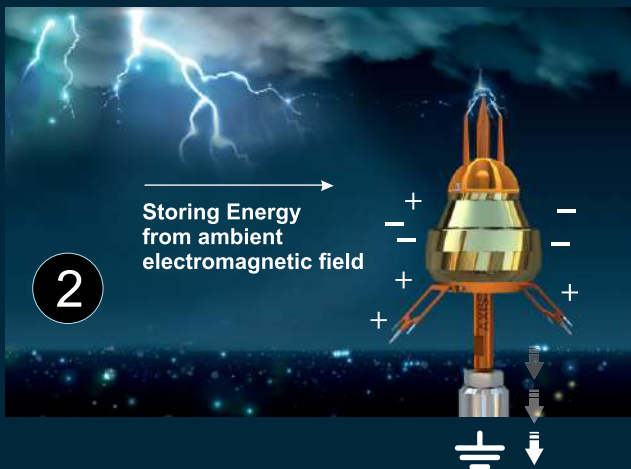
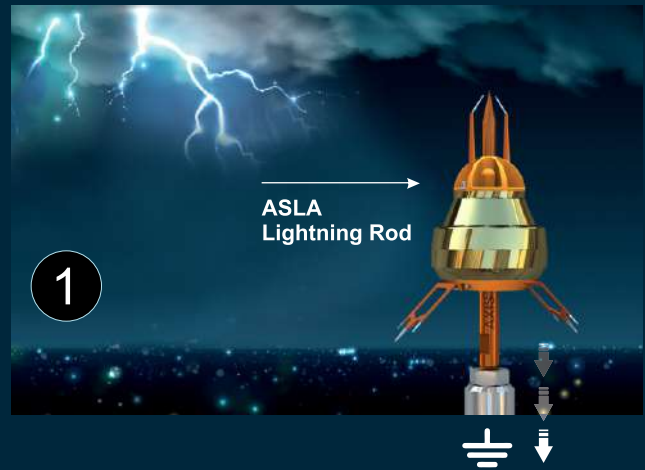
### Lightning Arrester work?

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 ( $\Delta T$ ) 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 protection provided by Early Streamer Emission Lightning Arrester than by a conventional lightning rod.

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

## Operation of an ESE Air Terminal (ASLA)



## 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  $\Delta T$  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  $\Delta T$  according to the standards is  $60\mu s$  and thus the maximum Radius of Protection cannot exceed 120m for Class IV Protection.

## Certified Lightning Protection

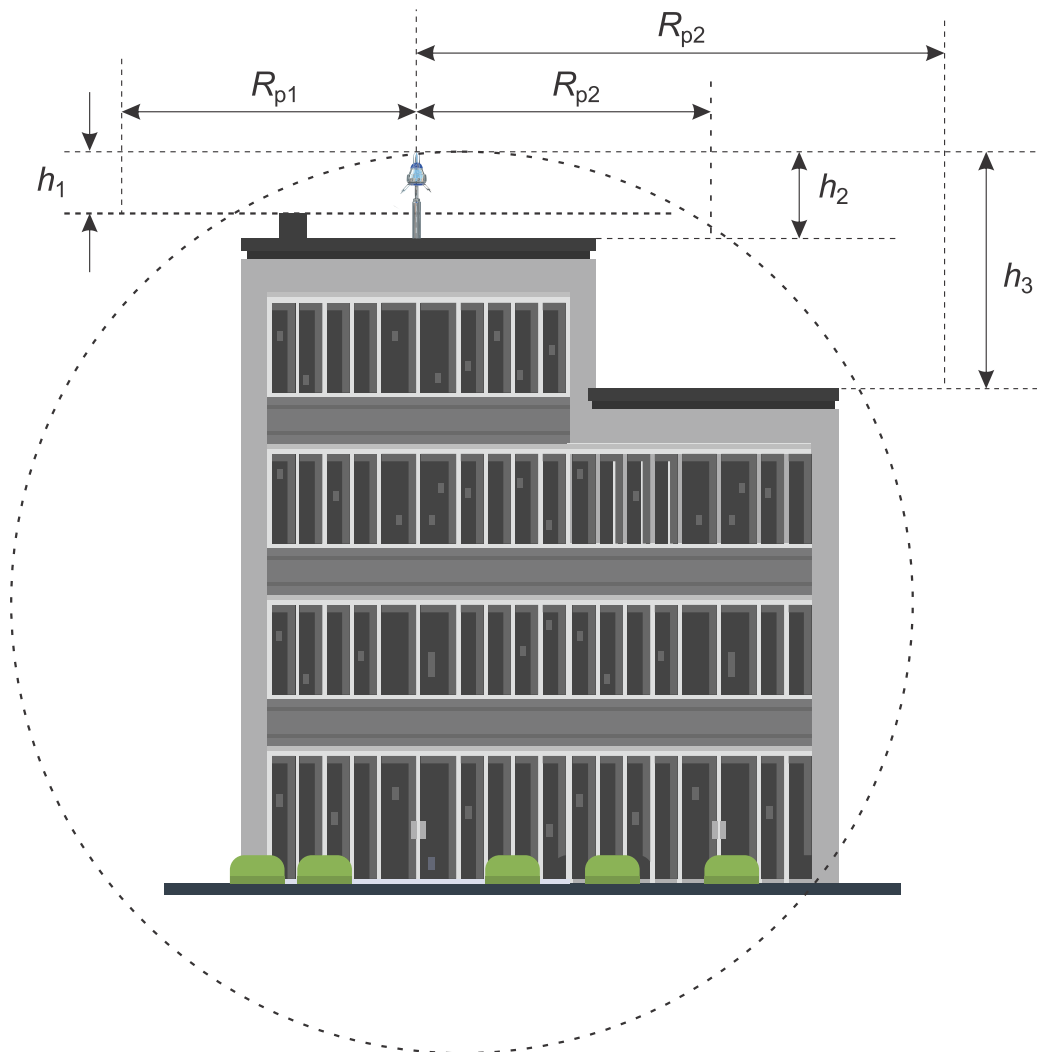
As a leading global name in Lightning Protection for the past 25 years, the Axis range of ESE Lightning Arresters are heavily tested using in-house facilities and third-party laboratories as per NFC 17-102 to ensure the highest levels of quality.

