

TECHNICAL DATA SHEET

LPI[®] GUARDIAN SYSTEM 5

- Fully Tested Air Terminals in Compliance with IEC 62561-2
- Family of Stainless Steel Air Terminals catering for all installation heights
- Easy to Install
- All Guardian CAT Terminals utilise a blunt finial tip for corona minimisation
- Cost Effective Lightning Protection
- Free Lightning Protection Designs & Risk Assessments Available on Request
- For connection to HVSC Plus or 2-inch GI pipe
- See Page 2 for Market-Leading Advantages

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Market Leading Advantages

LPI's award-winning families of enhanced air terminals have the following key characteristics:

- First company to introduce corona-minimising terminals with optimised blunt design and four independent panels;
- Extensive field experience with more than 50,000 installations over 15+ years in more than 75 countries around the world;
- Air terminal families designed to meet direct-strike placement methodologies in compliance with various international standards; and
- Proven technology based on international research findings, modelling and field testing.

Lightning Protection International Pty Ltd (LPI) was established by its principals in 2002 on the back of decades of experience in the lightning protection industry worldwide.

Recognising the need for reliable air terminals and having innovation as a core value of the company, LPI released its first range of air terminals based on a "blunt" configuration with an overall geometric design for reducing corona formation during the pre-stroke phase of a thunderstorm.

The detrimental effect of excessive pre-stroke corona space charge was first postulated by Prof. C. Moore et al in the USA in the 1990s. The theory was backed by the world's most extensive field experiment of its kind on a high mountain in New Mexico. His experiment has been running for more than 20 years and has proven conclusively that blunt air terminals are more effective at lightning capture than the original sharp rods proposed by Benjamin Franklin in the mid-1700s.

LPI was the first company in the world to release a "family" of air terminal with blunt tips and the corona-reduction concept flowing from the New Mexico experiments. All the LPI air terminal families are comprised of three sizes (small, medium and large), wherein installation of any particular size of air terminal is dictated by the height of installation.

LPI has received numerous export awards over the last 15 years for the air terminal design, including a "High Commendation" at the Australian Engineering Excellence Awards night in 2016. LPI's air terminals have had more than 15 years of proven experience in regions of the world with the highest lightning activity. More than 50,000 air terminals have now been installed. They protect a wide range of structures and facilities across all types of industries in more than 75 countries around the world.

Pre-stroke corona reduction, corona-streamer initiation and the launch of an upward leader that continuously propagates to intercept the lightning downward leader has been the major theme behind all LPI's research and development initiatives in air terminal technology. LPI air terminals also have other unique features. Such as four independent panels comprising the main body around the blunt central rod and use of materials that can withstand the harsh electrical and atmospheric environments to which the air terminals are subjected year after year.

LPI is one of very few companies in the world to offer different direct-strike placement methodologies for air terminals in compliance with various international standards.

The corona-reduction concept is now widely accepted in the lightning protection industry, as evidenced by recent publication of papers on this topic in prestigious journals by some of the world's leading lightning scientists, such as Prof. V. Cooray from Uppsala University.

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CATCALC Software Design

LPI® uses a CAD-based software design program called “CATCALC” to customise a cost-effective and safe lightning protection solution for any structure.

The CATCALC program considers factors such as lightning activity, height above sea level, level of protection desired or recommended (Standard, High and Very High), physical dimensions of the structure and the building materials used. Competing features, which also have the ability to launch upward leaders, are taken into consideration during the design process.

A customised CATCALC design provides the end customer with a design report encompassing elevation, plan and side views of the proposed lightning protection installation along with a detailed bill of materials for all required accessories.

Calculation Overview

The calculation of the protection radius of Guardian CAT terminals and the attractive radii of features on the structure that are most likely to be struck depend on many factors, including the geometry of the structure itself, environmental parameters and the statistics of lightning discharges.

The key factors and parameters taken into account in the calculations include: A. Protection level according to the “risk profile” of the structure (decided mainly by its height) or chosen by the customer (see table below); B. Downward leader charge distribution model and dynamic electric field of the downward leader as it approaches the structure. C. Striking distance computations using a leader propagation model that takes structure height into account and utilises capture volumes; . D. Electric field enhancement of the ambient electric field by the structure and its geometric features; E. Allowance for lightning approaching at an angle; F. Computation of striking distance surfaces for the structure and air terminals; G. The speed of the downward and upward leaders (the so-called “race condition”); H. Selection of the correct CAT terminal for the particular installation, e.g., CAT III is used at a greater height above the structure and/or on taller structures due to its larger geometry and greater ability to minimise pre-corona; I. Additional allowance for the corona-minimising characteristics of the air terminal; J. Determination of protection coverage, i.e., whether coverage is achieved based on the relative distances between the surfaces and typical leader velocities.

Based on lightning statistics from AS 1768 and IEC 62305, the following “protection levels” and their associated physical parameters are used for each of the CAT terminals in protection calculations:

| Air Terminal | Protection Level | Interception Efficiency (%) | I_p min. (kA) | Charge, Q (C) |
|---------------------------|------------------|-----------------------------|-----------------|---------------|
| Guardian CAT I, II or III | Standard | 88 | 15 | 1.5 |
| Guardian CAT I, II or III | High | 93 | 10 | 0.9 |
| Guardian CAT I, II or III | Very High | 98 | 6.0 | 0.5 |

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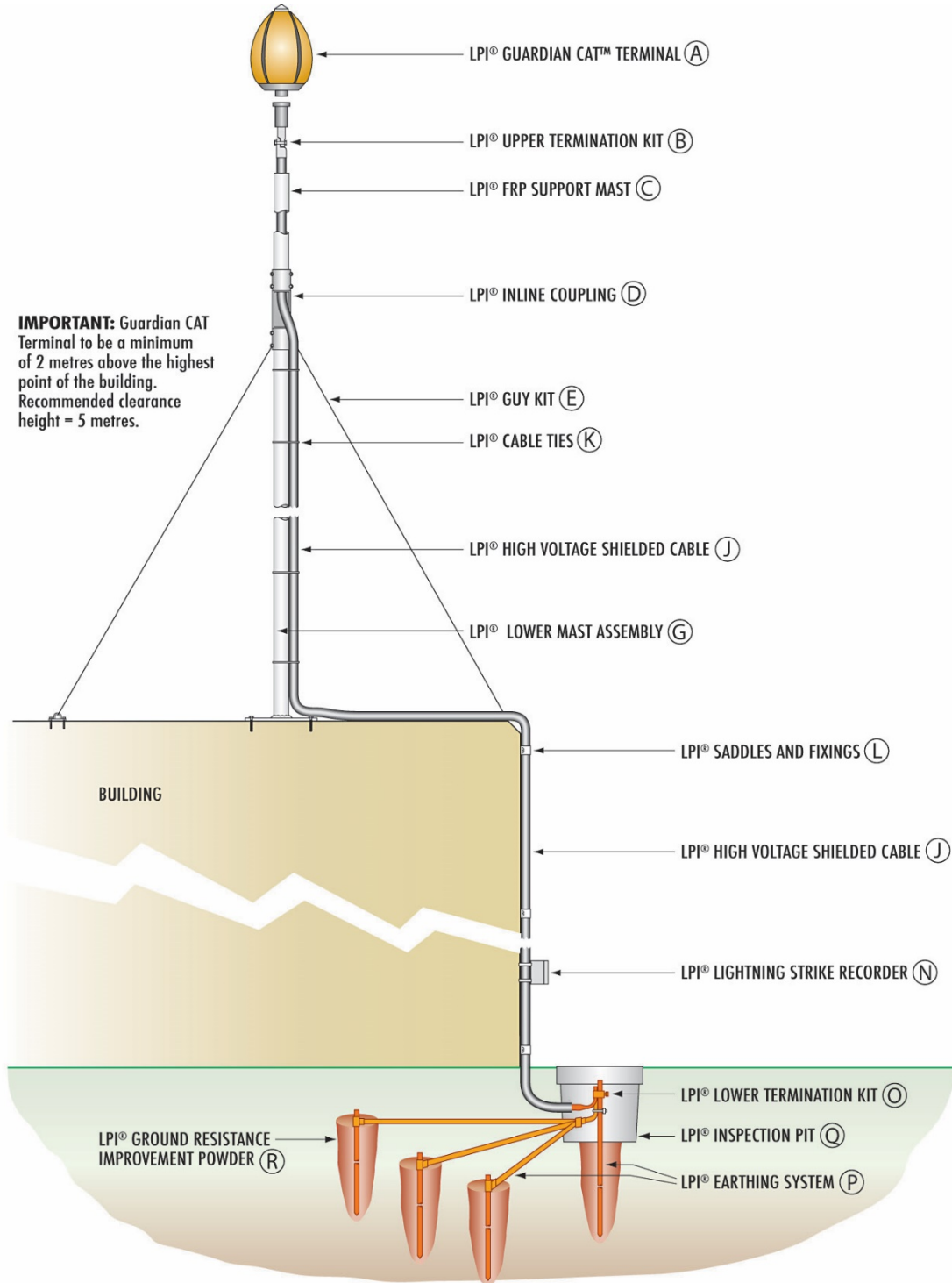
LPI® Product Range

