



**SAMAY ELECTRIC**

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**IVANAH**

# **SAMAY ELECTRIC**

**COMPLETE LIGHTNING PROTECTION SYSTEM**



# Lightning Protection



Principle - Lightning rods were originally developed by Benjamin Franklin. It's a pointed metal rod attached to the roof of a building. It connects to a large section of conductive wire which is connected to an earth pit buried in the ground nearby.

The purpose of lightning rods is often misunderstood. Many people believe that lightning rods "attract" lightning. It is better stated to say that lightning rods provide a low-resistance path to ground that can be used to conduct the enormous electrical currents when lightning strikes occur.



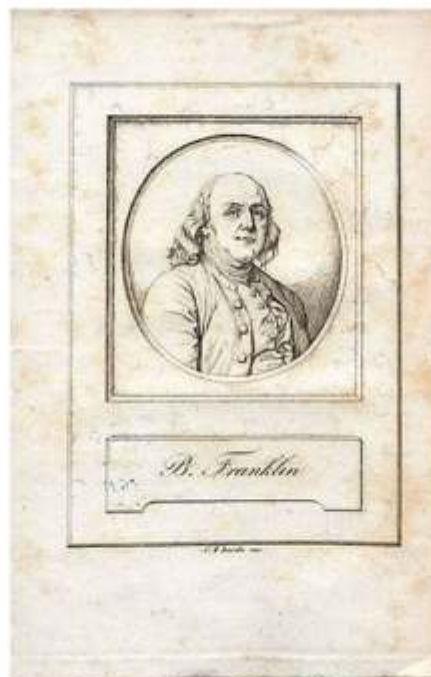
If lightning strikes, the system attempts to carry the harmful electrical current away from the structure and safely to ground. The system has the ability to handle the enormous electrical current associated with the strike.

Franklin's kite experiment was performed in Philadelphia in June 1752

The preliminary systems have been since then improved. Based on Faraday findings, the Belgian physicist MELLESENS, recommends protecting buildings by covering them with metal wires connected to a series of spikes on the roof and then well earthed. This was the very first meshed cage in the late 19th century.



Franklin's Birthplace, Milk Street.

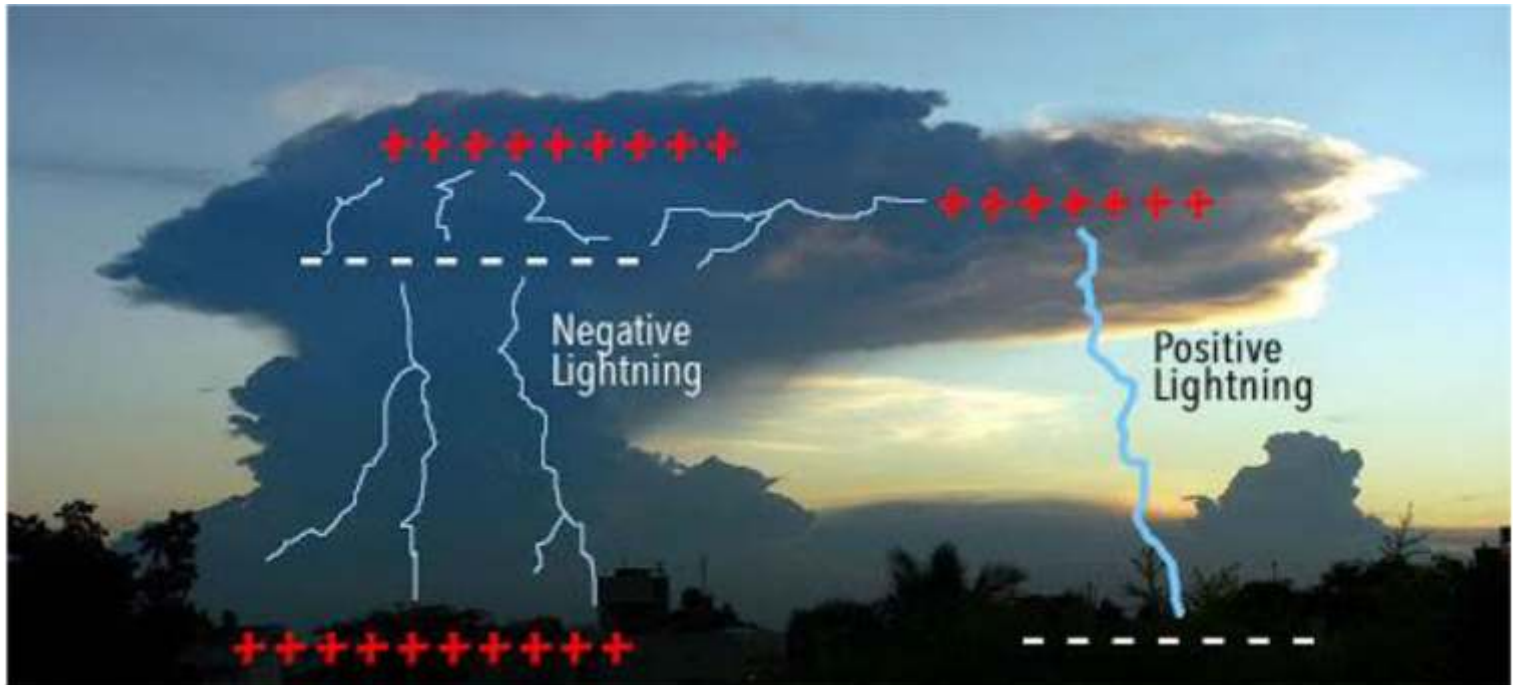


**Lightning** is a naturally occurring electrostatic discharge during which two electrically charged regions in the atmosphere or ground temporarily equalize themselves, causing the instantaneous release of as much as one gigajoule of energy.

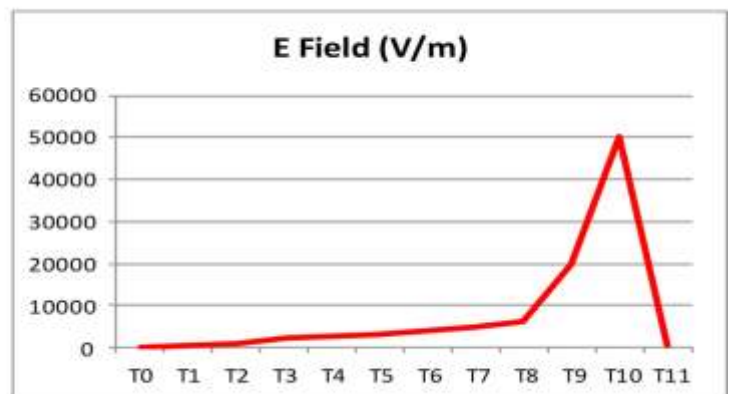
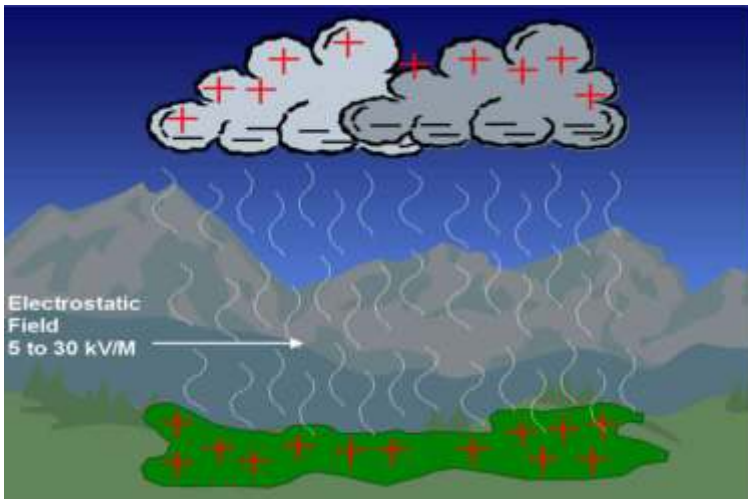


**Lightning Charges: -**

Positive & Negative Charges



**The Electric Field:** A region around a charged particle or object within which a force would be exerted on other charged particles or objects.



