Kim thu sét NLP 1100 - NLP 2200

Thiết kế theo các tiêu chuẩn Quốc tế:
UNE 21185, UNE 21186, IEC 61024-1, NFC-17-102, VDC 0185

NLP 1100 - NLP 2200: Kim thu sét phát tia tiên đạo (ESE) an toàn và hiệu quả nhất .

Những ưu điểm của kim thu sét phát tia tiên đạo (ESE):

NLP được thiết kế đặc biệt để giảm thiểu thời gian thực phát tia tiên đạo khi có sét. Nói cách khác, so với những phương pháp cổ điển sử dụng kim Franklin, thiết bị điện tử có bên trong kim thu sét NLP sẽ cho vùng bảo vệ lớn hơn nhiều. Do đó, lợi ích và ưu điểm lớn nhất mà ta có được khi sử dụng NLP là :

1) An toàn nhất. 2) Vùng bảo vệ lớn nhất. 3) Hiệu quả kinh tế nhất.

** Chế tạo theo tiêu chuẩn UNE 21186 - 96, phiếu kiểm nghiệm số: 200307350353-A / 200307350357-A do trung tâm thí nghiệm kỹ thuật điện tử (L.C.O.E) Tây Ban Nha cấp.

** Manufactured according to standard UNE 21186 - 96 with test certificates nos : 200307350355-A / 200307350357-A from Laboratorio Cenrtral Oficial de Electrotecnia (L.C.O.E) - SPAIN

Tính toán bán kính bảo vệ :

Bán kính bảo vệ (Rp) của kim thu sét ESE NLP được tính toán sử dụng công thức theo tiêu chuẩn Quốc gia Pháp NFC-17-102 (tháng 7, 1995):

$Rp = \sqrt{h(2D-h)} + \Delta L(2D + \Delta L)$ khi $h \geq 5m$.

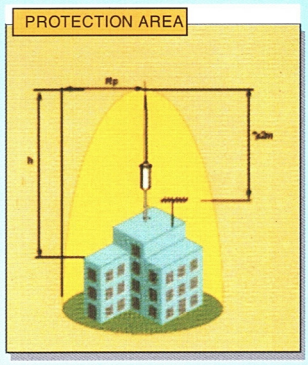
Những thông số để tính toán bán kính bảo vệ Rp:

- $\Delta L(m) = V.\Delta t$, V(m/s): Tốc độ tia tiên đạo
- Δt(µs): Thời gian phát tia tiên đạo theo thực nghiệm.
- h(m): Độ cao thực của km thu sét NLP so với mặt phẳng cần bảo vệ.
- D(m): Phụ thuộc vào độ an toàn được chọn. Các mức bảo vệ được chỉ rõ trong mục Annex B của tiêu chuẩn Pháp NFC-17-102.

D= 20m Mức an toàn 1 (An toàn cao).
D= 45m Mức an toàn 2 (An toàn trung bình).
D= 60m Mức an toàn 3 (An toàn tiêu chuẩn).

Trong đó, Thời gian phát tia tiên đạo Δt:

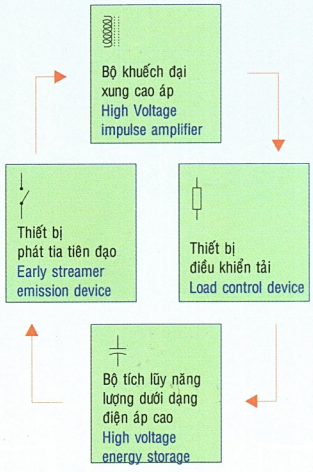
NLP 1100-15: $\Delta t = 15$ µs
NLP 1100-30: $\Delta t = 30$ µs
NLP 1100-44: $\Delta t = 44$ µs
NLP 2200 : $\Delta t = 72$ µs



NP: Mức bảo vệ
Rp: Bán kính bảo vệ
H: Độ cao đỉnh kim thu sét so với mặt phẳng cần bảo vệ.

Vật liệu chế tạo		100% thép không gỉ	
Nặng	Cao	Đường kính	Kim nhọn
2940gr	500mm	79mm	380mm

NLP XX00



Giấy kiểm nghiệm: series NLP 1100 và NLP 2200 được chế tạo theo tiêu chuẩn UNE 21186-96 giấy kiểm nghiệm số 200307350355-A và 200307350357-A do Laboratorio Central Oficial de Electrotecnia (L.C.O.E.), cấp ngày 02/06/05, với sự công nhận của ENAC tại Madrid (Spain)

Lightning Rod NLP 1100 - NLP 2200

Designed according to national and international standards:

UNE 21185, UNE 21186, IEC 61024-1, NFC-17-102, VDC 0185

NLP1100 - NLP2200: The safest and most effective Early Streamer Emission (ESE) system for lightning protection.

