

# Forward

## Lightning Protection



- The protected cover range is according to the ESE's rule NFC 17-102 and NFPA 781.
- VEGA is made from SUS316. It has anti-acid, anti-alkali, anti-corrode, and match the Taiwanese climate when it uses in lightning protection.
- High Voltage proof : 950KV
- High Current proof : 120KA
- Max. Current proof Available : 200KA

**VEGA**



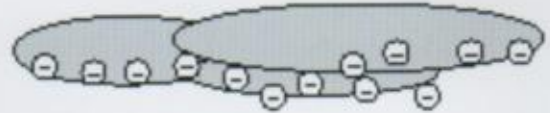
# VEGA

## Early Streamer Emission Lightning Conductor

---

### THE FORMATION OF LIGHTNING

In normal condition, the electrical balance in the atmosphere remains stable. However, when storm clouds develop, positive and negative charges split inside the cloud, producing a high electric field at the atmosphere.



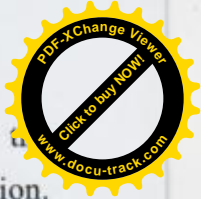
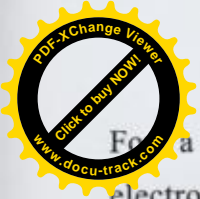
When this electric field reaches a value around 10KV/m, a discharge starts from the cloud, forming the downward leader. This leader approaches to the ground with steps that last microseconds. Any element on the area placed below can be stricken by the lightning.

The charges of the clouds and the downward leader induce a positive charge on the ground and on every element placed onto it. This charge is concentrated at these elements, especially on metallic parts. Then corona discharges appear around them, thus the positive charges are attracted in the electric field. One of them will develop to meet the downward leader. At this moment the path for the lightning is created and that element will receive the strike.

### THE PRINCIPLE OF VEGA

Variations in the electric field produced by the lightning storm are the source that gives the power to the lightning conductor: no other external supply is needed.

The inner triggering device of *VEGA* works with this energy. Thanks to the high voltage impulses generated by the internal device, the lightning conductor will emit the upward leader earlier than any other element inside its protection area, connecting with the downward leader and becoming then the preferred point of impact for the lightning.



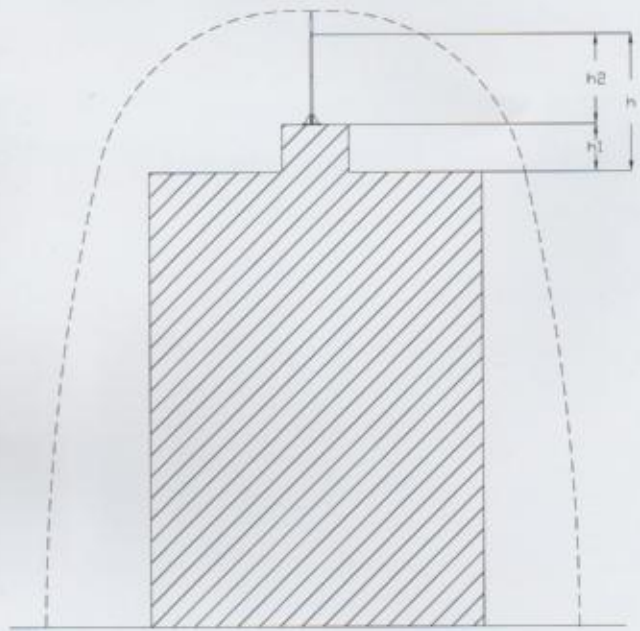
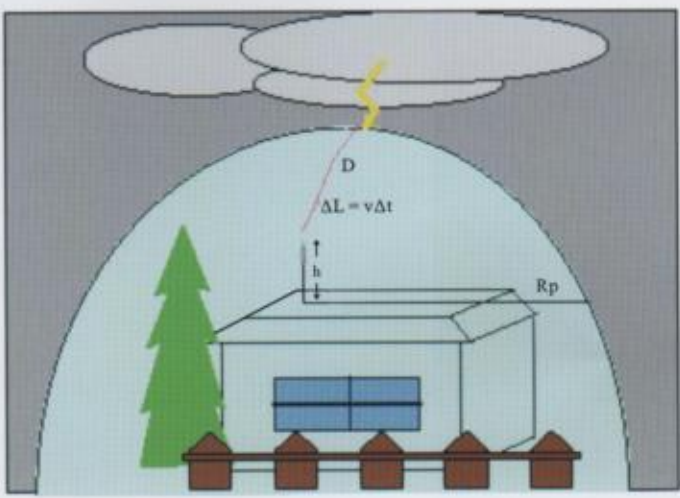
For a correct working of the triggering device, insulation between the armatures of the electroatmospheric capacitor must be ensured, even in snow and heavy rain condition. *VEGA* has incorporated a protection wing covering the gap, in order to avoid any connection that could reduce the efficiency of the lightning conductor.

In any case, the air terminal must always be placed at least two meters over any other element in the protected area, and the installation must provide a safe path to earth.

