

# Pulsar

## Range

Complies with NF C 17-102

CNRS-HELITA  
PATENT

## The high pulse voltage E.S.E lightning conductor.

*In ongoing collaboration with the CNRS (French National Research Organisation), Hélita continues to innovate, and has developed a new generation of lightning devices.*

*The new Pulsar range with increased initiation advance performances, represents further progress in terms of protection, operating autonomy and ease of maintenance.*

*These advancements reinforce Hélita's position as International leader in direct lightning protection with over 200 000 installations throughout the world.*



**Pulsar**

**HELITA**  
YOUR LIGHTNING PROTECTION

## INSTALLATION / VERIFICATION

The installation and verification of lightning protection systems utilising one or more Pulsar units must be performed in accordance with the manufacturer's recommendations and those given in standard NFC 17 102.

**Pulsar**  
Early Streamer  
Emission lightning  
terminal.

**Modular  
telecom  
protection**

**Low voltage  
lightning  
protection,  
the essential  
complement for  
comprehensive  
protection.**



**Test pole for  
lightning  
conductors**  
Unique maintenance  
system that permits  
a Pulsar to be tested  
in situ.

**Lightning strike  
counter**  
Effective aid to system  
maintenance.

### HELITA ALSO OFFERS A COMPLETE RANGE OF PRODUCTS:


- Simple rods, meshed cages, accessories • Grounding equipment, earth plates and accessories •
- Low voltage, Telecom and coaxial, surge arresters • Air navigation / obstacle beacons • Pylons •

Your installer/dealer



**HELITA**  
YOUR LIGHTNING PROTECTION

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**Pulsar**

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**Pulsar**

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**Product information**

**Pulsar 18**  
Conforms to NF C 17-102 Standard

Pulsar, the high pulse voltage E.S.E.A.T Early streamer emission air terminal



**An efficient streamer advance**

The Pulsar ESE air terminal generates high voltage pulses. Its effectiveness is guaranteed by the frequency of the pulses which limit the creation of space charges around the rod and generates a propagating upward streamer.

**Energy autonomy**

The Pulsar is self-contained. It draws its energy from the ambient field, which is required to generate high voltage pulses, creating and propagating an upward early streamer advance during a storm.

**A proven efficiency**

For more than 20 years, Hélita has run more than 40 000 strikes in many H.V. laboratories to certify its Pulsar lightning conductors. Hélita is the only ESE manufacturer in the world having performed numerous tests to measure the streamer advance.

Pulsar range performances ( $\Delta T$  values) are certified by major Official Governmental Third Party Organization.



**Ordering details**

$\Delta T$ $\mu s$	L mm	Description	Type	Order code	Weight kg
18	2.00	Stainless steel 2m Early Streamer Emission Air Terminal	Pulsar 18	2CTH01MH1812	5

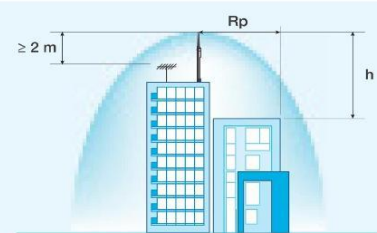
**BSI (British Standard Institute), United Kingdom**  
**LCIE (Central Laboratory for Electrical Industries), France**  
**KERI (Korean Electrotechnology Research Institute), Korea**  
**WHVRI (Wuhan High Voltage Research Institute), China**

# KIM THU SÉT PULSAR: KIM THU SÉT PULSAR 18, PULSAR 18 HIỆU HÉLITA - FRANCE - PHÁP

## Protected Area

The radius of protection  $R_p$  of a Pulsar is given by French Standard NF C 17-102. It depends on the initiation advance  $\Delta T$  of the Pulsar being measured in high voltage laboratory, on the levels of protection I, II, III or IV calculated according to the standard and lightning risk assessment included in the 2011 edition of NFC 17-102 equivalent to the IEC 62 305-2, and to the height  $h$  of the Pulsar tip over the area to be protected (minimum height  $h = 2$  m).

