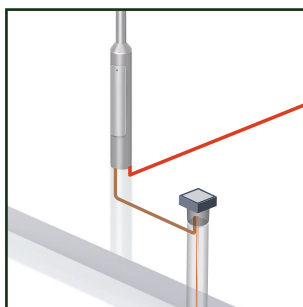
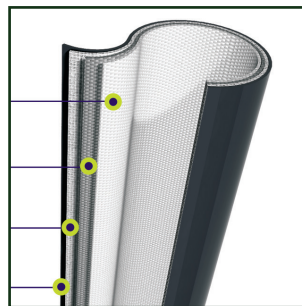


Innovation in Lighting Columns

COMPOSITE LIGHTING COLUMNS
SURGE PROTECTION
EARTHING SOLUTIONS



SOLUTIONS FOR UTILITY LIGHTING ENGINEERS

KINGSMILL INDUSTRIES (UK) LTD

A new name in the lighting industry, Kingsmill Industries (UK) Ltd are pleased to introduce a range of innovative Lighting Columns.

Kingsmill is a leading manufacturer and distributor of Earthing and Lightning Protection products. Whilst we are specialists in the field of Lightning Protection, the manufacturing technology used for our lightweight lightning mast is ideal for the production of Lighting Columns.

Our wealth of knowledge gives us the ability to offer cutting edge product development and unparalleled technical support. We are proud to provide the highest standards of service and customer care without compromising quality or price.

Through our Lightning Protection core activity, Kingsmill can complement the sale of Lighting Columns with our own range of Earthing materials. Additionally, Surge Protection Devices protect LED luminaires and electric vehicle charging points against the secondary effects of lightning activity and transient overvoltages (eg those caused by switching events).

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KINGSMILL
L I G H T I N G C O L U M N S

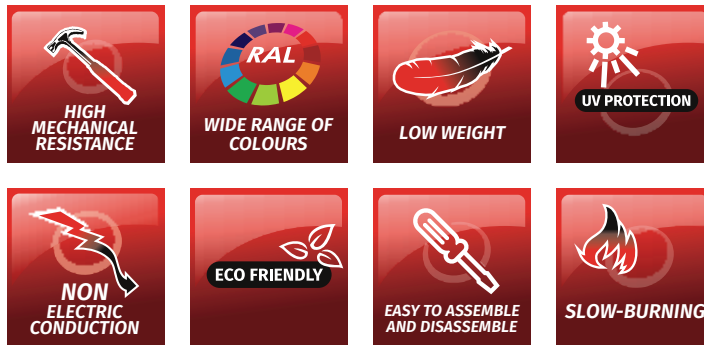


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Kingsmill are proud to introduce a range of *safe, lightweight and durable* Composite Lighting Columns which offer you the ability to customise their design.

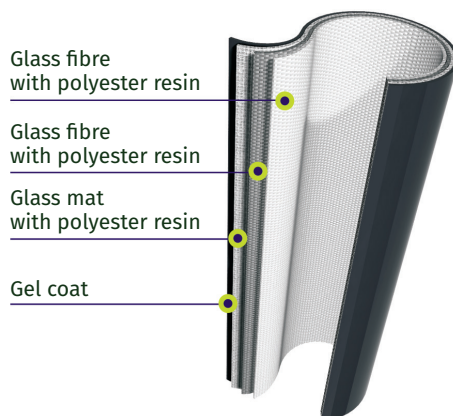
Kingsmill Lighting Columns are lightweight, strong, durable, corrosion resistant, easy to install and 100% recyclable. They comply with BS:EN 40-7.

The columns have limitless capacity for customisation through changing colours and adding graphics, as well as adding internal lighting. They offer a perfect foundation for innovative projects, with potential for electric vehicle charging points, public safety features, solar PV panels, and added intelligence.



ADVANTAGES OF COMPOSITE COLUMNS

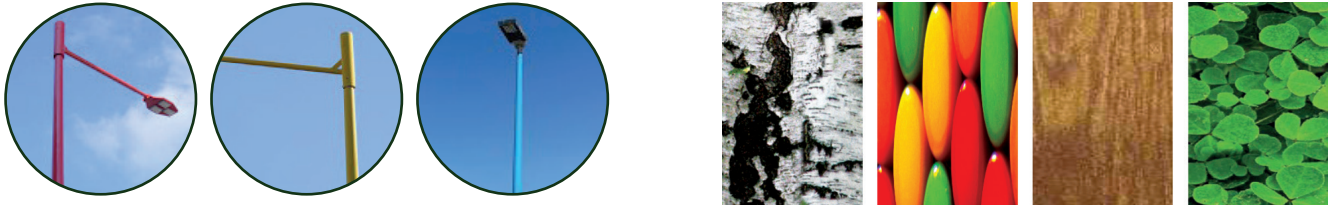
Composite lighting columns have many advantages over conventional metal columns, due to their manufacturing materials and process. Kingsmill columns are constructed from glass fibre polymer with a gel coating protecting the entire column. This produces a lightweight structure that is easy to install and extremely durable, perfect for areas with a high corrosion potential.



AESTHETICS

Unlike traditional steel lighting columns, composite columns offer a wide range of customisation options, not least colour choice. Manufactured as standard to resemble conventional metal columns, the Kingsmill lighting column can be produced in a wide range of colours to suit any aesthetic.

Not only can the columns be supplied coloured, but the Kingsmill lighting column offers the revolutionary possibility to add graphics to the body of the column. With endless possibilities for design, the column offers boundless flexibility and personalisation to suit any environment.



CORROSION RESISTANCE

Kingsmill lighting columns are highly corrosion resistant due to their composite materials and gel coating. This provides a smooth, UV resistant surface that is easy to clean. Dirt, glue residue and graffiti are all easy to remove from the column as acetone solvents don't damage the surface. The high quality materials used in production ensure UV resistance, preventing sun damage to the column and any added graphics.

Due to the fact that the composite column has no metal parts, especially if root mounted, the Kingsmill Lighting Column is rust and corrosion resistant, additionally resisting the effects of road salts, animal urine and traffic pollution. **This leads to a column lifespan of 40+ years.**



BASICPOLE installed in a coastal location. Finished in a sympathetic blue in order to blend into its surroundings.

ELECTRICAL SAFETY

The electrical components inside the column are protected as the column has a reduced dew point, stopping icing and preventing moisture from damaging the internal electrical components. When combined with the non-conductive nature of the column itself, this produces a safe environment for electrical components with minimal risk of electrocution in the event of an electrical fault.

VANDAL RESISTANCE

Kingsmill Lighting Columns are made from composite material. Unlike traditional metal columns they have no scrap value. This acts as a powerful theft deterrent, including of the access door.

The columns are also graffiti and vandal resistant. **Paint and adhesives are easily removed with acetone solvent that will not damage the gel coat.**

Our composite columns resist fire and mechanical damage potentially caused by malicious vandalism.



LOGISTICS

The composite materials used to produce the lighting column result in a much more lightweight structure than a traditional steel pole - an 8 metre column weighs only 50kg.

Columns can be easily handled by two people, reducing the necessity for large installation equipment and shortening the installation times. This in turn vastly reduces the installation cost compared to conventional metal columns.

When combined with the reduced transportation cost and smaller foundations required to mount the columns, the advantages of composite lighting columns over metal poles become clear.



ENVIRONMENT

Manufactured from glass fibre polymer, the Kingsmill Lighting Column is 100% recyclable.

Manufacturing methods also have low CO₂ emissions, resulting in minimal environmental impact.

Additionally, due to the ease of transportation and assembly of the columns, the environmental impact of installing them is also significantly lower than traditional lighting columns.

Since they are made of GFP material, the lighting columns do not cause interference to radio waves, microwaves, radars or other airport infrastructure. This makes them the perfect solution for such projects, minimising the impact of the lighting chosen on necessary infrastructure.



SAFETY TESTING AND RATING

Our composite lighting columns have been fully tested to comply with the BS:EN 12767 passive safety standard. This standard comes in three parts: **SPEED, ENERGY ABSORPTION** and **OCCUPANT SAFETY**.

The safety rating of Kingsmill columns is **70 NE 2** in accordance with BS:EN 12767 passive safety standards.

Tested at speeds of 35km/h and 70km/h, **Kingsmill columns are non-energy absorbing, with an occupant safety level of 2.**

We are also working on certification following testing at speeds of 50km/h and 100km/h. For more information, contact us for an update.

SPEED

All support structures are required to be crash tested at speeds of 35km/h, as well as one of 50, 70 or 100km/h.

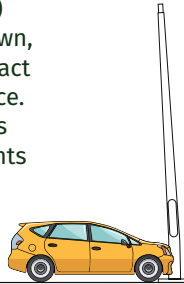
A performance class of 70 is recommended for use on roads in built-up areas, where the speed limit is 40mph or below.

ENERGY ABSORPTION

The extent to which the crash vehicle is slowed by impact with a passive structure:

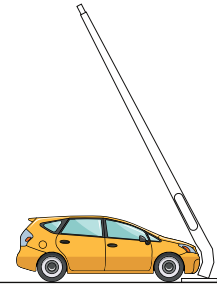
High Energy absorbing (HE)

- will considerably slow down, and generally stop the impact vehicle over a short distance. Risk of secondary collisions is reduced. Vehicle occupants impact severity is usually high.