**PROTECTED AREA**

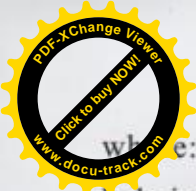
The main characteristic of an Early Streamer Emission (ESE) Lightning Conductor is its ability to start the upward leader earlier than any other element in its protected area. This parameter is called average gain in time of upward leader emission ( $\Delta t$ ).

The average gain of upward leader emission is the parameter that fixes the radius of protection of the ESE air terminal.



The radius of protection is calculated as follows:

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



h: height subtraction between the lightning conductor tip and the referred horizontal plan (usually the mast length).

D: a parameter that takes different values depending on the protection level:

D=20 m for LEVEL I (for areas with very high risk of lightning and/or very important goods to be protected)

D=45 m for LEVEL II (for areas with high risk of lightning and/or important goods to be protected)

D=60 m for LEVEL III (for areas with normal risk of lightning and/or normal goods to be protected)

$\Delta L$ : virtual height achieved upon the air terminal, thanks to the early streamer emission device.

$$\Delta L = v\Delta t \quad \text{where } v \text{ is the streamer velocity of propagation (approx. } 1\text{m}/\mu\text{s}).$$

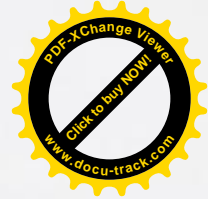
### Two Power of ionization are available

Designation	Reference	$\Delta t(\mu s)$ Test Lab. according NFC 17-102
PROTEL 30	VEGA 030S	62
PROTEL 60	VEGA 060S	122

### Radius of Protection of VEGA 030S and 060S

Model	Protection Level	ACCORDING TO FRENCH STANDARD TEST LAB. NFC 17-102 (in meters)									
		H(Meters)									
		2	3	4	5	6	8	10	15	20	30
030S	Level I	31	47	63	81	81	81	81	82	82	81
	Level II	39	58	78	99	100	100	101	103	104	106
	Level III	43	64	85	109	109	110	111	113	115	118
060S	Level I	43	64	85	141	141	141	142	142	142	142
	Level II	51	78	104	162	162	163	163	164	165	166
	Level III	55	80	109	173	174	174	175	176	178	180

Note : When the installation of lightning conductor  $h < 5\text{m}$ , please see the above table of radius without calculation.



# VEGA

# LSC-21

## Lightning Strike Counter

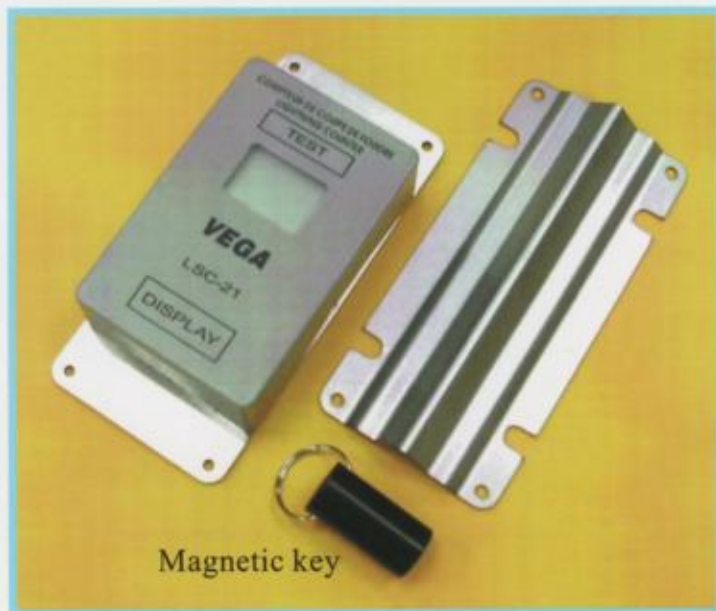
### APPLICATIONS

Statistics of maintenance of lightning earth terminal and over surge protection.

TEST Function  
With the magnetic key

DISPLAY Function  
With the magnetic key

LCD display (2 digits)



### PRINCIPLE

This lightning tech MSC digital counter, designed in surface mounting technology have got a very high sensitivity and reliability for little sizes.

It's designed to count the lightning strokes number.

A calibrated magnetical induction turn on the DISPLAY and TEST functions using the special key supplied.

- Impulse Value (WAVE 8/20us) : >50A
- Impulse Value (WAVE 8/20us) : >100A
- Impulse Value (WAVE 8/20us) : >200A
- Impulse Value (WAVE 8/20us) : >400A
- Impulse Value (WAVE 8/20us) : >800A
- Impulse Value (WAVE 8/20us) : >1.5KA

### PROPERTY

Stainless steel and aluminium, anti UV polycarbonate window and 100% waterproof IP68.

Concepted to be installed without opening the down conductor circuit.

Can be installed on the earth connection of over surge suppressors.

It's equipped of a large LCD display (2 digits) perfectly readable.