	LPL I	LPL II	LPL III	LPL IV
Rolling sphere radius $r$ (m)	20	30	45	60



$R_p(h)$  : Protection radius at a given height (h)  
 $R_p(h) = \sqrt{2rh - h^2 + \Delta(2r + \Delta)}$  (for  $h \geq 5$  m)  
 For  $h < 5$  m, refer to the table below

$h$  : Height of the Pulsar tip above the surface(s) to be protected

$r$ (m) : Standardized striking distance

$\Delta$ (m) =  $10^6 \cdot \Delta T$  (Pulsar efficiency)

## Our range of Products

- Pulsar 30, Pulsar 45, Pulsar 60 lightning conductors, simple rods, meshed conductors and accessories
- Earthing system materials
- Surge protective devices.

## Radius of protection as per NF C 17-102

Level of protection	Level I $r = 20$ m	Level II $r = 30$ m	Level III $r = 45$ m	Level IV $r = 60$ m
Pulsar	18	18	18	18
$\Delta T$ ( $\mu$ s)	18	18	18	18
2	14	16	19	22
3	21	25	29	33
4	28	33	38	44
5	35	41	49	55
6	35	42	49	56
8	36	43	51	58
10	37	44	52	60
15	38	46	55	64
20	38	47	58	67
45	38	48	63	77
60	38	48	63	78

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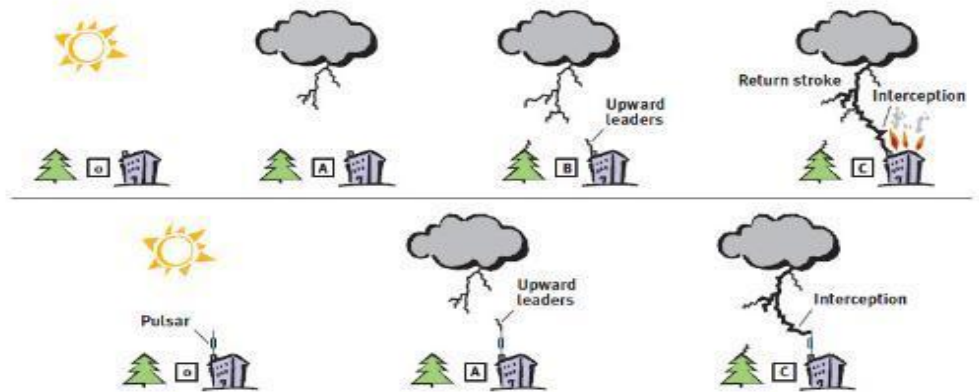
RodCheck has not been hit by a lightning stroke

RodCheck after few kA lightning strokes

RodCheck after several impacts or a strike greater than 40 kA

## THE ADVANTAGE OF INITIATION ADVANCE

The unique efficiency of the Pulsar lightning conductor is based on a specific initiation advance; well before the natural formation of an upward leader, the Pulsar generates a leader that rapidly propagates to capture the lightning and direct it to earth. Validated in the laboratory, this gain in time relative to the simple rod provides additional essential protection.



## COMPLETE AUTONOMY

During a storm the ambient electric field may rise to between 10 to 20 kV/m. As soon as the field exceeds a threshold representing the minimum risk of a lightning strike, the

Pulsar lightning terminal is activated. It draws its energy from the ambient electric field the energy required to generate high voltage pulses, creating and propagating an upward

leader. No other power sources are required, and no radioactive components are used.

## PROVEN EFFICIENCY

Hélita has proven commitment to research and development and continuously sets new benchmarks for the efficiency of lightning conductors. Hélita's co-operation with the CNRS led to a better understanding of the test process in high voltage laboratories and of the lightning phenomena itself.

The Pulsar has undergone testing in the IREQ laboratory in Canada and in Hélita's own LEHTM centre. International certification organisations including BSI, LCIE and KERI have validated the results obtained.



Ascending discharge on a Pulsar during the test procedure at IREQ (Canada)