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Installation Type 1

Installation type 1 illustrates a Guardian system installed on a building roof top (flat roof).

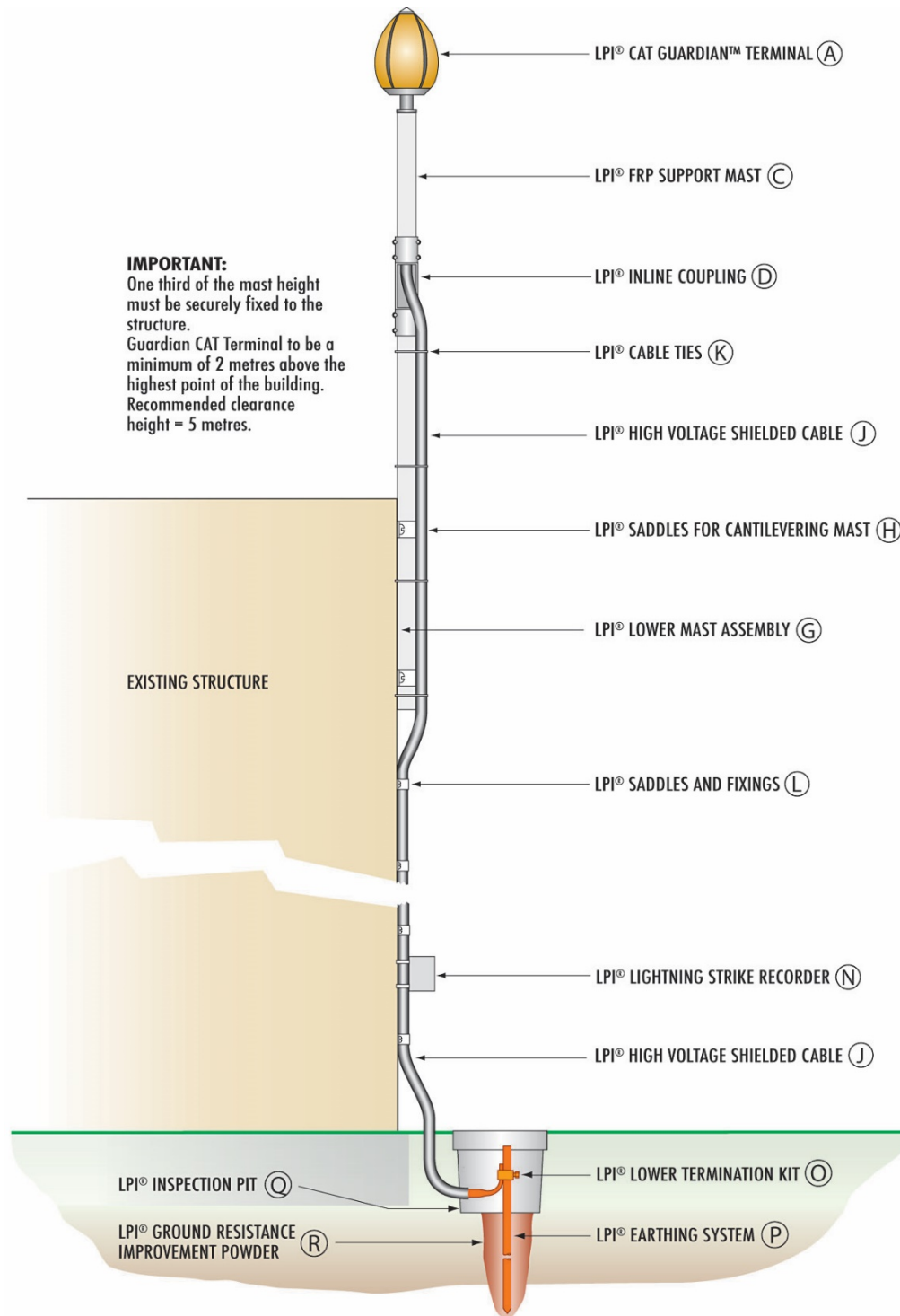


Please refer to page 28 for recommended earthing installation

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Installation Type 2

Installation type 2 illustrates a Guardian system cantilevered to the side wall of a building.