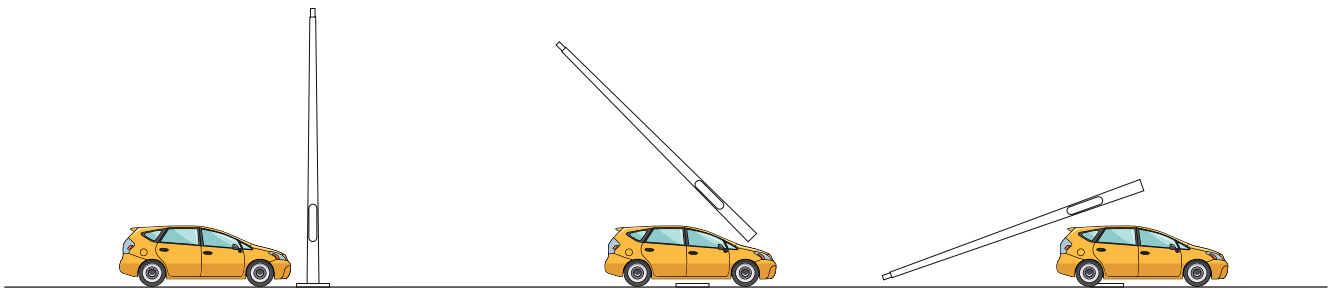


Low Energy absorbing (LE)

- designed to bend in front of the impact vehicle before detaching. Reduces the speed of the impact vehicle less than an HE structure, carrying less risk to vehicle occupants.



Non-Energy absorbing (NE) - structures are intended to shear from their foundation upon impact, lifting over the crash vehicle and allowing it to continue with minimal speed reduction. Vastly reduces the severity of the impact for vehicle occupants, and therefore primary injury risk and vehicle damage. The structure will generally fall within the vicinity of the foundation, making NE structures the recommended class for all-purpose roads and motorways in non-built up areas.



Kingsmill columns are all Non-Energy absorbing (NE) structures

OCCUPANT SAFETY

Occupant safety levels are determined by two risk requirements, from 1 to 4 in increasing safety levels:

Acceleration Severity Index (ASI) - expresses the accident severity for occupants of the impact vehicle.

Theoretical Head Impact Value (THIV) - a calculation of the hypothetical velocity (in km/h) at which a vehicle occupant would hit the occupant compartment of the vehicle (eg hitting the dashboard or steering wheel).

These two values combine to give an overall safety level of 1 to 4. Higher numbers show greater occupant safety. Occupant safety levels from 1 to 3 are recommended for lighting structures in rural and urban areas.



BASICPOLE

Manufactured with high strength parameters and complying with BS:EN 40-7, BASICPOLE columns are available in a wide range of RAL colours.

- High strength parameters
- Comply with BS:EN 40-7
- Easy to assemble
- Available in any RAL colour
- Variety of heights
- Top diameter of 60mm



Passive safety



100% recyclable



Lightweight



PASSIVEPOLE

PASSIVEPOLE is a passive safe composite column. The safety rating of the passivpole is 70 NE 2, as explained on page 5.

- Complies with BS:EN 12767 and BS:EN 40-7
- Passive safety rating of 70 NE 2
- Perfect for roadsides



Passive safety



100% recyclable



Lightweight

DECORPOLE

DECORPOLE incorporates a decorative base, providing an elegant silhouette to blend in with classic architecture.

- Decorative base - provides elegant silhouette
- Available in any RAL colour
- Composite or composite/aluminium material
- LED strips illuminate base

Elegant design



No scrap value



Lightweight



———— All Kingsmill composite Lighting Columns are vandal and fire resistant and easy to clean ————



DESIGNPOLE

DESIGNPOLE offers a ground-breaking opportunity for customisation with the addition of graphic images directly to the lighting column, protected from damage by the outer gel coat. DESIGNPOLE can also be illuminated from within, providing attractive landscaping features and a supplementary light source.

- Ground-breaking customisation - addition of graphic images
- Manufacturing process means the pattern is protected from damage and vandalism
- Potential for internal lighting



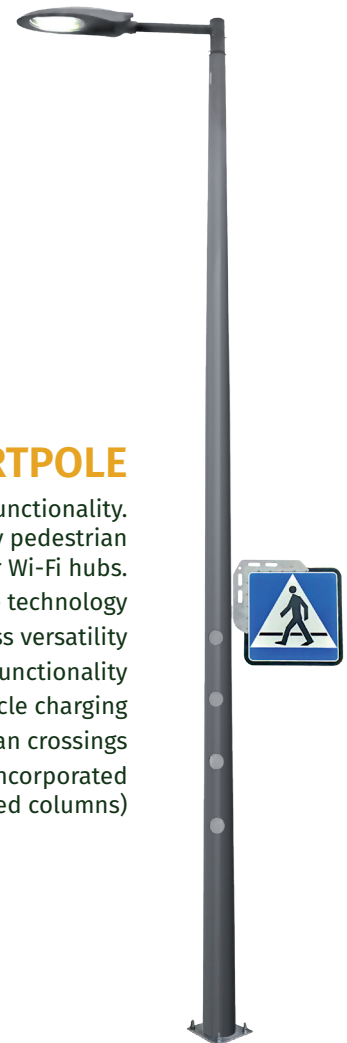
Non-conductive



Lightweight



High mechanical resistance



SMARTPOLE

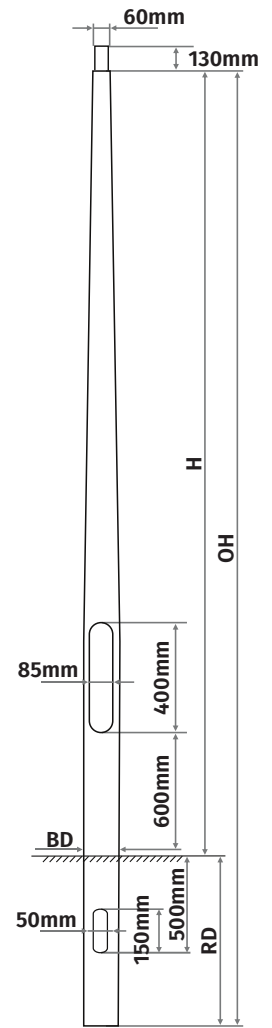
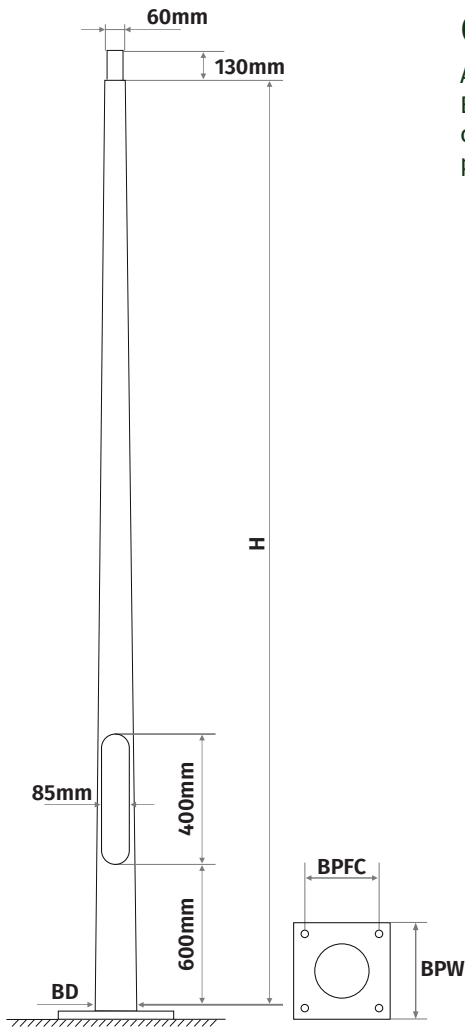
SMARTPOLE offers adaptability and additional functionality. These bespoke columns can be adapted into user-friendly pedestrian crossing points, intelligent public information points or Wi-Fi hubs.

- Innovative technology
 - Endless versatility
- Increased functionality
- Electric vehicle charging
 - Pedestrian crossings
- Solar PV cells can be incorporated (self-contained columns)

— All Kingsmill composite Lighting Columns are vandal and fire resistant and easy to clean —

COLUMN DIMENSIONS

All columns are manufactured to conform with BS:EN 40-7:2002 regulations with root mounted columns manufactured in line with UK standard planting depths, as shown in the table.



Column Height (H) (m)	Base Diameter (BD) (mm)	Overall Height (OH) (m)	Root Depth (RD) (m)	Base Plate		WEIGHT (kg)	
				Width (BPW) (mm)	Fixing Centres (BPFC) (mm)		
3.0	130/150	3.6	0.6	260	200	10	15
4.0	130/150	4.8	0.8	260	200	12	18
5.0	130/150/175	5.8	0.8	260	200	19	24
6.0	150/175	7.0	1.0	260	200	22	26
7.0	175/193	8.2	1.2	400	300	40	55
8.0	193	9.2	1.2	400	300	50	60
9.0	193	10.5	1.5	400	300	59	70
10.0	193	11.5	1.5	400	300	65	75
11.0	193			400	300		80
12.0	193			400	300		85

FLANGE MOUNTED

BOTH VERSIONS

ROOT MOUNTED

ELECTRIC VEHICLE CHARGING

With electric vehicles (EVs) set to increase exponentially in popularity over the next two decades, demand for EV charging points in public places is on the rise. Due to current capacities of existing grid systems and increased earthing requirements it is often preferable to consider combining EV charging points with street lighting columns.

Due to their non-conductive material composite columns are a safer alternative to traditional steel columns when adding EV charging points. Even if there is an electrical fault, there will be no touch potential from the column, thus preventing the risk of electrocution should someone touch the faulty pole.