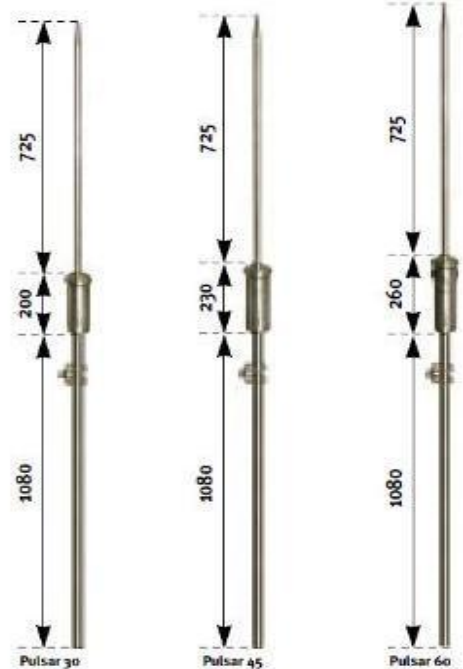
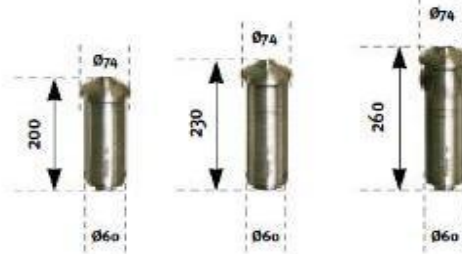
- Laboratoire Central des Industries Electriques - France
- British Standards Institute - Great Britain
- Korea Electromechanical Research Institute - Korea



## PULSAR REFERENCES

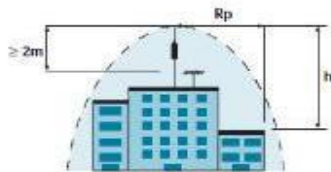
$\Delta t$ ( $\mu s$ )	Description	Reference	L(m)	Weight (kg)
30	Pulsar 30 stainless steel on 2 metres	IMH.3012	2,0	5,0
45	Pulsar 45 stainless steel on 2 metres	IMH.4512	2,03	5,3
60	Pulsar 60 stainless steel on 2 metres	IMH.6012	2,06	5,7

These lightning conductors are also available in copper-covered stainless steel and black stainless steel.



## CALCULATION OF PROTECTED AREAS

The radius of protection  $R_p$  of a Pulsar is given by the French standard NF C 17-102 of July 1995. It depends on the initiation advance  $\Delta T$  of the Pulsar measured in the high voltage Laboratory, on the levels of protection I, II, III calculated according to the lightning risk assessment guide (Appendix B of the French standard NF C 17-102) and the height  $h$  of the lightning conductor over the area to be protected (minimum height = 2m).



$R_p$  : radius of protection in a horizontal plane located at a vertical distance  $h$  from the Pulsar tip.

$h$  : height of the Pulsar tip above the surface(s) to be protected.

$D$  : standardised striking distance.

$\Delta L = 10^4 \cdot \Delta T$  (initiation advance)

$R_p = \sqrt{h(2D-h) + \Delta L(2D + \Delta L)}$  (for  $h \geq 5m$ )

For  $h < 5m$ , see the radius of protection table opposite.

$\Delta T$  = initiation advance measured during efficiency tests according to appendix C of the French standard NF C 17-102

### Pulsar radius of protection

Level of protection	I (D = 20 m)			II (D = 45 m)			III (D = 60 m)		
	Pulsar 30	Pulsar 45	Pulsar 60	Pulsar 30	Pulsar 45	Pulsar 60	Pulsar 30	Pulsar 45	Pulsar 60
Pulsar									
$h(m)$	Radius of protection $R_p$ (m)								
2	19	25	32	25	32	40	28	36	44
3	28	38	48	38	48	59	42	57	65
4	38	51	64	50	65	78	57	72	87
5	48	63	79	63	81	97	71	89	107
6	48	63	79	64	81	97	72	90	107
8	49	64	79	65	82	98	73	91	108
10	49	64	79	66	83	99	75	92	109
15	50	65	80	69	85	101	78	95	111
20	50	65	80	71	86	102	81	97	113
45	50	65	80	75	90	105	89	104	119
60	50	65	80	75	90	105	90	105	120

The level of protection is calculated according to appendix B of the French standard NF C 17-102.

For the Pulsar 60, limiting the value of  $\Delta T$ , that used in the radius of protection calculation, to

60  $\mu s$  has been validated by the experiment conducted by the members of Gimelec (Group of Industries for Materials for Electrical Equipment and associated Industrial Electronics).

## HELITA MANUFACTURING QUALITY

The enviable reputation of the Pulsar has been earned through maintaining a consistently high quality in manufacture. Before leaving the factory, each pulsar has been tested for insulation breakdown at

high voltage, and subjected to a current test that ensures its performance when conducting lightning discharges. The high voltage output pulses at the Pulsar are also examined to verify correct amplitude and

frequency. The Pulsar is built to withstand the arduous conditions encountered in service, and its ongoing performance can be monitored simply and quickly using the pulsar test set.

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