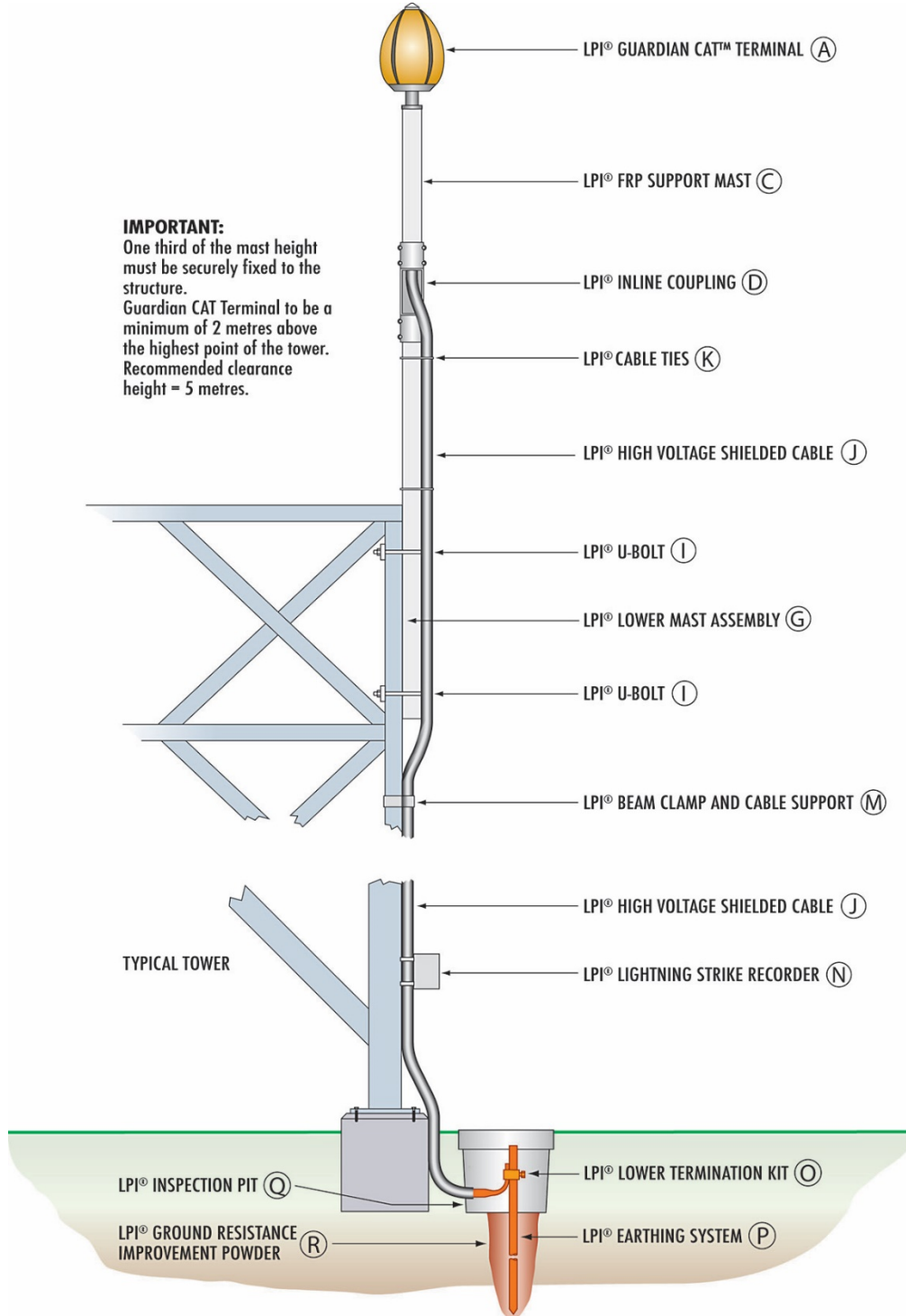


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Installation Type 3

Installation type 3 illustrates a Guardian system cantilevered to the top section of a tower.



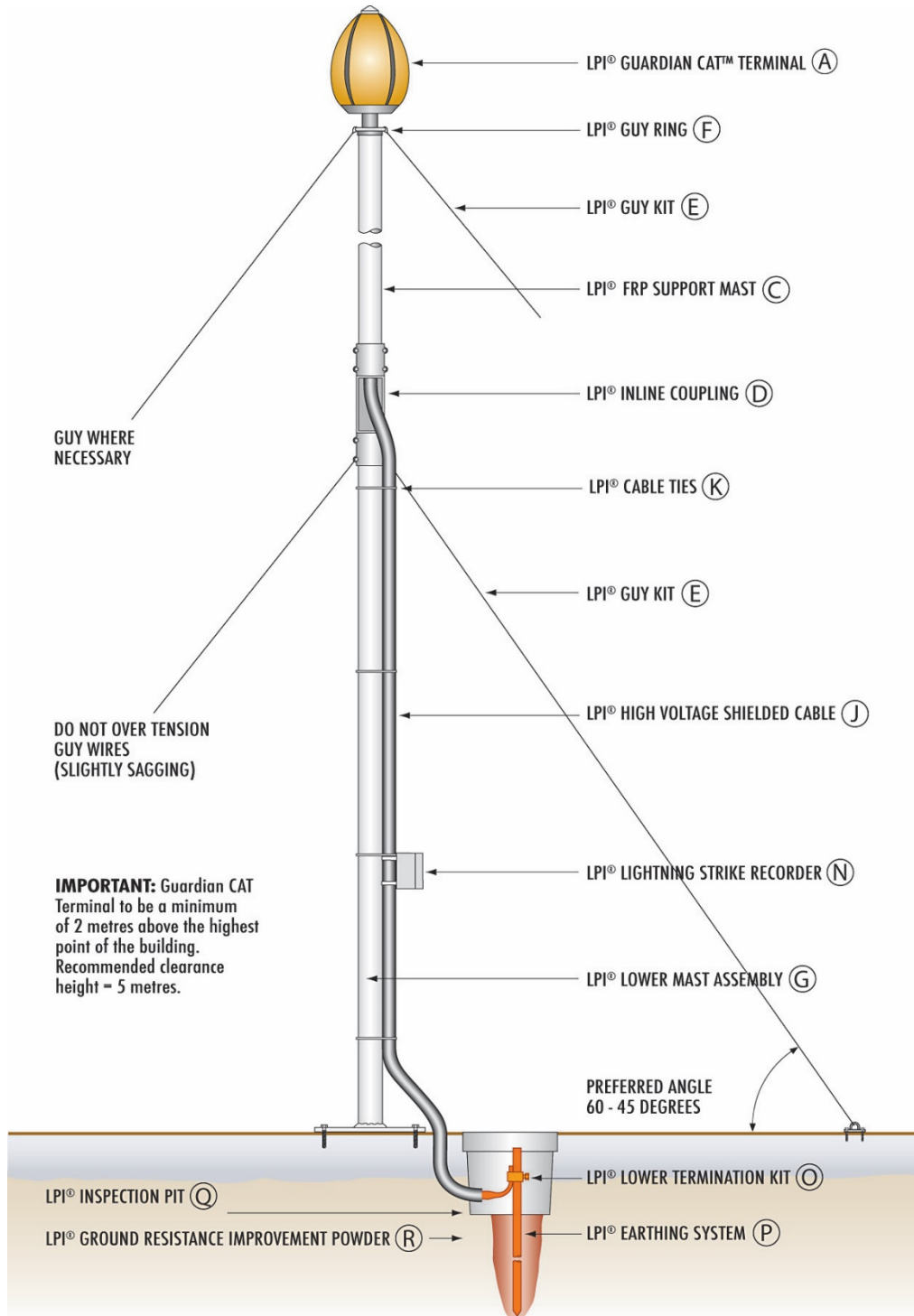
Please refer to page 28 for recommended earthing installation

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Installation Type 4

Installation type 4 illustrates a Guardian system installed on a building roof top (flat roof) or at ground level.

Note: Multiple guying kits are utilized due to increased mast height.