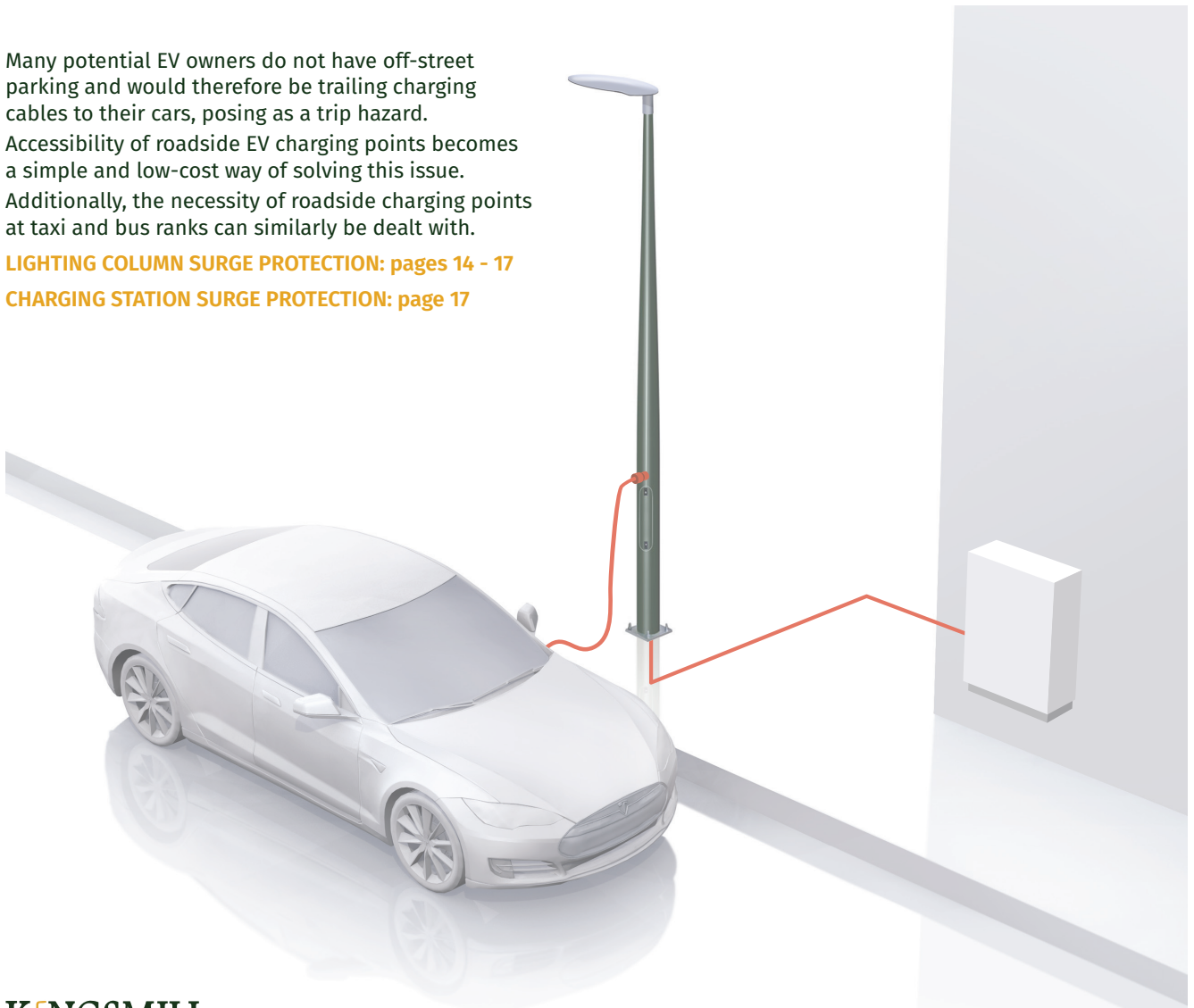
Many potential EV owners do not have off-street parking and would therefore be trailing charging cables to their cars, posing as a trip hazard.

Accessibility of roadside EV charging points becomes a simple and low-cost way of solving this issue.

Additionally, the necessity of roadside charging points at taxi and bus ranks can similarly be dealt with.

LIGHTING COLUMN SURGE PROTECTION: pages 14 - 17

CHARGING STATION SURGE PROTECTION: page 17



SPECIAL APPLICATIONS

Kingsmill lighting columns offer a wide variety of customisation options and innovative applications. Due to their non-conductive properties, they are safe for the addition of many electrical devices without risk to the public. We are happy to work with you to assess the suitability of your devices to be built into the column.

Aesthetic features include:

- Bespoke graphics blend to surroundings
- Any RAL colour finish
- Internal illumination for ambience

Practical features include:

- Wi-fi loudspeaker
- Built-in LED lighting
- Power outlets
- Autonomous power and lighting

Potential applications include:

- Point of interest/public information audio broadcasts
- Pedestrian road/rail crossings



BASICPOLE with black and yellow stripes to improve visibility.



DESIGNPOLE with birch tree bark design, consistent with the aesthetics in the park.



Dark green BASICPOLE, blending with the surroundings. Located in a family amusement park with high footfall, composite poles are the safest choice as they do not conduct electricity.



DESIGNPOLE with incorporated candy design. Perfect for a children's playground due to both the attractive appearance and non-conductive properties of the column.



INTERNAL LIGHTING

DESIGNPOLE incorporating internal lighting as an addition to the main luminaire, showcasing the birch tree design.



BESPOKE GRAPHICS

DESIGNPOLE with graphics showing hop leaves, befitting the local hop industry. Additionally, the luminaire is controlled by an astronomical clock, with internal lighting in place to minimise power consumption overnight.



BESPOKE GRAPHICS

DESIGNPOLE incorporating city emblem and street names into the graphic layer to protect them from corrosion.



AUTOMATED WARNING SYSTEMS

SMARTPOLE crossing installed to improve pedestrian safety. The column incorporates a warning signal, loudspeaker, illuminated sign and warning lights which activate when a pedestrian crosses the road.



AUTOMATED WARNING SYSTEMS

SMARTPOLE crossing installed including traffic lights, speaker and illuminated sign built into the column, designed to improve road safety for children near the local school.



INTERNAL LIGHTING

DESIGNPOLE with internal lighting at a lakeside setting.



AUDIO SYSTEM

DESIGNPOLE located on a beach, chosen for its corrosion resistance, fitted with an audio system. Transmitting and receiving equipment is protected from damage by sea spray within the pole - made possible due to electromagnetic permeability. Includes a PV solar cell to make the system self contained.

COLUMN MOUNTING OPTIONS

Our lighting columns can be installed either directly in the ground (root mounted) or on a flange base. A range of factors can affect the mounting type decision, including wind loading calculations, durability, ease of installation and the need to access the top of the column regularly. We can assist in designing the most suitable column for each application.

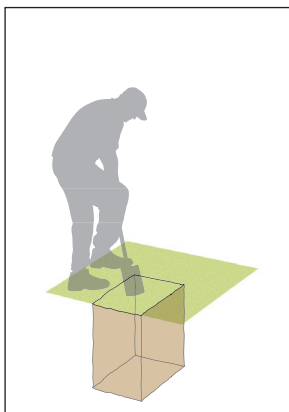
ROOT MOUNTED COLUMNS

Installing a composite lighting column directly into the ground has many advantages:

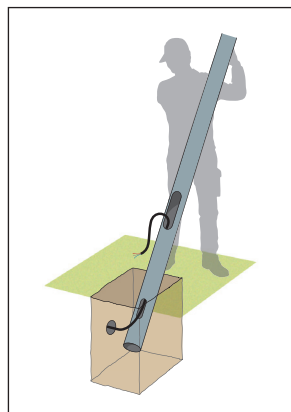
- They do not corrode like steel or aluminium
- There is a low installation cost, with no need for a concrete foundation
- No need for a metal base plate
- Smaller foundation requirement
- Reduced dew point, preventing moisture from affecting contained electrical systems

Without the need for a pre-prepared concrete and metal foundation, there is no risk of electrical conduction to nearby structures or people, making root mounting a great choice for public areas, especially those accessed by children on a regular basis such as parks.

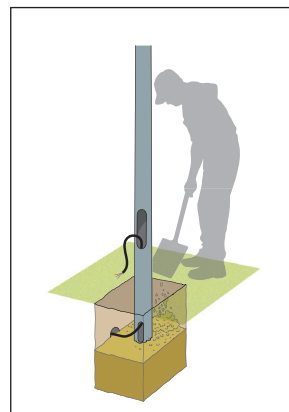
Root mounted columns are installed into a suitably sized hole or socket in the ground, which is then back-filled. Alternatively, they can be installed into a socket prepared in the ground, slightly larger than the column diameter and then back-filled.



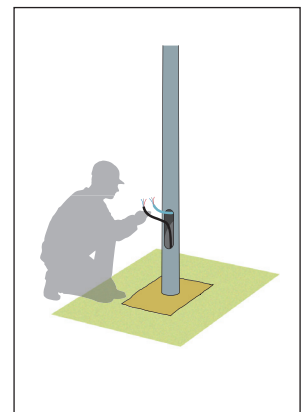
Dig foundation for part of the column mounted in the ground.



Insert the column into the trench.



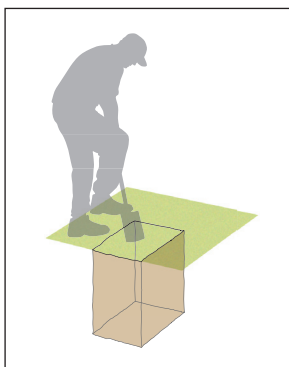
Backfill the trench with mixture of sand and gravel.



