

**Application**

**"Guardian-5" lightning arrester**

As a new generation of lightning rod currently developed by LPI, the "Guardian-5" system has made the following improvements on the original basis:

The pointed top is replaced by a convex top. The impact of corona is further reduced. This conclusion has been verified by experiments on the South Baldi Peak of Magodana Mountain in New Mexico, USA.

The lightning rod uses four independent plates instead of spherical plates, making the ability of the lightning terminal to enhance the electric field strength more in line with 1:15 (200KV: 3MV).

Due to the above improvements and process improvements, the Guardian-5 system has better performance ( $\Delta T=50-62\mu s$ ), complies with a series of standards such as UL-96, NFC17-102, and is also relatively low in price.

**The guard rod is a non-radioactive material structure**

The lightning rod can withstand voltage: 250KV within 1/50 microseconds (250KV at 1/50 $\mu s$  WAVESHAPe).

The lightning rod is made of stable materials and is not easily corroded in normal atmosphere.

The lightning rod does not require batteries or power to provide operating power, and has no active components.

The lightning rod calculates the protection range of the building based on the interception volume of the upward flash current to the downward leading current when the lightning discharge current is set at the intensity.

The working characteristics of the lightning rod are early discharge type (ESE), which complies with UL96 safety certification and IEC1024-1, GB50057-94, 99D562 standards. And ISO9002 certification.



**Lightning dedicated lower conductor LPI-HVSC**

The "Guardian-5" system can use copper strips and flat steel as lower conductors. However, in order to avoid the same situation as the general lightning protection system, when discharging lightning current, "side flash" will cause harm to nearby personnel and equipment.

LPI recommends using high-voltage protective cables as lower conductors in densely populated areas and places with sensitive equipment.

The lower conductor is composed of coaxial double-layer conductors separated by high-voltage insulating materials.

The main conductor is a multi-strand copper core wire with a cross-section of more than 50mm<sup>2</sup> arranged in parallel and distributed on a circumference of 18mm diameter.

The inductance of the lower conductor is  $\leq 22nH/m$

The capacitance of the lower conductor is  $\geq 1100\text{PF/m}$

The resistivity of the lower conductor is  $0.5 \times 10^{-3} \Omega/\text{m}$

The voltage of the lower conductor is  $\geq 200\text{KV}$  (1.2/50 waveform)

Conductivity: 135kA (50% of the lightning current is below 30kA, and the example of 135kA is less than 1%)

Characteristic impedance:  $4.5\Omega$

Two-layer shielding to reduce the influence of electromagnetic induction.

The lower conductor has low characteristic impedance and two layers of insulation to prevent lateral sparking.

The lower conductor is made of non-combustible materials.

The material of the lower conductor must be corrosion-resistant.

The lower conductor must comply with ISO9002 quality system certification.

### **Direct Lightning Counter (LC-1500)**

LC-1500 direct lightning counter has the characteristics of high sensitivity and does not require batteries or any other power supply.

Due to its good sealing (IP65), it is suitable for indoor and outdoor environments.

### **Thunderstorm Warning Device**

#### 1. Warning Principle

--Measure the intensity of lightning electric field

--Monitor the electric field changes of distant and near thundercloud discharges

2. It consists of a control console, an induction antenna and an alarm speaker

3. There is a thundercloud within the range of 10-15KM: the first warning (yellow light)

4. The thundercloud enters the range of 8-10KM: the second warning (sound, light)

5. The thundercloud enters the range of 1-2KM and gives an emergency warning

6. Microprogram controller operation

The lower conductor has low characteristic impedance, two layers of insulation, and prevents lateral sparking.

The lower conductor is made of non-combustible material.

The material of the lower conductor must be corrosion-resistant.

The lower conductor must comply with ISO9002 quality system certification.