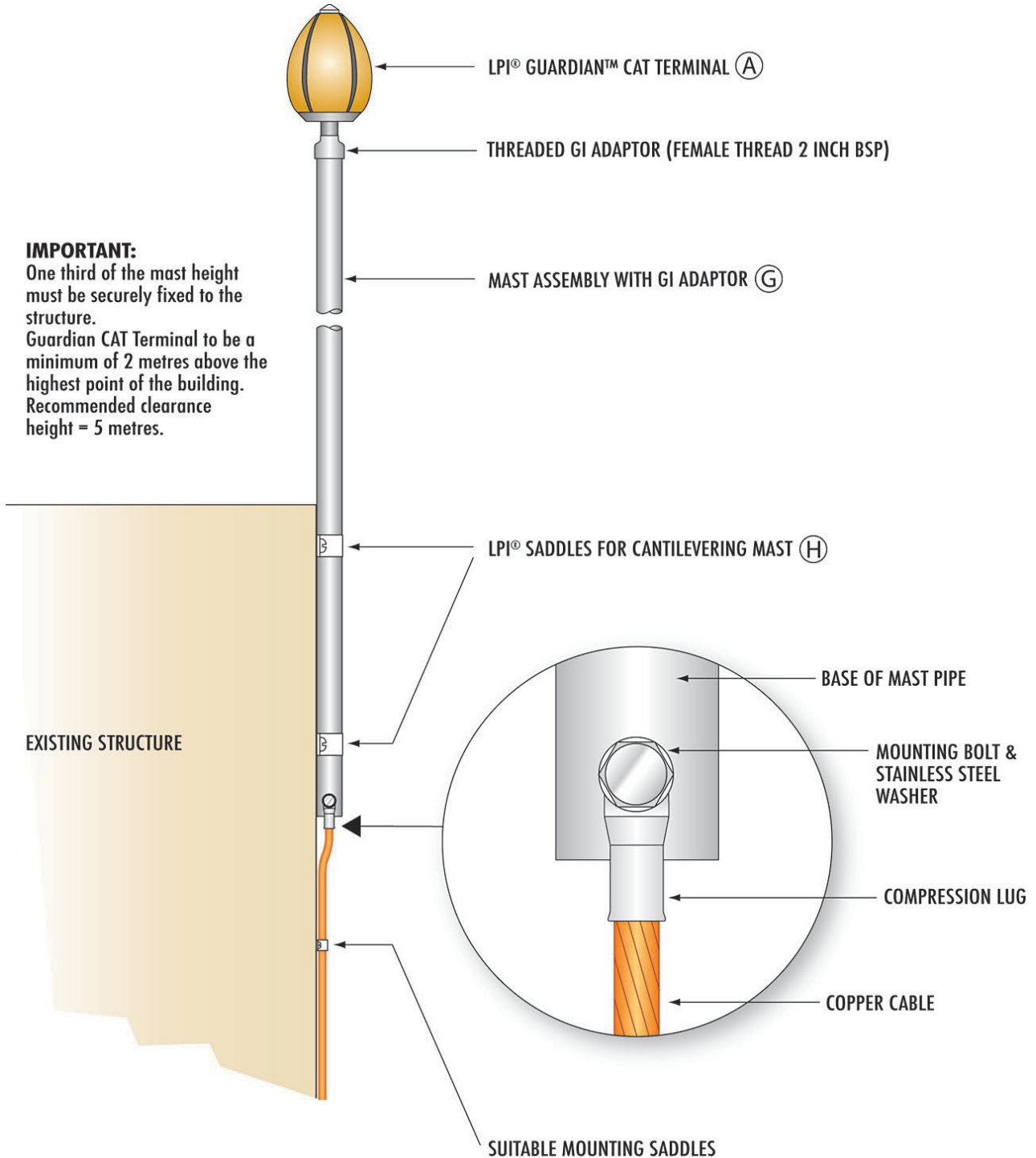


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Installation Type 5

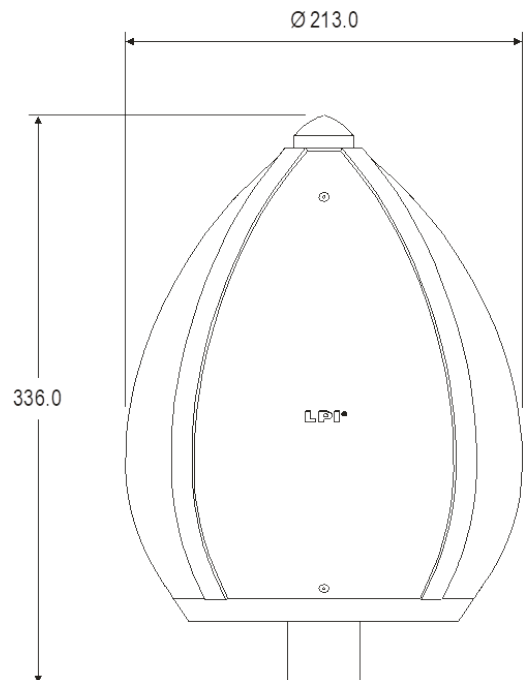
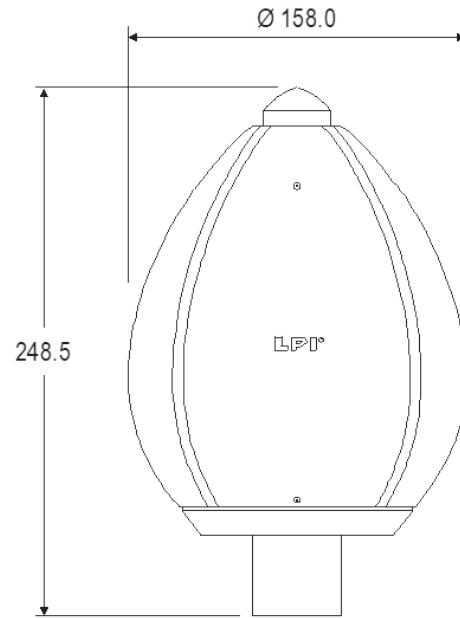
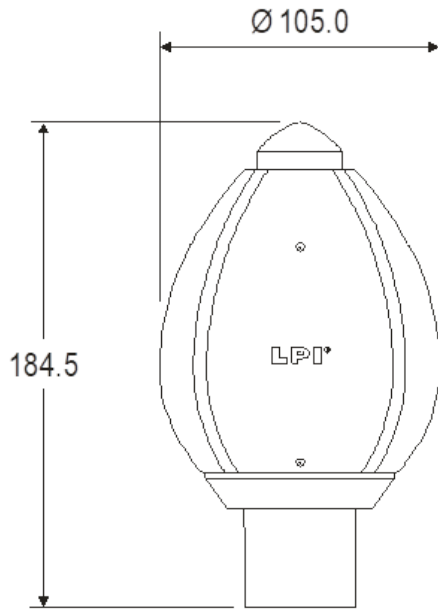
Installation type 5 illustrates typical mounting arrangement for cantilevered GI style Guardian Terminal.



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Section A - LPI[®] Guardian Cat Terminals



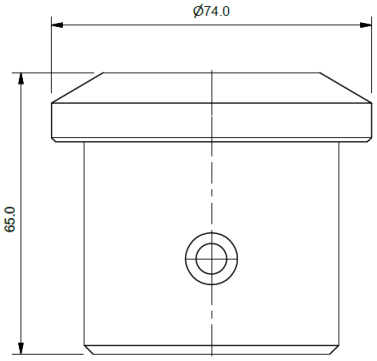
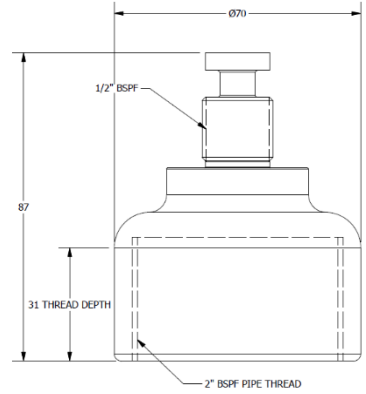
| ORDERING CODE | MATERIAL | WEIGHT (KG) | COLOUR | INSULATION MATERIAL |
|---------------|---------------------|-------------|--------|---------------------|
| CATI-SS | Stainless steel 316 | 0.655 | Silver | UV rated evoprene |
| CATII-SS | Stainless steel 316 | 1.177 | Silver | UV rated evoprene |
| CATIII-SS | Stainless steel 316 | 1.993 | Silver | UV rated evoprene |

* For connection to 2" GI Pipe add "GI" to end of Ordering Code (See pages 8 & 12 for more detail)


All dimensions are given in mm UNO

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LPI® Guardian CAT Terminals

| Standard Adaptor | GI Adaptor |
|---|--|
| <ul style="list-style-type: none"> For use with FRP mast & HVSC Plus downconductor Lug Connection to HVSC Plus completed with upper termination Weight: 0.22 kg  | <ul style="list-style-type: none"> Threaded GI adaptor Female thread 2 inch BSP for connection to GI pipe Weight: 0.22 kg  |