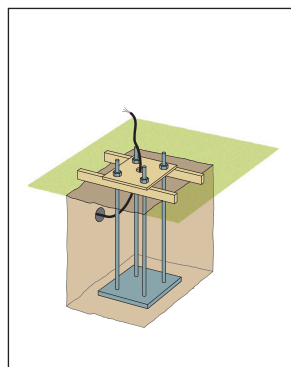
Connection of power wiring and electrical connectors.

FLANGE BASE MOUNTED COLUMNS

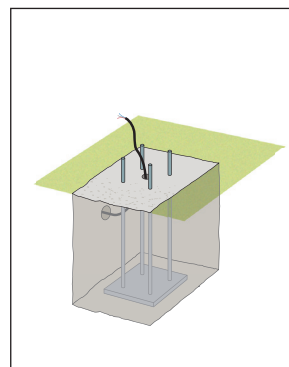
In some areas root mounting is not suitable for lighting columns and a flange base can be used instead. This involves a concrete foundation and hence a longer installation time, but can be particularly useful in built-up areas including rail platforms, multi-storey car parks and parapets.



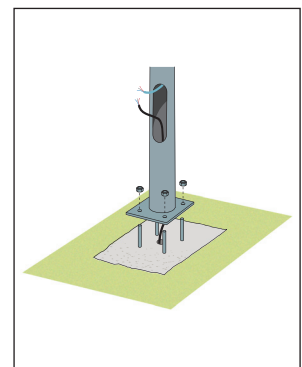
Excavate foundation pit to specified size.



Insert assembled foundation cage and duct from the trench.



Pour concrete to surface level.

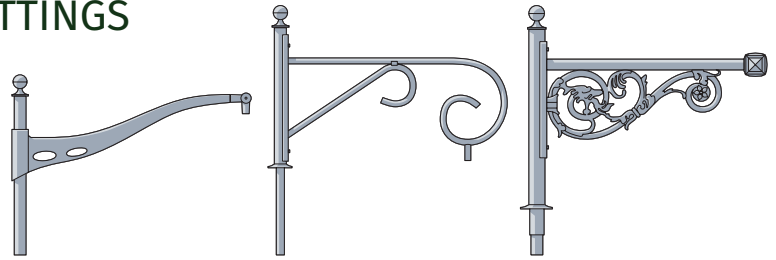


Remove template and install lighting column.

BRACKETS AND LUMINAIRE FITTINGS

Our lighting columns accept all standard brackets and luminaires, with a top diameter of 60mm.

We can source and supply a wide range of brackets and luminaires - the illustrations here are examples from a wide choice of possible brackets. **Contact us for details.**



ORDER CODES



BASICPOLE

Manufactured with high strength parameters, complies with BS:EN 40-7.

Columns are available in a wide range of RAL colours.

COLUMN HEIGHT (m)	PART NO.	
	ROOT MOUNTED	FLANGE BASE
3	KMSKPW3.0	KMSKPF3.0
4	KMSKPW4.0	KMSKPF4.0
5	KMSKPW5.0	KMSKPF5.0
6	KMSKPW6.0	KMSKPF6.0
7	KMSKPW7.0	KMSKPF7.0
8	KMSKPW8.0	KMSKPF8.0
9	KMSKPW9.0	KMSKPF9.0
10	KMSKPW10.0	KMSKPF10.0
11	-	KMSKPF11.0
12	-	KMSKPF12.0

To specify a colour, add the required RAL number as a suffix eg KMSKPW9.0-7032.



DESIGNPOLE

A ground-breaking opportunity for customisation with the addition of graphic images directly to the lighting column.

Can be illuminated from within, providing attractive landscaping features and a supplementary light source.

COLUMN HEIGHT (m)	PART NO.	
	ROOT MOUNTED	FLANGE BASE
3	KMSKPW-D3.0	KMSKPF-D3.0
4	KMSKPW-D4.0	KMSKPF-D4.0
5	KMSKPW-D5.0	KMSKPF-D5.0
6	KMSKPW-D6.0	KMSKPF-D6.0
7	KMSKPW-D7.0	KMSKPF-D7.0
8	KMSKPW-D8.0	KMSKPF-D8.0
9	KMSKPW-D9.0	KMSKPF-D9.0
10	KMSKPW-D10.0	KMSKPF-D10.0
11	-	KMSKPF-D11.0
12	-	KMSKPF-D12.0

To specify a colour, add the required RAL number as a suffix eg KMSKPW9.0-7032. Contact us to order a customised graphic.



DECORPOLE

DECORPOLE incorporates a decorative base, providing an elegant silhouette to blend in with classic architecture.

COLUMN HEIGHT (m)	PART NO.	
	ROOT MOUNTED	FLANGE BASE
3	KMSKPW-ST3.0	KMSKPF-ST3.0
4	KMSKPW-ST4.0	KMSKPF-ST4.0
5	KMSKPW-ST5.0	KMSKPF-ST5.0
6	KMSKPW-ST6.0	KMSKPF-ST6.0
7	KMSKPW-ST7.0	KMSKPF-ST7.0
8	KMSKPW-ST8.0	KMSKPF-ST8.0
9	KMSKPW-ST9.0	KMSKPF-ST9.0
10	KMSKPW-ST10.0	KMSKPF-ST10.0
11	-	KMSKPF-ST11.0
12	-	KMSKPF-ST12.0



PASSIVEPOLE

PASSIVEPOLE is a passive safe composite column.

The safety rating of the passivepole is 70 NE 2.

COLUMN HEIGHT (m)	PART NO.	
	ROOT MOUNTED	FLANGE BASE
3	KMSKPW-P3.0	KMSKPF-P3.0
4	KMSKPW-P4.0	KMSKPF-P4.0
5	KMSKPW-P5.0	KMSKPF-P5.0
6	KMSKPW-P6.0	KMSKPF-P6.0
7	KMSKPW-P7.0	KMSKPF-P7.0
8	KMSKPW-P8.0	KMSKPF-P8.0
9	KMSKPW-P9.0	KMSKPF-P9.0
10	KMSKPW-P10.0	KMSKPF-P10.0
11	-	KMSKPF-P11.0
12	-	KMSKPF-P12.0

To specify a colour, add the required RAL number as a suffix eg KMSKPW9.0-7032.

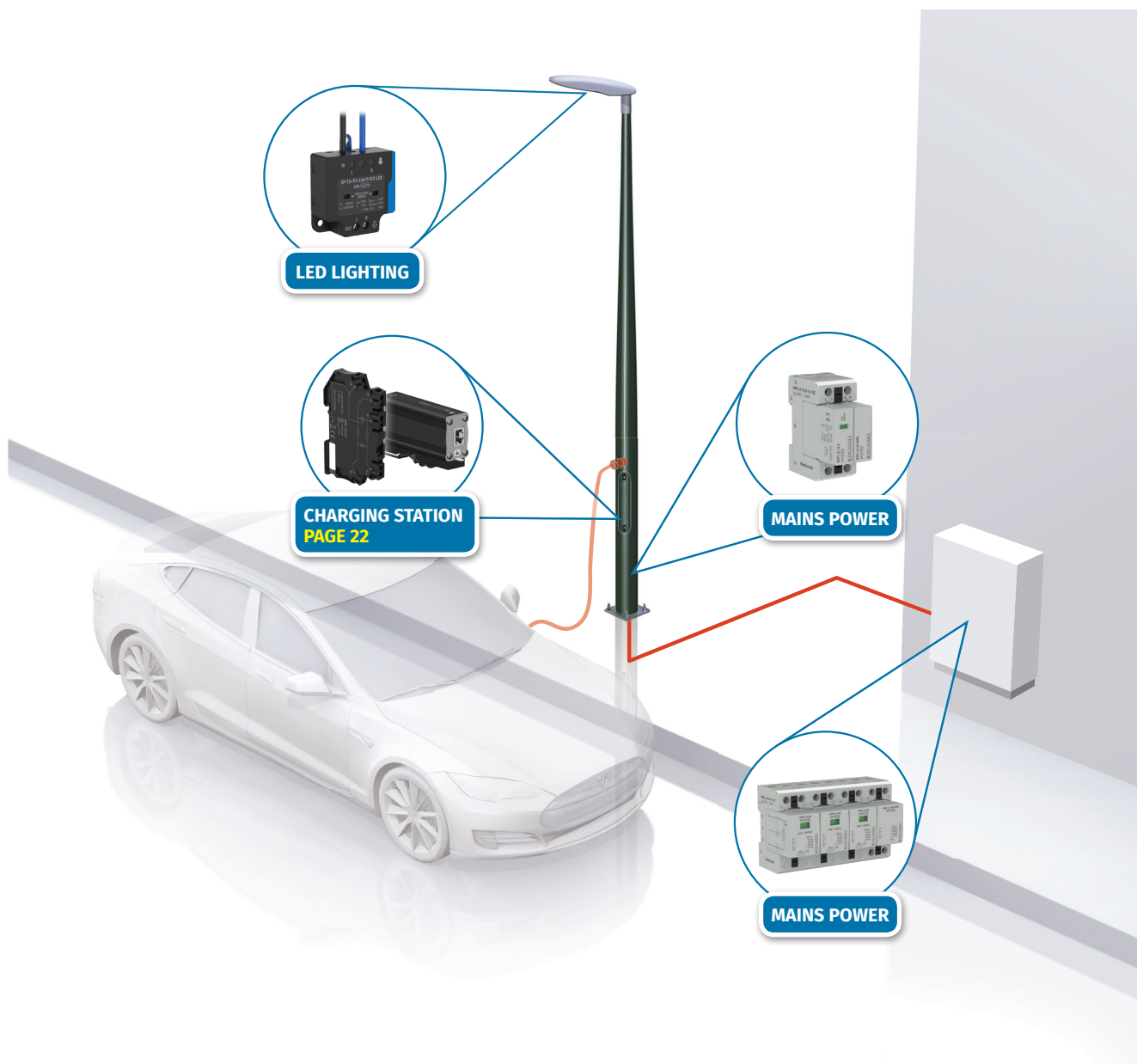
SURGE PROTECTION

PROTECTING ELECTRONIC SYSTEMS FITTED IN LIGHTING COLUMNS

Electrical and electronic systems are susceptible to damage from the indirect effects of lightning strikes and switching events. Transient overvoltages (also known as 'surges') degrade, damage and destroy sensitive circuitry.

