

# Between Sky and Earth

*The new generation of lightning conductor with  
excitation by impulse and propagation sustained*

*Powerful and selective*

*Pre-loaded and self-contained*

**Saint-Elme** Active  <sup>®</sup>

**FRANKLIN  
FRANCE**



# Saint Elmo Active 2D<sup>®</sup> lightning conductor

Excitation with Time control by impulse and sustained propagation speed

## Lightning conductor with excitation device In compliance with the NFC 17-102 standard – Franklin France Patent

### Saint-Elme Active 2D<sup>®</sup> Lightning conductor

The efforts which have been carried out until today to increase the radius of action of the lightning conductors were based mainly on the improvement of the excitation time of the upward leader. However, the effectiveness of a lightning conductor does not depend only on the excitation time of a leader to the rod but as well and above all of the capacity to propagate this leader on a large distance to capture the downward leader.

Fruit of many years of research, tests in laboratories and in situ, **FRANKLIN FRANCE** has developed a new revolutionary generation of lightning conductor and thus keeps its technology advance.

The operating principle of the **Saint-Elme Active2D<sup>®</sup>** consists, not only to initiate the upward leader, but moreover, provides enough energy to ensure its propagation until the junction with the downward leader.



## Principle & operating

A first device, named «**impulse device**» stores the electrostatic energy present in the atmosphere at the approach of a stormy cloud and releases the excitation of the ascending discharge at the right time.

A second device, named «**power device**», collects and stores the wind and / or the solar energy in several strong power capacitors. The Saint-Elme lightning conductor is in this way permanently pre-loaded of an important energy which enables him to support the propagation of the ascendant tracer.

Close to the storm activity, an integrated sensor measuring the surrounding electric field value, releases the impulse device like most of usual Early Streamer Emission systems. Those lightning conductors almost immediately reverse the polarity of their head, creating a sudden amplification of the electrical field.

The innovation of **Saint-Elme Active2D<sup>®</sup>** lightning conductor comes from the use of a second integrated sensor which measures the intensity of the electric discharge current, which is formed on the lightning conductor's head.

When the downward leader enters in the protection area of the lightning conductor, the measured current strongly increases. As soon as this current is higher than the characteristic threshold,

the power capacitors discharge and release the necessary energy for the propagation of the leader.

In this last device, the lightning conductor's head acts as a capture device. Therefore, the head is electrically insulated from the ground.



## Characteristics of the Saint-Elme Active 2D<sup>®</sup> lightning conductor

- Take in account the energetic information to choose the tracer which can become an ascending tracer
- Maintain the propagation of the tracer by discharge of the power device
- Source of energy autonomous and clean
  - **Solar (2)** or **wind (1)** energy for the «**power device**»
  - Atmospheric electrical field for the «**impulse device**» (3)
- Consider the cloud polarity
- Radius of curve of the head optimize to reduce the corona effect and guarantee the excitation device
- Protection of the electrical part against the rain with a **dimensioned flange (4)**
- High quality materials, esthetical
- Use of stainless steel to resist against corrosion



## Tests

The **Saint-Elme Active2D<sup>®</sup>** lightning conductor was tested in BAZET high voltage laboratory in compliance with the NFC 17-102 standard, and is subject of in situ tests campaign.

The **Saint-Elme Active2D<sup>®</sup>** lightning conductor's

excitation advance device has been determinated comparing to a rod of reference obtained in short-circuiting the double device of this lightning conductor.

The **Saint-Elme Active2D<sup>®</sup>** lightning conductor can be tested on site with his remote control tester.

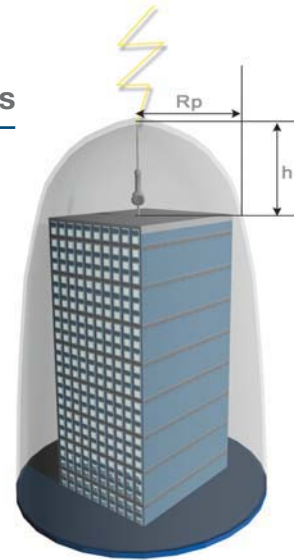
## Protection's performances of the Saint-Elme Active 2D<sup>®</sup> lightning conductor

### Protection offered by Saint-Elme Active2D<sup>®</sup> lightning conductors

#### Preferential capture

The ability to favour excitation at lower values of the electrostatic field (hence earlier), enhances «the capture probability» of conductor.