Guardian CAT Tester

| | |
|---|--|
|  | <ul style="list-style-type: none"> Spark-over tester designed for testing the Guardian CAT range of terminals Portable tester Visual identification of terminal operation Rechargeable batteries |
| <p>Ordering Code</p> | <p>AIR TERMINAL TESTER</p> |
| <p>Description:</p> | <p>LPI® Guardian CAT terminal tester</p> |
| <p>Construction:</p> | <p>Plastic enclosure</p> |
| <p>Charger operating voltage:</p> | <p>100 – 240 V</p> |
| <p>Batteries:</p> | <p>4 x 1.2 V rechargeable NiCad batteries</p> |
| <p>Dimension:</p> | <p>115 x 90 x 55 mm</p> |
| <p>Weight:</p> | <p>0.437 kg</p> |



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Section B - LPI® Upper Termination Kit

LPI® Upper termination kit is designed for use with the LPI HVSC Plus downconductor. The upper termination kit provides all accessories for the high voltage termination of the HVSC Plus downconductor to the Stormaster ESE terminal.



| Ordering Code | UTERMKIT-MK3 |
|-------------------------|--|
| Description: | Upper Termination Kit Mark 3 |
| Maximum voltage: | >500 kV 1.2/50 µs impulse |
| Operating temperatures: | - 20°C to + 85°C |
| Pack dimensions: | 70 x 70 x 1250 mm |
| Weight: | 0.760 kg |
| Contents: | Instruction, Semi-conducting tape, crimp lug, heat shrink tube, insulated friction cutting tool, insulation tape |

Section C - LPI® FRP Support Mast

LPI® Fibreglass Reinforced Plastic (FRP) mast is an insulated and water-resistant mounting pole which is designed to provide the necessary electrical isolation and mounting strength at the position where the high voltage upper termination between the HVSC Plus downconductor and LPI Stormaster terminal is completed.



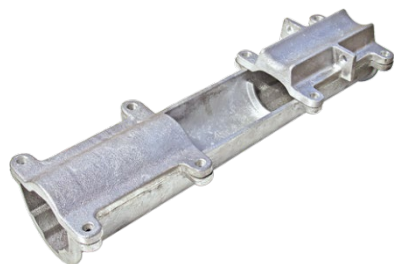
| Description | Fibreglass Reinforced Pole (FRP) |
|-------------------------|---|
| Colour: | Black |
| Material : | Fibreglass |
| Construction type: | Pre-impregnated reinforced epoxy resin laminate (flame retardant) |
| Resin tensile strength: | 70 MPa |
| Resin tensile modulus: | ≈ 34 GPa |
| Resin tensile strain: | 2.7% |
| Resin poisson ratio: | 0.35 |

| Ordering Code | Weight | Dimensions |
|---------------|--------|--|
| FRP-2M | 2.7 kg | Length 2000 mm, Outer diameter 68 mm, Inner diameter 60 mm |
| FRP-3M | 4.3 kg | Length 3000 mm, Outer diameter 68 mm, Inner diameter 60 mm |
| FRP-4M | 5.3 kg | Length 4000 mm, Outer diameter 68 mm, Inner diameter 60 mm |

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Section D - LPI[®] Inline Coupling

LPI[®] Inline coupling is a purpose-designed coupling which enables clamping of the FRP mast to the aluminium lower mast. The inline coupling provides 3 guy anchoring points and provides an exit point for the HVSC Plus.



| Ordering code | ILCOUPLING |
|-----------------------|--------------------|
| Description: | Inline coupling |
| Material: | Cast aluminium |
| Dimension: | 550 x 150 x 120 mm |
| Weight: | 2.7 kg |
| Anchoring points: | 3 |
| Max. clamping torque: | 55 kg/cm |

Section E - LPI[®] Guy Kit

LPI[®] non-conductive and stainless steel guy kits are provided in variable lengths to suit specific mast and terminal heights. The purpose designed guying kits are designed for anchoring from a guy ring or an inline coupling.



| Ordering Code | GUYKIT-7M |
|-------------------------|---|
| Description: | Stainless steel fittings and non-conductive synthetic guy wire kits |
| Material: | DYNEEMA [®] is an UHMWPE* fibre, non-conductive, UV stabilised, moisture resistant, chemical inert |
| Application: | Designed to provide additional stabilising/securing of mast arrangement where deemed necessary |
| Diameter: | 4 mm |
| Tensile yield strength: | 560 kg |
| Weight: | 0.53 kg |

*UHMWPE – Ultra-High Molecular Weight Polythene



| Ordering Code | GUYKIT-4M-SS | GUYKIT-7M-SS |
|-------------------------|---|--------------|
| Description: | Stainless steel guy wire kits | |
| Material: | Stainless steel, grade 316 | |
| Application: | Designed to provide additional stabilising/securing of mast arrangement from the inline coupling only | |
| Diameter: | 3.2 mm | |
| Tensile yield strength: | 450 kg | |
| Weight: | 0.8 kg | 1.2 kg |

Stainless steel guy kits are not to be used at top section of mast or with guy ring and should be anchored from the inline coupling.

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Section F - LPI® Guy Ring

LPI® guy ring provides 3 guy points for mounting between the top section of the FRP mast and the Guardian CAT terminal.



| Ordering Code | Guy Ring |
|--------------------|-------------------|
| Material: | Cast aluminium |
| Dimension: | 110 x 110 x 10 mm |
| Weight: | 0.12 kg |
| Guy hole diameter: | 10 mm |

Section G - LPI® Lower Mast Assembly

LPI® uses an aluminium mast as the lower mast assembly due to its high strength and light weight characteristics.



| Description | Aluminium Mast |
|-------------------|----------------|
| Colour: | Silver |
| Material: | Aluminium |
| Inside diameter: | 51.2 mm |
| Outside diameter: | 63.5 mm |

| Length | 3 Metres | 4 Metres | 5 Metres | 6 Metres |
|-----------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Weight: | 9 kg, 10.5 kg (with base) | 12 kg, 13.5 kg (with base) | 15 kg, 16.5 kg (with base) | 18 kg, 19.5 kg (with base) |
| No base: | ALUM-3M | ALUM-4M | ALUM-5M | ALUM-6M |
| With base: | ALUMB-3M | ALUMB-4M | ALUMB-5M | ALUMB-6M |
| With GI male adaptor: | ALUM3M-MGI | ALUMB4M-MGI | ALUMB5M-MGI | ALUMB6M-MGI |

LPI® Guardian GI terminals suitable for use with locally supplied 2" male threaded GI pipe.

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Section H - LPI[®] Cantilevering Saddles

Purpose designed stainless steel saddles for cantilevering the aluminium mast of 69.9 mm outer diameter to flat vertical surface.



| Ordering Code | CANTSAD |
|-----------------------|--|
| Description: | 63.5 mm saddles for mounting of aluminium mast (3 per set) |
| Material: | Stainless steel |
| Weight: | 180 g per saddle, 540 g per set |
| Dimension: | 130 (L) x 70 (W) x 1.2 mm (D) |
| Hole fixing diameter: | 8 mm |

Section I - LPI[®] U-Bolt

LPI[®] U-Bolt set is specifically designed to allow for the secure clamping of aluminium or FRP mast to tower section or handle rail.



| Ordering Code | U-Bolt |
|---------------|---|
| Description: | U-Bolt, 2 per set |
| Material: | U-Bolt: stainless steel, Plate: aluminium |
| Weight: | 0.75 kg per U-Bolt, 1.5 kg per set |
| Dimension: | 80 mm diameter, 170 mm length |

Section J - LPI[®] Mounting Bracket

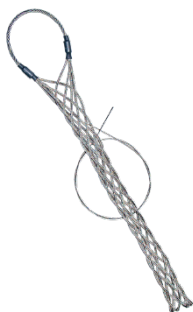
LPI[®] Offset brackets are designed for the offset cantilevering of aluminium support masts.