Surge Protection Devices (SPDs) provide effective protection against these effects.

This section briefly explains what transient surges are, how they affect lighting columns and how you can specify and fit Kingsmill SPDs.



For more comprehensive information on surge protection, visit www.kingsmillearthing.co.uk.

THE NEED FOR SURGE PROTECTION

Protection of electronic systems is often ignored, yet damage to such systems, caused by lightning, can be catastrophic.

The probability of electronic systems being damaged by lightning is many times greater than that of the installation itself being struck by lightning!

Lightning up to 1km away can damage electronic systems.

The resultant mains borne transients from the secondary effects of lightning can be as high as 6,000 volts and have the capacity to destroy electronic systems. Smaller transients may cause degradation to electronic components and disruption of system performance.

But the threat to electronic systems does not end there. Transient voltages caused by electrical switching are common.



Transient overvoltages (*surges*) are very short duration (*milliseconds*), high voltage (*up to 6kV*) 'spikes' caused by the secondary effects of lightning and electrical switching events.

“The probability of electronic systems being damaged by lightning is far greater than that of the lightning column itself being struck, as lightning strikes up to 1km away can damage electronics inside it.”

PROBLEMS CAUSED BY TRANSIENTS

Damage

This can range from burnt-out circuit boards to impaired operation of components.

Disruption

Disruption to the logic levels of the device rather than physical damage, resulting in data loss, software corruption and unexplained computer crashes.

A severe transient (15,400V according to IEC 60664) can result in serious damage to components and circuit boards. The damage can be obvious or difficult to pinpoint.

Long term exposure to transients (usually from switching) can result in degradation to electronic components, reducing system lifetime.

Transients can result in disruption to the electronic system, causing system downtime and consequential loss (equipment replacement, loss of service and labour costs).

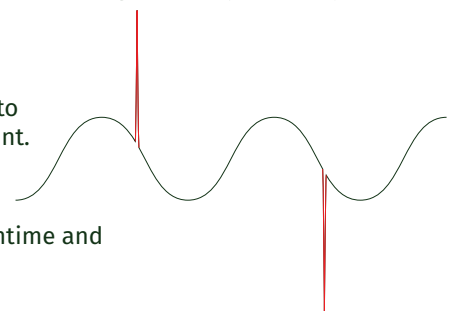


Degradation

Long term exposure to transients can result in invisible degradation of electrical components.

Downtime

Resulting from inoperative systems.



PROTECTION OF LED LIGHTING FROM TRANSIENT OVERVOLTAGE DAMAGE

Public lighting systems are exposed to risks of overvoltages induced by lightning strikes, as well as switching events. Transient overvoltages in extensive installations may reach values that are higher than the specified withstand voltage of the light source (luminaire), thus leading to damage.

According to BS:EN 62305-2, damage can be caused to installations by:

- Direct lightning strike to the installation.
- Lightning strike within the proximity of the installed equipment, switching phenomena in MV and HV grids near to the installation.
- Direct lightning strike to the connected mains supply.
- Lightning strike near to the connected mains supply.

The standards IEC 60364-5-53 Chapter S34 and IEEE C62.41.2 also recommend the fitting of Surge Protection Devices (SPDs) at the power input of an electrical installation.

APPLICATION OF SURGE PROTECTION DEVICES IN LIGHTING INSTALLATIONS

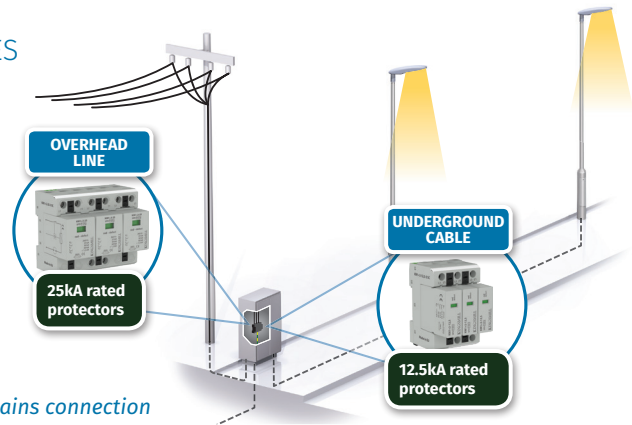
Several factors affect the susceptibility to damage from lightning induced surge voltages and the means by which these can be coupled into the electrical and electronic equipment contained within lighting columns.

LOCATION: CONNECTION OF STREET LIGHTING CABLES TO THE MAINS SUPPLY DISTRIBUTION BOARD

A Combined Type 1 & 2 lightning current and surge arrester is connected to the main distribution board (MDB).

Where the supply is via an overhead line, use 25kA protectors.

Where the supply is by underground cables, use 12.5kA protectors.



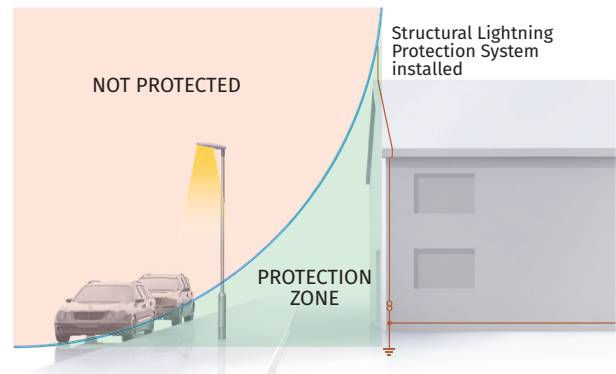
Overhead and underground mains connection

LOCATION: WHERE THE LIGHTING SYSTEM IS PRONE TO THE EFFECTS OF DIRECT LIGHTNING STRIKES

Lighting columns close to buildings with a structural Lightning Protection System (LPS) could be protected by this LPS in accordance with the rolling sphere method of design.

In most cases, due to the height of the lighting column, the installed electrical equipment will not be within this zone. The application of SPDs is recommended in these situations.

CONTACT US FOR INFORMATION RELATING TO STRUCTURAL LIGHTNING PROTECTION AND HOW TO SPECIFY EFFECTIVE SPDs.



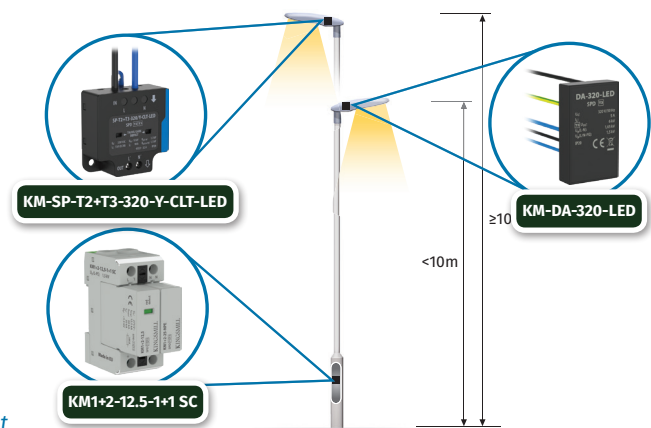
Street lighting adjacent to structural lightning protection

LOCATION: LOCAL PROTECTION OF A LUMINAIRE AND ITS CONTROL GEAR

Street lighting is often supplied from a three-phase cable. At the lighting column only one phase is connected to the luminaire and its control gear.

The distribution board is fitted with a three-phase SPD and the individual lighting column with a single phase SPD.

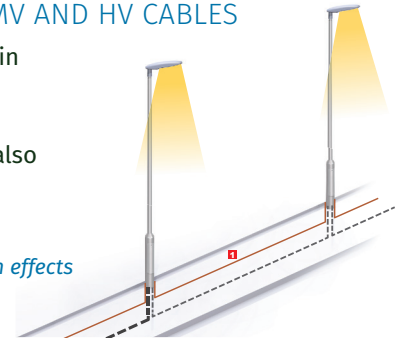
Where the cable length from the SPD mounted in the lighting column base, to the luminaire, exceeds 10m in length, then IEC 61643-12 dictates that an additional SPD is installed at the luminaire.



SPDs on street lighting posts of up to and above 10m height

PROTECTION AGAINST INDUCED VOLTAGES CAUSED BY PROXIMITY TO MV AND HV CABLES

LED systems can also be affected by induced voltages if the street lighting circuit is in close proximity to MV and HV cables. SPDs are also required in such applications. In addition, the installation of a buried earth conductor, earthed at both ends, can also help reduce the effect of voltages induced in this way.



