



LPI[®] TELCO ***Application Brochure***

LIGHTNING PROTECTION INTERNATIONAL PTY LTD





Lightning Protection International Pty Ltd

Lightning Protection International Pty Ltd is a fully owned Australian manufacturer and supplier of direct strike lightning, surge and transient protection equipment and grounding products to a wide range of industries throughout the world.

The Need for Protection

Lightning and over-voltage transients are responsible for millions of dollars of damage each year affecting a wide cross section of industries.

Telecommunications sites are particularly vulnerable to the dangerous effects of lightning. Many telecommunication installations consist of tall slender towers situated in elevated areas such as hill and mountain tops in regional areas and throughout metropolitan areas such installations can be found at the tops of tall buildings.

There is no single solution which can eliminate the risks associated with lightning induced energy. It is through the use of an all encompassing approach such as the LPI 4 Step Approach to Lightning Protection which assists in significantly reducing the risks presented by the natural occurrence of lightning to a typical telecommunications site.

Our system design approach includes:

- 1 Definition and provision of area protection
- 2 Creation of a bonded earthing system
- 3 Protection of power lines
- 4 Protection of signal, data and communication lines

Risk Analysis

It is important that management responsible for the installation and maintenance of telecommunications sites consider the consequences of leaving their sites partially or totally unprotected. The risks involved in failing to comprehensively address the issue of lightning and over-voltage protection can be summarised by the following.

- Partial or complete loss of operations and system downtime resulting in lost revenue.
- Customer complaints in response to system downtime.
- Physical damage to equipment resulting in replacement costs.
- Danger to staff and other personnel from the effects of lightning discharges.

LPI has a proven history in working with telecommunications customers to evaluate and provide recommendations on specific lightning protection solutions for your site. Through the application of the 4 Step Approach to Lightning Protection and in conjunction with the recommendations of International Standards applicable to lightning protection (**AS 1768-2003, IEC 61024, BS 6651**) our staff can assist you in offering a comprehensive solution to your lightning problems.

Key parameters considered in the risk assessment of a telecom or communications site would include:

- Risk of lightning in the region (Consideration of thunder days per year and Ground Flash Density).
- Site specific details such as surrounding terrain and site elevation.
- Type of structure and equipment usage.
- Strategic importance of the operation to your organization.

DIRECT STRIKE PROTECTION

The definition and provision of area protection is the first step that should be considered in protecting your site from the dangers of a direct lightning strike. It is the highest point of any given structure where the electric field intensification is maximised during storm activity, resulting in this point becoming the most vulnerable to direct strike. Many telecommunication sites contain tall slender towers in elevated and open areas and the risk of direct strike to these towers is considered high, particularly in areas of frequent lightning activity.

Through the correct placement of an LPI Guardian CAT or Stormaster ESE lightning terminal at the highest point of the structure, lightning discharges are captured to a preferred point and the energy is transferred to ground via the High Voltage Shielded Cable with minimal risk of electrifying the structure.

The family of LPI Guardian CAT (Controlled Advanced Triggering) terminals have been designed to limit corona production and to emit a streamer of ionised air at precisely the right time so that an approaching "down leader" is intercepted and brought under control. All terminals within the Guardian CAT family have been successfully tested in accordance with **IEC test standard: IEC 60-1: 1989**. LPI also offers the range of Stormaster ESE terminals which have been successfully tested in compliance to **Standard NF C 17-102**.