This capacity gives them greater efficiency in the role of «preferential capture points» compare to any other point of the building they protect. Therefore, these lightning conductors offer superior guarantees during low intensity discharges (2 to 5 kA) compared with simple rod – type lightning conductors, which can only intercept them over short distances. ( $D=101^{2/3}$ , D in meters, I in KA)



### Larger zone of protection

The zones of protection of lightning conductors are obtained theoretically by plotting the electro-geometric model.

French standard **NF C 17-102** defines the radius of protection Rp (m)

depending on the average excitation advance  $\Delta L$  (m) and on the level of protection Np of the Early Streamer Emission (ESE) lightning conductors determined in compliance with the IEC 62305-2 international standard.

Rp	SE2D30, $\Delta T = 30\mu s$					SE2D60, $\Delta T = 60\mu s$				
H(m)	40%*	I	II	III	IV	40%*	I	II	III	IV
2	11	19	21	25	28	19	31	34	39	43
4	23	38	43	51	57	38	63	69	78	85
5	29	48	55	63	71	48	79	86	97	107
6	29	48	55	64	72	48	79	87	97	107
8	29	49	56	65	73	48	79	87	98	108
10	29	49	57	66	75	48	79	88	99	109
20	29	50	59	71	81	48	80	89	102	113
30	29	50	60	73	85	48	80	90	104	116
60	29	50	60	75	90	48	80	90	105	120

(\*) According to the explanation card NFC 17 102 –01 of the standard NFC 17 102, and if the lightning constitutes a risk for the environment (C5=10) a security coefficient of 40% is applicable in France in the radius of protection concerning the protected sites for the environment protection (ICPE, law of the 28/01/93, JO 26/02/93 P3035) it

means the silo (law of the 15/06/00 JO 19/07/00 pl 11092), nuclear installation of base (INB, law of the 31/12/99 JO 15/02/00 p 2263)



# Applications *Saint-Elme* Active 2D<sup>®</sup>

Lightning is a natural, universal and permanent phenomenon. It occurs daily and strongly in tropical areas. Lightning causes considerable damages and expenses to a country's economy, it also represents a significant and constant threat for the population. Every year some people are killed, mainly while being in open-areas.

## Industries

Refineries, pump stations



## Open-air installations

Stadiums, golf courses, leisure parks



## Telecommunications

Hertzian relays, antennas



## Buildings

Warehouses, churches, monuments



## *Saint-Elme* Active 2D<sup>®</sup> range

Pattern	Solar	wind+solar	Counter*
SE2D30	AFB 1030 2D	AFB 1032 2D	Not included
SE2D60	AFB 1060 2D	AFB 1062 2D	Not included
SE2D30	AFB 1730 2D	AFB 1732 2D	Included
SE2D60	AFB 1760 2D	AFB 1762 2D	Included

\*Counter



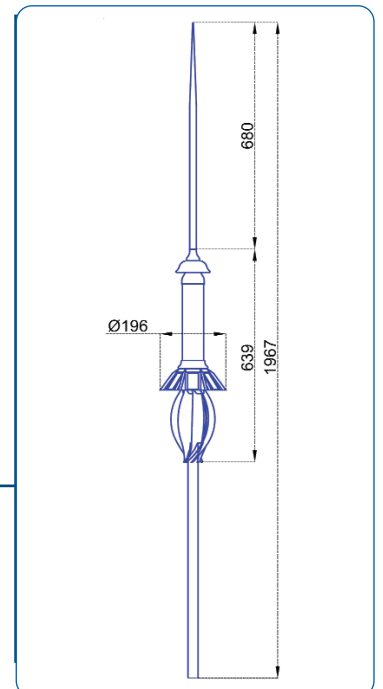
## Packaging

Lightning conductor complete conditioned in carton box.

- Weight : 7Kg
- Dimensions : 800 x 260 x 240 mm



## Dimensions





Founded in 1980, the company Franklin France built its notoriousness on a global approach to the lightning phenomenon.

For more than 25 years, the company has acquired the image of a specialist in lightning protection and rapidly took the position of leader on its market.

Franklin France offers a complete range of products :

Lightning conductors, overvoltage protection, obstacles beaconing and earthing material.

Franklin France also puts at your disposal its know-how as lightning protection expert :

- Lightning risk assessment
- Facilities audits
- Technical studies
- Installations
- Removal of radioactive lightning conductor
- Measure of contamination
- Technical assistance
- Training\*

\* with its training center



Distributor's stamp :