Compensation conductor [1] for the limitation of induction effects

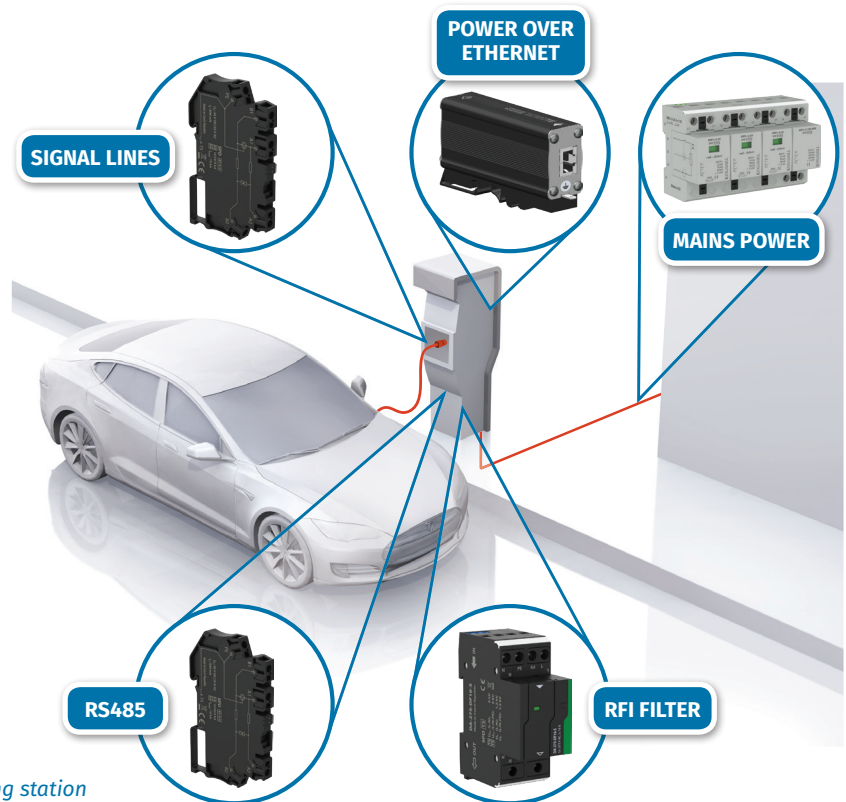
CHARGING STATION PROTECTION

Kingsmill composite lighting columns can house EV charging equipment suitable for use in private applications.

Public EV charging stations include additional electronic equipment such as data and signal lines to enable control systems such as those used in payment systems etc.

WHAT TO PROTECT?

- Rectifier for the DC charging output
- Rectifier for powering the control unit
- Battery - for charging stations with energy accumulation
- Communication between the control unit and the charging connector (eg RS485)
- Signal from the charging connector (eg temperature measurement)
- Communication between antenna and control unit (eg Ethernet) for data cable longer than 1 metre



Placement of SPDs at an electric vehicle charging station

SURGE PROTECTION DEVICES

Kingsmill Surge Protection Devices (SPDs) provide effective protection against surges caused by lightning activity and switching events. Below is a small selection from our extensive range of SPDs . . .

Feature packed

Kingsmill mains SPDs include a number of useful features as standard:

- Remote signalling
- Biconnect terminals
- Reversible installation
- DIN rail mountable
- Optical lifetime status indication
- Lock system for module fixing
- Pluggable modules
- Mechanical coding
- Safety thermodynamic disconnecter



MAINS POWER SURGE PROTECTION DEVICES

Type 1+2 lightning current and surge arrester



A range of high performance Type 1+2 surge arresters. Use in main distribution boards.

Features

- Remote signalling
- Reversible installation
- Biconnect terminals
- Locking pluggable modules
- Optical lifetime status indication

Benefits

- High performance lightning current arrester
- No follow-through current
- No leakage current

Type 2 surge arrester



A range of varistor based Type 2 surge arresters. Use in sub-distribution boards.

Features

- Remote signalling
- Reversible installation
- Biconnect terminals
- Locking pluggable modules
- Optical lifetime status indication

Benefits

- No follow-through current
- No leakage current

For full details of our range of Surge Protection Devices, visit www.kingsmillearththing.co.uk.

MAINS POWER SURGE PROTECTION DEVICES

25kA combined Type 1 & 2 lightning current and surge arresters

Part number	Earthing system	Poles	Phase
KM1+2-25-4+0 SC	TNS (MDB) / TN-C-S (SDB)	4	Three
KM1+2-25-3+1 SC	TT	4	Three
KM1+2-25-3+0 SC	TN-C / TN-C-S	3	Three
KM1+2-25-2+0 SC	TNS (MDB) / TN-C-S (SDB)	2	Single
KM1+2-25-1+1 SC	TT	2	Single
KM1+2-25-1+0 SC	TN-C	1	Single



12.5kA combined Type 1 & 2 lightning current and surge arresters

Part number	Earthing system	Poles	Phase
KM1+2-12.5-4+0 SC	TNS (MDB) / TN-C-S (SDB)	4	Three
KM1+2-12.5-3+1 SC	TT	4	Three
KM1+2-12.5-3+0 SC	TN-C / TN-C-S	3	Three
KM1+2-12.5-2+0 SC	TNS (MDB) / TN-C-S (SDB)	2	Single
KM1+2-12.5-1+1 SC	TT	2	Single
KM1+2-12.5-1+0 SC	TN-C	1	Single



20kA Type 2 surge arresters

Part number	Earthing system	Poles	Phase
KM2-20-4+0 SC	TNS / TN-C-S	4	Three
KM2-20-3+1 SC	TT	4	Three
KM2-20-3+0 SC	TN-C	3	Three
KM2-20-2+0 SC	TNS / TN-C-S	2	Single
KM2-20-1+1 SC	TT	2	Single
KM2-20-1+0 SC	TN-C / TN-S / TT	1	Single



10kA Type 3 surge arresters

Part number	Earthing system	Poles	Phase
KM3-10-3+1 SC	TN-C / TN-S / TN-C-S / TT	4	Three
KM3-10-1+1 SC	TN-C / TN-S / TN-C-S / TT	2	Single



2kA Type 3 surge protection module

Part number	Earthing system	Poles	Phase
KM3-275-A	TN-C / TN-S / TN-C-S / TT	N/A	Single



LED STREET, INDUSTRIAL AND SECURITY LIGHTING SURGE PROTECTION DEVICES

Type 2 + 3 surge arrester - LED lighting



Type 2 + 3 surge arrester for protection of LED lights.
Install close to protected equipment in low voltage power circuits.

Complies with EN 61643-11 (for surge protection devices).

Features

- Compact size
- Fault signalling by supply interruption

Benefits

Simple installation in space limited applications.

Type 3 surge arrester - LED lighting



Surge arrester for protection of LED lights.
Install close to protected equipment in low voltage power circuits.

Complies with EN 61643-11 (for surge protection devices).

Features

- Compact size
- Fault signalling by supply interruption

Benefits

Simple installation in space limited applications.

Type	Description	Part number
Type 3 surge arrester	Surge arrester for protection of LED lights	KM-DA-320-LED
Type 2+3 surge arrester	Surge arrester for protection of LED lights	KM-SP-T2+T3-320/Y-CLT-LED



CHARGING STATION SURGE PROTECTION DEVICES

Type 3 surge arrester with RFI filter



Protect low voltage power lines against the impact of surge voltage and RF disturbance.

Locate as close as possible to the equipment to be protected.

Features

- Remote signalling
- Reversible installation
- Biconnect terminals
- Locking pluggable modules
- Optical lifetime status indication

Benefits

- No follow-through current
- No leakage current

Type	Description	Part number
Type 3 surge arrester with RFI filter	Protect low voltage power lines against surge voltages and RF disturbance	KM-DA-275-DF-16-S

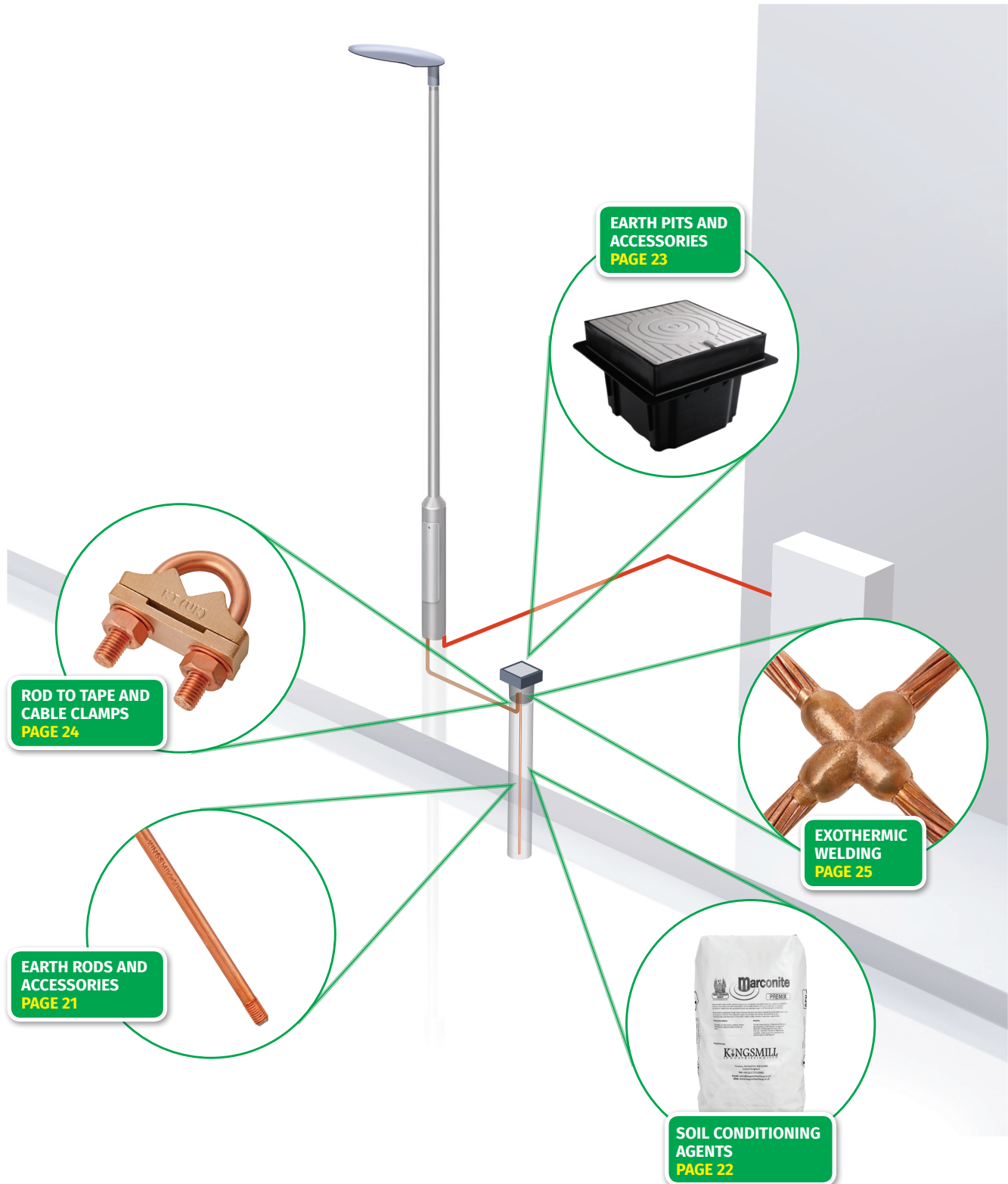


EARTHING SOLUTIONS

Whether you are using composite or metal columns, the electrical installation, including distribution boards, needs earthing.