## Corona Effect :

The electric field is constant on a flat surface. But, near sharp points, edges and elevated structures (trees, buildings, towers...) the electric field is much more intense:

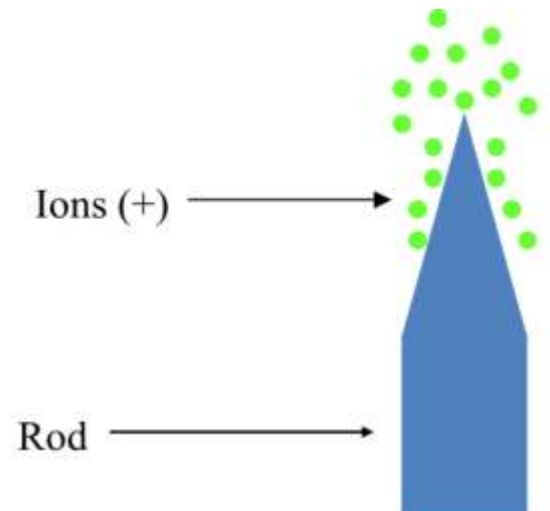
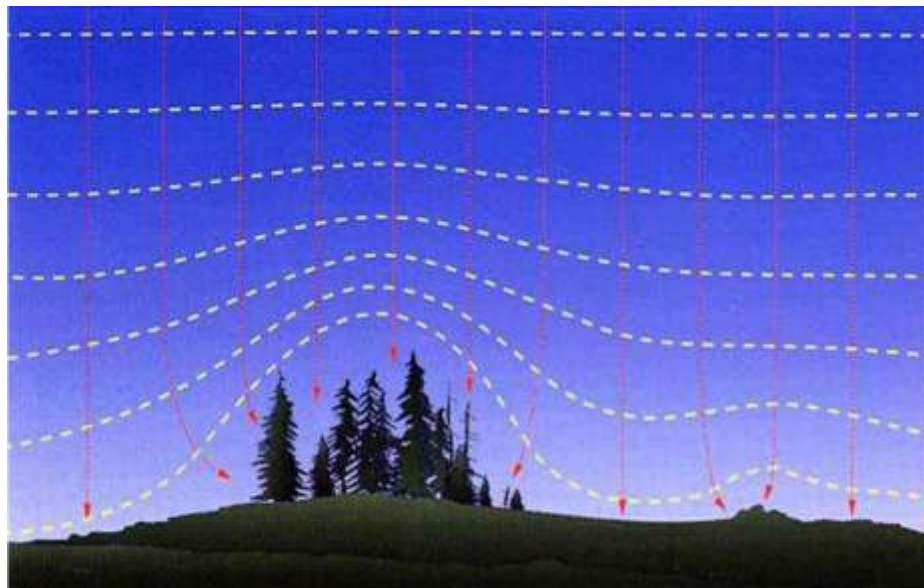
On a semi-sphere, the electric field value is three time more important than on a flat surface under same conditions. On the top of a sharp rod, the E field reaches 300 times more important values than on a flat surface.

Due to the increased E field values, the air molecules become ionised near the sharpest points. This is called the CORONA EFFECT.



## Lightning Discharges :

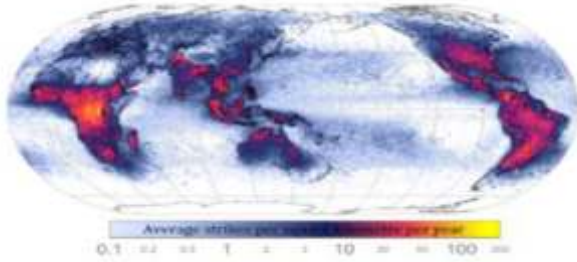
- 1- Ionization of the elevated points and apparition of the corona effect
- 2- Downward stepped leaders
- 3- Upward streamer
- 4- Connection
- 5- Return strokes



## Lightning Activities:

Lightning Activity depends on two main factors:

- The location of the site (approximately 70% of lightning occurs in the tropics)
- The season



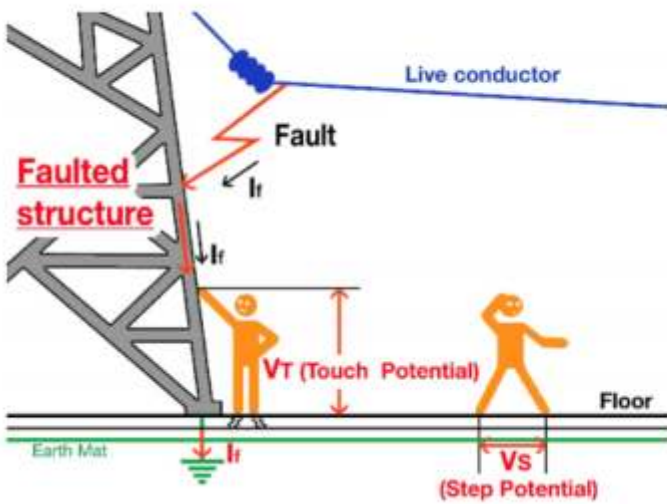
**Lightning Density:** Number of Discharges per year per square kilometer

**Keraunic Level:** Number of thunder storm days in a year

Lightning density data available in IS 2309 : 1989

Lightning Effects :

Touch Potential & Step Potential



Lightning spark over:



Direct lightning discharge:



Lightning damages to structures:



## Lightning Properties :

Peak Current	Up to 500 kA
Average Peak Current (50%)	≈ 30kA
Polarity Negative	> 90%
Time between Flashes	> 10 seconds
Strokes per Flash	Up to 26
Time Between Strokes	10 to 30 ms
Duration (99%)	30 to 200μs

## Direct & Indirect Lightning Protection:

Today, both the direct and indirect effects of a lightning discharge are taken into account to design a complete lightning protection system. The IEC 62-305 standards requiring the installation of type 1 SPD together with the installation of an air terminal (conventional).

Most people see lightning danger as a bolt of electricity coming from the sky and directly striking a person or object. This type of lightning, called a direct strike, only accounts for 3-5% of all lightning related injuries.

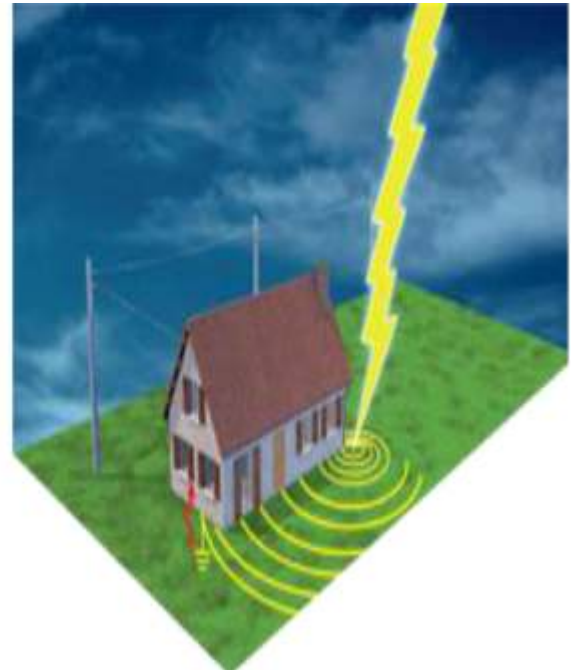
Often overlooked are the dangers of indirect strikes. Two of the most common indirect strike dangers include ground current, or step potential, and side flashes. Ground current/step potential occurs when lightning strikes the ground near a person or object. The current passes from the strike point, through the ground, and into that person or object. A memorable example from 2016 is when more than 300 reindeer in Norway were killed by ground charge from a nearby lightning strike.