| Ordering Code | Mounting Bracket |
|----------------------|----------------------|
| Description: | Offset bracket |
| Colour: | Silver |
| Material: | Stainless steel, 316 |
| Nominal clamping OD: | 70 mm |
| Weight | 1 kg |

Section K - LPI[®] Cable Sock

LPI[®] Cable sock is designed for the mounting support of the HVSC Plus downconductor when installing a free standing mast arrangement.



| Ordering Code | Cable Sock |
|-------------------------|--------------------------------------|
| Description: | Cable sock for HVSC Plus support |
| Material: | Two-ply galvanised steel wire strand |
| To grip cable diameter: | 28-40 mm |
| Grip length: | 600 mm |
| Max. pull approx, (kn) | 24 |

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Section L – Downconductors

LPI® High Voltage Shielded Cable



Withstand Voltage of ≥ 500 kV

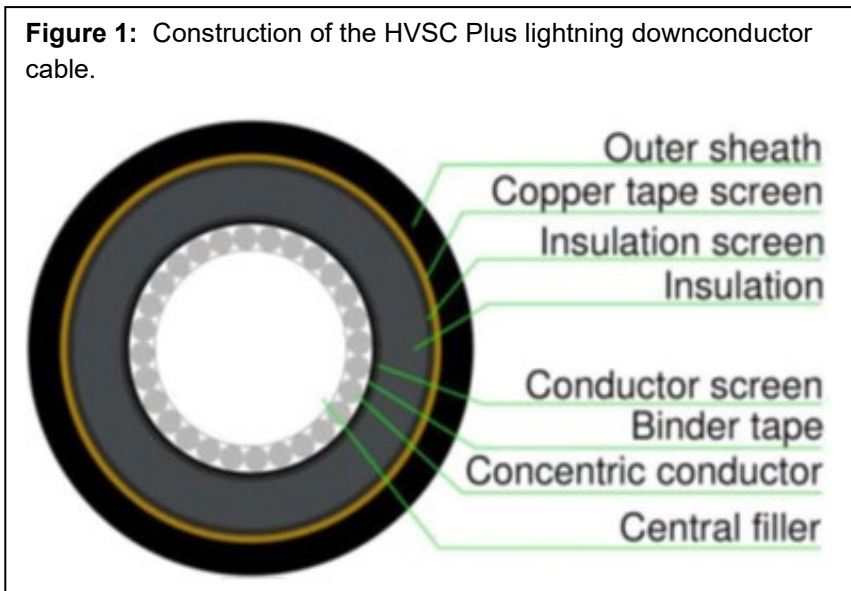
LPI’s “High Voltage Shielded Cable” (HVSC Plus) is a purpose-designed, high-integrity, low-impedance cable that is used to safely convey lightning currents to earth with minimal risk of side flashing or structure electrification. The design of the HVSC Plus incorporates carefully selected dielectric components to ensure optimum performance under the impulse or “transient” voltages and currents imposed by lightning discharges.

LPI’s new HVSC Plus provides improved features as a dedicated insulated lightning downconductor:

- Double the voltage withstand performance of past versions;
- 35% reduction in the mass per unit length of the cable;
- Improved manufacturing consistency via a continuous “triple extrusion” process;
- Reduced voltage stress via thin, semi-conductive screen layers; and
- Improved material parameters and performance.

The design of the cable is based on the optimisation of all of the key parameters associated with dealing with lightning discharges and the consequent voltage and current transients, including impedance, inductance, capacitance, insulation thickness (withstand voltage) and all of the relevant lightning statistics, plus practical aspects such as size, flexibility and mass.

Figure 1: Construction of the HVSC Plus lightning downconductor cable.



HVSC Plus has been tested by a certified, independent high voltage laboratory located at Monash University, Australia.

Product Ordering Code:

HVSCPLUS-PM or HVSCPLUS-500

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Physical Specifications of HVSC Plus:

| | |
|---|---|
| Mass per unit length | 1.34 kg/m |
| Construction | Triple extruded |
| Concentric conductor material | Aluminium |
| Concentric conductor XSA | ≥ 50 mm ² |
| Insulation | 5 mm (nominal) of XLPE |
| Metallic screen | Copper tape |
| Outer sheath | 3 mm (nominal) of PVC, UV Stabilised |
| Cable diameter | 36 mm |
| Min. bending radius <i>before</i> installation | 430 mm |
| Min. bending radius <i>after</i> installation | 358 mm |

Electrical Specifications of HVSC Plus:

| | |
|--|------------|
| Conductor DC resistance @ 20°C | 0.641 Ω/km |
| Conductor DC resistance @ 90°C | 0.821 Ω/km |
| Insulation resistance @ 20°C | 5000 MΩ |
| Inductance | 93 nH/m |
| Capacitance | 285 pF/m |
| Impedance | 18 Ω |
| Withstand voltage (1.2/50 μs impulse) | ≥ 500 kV |

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LPI® Aluminium Tape



| Ordering Code | FL6T253A |
|--------------------------|---|
| Description: | Aluminium rape 25 x 3 mm (soft drawn) |
| Material: | Aluminium |
| Dimension: | 25 (Width) x 3 mm (Thickness) |
| Weight: | 0.2 kg per metre |
| Electrical conductivity: | >60% I.A.C.S |
| Package: | Supplied in pancake coil form (50 m per coil) |

NFC 17-102 (2011)/EN 50164-2 has a requirement for copper and aluminium downconductors to have a cross-sectional area of 50 mm.

LPI® Stranded and Smooth Weave Copper Conductors

LPI® soft drawn stranded and Smooth Weave copper conductors are ideal for use as a conventional means of conveying lightning energy to ground. Manufactured in compliance with various standards, including BS6360, IEC 62561-2, IEC 62305, AS 1768 and UL96. Smooth Weave also available in Aluminium 50 mm² (BWAC50).



| Ordering Code | SCC70 | BWCC35 |
|------------------|-------------------------------------|---|
| Description: | Stranded copper, 70 mm ² | Smooth Weave Copper, 35 mm ² |
| Material: | Copper | Bare or tinned copper |
| Strand diameter: | 2.14 mm | 1.15 mm |
| No. of strands: | 19 | 34 |
| Weight: | 0.62 kg per metre | 0.33 kg per metre |

Section M - LPI® Cable Ties

LPI® Cable ties are designed for securing the HVSC Plus downconductor to structures and mast assembly.



| Ordering Code | SS-CABTIES-L |
|---------------|-----------------|
| Description: | Cable ties |
| Material: | Stainless steel |
| Length: | 520 mm |
| Width: | 7.9 mm |
| Weight | 10 g |

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Section N - LPI® Saddles and Fixings

LPI® Saddles

LPI® SAD FIX are specially designed for securing of HVSC Plus downconductor to structures.



| Ordering Code | SAD FIX |
|-----------------------|----------------------------|
| Description: | Saddles and fixings |
| Material: | Stainless steel, grade 304 |
| Dimension: | 90 mm long, 1.2 mm thick |
| Fixing hole diameter: | 7 mm |
| Weight: | 40 g |



| Ordering Code | SAD FIX-70 |
|-----------------------|--|
| Description: | Saddles to suit 70 mm ² cable |
| Material: | Stainless steel, grade 316 |
| Dimension: | 44 mm long, 1 mm thick |
| Fixing hole diameter: | 7 mm |
| Weight: | 5 g |

LPI® D.C Tape Clip

LPI® D.C Tape Clips are designed for the securing of Copper or Aluminium Tape to structures.



| Ordering Code | FL3DCTC253A |
|-----------------|--------------------------------------|
| Description: | D.C tape clip to suit 25 x 3 mm tape |
| Material: | High strength aluminium alloy |
| Conductor size: | 25 x 3 mm |
| Weight: | 17 g |