The most commonly used Earthing products are illustrated below and described on pages 21 - 25.

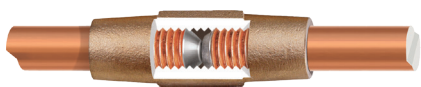
Further details can be found at www.kingsmillearthing.co.uk and in our comprehensive catalogue.



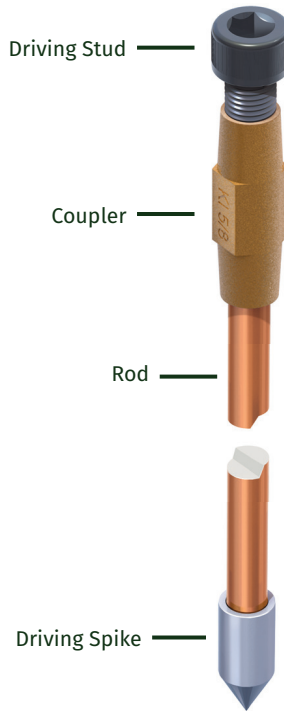
EARTH RODS AND ACCESSORIES

Copperbond Earth Rods, deep driven, usually provide the most cost effective earth system.

They are made from a low carbon, high tensile strength (minimum 600n/mm²) steel core with a coating of 99.9% pure electrolytic copper, that has been molecularly bonded to the steel core.



Kingsmill **Earth Rod Couplings** connect multiple **Earth Rods** together. They are counter-bored and of sufficient length to ensure that **Earth Rod** threads are enclosed within the coupling.



Copperbond Earth Rods

NOMINAL DIA. (in : mm)	LENGTH (mm)	THREAD SIZE UNC (in)	PART NO.
3/8 : 9	1200	3/8	ERCB1004
5/8 : 16	1200	5/8	ERCB1604
5/8 : 16	1500	5/8	ERCB1605
5/8 : 16	1800	5/8	ERCB1606
5/8 : 16	2400	5/8	ERCB1608
5/8 : 16	3000	5/8	ERCB1610
3/4 : 20	1200	3/4	ERCB2004
3/4 : 20	1500	3/4	ERCB2005
3/4 : 20	1800	3/4	ERCB2006
3/4 : 20	2400	3/4	ERCB2008
3/4 : 20	3000	3/4	ERCB2010

UL listed Copperbond Earth Rods

NOMINAL DIA. (in)	LENGTH (mm)	THREAD SIZE UNC (in)	PART NO.
5/8	2400	5/8	ERCB1608UL
5/8	3000	5/8	ERCB1610UL
3/4	2400	3/4	ERCB2008UL
3/4	3000	3/4	ERCB2010UL

Material: Pure copper molecularly bonded to a steel core
Copper Thickness: 254 microns (minimum)



Couplings (Copperbond Earth Rods)



DESCRIPTION	PART NO.
Rod Coupling 5/8" UNC	COUP16
Rod Coupling 3/4" UNC	COUP20

Material: High Copper Content Alloy



DESCRIPTION	PART NO.
16mm Rod Coupling 5/8" UNC (HEX)	COUP16HEX
20mm Rod Coupling 3/4" UNC (HEX)	COUP20HEX

Material: High Copper Content Alloy



DESCRIPTION	PART NO.
5/8" Rod Coupling	COUP16S

Material: Silicon Aluminium Bronze

Driving Studs are suitable for repeated use with power hammers.

Driving Spikes enable rods to be easily driven into hard/compacted ground and are internally threaded for screwing directly onto the **Earth Rod**.

Driving Studs



DESCRIPTION	PART NO.
16mm Driving Stud 5/8" UNC	DRST16
20mm Driving Stud 3/4" UNC	DRST20

Material: High Tensile Steel with a socket-head cap screw

Driving Spikes

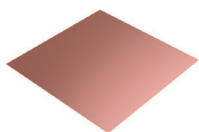


DESCRIPTION	PART NO.
16mm Driving Spike 5/8" UNC	DRSP16-CB
20mm Driving Spike 3/4" UNC	DRSP20-CB

Material: Case Hardened Steel

Solid Copper Plates

Solid Copper Earth Plates are used as part of an earthing network. A long lasting solution where it is not possible to use deep driven **Earth Rods**.



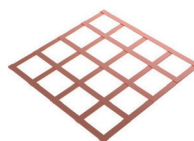
LENGTH x WIDTH (mm)	THICKNESS (mm)	PART NO.
600 x 600	1.5	SCEP615
600 x 600	3.0	SCEP630
900 x 900	1.5	SCEP915
900 x 900	3.0	SCEP930

Material: Copper

OTHER SIZES ARE AVAILABLE UPON REQUEST

Lattice Copper Earth Mats

Lattice Copper Earth Mats are used where step potential could cause problems.



LENGTH x WIDTH (mm)	PART NO.
600 x 600	LCEM630
900 x 900	LCEM930

Material: Copper
OTHER SIZES ARE AVAILABLE UPON REQUEST

They are a lower cost option to the solid plates and when used with **Marconite**[®], they provide a long lasting earth solution.

Pre-Fabricated Earth Mats

Kingsmill can provide a bespoke service for large **Earth Mats**, which can be rolled-out on site.

Please contact us with your requirements.

SOIL CONDITIONING AGENTS

Bentonite - Moisture Retaining Clay



Bentonite is used as a backfill to reduce soil resistivity.

When mixed with water, it swells to several times its dry volume. This moisture content can be retained for a considerable time and further moisture can be absorbed during rainfall etc.

MATERIAL	WEIGHT (kg)	PART NO.
Granulated Moisture Retaining Clay	25	BENT01
Powdered Moisture Retaining Clay	25	BENT02

Marconite® - Granulated Conductive Aggregate



Marconite® is a granulated conductive medium designed to replace the conventional aggregate in concrete and thereby provide a permanent medium with good electrical conductivity and high strength.

It can provide a permanent solution to problems in electrical/constructional situations.

Marconite® concrete is touch dry within hours, but it will be several days before it is fully cured.

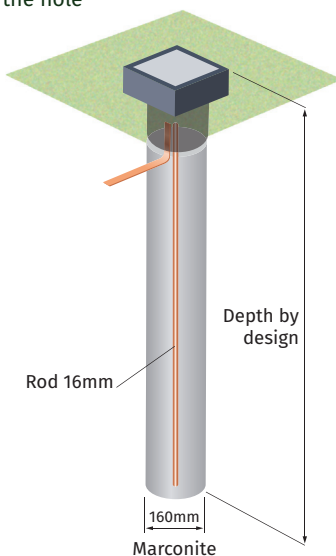
Unlike Bentonite, **Marconite®** does not rely on the presence of moisture in the ground to be effective.

MATERIAL	WEIGHT (kg)	PART NO.
Marconite Concrete (pre-mixed)	25	MARCONITE-01
Marconite Concrete	25	MARCONITE-02

Marconite application examples ...

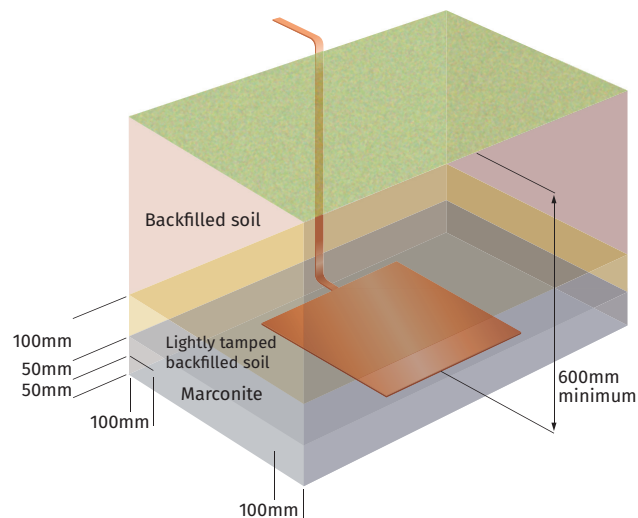
Earth Rod installation

- Drill a hole 10 x diameter of the earth rod
- Centre the earth rod in the hole and lower it to the bottom
- Mix Marconite® into a slurry and pour into the hole



Trench installation (plate/mat)

- Excavate a trench larger, all round, than the plate dimensions
- Mix the Marconite® into a slurry and pour into the trench
- Connect the earth plate/mat to the connecting conductors
- Place the earth plate/mat on top of the first layer of Marconite® mix
- Cover the earth plate/mat with a second layer of Marconite® mix
- Backfill the trench with native soil



CONCRETE INSPECTION PITS



Kingsmill **Concrete Inspection Pits** are suitable for load rating to 4,500kg and are suitable for most types of Earthing and Lightning Protection installations.