## Complete lightning protection system

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**LA+**  
**SPD**



**International Standards IEC:** The international IEC standards for lightning protection have been very recently revised. The latest edition **IEC 62-305** has been published in 2006:

**Part 1:** General Principles

**Part 2:** Risks management

**Part 3:** Physical damage to structures and life hazard.

**Part 4:** Electrical and electronic systems within structures



Lightning Threat

Lightning risk

LP: Lightning Protection

LPS: Lightning Protection System

SPM: Surge Protection Measures

**International Standards IEC:** The international IEC standards for lightning protection have been very recently revised. The latest edition **IEC 62-305** has been published in 2006:

**Part 1:** General Principles

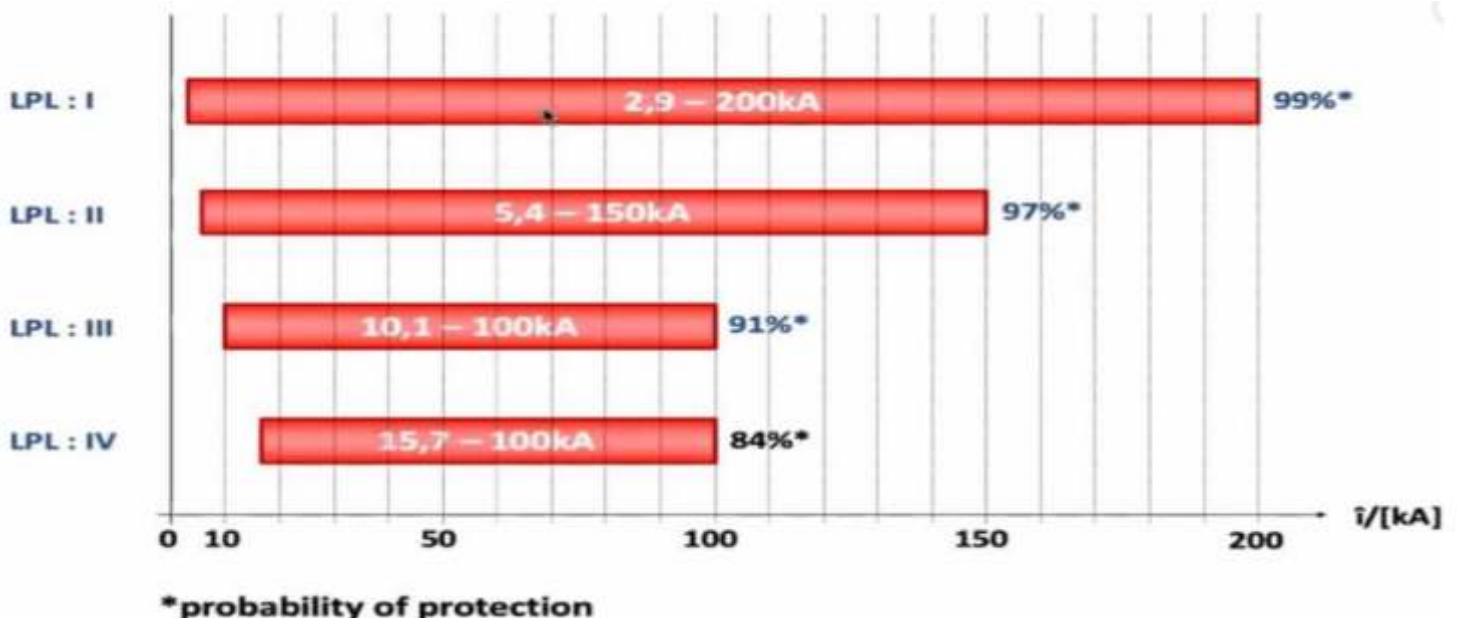
**Part 2:** Risks management

**Part 3:** Physical damage to structures and life hazard.

**Part 4:** Electrical and electronic systems within structures

### Protection Level (LPL):

Probability Of Protection				
Level Of Protection LPL	LPL I	LPL II	LPL III	LPL IV
Peak Current (KA)	200	150	100	100
Minimum Peak Current (KA)	3	5	10	1
Probability Of Protection (%)	99	97	91	84





# IEC 62-305-2 Ed. 1.0: Protection Against Lightning -- Part 2: Risk Management

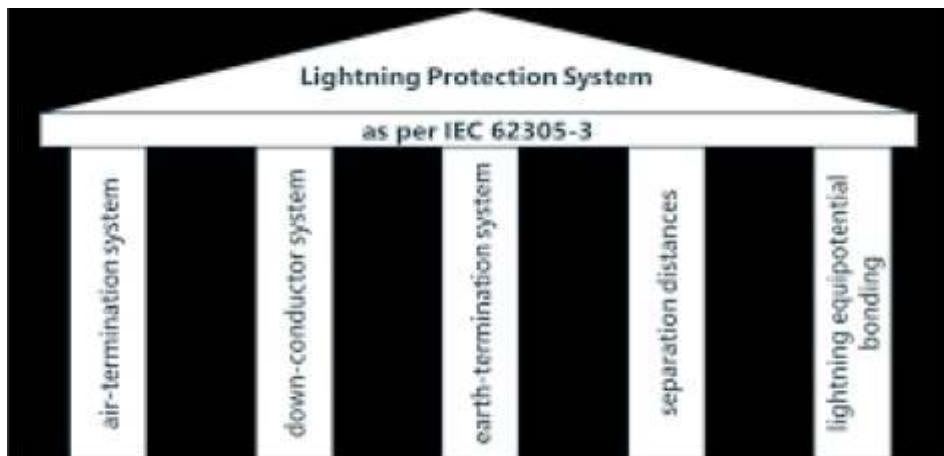
Whatever is the standard or the type of LPS specified, it is compulsory to conduct a risk assessment survey prior to designing or installing the lightning protection system. This survey will allow the calculation of the required protection level, depending on site characteristics:

Data collection for Risk Analysis to design Lightning protection system

1	Project Name	Chemical Factory - ITCL					
2	Project location address	Mysure					
3	Structure size	over all Length in mtr = 50.75	over all width in mtr = 24.54	Roof Height in mtr =	Peak above Roof in mtr =	Refer Drawing	
Please put check mark ✓ OR fill green colour in the relevent box below :-							
4	Information around Site / Project / Structure	surrounded by taller trees than the structure	surrounded by taller structures than the structure	surrounded by equal or smaller structures	Isolated, no objects in the vicinity	on a hill top or on a knoll	
5	Environment / Locality	Rural	Suburban	Urban			
6	Type of external Floor / Soil	Agricultural land	Concrete	Gravel			
7	Type of internal Floor	Concrete	Marble	Ceramics	Asphalt	Carpets	Wood
8	No.of persons occupancy in the structure in a day	below 100	100 to 1000	above 1000			
9	Duration in hours of stay by persons in a day	up to 12 Hrs	up to 18 Hrs.	up to 24 Hrs.			
10	Power Line installation	Aerial	Buried	Guarded through Conduit Pipe	through Trench	Shielded with resistive cover	
11	Data / Telecommunication Line installation	Aerial	Buried	Guarded through Conduit Pipe	through Trench	Shielded with resistive cover	
12	Distance of Transformer location from site / Structure	within 100 mtr	within 500 mtr	within 1 Km			
13	Equipments withstand capacity (which are connected by power line)	up to 1KV	up to 1.5KV				
14	Data & Telecommunication line withstand capacity	up to 1KV	up to 1.5KV				
15	Any Surge protection device fitted on Power line	yes	No				
16	Any Surge protection device fitted on Data / Telecommunication line	yes	No				
17	Any possibility of getting shock by touching the out side wall of Structure being conductive	yes	No				
18	Any possibility of getting affected due to induced voltage by stepping in to the area where Conductors are being laid.	yes	No				
19	Purpose of the Structure	Industry	Hospital	Hotel	Temple/Church	School	Residential
		Chemical Factory	Commercial complex	Public Building	Museum		
20	Any hazardous Explosives, Chemicals or Gases stored in the Structure / premises	If Yes, mention : Methanol	No				
21	Fire Fighting facility	No facility	Fire extinguishers manual	Fire extinguishers Automatic			
22	In Lightning protection system, would you like to have down conductors inside through the Columns or on the outside walls of the structure	Inside through Columns	On outside walls of the structure	Name :	Gajanan Johari		
				Designation :			
				Signature :			

# IEC 62-305-3 Ed. 1.0: Protection Against Lightning -- Part 3: Physical Damage to Structures and Life Hazards

## Design of Lightning Protection System :



## Air Termination system

Air Termination system can be composed of any combination of the follow elements:

- Rods (Including free standing Masts)
- Catenary Wires
- Meshed Conductors

## Positioning

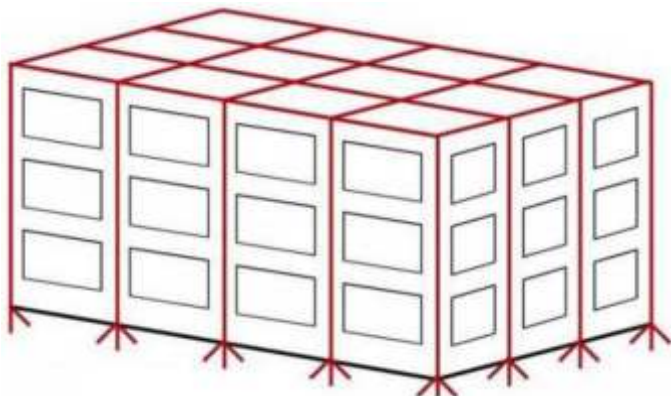
- Protection Angle Method
- Rolling Sphere Method
- Meshed Method



**Air Termination is design Based on the lowest possible Lightning strike of That LPL**

Protection Angle w.r.t height							
Class of LPS	Mesh Size in Meters	10 Meters	20 Meters	30 Meters	45 Meters	60 Meters	Rolling Sphere radius
1	5x5	45	23	Cannot be used			20
2	10x10	54	38	23	Cannot be used		30
3	15x15	62	48	36	23	Cannot be used	45
4	20x20	65	54	45	34	23	60

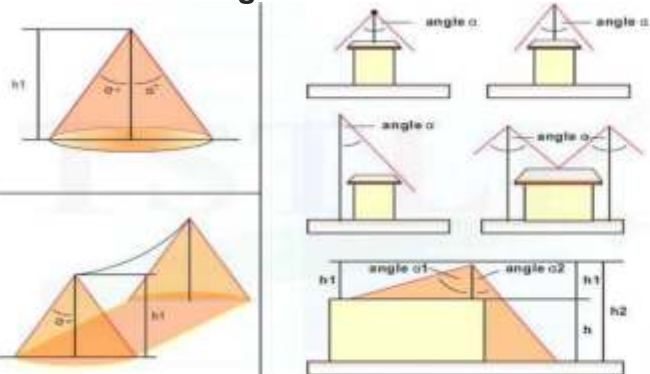
## Meshed Method:



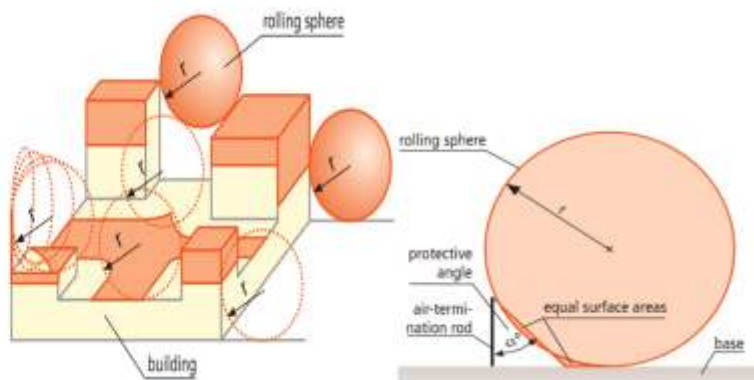
UPL	Mesh Size
I	5mx5m
II	10mx10m
III	15mx15m
IV	20mx20m

Mesh Size for mesh method

## Protection Angle Method :

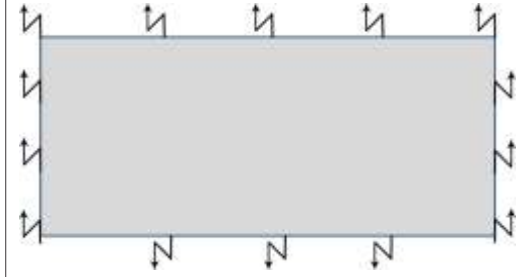


## Rolling Shpere Method :



## Down Conductor System:

Class of LPS	Distance in Meter "d"	
I	10	<ul style="list-style-type: none"> <li>• Outside of the Building</li> <li>• Throughout the Perimeter</li> <li>• Straight without ends If Possible</li> <li>• Safety Distance need to be maintained to avoid flashover</li> <li>• Not through shafts</li> </ul>
II	10	
III	15	
IV	20	

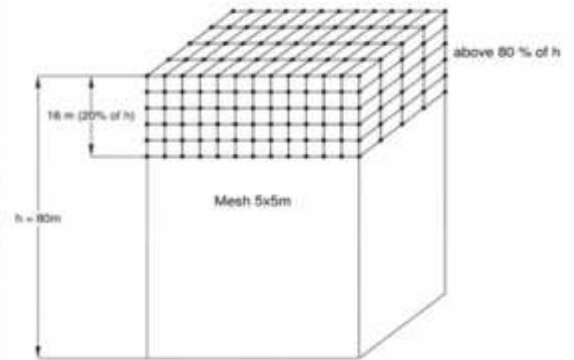
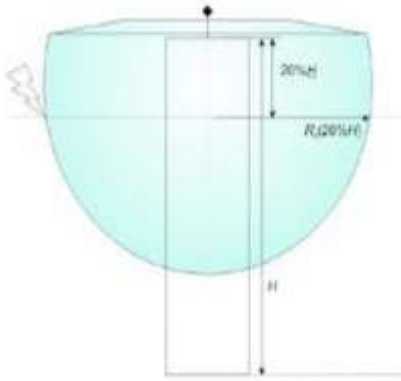