Advantages of Early Streamer Emission (ESE) lightning conductor:

The NLP has been specially designed to reduce the actual time associated with the upwards streamer emission created when lightning strike occurs. In the other words, compare to the traditional method used by a Franklin rod, the built-in electronic device allows a much bigger radius protection coverage. Therefore, what is the biggest benefits and advantages you can obtain with **NLP ?**

1) Best safety
2) Best protection
3) Best savings on installation

Calculation of protection radius:

The protection radius (Rp) of a NLP ESE terminal is calculated using the following formula as defined by the French National standard NFC-17-102 (July, 1995).

$Rp=\sqrt{h(2D-h)} + \Delta L(2D + \Delta L)$ for $h \geq 5m$. Where,

The following key parameters determine the calculation of Rp.

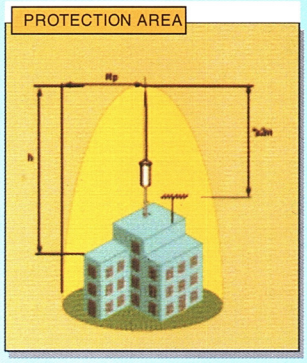
- $\Delta L(m) = V \cdot \Delta t$, V(m/s): Tracer speed
- $\Delta t(\mu s)$: Anticipation emission time as established during the test.
- h(m): actual height of NLP terminal above the area to be protected
- D(m): depends on the selected level of protection. Protection levels are specified in Annex B of the standard NFC-17-102.

D= 20m for protection level 1 (High protection).
D= 45m for protection level 2 (Medium protection).
D= 60m for protection level 3 (Standard protection).

Where, Anticipation Emission time Δt:

NLP 1100-15: Δt = 15µs
NLP 1100-30: Δt = 30µs
NLP 1100-44: Δt = 44µs
NLP 2200 : Δt = 72µs

Weight	Height	Diameter	Rod length	Material
2940gr	500mm	79mm	380mm	Stainless - Steel

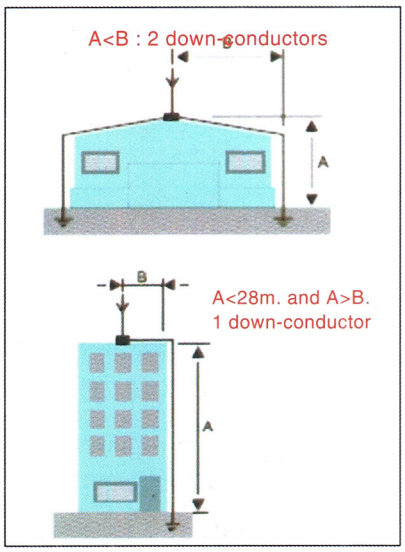


CDR 2000:
Lightning event counter
Imin = 250A

NP: Protection Level.
Rp: Protection Radius
H: Height of the top of the Nimbus on the surface to be protected.