The **Concrete Inspection Pit** protects the Earth Rod connection and makes it available for inspection. The **Concrete Inspection Pit** can have an Earth Bar fitted diagonally in slots provided for multiple conductor connections.

Concrete Inspection Pit



DESCRIPTION	PART NO.
Concrete Inspection Pit	CPIT



Inspection Pit Earth Bars



DESCRIPTION	PART NO.
5 hole Earth Bar	PBAR5
7 hole Earth Bar	PBAR7

Material: Copper

DESCRIPTION	PART NO.
3 hole Tinned Earth Bar	PBAR290
5 hole Tinned Earth Bar	PBAR316

Material: Tinned Copper

Lightweight Concrete Inspection Pit



DESCRIPTION	PART NO.
Lightweight Inspection Pit	CPIT/LW

Lightweight Pit Earth Bars



DESCRIPTION	PART NO.
5 hole Earth Bar	PBAR5/LW
7 hole Earth Bar	PBAR7/LW

Material: Copper

Concrete Pits (c/w lifting eye/brass plate)



DESCRIPTION	PART NO.
Pit c/w lifting eye	CPIT-LE
Pit c/w brass plate	CPIT-BP
Pit c/w lifting eye & brass plate	CPIT-LE-BP

PLASTIC INSPECTION PITS



The **Plastic Inspection Pit** protects the **Earth Rod** connection and makes it available for inspection. The **Plastic Inspection Pit** can have up to 3 **Earth Bars** fitted in the slots provided for multiple connections.

Paving can be laid up to the lid edge without an unsightly concrete filler surround. Installation instructions are printed on the side. Will withstand 6,000kg load when installed correctly.

Features a lockable lid, using a screwdriver or special key to release the locking mechanism.

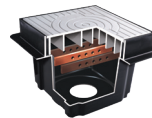
Plastic Inspection Pit



DESCRIPTION	PART NO.
Plastic Inspection Pit	PPIT-K

Material: Polypropylene (body), GRP (lid)

Earth Bars (for Plastic Inspection Pit)



DESCRIPTION	PART NO.
5 hole Earth Bar	PBAR5PPK
7 hole Earth Bar	PBAR7PPK

Material: Copper

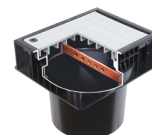
Light Duty Plastic Inspection Pit



DESCRIPTION	PART NO.
Light Duty Plastic Inspection Pit	PPIT-G

Material: Polypropylene

Earth Bars (for Light Duty Plastic Inspection Pit)



DESCRIPTION	PART NO.
5 hole Pit Bar	PBAR5/PP
7 hole Pit Bar	PBAR7/PP

Material: Copper

ROD CLAMPS

Rod To Tape and Rod to Cable Clamps are designed to join various sizes of conductor tape to the earth electrode. The clamps have a high resistance to corrosion and are mechanically strong to ensure a lasting connection.

Rod To Tape Clamps (A Type)



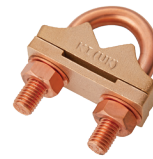
ROD DIAMETER (in : mm)	BOLT MATERIAL	PART NO.
5/8 : 16 - 3/4 : 20	Stainless steel	CLA2530
5/8 : 16 - 3/4 : 20	Stainless steel	CLA2510
5/8 : 16 - 3/4 : 20	Stainless steel	CLA4012
5/8 : 16 - 3/4 : 20	Stainless steel	CLA5060
5/8 : 16 - 3/4 : 20	Phosphor bronze	CLA2530/PB
5/8 : 16 - 3/4 : 20	Phosphor bronze	CLA2510/PB
5/8 : 16 - 3/4 : 20	Phosphor bronze	CLA4012/PB
5/8 : 16 - 3/4 : 20	Phosphor bronze	CLA5060/PB

Rod To Tape Clamps (U Bolt Single Plate Type)



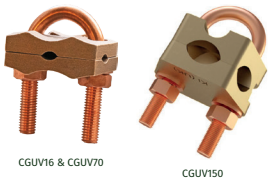
ROD DIAMETER (in : mm)	PART NO.
5/8 : 16	CLUB16
3/4 : 20	CLUB20
1 : 25	CLUB25
1 1/4 : 30	CLUB30
2 : 50	CLUB50

Rod To Tape Clamps (U Bolt Double Plate Type)



ROD DIAMETER (in : mm)	PART NO.
5/8 : 16	CLUB16-2
3/4 : 20	CLUB20-2
1 : 25	CLUB25-2
2 : 50	CLUB50-2

Rod to Cable Clamps (GUV Type)



CGUV16 & CGUV70

CGUV150

ROD DIAMETER (in : mm)	CONDUCTOR RANGE (mm ²)	PART NO.
5/8 : 16 - 3/4 : 20	16 - 70	CGUV16
5/8 : 16 - 3/4 : 20	70 - 185	CGUV70
5/8 : 16 - 3/4 : 20	150 - 300	CGUV150

Rod To Cable Clamps (JAB Type)



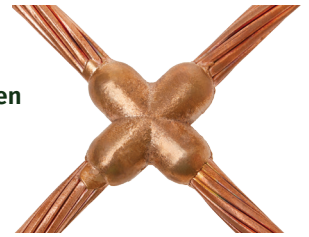
ROD DIAMETER (in : mm)	BOLT MATERIAL	PART NO.
5/8" : 16mm	Stainless steel	CLJA16
3/4" : 20mm	Stainless steel	CLJA20
5/8" : 16mm	Phosphor bronze	CLJA16/PB
3/4" : 20mm	Phosphor bronze	CLJA20/PB

EXOTHERMIC WELDING

EXOTHERMIC WELDING

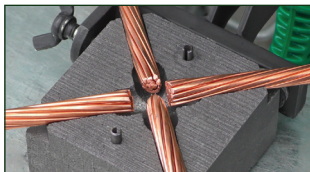
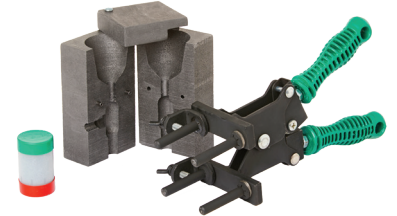
KingsWeld exothermic connections are permanent, maintenance-free welds that will not loosen overtime or deteriorate with age. The connections' current carrying capability is equal to or greater than that of the conductors being joined.

Exothermic welding is the best choice where safety, reliability, current carrying capacity and longevity are critical.



Making a KingsWeld connection

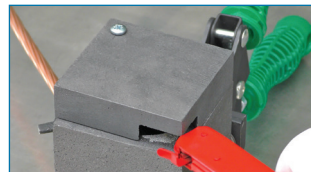
The exothermic reaction occurs between copper oxide and aluminium powder (in the weld metal) creating molten super-heated copper and an aluminium oxide slag. An ignition spark applied to the weld metal causes an exothermic reaction, melting and separating the metals. The aluminium rises to the top of the connection creating a slag leaving the molten copper to flow around the joint, creating the weld.



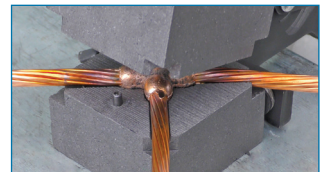
1 Position conductors in the mould



2 Pour weld metal into the mould crucible



3 Use flint gun to ignite starting powder



4 Completed weld can be removed in 20 seconds

Advantages of exothermic welding

- 1 Current carrying capacity of the connection is greater than or equal to that of the conductor
- 2 Lower electrical resistance than a mechanical connection
- 3 Does not deteriorate with age or loosen over time
- 4 Withstands repeated high current surges without deterioration
- 6 Does not require an external power source
- 7 Weld copper, copper alloys, copper bonded steel, stainless steel etc
- 8 Quick and easy to install
- 9 Exceptional corrosion resistance due to a very high copper content

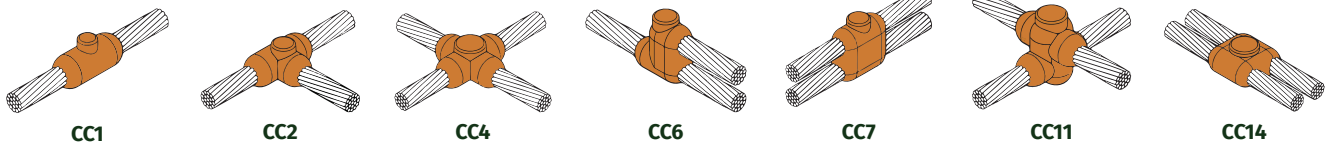


This adds up to a superior connection when compared to mechanical or pressure type (crimp) connectors.

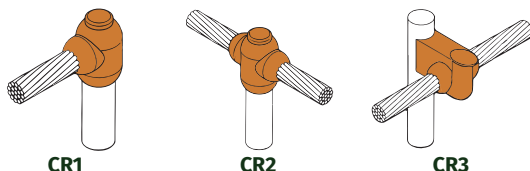
The KingsWeld exothermic connection is the best choice, especially in safety critical environments where reliability, longevity and current carrying capacity are paramount.

Joint type examples . . .

CABLE TO CABLE



CABLE TO GROUND ROD



This is just a small example of the joint types available. Contact us for details or visit www.kingsmillearthings.co.uk/kingsweld.



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