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LPI® Square Tape Clamp

LPI® Square tape clamps are designed to allow for the 2- and 4-way routing of copper and aluminium downconductors.



| | |
|----------------------|--|
| Ordering Code | FL4STC253A |
| Description: | Square tape clamp to suit 25 x 3 mm tape |
| Material: | High strength aluminium alloy |
| Conductor size: | 25 x 3 mm |
| Weight: | 78 g |

LPI® Oblong Test Clamp

LPI® Oblong test clamp are designed to allow for the disconnection of copper and aluminium downconductors for testing purposes.



| | |
|----------------------|--|
| Ordering Code | FL4OTC253A |
| Description: | Oblong test clamp to suit 25 x 3 mm tape |
| Material: | High strength aluminium alloy |
| Conductor size: | 25 x 3 mm |
| Weight: | 118 g |

Section O - LPI® Beam Clamp and Cable Support

LPI® Beam clamp and cable support are specifically designed for the securing of the HVSC Plus downconductor to tower legs.



| | |
|-----------------------|--|
| Ordering Code | BEAM CLAMP / CABLE SUPPORT - HVSC |
| Description: | Beam clamp and cable support |
| Material: | Stainless steel, polymer |
| Dimension: | 60 x 60 x 50 mm |
| Fixing hole diameter: | 38 mm |
| Weight: | 180 g |

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Section P - LPI[®] Lightning Strike Recorder

LPI[®] Lightning Strike Recorder (LSR2) is a lightning strike counter. The LSR2 is simply mounted at any location along the downconductor route. Its purpose is to record the number of strikes captured and conveyed by the downconductor.



| Ordering Code | LSR2 |
|------------------------|---|
| Description: | Lightning strike recorder |
| Current sensitivity: | 1500 A 8/20 µs impulse |
| Operating range: | Min. 1500 A and Max. 220 kA 8/20 µs |
| Display: | Mechanical 7 digits display (not re-settable). |
| Dimension: | 100 mm (B) x 100 mm (H) x 55 mm (D) |
| Weight: | 0.56 kg |
| Mounting: | Releasable UV resistant plastic cable ties suitable for up to ø40 mm cable or 50 x 5 mm flat tape |
| Construction: | Polycarbonate enclosure |
| Colour: | Light grey & blue |
| Environment: | IP 67 (IEC 529) |
| Operating temperature: | -15°C to 65°C |

LPI[®] Lightning Strike Recorder Tester

LPI[®] Lightning strike recorder tester is a high-current injection device designed to trigger a reading on an LPI Lightning Strike Recorder (LSR2).



| Ordering Code | LSR TESTER |
|------------------------|---|
| Description: | Lightning strike recorder tester |
| Impulse output: | 2 kA peak simulated lightning impulse |
| Open circuit output: | 55 Volts |
| Time between impulses: | 20 seconds |
| Display: | Red "Testing" LED indicator |
| Dimensions: | 190 mm (L) x 100 mm (W) x 35 mm (H) |
| Mounting: | Portable unit, no mounting required |
| Construction: | Polycarbonate Enclosure, IP 30 rating |
| Colour: | Light grey |
| Weight: | 0.58 kg |
| Working temperature: | -15°C to 65°C |
| Batteries: | 8 x AA 2000 mAh NiMH rechargeable Recharge time up to 16 hours |

TECHNICAL DATA SHEET

Section Q - LPI® Lower Termination Kit

LPI® Lower termination kit provides accessories and tools for the termination of the HVSC Plus lower end to the dedicated lightning earth.



| Ordering Code | LTERMKIT-MK3 |
|------------------|--|
| Description: | Lower termination kit |
| Pack Dimensions: | 270 mm (B) x 100 mm (H) x 40 mm (D) |
| Weight: | 515 g |
| Contents: | 1 x 95 mm crimp lug 1 x waterproofing tape 1 x earth rod clamp 2 x warning labels 1 x insulation friction cutting tool |

Suitable for use with conventional downconductors as required.

Section R - LPI® Denso Tape

Denso Tape is used to waterproof earthing installations and prevent corrosion.



| Ordering Code | DENSO-50mm |
|---------------|---|
| Description: | Waterproofing tape |
| Material: | Synthetic fabric, impregnated and coated with a neutral petrolatum compound |
| Pack: | 50 mm x 10 m |
| Weight: | 800 g |

TECHNICAL DATA SHEET

Section S - LPI® Earthing System LPI® Copper Bonded Earth Rods

LPI® Copper-bonded earth rods are made from high-tensile low-carbon steel and each rod is manufactured by molecularly bonding 99.9% pure electrolytic copper to the low-carbon steel core in accordance with national and international standards such as BS6651, BS7430 and UL467. Threads are rolled onto the rod, ensuring an even copper covering which eliminates the risk of chipping whilst driving.



Other sized rods available.

| Ordering Code | CBER1214 |
|------------------------|----------------------------------|
| Description: | Threaded copper bonded earth rod |
| Material: | Carbon steel bonded with copper |
| Length: | 1.2 m |
| Rod diameter (actual): | 14.3 mm |
| Threaded diameter: | 5/8" UNC |
| Weight: | 1.54 kg |

LPI® Stainless Steel Earth Rods

LPI® Solid stainless steel earth rods are manufactured using 316 grade stainless steel and are highly resistant to corrosion. Stainless steel rods are best used for earthing installations where the problem of galvanic corrosion may take place between dissimilar metals buried in close proximity to each other and where highly corrosive soil conditions exist. All solid stainless steel earth rods manufactured by LPI are supplied with external threads.



Other sized rods available.

| Ordering Code | SSER1215 |
|------------------------|------------------------------------|
| Description: | Threaded stainless steel earth rod |
| Material: | 316 grade stainless steel |
| Length: | 1.2 m |
| Rod Diameter (Actual): | 15.8 mm |
| Threaded Diameter: | 5/8" UNC |
| Weight: | 1.90 kg |

LPI® Coupling for Copper Bonded and Stainless Steel Threaded Earth Rods

Whether connecting rod-to-rod or driving stud-to-rod the high strength copper alloy coupling is counter-bored to protect the earth threads from damage and subsequent corrosion.



| Ordering Code | LEH-58R | LEH-58R-SS |
|---------------|--|--|
| Description: | Coupling for threaded Copper bonded earth rod 5/8" | Coupling for threaded Stainless steel earth rod 5/8" |
| Material: | High strength copper alloy | 316 stainless steel |
| Thread type: | 5/8" UNC | |
| Weight: | 106 g | 113 g |

TECHNICAL DATA SHEET

LPI® Copper Tape

LPI® 25 x 3 mm soft drawn copper tape is manufactured using the latest European developed extrusion technologies. LPI® FL6T253C is a high-quality tape which provides our customers with a guaranteed copper purity of 99.95%. Flat copper tape in comparison to stranded copper cable is considered as the most efficient conductor for the transfer of lightning energy to the ground mass. Flat tape provides greater surface contact with the surrounding soil which assists greatly in the dissipation of the lightning energy.



| Ordering Code | FL6T253C |
|--------------------------|---|
| Description: | Copper tape 25 x 3 mm (soft drawn) |
| Material: | 99.95% Copper |
| Dimension: | 25 (Width) x 3 mm (Thickness) |
| Weight: | 0.67 kg per metre |
| Electrical conductivity: | Minimum 100% I.A.C.S |
| Standard: | BS1432 |
| Tensile strength: | 210 - 250 N/mm ² |
| Package: | Supplied in pancake coil form (50 m per coil) |

LPI® Rod to Tape Clamp Type A

LPI® Rod to tape clamp provides a conductive and mechanically secure connection when installing a lightning protection earth encompassing flat copper tape and copper bonded earth rods.



