



Advanced Lightning Protection Generation 5

MAP WORLDWIDE SERVICES[®]

Standard Bearers of Excellence

ISO 9001:2008 & 14001:2004 COMPANY



Precision Power Pty Ltd (PP), a company based in Australia having strong footprints in South-East Asia and Far East, are acknowledged experts in Lightning Protection since 1982. **PP personnel and their Associates MAP Worldwide Services (MAP)** have vast experience in designing, providing, installation and certification of Lightning Protection System in some of the most lightning prone areas. Other than providing of Advance Terminals and Accessories, services offered are

- Carrying out Risk Assessment
- Preparation of BOQ
- Designing Optimum Area of Protection
- Training to Engineers of contractors and customers.

PP and **MAP** have commissioned Lightning Protection System in key segments, such as

- Airports
- Places of Worship
- Bungalows, Villas & Resorts
- Sporting and Recreation Centers
- Industrial facilities, Oil, Gas & Petrochemicals
- Ropeways
- Heritage Structures
- Defence & Telecom Installations
- Power Generation and Distribution
- High-rise Buildings-Commercial, Hotels, Hospitals & Residential etc

SENTINELS ACT terminals are **Generation 5** terminals, Generations ahead of ESE terminals. They are designed for 'Controlled Triggering' of upstreamer, as compared to ESE, which propagate a continuous upstreamer during a thunderstorm.

ADVANTAGE SENTINELS

The central finial of Sentinels ACT Terminal is connected via a downconductor/s to the ground earth. Hence, during a thunderstorm, the central finial tip acquires the same charge as the Earth.

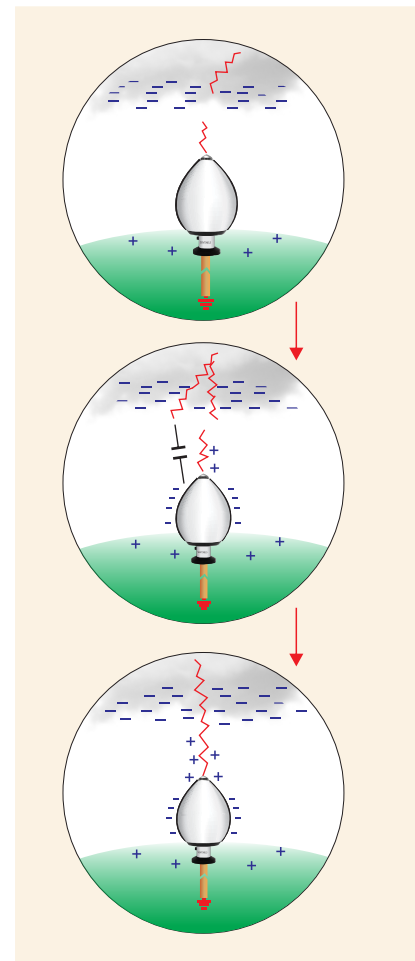
The dual 'Floating' panels of the Sentinels Terminal are electrically insulated and isolated from the central finial. Hence, during a thunderstorm, when the stepped leader (or down leader) begins its approach towards the ground, there is a rapid increase in the cloud charge. Due to capacitive coupling phenomenon, the twin panels develop the same charge as the clouds.

At this point, the finial and panels have opposite charges, and due to the dual thrust design an arc is triggered across the air gap between the finial and panels. This gives rise to an upstreamer, which is stronger and faster than the objects on the ground.

The basic difference between ESE terminal and Sentinels ACT terminal is the central finial – the tip of Sentinels terminal is round instead of a sharp tip of ESE terminal.

During 'static' conditions, the continuous propagation of upward streamer by ESE terminal results in 'corona' formation, which can inhibit the propagation of an upward streamer, resulting in a 'stalled' streamer. Hence, a space charge is formed which greatly reduces the efficiency of ESE terminal.

Tests were conducted in USA (New Mexico) which proved that a round tip of central finial in a terminal is much more efficient than a sharp tip. This is because it launches an upward streamer exactly at the same time as a



stepped leader advances from the thunder clouds towards the earth. This 'controlled' propagation of upward streamer ensures largest possible Area of Protection with enhanced efficiency.