## 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  $h_n$

## Protection Radius of Axis Smart Lightning Arrester B19:N35B19:N45D33B19:L2B19:N42

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

$$R_p(h) = \sqrt{2rh - h^2 + \Delta(2r + \Delta)} \quad \text{for } h \geq 5m \quad R_p = h \times R_p(5) / 5 \quad \text{for } 2m \leq h \leq 5m$$

where

R <sub>p</sub>	=	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, R<sub>p</sub> (m)

Height of ASLA terminal over the protection area h(m)	2	3	4	5	8	10	15	20	45	60
<b>Protection Level 1</b>										
ASLA 15	15	22	30	37	38	39	40	40	31	-
ASLA 30	19	29	38	48	49	49	50	50	43	30
ASLA 60	31	47	63	79	79	79	80	80	76	69
<b>Protection Level 2</b>										
ASLA 15	17	26	35	43	45	46	48	49	48	40
ASLA 30	22	33	44	55	56	57	58	59	58	52
ASLA 60	35	52	69	86	87	88	89	89	89	85
<b>Protection Level 3</b>										
ASLA 15	20	31	41	51	53	55	58	60	65	63
ASLA 30	25	38	51	63	65	66	69	71	75	73
ASLA 60	39	58	78	97	98	99	101	102	105	104
<b>Protection Level 4</b>										
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	43	64	85	107	108	109	111	113	119	120

## 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.

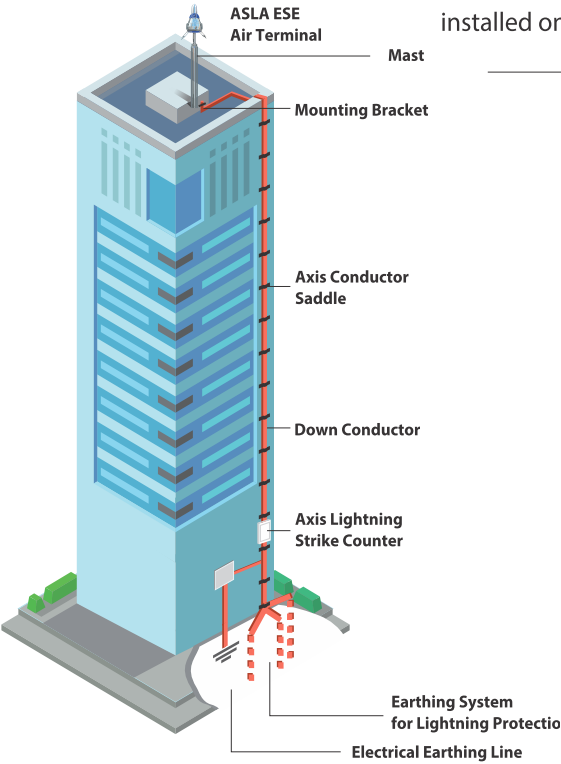


**Step 3:** Then place the pressing plate, flat gasket, spring washer, and screw nuts correctly and tighten the two screw nuts.