CDI 250:
Lightning event counter
Imin = 250A

PSG :
Predective Spark Gap
I_M =100kA ; U≤ 10kV



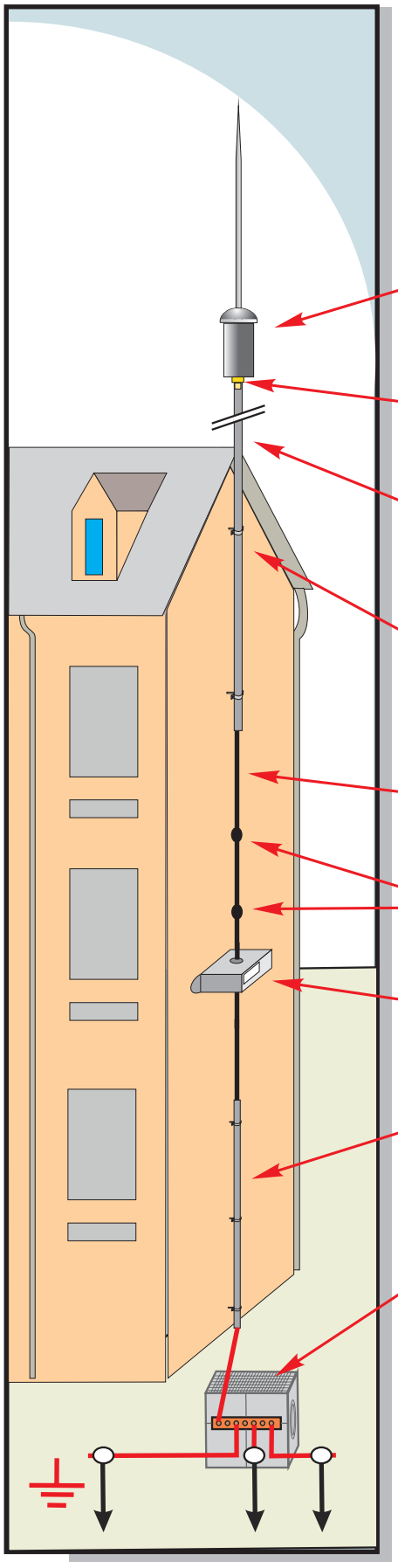
	NLP 1100-15			NLP 1100-30			NLP 1100-44			NLP 2200		
H(m)	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
2	13	18	20	19	25	28	24	30	33	32	40	44
3	18	26	30	23	35	44	35	45	50	48	59	65
4	25	36	41	28	50	57	46	60	67	64	78	87
5	32	45	51	48	63	71	58	75	88	79	97	120
6	32	46	52	48	64	72	58	76	88	79	97	120
8	32	48	54	49	65	73	59	77	90	79	98	121
10	33	49	56	49	66	75	59	77	91	79	98	122
15	34	52	60	50	68	77	59	79	93	79	101	124
20	35	55	63	50	71	81	60	81	96	80	102	126
45	35	60	73	50	75	89	60	85	102	80	105	126
60	35	60	75	50	75	90	60	85	104	80	105	132

According to GEMELEC, for the best result, maximum protection radius of NLP2200 should be 107m

The top of the lightning rod has to be 2m above any other points of the structure

What is the Certificate? NLP 1100 and NLP 2200 are manufactured according to standard UNE 21186-96 with test certificate number 200307350355-A and 200307350357-A issued on 02/06/05, at Laboratorio Central Oficial de Electrotecnia (L.C.O.E.), with ENAC accreditation in Madrid (Spain)

Lightning Rod NLP-1100 -30



NLP-1100 is manufactured according to standards UNE 21186 and NFC 17-102.

ANTICIPATION EMISSION TIME = 30µs

SELECTION GUIDE

In order to install a lightning rod, it is necessary to select all the components the system consists of. The following is a guide line which indicates the points to consider when selecting a lightning rod and its accessories.

1 CAPTURING HEAD — Ref. 77 901 071

The lightning rods NLP-1100-30 with feeding device release high voltage signals in order to anticipate the upgoing path, increasing this way the radius of the protected zone compared to a standard lightning rod.

2 ADAPTER ELEMENT — Ref. 77 902 610

The adapter element is used for the connection of the lightning rod to the mast.

3 MAST — Ref. 77 903 110

Extensible element which is adapted to the required height of the capturing head of the lightning rod in order to provide the desired protection radius.

4 MAST FIXATION — Ref. 77 904 900

Its function is the fixing of the mast. Different types of fixations exist such as fixing with screws or embedded.

5 DOWN-CONDUCTOR — Ref. 77 908 100

This element directs the current of the lightning strlke from the head of the lightning rod to the earth termination system.

6 CONDUCTOR HOLDING FIXTURE — Ref. 77 601 10172

It provides the fixing of the down-conductor.

8 DISCHARGE COUNTER — Ref. 77 920 100

The counter indicates the lightning strikes received by the protection system. Recommended in the standard UNE 21186 1996.

7 PROTECTION PIPE — Ref. 77 920 200

Pipe of galvanized sheet of 2 m length in order to avoid mechanical forces against the down-conductor.

INSPECTION PIT

Earth termination: there are various configurations depending on the construction and employed materials for earth termination systems.

Equipotentiality: it is recommended to connect the earth electrode of the lightning rod with the existing earth termination system and with close metal parts, in order to assure an appropiate equipotentiality and to avoid sparking when a lightning strike is absorbed.

See also on Earth Termination Systems.

INSTALLATION GUIDE

1 CAPTURING HEAD: the peak has to be located 2 m. above the highest parts of the area to be protected.

2 ADAPTOR ELEMENT : it has to provide the electrical contact between the capturing point and the downgoing conductor. It is put on the mast, on light poles, pillars, etc...