The Lightning Protection System offered by us consists of Sentinels Air Terminals PLUS all required accessories including FRP and GI / S.S. Mast with S.S. Cross-over Coupling, Guying kit, Single core and LIC downconductors, S.S. Brackets, Upper and Lower termination kits, Disconnecting Links, Lightning Strike Recorder, Transient Earth Clamp and Maintenance Free Earthing.

SENTINELS TERMINALS ARE CHARACTERISED BY

Superior Design

Sentinels terminals have dual thrust design, which results in faster and stronger upward streamer increasing the efficiency of Lightning Protection System.

Superior Material

Sentinels terminals are made from copper and brass. The outer panels are made from Copper while central rod is made of solid brass and both are coated with chrome.

Superior Quality

The copper and brass used are high grade pure metals. Plus they are coated with chromium for added protection against pollutants and corrosive atmosphere.

Superior Performance

The triggering of up streamer is non –electronic hence constant, superior performance. No battery or external power is required to activate the terminals.

We offer complete set of accessories for installation of Lightning Protection System and safe passage of lightning energy to the dedicated earthing. These include FRP and G.I. / S.S. mast with S.S. cross-over coupling, Single core and LIC downconductors, Lightning Strike Recorder, Transient Earth Clamp and Maintenance free earthing.



FRP Mast

Our FRP Masts are made of Fibreglass reinforced plastic. Fibreglass is a non-conducting material, does not corrode and is immune to the vagaries of nature. When a pipe is cast with Fibreglass using a suitable plastic resin, uv inhibitors and compressed, the pipe acquires various

properties. It is light-weight, water resistant, electrically insulated, non-inducting and possesses excellent mechanical strength. This FRP Mast provides all the properties needed for upper termination between Sentinels terminal and LIC cable.



Cross-over Coupling

Normally, an FRP mast of 2 meter length is provided on the installation. This has to be coupled with a G.I. / S.S. mast as

per required length. Our Cross-over Coupling is designed as a clamp between the FRP Mast and G.I. / S.S. Mast. The coupling is multi-purpose – It couples the upper FRP Mast to the lower G.I. / S.S. Mast, provides an exit path for LIC cable and also allows for guying cables to be anchored. PLUS it is made of Sheet Metal S.S. which is not brittle, providing excellent strength and non-corrosive properties.



Low Induction Conductor Cable

Low Induction Conductor (LIC) cable is designed for use in buildings/structures where induction currents can damage to sensitive equipment/components. It can be installed in a duct as it minimizes the risk of side flash or passage of induction currents into the structures. Impulse currents are also generated when lightning passes through a conductor. The LIC Cable is designed with multiple sheaths of insulators with double conductors in between. The inner conductor ensures that the lightning current is conducted with minimum resistance while the outer conductor takes care of induction currents generated, providing a low induction passage to a dedicated earthing. The LIC cable complies with IEC 60 -1 : 1989 and IEC 600601, 2nd Edition, 1989-11.

Protection Radius design :

The design of protection radius of Sentinels ACT terminals takes into consideration various factors, such as Site location and parameters, Competing structures, Total height and construction of the structure as well as other variables. The calculations are based on collection volume method and placement as well as application plays an important role in ensuring optimal protection. All these parameters are fed into our specially designed software which enables a reliable and optimal design for determining the radius of protection unique to each, individual structure.



Lightning Strike Recorder, also known as a Lightning Strike counter, records the number of lightning strikes captured by the Terminal. The LSR is designed for easy mounting at any location along the route of downconductor.

The LSR has a mechanical 6 digit display secured within a polycarbonate IP 67 rated enclosure. It has a current sensitivity of 1000 A @ 8/20 μ s impulse and operates by sensing current by means of an inductive pick-up loop. The LSR is non-electronic, self powered and DOES NOT need any external power source or battery.



Precision Power



-Solutions to Power Problems

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