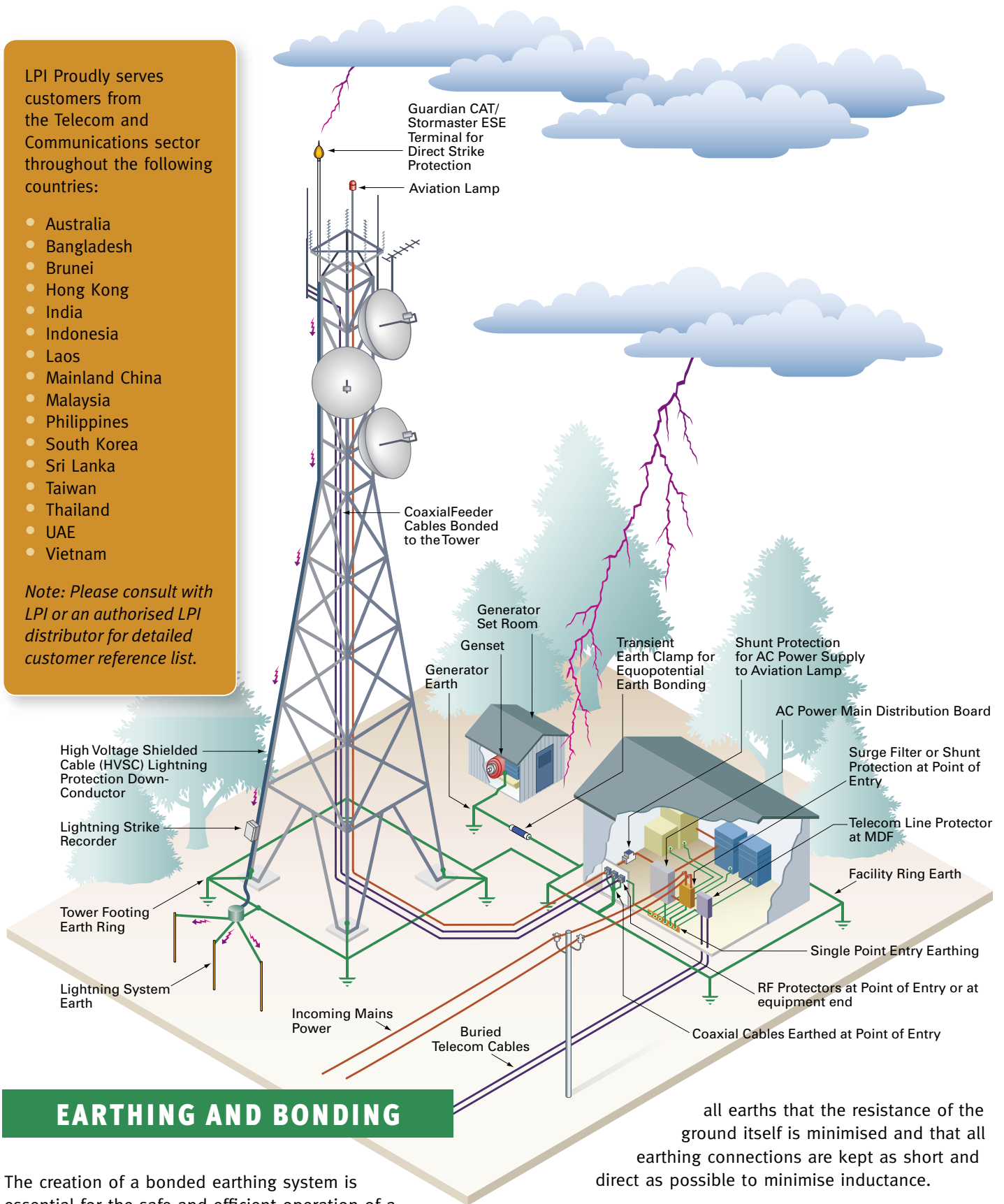
Following the successful interception of a lightning discharge the installation of LPI's High Voltage Shielded Cable (HVSC) allows for the safe passage of the lightning energy to a dedicated lightning earth. The insulated HVSC has been specifically designed to reduce the risk of sideflashing and aid in minimising the ability for the lightning energy to be induced to other equipment that may be installed on a telecommunications tower.



LPI Proudly serves customers from the Telecom and Communications sector throughout the following countries:

- Australia
- Bangladesh
- Brunei
- Hong Kong
- India
- Indonesia
- Laos
- Mainland China
- Malaysia
- Philippines
- South Korea
- Sri Lanka
- Taiwan
- Thailand
- UAE
- Vietnam

Note: Please consult with LPI or an authorised LPI distributor for detailed customer reference list.



EARTHING AND BONDING

The creation of a bonded earthing system is essential for the safe and efficient operation of a telecommunications site.

A dedicated low impedance lightning earth is required for the safe dissipation of the lightning energy into the ground mass, with the installation of a radial configured earth recommended. The lightning earth is one of several earths that may exist at any one site. Each earthing system (lightning, electrical, communications and equipment room) must be bonded together so that all earths present an equipotential plain ensuring that under transient conditions no hazardous potential differences occur. It is essential for

all earths that the resistance of the ground itself is minimised and that all earthing connections are kept as short and direct as possible to minimise inductance.