### d- Maximum distance allowed between two down conductors

#### •Test Joints



### Air Termination - Tall Buildings with more than 60 meters height:



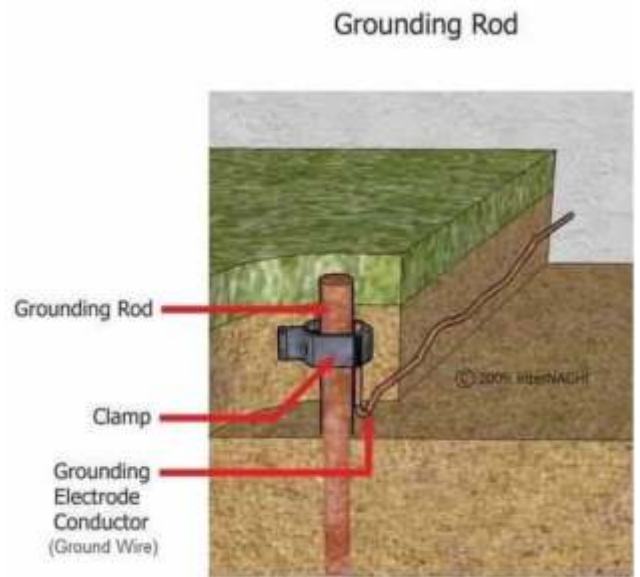
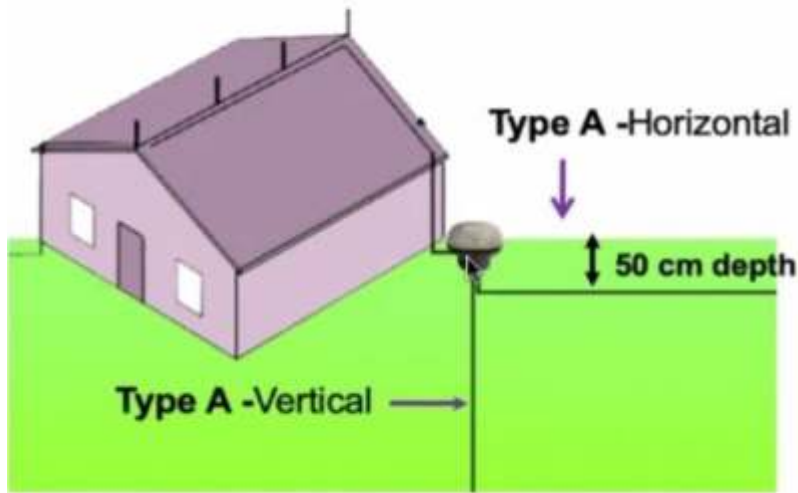
**Note :** Required only if electronic components are installed  
LPL 1 to 4 can be considered depending upon the Risk involved  
Aluminium Frame of glass wall cladding can be used

#### • Earth Termination System

- Type A Arrangement
- Type B Arrangement

### LPS Earthing - Type A arrangement (IS/IEC 62305) Radial and Vertical Earth Electrodes

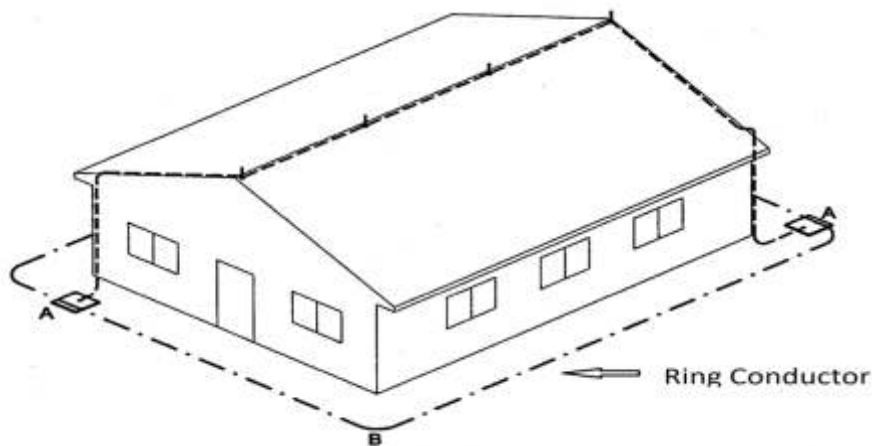
This type of arrangement comprises horizontal or vertical earth electrode installed outside the structure to be protected to connected to each down conductor. In type A arrangements, the total number of earth electrodes shall be not less than two ( minimum 2 down conductors for a building)



Suitable for small buildings with Electricity

### LPS Earthing - Type B arrangement (IS/IEC 62305) Ring Earth Electrode

This types of arrangement comprises either a ring conductor external to the structure to be protected, in contact with soli at least of 80% of its total length or a foundation Earth Electrode.



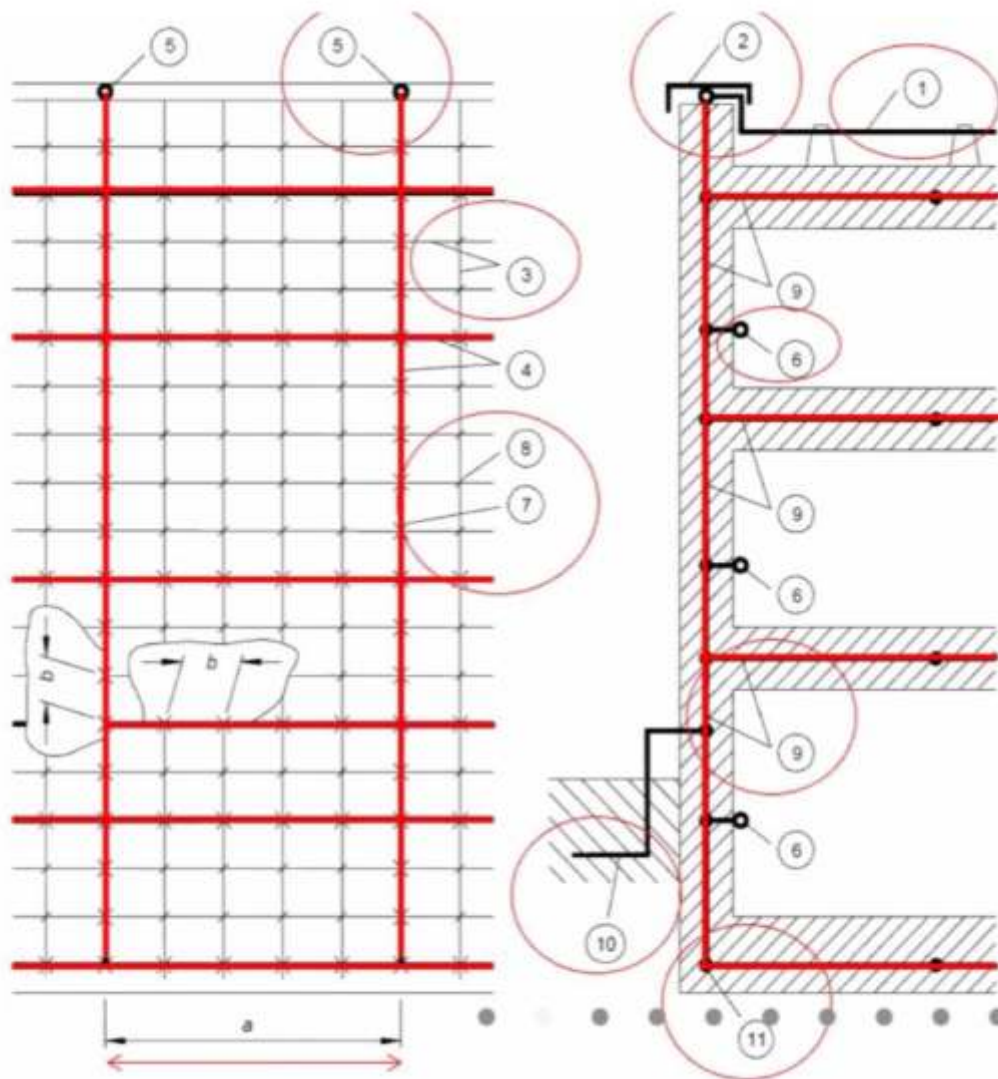
Suitable for Big buildings with Electronics System



Type A & Type B Earthing Electrode

## Lightning Equipotential Bonding:

### Shielding, Bonding and Earthing - Integrated into the building



Conductors Inside An Rcc Structure (or Below An Rcc Structure In Soil) Can Be Used For Earthing & Equipotential Bonding.