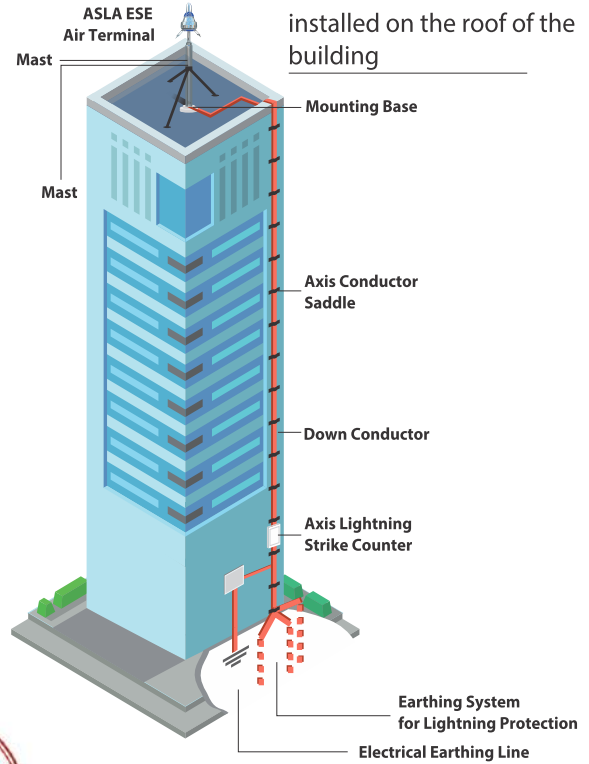
**Note:** Ensure that the ground wire of the power SPD or the Down Conductor of the Lightning Rod is not disturbed during installation

ASLA ESE Assembly

ASLA ESE Air Terminal installed on the side of the building



ASLA ESE Air Terminal installed on the roof of the building



Certification



**केन्द्रीय विद्युत अनुसंधान संस्थान**  
(भारत सरकार की सौम्यस्वी, विद्युत विभाग)  
जि. का. सं. सी. सी. एन. रोड, सदाशिवनगर इलाका, पी. नं. 104, बंगलूर - 560 080  
**CENTRAL POWER RESEARCH INSTITUTE**  
(A Govt of India Society under Min. of Power)  
Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8056, Bangalore - 560 080, India  
Website: www.cpri.in

सं./No. CPRI/BLRHVDMISC19T0608 दिनांक/Date: 06-08-2019

सेवा में/To  
महोदय, एक्सिस इलेक्ट्रिकल कंपोनेंट्स (आर) प्रा. लिमिटेड, Ms. Axis Electrical Components (I) Pvt. Ltd.,  
एक्सिस हाउस, प्लॉट नंबर 104 सी, कांदिवली Axis House, Plot No. 104C, Kandivali  
को-ऑपरेटिव इंडस्ट्रियल एस्टेट, कांदिवली (पश्चिम), Co-operative Industrial Estate,  
मुंबई- 400067, महाराष्ट्र, Kandivali (W), Mumbai-400067, India.

विषय/ Sub-परिष्कारण/पोर्ट Test Report

महोदय /Dear Sir(s),

आपके दिनांक 18-06-2019 के अनुरोध पर विषय सं CPRI/BLRHVDMISC19T0608 दिनांक 06-08-2019 इसके साथ संलग्न है।

With Reference to your request dated 18-06-2019 we are enclosing herewith report No./s CPRI/BLRHVDMISC19T0608 dated 06-08-2019 कृपया यादवी करें / kindly acknowledge the receipt of the same.

कृपया ध्यान दें कि संलग्न परिष्कारण रिपोर्ट में विषयवस्तु/विश्लेषण/बोर्ड, यदि कोई कोई भी त्रुटि है इस पर की जायेगी के 45 दिनों के अंदर सूचीबद्ध/अंतरों के प्रकार में लाने।  
Please note that anomalies/discrepancies in the test report enclosed, if any, shall be brought to the notice of CPRI within 45 days of receipt of this letter.

साथ ही कृपया ध्यान दें कि इस पर के जारी दिनांक से 15 दिनों के अंदर परिष्कारण के लिए नमूने नए नमूने तथा उनके साथ लाने लाने अतिरिक्त सामग्री उच्च वोल्टता प्रयोगशाला के परिसर से हटा दी जानगी। उपयोग अति के बाद किसी भी त्रुटि पर विचार न ही किया जाएगा तथा कुछ और दिनों के लिए नमूने को रखने के लिए इस अवधि के अंदर कोई लिखित अनुरोध की अनुमति पर सूचीबद्ध/अंतरों के प्रकारों के अनुसार नमूने का निष्पत्ता किया जाएगा।  
Also, please note that the samples and any additional material brought along with them for the testing shall be removed from the High Voltage Laboratory premises within 15 days from the date of issue of this letter. No claims will be entertained after the above period and samples will be disposed off as per CPRI norms, unless written request is received within this period for retaining the samples for a few more days.