3-4 MAST- MAST FIXATION : the mast provides the appropriate height corresponing to the area to be protected by the lightning rod and is usually mounted with 2 or 3 fixings depending on its length.

5 DOWN-CONDUCTOR : it leads the current of the lightning strike from the capturing head to the earth electrode. The conductors can be of sheet, plain twist, twisted or round cable, and the minimum area has to be 50 mm^2.
Each lightning rod should have at least a down-conductor, except in the following cases, where two down-conductors are needed:

-structures higher than 28 m.
-the horizontal projection is larger than the vertical projection

The path has to be the most rectilinear possible with the shortest distance, avoiding curves. The covering radius should not be less than 20 cm. The down-conductor should avoid crossing or the proximity of electrical or telecommunication networks.

When the crossing cannot be avoided, then the line has to be inside of a metallic shield which needs to be extended 1 m on each side of the crossing.

Cornices or elevations should be avoided. A maximum height of 40 cm is allowed with an angle of up to 45º.

6 CONDUCTOR HOLDING FIXTURES : Independent of the fixture type, three fixtures per meter are used for the down-conductor. The fixtures must not be in direct contact with inflammable material.

8 DISCHARGE COUNTER : This counter is installed above the control joint, and in all cases 2 m. above the ground. It is mounted on the down-conductor.

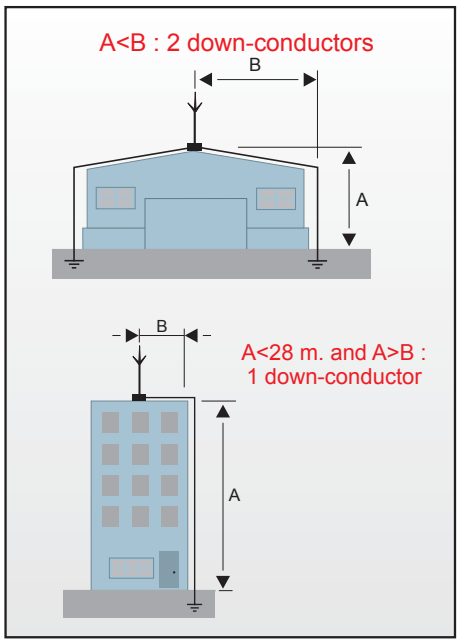
TEST JOINT : Each down-conductor has to incorporate a test joint, which allows to disconnect the earth electrode and thus allows to measure the resistivity. The test joint is mounted two meters above the ground.

7 PROTECTION PIPE : It is put between the ground and the control joint in order to protect the down-conductor against mechanical forces. The pipe is of metallic material and has a length of 2 m. It is mounted with three fixtures.

RADIUS OF PROTECTION

Model	NLP-1100-30		
NP	Nivel I	Nivel II	Nivel III
Rp (m) / h (m)			
2	19	25	28
3	23	35	44
4	28	50	57
5	48	63	71
6	48	64	72
8	49	65	73
10	49	66	75
15	50	68	77
20	50	71	81
45	50	75	89
60	50	75	90

From now on the results of early streamer emission air terminals are limited to 60 µs for calculation protection radius, according to NFC 17-102 from December 2001



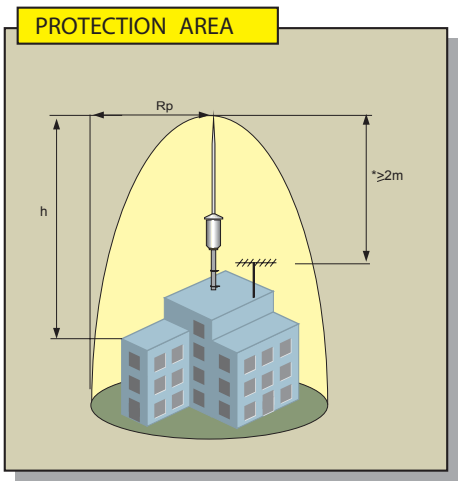
LEVEL OF PROTECTION

The protection level is a parameter to be determined according to the established standard. We use UNE 21186-96 based on NF C 17-102 standard. These standards establish three protection levels.

The protection level depends on:

- Lightning strikes density in the area.
- Situation of the structure to be protected (urban or rural zone, high buildings near the installation, …)
- Type of structure.
- Building's location.
- Cost valuation of period of the installation due to damages because of the lightning strikes.

Sometimes this last item is the cause of selecting a protection level I (Maximum security), as the losses because of non-operation the installation could be important.



NP: Protection Level
Rp: Protection Radius
H: Height of the top of the Nimbus on the surface to be protected.