1. Air Termination Conductor
2. Metal Covering Of Roof Parapet
3. Steel Reinforcing Rods
4. Mesh Conductors Superimposed On The Reinforcement
5. Joint Of The Mesh Conductor
6. Joint For An Internal Bonding Bar
7. Connection Made By Welding Or Clamping
8. Arbitrary Connection
9. Steel Reinforcement In Concrete (with Superimposed Mesh Conductors)
10. Ring Earthing Electrode (if Any)
11. Foundation Earthing Electrode A Typical Distance Of 5 M For Superimposed Mesh Conductors

SI No.	Products Name	Part Nos.	Page No.
1	Air Termination Rods	EL-IV-1111602 EL-IV-1111604 EL-IV-1111606	16
2	Spike rods	EL-IV-1110801	16
3	Side Wall Clamp for Air Termination Rod	EL-IV-1229001	16
4	Self supporting Concrete Base for Air Termination Rod	EL-IV-1269001 EL-IV-1269002	16
5	Tripod Stand	EL-IV-2229001	16
6	Fixture to hold ATR on the Ridge of a Metallic sloping Roof	EL-IV-2239001	16
7	Parallel Connector to clamp Spike, Parallel Conductors	EL-IV-1219003	16
8	ATR Clamp cum Connector	EL-IV-1119001	17
9	Al.Round Conductor	EL-IV-1210801	17
10	GI Flat Conductor	EL-IV-1232502	17
11	SS.Round Conductor	EL-IV-1221001	17
12	Copper cable Conductor	EL-IV-1240801	17
13	Steel Roof Conductor Holders with Plastic base	EL-IV-1209001	17
14	"Roof Conductor Holder Press to Fit" type without Plastic Base	EL-IV-1222201	17
15	"Roof Conductor Holder Press to Fit" type with Plastic Base	EL-IV-1202601	17
16	Snap Type Plastic Roof Conductor Holders	EL-IV-1289001	18
17	Snap Type Plastic Roof Conductor Holder without Round Base	EL-IV-1289002	18
18	1 Kg Concrete Roof Conductor Holders on Flat Roof	EL-IV-1269001	18
19	1 Kg Concrete Roof Conductor Holders on Flat Roof	EL-IV-1269002	18

SI No.	Products Name	Part Nos.	Page No.
20	Standing seam with Cleat on sloping Metallic Roof	EL-IV-1227003	18
21	Standing seam with Cross Connector on sloping Metallic Roof	EL-IV-1227004	18
22	Standing seam for sloping Metallic Roof vertical Joints	EL-IV-1227002	18
23	"Girder Clamp - Horizontal Flange" with Clamping Shoe	EL-IV-3233001	18
24	"Girder Clamp - Vertical Flange" with Clamping Shoe	EL-IV-3233002	19
25	Splicer/Straight Connector	EL-IV-1219002	20
26	Extension Piece	EL-IV-1219001	20
27	Fixed earth terminal	EL-IV-1329001	20
28	Strike Pad with stud	EL-IV-1329002	20
29	U-Clamp with conductor Holder	EL-IV-1329004	20
30	Multi Clamp	EL-IV-1229002	20
31	Saddle Clip with Pad for "Copper Cable with PVC Sleeve"	EL-IV-1329005	20
32	Shoe Clamp for Conductors	EL-IV-3222501	21
33	Epoxy Insulated Holder	EL-IV-1389001	21
34	Cross Connector Round to Flat	EL-IV-1329012	21
35	Cross Connector Round to Round	EL-IV-1329011	21
36	Cross Connector Flat to Flat	EL-IV-1329013	21
37	Disconnecting Clamp Round to Flat	EL-IV-1329006	21
38	Disconnecting Clamp Round to Round	EL-IV-1329008	21
39	Disconnecting Clamp Flat to Flat	EL-IV-1329007	22
40	Lightning Strike Counter	EL-IV-1309001	22



## 1. AIR TERMINATION ROD & ACCESSORIES

The length of ATR and No. of ATR to be selected in the lightning protection system. Material is AlMgSi. In Lightning protection system this is mounted vertically on the top most point of the structure.

### General Technical Data

Material of Air Termination Rod	AlMgSi		
Standard	EN62561-2		
Part No.	EL-IV-1111602	EL-IV-1111604	EL-IV-1111606
ATR	1Mtr.	2Mtr.	3Mtr.
O.D.	16mm	16mm	16mm
Total Length	1 Mtr.	2 Mtr.	3 Mtr.
No. of Clamps	1	2	2
Max gust wind speed	186 Km./h	186 Km./h	188 Km./h

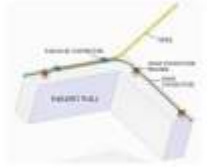


## 2. SPIKE

The length of Spike is 0.5 Mtr. And it has additional fixing length of 0.5 Mtr. It will be fitted at 0.4Mtr. apart at two points in fixing length.

### General Technical Data

Material of Spike	AlMgSi		
Standard	EN62561-2		
Part No.	EL-IV-1110801		
ATR	0.5Mtr.		
O.D.	8mm		
Total Length	0.5 Mtr.		
No. of Clamps	2		
Max gust wind speed	186 Km./h		



## 3. SIDE WALL CLAMP

Side Wall Clamp is a vertical mounting bracket for Air Termination Rod. It maintains 50mm distance from mounted wall surface.

### General Technical Data

Material of Side Wall Clamp	SS		
Standard	EN62561-1		
Part No.	EL-IV-1229001		
Clamping range	15 - 20 mm		
distance from wall	50mm		
Dist. between 2 Fixing Screws	90mm		



## 4. SELF SUPPORTING CONCRETE BASE

Concrete base provided to ATR is a self supporting base. This is used on flat roofs. This support to ATR, either as a single support or in multiples, as the case may be. The ATR will be fixed in the GI bush of Concrete Block with the glue.

### General Technical Data

Material of Concrete Base	Concrete C45/55	
Part No.	EL-IV-1269001	EL-IV-1269002
Weight	18 Kgs	9 Kgs
Base Diameter	340mm	240mm
Supporting Height	90mm	90mm
Compressive strength	28MPa	28MPa



## 5. TRIPOD STAND

To support ATR vertically on Flat roofs, Tripod Stands are used. It is having a SS Tube to hold ATR. ATR is fixed by gluing in the tube. There are three resting points, equally distributed on a circle of 1 Mtr. Dia. It is a rigid support to ATR

### General Technical Data

Material of Tripod Frame	GI/SS	
Standard	EN62561-1	
Part No.	EL-IV-2229001	
Support	Dia.16mm	
Required space	Circle of ø1Mtr.	
Wt.	20 Kgs.	

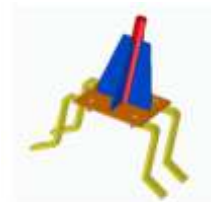


## 6. Fixture on the Ridge of sloping Metallic Roof

Frame of GI Strip of size 25X6 mm, is fabricated keeping a moderate clearance over the ridge of sloping metallic roof. A base plate is fastened over the frame. A GI bush is welded to Base Plate, so that the ATR can be mounted on it vertically. The length of Bush depends upon the length of ATR. The ATR is fixed by gluing in the Bush or can be fastened with 2 Nos of M8 Screws.