For a typical telecommunications site an earth ring should be installed surrounding the facility shelter with the lightning earth directly bonded to the facility earth ring. It is essential that a single point connection from all equipment within the facility shelter is created to the earthing ring. The use of a single point earthing connection ensures that if a surge arrives at the facility shelter via the mains power the installed surge protection devices will divert the excessive energy to ground and all earths will rise equipotentially eliminating the risk of potential differences been created between earth points.

POWERLINE PROTECTION

Following the installation of a dedicated lightning protection system on the telecommunications tower and the bonding of all facility earths, particular attention must now be given to providing safe and efficient protection of power lines.

Without adequate protection of the powerlines there remains the risk that over-voltage surge and transients may arrive via external cables to the site. High energy over-voltage surge and transients can originate from capacitive and inductive coupling from nearby lightning strikes. Additionally, site installations fed by long distribution lines are prone to equipment damage from temporary over-voltages caused by switching induced surges or irregular power distribution.

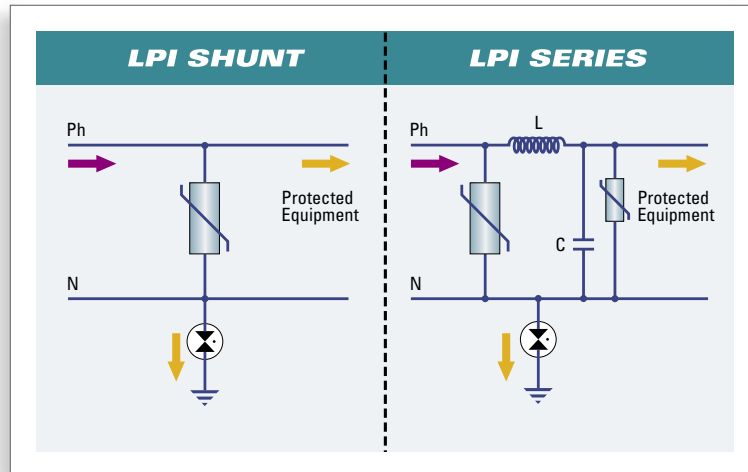
In order to safely protect the site from the risk of high energy over-voltage surge and transients it is important to install purpose designed products that provide efficient clamping and filtering of power transients at the point of entry of power lines to the facility.

LPI offers the SF range of Surge Filters which provides premium protection for over-voltage transients. The SF range of filters are connected in series with the load and comprise single and three phase hard-wired filters in a range of operating voltages and surge ratings. The filter technology

is able to limit the magnitude of the induced surge along with reducing the fast rising edge of the induced surge. The SF filters provide a high level of surge protection with low let through voltages and are ideally suited for the protection of sensitive equipment such as that found in telecommunication sites.

In addition, LPI also offers an extensive range of DIN mount shunt diverters and

low rated filters for protection of auxiliary power circuits including obstruction lights where individual protection is required.



TELECOMMUNICATIONS PROTECTION

The protection of signal, data and communication lines is an important final step that should be taken when implementing comprehensive protection for your telecommunications site.

The LPI range of RF protectors including the GSM 7/16", provides efficient protection against transients that may arrive from the telecommunications tower to transmission and telemetry equipment via radio feeder cables. Even with the installation of a dedicated insulated downconductor such as HVSC there still remains the possibility that some energy may be induced onto coaxial feeder cables.

The protection of telephone and data lines should also be considered in order to provide comprehensive protection for the overall site. Transients injected onto telecommunications and data lines have the potential to damage and destroy sensitive terminal equipment leading to a loss of communication and subsequent down time.

Our range includes LPI subscriber protection designed for KRONE LSA plus terminals and protectors for ADSL, PCM and high speed circuits.

Disclaimer

- LPI maintains a policy of on-going product development, specifications are subject to change without notice.
- Application detail, illustrations and schematic drawings are representative only and should be used as guides.
- It should be noted that 100% (100 percent) protection level for direct strike lightning and surge and transient protection equipment is not possible and cannot be provided due to the lightning discharge process being a natural atmospheric event.

LIGHTNING PROTECTION INTERNATIONAL PTY. LTD.

ABN 11 099 190 897



Complex 1,
16 Mertonvale Circuit, Kingston
Tasmania, Australia 7050.

Telephone: + 61 3 6227 1955
Facsimile: + 61 3 6229 1900
Email: info@lpi.com.au
Web: www.lpi.com.au