

**Application**

Spain's Apollo pre-discharge lightning rod (also known as APOLLO lightning rod) has a chain reaction device active lightning rod system-active lightning rod, mainly composed of three systems (atmospheric power capacitor, high-voltage pulse transmission system, current discharge system), and has The dual instantaneous discharge device is protected by multiple layers of materials with isolation from harsh environments and water tightness. It has no aging hazard and maintenance-free. It has been widely used in various buildings to prevent direct lightning strikes.

Atmospheric power capacitor: In 90% of cases, the lower layer of thunderclouds gathers negative charges, and the ground induces positive charges. When the charge of the thundercloud accumulates to a certain extent, the thundercloud can be regarded as a plate capacitor with a great field strength to the earth. The positive charge of the earth reaches the needle tip through the lightning rod rod. Because of the APOLLO lightning rod (Apollo early discharge lightning rod) shell and the needle rod It is isolated by insulating materials and two sets of instantaneous discharge devices. The electric potential in the induction capacitor of the shell is much lower than the needle tip electric potential, causing a strong electric potential difference.

Lightning protection starting system: Apollo pre-discharge lightning rod has a built-in transformer-type transmitter that generates high-voltage pulses depending on the changes in the surrounding electric field. When the surrounding electric field is very high (above 50kV/m), the energy concentrator of the lightning rod will absorb and accumulate the energy formed by the conversion of the floating potential difference through the external electrical puller. Then the transformer-type high-voltage transmitter will instantly radiate high-voltage pulses to ionize the air in the atmosphere, enhance and amplify the electric field strength around the lightning rod, increase the discharge potential of the lightning cloud upwards, and shorten the insulation distance between the lightning cloud and the lightning rod.

Lightning current discharge system: With the continuous enhancement of this process, the insulation distance between the thundercloud and the lightning rod is getting shorter and shorter, the field strength is greater, and the air is further ionized until the pilot discharge and the main discharge occur. The time for the high-voltage pulse emission must be before the time when the tracer reaches the ground for discharge, and the average speed of launching the tracer is 1 m/μs. The advance time difference of the entire operation procedure is called the advance discharge time.

APOLLO active lightning rod (TA discharge lightning rod in advance) has the following characteristics:

- The first discharge time is 30μs ~60μs, that is, the priority is to lead the mine into the ground;
- Under the same installation height, the protection radius of the ordinary Franklin lightning rod is several times larger;
- Pure physical structure lightning rod, no internal electronic devices, no aging, and maintenance-free.
- The appearance is beautiful, stainless steel is selected, and it can be installed in places where the environment is harsh and lightning-proof.
- The lightning protection device is light in weight and has low load requirements.

APOLLO lightning rod (Apollo lightning rod) model specifications are as follows: (TA-1 lightning rod, TA-2 lightning rod, TA-3 lightning rod)

ESE Model	Pre-discharge time ΔT
TA-1 Lightning Conductor (A-30)	25us
TA-2 Lightning Conductor (A-45)	45us
TA-3 Lightning Conductor (A-60)	60us

**APOLLO Lightning Conductor(APOLLO Lightning Conductor)Protection Radius as follows:TA Series ESE Air Terminal**

Different types of Spanish lightning protection with different installation heights The lightning protection radius of various lightning protection buildings (Rp)	
APOLLOLightning rod	h=The level of the lightning rod above the protected object (m)

installation height	2	3	4	5	7	10	45
LEVEL 1							
TA-1ESE	19	28	37	47	47	48	-
TA-2ESE	25	38	51	63	64	64	-
TA-3ESE	31	47	63	79	79	79	-
LEVEL 2							
TA-1ESE	24	36	49	62	63	65	-
TA-2ESE	32	48	64	81	82	83	-
TA-3ESE	39	58	78	97	98	99	-
LEVEL 3							
TA-11ESE	27	41	55	69	70	72	-
TA-2ESE	36	54	72	89	91	92	-
TA-3ESE	43	64	85	107	108	109	-