### General Technical Data

Material of Fixture	GI	
Standard	EN62561-1	
Part No.	EL-IV-2239001	
GI Strip for Frame	25X6mm	
Restig Length on either side	0.5 Mtr. each side	
No. of fastening on either side	2Nos on each side	
Max Gust Wind Speed	186 Km./h	



## 7. Parallel Connector

The Parallel connector is mainly used to connect two ends of parallelly laid conductors. In the same way it can also be used to clamp Spike rods.

### General Technical Data

Material of Parallel Connector	SS	
Standard	EN62561-1	
Part No.	EL-IV-1219003	
Material Sheet Thickness	2.8mm	
Clamping Range round	ø8- ø10mm	
No. of Screws	1	
Size of Screw	M8-20L	





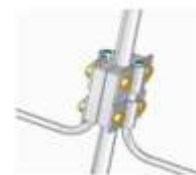


## 8. ATR Clamp cum Connector

ATR Clamp cum connector is clamped on ATR. Maximum two conductors can be held in this connector to connect with ATR.

### General Technical Data

Mat.: ATR Clamp cum connector	Al
Standard	EN62561-1
Part No.	EL-IV-1119001
Material Thickness	30mm
Clamping Range round	ø16mm
Holding Range of conductors	2 X ø8-ø10mm
No. of Screws	4
Size of Bolt,Nut,Thrust Washer	Hex Hd.M8
No.of Cleats	2



## 9. Aluminium Round Conductor

Aluminium Round Conductor of ø8mm is used of Lightning Protection System according to EN62561-2 as Roof and Down conductors.

### General Technical Data

Material of Al.Round Conductor	AlMgSi
Standard	EN62561-2
Part No.	EL-IV-1210801
OD of Conuctor	ø8mm
Cross section	50mm <sup>2</sup>
Material condition	Semi Rigid
Coil Weight	App.21.5 Kgs.



## 10. GI Flat Conductor

GI Flat Conductor of size 25X6mm is used in Lightning Protection System and in Earth Termination system, according to EN62561-2.

### General Technical Data

Material of GI Flat Conductor	low carbon steel
Standard	EN62561-2
Part No.	EL-IV-1232502
Size of Flat Conuctor	25X6mm
Cross section	150mm <sup>2</sup>
GI Coating	80 microns



## 11. SS Round Conductor

SS Round Conductor of ø10mm is used in Lightning Protection System and in Earth Termination system, according to EN62561-2.

### General Technical Data

Material of SS Round Conductor	SS
Standard	EN62561-2
Part No.	EL-IV-1221001
Size of SS Round Conuctor	10mm
Cross section	78.5mm <sup>2</sup>



## 12. Copper Cable Round Conductor

Copper Cable Round Conductor of ø8mm is used in Lightning Protection System and in Earth Termination system, according to EN62561-2.

### General Technical Data

Mat.: Copper Round Conductor	Copper
Standard	EN62561-2
Part No.	EL-IV-1240801
Size of Copper Round Conuctor	8mm
Cross section	50mm <sup>2</sup>
Outer Dia. With PVC Sleeve	13mm
No.of Strands X Wire Dia.	19NosXø1.8 mm



## 13. Steel Roof Conductor Holder with Plastic Base

Roof Conductor Holder with Plastic Base is used in LPS system to hold conductors of size ranging from ø8 to ø10mm. It is used to hold horizontal & vertical conductors.

### General Technical Data

Material of Steel RCH	SS316L
Standard	EN62561-2
Part No.	EL-IV-1209001
Holding Range	ø8 to ø10mm
Height of Conductor	(20 + 20)mm
Holder Fixing Screws	2 X M8 Screw



## 14. "Roof Conductor Holder Press to Fit" type without Plastic Base

"Roof Conductor Holder Press to Fit" type without Plastic Base is used in LPS system to hold conductors of size ranging from ø8 to ø10mm. It is used to hold horizontal & vertical conductors.

### General Technical Data

Material	SS
Standard	EN62561-1
Part No.	EL-IV-1222201
Base Size of RCH	34 X 30 mm
Height of Conductor	22mm
Holding Range	ø8 to ø10mm



## 15. "Roof Conductor Holder Press to Fit" type with Plastic Base

"Roof Conductor Holder Press to Fit" type with Plastic Base is used in LPS system to hold conductors of size ranging from ø8 to ø10mm. It is used to hold horizontal & vertical conductors.

### General Technical Data

Material	SS
Standard	EN62561-1
Part No.	EL-IV-1202601
Height of Conductor	26mm
Holding Range	ø8 to ø10mm





## 16. Plastic Roof Conductor Holder with Round Base

Plastic Roof Conductor Holder with round base is used in LPS system to hold conductors of size ranging from  $\varnothing 8$  to  $\varnothing 10$ mm. It is used to hold horizontal & vertical conductors.

### General Technical Data

Material of Plastic RCH	Plastic
Standard	EN62561-2
Part No.	EL-IV-1289001
Base Size of RCH	$\varnothing 65$ mm
Height of Conductor	37mm
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm



## 17. Plastic Roof Conductor Holder without Round Base

Plastic Roof Conductor Holder without round base is used in LPS system to hold conductors of size ranging from  $\varnothing 8$  to  $\varnothing 10$ mm. It is used to hold horizontal & vertical conductors.

### General Technical Data

Material of Plastic RCH	Plastic
Standard	EN62561-2
Part No.	EL-IV-1289002
Height of Conductor	37mm
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm



## 18. 1 Kg Concrete Roof Conductor Holder-Snap type

Concrete Roof Conductor Holders are used in LPS system to hold conductors on Flat roof only. The holding range is from  $\varnothing 8$  to  $\varnothing 10$ mm. It is used to hold horizontal conductors.

### General Technical Data

Material of Concrete RCH	C35/55
Part No.	EL-IV-1269001
Holding Material	Plastic
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm
Height of Conductor	70mm

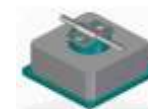


## 19. 1 Kg Concrete Roof Conductor Holder Cleat type

Concrete Roof Conductor Holders are used in LPS system to hold conductors on Flat roof only, by fixing with cleat. The holding range is from  $\varnothing 8$  to  $\varnothing 10$ mm. It is used to hold horizontal conductors.

### General Technical Data

Material of Concrete RCH	C35/55
Part No.	EL-IV-1269002
Holding Material	Plastic
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm
Height of Conductor	60mm



## 20. Standing Seam with Cleat

Standing Seam with Cleat is used in LPS system on sloping metallic roof where this can be clamped to one of the elements on or near the roof sheet. The roof conductor will be held in Cleat.

### General Technical Data

Material	SS / GI
Standard	EN62561-2
Part No.	EL-IV-1227003
Clearance below Conductor	70 mm
Holding range	$\varnothing 8 - \varnothing 10$ mm



## 21. Standing Seam with Cross Connector

Standing Seam with Cross Connector is used in LPS system on sloping metallic roof where this can be clamped to one of the elements on or near the roof sheet. The roof conductor as well as Down Conductor will be held in Cross Connector.

### General Technical Data

Material	SS / GI
Standard	EN62561-1
Part No.	EL-IV-1227004
Clearance below Conductor	70 mm
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm



## 22. Standing Seam on vertical Roof JOINT

Standing Seam on vertical Roof Joints is used in LPS system on sloping metallic roof where this can get clamped to the roof sheet vertical joint. With a set of 2 or 4 Nos ATR Base Plate can be mounted on it. It can also be used as a single clamp with cleat to hold roof conductors

### General Technical Data

Material	SS / GI
Standard	EN62561-1
Part No.	EL-IV-1227002
Clearance below Conductor	70 mm
Holding Range	$\varnothing 8$ to $\varnothing 10$ mm



## 23. Girder Clamp - Horizontal Flange with Clamping Shoe

This combination is used in LPS system on sloping metallic roof where this can be clamped to Girder and the roof conductor will be held in Shoe clamp.