| Ordering Code | RTC253 |
|-----------------|--|
| Description: | Rod to tape clamp to suit 14-17 mm Dia rod & 25 x 3 mm tape |
| Material: | High strength copper alloy |
| Rod Diameter: | 14-17 mm |
| Conductor size: | 25 x 3 mm |
| Weight: | 120 g |

TECHNICAL DATA SHEET

Section T - LPI[®] Inspection Pits

LPI[®] Inspection pits provide a secure and user-friendly access point for maintenance purposes and the periodical measurement of electrical resistance of a buried earthing system. In order to complete routine measurements of electrical resistance, simply remove the lid from the installed earth pit and connect a lead from the resistance meter to the earthing conductor.



| Ordering Code | EPIT-P |
|---------------|--|
| Description: | Polymer earth pit |
| Material: | Polymer |
| Dimension: | 250 mm (top) x 180 mm (base) x 210 mm (deep) |
| Weight: | 1.9 kg |
| Strength: | Withstand up to 5 tonnes |

Section U - LPI[®] Earthing Compounds
LPI[®] RESLO

LPI[®] RESLO-20 is a low-resistance, non-corrosive, bentonite-based earth enhancing compound which is supplied in easy-to-handle 20 kg bags.



| Ordering Code | RESLO-20 |
|---------------|---|
| Description: | Resistance lowering compound – 20 kg bag |
| Application: | To assist in achieving an earth resistance of less than 10 Ohms |
| Weight: | 20 kg |

LPI[®] SRIM PLUS

LPI[®] SRIMPLUS-20 is a highly conductive, cementitious earth enhancing compound which is supplied in 20kg bags. Designed for use in all soil conditions, SRIM PLUS offers an economical solution to improve and maintain the integrity of any earthing system.

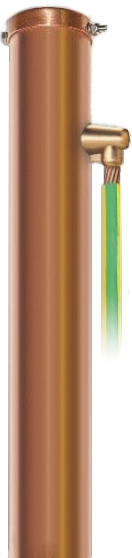


| Ordering Code | SRIMPLUS-20 |
|---------------|--|
| Description: | Highly conductive, cementitious earth enhancing compound – 20 kg Bag |
| Application: | To lower earth electrode system resistance and impedance |
| Weight: | 20 kg |
| Standard: | IEC62561-7, EPA 1311 |

TECHNICAL DATA SHEET

Section V - LPI® Chemical Ground Rod

LPI® Chemical ground rod provides a low-impedance earth to effectively dissipate lightning and electrical fault currents. The chemical ground rod is ideal in situations where space is restricted and normal lightning earths such as radial and grid-type systems cannot be installed.

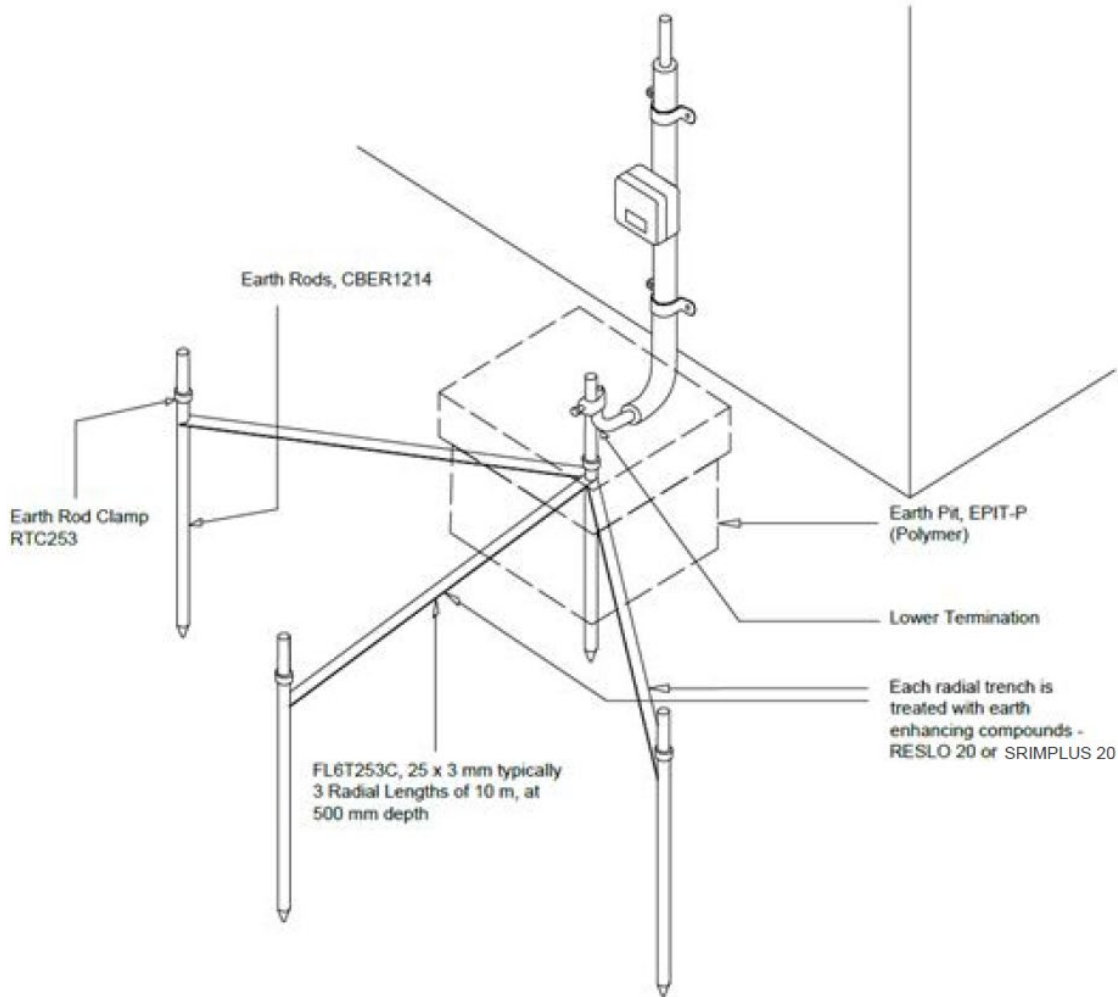


| Ordering Code | CHEMROD-2M | CHEMROD-3M |
|-------------------------------------|---|----------------------------------|
| Length: | 2 m | 3 m |
| Diameter: | 63.5 mm | |
| Copper composition: | 99.9% minimum | |
| Standard: | Australian Standard AS1432 | |
| Melting point: | 1083°C | |
| Specific heat capacity: | 0.385 kJ (kg.K) | |
| Electrical conductivity (Annealed): | 75-90% I.A.C.S. | |
| Wall thickness: | 1.6 mm | |
| Copper: | Hard-drawn | |
| Cap: | Removable type with air breather holes | |
| Drainage holes: | 4.5 mm diameter, provided every 40 cm for the length of the rod | |
| Mineral salts: | Pre-filled from factory with non-hazardous natural electrolytic salts | |
| Pigtail: | 70 mm stranded copper cable, pre-welded from factory to allow for connection to earthing system | |
| Weight: | 12 kg (CHEMROD) 40 kg (RESLO) | 21 kg (CHEMROD) 60 kg (RESLO) |

TECHNICAL DATA SHEET

Recommended Earthing Installation

This type of radial earth is recommended for installation as a lightning protection earth.



ISO 9001 & ISO 14001 Certificate

Lightning Protection International Pty Ltd operates a certified management system that complies with the requirements of AS/NZS ISO9001:2008. ISO 9001 and ISO 14001 certified by BSI under certificate numbers FS603875, EMS641121.



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