आभार में ही हमारी सर्वोत्तम सेवाओं का आभार माना तथा भविष्य के लिये।  
Thanking you and assuring you of the best of our services in the future also.

आपका विश्वास / Yours faithfully,  
U. R. SHESHAGIRI RAO  
U. R. SHESHAGIRI RAO  
अपर निदेशक और सहायक / ADDITIONAL DIRECTOR & HOD  
उच्चवोल्टता विभाग / HIGH VOLTAGE DIVISION

**केन्द्रीय विद्युत अनुसंधान संस्थान**  
(भारत सरकार की सौम्यस्वी, विद्युत विभाग)  
जी. का. सं. सी. सी. एन. रोड, सदाशिवनगर इलाका, पी. नं. 104, बंगलूर - 560 080, महाराष्ट्र  
**CENTRAL POWER RESEARCH INSTITUTE**  
(A Govt of India Society under Min. of Power)  
Prof. Sir C.V. Raman Road, Sadashivanagar Post Office, P.B. No. 8056 Bangalore - 560 080, India  
वेब साइट / website: http://www.cpri.in

सं./No. CPRI/BLRHVDMISC20T0299 दिनांक/Date: 03 July 2020

सेवा में/To  
महोदय, एक्सिस इलेक्ट्रिकल कंपोनेंट्स (इंडिया) प्रा. लिमिटेड, Ms. Axis Electrical Components (India) Pvt. Ltd.,  
एक्सिस हाउस, प्लॉट नंबर 104 सी, कांदिवली Axis House, Plot No. 104C, Kandivali  
को-ऑपरेटिव इंडस्ट्रियल एस्टेट, कांदिवली (पश्चिम), Co-operative Industrial Estate Ltd, Kandivali  
मुंबई- 400067, महाराष्ट्र, (West), Mumbai-400 067, Maharashtra, India.

विषय/ Sub-परिष्कारण/पोर्ट Test Report

महोदय /Dear Sir(s),

आपके दिनांक 26 June 2020 के अनुरोध पर विषय सं CPRI/BLRHVDMISC20T0299 दिनांक 03 July 2020 इसके साथ संलग्न है।

With Reference to your request dated 26 June 2020 we are enclosing herewith report No./s CPRI/BLRHVDMISC20T0299 dated 03 July 2020 कृपया यादवी करें / kindly acknowledge the receipt of the same.

कृपया ध्यान दें कि संलग्न परिष्कारण रिपोर्ट में विषयवस्तु/विश्लेषण/बोर्ड, यदि कोई कोई भी त्रुटि है इस पर की जायेगी के 45 दिनों के अंदर सूचीबद्ध/अंतरों के प्रकार में लाने।  
Please note that anomalies/discrepancies in the test report enclosed, if any shall be brought to the notice of CPRI within 45 days of receipt of this letter.

साथ ही कृपया ध्यान दें कि इस पर के जारी दिनांक से 15 दिनों के अंदर परिष्कारण के लिए नमूने नए नमूने तथा उनके साथ लाने लाने अतिरिक्त सामग्री उच्च वोल्टता प्रयोगशाला के परिसर से हटा दी जानगी। उपयोग अति के बाद किसी भी त्रुटि पर विचार न ही किया जाएगा तथा कुछ और दिनों के लिए नमूने को रखने के लिए इस अवधि के अंदर कोई लिखित अनुरोध की अनुमति पर सूचीबद्ध/अंतरों के प्रकारों के अनुसार नमूने का निष्पत्ता किया जाएगा।  
Also, please note that the samples and any additional material brought along with them for the testing shall be removed from the High Voltage Laboratory premises within 15 days from the date of issue of this letter. No claims will be entertained after the above period and samples will be disposed off as per CPRI norms, unless written request is received within this period for retaining the samples for a few more days.

आभार में ही हमारी सर्वोत्तम सेवाओं का आभार माना तथा भविष्य के लिये।  
Thanking you and assuring you of the best of our services in the future also.

आपका विश्वास / Yours faithfully,  
U. R. SHESHAGIRI RAO  
U. R. SHESHAGIRI RAO  
अपर निदेशक और सहायक / ADDITIONAL DIRECTOR & HOD  
उच्चवोल्टता विभाग / HIGH VOLTAGE DIVISION

"Happiness is when what you think, what you say and what you do are in harmony" - Mahatma Gandhi



An ISO 9001: 2015 Company

2025 Edition

Talk to Us



**AXIS ELECTRICAL COMPONENTS (I) P. LTD.**

**Registered Office:** AXIS House, Plot No. 149 BCD  
Kandivali Co-op Industrial Estate Ltd., Kandivali (W),  
Mumbai – 400067, Maharashtra, India. Tel: +91-22-67756000  
email: sales@axis-india.com | Website: www.axis-india.com