### General Technical Data

Material	GI
Standard	EN62561-2
Part No.	EL-IV-3233001
out side Size	30 X 25 X 75 mm
Holding range	3 - 18 mm





## 24. Girder Clamp - Vertical Flange with Clamping Shoe

This combination is used in LPS system on sloping metallic roof where this can be clamped to Girder and the roof conductor will be held in Shoe clamp.

### General Technical Data

Material	GI
Standard	EN62561-2
Part No.	EL-IV-3233002
out side Size	30 X 25 X 75 mm
Holding Range	3 - 18 mm



## 25. Splicer / Straight Connector

Splicer / Straight Connector is used in LPS system to connect and clamp two ends of Conductors which are laid in a line. Holding range is from ø8 to ø10mm.

### General Technical Data

Material of Straight Connector	Al
Standard	EN62561-1
Part No.	EL-IV-1219002
Holding Range	ø8 to ø10mm



## 26. Extension Piece

Extension Piece is used in LPS system to accommodate expansion/ Contraction of conductors, on roof, depending upon the seasons. It is fitted in conductors on roof after every 20 Mtrs. with Splicer / straight connectors

### General Technical Data

Material of Expansion Piece	Al ( AlMgSi)
Standard	EN62561-2
Part No.	EL-IV-1269001
Size	ø8 X 395mm L



## 27. Fixed Earth Terminal

Fixed Earth Terminals are used in LPS system to enable to connect, concealed conductor either in Columns or in walls with the conductors which are laid on the surface of columns and walls.

### General Technical Data

Mat.: Fixed earth terminal	SS
Part No.	EL-IV-1329001
Connecting Thread Size	M10 / M12
Connection Round Plate	ø80mm



## 28. Strike Pad with Stud

Strike Pads, in LPS system, are used to arrest Flash currents if any exist, above 60 Mtrs. Of Structure. And its Stud connects the flash current to down conductors. They are mounted on a conductor ring laid around outer surface of the structure.

### General Technical Data

Material of Strike Pad	Al
Standard	EN62561-1
Part No.	EL-IV-1329002
Size	Base ø80 X 35 ht
Fixing provision	M8 Tapped Hole



## 29. U-Clamp with Cleat

In Lightning protection system, when the conductors are cocealed in columns, U-Clamps will be clamped to reinforcement bars and the conductor will be held in its cleat. Similar application can also be done on Metallic roof.

### General Technical Data

Material of U Clamp	SS /GI
Standard	EN62561-1
Part No.	EL-IV-1329004
Clamping & Holding Range	ø32 MM / ø8mm



## 30. MV Clamp

To Clamp and connect two conductors in parallel or across, Vertically or Horizontally, this clamp is used in LPS System.

### General Technical Data

Material of MV Clamp	SS
Standard	EN62561-1
Part No.	EL-IV-1229002
Holding Range	ø8 to ø10mm
Hex Head / Truss Head Screw	M8 -25L



## 31. Saddle Clamp with Pad

This is used in LPS system to hold conductors of cable with PVC Sleeve.

### General Technical Data

Material	SS
Standard	EN62561-1
Part No.	EL-IV-1329005
Holding Range	ø10 - 13 mm





## 32. Shoe Clamp

Shoe Clamps are used in LPS system to hold conductors at various locations.

### General Technical Data

Mat.: Shoe Clamp	SS
Standard	EN62561-1
Part No.	EL-IV-3222501
Holding Range	ø10mm
Size	25x30 mm



## 33. Epoxy Insulating Holder

These are used in LPS system to hold Flat Conductors Vertically / Horizontally.

### General Technical Data

Mat.:Epoxy Insulating Holder	Red Epoxy
Part No.	EL-IV-1389001
Clamping Screws	2 X M8-12 L
Flat Size to Accommodate	25X3 / 25X6
Dist. from surface	10mm

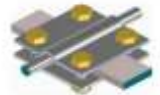


## 34. Cross Connector round to Flat

To Clamp and connect two conductors round & Flat across, this clamp is being used.

### General Technical Data

Material of cross connector	SS
Standard	EN62561-1
Part No.	EL-IV-1329012
Holding Range	ø8-ø10mm/30mm
Screw Size	4XHex Hd M8 Sc.



## 35. Cross Connector round to round

To Clamp and connect two conductors round & round across, this clamp is being used.

### General Technical Data

Material of cross connector	SS
Standard	EN62561-1
Part No.	EL-IV-1329011
Holding Range	ø8-ø10mm
Screw Size	4XHex Hd M8 Sc.

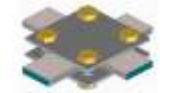


## 36. Cross Connector Flat to Flat

To Clamp and connect two conductors Flat & Flat across, this clamp is being used.

### General Technical Data

Material of cross connector	SS
Standard	EN62561-1
Part No.	EL-IV-1329013
Holding Range	30 / 30 mm
Screw Size	4XHex Hd M8 Sc.



## 37. Disconnecting Clamp Round to Flat

This is used to connect/diconnect down conductors with the link leadig to earth grid ring

### General Technical Data

Material of disconnecting clamp	SS
Standard	EN62561-1
Part No.	EL-IV-1329006
Holding Range	ø10mm / 30mm

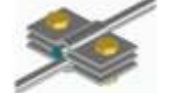


## 38. Disconnecting Clamp Round to Round

This is used to connect/diconnect down conductors with the link leadig to earth grid ring

### General Technical Data

Material of disconnecting clamp	SS
Standard	EN62561-1
Part No.	EL-IV-1329008
Holding Range	ø8 - ø10mm



## 39. Test Clamp / Disconnecting Clamp Flat to Flat

This is used to connect/diconnect down conductors with the link leadig to earth grid ring

### General Technical Data

Material of disconnecting clamp	SS
Standard	EN62561-1
Part No.	EL-IV-1329007
Holding Range	30mm



## 40. Lightning Strike Counter

This is used to count the impulse current occurred between equipotential bonding busbar and earths termination system.

### General Technical Data

Material of LSC	Plastic Body
Part No.	EL-IV-1309001
Digits displayed in counter	6 Digits
Size of Counter	45X60X55HT.





Incorporated in the year 2021 our companies involved in following activities -

Sale & servicing of Electricals safety - Mainly Design, Supply, Installation, Testing & Commissioning of Lightning Protection System, Maintenance Free Earthing Systems, Surge Protection Devices , Under the name of "IVANAH".

We have register Head office in Mumbai, a branch office at Pune. Serving Area all Over India & supply of the materials throughout India.



## **Balkrishna Bapu Chavan** *B.E. (Mech ), MDBA*

Certified profession by Siemens for 3D Modeling in Solid Edge Software. 30 Years experience in manufacturing field in various industries like Automobile, Foundry and Compressor for Railways & Ships, Sugar Plant Equipment Manufacturing etc. 18 Years experience in Design & Drafting

## **Mr. Pradeep Lahot** *Electrical Engineer*

Pradeep Lahot is an Electrical Engineer. He has work experience with French multinationals for 10 years before entering in to own business. He has traveled all over the country & to leading countries abroad on occasions & his exposed to the global developments & technologies. From the beginning of his career he dedicatedly involve only in the field of Lightning. He has vast knowledge in the field of Lightning Protection System Globally.



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